RISK ASSESSMENT OF EXTREMIST OFFENDERS AND THOSE

CONSIDERED VULNERABLE TO ENGAGEMENT

by

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Abstract

The aim of the present thesis was to explore the use of Structured Professional Judgement (SPJ) risk assessment tools designed for use with extremist offenders or those within the pre-crime space who are considered vulnerable to engagement. SPJ tools have been recommended for use with these populations (Monahan, 2012; Van Der Heide, 2019), however it is acknowledged that there are important differences between extremist offending and general violence risk (Copeland & Marsden, 2020; Pressman, 2009). In response to the challenges to assessing risk in extremist offenders, a number of tools have been developed over recent years specifically for use with this population and within the pre-crime space. Although such SPJ risk assessments are relatively new, given their widespread use globally and the rapidly expanding terrorism research, it is important to bring together the relevant literature on their development and validation attempts to date. Particular attention is paid to the UK perspective on terrorism and the use of the Extremist Risk Guidance (ERG22+).

A systematic review of the literature was conducted which identified four current SPJ tools: The ERG22+, Terrorist Radicalization Assessment Protocol (TRAP-18), the Violent Extremist Risk Assessment (VERA) and the Multi-Level Guidelines (MLG). Identified validation studies were subject to a quality review and the findings are discussed in relation to future research needs in the area.

Contributing to the current terrorism literature, this thesis presents an exploratory analysis using Multi-Dimensional Scaling Analysis (MDS) of individual and attack characteristics identified in mass casualty terror events, focusing specifically

on the key perpetrators of lone actor attacks. The results of which are discussed in

relation to the current research and offender typologies.

"The flower that blooms in adversity is the rarest and most beautiful of them all"

Bancroft & Cook (Directors). (1998). *Mulan* [Film]. Walt Disney Pictures

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Useful Abbreviations

ERG22+ - Extremist Risk Guidance (22+)

GTD – Global Terrorism Database

HMPPS – Her Majesty's Prison and Probation Service

IRR – Inter-Rater Reliability

MDS – Multi-Dimensional Scaling

MLG – Multi-Level Guidelines

SPJ – Structured Professional Judgement

SRG - Structured Risk Guidance

SSA – Smallest Space Analysis

TRAP-18 - Terrorist Radicalization Assessment Protocol (18)

VERA - Violent Extremist Risk Assessment

Chapter One:

Introduction

"The thorny question of an individual's risk for being involved (or reinvolved) in terrorism cannot be answered with any existing statistical formula or with a simple tally of possible risk factors. What we know of terrorism involvement suggests that it has many possible pathways".

(Borum, 2015, p.79)

Shortly after 10:30pm on 22nd May 2017, 22-year-old Salman Abedi walked into the foyer of the Manchester Arena and detonated a device packed with screws and bolts. The device killed 22 people and injured 120 others, including children, who were leaving a concert by singer Ariana Grande. Islamic State claimed responsibility for the attack. The bombing was the worst terror attack to hit Britain since the London attacks on 7th July 2005. It is reported that members of the local community had alerted the authorities about Abedi on at least five occasions in the years prior to him carrying out this attack (Dixon & Harley, 2017). Moreover, the Federal Bureau of Investigation (FBI) had passed on intelligence information about Abedi to Military Intelligence, Section 5 (MI5) (Dixon & Harley, 2017); despite this, United Kingdom (UK)-born Abedi managed to carry out his planned suicide attack successfully.

Despite the number of terrorist attacks that take place each year across Western Europe being considerably lower than those occurring in the Middle East, Asia, and sub-Saharan Africa (Miller, 2019, 2020), their impact keeps the threat of terrorism at the forefront of our minds and consistently present within the media. The ability to instil "fear, arousal and uncertainty on a wider, more distant scale" constitutes a large part of the effectiveness of acts of terrorism (Horgan, 2014, p. 11). Such devastating events

understandably drive the search for answers to several questions: what leads an individual, or group of individuals, to engage in such acts of violence; are there certain characteristics, profiles or risk factors that contribute to such acts; and how can we reduce the risk of future attacks? Such questions are particularly pertinent to the developing area of terrorism risk assessment. Thus far, this endeavour has posed several significant challenges given the complexity involved in answering these questions. Important ethical considerations have also been raised and need to be kept in mind when navigating the area of terrorism research.

This thesis aims to identify SPJ assessments that have been developed for use within the context of terrorism. Validation research to date is commented upon, with policy implications outlined and future research avenues explored. Research adding to the literature on risk factors and indicators for terrorist offending, focused on the individual and event characteristics of those who have directly carried out mass casualty terror events, is also presented.

The Challenge of Definitions

The term 'terrorism' is frequently used by the media, academics, and governments. However, despite the plethora of definitions in existence, there is no universally accepted definition (Home Office, 2007; Horgan, 2014; Horgan, 2017; Schmid, 2018). Definitions of terrorism are influenced not only by the media, but also by the agenda set by governments and security agencies, as well as the laws that govern a country (Gearty, 1991; Vergani et al., 2018), resulting in inconsistencies in the definitions employed around the world. Horgan (2014) describes terrorism at its broadest level as involving "the use, or threat of use, of violence as a means of

attempting to achieve some social or political effect" (p. 11). This political dimension is important in distinguishing terrorism from other violent crimes (Horgan, 2014). The Global Terrorism Database (GTD), which documents international and domestic terrorist attacks across the world, define terrorist attacks as "the threatened or actual use of illegal force or violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation" (National Consortium for the Study of Terrorism and Responses to Terrorism [START], 2019, p. 10).

Although definitions, such as that posed by the GTD, often refer solely to terrorism acts committed by non-state actors against the state or civilians, terrorist acts carried out by the state and governments against civilians can similarly involve acts of violence which are politically, ideologically, or religiously inspired; both acts are united in their purpose to cause widespread intimidation and to punish (Hewitt, 2020). Crucially, both state and non-state terrorism can function to stimulate and sustain one another (English, 2010; Hewitt, 2020).

The study of terrorism regularly refers to the concept of ideology, however there are differing views regarding the role that ideology can play (Ackerman & Burnham, 2021; Holbrook & Horgan, 2019). Broadly speaking, ideology relates to "a belief system centred upon some social or collective ideal (e.g., based on the values of justice, fairness, or inalienable rights)" (Kruglanski et al., 2009, p. 333). According to Kruglanski et al. (2009), terrorism-justifying ideologies help to motivate action by highlighting the discrepancy from the ideal and "offering a means of removing the discrepancy" (p. 333) through violence. Growing literature suggests that violent ideology is not a strong predictor of engagement in terrorism, despite the term often being used in counterterrorism efforts and in the responses made to terrorist events by

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political leaders (Holbrook & Horgan, 2019). It has been suggested that terrorist ideology helps in identifying the enemy and removing the guilt attached to acts of violence through processes such as dehumanisation of the enemy (Bandura, 1999; Webber & Kruglanski, 2018). Ideology is suggested to play some role in the process of becoming involved in terrorism, however, its exact relevance is likely to differ across cases and remains unclear at present (Holbrook & Horgan, 2019).

Extremism, along with another frequently used term - radicalisation, are concepts which are often contested, considered problematic, and at times misused (Knudsen, 2018; Neumann, 2013; Qureshi, 2016; Schmid, 2018). These terms are similarly plagued with varying and vague definitions (Bötticher, 2017; Vergani et al., 2018). As Bötticher (2017) highlights, most countries do not have legal definitions of these terms, however they may be referred to within government programmes aimed at counterterrorism; one such example being the UK Government's Prevent strategy, which falls under the wider counterterrorism strategy, Contest. This strategy was published in 2011 and is described as aiming to prevent individuals from "being drawn into terrorism" (Home Office, 2021, para. 5). Within the Prevent strategy, extremism is defined as the "vocal or active opposition to fundamental British values, including democracy, the rule of law, individual liberty and mutual respect and tolerance of different faiths and beliefs" which also includes "calls for the death of members of our armed forces" (Home Office, 2021, para. 7). Given that such definitions may be used to inform public bodies and the judiciary, the subjective nature of their interpretation can be considered problematic (Lowe, 2017).

Within the Prevent strategy, radicalisation is defined as "the process by which a person comes to support terrorism and extremist ideologies associated with terrorist

groups" (HM Government, 2021, Glossary of terms). In its simplest form, radicalisation can be thought of as a process involving many different factors, which takes place over time, often gradually, whereby people become extremists (Neumann, 2013). The end point to this process is often considered to be terrorism (Moskalenko & McCauley, 2020). Radicalisation is a term commonly referenced within the terrorism literature and used by European policy makers and practitioners (Schmid, 2013). The term has become more widely utilised and referenced within the academic literature following the terrorist attacks of 11 September 2001 (Neumann, 2013), particularly in the context of counterterrorism (Knudsen, 2018). Despite its prevalence, the term has been criticised by some for being "misleading, vague and based on ill-founded assumptions" (Knudsen, 2018, p. 2). The term is often interpreted in a way that minimises the impact of the wider geopolitical climate, social, and economic causes, by focusing on the role of ideology (Khalil et al., 2019). Moreover, the term has tended to be applied mostly within the context of Islamist extremism and jihadist terrorism, reflecting the arguably one-sided, biased focus of terrorism literature, research and media reporting following the September 11th attacks (Kearns et al., 2017; Koehler, 2019; Schmid, 2013). More recent views on radicalisation identify that the process may be just one of several different pathways into extremist action and therefore not always relevant (Neumann, 2013).

