

**Title: Rapid Evidence Assessment (REA) on Neurodiversity  
and Violent Extremism**

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## 1. Abstract

The multiple serious adverse sequelae of violent extremism have prompted efforts to identify factors that may influence individuals to engage in such behaviour. The majority of this work has focused on identifying factors that may increase the risk of extremist offending and comparatively little effort has focused on protective factors that may discourage individuals from participating in violent extremism (Marsden & Lee, 2022).

Previous publications in research and the media have postulated a link between autism and violent extremism (terrorism) and, collectively, this has led to a suspicion that the presence of autism may increase the risk of violent extremism. The aim of this paper was to establish the findings from the research in order to establish if any such link exists and, if so, clarify in what ways autism and other neurodiverse conditions may influence people to engage or disengage in terrorism.

A Rapid Evidence Assessment (REA) was conducted to undertake a thorough review of the literature in this area. 26 studies were found to meet the criteria for inclusion. This paper discusses the findings and makes recommendations for future research and practice.

## 2. Introduction

The purpose of this REA was to answer the following questions:

1. What is the prevalence of Neurodiversity in Violent Extremist Cohorts?
  - Age/gender/socio-economic status
2. What is known about online recruitment and radicalisation of Neurodiverse Cohorts?
  - Are these processes discernible to close contacts?
  - Is there any evidence that neurodiverse people are specifically targeted by extremist groups for recruitment purposes?
3. What is the prevalence of neurodiversity in the violent extremist cohort compared to the broader community?
4. Are neurodiverse individuals who become involved in violent extremism more likely to be lone actors or identify with a group?
5. Do people with neurodiversity present any different requirements in relation to counter-terrorism threat/risk assessment, intervention or support strategies?
6. Do pathways to engagement in violent extremism differ for neurodiverse individuals in terms of behavioural indicators?

Although the REA commenced with the intention to answer the above questions in relation to the broad range of neurodiverse conditions, it rapidly became evident that there was no evidence relating to non-autism related neurodiverse conditions and violent extremism. For example, a direct

search for papers relating to Attention Deficit Hyperactivity Disorder (ADHD) – a common neurodiverse condition – and violent extremism, did not produce any that could answer the aforementioned questions. For this reason, in the current REA, neurodiversity will be addressed with a focus on autism.

For each of the above questions, the published evidence will be reviewed and a summary presented, followed by a discussion of the published evidence informed by the clinical forensic subject matter expertise of the authors.

According to the Diagnostic and Statistical Manual, Fifth Edition –Text Revision (APA, 2022), Autism Spectrum Disorder (299) is characterised by:

- A) Persistent deficits in social communication and social interaction across multiple contexts.
- B) Restricted, repetitive patterns of behaviour, interests, or activities.
- C) Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).
- D) Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.
- E) These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

The diagnosis should note whether the person has Autism Spectrum Disorder ‘with or without accompanying intellectual impairment’. Furthermore, categorisation also attends to the severity of autism with the DSM-5 describing this as being in a range from: Level 1 (requiring support); Level 2 (requiring substantial support); Level 3 (requiring very substantial support). Historically a range of terms have been used to describe people with Autism, such as ‘Autism Spectrum Disorder [ASD], ‘Autism Spectrum Condition [ASC], ‘Aspergers’ and ‘High Functioning Autism’. These terms may be used interchangeably throughout this REA in line with the terms used in the studies identified.

According to Al-Attar (2016, 2018, 2019, 2020, 2022), whilst there is no causal link between autism and terrorism and no link between the two in the general population, for those with autism who are drawn to terrorism, aspects of autism may contextually link to the individual’s pathway to terrorism. Al-Attar (2018) proposed that facets of autism can contribute to ‘push’ and ‘pull’ factors that shape an individual’s pathway to terrorist offending (Aho, 1988; Altier et al., 2017; RAN, 2016). Specifically, these were identified as: circumscribed interests; rich vivid fantasy amidst a backdrop of

impaired social imagination; need for order, rules, rituals, routine and predictability; obsessionality, repetition and collecting; social interaction and communication difficulties; cognitive styles; and sensory processing (Al-attar, 2018, 2020). In addition, it is recommended that an individualised case formulation approach is used to identify if and how facets of ASD contribute to push and pull factors (Al-Attar, 2018, 2019, 2020, 2022).

Walter, Leonard, Miah and Shaw (2020) adopted a qualitative method of semi-structured interviews of 34 participants (N=22 professionals and N=12 young people with autism between the ages of 14-19), to explore the vulnerabilities that autism may create towards extremism in young people. It should be noted that none of the young people in the study were convicted terrorists or known extremists. The paper identified that participants highlighted striking a balance between not assuming interests were ideologically driven and that autism in itself is not a risk factor for radicalisation, on the one hand, and recognising that facets and characteristics of autism may increase vulnerability, on the other.

Thus, it is noted that having a diagnosis of autism does not, by itself, adequately explain how someone proceeds along the path toward terrorism. However, for those who are vulnerable to extremism, aspects of autism should be considered within the formulation. What is also notable is that the aforementioned studies are theoretical in that they have not included data from individuals at risk of extremism or radicalisation. Thus, in what way autism contributes to risk of extremism and radicalisation and how this should be reduced is empirically unclear.

### **3. Methodology**

#### *Search strategy*

An initial search was completed on the Cochrane Library to determine no previous review on the topic had been completed. A Rapid Evidence Assessment was conducted following the standards by the Centre for Evidence-Based Management (CEBMA; Barends, Rousseau, & Briner, 2017). A REA is similar to a systematic review in that it is a method used to identify all relevant studies on a specific topic as comprehensively as possible using a systematic approach based on explicit inclusion and exclusion criteria. The benefit of this approach is that it is transparent, verifiable and reproducible (Barends et al, 2017). A REA adopts the same methodology as a systematic review in that it follows a 12 stage process. While this methodology is a part of the systematic approaches, it makes concessions when compared to a full systematic literature review, such as excluding unpublished research.

To ensure the quality of the REA, it was completed following the standards set out by the Centre for Evidence-Based Management (CEBMA; Barends et al., 2017). A PECO research protocol was used firstly to support the development of a relevant search string and a pilot review was conducted to assess the content before selecting the most appropriate databases to search. PECO stands for:

- Population of Interest
- Exposure (Risk Factor) being considered
- Comparator (what the risk factor is being compared to)
- Outcome(s)

Based on the pilot searches the databases used included: EBSCO; OVID; SCOPUS; PsycInfo; Pubmed; ProQuest; and Google Scholar Central databases. The search applied the following filters:

1. Scholarly journals, peer reviewed
2. Articles in English
3. Human

Within the pilot search a range of search string combinations were trialled and recorded based on the relevance and number of articles retrieved. The search terms used included: (neurodivers\* OR autis\* OR asperg\*) AND (radical\* OR terror\* OR extremis\* OR recruitment\* OR incel\* OR Mass\* OR Murder\*) AND (adolescen\* OR adult). Throughout the process reference lists of articles were monitored and potential articles already known to the researchers were included. This reduced the potential for publication bias.

A further direct search for the following terms (ADHD\* OR attention deficit hyperactivity disorder\*) AND (radical\* OR terror\* OR extremis\* OR recruitment\* OR incel\* OR Mass\* OR Murder\*) AND (adolescen\* OR adult) was conducted because even though the prior search term included the term 'neurodiverse' all of the resulting papers related to autism. The direct search including the term ADHD yielded only one relevant paper which looked at mass murderers in Germany whereby it was noted that 'most' in Cluster 3 (n=14) were diagnosed with 'depression or anxiety disorder, addiction or ADHD' (Peter et al, 2019). Therefore no conclusions can be drawn in relation to ADHD and mass murder due to the lack of clarity regarding comorbid diagnoses and this being based on a single study with a small sample size.

## Study Eligibility

While completing the PECO research protocol inclusion and exclusion criteria were adhered to using the following criteria to ensure only studies that address the research parameters were included (see Table 1).

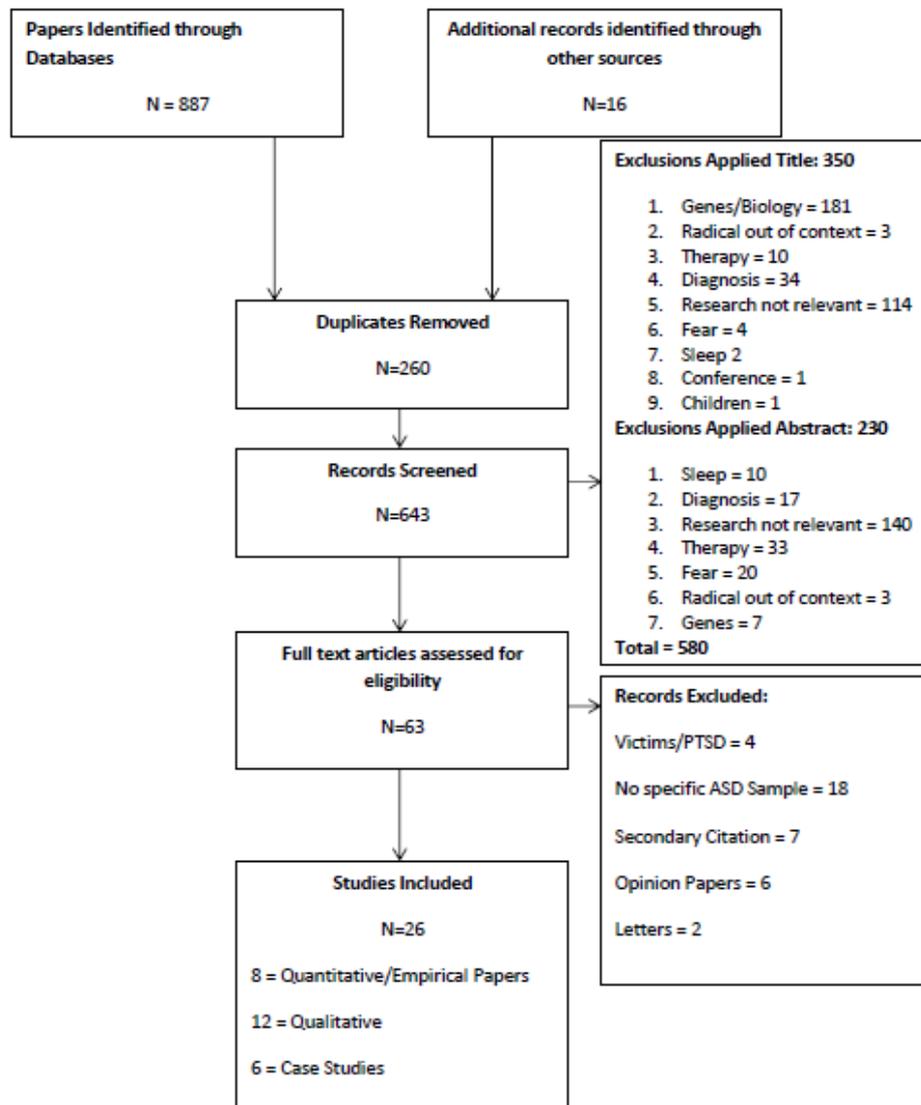
*Table 1: Inclusion and Exclusion Criterion*

	Inclusion	Exclusion
Population	Male and Female Over the age of 13 People with neurodiversity	Children aged 12 and under
Exposure	Radicalisation Terrorism Extremism Online recruitment	Focuses solely on victim factors
Context/Language	English Worldwide Community and offending samples	Published in other languages
Outcomes	Frequency/Severity of behaviour Detection of vulnerability Reduction in Risk Improved intervention/support	Behaviour indicated that it could be considered a different type of offence
Type of publication	Peer reviewed Individual Studies identified from reviews Primary and Secondary Data	Literature reviews Book Chapters Opinion papers Unpublished studies or dissertations
Date restrictions	None	

## Selection of studies

The final systematic search retrieved 903 articles. Duplications were identified using title and abstract comparisons and were removed. Additional articles from other sources were then added, before completing a title review of each study to assess whether they met the immediate inclusion/exclusion criteria. Those which did not meet the inclusion criteria were excluded. A similar review was conducted using the abstracts of the remaining articles and those that did not meet the criteria were removed. Those studies where it was unclear as to whether they could be confidently excluded or where it appeared inclusion criteria were met were subject to a full text review (n = 63). After a thorough full-text review, 37 studies were excluded. Throughout the screening process, a second reviewer was given a random sample and feedback received. Figure 1 provides a flowchart outlining the stages of the selection of studies.

Figure 1 – Flowchart outlining the study selection process



### Quality Appraisal of Studies

26 studies met the criteria for inclusion. This consisted of 7 quantitative (cross-sectional designs), 1 Systematic Review, 12 qualitative studies and 6 case studies. Due to the mixed methodology between studies a range of appraisal tools were used. This included the Critical Appraisal Skills Programme (CASP) qualitative checklist (CASP, 2018), the CASP cohort study checklist (CASP, 2018) and the Appraisal tool for Cross-Sectional Studies (AXIS) (Downes et al., 2016). Appraisals were completed by one of the authors and shared with a second author who acted as reviewer to ensure quality in the assessments, as recommended in the the Centre for Evidence-Based Management (CEBMA; Barends, Rousseau, & Briner, 2017).

Following the guidelines by Barends, Rousseau, and Briner (2017), the screening of papers was established following a two-fold approach. First, all included studies were classified based on the six levels of appropriateness (Shadish, Cook, & Campbell, 2002; Petticrew & Roberts, 2008) that assess a study's validity. Levels range from "AA", representing the so-called "gold standard" (Barends, Rousseau, & Briner, 2017, p. 17) with systematic reviews or meta-analyses of randomized control trials, to the lowest level of appropriateness "E", representing case studies, case reports, and other anecdotal data. Secondly, methodological quality was assessed using the Cohort Study Checklist by the Critical Appraisal Skills Programme (CASP; 2018). The 12-item tool guides the assessor systematically through the appraisal, enabling critical reflection of each study's results. Items include the appraisal of the research question and the recruitment process, amongst other aspects. Depending on the tally of methodological weaknesses, the appraised studies were downgraded a certain number of levels (e.g. two weaknesses result in the downgrading of one level, three in two levels, etc.; Barends, Rousseau, & Briner, 2017).

All studies were retained in the review to reduce bias, however the quality assessments allowed weighting to be given to the findings drawn from particular studies. Inter-rater reliability [IRR] between ratings was assessed (Hallgren, 2012) to be 0.8 (scores between 0.75-0.9 are classified as good) therefore IRR was rated as good.

#### *Data extraction*

Due to the number of included studies ( $n=26$ ), each one was assigned a reference number (e.g. [1]) that allowed easier identification throughout data extraction. These reference numbers can be found in Table 2 and will be used throughout the remainder of this review. All studies were reviewed several times; this ensured all relevant data to the research question was extracted.

#### *Analysis*

Through the data extraction process, it was identified that there were discrepancies in findings across studies. It was therefore decided that a narrative synthesis approach would be used to analyse and compare the studies (Popay et al., 2006). In summary, the process of narrative synthesis firstly involved one of the authors organising the characteristics and main findings from each study. This step provided a preliminary synthesis of the data and the opportunity for the lead reviewer and second reviewer to further familiarise with the data. Idea mapping and thematic analysis was then utilised alongside another the lead reviewer and second reviewer to explore findings within and between the studies. Through this process findings were clustered together and grouped into appropriate sub-themes. These sub-themes were then subject to further exploration

and placed into over-arching themes. Qualitative textual descriptions were then completed to summarise and explain findings (see Appendix 4 for further information).

*Table 2 - Final List of Papers Included with Methodological Appropriateness Classification System (Berrends et al., 2017)*

Paper ID	Author, Year and Title	Quality Appraisal Level (AA-E)	
1	Walter, F., Leonard, S., Miah, S., & Shaw, J. (2021). Characteristics of autism spectrum disorder and susceptibility to radicalisation among young people: a qualitative study. <i>The journal of forensic psychiatry &amp; psychology</i> , 32(3), 408-429.	D	Interview
2	Bhui, K., Otis, M., Silva, M. J., Halvorsrud, K., Freestone, M., & Jones, E. (2020). Extremism and common mental illness: Cross-sectional community survey of White British and Pakistani men and women living in England. <i>The British Journal of Psychiatry</i> , 217(4), 547-554.	D	Survey
3	Speckhard, A., Ellenberg, M., Morton, J., & Ash, A. (2021). Involuntary Celibates' Experiences of and Grievance over Sexual Exclusion and the Potential Threat of Violence Among Those Active in an Online Incel Forum. <i>Journal of Strategic Security</i> , 14(2), 89-121.	E	Survey
4	Corner, E., & Gill, P. (2015). A false dichotomy? Mental illness and lone-actor terrorism. <i>Law and human behavior</i> , 39(1), 23.	D	File Data
5	Moskalenko, S., González, J. F. G., Kates, N., & Morton, J. (2022). Incel Ideology, Radicalization and Mental Health: A Survey Study. <i>The Journal of Intelligence, Conflict, and Warfare</i> , 4(3), 1-29.	E	Survey
6	Speckhard, A., & Ellenberg, M. (2022). Self-reported psychiatric disorder and perceived psychological symptom rates among involuntary celibates (incels) and their perceptions of mental health treatment. <i>Behavioral Sciences of Terrorism and Political Aggression</i> , 1-18.	E	Survey
7	Jaki, S., De Smedt, T., Gwózdź, M., Panchal, R., Rossa, A., & De Pauw, G. (2019). Online hatred of women in the Incels. me forum: Linguistic analysis and automatic detection. <i>Journal of Language Aggression and Conflict</i> , 7(2), 240-268.	E	Online data
8	Daly, S. E., & Reed, S. M. (2022). "I Think Most of Society Hates Us": A Qualitative Thematic Analysis of Interviews with Incels. <i>Sex Roles</i> , 86(1), 14-33.	E	Interview
9	Sturup, J. (2018). Comparing serial homicides to single homicides: A study of prevalence, offender, and offence characteristics in Sweden. <i>Journal of Investigative Psychology and Offender Profiling</i> , 15(2), 75-89.	E	File Data
10	Weenink, A. W. (2015). Behavioral problems and disorders among radicals in police files. <i>Perspectives on terrorism</i> , 9(2), 17-33.	D	File Data
11	Allely, C. S., Minnis, H., Thompson, L., Wilson, P., & Gillberg, C. (2014). Neurodevelopmental and psychosocial risk factors in serial killers and mass murderers. <i>Aggression and Violent Behavior</i> , 19(3), 288-301.	E	File Data
12	Dinesson, K. E. (2022). (Un) reasonable excuses—On R v Dunleavy, R v Copeland, and Section 58. <i>The Modern Law Review</i> , 2022 (1).	E	File Data

13	Palermo, M. T. (2013). Developmental disorders and political extremism: a case study of Asperger syndrome and the neo-Nazi subculture. <i>Journal of Forensic Psychology Practice</i> , 13(4), 341-354.	E	File Data
14	Faccini, L., & Allely, C. S. (2016). Mass violence in individuals with Autism Spectrum Disorder and Narcissistic Personality Disorder: A case analysis of AB using the "Path to Intended and Terroristic Violence" model. <i>Aggression and Violent Behavior</i> , 31, 229-236.	E	File Data
15	Little, R., Ford, P. and Girardi, A. (2021), "Online self-radicalisation: a case study of cognitive vulnerabilities for radicalization to extremism and single actor terrorism", <i>Journal of Intellectual Disabilities and Offending Behaviour</i> , Vol. 12 No. 3/4, pp. 112-123. <a href="https://doi.org/10.1108/JIDOB-03-2021-0006">https://doi.org/10.1108/JIDOB-03-2021-0006</a>	E	File Data
16	Faccini, L. and Allely, C.S. (2017), "Rare instances of individuals with autism supporting or engaging in terrorism", <i>Journal of Intellectual Disabilities and Offending Behaviour</i> , Vol. 8 No. 2, pp. 70-82. <a href="https://doi.org/10.1108/JIDOB-11-2016-0022">https://doi.org/10.1108/JIDOB-11-2016-0022</a>	E	File Data
17	Langman, P. (2015). The enigma of AL's mind and motivations for murder. <i>The Journal of Campus Behavioral Intervention</i> , 3, 1-11.	E	File Data
18	Allely, C. S., Wilson, P., Minnis, H., Thompson, L., Yaksic, E., & Gillberg, C. (2017). Violence is rare in autism: when it does occur, is it sometimes extreme?. <i>The Journal of Psychology</i> , 151(1), 49-68.	E	File Data
19	Allely, C. S., & Faccini, L. (2019). Clinical profile, risk, and critical factors and the application of the "path toward intended violence" model in the case of mass shooter DR. <i>Deviant Behavior</i> , 40(6), 672-689.	E	File Data
20	White, S. G., Meloy, J. R., Mohandie, K., & Kienlen, K. (2017). Autism spectrum disorder and violence: Threat assessment issues. <i>Journal of Threat Assessment and Management</i> , 4(3), 144.	E	File Data
21	Percich, A. (2021). Supreme Gentlemen or Radicalized Killers: Analyzing the Radicalization Paths of Involuntary Celibate Killers and the Role of the Online Incel Forums. <i>Doctoral dissertation, Georgetown University, ProQuest Publishing, August, 2021.</i>	E	File Data
22	Rozdilsky, J. L., & Snowden, E. (2021). The 2018 Toronto Van Attack: Understanding the Disaster by Looking at Vulnerability, Tactics, and Motives. <i>Canadian Journal of Emergency Management Vol 1 No 1 (2021).</i>	E	File Data
23	Hewitt, S. (2021). "One-man war": a history of lone-actor terrorism in Canada, 1868-2018. <i>Canadian Network for Research on Terrorism, Security and Society (TSAS), 2021, pp1-68.</i>	E	File Data
24	Vermeulen, F., van Leyenhorst, M., Roex, I., Schulten, N., & Tuzani, N. (2022). Between Psychopathology and Ideology: Challenges and Practices in Interpreting Young Extremists Experiencing Mental Illness in the Netherlands. <i>Frontiers in Psychiatry</i> , 2022, Vol 12, p1-6). <a href="https://doi.org/10.3389/fpsy.2021.790161">https://doi.org/10.3389/fpsy.2021.790161</a>	E	File Data
25	Corner, E., Gill, P., & Mason, O. (2016). Mental health disorders and the terrorist: A research note probing selection effects and disorder prevalence. <i>Studies in Conflict &amp; Terrorism</i> , 39(6), 560-568.	E	File Data
26.	Faccini, L. (2016). The application of the models of autism, psychopathology and deficient Eriksonian development and the path of intended violence to understand the Newtown shooting. <i>Archives of Forensic Psychology</i> , 1(3), 1-13.	E	File Data

## 4. Results

### *Key Characteristics of the Studies*

Of the 26 studies, sample sizes ranged between 1 [13, 14, 15, 17, 19, 22, 26] and 618 [2]. Studies were published between 2013-2022, with 72% published in the past five years. The majority of studies (73%) used data obtained from file information or information online pertaining to people convicted of terrorism acts. Only 4 studies [2, 3, 5, 6] used survey data. None of the individuals in these survey study samples were known to have convictions for terrorism nor did the survey ask about intention to act. Three of these papers [3, 5, 6] used the same data set. Two studies [1, 8] used interviews but neither of these included people convicted of terrorism. Study 1 interviewed staff working with people with autism and Study 8 interviewed people who identified as incels. Study 10 contained data from the records of people considered to be jihadi travellers or at risk of engaging in this behaviour. However, 0% of the 26 studies included data directly reported by people convicted of terrorism offences, nor those with autism who had engaged in terrorism. Only one study [2] consisted of females but it was unclear if any of these identified as having autism and the study explored attitudes towards extremism and not intention to act. None of the studies explored interventions.