One of the main assumptions when using the terms radicalisation and extremism is that violent thoughts or radical ideas will lead to action. In this case violence in the form of terrorism (McCauley & Moskalenko, 2017; Moskalenko & McCauley, 2020). It is argued however by many researchers that extremist or radical thoughts rarely lead to terrorist action and that that such a link is based on little scientific evidence (Dawson,

2019; Kinninmont, 2016; Koomen & Van Der Plight, 2016; Moskalenko & McCauley, 2020; Neumann, 2013; Quershi, 2016; Schmid, 2013). Opinion poll studies highlight that many people sympathise with terrorist causes and justify the use of violence, however, very few will move to action (Hafez & Mullings, 2015; McCauley, 2020; Sageman, 2017). Moreover, many terrorists who in engage in violence do not appear to possess radical ideas, with a number not adhering to a violent extremist ideology (Borum, 2015; Horgan & Taylor, 2011; Khalil et al., 2019; Moskalenko & McCauley, 2020). It has therefore been suggested that radicalisation of opinion and radicalisation of action are treated as separate psychological phenomena (Borum, 2011; Khalil et al., 2019; McCauley, 2020; McCauley & Moskalenko, 2017; Moskalenko & McCauley, 2020).

The subject of terrorism is extremely sensitive, inevitably value-laden, and highly emotive (Gearty, 1991). What one person may class as an act of 'terrorism' is often a matter of perspective (Silke, 2009). There are significant negative consequences to an individual when labels such as 'extremist', 'radicalised' or 'terrorist' are used to describe their beliefs and/or actions. It is therefore imperative that professionals using such labels are clear as to what definition they are using to form their judgement and that they can provide evidence for such judgement (Van Der Heide, 2019; Moskalenko & McCauley, 2020). Risk assessment tools can be valuable places for professionals to begin collating such evidence in order to guide appropriate interventions and treatment (Van Der Heide, 2019); however, it should be expected that subjectivity and bias will be introduced into any risk assessment process (Dean & Pettet, 2017). This may be particularly pertinent to terrorist risk assessment, given the subjectivity of defining the risk in the first instance; an area which will be expanded on within chapter four.

Typologies of Terrorism

The phenomenon of terrorism can be divided into categories, or typologies, based largely on the source of motivation (Cronin, 2003; Europol, 2021; Koomen & Van Der Plight, 2016; Post, 2005). These typologies include: left-wing terrorism, also referred to as social-revolutionary and anarchist terrorism (an example of which being the Red Army Faction in Germany which carried out "acts of resistance against the capitalist West German state" [Koomen & Van Der Plight, 2016, p. 1]); right-wing terrorism, referred to as "racially, ethnically, and/or sexually defined nationalism, which is typically framed in terms of white power and/or white identity" (Conway et al., 2019, p. 3) [an example being the Klu Klux Klan]); ethno-nationalism and separatism, such as the Irish Republican Army of Northern Ireland (IRA), which sought a united Ireland, separate from the UK; religious, which includes Jihadist terrorism, such as Islamic State and Al-Qaeda; and single-issue terrorism, which focus on changing a specific policy or practice (for example animal rights activists and environmental protection [Cronin, 2003; Koomen & Van Der Plight, 2016; Post, 2005]). There are also groups that will be hybrid in nature and not fit clearly into a particular category (Koomen & Van Der Plight, 2016), for example, both left-wing and right-wing ideologies can often be observed in ethno-nationalist and separatist groups (Europol, 2021). Given that these generalised categories may each be suggestive of differing motivations, it can be considered useful to compare behavioural manifestations and patterns across typologies (Cronin, 2003; Post, 2005).

Lone Actor Terrorism Versus the Terrorist Group

Quantitative research focusing specifically on lone actor terrorism has expanded over the past decade (Corner et al., 2021). Lone actor terrorism shares similar

definitional challenges to the broader terrorism field, with no consistent definition available (Pantucci et al., 2015) and debate around what constitutes a lone-actor terrorist (Bouhana et al., 2019; Gill, 2015a). One of many definitions available comes from Ellis et al. (2016) who have defined lone actor terrorism as:

> The threat or use of violence by a single perpetrator (or small cell), not acting out of purely personal-material reasons, with the aim of influencing a wider audience, and who acts without any direct support in the planning, preparation and execution of the attack, and whose decision to act is not directed by any group or other individuals (although possibly inspired by others). (Methodology, para. 1).

Definitions vary in terms of whether they consider that an attacker must act alone or whether dyads or triads should be included, as well as the level of outside group direction or influence that may be present (Borum et al., 2012). Lone actor terrorism is often considered a greater challenge to intelligence services than group terrorism, given lone actors perceived isolation and lack of co-conspirators and the impact of this on detection attempts (Brugh et al., 2020; Clemmow et al., 2019; Schuurman et al., 2017). However, research does tend to indicate that lone-actor terrorists are rarely completely isolated, perhaps being part of a wider movement and having ties to extremist groups or individuals online or in person (Clemmow et al., 2019; Gill et al., 2014; Gill et al., 2019; Hofmann, 2020; Schuurman et al., 2017; Spaaij & Hamm, 2015).

Lone actor terrorism is relevant across ideologies, although often associated more with right-wing extremists (Bouhana et al., 2018). Within Europe, lone actors are often religiously inspired and motivated by jihadist views (Liem et al., 2018).

Categorising lone actors by ideology is not always straightforward; within the USA for example, perpetrators have more recently appeared motivated by a diverse range of overlapping ideologies, often with no affiliation to a group or organisation (Miller, 2020). Moreover, lone actor terrorism can be difficult to classify in cases where political motivation is not clear (Moskalenko & McCauley, 2020).

Terrorism Research

The volume of terrorism related research and literature has increased greatly following the terrorist attacks of September 2001 (Silke, 2019), with the recent focus being largely on Islamist extremism (Silke, 2007; Vergani et al., 2018). Prior to the September 2001 attacks, the most heavily researched organisation in the main terrorism journals was the IRA (Silke, 2007). It is suggested that the current biased attention from researchers, intelligence agencies and policy makers on Islamist extremism can be deemed as contributing to less of an understanding of other forms of threats such as far-right terrorism, which is on the rise across Western Europe and the United States (HM Government, 2018; Jones, 2018; Koehler, 2019; Schuurman, 2019). Moreover, historical approaches and earlier terrorism research are often not considered, with the tendency being for research to be event-driven and swayed by trends (Schuurman, 2019; Silke, 2007; Youngman, 2018).

Despite an exponential increase in the volume of literature on extremism and terrorism from a range of fields (including psychology, criminology, sociology, history, and political science), the area has been plagued by a lack of empirical research, with the tendency to use descriptive statistics (Schuurman, 2018). Consequently, the study of terrorism is occupied by a plethora of theoretical approaches that some have argued are

not particularly convincing or comprehensive in nature (Horgan, 2014; Koomen & Van

Der Plight, 2016). Methodological issues including: the limited use of primary sources;

a lack of comprehensive data and comparison groups; small sample sizes; and use of

case study methodology, have been regularly cited criticisms within the field (Horgan,

2014; Monahan, 2016; Sageman, 2014; Schuurman, 2019; Silke, 2009). The pertinence

of these issues in relation to the ongoing development of risk assessment in the area is

expanded upon throughout this thesis. Positively, this second wave of terrorism studies

has seen research methodologies within the area improving (Horgan, 2014; Pape, 2009).

There is now a greater abundance of peer reviewed journals relating to terrorism

research (Horgan, 2017). Moreover, there is now greater collaboration within the field

across disciplines (Moskalenko & McCauley, 2020). Given that terrorism is often

considered as a multiply determined problem (i.e., caused by an interaction between

multiple individual and environmental factors, rather than by a singular experience or

factor (Dawson, 2017; Ellis et al., 2020), this sharing of knowledge and collaboration is

welcomed.

As Horgan (2014) states, terrorism can be "an extremely heterogeneous

phenomenon, ever-changing, and can be a tactic within a bigger toolbox of means, open

to newer types of movements with each passing decade" (p. 37). Such heterogeneity can

be observed across typologies, ideologies, the individual's role within a wider group,

and across different countries, all of which can be influenced by the period studied. This

highlights the need for ongoing, high-quality terrorism research, exploring different

aspects of the overall umbrella term 'terrorism'.

The Making of an Extremist Offender

There are a substantial number of theories spanning a range of disciplines that seek to explain why individuals engage in extremist offending, particularly violent extremism (Clemmow, 2020; Crenshaw, 1981). Theories cover varying aspects of the individual, social and cultural factors, group processes, and macro factors relating to the wider political context, although most of the scientific literature to date has focused on the individual level (Desmarais et al., 2017). Moreover, it is noted that empirical support for such theories is limited and therefore there is a need for "greater theoretically grounded empiricism in order to advance research to the explanatory level" (Clemmow, 2020, p. 34). In relation to this, researchers in the field have looked to other more established research bases such as the general violence offending literature, group-based theories and trauma informed approaches to help expand the knowledge base (Freilich & LaFree, 2017; Lewis & Marsden, 2021; Pisoiu & Hain, 2017). Given the depth and breadth of the literature on extremist offenders, a thorough discussion of all the main theories is beyond the scope of this thesis however an overview of some of the main themes is provided (See Clemmow, 2020 for a detailed overview of theoretical models).

The Idea that Terrorists are 'Mad'

Within the terrorism literature there has been a shift from early psychological theories which tended to view motivation to engage in terrorism as related to psychopathology or a terrorist personality (Borum, 2014; Gill & Corner, 2017); ideas which were later contended (e.g., Crenshaw 2000). This is not to say that in some cases mental health symptoms or personality factors are not important considerations but focusing on such factors in isolation was considered too simplistic a notion (Gill &

Corner, 2017). The emergence of more sophisticated research is beginning to address some of the flaws which were inherent in early research attempts, to help expand understanding of how mental health and personality factors can, in some situations, relate to engagement in terrorism (Dawson, 2019; Corner at al., 2016; Gill et al., 2021). This involves a shift from focusing solely on static factors, which miss critical features associated with terrorism, such as the process of socialisation into terrorism (Horgan, 2008), to a combination of proximal and distal risk factors, of which mental disorder may be just one (Corner & Gill, 2015). Moreover, studies are now beginning to look in greater depth at the broader area of mental health, by exploring not just mental illness diagnoses, but the impact of a wider range of complex needs including stressors and trauma (Corner & Gill, 2015; Gill et al., 2021; Lewis & Marsden, 2021).

What the more recent literature on mental health does highlight is the importance of disaggregating extremist offending into typologies, ideologies, roles and geographic location when looking at risk factors (Corner et al., 2016; Victoroff, 2005). Research thus far has largely focused on lone actor terrorists, with preliminary studies suggesting a higher prevalence of mental illness in lone actor terrorists than with group actors and the general population (Corner & Gill, 2015; Corner et al., 2016; Gill & Corner, 2017; Gruenewald et al., 2013; Weenink, 2015, 2019); leading to the idea that lone and group terrorists are distinct groups (Gill et al., 2021). Reasons why group actors appear to have a lower prevalence of mental disorder than lone actors are complex, however have been hypothesised as relating to the impact of the group in acting as a buffer from psychological distress (Monahan, 2015; Swann et al., 2012), selection effects of the group (Corner et al., 2016) and a lack of disclosure of mental health symptoms among members of terrorist groups (Corner and Gill, 2021).

A broad range of mental health problems have been identified as prevalent in lone actor terrorist samples (Corner et al., 2016; Gill et al., 2019). A study by Corner et al. (2016) found higher prevalence rates of schizophrenia, delusional disorder and Autistic Spectrum Disorders (ASD), and lower rates of depression within their sample of 153 lone actor terrorists compared to the general population. Weenink's (2019) study of 319 jihadi travellers from the Netherlands similarly found higher levels of mental health problems, particularly psychotic disorders and Post Traumatic Stress Disorder (PTSD), as well as trauma histories, distress and adversity than age-matched peers. A systematic review of mental health problems and violent extremism more generally by Gill et al. (2021), highlighted that a minority presence of mental health problems was common across the studies identified in their review, but that terrorist samples were diverse in terms of the diagnoses that were prevalent, with no common diagnosis identified. Of particular relevance was the larger volume of other co-occurring complex needs such as trauma, substance abuse, relationship problems, employment problems, discrimination and life changes (Gill et al., 2021). There is a need to hone in on the relevance of specific mental health diagnoses and, in particular, the symptoms that may be of most relevance to our understanding of the extremist offending process, as well as co-occurring risk and protective factors (Douglas et al., 2009; Gill & Corner, 2017).

The relationship between extremist offending and personality disorders or specific personality traits is equally complex, with conflicting and often methodologically weak literature, spanning multiple theoretical models, being identified (Corner et al., 2021). What is apparent is that there is no one terrorist personality, however certain personality traits may have a more indirect role in extremist offending behaviours (Corner et al., 2021). Anti-social personality disorder has been highlighted

within the terrorism literature, as well as anti-social traits comorbid with narcissistic

rage (Martens, 2004). Narcissistic rage can be defined as "the need for revenge, for

righting a wrong, for undoing a hurt by whatever means, and a deeply anchored,

unrelenting compulsion in the pursuit of all these aims" (Kohut, 1972, p. 380). This is

thought to occur in the context of narcissistic injury, where there is a perceived threat to

the individual's self-esteem or self-worth (Lazarus, 2019). Such threats may include a

perceived rejection that relates to childhood trauma experiences or a reaction to

interpersonal slights that leads to feelings of shame and humiliation which can increase

likelihood to engage in violence towards others (Gilligan, 2017).

The dark tetrad personality dimensions which include narcissism, psychopathy,

Machiavellianism and sadism have been linked to antisocial and criminal behaviours

(Chabrol et al., 2009; Paulhus & Williams, 2002). Moreover, they have been

empirically associated to radicalisation and terrorism both directly and indirectly

(Chabrol et al., 2020; Corner et al., 2021; Morgades-Bamba et al., 2018). Cultural

factors and societal trends are however important considerations when interpreting such

research, for example within more individualistic societies, traits of narcissism and

Machiavellianism are normalised and even considered desirable (Remes, 2016).

The systematic review by Corner et al. (2021) found that traits such as

impulsivity, sensation seeking, poor self-control and low empathy were equally

associated with radicalisation and terrorism. Such traits as discussed within general

violence literature, can be related to a person's biology (Ansbro, 2008; Beech &

Mitchell, 2005; Henry & Wang, 1998; Raine, 2014), as well as an interaction with their

environment, particularly where trauma is experienced or a trigger event has occurred

(Meloy at al., 2017). Rather than seeing engagement in extremist offending as related to psychological abnormality, Borum (2014) proposes that propensity for involvement can be affected by both "characteristic attitudes, dispositions, inclinations, and intentions" (p. 286), a concept he called 'mindset', and 'worldview', "the ways we make sense and meaning of the world and our experience in it" (p. 287). It is recognised that further empirical testing and replication studies are required given the methodological limitations of empirical studies into personality to date (Corner et al., 2021).

The Impact of Trauma

Trauma is defined as "the experience of an inescapable stressful event that overwhelms one's existing coping mechanisms" (Van der Kolk & Fisler, 1995, p. 506). Both single incident traumatic events and multiple trauma experiences can impair both psychological and physiological functioning, however multiple traumas are often of greater detriment to health (Kolassa et al., 2010; Turner et al., 2017). Research into the links between trauma experiences and engagement with extremist offending is in its infancy, however such links are better established in the general violent offending literature (Dierkhising et al., 2013; Lewis & Marsden, 2021; Stimmel et al., 2014).

In terms of violent extremism, exposure to childhood trauma appears correlational, with any causal links remaining unclear (Lewis & Marsden, 2021). It is suggested that trauma may be a push factor for radicalisation (Becker et al., 2020). For example, North American-based former white supremacists demonstrated elevated rates of childhood adverse experiences when compared with a general population sample and a juvenile offending sample (Windisch et al., 2020). Windisch et al. (2020) surmised that extremist onset may be the result of the cumulative effect of multiple childhood

adversities and the resulting maladaptive coping strategies that subsequently increase vulnerability to misconduct and extremism. Furthermore, the systematic review by Gill et al. (2021) also highlighted the prevalence of adverse life experiences in violent extremists. These included experiences of physical abuse, neglect, sexual abuse and abandonment, although rates varied greatly across studies. The collective extremist group can function to provide an outlet to cope with emotions such as anger, aggression and feelings of rejection that result from early childhood risk factors (Simi et al., 2016), whilst propaganda can offer explanations for individuals' trauma experiences, therefore may be attractive to certain individuals (Gill et al., 2021).

It is not just individual trauma experiences that are important, Lewis and Marsden (2021) highlight the need to explore collective complex trauma (actual or perceived trauma inflicted on a group who share an identity, e.g., war) and intergenerational trauma (transmission of trauma effects across generations) further within research. Grievance (Cherney et al., 2020) and collective strain, such as perceived discrimination (Nivette et al., 2017) have also been linked to collective trauma as a possible contributor to radicalisation.

The literature on trauma thus far highlights the potential benefits of further research in this area, noting that although trauma by itself cannot fully explain radicalisation or engagement in extremist offending, it may contribute to our understanding of the process for some individuals when viewed in combination with other social, environmental and individual factors (Lewis & Marsden, 2021). Such insights have important considerations to risk assessment, management and particularly

interventions offered to extremist offenders and those deemed vulnerable to engagement (Gill et al., 2021).

An awareness of cultural differences between actors in terms of mental health disorder prevalence rates and reporting of psychological distress is important when interpreting the research in this area (Gopalkrishnan, 2018). Such differences have been identified across countries, which may relate to factors such as awareness of mental health symptoms, acceptability of behaviours, and help seeking (Gopalkrishnan, 2018; Njoku, 2020). Critically, mental health problems, increased psychological distress and perpetrator trauma can also be the by-product of terrorist activity and can assist in disengagement from terrorism in some cases (Corner & Gill, 2019, 2021; Gill & Corner, 2017; Koehler, 2020), as such formulation of an individual's mental health problems and psychological distress are important considerations for practitioners working with extremist offenders, particularly violent offenders.

Moving from the Terrorist Profile to Pathways

Given the global impact of events such as 9/11, it is not surprising that there has been a revival in researchers seeking to create a terrorist profile identifying which individuals could be capable of causing such harm and why. Early profiling attempts focused on psychopathology, socioeconomic backgrounds, as well as identifying racial and physical features to separate terrorists from non-terrorists (Rae, 2012). Unfortunately, such hypothesised variables lacked specificity, given that many individuals presented with such variables but did not become engaged in extremist offending (Dawson, 2019; Gill & Young, 2011). Moreover, racial and physical profiling led to whole population stereotypes (Dawson, 2019). Efforts to develop 'terrorist

profiles' have so far had limited success; this is likely not because there are no differences between terrorists and non-terrorists in terms of their psychological characteristics, but because there are such vast differences among terrorists (Borum, 2014). While it is not possible to simply predict who will become a terrorist, Gill and Young (2011) offer some hope that the profiling approach can have utility in supporting counter-terrorism practitioners when comparing specific terrorist role types. Moreover, Rae (2012) suggests that profiling the *process* of terrorism rather than the actual terrorist may be more fruitful, with a move away from why someone becomes a terrorist to how someone becomes a terrorist.