### *Quality of studies*

Using the classification system of Shadish, Cook & Campbell (2002) and Petticrew & Roberts (2006) studies were rated from Level AA (expected to have a high level of trustworthiness) to Level E (having a high risk of bias). Based on this 22 studies were rated at Level E [the lowest level] with only 4 studies [1, 2, 4, 10] meeting Level D. Primary weaknesses related to the studies using case studies and drawing on file information meaning findings could not be generalised [11, 12, 13, 14, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26]. Other weaknesses related to poor diagnostic criteria for autism being used [2,3, 4, 5, 6, 21, 25] and a lack of acknowledgement that the clients in these case studies were also noted to have co-existing conditions such as intellectual disability, personality disorder and mental illness being present in the cases being discussed [2, 3, 4, 5, 6, 9, 11, 14, 16, 18, 19, 25]. In accordance with the principle implemented by Judge Molloy [21] the names of the individuals cited in the case studies of the papers will not be used. This is to avoid reinforcing a 'desire for notoriety' [21] and instead the initials only will be used where necessary.

### *Narrative Synthesis*

Narrative synthesis was used to explore the seven overarching themes and sub-themes. The themes, sub-themes and their associated studies are found in Table 3.

Table 3 – Over-arching themes and Sub-themes

Theme	Theme Title	Subtheme	Study Numbers
1	What is the prevalence of Neurodiversity in Violent Extremist Cohorts?	- Age/gender/socio-economic status	[2, 3, 4, 5, 6, 9, 10, 11]
2	What is known about online recruitment and radicalisation of Neurodiverse Cohorts?	- Are these processes discernible to close contacts? - Is there any evidence that neurodiverse people are specifically targeted by extremist groups for recruitment purposes	[1, 13, 14, 15, 19, 21]
3	What is the prevalence of neurodiversity in the violent extremist cohort compared to the broader community?		[2, 3, 5, 6, 4, 9, 10, 11, 18, 25]
4	Are neurodiverse individuals who become involved in violent extremism more likely to be lone actors or identify with a group?		[4, 11, 12, 13, 14, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26]
5	Do people with neurodiversity present any different requirements in relation to counter-terrorism threat/risk assessment, intervention or support strategies?		[1, 3, 5, 6, 7, 8, 9, 12, 13, 15, 16, 19]
6	Do pathways to engage in violent extremism differ for neurodiverse individuals in terms of behavioural indicators?		[1, 3, 5, 6, 7, 9, 12, 13, 14, 15, 16, 17, 19, 21, 23, 25, 26].
7	Recommendations		[1, 9, 13, 14, 16, 18]

**Theme 1 - What is the prevalence of Neurodiversity in Violent Extremist Cohorts?**

Eight papers referred to the prevalence of neurodiversity in violent extremism cohorts [2, 3, 4, 5, 6, 9, 10, 11].

*Indirect Proxies of Violent Extremism & Autism*

Sympathy for Violent Protest and Terrorism (SVPT) was explored in a sample of 618 UK men and women aged 18-45 [2]. Autism and personality disorder scores were not associated with SVPT.

SVPT was more common in those with major depression with dysthymia, anxiety or PTSD. SVPT were shown by 15.1% of the White British and 8.1% of the Pakistani groups. SVPT were significantly more common in lifetime alcohol drinkers, tobacco users, illicit drug users and in those with a criminal conviction. Younger people, single people and those born in the UK more often expressed SVPT. Gender, religion, religious attendance, education level, political engagement, life events, discrimination, social capital and social support were not associated with SVPT. However, this paper measured 'autism' using self-report on the AQ-10. This is a 10 item self-report measure for autism which has been found to have poor reliability and research has shown that it is not a psychometrically robust measure of autism in non-clinical samples from the general population (Taylor et al., 2020). Furthermore, the study did not explore the difference between SVPT and intention to act. In effect, the sample was neither extremist nor violent extremist in legal terms, and instead was from the general population.

#### *Involuntary Celibates (incels)*

Three other studies [3, 5, 6] explored the prevalence of self-reported autism in a sample of members of an online incels (involuntary celibates) forum with 20,000 registered users. 271 respondents (male) and 1 respondent, who preferred not to answer about their gender, completed the 68 question survey where participation was rewarded with the option to win a monetary prize. Participants in the study were asked if they had an ASD diagnosis [6] with 18.38% stating they did. Additionally, 38.6% of the incel survey respondents reported a depression diagnosis and 37.13% of the survey respondents endorsed having a formal anxiety diagnosis [6]. However, the authors did not clarify if the people with autism had co-existing anxiety or depression. Participants were also asked to respond to a single question on a 5 point Likert scale regarding the 'intensity' to which they experienced 'symptoms of autism spectrum disorder'. The scale for this is not provided in the paper, which reported that 24.6% rated themselves as 4 or 5 out of 5 [3]. However, the scale was reported in more depth [6] using the same data set, whereby 'severity' was measured [6] with a rating of 1 = not at all to 5 = very much whereby participants' self-reported intensity of autism-spectrum traits averaged at  $M=2.57$  [5]. This places the mean score for participants slightly above (2.57) the mid-point (2.5). Using the same data set [5] the authors reported that 199 participants out of 274 (74%) reported experiencing some autism-spectrum traits. This is not consistent with the results in the other papers [3, 6], which states that 24.6% self-report ASD traits from the same data set. This appears to be due to how the different authors have coded the Likert scale from 1-5. Authors in the other papers using the same cohort [3,6] only included respondents who rated themselves as 4 or 5 whereas this paper include participants who rated 'some' traits (thus anyone who rated themselves as 2-5) on the scale. This scale was only one single item and the term 'intensity' and what would

constitute 'symptoms' of autism was not defined for participants thus it is unknown what symptoms the respondents were considering.

64.3% of participants reported the presence of depressive symptoms, 59.6 % reported the presence of anxiety symptoms, 47.8 % reported the presence of suicidal ideations (compared with 3.8% of millennials in a large, nationally representative study of American adolescents and adults (Twenge et al., 2019)), and 27.9% reported the presence of symptoms of posttraumatic stress disorder [6]. Again, none of the studies [3,5,6] provide any data on whether people with autism also had co-occurring mental health conditions. No data is provided on whether respondents who rated themselves as having autism traits experienced any intent to act illegally [3, 5, 6]. Self-reported intensity of autism spectrum traits was significantly associated with agreement that the forum had made the respondent feel violent and misogynistic [6].

The research found that two separate factors existed in relation to incels, one related to incel ideology, the other on radical attitudes and intentions. The two factors were not strongly correlated, suggesting that incel ideology does not predict radical attitudes or radical intentions [5]. The study found that a history of being bullied and diagnosed with autism correlated significantly with Radicalism but did not correlate with ideology. Conversely, having been persecuted as an incel and having a diagnosis of anxiety were significant predictors of ideology but not of Radicalism. Finally, while self-reported depression and self-reported autistic traits correlated with both ideology and radicalization, self-reported depression was a better predictor of ideology than of radicalism, and self-reported autism was a better predictor of radicalism than of ideology.

In summary, 3 studies [3,5, 6] analysed the same data set of 172 participants over the age of 18. Whilst this is a good sample size, it is small in comparison to the 20000 users of the forum. Thus, it is unclear if the high prevalence of self-reported autism reflects that people with autism are more likely to respond to online surveys with a financial reward. The authors noted that approximately 3.6% of male adults in the U.S. suffer from ASD. This is in contrast to the rate of diagnosed ASD in the sample of incels in this study (18%). Rates of undiagnosed ASD have been found to be about 25% higher than the rate of diagnosed autism (Wiggins et al., 2019). Together with the estimated rate of diagnosed ASD (Dietz et al., 2020), this projects to the total of about 7% in the general population having both diagnosed and undiagnosed ASD [5]. The prevalence of autism in the aforementioned studies therefore exceeds even the less cautious of general population prevalence. However, whether the same autistic respondents in the data had comorbid mental health conditions is not reported, and in all cases there was no suggestion that the respondents had acted upon their views or feelings in any legal sense, and hence neither autism per se nor violent extremism were directly

measured, and the prevalence and role of co-morbidities that may impact the autism were not reported on.

#### *Lone Actor and Group Terrorists*

One paper [4] explored the prevalence of 'mental illness' in lone actor terrorists (N = 119) compared to a matched sample of group terrorists (N = 119). The definition of mental illness used in this paper included people with personality disorder, intellectual disabilities, neurodiversity (autism) and mental illness. However, the authors use the over-arching term 'mental illness' to encompass all of these conditions. Whilst they concluded that there is a stronger association between mental illness and lone-actor terrorism than mental illness and group-based terrorism, they did not differentiate this by the type of 'mental illness'. For example, they noted that the odds of a lone-actor terrorist having a mental illness is 13.49 times higher than the odds of a group actor having a mental illness. However, the category 'mental illness' comprised of people meeting the criteria for a range of conditions including: substance use; schizophrenia, schizotypal, and delusional disorders; mood disorders; neurotic, stress related, and somatoform disorders; behavioural syndromes associated with physiological and physical factors; personality disorder; intellectual disabilities ("mental retardation"); disorders of psychological development; and behavioural and emotional, onset in childhood, and adolescence (e.g. ADHD). Thus, it is not known how many of these met the criteria for autism in this sample.

#### *Serial Homicides/Mass Murderers*

Two papers explored the prevalence of autism within mass murderers/serial homicide offenders [9,10]. Using a sample of 226 offenders from Sweden, data was collected from the National Adult Crime Register. 96% of the serial homicide offenders had undergone a psychiatric evaluation [9]. The authors found that serial offenders were more often diagnosed with personality disorders and autism-spectrum disorders compared with single offenders. In their sample, 33% had a diagnosis of autism in the 'serial' category. However, the authors did not identify which of these related to terrorism specific offences and which related to serial sexual homicides as well as mothers who killed their biological or adopted children. Other offences also included those committed in relation to substance misuse. No information was given about if participants had comorbid diagnosis such as low IQ, personality disorder, substance misuse or mental illness. Thus, it is unclear what the prevalence was of autism for people in engaging in acts which would be classified as terrorism due to the heterogeneity of the cohort studied.

Using a systematic review of case studies, 239 'killers' were identified [11] of which the authors reported that 28.03% (N = 67) had 'definite, highly probable or possible ASD'. However, only 6 of these had a definite diagnosis of autism with the remaining 61 being classified by the authors as having highly probably or possible autism from reading case information obtained online. This included data obtained from websites such as 'murderpedia'. For example, the authors noted that "for those with highly probable ASD, the majority of these individuals were included here because it was suggested that they have ASD in peer reviewed articles, and/or it has been suggested by a psychiatrist/psychologist in articles/books/online resources". For those with possible/probable ASD, accounts varied from being described as 'odd', withdrawn, or being a loner with few friends. In many cases, they had included the individual in the category of "possible ASD" because of suggestive descriptions – such as the individual being "a loner", rather than because of diagnostic or symptomatic markers. Thus, these identified individuals were not included as having autism because they had not been formally assessed by a trained clinician and opinion data was not included as being sufficiently eligible or reliable to include in this REA. Of the 6 individuals who did have a definite diagnosis of autism, 3 had convictions for terrorism. One of these also had an IQ of 66 which would place him the category for an intellectual disability. All 3 of the autistic individuals also had a co-occurring personality disorder. Hence only 3 out of the sample of 239 had a diagnosis of autism that related to terrorism (1.3%). It is generally accepted that the prevalence of diagnosed autism in the general population is around 1% (Baird et al., 2006; Brugha et al, 2011) although given the well-recognised under-diagnosis of high functioning autism, it is likely to be higher. Therefore, the aforementioned study's prevalence of autism in terrorism cohorts is comparable to the prevalence of autism in the general population.

#### *Radical Islamists/Jihadi*

One paper explored the prevalence of autism in a sample of n=140 male and female radical Dutch jihadists [10] over the age of 18 whom the Dutch police suspected of having joined the fight in Syria, or were considered potential travellers (for example, because they had expressed their intent to do so). The sample was taken from a national 'List of Travellers' (LOT), as compiled by the Counterterrorism and Extremism (CTE) team in the Central Unit of the Dutch National Police. Police files were used to obtain the information and people were only coded as meeting the criteria for autism if they had a formal diagnosis in their records. Three individuals were identified with autism out of a sample of 140. In a clarification of their findings the authors noted that autism spectrum disorders were present in 1.5% of the sample. The gender of these individuals is unknown. One of these individuals was labelled as having 'autism/schizophrenia' thus it is unclear if autism was a definite diagnosis. In addition, the other individual was also given a label of autism and 'childhood

trauma'. Thus evidence of comorbidity exists. The strength of this paper is that it uses the presence of a formal diagnosis to code the presence of autism and also uses a real sample where intent to act has been indicated.

### *Age*

The youngest individual identified was 13 year old male who had made attempts to engage with other Neo-Nazi right wing extremists online and had met them in person, having only been declined to lead their party when they discovered his age [13]. The oldest identified person in the studies was a 69-year old male incel [3], although the authors suspected this was not the participant's true age. They noted "given the sexually suggestive connotation of the number 69 among this population and the fact that no ages between 52 and 69 were entered, it is likely that the participant who entered his age as 69 did so in jest and is not actually 69 years old". Thus, the age range in this sample of incels was classed as between 18-52.

21 case studies were identified across all of the studies included. 19 of these had available ages. One was aged 9 and hence excluded from this study due to being under the age of 12 and 1 was aged 13 and was not convicted. Of the remaining 17 cases their ages ranged from 17 – 39 with a mean age of 22.5. Of these 17, 14 had a co-existing personality disorder, mental illness, ADHD or intellectual disability. There was insufficient reliable information in the case studies to draw any conclusions on the age of diagnosis for the case studies.

### *Gender*

All 21 of the case studies were male. From the studies included, 15 included male only participants [3, 5, 6, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 26]. The majority of the studies pertaining to incels included males only [3, 5, 6, 21] with only 1 paper not stating this explicitly [8] but with the clear themes of masculinity identified it can be assumed participants were all male. Six studies did not provide data on gender [4, 7, 8, 11, 24, 25].

Four studies included female participants. Three female participants with autism were included in the qualitative study [1] but none of these were involved in terrorism. Gender, religion, religious attendance, education level, political engagement, life events, discrimination, social capital and social support were not associated with SVPT [2], however the number of female participants was unclear and neither was there any evidence of whether they had autism. Another 2 papers included female participants but it was unclear if they had autism or if they were convicted of terrorism offences [9, 10]. Another paper explored lone actor and group terrorists and had 1 female in the sample but they did not have autism [23].

None of the studies that met the inclusion criteria had a female individual with autism who was convicted of or suspected to be involved in terrorism.

### *Ethnicity*

In 7 out of the 21 case studies included, the ethnicity of the males was unknown, 3 were identified as having parents of mixed heritage and 11 were classified as white. One incel mass murderer in the USA was noted to have parents of mixed race (their father was specified as White English and their Mother Black American). One incel mass shooter from Canada was noted to have parents of mixed race (his Father was from Armenia and his Mother from Iran) and another far right, racially motivated serial murderer from Sweden was noted to have a father who was Swiss and a mother who was German. Of the 11 white males, their types of violent extremism were: 3 x Neo Nazi/Far Right; 4 x Islamic State; 2 x Revenge Attack School; 1 x not convicted; 1 x unknown spree. None of the studies captured data on ethnicity of the cohort who had autism.

### **Conclusion & Discussion**

The prevalence of neurodiversity in the violent extremism cohort remains poorly understood, and we do not yet know how this compares with the prevalence in the general population. The most commonly reported neurodevelopmental condition is autism and for this reason the current REA focused on studies that report autism. In the general population, estimates often suggest that 1% or higher have diagnosed autism (Baird et al, 2006; Brugha et al, 2011) and there is some indication that the prevalence in criminal or forensic populations is higher (Collins et al., 2022). However, it is very well acknowledged in the clinical field of autism that the true prevalence is likely to be higher, given the under-diagnosis of high functioning autism (autism in individuals without intellectual disability), especially in women and in ethnic minority groups (Gupta & Chaudray, 2021; Lockwood et al., 2020). In forensic populations, a higher prevalence of autism than the general population has been reported (Dein et al, 2021). It is also acknowledged that high functioning autism is commonly mis-diagnosed or its high co-morbidity prevalence could lead to other conditions being diagnosed but the autism going undetected. Furthermore, autism is highly co-morbid with other neurodevelopmental conditions such as ADHD and yet until 2013, the DSM IV did not allow for autism to be diagnosed with any comorbid conditions, meaning that research samples with both conditions who were diagnosed using earlier versions of the DSM would either have their autism or ADHD (or other comorbid condition) diagnosis undetected. This suggests a further reason to assume an underestimate of autism and neurodiversity prevalence in research.

With this in mind, there is compelling evidence that autism is above 1% in the general and forensic populations (Young et al., 2017) and one would benchmark the prevalence of autism in the violent extremist population against this rate. Given that most violent extremists are likely to be of average or high intellectual ability, one should cautiously use a slightly higher benchmark, which would be associated with higher functioning autism. Overall, the research on autism in violent extremist populations is of limited reliability and points to a mixed picture, with very little compelling evidence that the prevalence is higher than what would be expected in both the general and forensic populations.

Violent extremism was not directly measured in all the studies included in the current REA and other softer proxies were explored, including attitudinal proxies of extremism in the general population and a range of extreme violent offences in the criminal population. With those wider remits included, the findings on autism prevalence were mixed. Some studies suggested that autism prevalence was higher in cohorts associated with violent extremist proxies, although the rates varied widely and given the small sample sizes, were not interpretable. Findings of interest were for example that autism prevalence was not disproportionate in sub-groups of the general population who endorse indirect proxies of extremism, was heightened in incel forum members (who have not broken the law), lone actor terrorists and possibly also mass killers.

Significant methodological as well as conceptual limitations in the studies included in the REA mean that little can be concluded in terms of true prevalence of the formal diagnosis of autism in violent extremist cohorts who have committed illegal acts. These limitations are marked and must not be overlooked when trying to extrapolate to convicted violent extremists with autism. For example, in most of the studies, autism was self-reported and not clinically diagnosed, measured through unreliable proxies, or even inferred by academic authors from broad descriptors that are not only non-specific to autistic people, but are not diagnostic in any way. Furthermore, many of the cohorts studied had not committed acts of violent extremism in legal terms. Limitations in autism and violent extremism proxies used notwithstanding, there are other limitations that hinder our understanding of the quantitative links between autism and violent extremism. For example, many of the included cases who self-reported autism may have also been those who had self-reported co-morbid psychiatric conditions such as anxiety and depression, and in some studies autism and co-morbidities were not differentiated. When autism was distinguished, it did not link to all proxies of violent extremism (e.g. all proxies of incel involvement such as ideology, intent, and radicalism),

suggesting that links between autism and violent extremism are not only confounded by other co-morbidities but may not relate to all dimensions of violent extremism. Whilst those who reported higher severity of autistic traits appeared more likely to self-report incel forums making them 'feel' more violent and misogynistic, given they had not committed violent extremist acts, this means that we cannot infer an association between heightened prevalence and severity of autism and violent extremist acts. For cohorts who had committed violent serial offences, a higher prevalence of autism was indicated but it was not possible to determine if this applied to those who had committed terrorism related offences specifically. Furthermore, some studies reviewing such offender profiles defined autism on the basis of actual diagnosed as well as 'inferred' autism, with such inferences made by academic authors who had never met the individuals and based their inferences on such vague characteristics as the individual being a 'loner'. Hence, the proxies of autism used in studies of violent offenders are highly questionable in such instances and inferences cannot be drawn about autism-offence links in the cohort, from these studies. Finally, where autism has been shown to have a higher prevalence, whether alone or alongside co-morbidities, this seems more well-established in lone actor cohorts or cohorts for whom offline social networks may be limited, such as incels. This limits the generalisability of the findings to group actors or individuals with social networks.