The idea of a pathways approach to describe the *process* of terrorism has been argued for (Horgan, 2008; Shaw, 1986; Taylor & Horgan, 2006). There has been a shift from stage models, which see radicalisation as a process occurring in linear stages, to pathway models which imply incremental change towards or away from terrorism (Taylor & Horgan, 2006). A trajectory is seen as the pathway for an individual "marked by a sequence of transitions" (Taylor & Horgan, 2006, p. 589). There are considered to be multiple pathways which may lead into violent extremism and multiple factors that contribute to each individual's pathway, with patterns of risk and protective factors varying from case to case (Bartlett et al., 2010; Gill et al., 2021; McCauley & Moskalenko, 2008).

Literature on typologies of terrorism have often referred to three broad types of terrorist, which mirrors the pathways suggested from casework with terrorist offenders in the UK: Those who are politically motivated, with a noble cause and appear to go through a process of radicalisation; those with a criminal history, whereby attitudes

supportive of violence could potentially bi-pass radicalisation (Lloyd & Dean 2015; Lloyd & Kleinot, 2017); and a clinical pathway, involving personality aspects and mental health symptoms that may contribute to engagement and offending (Lloyd & Kleinot, 2017), factors which can tend to be neglected within pathway models (Gill & Corner, 2017). These pathways are not considered to be mutually exclusive (Lloyd & Kleinot, 2017). As research in this area progresses, Gill (2015b) has highlighted that sequencing behaviours in terrorist samples can offer greater understanding of how an individual might move along a pathway towards committing a terrorist act.

Clemmow (2020) outlines a number of conceptual models which attempt to explain the process of how individuals engage in extremist violence, the majority of which focus at the individual-level (Borum, 2003; Moghaddam, 2005; Sageman, 2008; Silber & Bhatt, 2007; Wiktorowicz, 2004). Common to the majority of these models is the idea that susceptibility to radicalising influences is the result of an interaction between individual vulnerability factors and the individual's environment (Bouhana, 2019; Clemmow, 2020). This interaction, particularly where there may be experience of a personal crisis, is said to lead to a cognitive opening, which may increase vulnerability and receptivity to the extremist ideologies (Wiktorowicz, 2005). As a result of this personal crisis, a number of models suggest a process of individuals attempting to seek a narrative that will address their grievances (Clemmow, 2020). If such an extremist narrative meets the individual's needs, they are thought to internalise a new extremist worldview (Clemmow, 2020; Sageman, 2008). Other mechanisms that may contribute to such a process are group-level mechanisms such as group think (Clemmow, 2020). Models similarly present the idea of socialisation into terrorism through social ties and the impact of tipping points or trigger events occurring along the

pathway to violent extremism (Clemmow, 2020). These earlier, stage-based models, which view radicalisation as an ongoing process of moving along various stages, have been criticised for their linearity and exclusivity, in that they fail to acknowledge other pathways to radicalisation (Beelman, 2020).

Bouhana (2019) identified the need to explain the interactions between the different levels of analysis, other than just the micro-level, that was missing in other theories. A multilevel analysis of extremism known as the S^5 inference framework is provided, which is a development of the Situational Action Theory ([SAT] Wikström, 2004), a general theory of crime and its causes which attempts to explain moral actions. Five key interacting categories of determinants are outlined within the S^5 framework which are thought to either generate or supress propensity towards extremist behaviours. The framework seeks to guide the formulation process, in helping to infer "what kinds of people in what kinds of contexts at what times should be considered 'at risk'" (Bouhana, 2019, p. 11). Bouhana (2019) expresses the importance of understanding how violent extremism becomes morally justified by individuals, the process known as radicalisation, and emphasises the need to treat radicalisation and action as independent processes. Only one of the levels in the S^5 is focused at the individual level of analysis, susceptibility to moral change, with the remaining pertaining to contextual, exogenous drivers. The dimension of susceptibility to moral change, is the idea that there are individual differences in susceptibility to environmental influences. Determinants may relate to neurobiological factors such as impulsivity, emotional regulation, thrill seeking, dysexecutive functioning and cognitive inflexibility, as well as poor self-control a weak commitment to law-relevant morality. Bouhana (2019) discusses how the same susceptibilities appear to drive general

criminality and extremist offending, but that it is not only criminals who can be susceptible. The role of context helps to explain why only some individuals with susceptibilities adopt extremist beliefs and engage in extremist actions, as well as why some individuals who do not appear susceptible may still be drawn into extremism.

The contextual categories outlined by Bouhana (2019) are selection, settings, social ecology, and system. Selection refers to exposure to extremism-enabling environments and is linked to factors such as belonging to a particular social, religious or ethnic group, living in a particular location and socio-economic status (Bouhana, 2019); Extremism-enabling settings need to have features that expose the individual to extremism-supportive moral norms and induce certain cognitive states that allow for the adoption of new moral beliefs (Bouhana, 2019). Social ecology relates to the concentration of extremist- enabling settings in certain areas, communities, or online platforms (e.g., certain prisons) and the factors that shape these moral ecologies (Bouhana, 2019). This level focuses on changes which affect social segregation; included in this is technology that may for example foster group competition, contribute to the segregation of groups and undermine trust in legitimate authorities. Finally, at a whole-system level, factors that encourage the emergence of extremism-supportive moral ecologies are considered which include: normalisation of extremist values and behaviours; systematic changes that affect governance, for example loss of trust in moral authorities; processes which induce segregation between social groups; and processes that result in individual or collective strains such as marginalisation, power imbalance and unjust administration of justice (Bouhana, 2019).

It has been stated that the study into the causes of terrorism remains "theoretically fragmented" (Bouhana et al., 2016, p. 46). Theoretical models are of course important in terms of grounding understanding of a phenomenon and in framing research and organising the knowledge base, however it is important to empirically validate these models (Bouhana et al., 2016; Clemmow, 2020; Dawson, 2019). Further research is needed if typical pathways are to be identified and causal mechanisms connecting such processes are to be described (Beelmann, 2020). However, as Dawson (2019) highlights, "empirical research reveals a complex reality that confounds modelling these pathways" (p. 156). Such research will however be valuable in informing ongoing risk assessment development and adaptation, with the hope of contributing to the prevention of future attacks, aiding decision making for professionals working with offenders, and improving rehabilitative treatments for offenders.

Aims of the Thesis

Considering that the Structured Professional Judgement (SPJ) approach has been recommended for use within the terrorism field (Monahan, 2012; Van Der Heide, 2019), the following thesis broadly aims to critically explore the current use of SPJ risk assessment tools specific to the area of terrorism. Given the rapidly expanding research within the terrorism literature (specifically literature related to terrorism risk assessment, as well as the extensive use of such tools across a range of settings), it is crucial to maintain a critical overview of current practice. The chapters within this thesis will therefore focus on the development and subsequent validation attempts of known SPJ tools identified for use with terrorist offenders, extremist offenders who fall short of terrorism (see chapter two), and those considered vulnerable to engagement in

terrorist offences. There will be particular attention paid to the UK's perspective on terrorism and the current use of the Extremist Risk Guidance (ERG 22+; National Offender Management Service [NOMS], 2011). Moreover, some of the challenges to risk assessment, including the ethical dilemmas that present, will be discussed. The thesis also aims to contribute to the current terrorism literature, specifically in terms of the developing area of terrorist risk assessment and management, by identifying characteristics associated with mass casualty terrorist events across Western Europe over the previous two decades. The thesis is therefore separated into three distinct chapters, with the findings of each summarised and collated within chapter five.

Chapter two expands upon why risk assessment is important within the area of terrorism and highlights some of the challenges involved in developing and evaluating risk assessment tools specific to terrorism risk, as opposed to general violence. A systematic literature review is presented which identifies existing SPJ risk assessment tools which are designed for use in a clinical or operational setting for use with extremist or terrorist offenders or those considered vulnerable to engagement. The review employed a systematic search strategy to identify studies which contribute to the validation of these tools. The chapter provides an outline of the identified tools, their intended use, a comparison of risk factors across tools, and the extent of validation efforts to date.

Chapter three takes a closer look at the extent of terrorism globally and focuses on those perpetrators who commit attacks, rather than other roles within a group or organisation with which some risk assessment tools broadly cover. An empirical study is presented, which explores patterns in situational, behavioural and individual characteristics identified across mass casualty terrorist events that have taken place in

Western Europe over the past two decades, using a multi-dimensional scaling analysis. The study particularly focuses on attacks perpetrated by lone actor terrorists. The results of this study are considered in relation to the findings presented in chapter two and future implications for research and practice are also discussed.

Chapter four expands on these findings, by offering a perspective on the UK's approach to terrorism and counterterrorism, specifically by critically examining the ERG 22+ (NOMS, 2011) which is used within England and Wales to assess all those convicted under terrorist legislation. The findings are discussed in relation to the future validation of the tool. The use of the ERG 22+ indicators in assessing risk posed by individuals considered vulnerable to engagement under the Contest strategy will also be touched upon.

Chapter five consolidates the findings of the previous chapters and discusses the implications for practice, particularly given the infancy of the risk assessment validation attempts this far. Future research is also discussed in the context of developing terrorism risk assessment further.

Chapter Two:

A Comparison of Structured Professional Judgment Risk Assessment Tools for use with Extremist Offenders and those Considered Vulnerable to Engagement: A Systematic Literature Review

Abstract

The concepts of risk and risk assessment in the area of extremist offending are relatively new, however a number of tools are used across the UK, Europe and the USA to identify such risks. Informed by a systematic approach, the current review aimed to identify existing Structured Professional Judgement (SPJ) risk assessment tools designed for use in a clinical or operational setting to assess extremist or terrorist offenders, as well those individuals considered vulnerable to engagement in acts of terrorism. The review offers a brief comparison of the identified risk assessment tools, as well as a critical overview of the identified studies which sought to validate their use. Relevant databases were searched, and additional papers were sought through hand searching the main terrorism research journals and reference lists from key papers. Identified studies were subject to inclusion and exclusion criteria and were quality assessed, although due to the nature of research in this field, studies were not excluded based on quality scores. Nineteen articles meeting the inclusion criteria were identified, four of these outlined a risk tool and methodology, and fifteen were studies contributing to the validation of these existing tools. Specific tools included within the review were the ERG22+, MLG, VERA and the TRAP-18. Several overlaps between the themes of risk factors were found across measures. Differences across measures appeared attributable to the context and purpose of the measure. Validation attempts of these measures at present appear minimal, however this picture appears to be improving. Findings are discussed in relation to practice and future research.