When the more reliable studies of violent extremism and terrorism offenders with diagnosed autism are examined, the prevalence of autism appears similar to the general population, although such studies report on very small samples that cannot be used to draw inferences and generalisations from. Other limitations to generalisation include the male dominance in the samples and the skewed age ranges, with younger adult participants dominating the samples. In summary, there are weak indications that in some sub-types of violent extremism such as lone actor sub-types, autism prevalence may be disproportionately high, although given the severe limitations of the studies, one must be very cautious about drawing conclusions. This is not to say that heightened prevalence should be discounted and in fact, research cohorts may not reflect the more recent cohorts of violent extremists who are increasingly reliant on digital technology (Scrivens & Conway, 2020) and who, based on anecdotal international experiences in the field, are including more younger individuals, including children. Furthermore, the changes in diagnostic classifications (DSM-5) in 2013 that allowed for autism and ADHD to be dual diagnosed and the broadening of autism criteria in DSM-5 and more recently ICD-11, to allow for mild forms of camouflaged autism to be diagnosed, are likely to lead to increased prevalence of autism, and autism alongside ADHD in the general population. Such increases in diagnosed autism and ADHD, alongside increased awareness of neurodiverse conditions that may lead to referral for a diagnosis in the first instance, may well

create an increase in prevalence of neurodiversity in the extremist population. Additionally, the digitalisation of terrorism and increased access to digital spaces, including during the Covid-19 lockdown period, may further increase the prevalence of neurodiversity in violent extremist populations. More research is needed to establish the true prevalence of autism in violent extremists, especially those convicted in very recent years.

Finally, neurodiversity extends beyond autism and the co-occurrence of several neurodevelopmental conditions is common across all populations. Anecdotal practitioner experiences from many developed countries have suggested that both autism and ADHD may be increasing in prevalence amongst those identified at risk of extremism. Other neurodevelopmental conditions such as developmental language disorder, sensory processing disorder, dyslexia, dyspraxia (developmental coordination disorder [DCD]) and dyscalculia are commonly co-morbid but under-researched and their prevalence in violent extremist populations remains unknown. Of the greatest concern is the significant gap in knowledge on ADHD in the violent extremist population, whether alone or alongside autism. Given the high prevalence of this condition in general forensic populations, and given the common under-diagnosis of ADHD in high functioning adults, this neurodiverse condition may be undetected in the research samples reviewed but highly prevalent. Therefore, research in wider neurodiversity and its prevalence in the violent extremist population is almost non-existent and requires urgent attention.

### ***Theme 2 - What is known about online recruitment and radicalisation of Neurodiverse Cohorts?***

Six papers referred to the online recruitment and radicalisation of neurodiverse cohorts [1, 13, 14, 15, 19, 21].

Staff working with autistic young people who were vulnerable identified that an inability for the young people to engage in fact checking [1] contributed to them not questioning radical ideas placed online. This was exacerbated if the young people perceived the person to be an 'authority' on the subject, 'an individual they trust' or that they perceive them as 'convincing'. It was also noted both staff and autistic young people felt the nature of the 'online world' was attractive to young people with autism who may struggle socially and that 'predatory individuals' might invite people with autism into such groups online and praise them for their specialist knowledge, providing the person with a sense of belonging.

One paper noted that the mechanism for recruitment online replicates the first 4 stages identified for neurotypical cohorts [13] in terms of the Taarnby (2005) 8 stage recruitment process.

However, the difference being that in a single case study [13] the role of social bonding seen in neurotypical group recruitment was not present [13].

*Are these processes discernible to close contacts?*

One paper (which sought the views of staff working with young autistic people potentially at risk of radicalisation) identified a list of key behavioural changes which indicate someone with autism might be developing radical ideology [1] however they noted these were no different to the behavioural changes already identified in the literature for people without autism. The paper indicates these were:

- Stopping attending school and being generally withdrawn
- Decreased social contacts/increased isolation
- Behavioural changes such as a sudden need to have curtains closed at home
- Increased risky behaviour such as illicit drug use
- Repeatedly 'going missing' without contacting anyone
- Becoming more and more submerged into a specific group, organisation or topic
- Becoming secretive and not wanting to share what they do
- Voicing opinions which seem unusual, out of character, offensive or present a change in opinions or beliefs
- Changes in mood and depressive symptoms
- Changes in appearances and/or wish to be different from mainstream lifestyle
- Constantly feeling under threat

It was also noted that these indicators 'may actually be typical' for a person with autism and thus any behavioural indicators should be assessed individually [1].

In terms of discernibility it was identified that parents of young people may be aware of some of the content of the person's activities but not recognise the seriousness of this, consider this a 'quirk' [1] and not challenge the behaviour [1]. Others felt that some parents were not aware of their child's behaviour because of a lack of monitoring [1].

It was also identified that radical ideas may be passed from a parent to a young person with autism [1] and that in this instance close contacts such as professionals (teachers, social workers etc.) should be aware of family environments.

*Is there any evidence that neurodiverse people are specifically targeted by extremist groups for recruitment purposes?*

One paper noted that police felt ‘groomers might jump’ on an autistic person’s ‘obsessionality’ [1]. Two examples of this existed in one paper [16]. One of these was a teenager who attempted to persuade another teenager with autism to buy bomb making equipment. The other was ‘befriended by a group of Muslim men...he became interested in Jihad, possibly from one individual who was suspected of harbouring terrorist ties’. Both of these were in-person influences rather than online and related to interests in Islamic State. One had autism and ADHD and the other had autism and Emotionally Unstable Personality Disorder.

Specific targeting through online recruitment was identified in one paper [1]. This was triggered by the individual publishing a right-wing manifesto in a single case study [13] although it should be noted this individual was not arrested or convicted and did not display intent to act. Furthermore, it has been noted that an individual’s explicit divulging of ideas may capture the attention of people seeking to recruit online [1, 13]. However this was only postulated in one qualitative paper with no evidence to support this opinion [1] and only a single case study was used in the second paper [13]. In addition, it was also noted in another single case study that expression of radical views online, writing a manifesto and seeking out contact with people with radical views may also be initiated by the person with autism [14]. However, the online posting of radical views did not result in others with this interest contacting the individual for recruitment purposes [14, 19, 20 – this is the same individual described in 3 different papers]. Therefore, the writing of a manifesto cannot be clearly linked with being recruited by others to act in violence.

Witnessing a far-right rally was also identified as a trigger in a single case study [15] which led to the individual then researching information online and developing clear intent to act for which they were arrested. However, it was noted that whilst networking (face to face) with other like-minded individuals is a central feature in the process of radicalisation (Kruglanski et al, 2014) this did not appear to be the case for this individual and several of the other case studies for people with autism [15, 21, 17].

It was also noted that people with autism may access information independently because they may ‘stray’ when researching a topic of interest [1, 13]. However this was only postulated in one qualitative paper with no evidence to support this opinion [1] and only a single case study was

used in the second paper [13]. Furthermore, there was evidence that some of the case studies had intentionally communicated with each other prior to offending (AM and ER) [21] and that they had also attempted to incite others online [21]. Thus, their contact was not the result of serendipitous straying but was intentional. AM was diagnosed with autism and ER with Pervasive Developmental Disorder (NOS) (a type of autism spectrum disorder) [21]. This is also consistent with the findings that engaging in the incel forum made people feel 'more violent' [3, 5, 6] although it was unclear if this pertained specifically to respondents with autism. In addition, there was also evidence that some of the case studies actively sought to contact people with extremist views after seeing this online, rather than them being specifically targeted [14, 16].

## **Conclusion & Discussion**

There is limited, qualitative research in this area and it is largely based on opinions from professionals working with those vulnerable to extremism or academics reviewing the field. Some professionals perceived some autistic young people to have specific vulnerabilities that make them less critical of information and its sources, and this was inferred to make them more susceptible to being exploited online. Professionals also recognised that the appeal and attraction of the online world, especially when compared with the psychosocially challenging offline space, may also play a part in shaping vulnerability, although the role of social bonds in shaping such vulnerability was questionable. However, the professionals providing those views did not work with convicted violent extremists and only worked with autistic children who may include those deemed potentially vulnerable to extremism. This may not be generalisable to older, higher functioning adults who have carried out violent extremist acts. Case studies included were very limited in number and profile, further limiting generalisability. Perceptions of vulnerability to being exploited online do not equate to evidence that online recruiters are targeting neurodiverse individuals and there is no published evidence for the latter.

Rather than framing online vulnerability solely in terms of exploitation by radicalisers alone, it is important to consider individual susceptibility to online extremist materials. In other words, online vulnerability does not merely arise from terrorist groups deliberately targeting vulnerable individuals and those individuals being passive consumers of such influence. Instead it may also be borne out of psychological features of those individuals that make them receptive to the online space more generally and which make extremist messages online resonate with them, regardless of whether they meet radicalisers online or not. The research into online radicalisation does not examine subtle neurocognitive features of autism and how these interface with the demands of the

online space, with this being believed by practitioners to be an important aspect of vulnerability where neurodiversity is concerned (Al-Attar, 2020). The evidence base suggests that high functioning autistic individuals are not more likely to be 'suggestible' than neurotypical age peers (Griego et al., 2019; Maras & Bowler, 2012) and, in fact, may be less suggestible. One known feature of autism is a strong orientation towards one's own interests, routines and preferences and reduced motivation to follow social and emotional trends. This could imply that autistic individuals are less susceptible to social norms online or to social pressure and dynamics. What makes them vulnerable may not be the influence of others or social or emotional peer norms in the online space, but instead may be the 'pull' that certain online forums, information types and stimuli may have for them, by virtue of a number of neurocognitive styles associated with autism. These neurocognitive styles may include a preference for categorical or detailed information, patterns and theories, an overfocus on details and facts at the expense of the bigger picture, context and social and emotional nuances, and a strong preference for visual information (Al-Attar, 2018, 2019, 2020). Furthermore, when special interests and skills relating to extremism are validated online, this may be reinforcing and autistic individuals may feel more connected with (rather than be exploited by) those who share their extremists interests. In this respect, vulnerability may not be shaped by direct influence and where influence occurs, neurodiverse individuals may be both influenced and influencers, just like neurotypical individuals. Nevertheless, should others present extremist materials to them and attempt to influence them, a further neurocognitive factor, namely impaired 'theory of mind' may act as a vulnerability by limiting the autistic individual's ability to read others' intentions and motivations and hence to second guess their agenda, instead accepting information as facts and details and overlooking the interpersonal agenda behind its provision (Al-Attar, 2020).

Some research shows impairments in 'source memory' in some autistic individuals, which could make autistic individuals less cognisant of the original source of their information (Bowler et al., 2004). This could mean that information of interest may be accumulated without recalling where it came from, and in this sense they may not be as critical of its source. Furthermore, autism can be associated with an over focus on fine detail alongside theory of mind impairment contributing to context blindness. (Vermeulen, 2015). This means that detailed information (facts, images, videos, documents, or paraphernalia) relating to interests may become captivating and have strong motivational and attentional pull, and be collected, without focus on its social or legal context and consequences or focus on the agendas of those who provide this information. This is not the same as not knowing right from wrong or being suggestible and relates to very different neurocognitive features of autism, which may render autistic individuals more 'susceptible' to being drawn to online materials and forums, rather than passively suggestible to social or emotional exploitation, as

commonly believed. Finally, online imagery may have rich aesthetic value, intricate detail and pattern that could be pleasurable and stimulatory and may offer a range of sensory rewards (including visual, auditory and motor where typing or device operation are involved). This could add to the 'pull' of online stimuli and the reinforcement of online behaviour. Overall, social belonging and social reinforcement within the online space may well be an important part of the online extremist space for some individuals with autism. However, often overlooked aspects of susceptibility of autistic and neurodiverse individuals to online hazards are neurocognitive and sensory aspects of the online space and these are not addressed directly in any research, and warrant further attention (Al-Attar, 2016, 2018, 2020).

In terms of detectable behavioural changes that may correspond to online radicalisation in autistic individuals, there is a very limited evidence base from which to draw conclusions. Preliminary findings from the REA suggest that behavioural changes do not differ between autistic and neurotypical individuals showing such online vulnerability and in fact, some vulnerabilities were deemed by the professionals interviewed in one study as common in young people with autism who are not susceptible to online radicalisation. Hence, it is not possible to discern reliable, predictive behavioural indicators of online radicalisation in individuals with autism, and given the very limited cases studied and heterogeneity of both autistic and online radicalisation markers, one must be very cautious about drawing any conclusions that inform risk prediction in wider populations and must instead focus on individualised case formulation.

A word of caution is also warranted about over-reliance on behavioural (offline) indicators of risk. In clinical forensic practice, it is acknowledged that certain behaviours may not be expected to 'change' with increasing violence risk in individuals with autism. These include emotional expressivity, initiation of social communication, and changes in routine, all of which are not expected to alter in individuals with autism and hence must not be over-relied on as proxies of risk. In other words, an individual with autism may undergo online radicalisation and reach the point of readiness and intent to offend but not necessarily visibly express emotions, socially communicate their change in motivation or alter their daily routine and general lifestyle. Furthermore, online social communication and research of interests may link to risk but not be accompanied by offline social communication or physical behaviours that are observable, as a level of compartmentalised focus is associated with autism, whereby an individual may be hyper-focused [HF] on an interest separate to their daily life routines and goals, even where the two are morally at odds with one another. For this reason, it is not only unhelpful to over-rely on outward, offline behavioural indicators of online radicalisation but also unlikely that research studies would generate reliable evidence of such

behavioural indicators, given the lack of nuanced information they can access about the individuals concerned.

Behavioural changes may be more pronounced online and hence more detectable by authorities (through surveillance), AI-generated cyber-security measures, or individuals in a position to detect the individual's online behaviour (e.g. those who communicate with them online and access their social media online). Parents and teachers may not be aware of a young person's online behaviour and the online behaviour of older individuals may not be supervised personally or professionally. Research using online proxies of behavioural change is very limited, especially in more recent cohorts of younger, digitally competent violent extremists. Most of the 'data' on such behaviours may be held by security services, police or criminal justice workers dealing with convicted extremists whose online behaviour led to violent extremist offending and this would not likely be accessible to researchers.

As well as the online vulnerability of autistic individuals and its detection, it is important to consider if autistic individuals are deliberately targeted online. One of the challenges of answering this question is that it is unlikely that individuals would publicise their autism online and online 'groomers' are not clinicians and unlikely to detect subtle markers of high functioning autism from online communication or posting. They may detect vulnerability, but social communication vulnerability may not manifest so clearly online when an individual has technical and linguistic sophistication (as many individuals with high functioning autism do, especially when engaging in the online communication that uses their strengths and higher skills). Hence, one must caution against the assumption that autistic individuals present clear evidence of autism and vulnerability online and the research only relies on anecdotal cases and speculates on how their vulnerability may have been used. Some of those cases were not convicted extremists and others who did commit offences may have sought others out online and presented their extremist views to others rather than the reverse. Hence, it would be misleading to simplify the nature and direction of such vulnerability in a way that positions the autistic individual as vulnerable and passive to other deliberate exploiters. Individuals with autism may share their extremist interests and influence others, as well as be influenced. One issue that has not been addressed in research is whether autistic individuals may exploit or at least influence one another in the online space. The studies of incel forums reviewed suggested that there is a high prevalence of autism and clinical forensic practice suggests that autism is even discussed by incel members on their forums. Furthermore, almost all of the mass shooter cases with actual or suspected autism appeared to make reference to the legacy and online material of their predecessors who had autism and committed mass shootings. Whether they realised they had

autism or not, it seems the narratives and online materials of their predecessors strongly resonated with them.

If this is extrapolated to violent extremist online forums more generally, it is possible that individuals with autism may find a connection and congruence with other autistic individuals online and may present extremist information and stimuli online, in formats that appeal to like-minded individuals. Thus, one research question that has yet to be explored is if the presence of autistic individuals in an online extremist forum can make that space have a greater pull for other autistic individuals and whether the experiences, narratives and communication styles used by one autistic member of that extremist forum can then resonate with and attract other neurodiverse audiences. This question has not yet been addressed by published research but is of operational and clinical importance.

It must be noted that online vulnerability in autistic individuals is not simply a matter of an autistic individual being deliberately groomed by those who can detect their autism or vulnerability, nor is it about suggestibility or passive acceptance of ideas that are presented by others. Not only is there no evidence to suggest that autistic individuals without intellectual disability are any more suggestible than neurotypical individuals (and in most high functioning autistic people are more independent minded and less impacted by social emotional norms (Maras & Bowler, 2012)), but vulnerability itself is not confined to suggestibility. A more helpful way of construing autistic vulnerability in the online violent extremist context is to consider the different ways in which the online space and violent extremist materials, stimuli, forums and networks within it, may have a pull for autistic individuals. Such pull may include the accessibility of information and its visual/factual presentation, the ease with which an autistic individual can engineer their social interactions to revolve solely around their interests, and the richness of the online space in terms of information and imagery that can provide material for 'research' (Al-Attar, 2020).

The neurocognitive styles associated with autism, along with the nature of restricted interests, means that many autistic individuals derive great pleasure from autonomous, detailed research on topics that interest or pre-occupy them. In the midst of such research, they may tangentially stumble on topics or sources of information that link to violent extremism. In some instances, aspects of violent extremism may then become restricted interests in their own right and in so doing, offer intrinsic reward, pleasure and intellectual intrigue - leading to a snowballing of further detailed, tangential research. When such research is performed in digital space, it can generate a wider, uncensored, plethora of information. Social validation and connectedness may then play out when that individual finds others who share their interests. This social process may

involve autistic individuals influencing others and one another, as much as being influenced by others and, consequentially, experiencing a sense of belonging that may become a secondary reinforcer along a radicalisation pathway. Understanding vulnerability in this sense extends far beyond a focus on exploitation of autistic individuals by neurotypical terrorist recruiters. It also directs attention away from understanding online vulnerability in terms of 'autistic weaknesses' and directs our attention to autistic strengths that may find expression in the online space, often independently of others. Finally, it frames vulnerability as a process rather than a single event or 'node' of behaviour and influence, and radicalisation pathways can be understood as a trajectory of push and pull factors that play out, with online exploitation either being one of many points in that trajectory or not even featuring in some trajectories. For example, it should also be noted that for adolescents and young adults (neurotypical or neurodiverse) their stage of brain development sensitises them to be oriented to the influence of peers. Thus, any peer influence online/offline may relate to underlying generic brain developmental processes, not autistic ones (Albert, Chein & Steinberg, 2013). Thus, a multiplicity of factors should be considered alongside autism when considering risk of radicalisation.

In summary, whilst common stereotypes of autistic individuals as 'vulnerable' may lead to anecdotal beliefs that their online radicalisation may arise from others deliberately exploiting them and them being passively suggestible to influence and information, there is neither research evidence nor clinical plausibility to such assumptions, especially where high functioning autistic individuals are concerned. High functioning autistic individuals are rarely passively suggestible to ideas nor are they less likely to critique detailed facts, and instead the pull of information, stimuli and networks related to special interests may be a key source of susceptibility to online extremism. Research tentatively suggests that autistic individuals' radicalisation pathway may not require networking with others in all instances and in fact prevalence studies suggest autism may be a feature more of lone than group actors. The question of operational or clinical relevance is not simply whether there are others or not to influence an autistic individual online, but whether others become sources of interest-related information online and can therefore have a pull on the individual. Should such others then validate the depth and breadth of the autistic individual's knowledge on their area of interest, they can become social reinforcers of such susceptibility, whether they do so deliberately and insidiously or inadvertently. Of course, theory of mind impairments could mean that an autistic individual may process all information (including from others) as facts and not process the social and emotional agendas of others, adding a level of vulnerability to those who seek to deliberately exploit the autistic individual once they recognise

their enthusiasm for information on their special interest and spot their inability to ‘read others’ (understand others’ agendas and motivations). It must also be considered that autistic individuals may themselves expose others to radical material and information and may, as a consequence, radicalise others. There is no evidence to show that they are any less capable of doing so, albeit theory of mind limitations may impact their understanding of the impact of this on others in some instances.

The research evidence offers little more than anecdotal opinions on online vulnerability in autistic individuals and the anecdotal opinions presented are often inconsistent with our well-established knowledge of high functioning autism. In fact, the very finding that autism appears to be more prevalent in lone actors and that many lone actors’ offence pathways may involve online activity but not necessarily an online social network of extremists, would be suggestive that online vulnerability is not merely about grooming and suggestibility. It suggests that we need to adopt a more nuanced understanding on what vulnerability comprises, including consideration of the strengths that come with autism and how these may render the online world more potent in its influence. Others, who exploit such factors, may come to be included in the many facets of vulnerability that the online world may present, although the reverse direction of influence must not be disregarded. Overall, there is little research that examines online vulnerability in a sufficiently nuanced way and some of the current perspectives on autistic individuals’ vulnerability to online exploitation are based more on anecdotal assumptions than empirical evidence or clinical knowledge of high functioning autism. Other neurodiverse conditions, such as ADHD, are under-researched in the violent extremism context and early research in other fields such as cyber-crime, online addictions, and gaming addictions, have begun to raise questions as to the possible role that ADHD may play in online risk-taking behaviours and the pull of the online space and its visual and stimulatory material. Future research needs to expand such areas of empirical enquiry to the online violent extremist world, especially as this space becomes more visually sophisticated and technically elaborate. The gamification of extremism is already being explored in the Countering Violent Extremism (CVE) space, and terrorism legislation in many countries has now expanded to a wide range of online behaviours, and hence such research is not only timely but urgent. Until such nuanced and modern-day conceptualisations of online vulnerability are researched, our current understanding of the vulnerability of neurodiverse cohorts to the online space remains limited and of limited ecological validity or practice utility.

***Theme 3 - What is the prevalence of neurodiversity in the violent extremist cohort compared to the broader community?***

### *Community Prevalence of Autism*

The World Health Organisation places an estimate that ‘about 1 in 100 children has autism’ but the reported prevalence varies substantially across studies. Tracking the rates of autism around the world is a significant challenge for two main reasons. Firstly, because there are no specific uniform criteria for assessing and diagnosing autism, and secondly, because cultural differences may contribute to variances in reporting, assessment, and referral. For example, there was a divergence in diagnostic criteria for autism related disorders between DSM-IV and ICD-10 which affected both clinical and research undertaken using these criteria. With the publication of DSM-5, DSM-5-TR and ICD-11 (International Classification of Diseases Version 11) there is now more convergence, although some variation remains (First et al, 2021).

A systematic review looking at the prevalence of autism found that rates varied within countries (e.g. between different states in the US) and between rural and urban areas with different prevalence rates across race and ethnicity. Prevalence for autism was noted to range from 1.09 per 10,000 people (less than 1%) to 436 per 10,000 people (4.36%) with a median prevalence of 100 per 10,000 people (1%). The same study also found that males outnumbered females.

The Center for Disease Control announced in 2021 that the rate of autism in 8-year-old children in the U.S. during 2018 was 1 child in 44. This is a notable rise from rates given in Scientific American for 2016 (1 in 68, though other sources claim an even-higher 1 in 54 by age 8), 2008 (1 in 88) and 2000 (1 in 150). Moreover, this trend of rising autism, which dates back to the early 1990’s, is a global occurrence not confined to the United States. Prevailing theories suggest that the rise is largely due to increased awareness and diagnosis of autism and the widening of the criteria for an autism diagnosis, rather than a massive increase in overall occurrences of autism.

### *Community Prevalence of Terrorism*

According to the Institute of Economics and Peace in 2021 there were a total of 5226 terrorist attacks. The 2022 Global Terrorism Index (GTI) reveals that despite an increase in attacks, the impact of terrorism continues to decline. In 2021, deaths from terrorism fell by 1.2% to 7,142, while attacks rose by 17%, highlighting that terrorism is becoming less lethal but more frequent. The Index highlights that terrorism remains a serious threat, with Sub-Saharan Africa accounting for 48%

of total global deaths from terrorism. Four of the ten countries with the largest increases in deaths from terrorism were also in sub-Saharan Africa: Niger, Mali, the DRC and Burkina Faso.

The Global Terrorism Index found that terrorism is more concentrated in countries already experiencing conflict, with conflict zones accounting for 97% of all deaths. The ten countries most affected by terrorism are all in conflict zones. Only 44 countries recorded a death from terrorism in 2021, compared to 55 countries in 2015.

It is noted that in the West, acts of religious terrorism declined by 82% in 2021 [IEP], and have been overtaken by politically motivated terrorism, which now accounts for five times as many attacks (OCHA) and that most attacks which are driven by a left or right ideology are perpetrated by individuals or groups with no formal affiliation to a recognised organisation (OCHA).

According to RAND there is no standard definition of what constitutes a mass shooting, and different data sources—such as media outlets, academic researchers, and law enforcement agencies—frequently use different definitions when discussing and analyzing mass shootings. Differences in measures may relate to the criteria they use in counting such events such as the minimum threshold for the number of victims, whether the victim count includes those who were not fatally injured, where the shooting occurred, whether the shooting occurred in connection to another crime, and the relationship between the shooter and the victims. These inconsistencies lead to different assessments of how frequently mass shootings occur and whether they are more common now than they were a decade or two ago.

CNN reported that between January 2022 and June 2022 there had been 246 mass shootings and a total of 692 mass shootings in 2021 in the USA. Between 2019 and 2020, the total number of mass shootings all year jumped from 417 to 610. A mass shooting was defined as one in which at least four people are shot, excluding the shooter.

### *Lone Actors and Autism*

One paper explored the prevalence of 'mental illness' in N = 153 lone actor terrorists [4] however, the diagnosis of autism specifically was not clear as people in the study were coded under the ICD-10 Classification Code of 'Disorders of Psychological Development [F80-F89]' which includes multiple diagnoses such as language disorders, aphasia, reading and spelling disorders as well as

autism. These would also not be classified as a 'mental illness'. The authors neglected to outline the prevalence of each disorder within the lone-actor terrorist sample and they did not compare this to a base rate of the general population. In addition, the data was analysed in terms of whether someone had a mental illness or not. No differential data was provided on whether any specific disorder was associated with terrorism behaviour. Thus no conclusions about the relationship of autism and lone actor attacks can be drawn from this paper.

However, the authors reanalysed this data in a later paper [25] to investigate whether selection effects are present in the selection process of terrorist recruits. The authors concluded that there are only three disorders that have a substantially higher prevalence in the lone-actor population, the most noteworthy being schizophrenia, then delusional disorder and then autism. The precise prevalence is not given in the paper but based on the graph provided looks to be approximately 3.2.% in lone offenders and none for group actors. As noted previously, the coding of autism is based on the people in the ICD-10 classification system F80-F89, which also includes diagnoses other than autism. In addition, the paper does not identify co-morbidity in diagnoses, so it is unclear if people identified as having 'autism' had comorbid other mental health problems (such as schizophrenia, delusional disorder etc).

#### *Jihadists and Autism*

Another paper explored the prevalence of autism in N = 140 male and female Dutch radical jihadists [10]. Three individuals were identified in the sample of 140 to have autism. This amounts to 2.14% of the sample. The gender of these individuals is unknown. One of these individuals was labelled as having 'autism/schizophrenia' thus it is unclear if autism was a definite diagnosis. In addition, the other individual was also given a label of 'childhood trauma'. Thus evidence of comorbidity exists and the role of autism is unclear.

#### *Serial Killers/Mass Murderers*

Two papers explored the frequency of neurodevelopmental disorders in N = 239 serial killers and mass murderers [11, 18]. One study [11] concluded that N = 67 had definite, highly probable or possible ASD. However, the data used as evidence for individuals in the study was obtained from Google searches of the individual's name plus the word autism 'because the peer-reviewed literature was so limited, we paid particular attention to additional sources of literature. These

included online articles; newspaper articles; court transcripts and in particular two comprehensive online resources'. This included databases such as 'murderpedia' and the Radford Serial Killer Database whereby information was used to postulate as to whether participants had autism. Thus, the accuracy of the information obtained is unclear. Furthermore, even from the data obtained, only N = 6 had a formal diagnosis of autism in the records and only N = 3 had convictions for terrorism (the others were convicted of serial sexual murder, serial killings and killing their parents). Of the N = 3 with autism who had engaged in or attempted to engage in terrorism, N = 1 had Aspergers, Personality Disorder and an IQ of 66 which places them in the extremely low range of intellectual functioning and could place them in the category of having an intellectual disability. N = 1 had Autism and Emotionally Unstable Personality Disorder (as noted by the coroner). N = 1 was noted to have Autism and Personality Disorder. Thus only N = 3 out of N = 239 (1.3%) had a diagnosis of autism and all of these had a comorbid personality disorder. Hence, the prevalence of autism in this study (1.3%) does not appear significantly elevated in comparison to the prevalence of autism found in the community (approximately 1%).

In the second paper [18] N = 6 cases out of N = 75 were identified by the authors 'that referred to diagnosis of an ASD by family and friends or there were strong suggestions of ASD made by family and friends'. Based on this the authors argued there was strong evidence of ASD in 8% of cases however, the table in the paper noted that only N = 3 had a confirmed diagnosis of autism which is equivalent to 4% of the sample with the remaining being noted to have 'traits' which were identified by the authors based on file information. It should be noted that at the time of the publication of this paper the US prevalence of autism in 2017 was 1 in 42 for boys (all of the those identified were male in the study) which is 2.4% (Scientific American). Of the N = 3 cases cited in the paper [18] (and using the same source of information that the papers used to clarify the diagnosis of autism), N = 1 had comorbid bipolar disorder and was being treated with anti-psychotic medication, and N = 1 was discharged from the army with a diagnosis of personality disorder. Thus, evidence of comorbidity exists and the role of autism in any extremist behaviour is unclear.

One study exploring serial homicide and single homicide offenders in Sweden [9] found that 33% of the serial homicide offenders had autism. However this included offences such as sexual homicide and the incidence pertaining to terrorism is not provided therefore no conclusions can be drawn from this paper.

*Sympathies for Violent Protest and Terrorism*

One paper [2] explored the association between ICD-10 diagnoses and sympathies for violent protest and terrorism (SVPT) in N = 618 men and women in the UK. They found autism and personality disorder scores were not associated with SVPT although it should be noted that the 'autism' condition was based using a score on the AQ-10 screening tool, rather than on results from a formal diagnostic tool. Concerns have recently been expressed about the validity of the AQ10, with a warning for caution when using it in research (Taylor et al, 2020).

### *Involuntary Celibates*

Three papers [3, 5, 6] explored the prevalence of self-reported autism in a single sample of members on an online incels (involuntary celibates) forum with 20,000 registered users. Of the N = 271 respondents 18.38% stated they had a diagnosis of autism. However, 38.6% of the incel survey respondents reported a depression diagnosis and 37.13% of the survey respondents endorsed having a formal anxiety diagnosis [6]. No data is provided on whether respondents who rated themselves as having autism traits were associated with intent to act [3, 5, 6]. Thus no conclusions can be made about this data set and the prevalence of violent extremism.

### *Case Studies*

From the 26 articles included in the study, 21 individuals were identified as being involved in violent extremism and having a diagnosis of autism. Of these 21, two were children who were not convicted and a further 4 adults were not convicted. Of those convicted two were aged 17 and the remaining were all adults. In addition N = 15 had an additional comorbid diagnosis of personality disorder, ADHD, depression, bi-polar disorder, anxiety, Mental Illness and/or Intellectual Disability.

## **Conclusion & Discussion**

Based on a '1% plus' benchmark of a general population prevalence of autism, and using broad definitions of terrorism, the collective research shows that violent extremists are no more likely to be autistic than the general population, although lone actors appear to show slightly higher prevalence. Nevertheless, this finding should be interpreted with caution, due to autism not always being distinguished from other clinical conditions or indeed formally assessed in research samples. The limited research on non-convicted incels and case studies using secondary, open-source data on convicted violent extremists, show a higher prevalence of autism, but this was often alongside co-

morbidities and did not offer insight into if autism per se was linked to violent extremism and if so, how. Furthermore, most of the research samples are from either western or developed countries, which have lower rates of terrorism overall and more specifically religiously-motivated terrorism. When examining the limited samples of religiously motivated 'jihadi' extremists, rates of autism were not significantly raised and within the autistic cohort, some had other psychiatric conditions. Studies of 'serial killers' include few with violent extremist offences and of those, very few have reliable measures of autism or if they have a diagnosis of autism, they have other co-morbid conditions. Even with such limitations, there is no suggestion that the prevalence of diagnosed autism is higher than the general population prevalence. Studies of serial homicide offenders in Sweden showed a very high prevalence of autism but it was not known if this sample included terrorism offenders. Overall, there is limited evidence of raised prevalence of autism amongst broad violent extremism cohorts and many of the studies use unreliable measurements of both autism and, to an extent, violent extremism, making it next to impossible to generate a reliable measure of the prevalence of autism in the violent extremist population.

A word of caution is warranted at this juncture. Most convicted violent extremists in developed countries would likely be clinically and forensically assessed post-arrest and their clinical diagnosis not made public knowledge. Hence, the 'data' of relevance to reliably answering a question on prevalence is unlikely to be accessible to academic researchers. Furthermore, it is possible that lone actors are assumed to have psychological problems and are clinically assessed more, with the reverse being the assumption for group actors. The diagnostic criteria (or their commonly assumed behavioural manifestations) are also argued to be less culturally sensitive for non-western cultures, raising the question of under diagnosis in ethnic or religious minority cohorts. Thus, the prevalence reported in research may be confounded by biases in detection and diagnosis of autism. For this reason, prevalence across the violent extremist population can neither be concluded to be higher or equal to the general population.

For real life Prevention of Violent Extremism (PVE) practice purposes, it can be argued that it is of little benefit to focus on delineating prevalence of neurodiverse or indeed any clinical condition as the numbers of convicted violent extremists in developed countries are small overall and hence, regardless of exact prevalence, this does not have a significant operational impact. What is of far greater importance is understanding the links, if any, between autism/neurodiversity and violent

extremist pathways, in those individuals presenting with both as this offers opportunity for more effective diversion away from extremist offending and post-offence intervention.

Overall, prevalence of autism amongst violent extremists has been shown to be the same as the general population in some studies and higher in others, but the questionable methodology and measurements of autism and violent extremism used, alongside the presence and possible influence of co-morbidity in those who have autism and carry out violent extremist acts, makes the links between autism prevalence and violent extremism difficult to quantify. Instead, it is proposed that the qualitative links (i.e. push and pull factors that autism may impact) are of greater relevance to public safety, especially in developed countries with low base rates of terrorism and therefore, a very low number of autistic individuals who commit violent extremist acts.

***Theme 4 - Are neurodiverse individuals who become involved in violent extremism more likely to be lone actors or identify with a group?***

The Australian Security Intelligence Organisation (ASIO) refers to two categories: ideologically motivated violent extremism and religiously motivated violent extremism. Individuals with no clear ideology (e.g. school shooters based on personal grievance), who do not fit into either category, would generally be referred to as mass casualty threat.

From the 26 articles included in the study, 21 individuals were identified as being involved in violent extremism and having a diagnosis of autism. Of these N = 6 were not convicted of terrorism. For example one case related to a 13 year old male who had far right interests but had not acted to engage in offending. Another (CC) was cleared by the Supreme Court who found the individual had an interest in the military and bomb making but no intention to engage in terrorist acts. Mr G [16] had a fixated interest in trains and was fearful he was at risk for being recruited or abducted by terrorists. The paper reported that he was arrested with literature that could be considered associated with an extremist group, possibly for the purpose of making a case for some connection with this group. The paper concluded this individual was outside the “degree of radicalization” and hence he was not deemed to be involved in terrorism. In the case of PP he was found not guilty by the court ‘by reason of mental defect’ because he had a diagnosis of ‘mental retardation, autism and ADHD’. The final case study [HT] was also not convicted at trial due to a search of his home finding

nothing to incriminate him and he was noted to be vulnerable and have ‘learning disabilities’ although the nature of these is unclear. When these 6 were removed from the dataset the remaining 15 were noted to be in the following categories:

	Number	Percentage
Mass Casualty Threat	4	27
Ideological	7	47
Religiously Motivated	4	27

	Number	Percentage
Lone	12	80
Group	0	0
Unknown	3	20

Two studies [4, 25] explored the incidence of lone actor and group terrorists in relation to mental illness and autism. The first paper [4] found there was a stronger association between mental illness and lone-actor terrorists than between mental illness and group-based terrorists. However, the authors neglected to outline the prevalence of each disorder within the lone-actor terrorist sample and they did not compare this to a base rate of the general population. In addition, the data was analysed in terms of whether someone had a ‘mental illness’ or not. No differential data was provided on whether any specific disorder associated with terrorism behaviour. However, the re-analysis of the data [25] found that people with ASD also show a higher than expected prevalence in the lone-actor sample. The precise prevalence is not given but based on the graph provided looks to be approximately 3.2.% in lone offenders. No group actors had a diagnosis of ASD.

## Conclusion & Discussion

Small studies with limited generalisability indicate that lone actors are more likely to have mental disorder than group actors. Such studies do not reliably demarcate autism from other clinical conditions and of those which do identify autism, it is not known if there are co-morbidities that exist alongside it. Tentatively, it can be concluded that lone actors may have a very slightly heightened prevalence of autism but this finding requires larger scale research with greater clinical information made available from which to conclude that autism is reliably present and whether it is co-morbid with other conditions.

Two words of caution are warranted at this juncture. Firstly, many convicted terrorists in developed countries may be clinically assessed and receive diagnoses but this information may not be accessible to researchers. Therefore the true prevalence of autism in both lone and group

actors remains unknown to the researchers. Secondly, the definition of lone actor has historically been debated due to the complexities of identifying if 'lone' means the actor was alone along the whole pathway to their radicalisation or just in the commission of the offence. This definitional complexity has become even greater with the digitalisation of terrorism, which has meant that individuals may communicate with other extremists online but not be influenced by them or enlist their operational help in the offence commission, and inversely, they may be self-initiated and self-radicalised but enlist the operational help of others whom they contact online. Where a lone actor ends and group actor begins in such scenarios is less well-defined and absolute. Lone actors may be more networked with others online and group actors may have no offline contact with others in the modern digital space, and many terrorist organisations rely heavily on online remote membership, propaganda, influence, capability-building, co-creation and co-planning of offences, financing, and communications about practical logistical matters. Research on historical samples of actors that were easier to demarcate into lone and group actors may not be generalisable to the modern-day violent extremist actors, as neither the processes of radicalisation and planning nor the profiles of individuals caught up in these processes, are as easy to divide into lone and group actions and actors.

***Theme 5 - Do people with neurodiversity/ASD present any different requirements in relation to counter-terrorism threat/risk assessment, intervention or support strategies?***

*Early Warning Signs*

It has been highlighted that although people with autism may be more likely to act alone [16] they 'did not work in a vacuum' in the sense that there appeared to be evidence that traces of their interests were clearly available online. The authors suggest that the same principles identified by Cohen et al (2014) should be adopted for tracing behavioural markers for radical violence in written text on social media that are used for people without autism. However, no data is available to support the efficacy of this.

*Legal Process*

Two papers [3, 12] suggested the law should be changed to reflect the difference between collecting material and intending to act. It was noted that assuming interests are ideologically driven in people with autism may be inaccurate [1] and that ideology and radicalism were two separate factors among incels that were not highly correlated. In other words, subscribing to incel ideology was not a good predictor of radical attitudes or intentions, and vice versa [5].

*Risk*

In terms of referrals to agencies, one paper [1] noted how professionals who worked with young people with autism at risk of radicalisation felt that there was an over-representation of young people referred to the police, due to concerns over terrorism because of a lack of training in this area. They felt professionals would initiate referrals in order to comply with safeguarding obligations adopting a 'better safe than sorry' approach leading to further stigmatisation of people with autism. They felt professionals lacked appropriate training in autism to understand who posed a risk and that standard risk assessment tools such as those identified in the PREVENT<sup>1</sup> literature may not apply to people with autism (for example having 'decreased social contacts') because this may be typical of the person's behaviour generally, rather than being indicative of an increase in risk. It was noted that professionals working with people with autism at risk of radicalisation would benefit from more specific guidance and training [1].

It has been suggested that, in terms of lone offenders, it would be helpful to create a National Fixated Threat Assessment Centre [NFTAC, Buggy, 2016] [16] which would employ mental health clinicians to work with the police and intelligence agencies to assist in threat assessment and risk. The authors suggest this could be developed in conjunction with the Violence Risk Assessment of the Written Word (VRAW2, Van Brunt, 2016) which assesses five factors: fixation and focus; hierarchical thematic content; action and time imperative; pre-attack planning; and injustice collecting. However, as the authors note there is no research on the efficacy of this tool and research would be required to investigate the utility of any such risk assessment tool. Both of these recommendations [16] are not autism specific and are recommendations which have been made for people without autism. Furthermore, these recommendations were based on 8 case studies where the authors relied on secondary data and did not attend to secondary issues of mental illness.

Based on a single case study [15] it was noted that the obsessional traits of autism may increase a person's vulnerability online because of the way in which online content is algorithmically designed to put ever more 'attention grabbing, extreme content towards individuals, exposing them to progressively more extreme ideological material (Johnson, 2018)' [15]. This may make fact-checking more difficult [1, 15].

It has also been noted that people with autism may be vulnerable to 'grooming' by people online who invite people into established groups [1] and that being part of such a group may offer a sense of belonging/approval [1, 3, 7, 8, 13].

### *Support*

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<sup>1</sup> The PREVENT programme is a UK government led multi-agency programme designed to stop individuals going on to engage in terrorism.

One paper [1] suggested that the approach to people with autism in terms of specialised interests in radicalisation material should not be suppression but mentoring to create a more balanced view. Professionals working directly with this group felt that providing counter narratives to ideology can worsen the interest for people with ASD due to ASD specific characteristics such as rigid thinking. Thus, the participants felt that mentoring provided an opportunity for a more individualised approach which provided a balanced view and increased skills in fact-checking rather than counter-argument. However, it should be noted this was based on a small number of participants [N=22 professionals] and no outcome data regarding the efficacy of mentoring in comparison to the use of counter-arguments was provided.

Based on the analysis of a single case study it was suggested that better access to mental health support [9, 15] was a need for people with autism with co-morbid psychiatric problems and this should be provided by people who are trained in working with people with neurodevelopmental disorders [15]. However, no research has been undertaken to provide evidence of testing the efficacy of this. It was also suggested that in some cases prison sentences would be better served through compulsory psychiatric care [9].

In terms of mental health treatment, it was noted that incels perceived this would not be effective for them [3, 5, 6] as well as in the case of a single mass shooter [19]. However, there are no studies of the effectiveness of any interventions for neurodiverse/autistic violent extremists.

## **Conclusion & Discussion**

The research evidence addressing this question is extremely limited, fragmented and neither addresses violent extremism 'risk assessment' in the formal sense nor evaluates intervention or support approaches in any empirical manner. Instead, the research studies reviewed generate tentative findings on 'threat assessment', possible behavioural proxies of risk in individuals before they commit violent extremist acts, and anecdotal views on the limitations of standard approaches for autistic individuals. These findings are summarised above, and it is difficult to draw broader conclusions and generalised recommendations from them beyond what is reported. In order to maximise practice utility, the current section will instead highlight some key areas for clinical/forensic focus that have yet not been subjected to research and hence are important gaps in research and areas for urgent attention.