"Assessing the risk posed by terrorists and violent extremists is important, as it cannot

be assumed that all terrorists pose the same risk of serious harm".

(Hall, 2020, as cited in Risk Management Authority [RMA], 2021, p. 12).

In comparison to general violence risk assessment tools, assessing risk in the case of terrorist offenders, or those considered vulnerable to engaging in extremist offences, poses specific challenges; it is important for intelligence services, practitioners, and the judiciary to consider these challenges when using such tools to inform decision making. This review sought to collate information on known SPJ risk assessment tools, identified for use specifically within the area of terrorism or extremist offending, to ascertain their development, intended uses and, importantly, critically report any validation attempts to date. Moreover, the challenges of developing and validating such risk assessment tools, and hence some of the ethical dilemmas that arise, are touched upon.

Managing risk is considered the "cornerstone of global efforts to counter terrorism" (Borum, 2015, p.79). Due to on-going advances in our understanding of terrorism, intelligence gathering processes, and a focus on counterterrorism strategy, many potential terrorist attacks have been prevented.[1] However, counterterrorism is a difficult task involving the prioritisation of a high volume of cases using intelligence-based judgements and based on available resources (McCallum, 2021). It being suggested that at any one time, UK defence officials have around 500 terror

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[1] It has been reported that eight extreme right-wing terror plots and 19 Islamist extremist plots, all within the late stages of planning, were foiled in the UK between 2017 and 2020 alone (Walsh, 2020).

investigations, involving 3000 subjects, to manage (Dixon & Harley, 2017). Despite

advances in counterterrorism, the task of assessing the risk of an individual becoming

involved in terrorist activities and predicting the imminence of such risk remains

challenging. Parallel to this, is the need to consider the risk of recidivism in those

serving convictions for terrorist offences, or those convicted of criminal offences where

there may be evidence of ideological motivation; the aim being to identify appropriate

and proportionate risk management and treatment plans to mitigate future risk

(Pressman, 2009; Pressman & Flockton, 2014).

Risk assessment can be defined as, "the systematic collection of information to

determine the degree to which harm (to self or others) is likely at some point in time"

(The British Psychological Society [BPS], 2006, p. 4). Risk factors are "variables

associated with the increased likelihood of a negative outcome" (Copeland & Marsden,

2020, p. 5). The risk assessment process should encourage the assessor to clearly

identify what outcomes are to be prevented, as well as consider the potential severity,

likelihood, and imminence of such an outcome occurring (Department of Health [DH],

2009). Within terrorism-related risk assessment, the potential outcomes to be assessed

can cover a broad range of risk behaviours which are not always inclusive of direct

violence risk (Borum, 2015; Horgan & Taylor, 2011). Moreover, as Horgan (2014)

outlines, the concept of terrorism also covers different phases of involvement: becoming

involved in terrorism, engagement, and sometimes disengaging from terrorism.

Therefore, the broad concept of terrorism and definitional problems highlighted in

chapter one, can provide challenges to the terrorism-related risk assessment field, where

tools may be required to assess a wide range of risk behaviours for individuals at

differing stages of the process. It is postulated that different risk indicators and risk

factors may have greater relevance dependent on the type of risk and the stage in the process (Borum, 2015). It is therefore paramount for the assessor to ensure that the appropriate risk assessments are applied, dependent on the outcome to be assessed. Such outcomes are likely to be different for practitioners working within custodial settings or probationary settings compared with those working within intelligence services.

Risk Assessment in the Pre-Crime Space

'Pre-crime' is a term coined by Philip K. Dick in his 1956 short science fiction story, 'The Minority Report' (Dick, 2002). The term pre-crime, in the terrorism context, is linked to "preventing crime and pre-empting threats" (McCulloch & Pickering, 2009, p. 629). As McCulloch and Pickering (2009) highlight, this movement away from individual offending towards anticipating risks and making interventions before a crime has been committed, has expanded following the events of 9/11. The use of risk assessment tools in the 'pre-crime' space, as a way of assessing vulnerability towards an individual engaging in extremist violence, has prompted intensive ethical debate (Qureshi, 2016). In particular, the potential negative impact of the UK's pre-crime approach, through its 'Prevent' agenda, on individuals, their families and, particularly, Muslim communities, are expressed (Qureshi, 2016). Yet, given the perceived risk of potential future terrorist acts and the significant impact of such acts if they were to occur, the use of pre-crime strategies are often justified on the basis of contributing to preventing future terrorism and therefore harm to society.

Approaches to Risk Assessment

Approaches to risk assessment include Unstructured Clinical Judgement (UCJ), actuarial and SPJ risk assessment. The first generation of risk assessments, UCJ, relied on a professional's experience, skills, knowledge, and opinion to identify the level of risk an individual posed and was therefore not generally based on solid empirical evidence (Douglas, et al., 2013a). Importantly, in UCJ the clinician decides which risk factors to include without formal guidance, meaning that relevant risk factors may be missed and there is a greater likelihood of inconsistencies occurring across clinician ratings due to the subjective nature of the assessment (Douglas et al., 2013a). It has been suggested that the UCJ approach offers a "modest, better-than-chance level of accuracy" (Mossman, 1994, p. 790).

In contrast, actuarial risk assessments provide a quantitative estimate of risk and are based on empirically supported factors associated with the outcome, usually recidivism, removing clinical judgement completely (Geraghty & Woodhams, 2015). Risk is calculated from large datasets, with static risk factors (factors that generally do not change over time such as criminal history) related to the risk being assessed (Kebbell & Porter, 2012). Actuarial risk assessments ensure consistency in judgements, are easy to apply, and require minimal training. They are designed to "predict outcomes for a specific population within a given time frame" (Cook, 2014, p.4), but do not consider risk management strategies in the way that UCJ and SPJ tools do, failing to tell the user what to do with the information (Hart, 2013). Moreover, actuarial risk assessments fail to consider the complexity of individuals, heterogeneity of individuals and the context (Hart, 2013), which is particularly relevant to the area of terrorism. Given that acts of terrorism are thankfully rare in comparison to other crimes, it is

suggested that actuarial risk assessment is not appropriate in exploring risk in violent extremist's or those considered to be on a trajectory towards terrorism (Sarma, 2017). As Sarma (2017) highlights, "the true base rate for involvement in terrorism in the West is negligible" (p.283), which causes problems for such statistical approaches to risk assessment (Quinsey et al., 1998). Moreover, we cannot identify how reliable a risk factor is, either in isolation or in combination, without knowledge of the societal prevalence of a particular indicator (Copeland & Marsden, 2020; Gill, 2015b); this is where terrorism research has been relatively limited to date.

Whereas actuarial risk assessment adopts a prediction approach to risk assessment, SPJ focusses on a prevention approach (Hart, 2013). SPJ approaches are an attempt to bring static and dynamic risk factors (factors that fluctuate over time and can be changed) together and should be based on a broad review of the current literature in the field. Risk factors should be clearly defined, with specific guidance allowing for the coding of items (Cook, 2014). Systematic steps are followed for evaluating the presence of risk factors and, where relevant, the absence of protective factors (factors that decrease the likelihood of the negative outcome occurring). The SPJ approach recognises that risk is dynamic and will change dependent on different conditions and contexts (Douglas et al., 1999). In general violence risk assessments, presence of risk factors will tend to contribute to an individual formulation of risk, future scenario planning and development of management strategies to reduce the future likelihood of risk (DH, 2009). Formulation "provides a hypothesis about a person's difficulties, which draws from psychological theory" (Johnstone & Dallas, 2014, p. 5). Within SPJ risk assessment, the formulation is generally considered a priority given its focus on synthesising the information gathered from identified risk factors to help understand the

individual being assessed (Hopton et al., 2018). SPJ approaches do not tend to combine

factors to provide a quantitative, predictive score as actuarial assessments do and

individual factors do not tend to be weighted. Instead, an individual's level of risk will

be evaluated based on the professional's judgement, given the available information and

risk factors identified (Heilburn et al., 2010). SPJ approaches tend to require specialist

training and skills, supervision, a range of sources of information, and are more time

consuming to complete.

It is considered that the SPJ approach, often successfully used to assess risk for

interpersonal violence, may be adapted and usefully applied to the risk assessment of

terrorism and extremist offending (Dernevik et al., 2009; Monahan, 2012; Pressman &

Flockton, 2014; Sarma, 2017). Despite the apparent differences in terrorism to other

forms of violence, a comprehensive risk assessment which includes consideration of

individual-level risk factors and violence risk assessment, such as the Historical-

Clinical-Risk-Management-20 ([HCR-20 v3], Douglas et al., 2013b), should take place

to best inform risk management plans (Hart et al., 2017). This seems wise given the

nexus between crime and violent extremism noted more recently in European jihadis,

wherein criminal antecedents are noted in a number of terrorist offenders; it is therefore

suggested that some of the same susceptibilities may drive both types of offending

(Basra & Neumann, 2017; Bouhana, 2019). It has however been highlighted that the

predictive validity of these standardised risk assessment tools for general violence may

be compromised when used with violent extremists, given that they have not been

validated on ideologically motivated offenders at present (Pressman & Flockton, 2014).

The consensus concludes that despite some overlap between risk factors identified in

violent offending risk and extremist offending, there are important differences that need

to be taken into account, with violence risk assessment tools not capturing the

motivations and actions that are considered unique to violent extremism (Copeland &

Marsden, 2020; Pressman, 2009).

SPJ risk assessments for general violence tend to work on the assumption that

the more risk factors that are present, the higher the risk of violence, which does not

necessarily appear to be the case in extremist offenders (Borum, 2015a). This may in

part relate to the idea of different pathways into extremist offending (Lloyd & Dean,

2015) potentially resulting in different clusters of risk factors dependant on the

individual pathway taken. Borum (2015a) therefore suggests using an SPJ-like tool with

broader categories and emphasises the importance of individual formulation to guide the

risk assessment. Thus, risk assessments that focus on specific risk factors and indicators

considered relevant to extremist offending for use in the pre- and post-crime space have

been, and continue to be, developed (RTI International, 2018). Such an approach is

important as it can benefit the offender by assisting in proportionate risk management

(Lloyd & Dean, 2015); ultimately beginning to support a move away from a position

where all extremist offenders are viewed as high risk and considered to remain high risk

(Silke, 2014).

Challenges to Assessing Risk Using the SPJ Approach

When evaluating the accuracy of risk assessments in general violence literature,

the predictive validity is typically assessed (Geraghty & Woodhams, 2015). Predictive

validity is measured using correlations between the test and an outcome variable (Kline,

1986); in risk assessment, this is often an assessment's ability to predict recidivism.

Evaluating risk assessment tools in this traditional sense, by monitoring reconviction

data, is particularly difficult in the context of terrorism. This is due, in part, to the potential level of surveillance and restrictions placed on extremist offenders upon release which limit people's ability to reoffend (Cherney, 2018; Lloyd & Dean, 2015). Furthermore, higher risk offenders are likely to be serving extremely long periods in custody (Lloyd & Dean, 2015). It is also worth noting that those convicted may remain involved in terrorism at some level but withdraw from the front-line roles, making detection less likely (Lloyd & Dean, 2015). The aforementioned challenges, combined with low base rates of extremist offenders, and temporal changes in manifestations of extremism and the political climate, makes it unrealistic to focus primarily on the predictive validity of risk assessment tools in the area at this time (Lloyd & Dean, 2015; Meloy et al., 2015).

Identifying valid risk factors and indicators to form extremist risk assessment tools is a further challenge. To date, risk factors have largely been identified by academics using open-source case studies combined with input from practitioners or 'experts' in the area (Copeland & Marsden, 2020). Gaining access to extremist offenders or those who are engaged in terrorist organisations in the community, as well as closed source data, is understandably a great challenge for academics. Moreover, a number of studies relating to risk assessment of extremist offenders may be unpublishable or classified due to the security implications of such information being available in the public domain. Open-source data can provide rich information to inform risk assessment, however its limitations are widely acknowledged (see chapter three). It has been suggested that greater cross-working between academics and those working in the field is needed to develop knowledge in the area (Monahan, 2016); positively academics are beginning to bridge this gap.

The literature identifies a broad range of risk factors considered important in assessing extremist offending risk, however the area to date is limited by a lack of studies testing prevalence and validity of these factors (Copeland & Marsden, 2020); such an endeavour is complicated by the expanse of behaviours that fall under the broad definitions of extremism and the differences in risk factors from one form of terrorism to another (Sarma, 2017). Many risk factors have been identified based on their presence in a small numbers of terrorist offenders, without examining the presence of such factors in the general population or in non-violent extremist offenders (Copeland & Marsden, 2020; Wolfowicz et al., 2019). Positively, as the systematic review by Wolfowicz et al. (2019) highlights, there are several more recent studies identifying risk and protective factors for both radical attitudes and terrorist offending, where direct comparison groups or cross-sectional samples are employed successfully.

It must also be considered that the face of terrorism is always changing. Over time new organisations emerge, with differing core beliefs, recruitment strategies (increasingly complicated by the internet and social media), and end targets; this means that with time new vulnerability factors are likely to be identified and others adapted. As Laqueur (2003) identifies, "many terrorisms exist, and their character has changed over time and from country to country" (p. 22). The current focus of much empirical research into potential risk factors is on Islamic (or Jihadi) terrorism in North America, Europe, and Australia (Vergani et al., 2018) and this may not be generalisable to other ideologies; this is an area where further research is required.

A further consideration to risk assessment is the potential differences dependent on the role an individual may have within a terrorist group, or similarly if they act

alone; it is likely that different risk factors will be prevalent amongst certain roles or

activities (Borum, 2015a; Gill & Young, 2011; Smith, 2018). Those with more 'front

line' roles, such as suicide bombers, if successful in their offending, are also highly

likely to be killed during the attack or by the Police. This means that our understanding

of these offenders is largely based on second-hand sources, such as family and friends,

and interpretations of any evidence found, which may be limited. Moreover, people's

involvement in terrorism can adapt over time and the roles they take may change,

therefore, the level of risk that an individual is considered to be at any one time is also

subject to change (Borum, 2015a). As such, it is important for research to begin to

separate out risk factors and indicators depending on the specific risk that individuals

pose, in order to identify the most appropriate interventions and management strategies.

It is considered important that risk assessments ensure specificity in terms of what they

are measuring or seeking to predict (Roberts & Horgan, 2008).

Risk Factors and Indicators Informing Current Extremist Risk Assessment

As discussed in chapter one, there are a substantial number of theories suggested

within the terrorism literature that seek to explain extremist offending, particularly

violent extremist offending. The wealth of research, which far exceeds that summarised

in chapter one, has contributed to the identification of proposed risk factors and risk

indicators for terrorism, however there is academic disagreement around the main

drivers and causes (UK Government, 2018). As Bouhana (2019) reflects, "the drivers

and possible risk indicators of extremist behaviours are theoretically infinite and ever

changing" (p. 10). The consensus among many researchers is that numerous factors,

with infinite individual combinations and degrees of relevance, can impact on

involvement in violent extremism (Dawson, 2019; Ranstorp, 2016). It is also important

to emphasise that the majority of individuals who share such risk factors do not engage in extremist offending (UK Government, 2018).

On-going research is urgently required to validate identified risk factors and indicators to better support the risk assessment and management process. As Horgan (2014) emphasises, "the predictive ability of these remains completely unverified in the absence of more fully developed, controlled, research" (p. 100). The lack of rigorous research methods also causes issues for answering questions about the causal direction of proposed risk factors (Vergani et al., 2018). Furthermore, it is likely that indicators that highlight an individual is adopting an extremist ideology and those of someone planning an attack are underpinned by different behaviours (Gill, 2015b), therefore will require different intervention and management.

A risk factor can be defined as something that increases the likelihood that "an individual will engage or attempt to engage in terrorism" (Smith, 2018, p. 2). Whereas an indicator helps to "signal the presence of that outcome" (RTI International, 2018). There is some support for a range of factors and indicators associated with terrorism such as gender, age, criminality, socioeconomic status, geographic location, employment status, relationship status, education, substance abuse, mental illness, personality and grievances (Desmarais et al., 2017; Monahan, 2012, 2016).There are however discrepancies within the available data which likely reflects the heterogeneity of extremist offending in terms of types of offending, roles, ideologies and typologies, therefore highlighting the need to disaggregate extremist offending to better understand the relevance of such factors (Gill et al., 2016; Gruenewald et al., 2013).

The National Institute of Justice (NIJ) have compiled information on widely accepted risk factors and indicators for engaging or attempting to engage in terrorism from examining risk assessment research in the US, Canada, and UK, as well as summarising results from their sponsored research focused particularly on violent action (see Smith, 2018 and RTI International, 2018, for more detail). Table 1 summarises these widely accepted risk factors and indicators, differentiating between those thought relevant for radicalisation and those relevant to violent extremism (RTI International, 2018). Although the risk factors and indicators presented are suggested as those which are most widely accepted, it is acknowledged that the empirical support for some of these factors and indicators are limited. RTI International (2018) also note potential gaps in identified risk factors, with many risk factors identified within other models of extremist violence not been identified within the NIJ-funded research. Another systematic review was completed by Vergani et al. (2018) and highlighted a range of push, pull and personal factors, identifying a need to focus on the interaction between these factors within future research. Most recently, a field wide systematic review by Wolfowicz et al. (2019) highlighted a number of risk and protective factors for both radical intentions and radical behaviours, supporting the notion that scholars have often relied on background characteristics and have paid less attention to psychological and personality traits. The review also supported previous research findings highlighting the significant overlaps between terrorists and general criminals in terms of risk and protective factors (Wolfowicz et al., 2019). Importantly, it has also been argued that it is insufficient to focus upon single risk factors, as it is the combination of factors that make up an individual's circumstances that should explored (Gill et al 2021).