Firstly, it is important to highlight the need to distinguish behavioural proxies of threat in those who have not committed an offence, from risk factors in those who have. Threat of possible behaviour happening before it happens, and risk of re-occurrence of behaviour that has happened, are conceptually and empirically different, and in effect come with a different 'science' and must not be conflated operationally and clinically. Therefore studies that provide hypotheses on 'threat' should not be extrapolated to assessments of risk and vice versa. 'Risk assessment' should refer to identified risk factors in violent extremists who have committed offences, based on an analysis of the factors that previously acted as risk factors for such acts. This may not be confined to overt behaviours or outward changes, especially where autistic individuals and online risk pathways are concerned, for reasons discussed earlier. The limited studies on threat assessment and behavioural indicators in neurotypical individuals cannot therefore be extrapolated to risk assessment in autistic/neurodiverse individuals. Instead, one must consider what is known about extremism risk assessment and risk assessment in autistic individuals. Al-Attar (2016, 2018, 2019, 2020) addresses the facets of autism that may need to be considered when carrying out risk assessments and formulations in those who have carried out violent extremist offences. These papers, alongside a broader risk framework named the FARAS (Al-Attar, 2018, 2019) have been used as an adjunct and supplement to extremism risk assessment and formulation tools, such as the ERG 22+ (see Lloyd & Dean, 2015) and VERA (Pressman, 2016), internationally. Due to the sensitivity of such work, it has naturally not been published or made accessible to researchers. Even were such data to be accessible to researchers, numbers will be limited due to the low base rate of terrorist offending and even lower numbers of terrorist offenders with autism, and hence generalisations about risk and support needs in autistic violent extremists are not feasible.

Secondly, support and interventions for violent extremists in general, and the subset of them who have autism, is not well researched. This is not to say that such knowledge does not exist within the clinical, forensic and operational spaces across many countries and as with all violent extremism practice, its sensitivity means that it is not readily accessible to the public or to researchers. Al-Attar (2019, 2020) addresses some of the approaches to enhancing protection and resilience in individuals with autism who commit terrorist offences. In practice, such guidelines have been used as an adjunct to standardised support and intervention programmes internationally. However, it is important to emphasise that no published evaluations of support and intervention approaches adopted with autistic individuals convicted of violent extremist offences are available in the public domain. What is widely accepted in the field is that it is important to tailor support and intervention to each individual as both violent extremism risk and autism (and the subtle and

complex role the latter plays in shaping risk and protection against the former), are all idiosyncratic to each individual. Also important is consideration of the individual's age and developmental needs, their gender and cultural needs. Hence, individualised risk formulation that is informed by specialist knowledge of both violent extremism risk and high functioning autism/neurodiversity, across the lifespan, should inform individually tailored support and intervention approaches. In turn, the effectiveness of those should be evaluated through the use of individually tailored measures of risk and its reduction. Of course, in autistic and neurotypical individuals who commit terrorism offences, risk assessment, before or after interventions, must be multi-disciplinary and triangulate many sources of information, including intelligence, monitoring and surveillance data, and observations of that individual's behaviour (online and offline, as relevant). It is highly unlikely that academic researchers will have full access to such sensitive information nor the relevant training to clinically evaluate risk reduction. Finally, reconviction data alone should not be used as a proxy of effective approaches, as violent extremist offending has a very low base rate and this will be lowered further when considering the sub-set of autistic offenders who commit such offences. Furthermore, many such cohorts serve long prison sentences and where released, may be under very strict supervision and hence reconviction data that is typically gathered following years of an offender being at liberty, is scarce. There is unlikely to be a large enough sample in any country on which to calculate meaningful reconviction data. Thus, evaluating effective risk measurements and support or intervention approaches, remains a qualitative rather than a quantitative process and should only be undertaken by researchers with specialist knowledge and access to a range of sensitive information sources in order for it to provide real life utility. Even then, this would provide individualised examples of effective risk measurement and intervention, rather than generalisable principles.

Finally, the limited publicly accessible research in this field must not deter the use of specialist knowledge in violent extremism risk assessment and high functioning autism, to inform guidance. The low base rate of terrorism, low numbers of autistic individuals convicted of violent extremist offences, and the sensitivity and lack of public accessibility of data and intelligence proxies on such individuals, means that practice has to precede and often be ahead of research, when developing risk assessment and supportive interventions and rehabilitation. In many countries, theoretically grounded assessment and intervention approaches have been developed and implemented and can be evaluated with rigour and impartiality. For example, the evaluation may be undertaken by individuals who have not been involved in the implementation and delivery of the practice. The evaluations may also be subject to peer reviews by security-cleared academics. It is

important for sensitive research of this nature to be based on rigorous scientific principles, and for it to inform the ongoing development of practice.

Finally, it is important to acknowledge that terrorism is both an emotive and often sensationalised topic, due to its high impact on society. This inevitably makes published research on terrorism high profile and on occasions newsworthy. It is important to consider the ethical and clinical/forensic impacts of sensationalising terrorism, something academics as well as media outlets need to consider. Many of the case studies reviewed in the current REA highlight the role played by the notoriety and high profile of past terrorists or mass shooters, in inspiring those that succeeded them and emulated their offence. This highlights the importance of minimising the sensationalisation of terrorists and violent extremists, including through academic publications. Using synthesised data from several anonymised cases rather than seeking to publish on and name each high profile case, may be one approach. The current REA did not name the cases addressed in the reviewed publications, for this reason.

In summary, there is limited open-source research that can inform risk assessment, support, and intervention practice, where neurodiverse violent extremists are concerned. The prediction of behaviour that has not happened is not the same as prediction of repetition of behaviour that has happened, and hence research on threat assessment cannot be generalised to risk assessment practice and vice versa. The former is the challenge faced by violent extremism prevention whilst the latter pertains to assessment and intervention with convicted violent extremists. One must be cautious when extrapolating from research and be mindful of the limitations of our ability to predict behaviour that has not taken place, a challenge that is quite unique to the terrorism arena where governments and authorities are tasked with preventing violent extremist crimes before they occur whilst only intervening with other crimes after they occur. There is unprecedented societal and political impetus to prevent violent extremism, and this can place pressure on practitioners to find effective practices. What is deemed effective is normally grounded in research evidence and yet, for a range of earlier mentioned reasons, research into violent extremism is limited and instead of 'evidence-based practice', practitioners may find themselves relying on 'practice-based evidence'. In addition to the heightened societal and political pressures, further ethical and legal challenges may arise when considering effective practice with violent extremists with autism and neurodiverse conditions. Even implied links between neurodiversity and violent extremism may raise natural ethical tensions and legal complexities, and against a backdrop of a dearth of research evidence, this

can become a precarious area and one that many practitioners and researchers are loathe to address and may not have relevant specialist knowledge to address. For this reason, it is important to adopt a cautious, but scientific approach that capitalises on insights from terrorism risk and autism experts, but which also acknowledges the significant limitations of the current research and develops learning from sensitive internal research from different countries. Future research, in this vein, needs to examine not only the published research evidence, but the gaps in such evidence and highlight the relevant areas of specialist knowledge that may come to bear on the subject, even if such knowledge is not publicly accessible. In the terrorism space, the nature of specialist knowledge is such that it will often include information of a sensitive nature that cannot be publicly accessible, but which is subjected to scientific rigour and is theoretically, clinically, and operationally grounded. Government or government-vetted researchers with specialist clinical and operational knowledge, in many countries, are well placed to develop such specialist knowledge, and this is especially pertinent to knowledge on violent extremist risk and approaches to its reduction, in neurodiverse individuals.

***Theme 6 - Do pathways to engagement in violent extremism differ for neurodiverse individuals in terms of behavioural indicators***

*Interests*

In some cases it was noted that an interest in the military related to an interest in uniforms extending from childhood [1, 12, 13, 17] and that this may be heightened through history education in school/in adolescence [1, 13, 19] in relation to Nazism. However, this interest may not be indicative of an intent to act [1, 3, 12, 13].

These findings were also replicated in research in relation to incels, where radical intentions showed a skewed pattern, with only a small minority of participants endorsing them and most participants rejecting radical attitudes and radical intentions including those participants who strongly endorsed incel ideology [5]. However, those who scored high on radicalization, but not on ideology, were more likely to report a history of bullying and a formal diagnosis of autism [5]. Thus, the factors radical attitudes and intentions appear more important than ideology in this study.

*Individual Vulnerability Factors*

Being socially isolated [1, 5, 6, 7, 14, 16, 17] and bullied in school/education [1, 5, 15, 17] were identified as factors which may increase a person's vulnerability when this was combined with perceived injustice [15, 19, 21] a 'wish for revenge' and 'seeking attention/shock' [1, 14, 15, 16, 17, 19, 21] or a need to control their situation [1, 17, 19]. This was noted to be potentially exacerbated

by obsessional traits 'searching for hours every day' for information related to an interest [1, 14, 15, 16, 19, 21, 26] and poor fact-finding or fact-checking skills/naivety [1, 9, 15]. However, it was noted that in terms of intention to act, these vulnerabilities seemed to combine with pre-existing dissocial/aggressive behaviour [7, 9, 14, 15, 17, 21], a lack of empathy [9, 14, 15, 21], mental health problems/personality disorder [5, 6, 7, 9, 14, 17, 19, 21, 23, 25, 26] and suicidality [6, 17, 19, 21, 26].

Social communication deficits/difficulties with relationships [1,9] were noted in terms of how these may contribute to being socially isolated and being bullied, which may make the online world easier to navigate and more appealing [1] and provide a sense of belonging/approval [1, 3, 7, 8, 13]. Rigidity in thinking was noted to contribute to poor fact-checking skills [1] and a need for structure were also identified [1] as being aligned to interest in the military which is deemed to be structured with clear rules and hierarchies.

## **Conclusion & Discussion**

There are no published research studies that directly and empirically examine psychological pathways and trajectories to violent extremism in autistic and neurodiverse individuals. Some studies use hypotheses on pathways to general violence to provide opinions on whether those apply to specific high profile extremist cases. Most studies are authored by academics who do not directly know the cases they report on or have specialist clinical, forensic expertise in the field. This is inevitable given the sensitivity of the field and the limits to its access. Nevertheless, the significant limitations this places on generalising from academic research need to be considered. In this regard, the current research evidence cannot shed light on pathways to violent extremism and the complex role that autism may play in such pathways. Nevertheless, the broad factors and general hypotheses purported in the published work are consistent with clinical forensic knowledge of high functioning autism and how it may contextualise risk and protection in violent extremist offenders (Al-Attar, 2016, 2018, 2019, 2020), albeit only providing anecdotal hypotheses about selected features of autism, that may be of relevance to pathways to violent extremism. These features include social communication, cognitive facets of autism and restricted interests.

Future research needs to conduct more nuanced analyses of pathways to violent extremism in neurodiverse individuals. For example, Al-Attar (2016, 2018, 2019, 2020) proposed at least seven features associated with autism spectrum disorder which may shape risk and protective factors along a pathway to terrorist offending, with such factors playing out in individually nuanced and

mutually reciprocal ways to create 'push' towards terrorist ideologies, groups, narratives and stimuli, and to increase the 'pull' that such dimensions of terrorism may have. This framework for understanding how autism, instead of being causal of risk, instead may play a multitude of contextual roles in shaping pathways to terrorism, may be an example of how finer-grained research in the future may examine pathways. This framework may also be used to understand how the same features of autism can contextualise protection and resilience against violent extremism and hence can contextualise pathways away from violent extremism and to healthy, law-abiding lives. Diversion from terrorism can be generated by reducing the pull terrorism has and increasing the pull that safer alternatives may have for that individual, alongside reducing the push factors in their life. Future research can examine pathways out of violent extremism, using this amongst other frameworks, to offer more clinically nuanced analysis.

### **Theme 7 – Recommendations**

The following recommendations were made in the papers reviewed. However, it should be noted these were suggestions made by the authors of the studies and have not been empirically tested for their efficacy/effectiveness.

#### *A note of caution*

Several papers noted the need for caution in terms of inferring links between ASD and radicalisation [1, 13]. Specifically it was noted that there may not be a causal link [1, 13] and that making speculative connections about autism and radicalisation is unhelpful [9, 14] especially as these are built on a small number of cases [9]. It is also noted that caution should be observed in terms of the link between autism and radicalisation because of the presence of co-existing mental/personality disorders [14]. Any development of future research and risk assessment should attend to this.

#### *External Factors*

It was suggested that attendance to external factors should be considered, such as the family surrounding the person [1] who may endorse radical views themselves [1] or fail to monitor and safeguard the individual [1]. Young people may be particularly influenced by family, peer and educational factors.

#### *Sharing information amongst Professionals*

Creating better links between parents, schools and professionals was suggested as one strategy which may assist (young) people at risk [1, 18]

#### *Future research*

It has been noted that there is a need for future research in relation to risk assessment [14] and that one method which could be used to achieve this would be to gather information on previous perpetrators' backgrounds, and also information on their behaviour prior to their attack, so that a database is built up of enough cases in order to identify which patterns and pathways are most predictive of a "lone wolf" terrorist attack [16].

#### ***Summary & Conclusions***

The above recommendations are helpful in identifying a number of basic themes that academics, practitioners and policy makers should consider when addressing the involvement of neurodiverse individuals in the violent extremism context. The greatest value of the above recommendations is in their identification of the gaps in academic knowledge and the empirical limitations of the existent research evidence and what theoretical conclusions can be drawn from it. The academic evidence base in terrorism is extremely limited for a number of inevitable reasons. Firstly, terrorism is a highly sensitive and securitised field, access to which is very limited for academics. Secondly, terrorists with clinical conditions may be extensively assessed by highly specialist forensic clinicians, generating highly intricate information which is typically unavailable to academics. Where research access is granted, the interpretation of intricate clinical forensic information may not be within the remit of academics who are not trained in the field to interpret this. Hence, neither the terrorism risk (forensic) nor the autism (diagnostic, clinical) nuances and complexities are fully accessible to most academics addressing these two factors through open-source research using generic variables and proxies. This naturally has significant limitations and should be cautioned against. This is why the very academics who publish such work, rightly conclude that their methods are limited, their data partial, and they are often not positioned to draw what are clinical forensic conclusions and inferences. It is important for such natural limitations in any terrorism research to be recognised when considering the application of findings from such research to practice.

For the above reasons, academic researchers may not realistically be in a position to provide specific, in-depth, clinical and operational analysis and by inference, make clinical or operational

recommendations on the role played by neurodiversity in pathways to violent extremist offences. That is not to say theory and research is not essential to the field, and academia and practice need to be synthesised in order to interpret and build on academic research. With this in mind, the current REA set out to review the academic evidence using the standard REA method followed by a discussion of the evidence through a clinical and forensic lens. It was conducted by a team of clinical/forensic and academic specialists in the field of autism/neurodiversity and violent extremism specifically, in order to provide a clinically and forensically informed academic analysis and interpretation of the research evidence that currently exists in the public domain. This enables not only an academic summary of research, but conclusions and discussion of such findings from a clinical and forensic perspective. This may enhance the 'real world' application of the REA. For this reason, in each of the above sections or 'themes', a rapid evidence review is presented, followed by a discussion of the real-life application and limitations of the research.

## **5. Summary of Findings, Limitations and Implications for Practice**

There are no published research studies that directly and empirically examine psychological pathways and trajectories to violent extremism in autistic and neurodiverse individuals. The studies that examine prevalence are limited by unreliable measures of autism. Hence, the prevalence of neurodiversity in the violent extremism cohort remains poorly understood. Most studies were written by academics who did not directly know the cases they report on nor have specialist clinical, forensic expertise in the field. This is inevitable given the sensitivity of the field and the limits to accessing data. Furthermore, many of the included cases deemed to have autism were also noted to have co-morbid psychiatric conditions such as personality disorder, anxiety, depression, suicidality, intellectual disabilities and ADHD. Thus, it is unclear to what extent autism alone may contribute towards or away from a risk of radicalisation or whether there is no relationship at all.

When the more reliable studies of violent extremism and terrorism offenders with diagnosed autism are examined, the prevalence of autism appears similar to the general population, although such studies report on very small samples that cannot be used to draw inferences and generalisations from. Other limitations to generalisation include the male dominance in the samples and the skewed age ranges, with younger adult male participants dominating the samples. In summary, there are weak indications that in some sub-types of violent extremism such as lone actor sub-types, autism prevalence may be disproportionately high, although given the severe limitations of the studies, issues of comorbidity and small sample sizes, one must be very cautious about drawing conclusions. Furthermore, perceptions of vulnerability to being exploited online do not

equate to evidence that online recruiters are targeting neurodiverse individuals and there is no published evidence for the latter.

Based on the findings it is not possible to discern reliable, predictive behavioural indicators of online radicalisation in individuals with autism, and given the very limited cases studies and heterogeneity of both autistic and online radicalisation markers, it is not possible to draw any conclusions from current studies to inform risk prediction. Instead it is recommended that the focus for understanding violent extremism in people with autism should be conducted through an individualised case formulation.

Overall, there is limited evidence of a raised prevalence of autism amongst broad violent extremism cohorts and many of the studies use unreliable measurements of both autism and, to an extent, violent extremism, making it next to impossible to generate a reliable measure of the prevalence of autism in the violent extremist population. Furthermore, most convicted violent extremists in developed countries would likely be clinically and forensically assessed post-arrest and their clinical diagnosis not made public knowledge. Hence, the 'data' of relevance to reliably answering a question on prevalence is unlikely to be accessible to academic researchers. It is possible that lone actors are assumed to have psychological problems and are clinically assessed more, with the reverse being the assumption for group actors. The diagnostic criteria (or their commonly assumed behavioural manifestations) are also argued to be less culturally sensitive for non-western cultures, raising the question of under diagnosis in ethnic or religious minority cohorts. Thus, the prevalence reported in research may be confounded by biases in detection and diagnosis of autism, with such bias operating differently for different sub-groups of violent extremists. For this reason, prevalence across the violent extremist population can neither be concluded to be higher or equal to the general population.

Finally, no published evaluations of support and intervention approaches adopted with autistic individuals convicted of violent extremist offences are available in the public domain. Thus, it is recommended that individualised risk formulation should be adopted by individuals with specialist knowledge of both violent extremism risk and high functioning autism/neurodiversity. This formulation should be undertaken from a position of considering how an individual's strengths may be enhanced and utilised to mitigate any risks. It should avoid being solely focused on identifying and compensating for any deficits (Rogers, 2000; Maruna & Lebel, 2003; Marsden & Lee, 2022). Contextual factors such as age and previous experiences of trauma may also influence formulation of risk. The formulation should be used to inform individually tailored support and intervention

approaches. In turn, the effectiveness of those should be evaluated through the use of individually tailored measures of risk and its reduction. This is because violent extremist offending has a very low base rate and this will be lowered further when considering the sub-set of autistic offenders who commit such offences. Hence, reconviction data may not be realistically obtainable and even if obtained, should not be used as a standalone measure of effective approaches.

## **6. Recommendations**

- The field of counter-terrorism and its practitioners could work collaboratively, taking into account the sensitivity of the field, with academic researchers and experienced clinicians to broaden the research in relation to autism and terrorism. This would increase the reliability of the data obtained and the associated inferences made from this research.
- Research in the field would benefit from identifying what differentiates the factors driving neurodiverse versus neurotypical individuals who commit violent extremism acts and whether these factors differ over the lifespan.
- Future research should also seek to establish what enabled those at risk to choose and adhere to a pathway out of offending, so this can inform future interventions.
- Research should also seek to ascertain what factors in addition to autism contribute towards an increased or reduced risk of violent extremism and consider whether these change across the lifespan.
- Identification of the risk factors and warning signs specific for people with autism who are at risk of violent extremism could be used to educate professionals (such as teachers) as to how to identify these in order for additional support to be provided to the person.
- Future research should consider the appropriateness of naming individuals involved in terrorist activity in academic papers, given the potential for this to contribute to infamy and reinforce the function of extremist behaviour for that individual and others who come to be inspired by them.
- Future research would benefit from considering if there are any cultural variations in the prevalence of autism and neurodiversity in those at risk of violent extremism.
- Understanding the links between gender, autism and violent extremism should be further explored given the lack of females noted in the present REA. This could include exploration as to why females are not identified in the research. For example, if this is due to under-diagnosis of autism in female violent extremists or if females with autism choose alternative pathways to manage their life experiences - which could inform future interventions for males.
- Finally, it would also be of benefit for the research to explore a wider range of neurodiverse conditions and violent extremism.

## References

- Albert D, Chein J, Steinberg L. Peer Influences on Adolescent Decision Making. *Curr Dir Psychol Sci*. 2013 Apr;22(2):114-120. doi: 10.1177/0963721412471347. PMID: 25544805; PMCID: PMC4276317.
- Al-Attar, Z. (2016). *Autism & Terrorism Links – Fact or Fiction?* 15th International Conference on the Care and Treatment of Offenders with an Intellectual and/or Developmental Disability, National Autistic Society, Manchester, April 19–20.
- Al-Attar, Z. (2016). *Autism & Terrorism Links – Baseless Headlines or Clinical Reality?* XI Autism-Europe International Congress, Autism-Europe & National Autistic Society, Edinburgh, September 16–18.
- Al-Attar, Z. (2018). *Terrorism and Autism – Making Sense of the Links in Formulations of Risk and Protective Factors*. The Autism Professionals Annual Conference 2018, Harrogate, March 7–8.
- Al-Attar, Z. (2018). *Assessing Risk in Extremists with Complex Needs: Autistic Spectrum Disorder*. Radicalisation Awareness Network: Prison & Probation Working Group Conference, Brussels, July 9–10.
- Al-Attar, Z. (2018). *Autism: Implications for Exit and Diversion from Extremism*. Radicalisation Awareness Network: Health & Social Care / Exit Conference, Vienna, Nov 7.
- Al-Attar, Z. (2018). *Autism: Implications for Prevent*. Prevent NHS England Conference, Harrogate, December 6.
- Al-Attar, Z. (2018). Framework for the Assessment of Risk and Protection in Offenders on the Autistic Spectrum (FARAS).
- Al-Attar, Z. (2019). *Autism: Implications for Prevent Work with Adolescents*. Prevent NHS England Conference, Manchester, January 24.
- Al-Attar, Z. (2019). *Mental Illness & Extremism: The Evidence Base Informing Assessment Methodology*. Radicalisation Awareness Network: Health & Social Care Sub-Group, Turin Italy, March 13.
- Al-Attar, Z. (2019). *Introducing the FARAS – a Framework to Aid Risk Assessment with Offenders on the Autistic Spectrum*. 18th International Conference on Offenders with an Intellectual and/or Developmental Disability, Birmingham, April 11.
- Al-Attar, Z. (2019). *Extremism, Radicalisation & Mental Health: Handbook for Practitioners*. Radicalisation Awareness Network (RAN): Health and Social Care. November 2019.
- Al-Attar, Z. (2020). Autism spectrum disorders and terrorism: how different features of autism can contextualise vulnerability and resilience. *The Journal of Forensic Psychiatry & Psychology*, 31, 926-949.(2020).
- Al-Attar, Z. (2022). Autism spectrum disorders and terrorism: how different features of autism can contextualise vulnerability and resilience. In: Logan, C (Ed). *Violent Extremism: A Primer for Mental Health Practitioners* (Chapter 6). Routledge, 2022.

Allely, C. S., & Faccini, L. (2019). Clinical profile, risk, and critical factors and the application of the “path toward intended violence” model in the case of mass shooter DR. *Deviant Behavior*, 40(6), 672-689.

Allely, C. S., Minnis, H., Thompson, L., Wilson, P., & Gillberg, C. (2014). Neurodevelopmental and psychosocial risk factors in serial killers and mass murderers. *Aggression and Violent Behavior*, 19(3), 288-301.

Allely, C. S., Wilson, P., Minnis, H., Thompson, L., Yaksic, E., & Gillberg, C. (2017). Violence is rare in autism: when it does occur, is it sometimes extreme?. *The Journal of Psychology*, 151(1), 49-68.

American Psychiatric Association. (2022). *Diagnostic and Statistical Manual of Mental Disorders* (5th edition – Text Revision). Washington, DC

Baird, G., Simonoff, E., Pickles, A., Chandler, S., Loucas, T., Meldrum, D., & Charman, T. (2006). Prevalence of disorders of the autism spectrum in a population cohort of children in South Thames: the Special Needs and Autism Project (SNAP). *The Lancet*, 368(9531), 210-215.

Bhui, K., Otis, M., Silva, M. J., Halvorsrud, K., Freestone, M., & Jones, E. (2020). Extremism and common mental illness: Cross-sectional community survey of White British and Pakistani men and women living in England. *The British Journal of Psychiatry*, 217(4), 547-554.

Bowler, D.M., Gardiner, J.M. & Berthollier, N. (2004). Source memory in adolescents and adults with Asperger's syndrome. *Journal of Autism and Developmental Disorders*, 34, 533–542.

Brown, R., Speyer, L. G., Eisner, M., Ribeaud, D., & Murray, A. L. (2022). Exploring the effect of ADHD traits on the moment-to-moment interplay between provocation and aggression: evidence from dynamic structural equation modelling. PsyArXiv. March 1. doi:10.31234/osf.io/d27ta.

Brugha, T.S., McManus, S., Bankart, J., Scott, F., Purdon, S., Smith, J., Bebbington, P., Jenkins, R. & Meltzer, H. (2011). Epidemiology of autism spectrum disorders in adults in the community in England. *Archives of General Psychiatry*, 68(5), 459-65.

Buggy, C.K. (2016), “Under the radar: how might Australia enhance its policies to prevent ‘lone wolf’ and ‘fixated person’ violent attacks?”, Indo-Pacific strategic papers, The Centre for Defence and Strategic Studies, available at: [www.defence.gov.au/ADC/Publications/IndoPac/Buggy\\_IPSP\\_Final.pdf](http://www.defence.gov.au/ADC/Publications/IndoPac/Buggy_IPSP_Final.pdf) (accessed February 27, 2017).

Corner, E., & Gill, P. (2015). A false dichotomy? Mental illness and lone-actor terrorism. *Law and human behavior*, 39(1), 23.  
CNN - <https://edition.cnn.com/2022/06/07/us/2022-shootings-pace-worst-ever/index.html>

Cohen, K., Johansson, F., Kaati, L., & Mork, J. C. (2014). Detecting linguistic markers for radical violence in social media. *Terrorism and Political Violence*, 26(1), 246-256.

Collins, J., Horton, K., Gale-St Ives, E., Murphy, G. & Barnoux, M. (2022). A Systematic Review of Autistic People and the Criminal Justice System: An Update of King and Murphy (2014). *Journal of Autism and Developmental Disorders*, 52, May 30.

- Corner, E., Gill, P., & Mason, O. (2016). Mental health disorders and the terrorist: A research note probing selection effects and disorder prevalence. *Studies in Conflict & Terrorism*, 39(6), 560-568.
- Daly, S. E., & Reed, S. M. (2022). "I Think Most of Society Hates Us": A Qualitative Thematic Analysis of Interviews with Incels. *Sex Roles*, 86(1), 14-33.
- Dein K, Hassiotis A, Woodbury-Smith M, Roychowdhury A, Squires R, Freestone M. (2021). Prevalence of autism within medium secure units: a feasibility study. *J Forens Psychiatry Psychol*. 2021;32:861-78.
- Dinesson, K. E. (2022). (Un) reasonable excuses—On R v Dunleavy, R v Copeland, and Section 58. *The Modern Law Review*, 2022 (1).
- Faccini, L. (2016). The application of the models of autism, psychopathology and deficient Eriksonian development and the path of intended violence to understand the Newtown shooting. *Archives of Forensic Psychology*, 1(3), 1-13.
- Faccini, L., & Allely, C. S. (2016). Mass violence in individuals with Autism Spectrum Disorder and Narcissistic Personality Disorder: A case analysis of AB using the "Path to Intended and Terroristic Violence" model. *Aggression and Violent Behavior*, 31, 229-236.
- Faccini, L. and Allely, C.S. (2017), "Rare instances of individuals with autism supporting or engaging in terrorism", *Journal of Intellectual Disabilities and Offending Behaviour*, Vol. 8 No. 2, pp. 70-82. <https://doi.org/10.1108/JIDOB-11-2016-0022>
- First, M. B., Gaebel, W., Maj, M., Stein, D. J., Kogan, C. S., Saunders, J. B., ... & Reed, G. M. (2021). An organization-and category-level comparison of diagnostic requirements for mental disorders in ICD-11 and DSM-5. *World Psychiatry*, 20(1), 34-51.
- Griego, AW., Datzman, J.N., Estrada, S.M. & Middlebrook, SS. Suggestibility and false memories in relation to intellectual disability and autism spectrum disorder: a meta-analytic review. *Journal of Intellectual Disabilities Research*, 63(12), 1464-1474.
- Gupta, M., & Chaudhary, R. (2021). Diagnostic Challenges of High-Functioning Autism Spectrum Disorder in Females. *Cureus*, 13(1).
- Hewitt, S. (2021). "One-man war": a history of lone-actor terrorism in Canada, 1868-2018. *Canadian Network for Research on Terrorism, Security and Society (TSAS)*, 2021, pp1-68.
- Institute for Economics & Peace. Global Peace Index 2021: Measuring Peace in a Complex World, Sydney, June 2021. Available from: <http://visionofhumanity.org/reports>.
- Jaki, S., De Smedt, T., Gwózdź, M., Panchal, R., Rossa, A., & De Pauw, G. (2019). Online hatred of women in the Incels. me forum: Linguistic analysis and automatic detection. *Journal of Language Aggression and Conflict*, 7(2), 240-268.
- Kruglanski, A. W., Gelfand, M. J., Bélanger, J. J., Sheveland, A., Hetiarachchi, M., & Gunaratna, R. (2014). The psychology of radicalization and deradicalization: How significance quest impacts violent extremism. *Political Psychology*, 35, 69-93.

- Langman, P. (2015). The enigma of AL's mind and motivations for murder. *The Journal of Campus Behavioral Intervention*, 3, 1-11.
- Little, R., Ford, P. and Girardi, A. (2021), "Online self-radicalisation: a case study of cognitive vulnerabilities for radicalization to extremism and single actor terrorism", *Journal of Intellectual Disabilities and Offending Behaviour*, Vol. 12 No. 3/4, pp. 112-123. <https://doi.org/10.1108/JIDOB-03-2021-0006>.
- Lloyd, M., & Dean, C. (2015). The development of structured guidelines for assessing risk in extremist offenders. *Journal of Threat Assessment and Management*, 2(1), 40.
- Lockwood Estrin, G., Milner, V., Spain, D., Happé, F., & Colvert, E. (2021). Barriers to autism spectrum disorder diagnosis for young women and girls: A systematic review. *Review Journal of Autism and Developmental Disorders*, 8(4), 454-470.
- Maras, K. L., & Bowler, D. M. (2012). Brief Report: Suggestibility, compliance and psychological traits in autism spectrum disorder. *Research in Autism Spectrum Disorders*, 6(3), 1168–1175. <https://doi.org/10.1016/j.rasd.2012.03.013>.
- Marsden, S & Lee, B (2022) Protective Factors for Violent Extremism and Terrorism. Rapid Evidence Assessment. Centre for Research and Evidence on Security Threats. Published 23 June 2022. <https://crestresearch.ac.uk/resources/protective-factors-for-violent-extremism-and-terrorism-rapid-evidence-assessment/>
- Maruna, S., & LeBel, T. P. (2002). Welcome home-examining the re-entry court concept from a strengths-based perspective. *W. Criminology Rev.*, 4, 91.
- Moskalenko, S., González, J. F. G., Kates, N., & Morton, J. (2022). Incel Ideology, Radicalization and Mental Health: A Survey Study. *The Journal of Intelligence, Conflict, and Warfare*, 4(3), 1-29.
- Palermo, M. T. (2013). Developmental disorders and political extremism: a case study of Asperger syndrome and the neo-Nazi subculture. *Journal of Forensic Psychology Practice*, 13(4), 341-354.
- Percich, A. (2021). Supreme Gentlemen or Radicalized Killers: Analyzing the Radicalization Paths of Involuntary Celibate Killers and the Role of the Online Incel Forums. *Doctoral dissertation, Georgetown University, ProQuest Publishing, August, 2021*.
- Peter, E., Seidenbecher, S., Bogerts, B., Dobrowolny, H., & Schöne, M. (2019). Mass murders in Germany—classification of surviving offenders based on the examination of court files. *The Journal of Forensic Psychiatry & Psychology*, 30(3), 381-400.
- Pressman, D. E. (2016). The complex dynamic causality of violent extremism: Applications of the VERA-2 risk assessment method to CVE initiatives. In *Disaster Forensics* (pp. 249-269). Springer, Cham.
- Rogers, R. (2000). The uncritical acceptance of risk assessment in forensic practice. *Law and human behavior*, 24(5), 595-605.
- Rozdilsky, J. L., & Snowden, E. (2021). The 2018 Toronto Van Attack: Understanding the Disaster by Looking at Vulnerability, Tactics, and Motives. *Canadian Journal of Emergency Management Vol 1 No 1 (2021)*.

Scrivens, R., & Conway, M. (2019). The roles of 'old' and 'new' media tools and technologies in the facilitation of violent extremism and terrorism. Chapter 13 In *The human factor of cybercrime*, Leukfeldt, R & Holt, T.J. (2020). Taylor & Francis, London and New York.

Speckhard, A., & Ellenberg, M. (2022). Self-reported psychiatric disorder and perceived psychological symptom rates among involuntary celibates (incels) and their perceptions of mental health treatment. *Behavioral Sciences of Terrorism and Political Aggression*, 1-18.

Speckhard, A., Ellenberg, M., Morton, J., & Ash, A. (2021). Involuntary Celibates' Experiences of and Grievance over Sexual Exclusion and the Potential Threat of Violence Among Those Active in an Online Incel Forum. *Journal of Strategic Security*, 14(2), 89-121.

Sturup, J. (2018). Comparing serial homicides to single homicides: A study of prevalence, offender, and offence characteristics in Sweden. *Journal of Investigative Psychology and Offender Profiling*, 15(2), 75-89.

Taylor, E., Livingston, L., Clutterbuck, R., & Shah, P. (2020). Psychometric concerns with the 10-item Autism-Spectrum Quotient (AQ10) as a measure of trait autism in the general population. *Experimental Results*, 1, E3. doi:10.1017/exp.2019.3

Taarnby, M. (2005). Recruitment of Islamist terrorists in Europe: Trends and perspectives. *Danish Ministry of Justice*, 14.

Twenge, J. M., Cooper, A. B., Joiner, T. E., Duffy, M. E., & Binau, S. G. (2019). Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005–2017. *Journal of Abnormal Psychology*, 128(3), 185.

Van Brunt, B. (2016). Assessing threat in written communications, social media, and creative writing. *Violence and gender*, 3(2), 78-88.

Van Brunt, B. (2015). Violence risk assessment of the written word (VRAW2). *Journal of Campus Behavioral Intervention*, Vol. 3 (2015), pp. 12-25.

Vermeulen, P. (2015). Context blindness in autism spectrum disorder: Not using the forest to see the trees as trees. *Focus on Autism and Other Developmental Disabilities*, 30(3), 182-192.

Vermeulen, F., van Leyenhorst, M., Roex, I., Schulten, N., & Tuzani, N. (2022). Between Psychopathology and Ideology: Challenges and Practices in Interpreting Young Extremists Experiencing Mental Illness in the Netherlands. *Frontiers in Psychiatry*, 2022, Vol 12, p1-6). <https://doi.org/10.3389/fpsy.2021.790161>

Walter, F., Leonard, S., Miah, S., & Shaw, J. (2021). Characteristics of autism spectrum disorder and susceptibility to radicalisation among young people: a qualitative study. *The journal of forensic psychiatry & psychology*, 32(3), 408-429.

Weenink, A. W. (2015). Behavioral problems and disorders among radicals in police files. *Perspectives on terrorism*, 9(2), 17-33.

White, S. G., Meloy, J. R., Mohandie, K., & Kienlen, K. (2017). Autism spectrum disorder and violence: Threat assessment issues. *Journal of Threat Assessment and Management*, 4(3), 144.

Young, S., González, R. A., Mullens, H., Mutch, L., Malet-Lambert, I., & Gudjonsson, G. H. (2018). Neurodevelopmental disorders in prison inmates: comorbidity and combined associations with psychiatric symptoms and behavioural disturbance. *Psychiatry research*, *261*, 109-115.

## Appendix 1 – List of Papers Excluded

	Author(s)	Reason for Exclusion <sup>2</sup>
1	Al-Attar, Z. (2020). Autism spectrum disorders and terrorism: how different features of autism can contextualise vulnerability and resilience. <i>The Journal of Forensic Psychiatry &amp; Psychology</i> , 31, 926-949.(2020).	Opinion Paper
2	Al-Attar, PhD, Z. (2018). Interviewing terrorism suspects and offenders with an autism spectrum disorder. <i>International Journal of Forensic Mental Health</i> , 17(4), 321-337.	Opinion Paper
3	Kobrin, N. H. (2016). Nobody born a terrorist, but early childhood matters: Explaining the jihadis' lack of empathy. <i>Perspectives on Terrorism</i> , 10(5), 108-111.	Literature Review/Secondary Citation
4	Allely, C. S., & Faccini, L. (2018). Rare instances of individuals with autism supporting or engaging in terrorism: a reply. <i>Journal of Intellectual Disabilities and Offending Behaviour</i> .	Letter
5	Chown, N. P., Beardon, L., & Cossburn, K. (2018). Rare instances of individuals with autism supporting or engaging in terrorism: A response to Lino Faccini and Clare Allely. <i>Journal of Intellectual Disabilities and Offending Behaviour</i> .	Letter
6	Woodbury-Smith, M. R., Loftin, R., Westphal, A., & Volkmar, F. R. (2022). Vulnerability to Ideologically-Motivated Violence Among Individuals With Autism Spectrum Disorder. <i>Frontiers in psychiatry</i> , 13, 873121.	Opinion Paper
7	White, S. G. (2017). Case study: The Isla Vista campus community mass murder. <i>Journal of Threat Assessment and Management</i> , 4(1), 20.	Not specific ASD
8	Stijelja, S. (2021). The Psychological Profile of Involuntary Celibates (Incels): A Literature Review.	Opinion paper
9	DeCook, J. R., & Kelly, M. (2021). Interrogating the “incel menace”: assessing the threat of male supremacy in terrorism studies. <i>Critical Studies on Terrorism</i> , 1-21.	Opinion Paper
10	Williams, D. J., Arntfield, M., Schaal, K., & Vincent, J. (2021). Wanting sex and willing to kill: Examining demographic and cognitive characteristics of violent “involuntary celibates”. <i>Behavioral sciences &amp; the law</i> , 39(4), 386-401.	Authors note no specific diagnosis
11	Erlandsson, Å., & Reid Meloy, J. (2018). The Swedish school attack in Trollhättan. <i>Journal of Forensic Sciences</i> , 63(6), 1917-1927.	No specific ASD diagnosis

<sup>2</sup> Papers were excluded if they did not contain data relating to people with a clinical diagnosis of autism or neurodiversity. For example, these included where the author(s) postulated retrospectively that based on traits from secondary sources the individual may meet the criteria for autism. Primary sources from the individual reporting they had a diagnosis or traits of autism were included. Secondary citations (where an author cited research pertaining to autism and violent extremism) such as in literature reviews were excluded and the original cited papers were used. Opinion papers with no original data to substantiate opinions were also excluded.

12	Kobrin, N. & Simms, N. (2008). Jihaditism? Parallels between Autism and Terrorism. <i>Mentalites</i> , 22 (2): 1-38.	Essay/Opinion Paper
13	Fitzgerald, Michael. "Autism and school shootings—Overlap of autism (Asperger's syndrome) and general psychopathy." <i>Autism spectrum disorder—Recent advances</i> (2015): 3-12.	Book Chapter. Unclear if had diagnosis
14	Paulussen, C., Nijman, J., & Lismont, K. (2017).Mental Health and the Foreign Fighter Phenomenon: A Case Study from the Netherlands. ICCT. <a href="https://icct.nl/publication/mental-health-and-the-foreign-fighter-phenomenon-a-case-study-from-the-netherlands/">https://icct.nl/publication/mental-health-and-the-foreign-fighter-phenomenon-a-case-study-from-the-netherlands/</a>	Secondary citation
15	Weenink, A. W. (2019). Adversity, criminality, and mental health problems in Jihadis in Dutch police files. <i>Perspectives on Terrorism</i> , 13(5), 130-142.	No ASD
16	Pressman, D. E., & Flockton, J. (2012). Calibrating risk for violent political extremists and terrorists: The VERA 2 structured assessment. <i>The British Journal of Forensic Practice</i> , 2012 Nov. 14(4), 237–251. <a href="https://doi.org/10.1108/14636641211283057">https://doi.org/10.1108/14636641211283057</a>	Not ASD
17	Pressman, E., Duits, D., Rinne, T., & Flockton, J. (2018). VERA-2R A structured professional judgement approach. European Commission. <a href="https://ec.europa.eu/homeaffairs/node/11702_en">https://ec.europa.eu/homeaffairs/node/11702_en</a>	Not ASD
18	Erlandsson, Å., & Reid Meloy, J. (2018). The Swedish school attack in Trollhättan. <i>Journal of Forensic Sciences</i> , 63(6), 1917-1927.	No confirmed diagnosis or self-report
19	Logan, C. & Sellers, R. (2021). Risk Assessment and Management in Violent Extremism: a Primer for Mental Health Practitioners. <i>Journal of Forensic Psychiatry and Psychology</i> , 2021, Vol. 32, No.3, 355-377.	Secondary Citation
20	Grimbergen, C., & Fassaert, T. (2022). Occurrence of psychiatric disorders, self-sufficiency problems and adverse childhood experiences in a population suspected of violent extremism. <i>Frontiers in psychiatry</i> , 13.	Prevalence estimates of ASD not confirmed
21	Lloyd, M., & Dean, C. (2015). The development of structured guidelines for assessing risk in extremist offenders. <i>Journal of Threat Assessment and Management</i> , 2(1), 40.	Not ASD
22	Wagner, K. D. (2011). A Potpourri of Timely Topics. <i>The Journal of Clinical Psychiatry</i> , 72(9), 14928.	Victims
23	National Association of School Psychologists. (2002). Coping with Terrorism-Helping Children with Special Needs: Tips for School Personnel and Parents. <i>Communication Disorders Quarterly</i> , 23(2), 100-102.	Victims
24	Rahman T, (2018). Behavioral sciences (Basel, Switzerland) [Behav Sci (Basel)], ISSN: 2076-328X, 2018 Jan 12; Vol. 8 (1).	No ASD sample
25	Rosenfeld, D (1986). <i>The International Journal of Psychoanalysis</i> , Vol 67(1), 1986 pp. 53-64.	Victims