Table 1. *Potential Risk Factors for Radicalising to Violent Extremism. Reproduced from RTI International (2018, p. 5-6)*

Risk Factor	Radicalisation	Violence
Experiencing identity conflict/being a loner	●	
Feeling there is a lack of meaning in life	●	
Wanting status	●	
Failing to achieve aspirations		●
Wanting to belong/trouble with platonic relationships	●	●
Trouble in romantic relationships		●
Desiring action or adventure/military experience	●	●
Having experienced trauma/abuse	●	●
Having mental health issues or being emotionally unstable/troubled	●	●
Being naïve or having little knowledge of religion and ideology	●	
Having strong religious beliefs/extremist ideology	●	●
Having grievances	●	
Feeling under threat	●	
Having an "us versus them" world view	●	
Justifying violence or illegal activity as a solution to problems	●	
Having engaged in previous criminal activity	●	●
Involvement with a gang or delinquent peers		●
Stressors (e.g., a family crisis, being fired from a job)	●	●
Societal discrimination or injustice	●	
Exposure to violent extremist groups or individuals	●	●
Exposure to violent extremist belief systems or narratives	●	●
Family members or friends in violent extremist network	●	●

Table 2. *Potential Risk Indicators for Radicalizing to Violent Extremism. Reproduced from RTI International (2018, p. 5-6)*

Indicators	Radicalisation	Violence
Seeking information on a violent extremist ideology	●	
Withdrawing from society or existing relationships	●	
Engaging in conflict with family/others (e.g., teachers, religious leaders)	●	●
Making dramatic lifestyle changes (e.g., unexpectedly quitting work, leaving home)	●	
Immersing oneself with violent extremist peers	●	
Joining or staying in a violent extremist organization	●	●
Making public statements about violent extremist beliefs	●	●
Expressing threats or the intent to engage in terrorist activity	●	●
Engaging in preparatory activities related to an attack (e.g., training, obtaining weapons and materials, conducting surveillance	●	●
Others becoming aware of one's grievances		●

Protective Factors

Protective factors are circumstances, events or individual factors which decrease the likelihood of a negative outcome of harm towards others (RTI International, 2018). There is limited research exploring protective factors in violence extremism to date, however suggested factors are thought to include high self-esteem, exposure to non-violent belief systems, strong societal ties, education, marital status, school bonding, age, mental health treatment, self-control, positive parenting, adherence to law, nonviolent others and attachment to society (Lösel et al., 2018; RTI International, 2018; Wolfowicz et al., 2019). The importance of incorporating protective factors and individual strengths into risk formulation has long been stated in the general violence literature to improve accuracy and utility of risk assessments and help target interventions (DH, 2009; Neil et al., 2020). It has been argued that there are significant overlaps between protective factors for criminality and radicalisation, however some protective factors may be more specific to extremism (Lösel et al., 2018). It is expected that protective factors should feature in risk assessment and management guidance in the field of violent extremism (Logan, 2021), however clearly further research is needed to establish which protective factors are most salient.

The Current Review

The use of risk assessment tools prior to comprehensive validation, and without the empirical research to validate suggested risk factors, indicators and protective factors, has been the cause of significant debate and has posed important ethical dilemmas (See Qureshi, 2016). The preceding discussion has highlighted some of the developments in research, particularly in identifying risk factors and indicators and is suggestive of a move in the right direction, however clearly there is a lot more growth

that needs to be done to help inform current risk assessment practice in extremist offending populations.

To date, there has been one systematic review identified within the literature which has involved consideration of the properties of risk assessment tools relating to terrorism and extremism. The review by Scarcella et al. (2016) sought to explore the psychometric properties of instruments developed to identify risk factors of terrorism, extremism, radicalisation, authoritarianism, and fundamentalism, and included instruments used both operationally and those developed as research measures. The review by Scarcella et al. differed in its aims from the current review given its broader focus in terms of definitions employed and the inclusion of measures used in research, including questionnaires. With the aim of providing greater comparison, the current review has focused solely on SPJ tools used operationally and clinically, excluding questionnaires and screening tools. Moreover, the review by Scarcella et al. was restricted to peer-reviewed articles only, therefore potentially useful studies from the grey literature, such as Government research papers, may have been missed. The current review also hand-searched journals specific to the area of terrorism and extremism. Given the relatively recent development of SPJ risk assessment for extremist offending, regular reviews taking account of the ongoing development and evaluation risk is considered advantageous.

Additional resources that provide a comparison of SPJ risk assessment tools specific to extremist offending and terrorism have become available within the literature during the completion of this review (Lloyd, 2019; Risk Management Authority [RMA], 2021; RTI International, 2018; Van der Heide et al., 2019) and provide a good overview of available tools. This review compliments these resources, by providing a

quality assessment of available studies and their relevance to the key SPJ risk assessments outlined.

The current review aimed to:

- Identify existing risk assessment tools using a SPJ approach, or structure, that have been developed either specifically to explore risk related to terrorism or have explicitly identified that the tool can be used in this population; this includes risk of both violent and non-violent extremist offences.

- Summarise comparisons of existing risk assessment tools; focusing particularly on commonalities between tools in terms of their theoretical basis and identified risk factors or indicators, as well as highlighting any important differences between tools.

- Collate any validation studies of the identified risk assessment tools and comment on the quality of these early validation attempts and highlight any stated directions of how the authors plan to further evaluate the tools

Method

Scoping Search

An initial scoping exercise was conducted in October 2018 to determine the need for the current review and offered a preliminary search of the literature. Electronic databases accessed for this exercise included The Campbell Library of Systematic Reviews, Cochrane database of systematic reviews, Ovid PsycINFO, and ProQuest Applied Social Sciences Index and Abstracts (ASSIA). As noted, one similar systematic review was identified from this search (Scarcella et al., 2016).

Systematic Review Search Strategy

To identify potential papers for inclusion in the review, a search of four databases was undertaken on 20th October 2018 and then updated on 1st January 2022: ASSIA; Web of Science; Ovid PsycINFO; and ProQuest National Criminal Justice Reference Service (NCJRS) Abstracts. The search was limited to 2001 onwards given that the study of terrorism has vastly expanded since the events of 9/11 and considering that risk assessment specific to this area has only more recently been developed (Gudjonsson, 2009; Roberts & Horgan, 2008; Schuurman, 2018). The searches were limited to English language only.

Seven key journals relevant to the review topic and reference lists of key papers were also hand-searched to increase the comprehensiveness of the review. Additionally, Google Scholar Search Engine was used to identify any further publications, such as government documents, which were not located through the database searches. Finally, a search of the British Library EThOS was conducted to identify any relevant doctoral theses.

Search Terms

        The search combined terms relating to assessing risk and extremist offending. "Wild card" search characters were used to ensure that variations of the search terms were captured. Subject headings were identified using the thesaurus function dependant on the database; there was a slight discrepancy across databases (See Appendix A). Figure 1 outlines the identified search terms applied to electronic databases. Search terms were identified from exploring the key words of relevant articles in the literature to ensure that terms were broad enough to capture the majority of articles, whilst not drawing in too many irrelevant articles.

Figure 1. *Diagram of Search Terms*

Extremis* OR Terroris* OR "Violent extremism" OR "Radical movement*"

AND

Tool* OR Framework* OR Model* OR Assessment* OR Measure* OR "Risk assessment*" OR "Screening test*" OR "Assessment tool" OR "Need* assessment*"
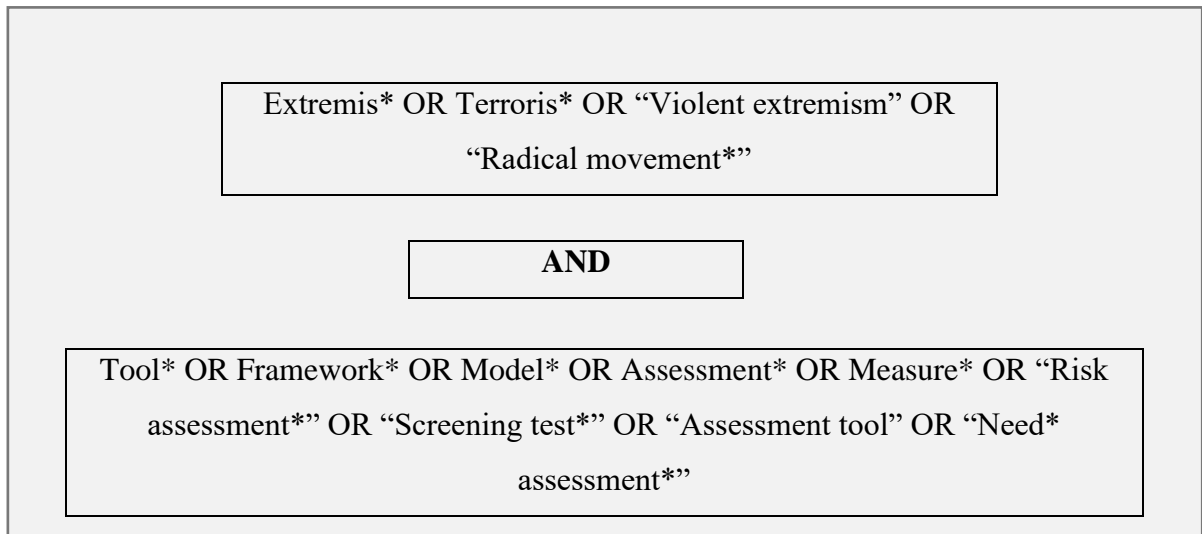
Table 3. *Inclusion and Exclusion Criteria*

Inclusion criteria	Exclusion criteria
Paper outlines the development of a risk assessment tool that is specifically designed for exploring risk in terrorist or extremist offenders or in assessing risk of those considered 'vulnerable' to engagement in terrorism and adopts an SPJ approach *Or* Paper outlines a risk assessment tool that although not developed exclusively for exploring risk in the area of terrorism or extremism, is explicitly identified as applicable for use in this area *Or* Paper attempts to evaluate a risk assessment tool as specified above	Risk assessment tools exploring risk of violence in general Risk assessment tools that are not used clinically/ operationally Assessments or measures that may form part of a risk assessment but are not considered standalone risk assessment tools, e.g., a measurement of one risk factor in isolation, risk screening tools, questionnaires, guidance documents Review papers that do not contribute any novel information pertaining to the assessment tools psychometric properties or validation attempts
Some discussion or attempt made to measure either the reliability or validity of the instrument in question (even if specific information is not published/ in the public domain)	No discussion about the reliability or validity of the assessment or future attempts to evaluate the tool
Both published and unpublished papers considered. These can include theoretical papers, review papers, theses, Government reports	Single case studies Those whose validation studies are not available within the public domain
Language of publication: English	Languages other than English given research constraints
Year of publication: 2001 to 2022	Those outside of the search dates highlighted above

Study Selection

Inclusion/ Exclusion Criteria

Given the expected limited empirical examination of risk assessment tools specific to terrorist and extremist offending to date, a broad inclusion criterion was adopted. Table 2 outlines the inclusion and exclusion criteria employed.