26	Baron, R. M (1997) On Making Terror Management Theory less motivational and more social. <i>Psychological Inquiry, Vol 8(1), 1997 pp. 21-22.</i>	No ASD sample
27	Bhui, Kamaldeep; Otis, Michaela; Silva, Maria Joao; Halvorsrud, Kristoffer; Freestone, Mark; Jones, Edgar (2020). <i>British Journal of Psychiatry</i> ; Oct2020, Vol. 217 Issue 4, p547, 8p	Opinion Paper
28	Barber, C. (2017). Social media and autism spectrum conditions. <i>Practice Nursing, 28(7), 292-298.</i>	Victims
29	Tantam, D. (1988). Lifelong eccentricity and social isolation: I. Psychiatric, social, and forensic aspects. <i>The British Journal of Psychiatry, 153(6), 777-782.</i>	ASD sample unclear
30	Allely, C. S. (2020). The contributory role of psychopathology and inhibitory control in the case of mass shooter JH. <i>Aggression and violent behavior, 51, 101382.</i>	Unclear if has ASD
31	Collins, C. J., & Clark, J. J. (2021). Using the TRAP-18 to identify an incel lone-actor terrorist. <i>Journal of Threat Assessment and Management, 2021, Sept.</i>	No ASD sample
32	Allely, C. S., & Wicks, S. J. (2022). The feasibility and utility of the Terrorist Radicalization Assessment Protocol (TRAP-18): A review and recommendations. <i>Journal of Threat Assessment and Management., 2022, April.</i> <a href="https://doi.org/10.1037/tam0000179">https://doi.org/10.1037/tam0000179</a>	No ASD sample
33	Williams, D. J. (2021). Forensic behavioral science of serial and mass murder with an addition of leisure research: a descriptive synthesis. <i>Forensic Sciences, 1(1), 16-24.</i>	Secondary Citation
34	Rahman, T., Zheng, L., & Meloy, J. R. (2021). DSM-5 cultural and personality assessment of extreme overvalued beliefs. <i>Aggression and Violent Behavior, 60, 101552.</i>	Secondary Citation
35	McBride, M. K., Carroll, M., Mellea, J. L., & Savoia, E. (2021). Targeted Violence: A Review of the Literature on Radicalization and Mobilization. <i>US Department of Homeland Security, Science and Technology Award, Oct, 2021.</i>	Literature Review
36	Basu, N. (2021). Learning lessons from countering terrorism: the UK experience 2017–2020. <i>Cambridge Journal of Evidence-Based Policing, 5(3), 134-145.</i>	No ASD sample
37	Schuurman, B., Bakker, E., Gill, P., & Bouhana, N. (2018). Lone actor terrorist attack planning and preparation: a data-driven analysis. <i>Journal of forensic sciences, 63(4), 1191-1200.</i>	No ASD sample

Appendix 2 – Full Summary of Articles included

New ID	Author, Year and Title	Sector/ Population/ Sample	Methodology Or Design and Sample Size	Relevant or Main Findings	Strengths & Limitations	Level (AA-E)
1	Walter, F., Leonard, S., Miah, S., & Shaw, J. (2021). Characteristics of autism spectrum disorder and susceptibility to radicalisation among young people: a qualitative study. <i>The journal of forensic psychiatry &amp; psychology</i> , 32(3), 408-429.	This UK study was commissioned by a specialist school for autistic children in England to provide guidance for staff on how to identify and manage autistic young people at risk of being radicalised.	The study included 34 qualitative interviews with experts in the field. Participants included National Health Service staff, academics, educational staff and counter-terrorism officers, as well as young people with autism from the UK.	Four key themes were identified in the interview data pertaining to (1) the current evidence, (2) training needs of professionals, (3) key autistic traits and susceptibility to radicalisation and (3) social and cultural considerations.  Participants stressed that no assumptions should be made regarding the link between ASD and radicalisation in the absence of sophisticated research and reliable evidence. In the absence of this knowledge, there was collective agreement that it is irresponsible to promote the notion of an association between autism and radicalisation at present.	Strengths: This study is the first investigation into the experiences of young people with ASD and professionals working with these individuals with regard to their susceptibility to radicalisation. The methodology used was clear.  Limitations: Small sample size and the young people involved had no experience of being radicalised.	D
2	Bhui, K., Otis, M., Silva, M. J., Halvorsrud, K., Freestone, M., & Jones, E. (2020). Extremism and common mental illness: Cross-sectional community survey of White British and Pakistani men	Population survey of 618 White British and Pakistani people in England.	Extremism was assessed by an established measure of sympathies for violent protest and terrorism (SVPT). Respondents with any positive scores (showing sympathies) were compared with those with all negative scores. The researchers calculated	SVPT were more common in those with major depression with dysthymia (risk ratio 4.07, 95% CI 1.37–12.05, P = 0.01), symptoms of anxiety (risk ratio 1.09, 95% CI 1.03–1.15, P = 0.002) or post-traumatic stress (risk ratio 1.03, 95% CI 1.01–1.05, P = 0.003).  SVPT were shown by 15.1% of the White British and 8.1% of the Pakistani groups. SVPT were significantly more common in lifetime alcohol drinkers, tobacco users, illicit drug users and in those with a criminal conviction. Younger people, single people and those born in the UK	Strengths: Large Sample of Participants. Considers a wide range of demographic factors that may contribute to extremist views.  Limitations: The 'Autism' condition was based using a score on the AQ-10 rather than a formal diagnostic tool. AQ10 score about 2.5 for each group. 78 cases had missing AQ10 data. Taylor et al (2020) found that the AQ10 does not have a uni-factorial structure. Rather, it appears to have	D

	and women living in England. <i>The British Journal of Psychiatry</i> , 217(4), 547-554.		associations between extremist sympathies and ICD-10 diagnoses of depression and dysthymia, and symptoms of anxiety, personality difficulties, autism and post-traumatic stress.	more often expressed SVPT. Gender, religion, religious attendance, education level, political engagement, life events, discrimination, social capital and social support were not associated with SVPT. Autism and personality disorder scores were not associated with SVPT.	multiple factors, likely because its items were drawn from 5 different subscales of the full AQ (Baron-Cohen et al., 2001). Therefore, its factor structure neither reflects autism conceptualised as a unitary construct, nor the dyad of social-communicative and rigid and repetitive impairments that underpin diagnosable autism (American Psychiatric Association, 2013). They also found it has poor reliability, and hence this study indicates that the AQ10 may not be a psychometrically robust measure of autism in non-clinical samples from the general population.	
3	Speckhard, A., Ellenberg, M., Morton, J., & Ash, A. (2021). Involuntary Celibates' Experiences of and Grievance over Sexual Exclusion and the Potential Threat of Violence Among Those Active in an Online Incel Forum. <i>Journal of Strategic Security</i> , 14(2), 89-121.	Cross Sectional Within Subjects Design of Incels over the age of 18. Participants were worldwide of varying religious backgrounds. 271 respondents were male with 1 preferring not to answer. This was a study of involuntary celibates (incels). All aged 18 or older.	The owner of the forum sent the survey to active members of the same large incel forum with an invitation for adult forum members who self-identify as incels to participate. The survey was open from December 7, 2020 to January 2, 2021  The survey included 68 questions in a variety of formats (multiple choice, checklists, short and long answer) covering a wide array	With regard to reporting current psychological symptoms, participants were asked to rate the intensity with which they experienced various symptoms on a scale from one to five as well as to indicate whether they had been diagnosed formally with associated disorders. Most of the participants agreed (rated as 4 or 5) that they experienced: Depressive symptoms 64.3 percent; Symptoms of Autism Spectrum Disorder 24.6 percent; Symptoms of posttraumatic stress 27.9 percent; Anxiety symptoms 59.6 percent; Suicidal ideations 47.8 percent.  Self-reported intensity of depressive symptoms significantly correlated with agreement that the forum made them feel depressed and dangerousness significantly correlated with agreement that the forum made them feel	Strengths: Obtained participants consent. Methodology clearly described.  Limitations: Did not have a comparison group of non-incels. Did not provide statistical analysis to control for differences in variables (for example whether the participants with self-reported autism symptoms also had co-existing psychological symptoms of depression and anxiety. Participants' rating of 'autism traits' were self-reported and not formally diagnosed and the calculation of 24.6% was made on people answering 4 or 5 on a likert scale of 1-5 that they experienced symptoms of autism. The authors state that respondents were asked to	E

		<p>The authors issued a comprehensive questionnaire over the largest and most active incel affiliated communication forum in the world, with over 20,000 registered users and 1,000 regular daily users. In all, 312 answered the questionnaire and 272 of their answers are analyzed.</p>	<p>of topics, ranging from participants' social lives and personal experiences, their adherence to various facets of the incel ideology, their perspectives regarding incel-related violence, endorsement of those incels who have carried out violent actions and the debate over whether incels should be considered violent extremists, and demographic information. They were also asked about their psychological traits and symptoms, as well as their experiences with mental health professionals. The researchers excluded all respondents under the age of 18.</p>	<p>violent.</p> <p>While the vast majority (97.1 percent) report having some sort of psychological issues and features of autism (44.9 percent), The study found that although the majority of incels are non-violent and do not approve of violence, those who consider themselves to be staunch misogynists are likely to endorse a desire to commit violence and are also likely to become more misogynistic through participation on incel web forums, which validate their views. The study also found that while many incels participants reported experiencing a variety of psychological symptoms, they were reluctant to seek help from mental health professionals.</p> <p>24.6% self-reported they had symptoms of ASD by rating a single item from 1 to 5 for "how intensely do you experience the following states: ASD traits".</p>	<p>indicate if they had been formally diagnosed with disorders but this information is not provided in the data. No data is provided on whether respondents who rated themselves as having autism traits was associated with violence, dangerousness or intent to act.</p>	
4	<p>Corner, E., &amp; Gill, P. (2015). A false dichotomy? Mental illness and lone-actor terrorism. <i>Law and human behavior</i>, 39(1),</p>	<p>The sample includes an extensive codebook from Gill et al.'s (2014) dataset of 119 lone-actor terrorists and a</p>	<p>To compare group and lone actors, the authors also created a sample of group terrorist actors. The observations were sourced from Simcox, Stuart, Ahmed,</p>	<p>The results suggest there is a stronger association between mental illness and lone-actor terrorists than mental illness and group-based terrorists. Mental Illness was defined in terms of whether a person fell into the following categories:</p> <p>F00-F09- Organic</p>	<p>Strengths: A large sample size was used. The diagnosis name was located in the literature, and reliability and quality of the source was taken into account. Diagnostic categories were noted either from a confirmed diagnosis in articles, or from a series of symptoms that were cross-referenced</p>	D

23.	<p>matched sample of 119 group-based terrorists. Actors were either convicted or died in the commission of their offense in the United States and Europe since 1990. The sample includes violent and nonviolent behaviors carried out by individuals and isolated dyads who either self-radicalized, or radicalized via a larger organization and then carried out acts external to command and control links. Profiles were built using the LexisNexis archive of open source information, scholarly articles, and public record depositories, and</p>	<p>Murray, and Carlile (2011) and Mother Jones (2013), which contain open source profiles on U.S. and non-U.S. terror-based activities since September 11, 2001. A systematic stratified sampling methodology was utilized to gather the sample of 119 group terrorist actors. The data were matched to the lone actor sample through the country of attack variable (55 U.S. and 64 non-U.S.). Randomly chosen from larger cohort of group actors.</p> <p>The Gill codebook examined mental illness as a dichotomous variable. The authors created additional variables including the number and name of diagnoses and diagnostic categories.</p> <p>Available literature was sourced from the</p>	<p>F10-F19 - Substance use  F20-F29 - Schizophrenia, schizotypal, and delusional  F30-F39 - Mood  F40-F48 - Neurotic, stress related, and somatoform  F50-F59 - Behavioral syndromes associated with physiological and physical factors  F60-F69 - Personality  F70-F79 - Intellectual disabilities (“mental retardation”)  F80-F89 - Disorders of psychological development  F90-F98 - Behavioral and emotional, onset in childhood, and adolescence  F99-F99 - Unspecified</p> <p>The only finding pertaining to autism was that those who had divorced parents were significantly more likely to have psychological development disorders (in this cohort, autism).</p>	<p>with diagnostic material, and given a provisional diagnosis (ICD10).</p> <p>Limitations: The sample of people with autism was not clear and data was not provided to differentiate this. Autism is coded under ICD-10 as F84 but the authors coded participants based on Disorders of Psychological Development [F80-F89] which includes multiple diagnoses such as language disorders, aphasia, reading and spelling disorders as well as autism. The authors neglected to outline the prevalence of each disorder within the lone-actor terrorist sample and they did not compare this to a base rate of the general population. In addition, the data was analysed in terms of whether someone had a mental illness or not. No differential data was provided on whether any specific disorder predicted terrorism behaviour.</p>	
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		the codebook includes 185 variables concerning socio-demographical information, antecedent, event and post-event specific behaviors.	Lexis Nexus database, sworn affidavits, indictments, manifestos, warrants, trial proceeding transcripts, trial memorandums, government and expert witness reports, and competency evaluations.			
5	Moskalenko, S., González, J. F. G., Kates, N., & Morton, J. (2022). Incel Ideology, Radicalization and Mental Health: A Survey Study. <i>The Journal of Intelligence, Conflict, and Warfare</i> , 4(3), 1-29.	This paper appears to use the same data set as Speckhard, A., Ellenberg, M., Morton, J., & Ash, A. (2021) and Speckhard, A., & Ellenberg, M. (2022) although states the sample size used was 274. The authors differ in the number of respondents they felt did not identify as incels (stating this was 17 as opposed to 18 in the other papers). The	This paper does not have the survey attached but it appears to be the same survey used in the other 2 papers as there is the same number of questions (68) and it uses the same data set. Only one question (16) is on self-reported autism traits on one item likert scale.  In-depth surveys of 274 active Incels	Incel ideology was only weakly correlated with radicalization, and ideology and radicalization were differentially correlated with mental health measures. Most Incels in the study rejected violence.  The authors reported that 199 participants out of 274 (74%) reported experiencing some autism-spectrum traits. This is not consistent with the results in the other papers, which states that 24.6% self-report ASD traits from the same data set. This appears to be due to how the different authors have coded the likert scale from 1-5. Authors in the previous paper only included respondents to rated themselves as 4 or 5 whereas this paper include participants who rated 'some' traits (thus anyone who rated themselves as 2-5) on the scale. This scale was one single item.  Participants self-reported intensity of autism-spectrum traits averaged at M=2.57 (SD=1.33) on 5-point Likert scale. The authors do not	Strengths: The study used a large sample size and appropriate use of statistical analyses. The authors specifically attended to if participants self-reported having a diagnosis of autism.  Limitations: Relies on self-report using a single item question to measure anxiety, depression and autism traits. Their report of incidence of self-reported ASD traits differs to that cited in the same sample set. The study did not analyse data on intention to act in terms of autism. Nor did it report co-morbidity of conditions.	E

		<p>authors also differed in the number of respondents they stated were under the age of 18 stating this was n=16 in comparison to the other papers which stated this was n=25.</p> <p>99% were male (no females, 2 participants did not answer the question).</p> <p>This paper does not have the survey attached.</p>		<p>provide the scale but this is cited in the Speckard &amp; Ellenberg (2022) paper as ranging on a scale of 1-5 with 1 being not at all and 5 being very much. This places the mean score for participants slightly above (2.57) the mid-point (2.5).</p> <p>The authors found that 50 participants (18%) reported having received a formal diagnosis of autism-spectrum disorder.</p> <p>Nearly all participants (261, 95%) experienced some depression, responding above 1 on the 5-point Likert scale. Nearly all participants (257, 94%) reported some anxiety.</p> <p>A history of being bullied and diagnosed autism correlated significantly with Radicalism but did not correlate with Ideology. Conversely, having been persecuted as an Incel and a diagnosis of anxiety were significant predictors of Ideology but not of Radicalization. Finally, while self-reported depression and self-reported autistic traits correlated with both Ideology and Radicalization, self-reported depression was a better predictor of Ideology than of Radicalization, and self-reported autism was a better predictor of Radicalization than of Ideology.</p> <p>A factor analysis revealed that ideology and radicalism were two separate factors among Incels that were not highly correlated. In other words, subscribing to Incel ideology was not a good predictor of radical attitudes or intentions, and vice versa.</p>		
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				Those who scored high on radicalization, but not on ideology, were more likely to report a history of bullying and a formal diagnosis of autism		
6	Speckhard, A., & Ellenberg, M. (2022). Self-reported psychiatric disorder and perceived psychological symptom rates among involuntary celibates (incels) and their perceptions of mental health treatment. <i>Behavioral Sciences of Terrorism and Political Aggression</i> , 1-18.	<p>Cross Sectional Within Subjects Design of Incels over the age of 18. Participants were worldwide of varying religious backgrounds. 271 respondents were male with 1 preferring not to answer. This was a study of involuntary celibates (incels),</p> <p>All males except for one who decline to state their gender. Same data set as paper 14. All participants were over the age of 18.</p> <p>Uses the same data set as Moskalenko, S., González, J. F. G., Kates, N., &amp;</p>	Utilizes the data from the largest-ever comprehensive survey of self-identified incels (n = 272) to explore the prevalence of self-reported diagnoses and perceived symptoms of depression, anxiety, autism, posttraumatic stress disorder, alcohol use disorder, substance use disorder, suicidal ideation, and self-harm.	<p>18.38% of participants reported an ASD diagnosis. 38.6 percent of the incel survey respondents reported a depression diagnosis, 37.13 percent of the survey respondents endorsed having a formal anxiety diagnosis.</p> <p>Counting scores of four or five on a Likert scale from one to five as 'present', 64.3 percent of participants reported the presence of depressive symptoms, 59.6 percent reported the presence of anxiety symptoms, 47.8 percent reported the presence of suicidal ideations (compared with 3.8 percent of millennials in a large, nationally representative study of American adolescents and adults, Twenge et al., 2019), 27.9 percent reported the presence of symptoms of posttraumatic stress disorder, and 24.6 percent reported the presence of symptoms of autism spectrum disorder. Moreover, 41.2 percent of participants reported ever engaging in drug or alcohol abuse (rated as two or greater) and 33.5 percent of participants reported ever engaging in self-harming behaviors (rated as two or greater).</p> <p>Self-reported intensity of autism spectrum traits was significantly associated with agreement that the forum has made the respondent feel violent.</p>	<p>Strengths: The study used a large sample size.</p> <p>Limitations: All psychological challenges and diagnoses were self-reported on a checklist, not measured through validated psychological assessments. The study did also not capture data on intention to act only data on membership to the forum. Did not provide statistical analysis to control for differences in variables (for example whether the participants with self-reported autism symptoms also had co-existing psychological symptoms of depression and anxiety. No data is provided on whether respondents who rated themselves as having autism traits was associated with intent to act.</p>	E

		Morton, J. (2022) and Speckhard, A., Ellenberg, M., Morton, J., & Ash, A. (2021)				
7	Jaki, S., De Smedt, T., Gwózdź, M., Panchal, R., Rossa, A., & De Pauw, G. (2019). Online hatred of women in the Incels. me forum: Linguistic analysis and automatic detection. <i>Journal of Language Aggression and Conflict</i> , 7(2), 240-268.	This paper presents a study of the (now suspended) online discussion forum Incels.me and its users, involuntary celibates or incels.	The aim of this study is to shed light on the group dynamics of the incel community, by applying mixed-methods quantitative and qualitative approaches to analyze how the users of the forum create in-group identity and how they construct major out-groups, particularly women. They investigated the language/speech used by incels, applying automatic profiling techniques to determine who they are, discuss the hate speech posted in the forum.	The Linguistic Inquiry and Word Count analysis (LIWC; Pennebaker, Francis, and Booth 2001) automatically identifies psychological categories for common words. This found that some users argued that mental disorders like autism can also render a person an incel. This opinion is in line with the forum's rules section, where 'mentalcels' are implicitly included as a "[t]ype of incel whose reason for failure in relationships/sex is related to mental illness or major insecurities". Some users report taking psychotropic drugs and having been diagnosed with schizophrenia, autism, and/or personality disorders, as in "I'm diagnosed autistic aspergers, social anxiety and anti-social personality disorder aka sociopath". These members have usernames such as Schizoidcel, Psychocel, or HopelessMentalcel.	Strengths: The paper explored a wide range of text.  Limitations: No specific data was presented in relation to autism.	E
8	Daly, S. E., & Reed, S. M. (2022). "I Think Most of Society Hates Us": A Qualitative Thematic Analysis of Interviews with	This study explored the discursive nature of hegemonic masculinity through incel behaviors, such as "shit-posting,"	Using a hegemonic masculinity framework, this article analyzes data from interviews with incels (N = 10) to identify emergent themes about their situations,	The data reveal that the participants feel that they 1) experience masculinity challenges that affect their romantic opportunities, 2) are marginalized or treated as "subhumans" due to their appearance or other characteristics, and as a result, 3) experience negative emotions related to their inceldom. This, in turn, affects their belief in the BlackPill and their online	Strengths: The method allowed participants to describe their lived experience. The method of coding was clearly described.  Limitations: It was unclear if any of the participants had a diagnosis of autism. Their views are based on opinion on	E

	Incels. <i>Sex Roles</i> , 86(1), 14-33.	while providing a broad overview of how incels make sense of their lived experiences.	attitudes, and experiences.	<p>behavior such as shit-posting</p> <p>Analysis of the interview data led to the generation of five themes detailing the incel experience;</p> <ol style="list-style-type: none"> <li>1. masculinity challenges,</li> <li>2. subhuman status and social rejection,</li> <li>3. the BlackPill,</li> <li>4. shit-posting</li> <li>5. perceived effects of incel-dom</li> </ol> <p>Autism was mentioned in masculinity challenges in 1 quote. No data was given on any link between autism and shitposting and no comments were made about the autism and the theme of Perceived Effects of Inceldom.</p>	how autism may impact on others. The study used a small sample size and lacks generalizability.	
9	Sturup, J. (2018). Comparing serial homicides to single homicides: A study of prevalence, offender, and offence characteristics in Sweden. <i>Journal of Investigative Psychology and Offender Profiling</i> , 15(2),	Data collected from the National Crime Register. Adult homicide offenders.	<p>The study included all convicted serial-homicide offenders in Sweden from 1973 to 2012 (n = 25), as well as a population-based control sample of single-homicide offenders collected during 2007 and 2009 (n = 201).</p> <p>Serial-homicide</p>	<p>The study found that approximately 1.6% of homicides could be attributed to serial-homicide offenders. Serial offenders were more often diagnosed with personality disorders and autism-spectrum disorders compared with single offenders.</p> <p>However the results are all included as 'serial homicide' and are not separated between multiple and serial homicide.</p> <p>Serial homicide then compared with control group of single homicide.</p> <p>8 (33%) of serial offenders had ASD cf 4% of</p>	<p>Strengths: Data was obtained from the National Crime register rather than open source. 96% of the 25 had undergone forensic-psychiatric or forensic-psychological assessment. Therefore autism was diagnosed by trained clinicians using recognised classification tools and systems.</p> <p>Limitations: No information was given about if participants had comorbid diagnosis such as IQ, personality disorder, substance misuse or mental</p>	E

	75-89.		<p>offender is operationalized as an individual who commits two or more homicides during a period of more than 24 hrs.</p> <p>No definition of multiple killing is provided.</p>	single homicides.	<p>illness. It is unclear what number of people with autism engaged in multiple homicide versus serial homicide or what types of offences they committed. For example, serial homicide may include sexual offending rather than terrorism.</p> <p>3 are in the “other category” but not stated if this includes IPMV. The serial definition included 3 mums killing repeated children. The control group had less evaluation so some diagnoses could be missed.</p>	
10	<p>Weenink, A. W. (2015). Behavioral problems and disorders among radicals in police files. <i>Perspectives on terrorism, 9</i>(2), 17-33.</p>	<p>Quantitative Data Synthesis</p> <p>Dutch male and female radical jihadists.</p> <p>Conducted a number of database searches in the Dutch National Police database by entering the personal details of known and suspected jihadists. They searched for information</p>	<p>Quantitative (Cross-Sectional)</p> <p>N = 140 Males N = 117 and Females N = 23</p> <p>The sample is a list containing personal details of radical Islamists from the Netherlands whom the Dutch police suspect of having joined the fight in Syria, or are considered potential travelers (for example, because they have expressed their intent to do so).</p>	<p>3 individuals were identified as having the following:</p> <p>N = 1: ‘Compulsive Disorder’ and ‘Autistic/Schizophrenia’. N =1: ‘Autism’. ‘Childhood Trauma’. N = 1: ‘ASD/PDD-NOS. Aggressive’.</p> <p>In a clarification of their findings the authors noted that autism spectrum disorders were present in 1.5% of the sample. This provided in an updated research note on this study (See Weenink, A. W. (2019). Adversity, criminality, and mental health problems in Jihadis in Dutch police files. <i>Perspectives on Terrorism, 13</i>(5), 130-142).</p>	<p>Strengths: Uses formal diagnostic criteria to categorise cases using evidence from files so did not attempt to diagnose as researchers.</p> <p>Limitations: Limited to Dutch Radical Islamists. There was no access to psychiatric reports, and the authors noted the limitations pertain to the completeness and quality of databases. Files from local police in BVH that are older than five years, could not be consulted, and the police registration system of suspicions (HKS) in most cases does not contain data from the period before a subject reaches 18 years of age. HKS appeared to be incomplete as well, because several records appeared to be missing. Furthermore, police do not record socio-economic</p>	D

		indicating that these jihadists have been diagnosed with a disorder or disability (conduct disorder, personality disorder, mental illness, cognitive disability), as well as for signs of problem behavior	The list is a national 'List of Travelers' (LOT), as compiled by the Counterterrorism and Extremism (CTE) team in the Central Unit of the Dutch National Police. The original data come from local police units.		and educational statuses of subjects in a systematic way. 3 individuals were identified with autism out of a sample of 140. This amounts to 2.14% of the sample. The gender of these individuals is unknown. 1 of these individuals was labelled as having 'autism/schizophrenia' thus it is unclear if autism was a definite diagnosis. In addition, the other individual was also given a label of 'childhood trauma'. Thus evidence of comorbidity exists.	
11	Allely, C. S., Minnis, H., Thompson, L., Wilson, P., & Gillberg, C. (2014). Neurodevelopmental and psychosocial risk factors in serial killers and mass murderers. <i>Aggression and violent behavior</i> , 19(3), 288-301.	Systematic Review using the Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines (Liberati et al., 2009), internet-based bibliographic databases were searched to access studies/books (published and in progress) which involved serial killers, violent crime,	Systematic Review of cross-sectional studies  N=165 studies with N=239 killers.  The authors actively looked for ASD through typing in the offenders name and autism using Google searches. The authors noted 'because the peer-reviewed literature was so limited, we paid particular attention to additional sources of literature. These included online	The paper noted that among all the 239 eligible killers, 28.03% (N = 67) had 'definite, highly probable or possible' ASD of which 5 (7.46%) also had a head in-jury. 21.34% (N = 51) had had a definite or suspected head injury of which 13.72% (N = 7) also had evidence of ASD 'traits'. Out of the 106 killers with ASD and/or head injury, 55% (N = 58) had experienced psychosocial stressors.  The authors concluded that N = 67 had 'definite, highly probable or possible ASD of which 5 also had a head injury.  Only N = 6 of these in the sample were in the definite diagnosis category of autism. 3 of these related to offences of terrorism.	Strengths: Used a large sample size.  Limitations: None of the eligible studies extended beyond single case reports. Of these only 6 had a formal diagnosis of autism in the records. Of these 6 only 3 had convictions pertaining to terrorism and all of these 3 had comorbid diagnoses in addition to autism. The remaining 3 did not have convictions for terrorism. Hence only 3 out of the sample of 239 had a diagnosis of autism that related to terrorism (1.3%).	E

		psychopathy (or narcissistic personality disorder), and Autistic Spectrum Disorders..	articles; newspaper articles; court transcripts and in particular two comprehensive online resources such as murdopedia, the encyclopedia of murders and the Radford Database of Serial Killers.			
12	Dinesson, K. E. (2022). (Un) reasonable excuses—On R v Dunleavy, R v Copeland, and Section 58. <i>The Modern Law Review</i> .	UK Males  This paper critically assesses these recent cases and the offences they concern for R v Dunleavy and R v Copeland, advocating for the reform of section 58 of the Terrorism Act 2000 with particular reference to the treatment of Autism Spectrum Disorder	Qualitative Case Study N = 2	Advocates replacing the section 58 reasonable excuse defence with a lawful object defence that recognises self-education Terrorism Act 2000, criminalises the collection, viewing and accessing of certain materials.	Strengths: Describes information from two real cases in the UK.  Limitations: Small cohort so lacks generalizability and uses secondary data.	E
13	Palermo, Mark, T. Journal of Forensic Psychology	Single Case Study 13 year old Italian Male involved in right	Qualitative Case Study  N = 1	Describes a case study of a 13 year old boy referred by his parents due to concerns about his behaviour. By age 12, he had begun to read the biographies of Adolf Hitler, Mao Tze-tung,	Strengths: Used factual information from the case to consider factors which may contribute towards a risk of radicalisation .	E

	Practice. Jul-Sep2013, Vol. 13 Issue 4, p341-354. 14p	wing extremism.		and a variety of publications on Nazi leaders as well as on contemporary authoritarian and controversial figures tied to recent events, such as Slobodan Milosevic and Radovan Karadzic. The paper described how the individual perused the internet and to access right-wing extremist blogs and decides to interact with them. He publishes his "Manifesto," lying about his age, in order to introduce himself. The paper used factual information from the case to consider factors which may contribute towards a risk of radicalisation to radicalisation, the knowledge and training needs among those working with people who may be at risk.	Limitations: Single Case study so generalisations cannot be inferred across samples.	
14	Faccini, L., & Allely, C. S. (2016). Mass violence in individuals with Autism Spectrum Disorder and Narcissistic Personality Disorder: A case analysis of AB using the "Path to Intended and Terroristic Violence" model. Aggression and violent behavior, 31, 229-236.	Single Case Study Norwegian Male Mass Shooter AB.	Qualitative Case Study N = 1	Explores the Pathways To Violence for an individual Mass Shooter with Autism and Personality Disorder.	Strengths: Uses information from the case to explore the pathways to violence.  Limitations: Relies on secondary data taken from a book describing the individual. The individual had coexisting personality disorder diagnoses.	E
15	Little, R., Ford, P., & Girardi, A. (2021). Online self-	Single Case Study - UK Adult Male inciting murder, anti-Muslim hate	Qualitative Case Study N = 1	The authors identify a number of variables as contributing towards the individual's vulnerability to radicalisation, such as deficits in higher order cognition, psychopathology, autism	Strengths: The authors had the client's consent and access to full records for information.	E

	radicalisation: a case study of cognitive vulnerabilities for radicalization to extremism and single actor terrorism. <i>Journal of Intellectual Disabilities and Offending Behaviour</i> .	crimes		spectrum disorder, traits, personal interests, social isolation and life stressors.	Limitations: Single Case study so cannot be generalised across populations.	
16	Faccini, L., & Allely, C. S. (2017). Rare instances of individuals with autism supporting or engaging in terrorism. <i>Journal of Intellectual Disabilities and Offending Behaviour</i> .	Case Study  Males  The authors stated the aim of the paper was to identify using specific case information to illustrate how the ASD is functionally connected to the path toward being inspired to act on behalf of a terrorist's cause, joining a terrorism organization and engaging in directed attacks, or engaging in	Qualitative Case Study  N= 8 males (one child age 9) the rest adults  N= 4 white  .	Findings:  Case of Mr G - Mr G was diagnosed with Asperger's syndrome and cyclothymia.  JE - a nine-year old with a diagnosis of an ASD, was charged with making terroristic threats. The nine-year-old wrote "bone thrat" (bomb threat) after witnessing an event the prior week, where as the result of a "bomb threat" having been written on a middle school's bathroom wall; the school was evacuated. (Not included in this study due to his age).  MH - who was sentenced to 18-months' probation for downloading copies of the terrorist magazines Inspire and Palestine which are created by the global terrorist group formerly headed by Osama bin Laden. It was recognized that he had not been radicalized.  PP - diagnosed with autism, mild intellectual disability and attention-deficit disorder was arrested for sending bomb-making instructions	Strengths: Looks at 8 cases of people with autism who have been involved in extremist behaviour.  Limitations: Case study methodology so cannot be generalised across populations. The authors had not had contact with the people in the case study so secondary information used to support deductions. The authors were subsequently criticised for not commenting sufficiently on the comorbidity of conditions by subsequent authors (Chown & Beardon, 2018).  NR was noted by the coroner in the inquest to his death to have Emotionally Unstable Personality Disorder as well as Aspergers which was not mentioned in the paper.	E

		lone wolf terrorism.		<p>to a person he believed was part of ISIS.</p> <p>HT – An individual who was encouraged by a friend who attempted to radicalise him. The paper stated HT had Asperger’s Syndrome and ADHD. He was not convicted of acts of terrorism.</p> <p>MK - involved him gaining assistance by an “ISIS” operative to bomb a Department of Motor Vehicles (DMV). However, not enough public information was released other than this individual was diagnosed with autism and mental illness; as a result, it is difficult to establish a functional connection between his autism-based deficits and the terrorism plot.</p> <p>JK - an 18-year-old diagnosed with autism who wanted to join a terrorism organization in Yemen.</p> <p>NR - an 18-year-old male, diagnosed with Asperger’s syndrome. He devised a plan to make three crude bombs, strap them to his chest as a suicide bomber then run out in a crowded restaurant to kill as many people as possible. He failed in his attempt and injured himself. He was sent to a high secure hospital and then committed suicide while in prison.</p> <p>AB - carried out a massacre in Norway .A Professor told the criminal court in Oslo that it was plausible that AB had Asperger's, Tourette’s and a narcissistic personality disorder (but paranoid psychosis could not completely be ruled out).</p>		
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17	Langman, P. (2015). The enigma of AL's mind and motivations for murder. <i>The Journal of Campus Behavioral Intervention</i> , 3, 1-11.	Single Case Study US Male School Shooter AL.	Qualitative Case Study  N = 1	Suggests that the perpetrator may have had comorbid schizophrenia as well as Asperger's.	Strengths: Uses direct quotes from the perpetrators postings online to support argument.  Limitations: Single Case study therefore lacks generalisability. Not possible to substantiate potential comorbid diagnosis.	E
18	Allely, C. S., Wilson, P., Minnis, H., Thompson, L., Yaksic, E., & Gillberg, C. (2017). Violence is rare in autism: when it does occur, is it sometimes extreme?. <i>The Journal of Psychology</i> , 151(1), 49-68.	Review of Case Studies  Examined all cases identified by Mother Jones in their mass shooter database comprising 73 events from 1982–2015 amounting to 75 cases. Internet-based bibliographic databases.	Qualitative Review of Case Studies  N = 75	Of the total 75 cases in the database, information was found for six cases that referred to diagnosis of an ASD by family and friends or there were strong suggestions of ASD made by family and friends (CH, AL, JH, IS, SHC and DA). The authors argue that as a result, from the total sample of 75 mass shooters, there was strong evidence of ASD in 8%. However, table 1 in the paper identifies that only 3 had a diagnosis of autism (CH, AL and DM) . Thus, 3 out of 75 participants amounts to 4%.	Strengths: Uses a larger sample size of case studies.  Limitations: Mother Jones mass shooter database as it does not include all mass shootings. Instead it identified the cases which were considered to be senseless, random, or at least public in nature. This could have biased the sample. Only 3 of the case studies had confirmed diagnoses of autism with the remaining 19 having 'traits' identified by the authors. The Mother Jones database also only contains cases of mass shootings that occurred in the United States, which is a limitation.  CH was also cited to have bipolar disorder and being treated with anti-psychotic medication. DM was cited on the murdopedia website which the authors used as being 'unable to get along with the other recruits, and an Air Force psychiatrist recommended	E

					he be discharged for a “personality disorder.”	
19	Allely, C. S., & Faccini, L. (2019). Clinical profile, risk, and critical factors and the application of the “path toward intended violence” model in the case of mass shooter DR. <i>Deviant Behavior</i> , 40(6), 672-689.	Single Case Study Adult Male DR  On June 17, 2015, 21-year-old DR who shot nine people at an Emanuel African Methodist Church in the USA.	Qualitative Case Study  N = 1	The authors applied the Pathways to Intended Violence to a single Case Study. This included attending to comorbid mental illness.	Strengths: Uses evidence from the trial including family member reports and psychological and psychiatric assessments which used the gold standard diagnostic tools.  Limitations: Single Case study so lacks generalisaibility. He also had comorbid mental illness.	E
20	White, S. G., Meloy, J. R., Mohandie, K., & Kienlen, K. (2017). Autism spectrum disorder and violence: Threat assessment issues. <i>Journal of Threat Assessment and Management</i> , 4(3), 144.	Case Study  Males  Five cases are presented: an ASD college student false positive for violence, a false claim of ASD in a psychopathic defendant, a mass murder, a thwarted attack, and a rape and homicide by a psychopath paired with an ASD individual.	Qualitative Case Study  N = 5	Case Number 1: Misperception of a Student With ASD as a “Deranged Stalker” did not relate to terrorism.  Case Number 2: False Claim of ASD in a Psychopathic Individual – did not relate to terrorism.  Case Number 3: ASD Individual’s Accomplice to Homicide With a Manipulative Psychopath. Did not relate to terrorism.  Case Number 4: Explores the likely predominance of ‘Severe Psychopathy’ Comorbid With ASD in a Mass Murder. This case discusses AM.  Case Number 5: ASD and Comorbidity Issues in a Thwarted Attack by a 17 year old (JL) The paper queries if the individual had comorbid	Strengths: Uses case studies to demonstrate hypotheses and attends to the possibility of comorbid factors contributing towards offending.  Limitations: Limited generalisability.	E

				<p>narcissistic features and/or psychopathic features that may have been predominant in his overall clinical picture and violent trajectory, or at least contributory. Later evidence indicates the presence of a major depressive episode at the time as well.</p> <p>A specific focus in this paper is the distinction between psychopathic and ASD-related motives and behaviors. ASD characteristics of deficits in theory of mind, emotional regulation, and moral reasoning are discussed as they may contribute to either impulsive or predatory violence. Guidelines are offered for conducting ASD-related violence risk assessments, and an overview of case management strategies and issues.</p>		
21	<p>Percich, A. (2021). <i>Supreme Gentlemen or Radicalized Killers: Analyzing the Radicalization Paths of Involuntary Celibate Killers and the Role of the Online Incel Forums</i> (Doctoral dissertation, Georgetown University).</p>	<p>Case Studies of Incels. All male.</p> <p>Uses case studies to explore the radicalization paths, the manifestos and online postings left behind by ER CM and AM. The paper discusses the degree to which the online communities played a role in their violent attacks.</p>	<p>Qualitative Case Study</p> <p>N = 3</p> <p>1 = Diagnosed PDD-NOS, male.</p> <p>1 = Not officially diagnosed, mother posted he had Aspergers. Male.</p> <p>1 = Diagnosed with Autism from Canada. Male</p>	<p>The paper concludes that the three most prolific perpetrators, ER, CM and AM engaged with the online communities prior to their planned attacks. However, the author noted that all 3 had extensive behavioral and mental health issues and were considered loners at school. Their 'online postings, manifestos, and videos reveal men in severe psychological distress and while all three were diagnosed with autism spectrum disorder (ASD), they lacked the appropriate mental health support to cope and work on their frustrations with school, friends, and women'.</p>	<p>Strengths: Explores the potential functions and reinforcers for 3 individuals.</p> <p>Limitations: Small sample size and diagnoses of all 3 unclear.</p>	E

22	Rozdilsky, J. L., & Snowden, E. (2021). The 2018 Toronto Van Attack: Understanding the Disaster by Looking at Vulnerability, Tactics, and Motives. <i>Why CJEM?</i> , 10.	Observational and Narrative Synthesis Adult Male (AM).	Qualitative - Observational and Narrative Synthesis.  N = 1	This paper explores issues of vulnerability, tactics, and motives related to a vehicular ramming attack. It is suggested that the pervasive threat of gender-driven violence needs to be recognized, crime prevention through environmental design and counter terrorism-based soft target hardening strategies can work to reduce risks, failure of imagination leading to disregard of criminal and terrorist threats should be avoided, and any security measures to defend pedestrians should be commensurate with the actual risk present.	Strengths: Considers the physical environment contributing towards terrorism victim vulnerability using field observation.  Limitations: Single Case Study.	E
23	Hewitt, S. (2021). "One-man war": a history of lone-actor terrorism in Canada, 1868-2018.	Qualitative 'collective biographical approach'  Males and 1 female. Only 1 male with autism out of the sample (AM)	Qualitative  N = 19 Lone Actor  N = 20 Terrorists (19 male, 1 female)	Examines, through a series of qualitative case studies, nineteen lone-actor terrorist attacks that occurred in Canada across a 150-year period, specifically between 1868 and 2018. focusing on commonalities of the attacks and the backgrounds of the perpetrators, along with their motivations and tactics, techniques and procedures, analysis is provided, including through the use of templates from other work on lone-actor terrorism.	Strengths: Includes one case study with a person with autism out of 19. Discusses a wide range of factors that may contribute to terrorism.  Limitations: Small sample size so lacks generalisability	E
24	Vermeulen, F., van Leyenhorst, M., Roex, I., Schulten, N., & Tuzani, N. (2022). Between Psychopathology and Ideology: Challenges and Practices in Interpreting Young Extremists Experiencing	Discussion Paper on the Dutch risk assessment and processes used	Qualitative Practice Paper	This article seeks to contribute to academic and policy discussions on psychopathology and extremism by combining relevant insights from practices in the Netherlands. The paper highlights a Dutch case noting the need for expertise in terms of ideology and psychopathology and the need for future research.	Strengths: Written by practitioners in the field with direct experience of working with clients who have engaged in terrorism.  Limitations: Provides no data to substantiate recommendations.	E

	Mental Illness in the Netherlands. <i>Frontiers in Psychiatry</i> , 2584.					
25	Corner, E., Gill, P. and Mason, O. (2016), "Mental health disorders and the terrorist: a research note probing selection effects and Disorder Prevalence.	Collection of Case Studies  Used the same sample from their previous data set and re-analysed the data.	Qualitative Case Study  119 lone-actor terrorists and a matched sample of 119 group-based terrorists	The authors re-analysed the data from the original paper in 2015 to investigate whether selection effects are present in the selection process of terrorist recruits. Second, it builds on the argument that mental health problems and terrorist behaviour should not be treated as a yes/no dichotomy. Descriptive results of mental health disorders are outlined utilizing a number of unique datasets.  The authors concluded that there are only three disorders that have a substantially higher prevalence in the lone-actor population, the most noteworthy being schizophrenia. The authors stated that Autism spectrum disorders (ASD) also show a higher than expected prevalence in the lone-actor sample. The precise prevalence is not given but based on the graph provided looks to be approximately 3.2% in lone offenders. No group actors had ASD.	Strengths: Compares data to a normative community sample.  Limitations: Does not identify comorbidity in diagnoses so it is unclear if people identified as having 'autism' had comorbid other mental health problems. The coding of autism is based on the people in the ICD-10 classification system F80-F89 which also includes diagnoses other than autism.	E
26.	Faccini, L. (2016). The application of the models of autism, psychopathology and deficient Eriksonian development and the path of intended violence to understand the Newtown	Single Case study description of a male who engaged in a school shooting.	Case study [AL] using secondary sources.	The author describes this as a theoretical paper which applied two different models to understand the intended mass violence for a case study for an individual with autism who engaged in a school shooting. They argue that the combination of 'autism-based deficits, psychopathology and deficient Eriksonian psychosocial development has been demonstrated to lead to criminality' and used the Pathways to Violence model to apply to the case study. The authors suggest that the factors which took the individual closer to engaging in	Strengths: Considers the formulation of factors which contributed to the offence.  Weaknesses: Single case study using secondary sources with no contact with the client or primary sources. Based on supposition.	E

	<p>shooting.  <i>Archives of Forensic Psychology, 1(3), 1-13.</i></p>		<p>the shooting were ‘a sense of a threatening world, due to a combination of his difficulties with sensory processing, contamination rituals and exaggerated fears; this sense of threat, when exacerbated by progressive losses’ and that ‘the nexus of the two models occurred when autistic restricted interests in death and violence, combined with depression and suicidal ideation, progressed into a fascination and restricted interest in mass shootings and shooters’ as well as ‘his fascination with weapons and mass murderers was also consistent with the second of six steps that eventually lead to the attack’</p>		
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