Screening

Figure 2 provides a visual overview of the data selection process. Searches from the four databases yielded a total of 3,793 results. Titles and abstracts were reviewed to assess potential relevance to the current review and where necessary full papers were acquired. Hand-searches of the seven journals deemed to be most relevant yielded one additional relevant paper. Hand searching of reference lists from key papers yielded 11 papers, however upon further reading these did not meet the inclusion criteria for the review and one study was only outlined briefly within a book. The Google Scholar search identified one additional relevant paper which was not available within the databases due to it being a government document. Contact with experts within the field identified four potential papers. In total, 3,831 papers were identified from the search.

The initial sifting removed 3,795 papers due to irrelevance or duplications. One risk assessment manual documentation was provided via an educational license (Extremist Risk Guidance [ERG22+]; National Offender Management Service [NOMS], 2011), however, information from this manual has not been included within this review given the terms of the license. Thirty-Six articles were reviewed in full and assessed against the inclusion criteria. Appendix B provides details of the 17 papers excluded based on the inclusion/exclusion criteria. Of the 19 remaining papers, four solely provided outlines of the tool's development and were therefore not subject to

quality assessment. A quality assessment was completed for the 15 remaining empirical papers.

Quality Assessment

A quality assessment was completed for comparison and evaluative purposes; however, it was decided that all papers would be included in the final review regardless of their quality. The main reason for taking this decision was that all of the tools identified for review were in their infancy in terms of development, resulting in a dearth of papers offering some attempt to evaluate the tools. Given the aforementioned challenges to empirical validation research in the area, it was not expected that all studies would meet high standards of quality assessment that similar reviews would normally necessitate. This is clearly a limitation of the current review, however it is imperative to offer a realistic picture of the current literature around the development and evaluation of the risk assessment tools, given that these risk assessment tools are already utilised in clinical and operational settings.

There are numerous quality assessment tools and checklists in existence, however these are largely specific to a particular study design (Centre for Reviews and Dissemination [CRD], 2008; Critical Appraisal Skills Programme [CASP], 2018). Given the diversity of the research questions and research designs within the current review, the Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018) was considered the most suitable approach to appraising the quality of included empirical studies and advantageous to using separate checklists for different study designs (See Appendix C). It is suggested that using tools or scales to produce a quality assessment score or rating is problematic and not recommended (CRD, 2008; Higgins & Green, 2011), a view

shared by the MMAT's authors. Instead of a quality assessment score, the categorical ratings of each criterion specific to the study are therefore discussed.

Data Extraction

Two predefined forms were used to extract data from each article. The first form was used for the 15 empirical papers (See Appendix D) and included information relating to the risk assessment tool that the study was evaluating, the studies aim, participants, analysis, results and key limitations. The second form offered a more general overview which included all the papers and provided information relating to the risk assessment tool more specifically, for example: the number of items and/or dimensions that the risk assessment consisted of; the target population; the mode of completion; purpose of the tool; attempts to evaluate its use; and comments on theory and item selection (See Appendix E).

Results

Overview of Risk Assessment Tools and Corresponding Studies Identified

The review identified four SPJ risk assessment tools: Extremist Risk Guidelines (ERG22+), Multi-level Guidelines (MLG), Violent Extremist Risk Assessment (VERA) and Terrorist Radicalization Assessment Protocol (TRAP-18). Fifteen studies were identified for review, all of which attempted to evaluate one of these tools. Table 3 provides an overview of the nineteen articles identified within the review, whether these were studies or overview papers and the risk assessment tool that they correspond to. Table 4 provides detail pertaining to the key characteristics of the six studies that were included in the review and comments on their quality and limitations based on the MMAT criteria.

Figure 2. *Flow Chart of the Search Strategy*

Number of hits when search terms were applied to databases using English language only and date range 2001-current filters		Articles identified through hand searching relevant journals:	
ASSIA	*n* = 618	Journal of Terrorism Research	*n = 0*
Web of Science	*n* = 409	Perspectives of Terrorism	*n = 1*
NCJRS	*n* = 840	Studies in Conflict and Terrorism	*n = 1*
PsycINFO	*n* = 1926	Journal of Threat Assessment & Management	*n = 8*
		Journal of Forensic Sciences	*n = 4*
		Legal and Criminological Psychology	*n = 1*

Articles identified through hand searching reference lists

n =11

Articles identified through expert contact

n = 4

Articles/ documents identified through Google Scholar *n* = 7

Total from initial screen *n*= 3,831

Articles removed after initial sifting due to irrelevance   *n* = 3,795

Of which duplicates removed   *n* = 17

Of which unobtainable/ not for use   *n* = 1

Full articles retrieved   *n* = 36

Articles removed after inclusion/ exclusion criteria applied   *n* =17

Articles excluded following quality assessment   *n* = 0

Final Articles   *n* = 19 (15 studies, 4 overview

It is worth noting that articles relating to the Identifying Vulnerable People ([IVP]; Cole, Alison, Cole & Alison, 2009) tool were identified during the review but were excluded given that the tool was not considered a risk assessment and was designed as a screening tool (J. Cole, personal communication, October 17, 2016). It is important to highlight that within a recently published extremism risk assessment directory, the IVP is "now conceived of as a Structured Professional Judgement tool" (Lloyd, 2019, p. 24). Nevertheless, the IVP was excluded from the current review given that it did not meet inclusion criteria. Additionally, the Islamic Radicalization (IR-46) framework was excluded from the current review given that the framework has not been published and therefore no external validation studies are available (Lloyd, 2019). For reference, the IR-46 was developed in 2016 by Psychologists working with the Dutch national Police and based on closed source terrorist causes, information from intelligence analysts and terrorism literature (Lloyd, 2019). This framework was designed for use in the pre-crime space by police intelligence in order to assess Islamist terrorism risk (RMA, 2021).

Table 4. *Overview of Identified Papers Relevant to Specific Assessment Tools*

Risk assessment tool	Title of paper	Authors	Year	Study or overview of tool
ERG22+	The development of structured guidelines for assessing risk in extremist offenders	Lloyd & Dean	2015	*Overview*- Outlines development of the ERG22+ and describes the tool.
	An examination of the structural properties of the Extremism Risk Guidelines (ERG22+): A structured formulation tool for extremist offenders	Powis et al.	2019a	*Study*- Construct validity and the structural properties of the ERG22+ are explored through factor analysis and multidimensional scaling (MDS).
	Inter-rater reliability of the Extremism Risk Guidelines 22+ (ERG22+)	Powis et al.	2019b	*Study*- Explored the research and field reliability of the ERG22+.
	A process evaluation of the Structured Risk Guidance for extremist offenders	Webster et al.	2017	*Study*- Qualitative study (process evaluation) of the pilot Structured Risk Guidance (SRG) for extremist offenders (previous version of ERG22+).
MLG	Risk assessment and management of group-based violence	Cook	2014	*Overview and Study*- Outlines development of MLG based on a systematic literature review. Study evaluates utility and reliability of the MLG based on two MLG training courses.
	A concurrent evaluation of threat assessment tools for the individual assessment of terrorism	Hart et al.	2017	*Study*- Evaluate the content of MLG through two studies. First study looking at interrater reliability of MLG and concurrent validity of MLG, VERA and HCR-20v3. Second looking at content overlap of MLG and VERA 2.
VERA	Applying the Violent Extremist Risk Assessment (VERA) to a sample of terrorist case studies	Beardsley & Beech	2013	*Study*- Process evaluation of the usefulness of the VERA and measure of interrater reliability.
	Risk Assessment Decisions for Violent Political Extremism 2009-02	Pressman	2009	*Overview*- Introduces VERA consultation version.
	Calibrating risk for violent political extremists and terrorists: The VERA 2 structured assessment	Pressman & Flockton	2012	*Overview*- Introduces second version of VERA.
TRAP-18	Islamist terrorists in Germany and their warning behaviours: A comparative assessment of attackers and other convicts using the TRAP-18	Böckler et al.	2021	*Study*- To explore the content validity of the TRAP-18.
	Application of the TRAP-18 framework to U.S and Western European lone actor terrorists	Brugh et al.	2020	*Study*- Examines feasibility and relevance of TRAP-18 framework on a sample of jihadism-inspired lone actor terrorists using open-source data.

Risk assessment tool	Title of paper	Authors	Year	Study or overview of tool
	Postdicting violence with sovereign citizen actors: An exploratory test of the TRAP-18	Challacombe & Lucas	2018	*Study*- To explore the effectiveness of the TRAP-18 in postdicting violence in a sample of American sovereign citizen members.
	Visualizing the relationship among indicators for lone actor terrorist attacks: Multidimensional scaling and the TRAP-18	Goodwill & Meloy	2019	*Study*- To demonstrate the validity of the TRAP-18 by comparing North American lone actor attackers and non-attackers using a Multidimensional scaling (MDS) analysis.
	TRAP-18 indicators validated through the forensic linguistic analysis of targeted violence manifestos	Kupper & Meloy	2021	*Study*- To examine the feasibility of coding the TRAP-18 using limited data – targeted violence manifestos completed by lone actors that planned or committed an attack.
	The operational development and empirical testing of the Terrorist Radicalization Assessment Protocol (TRAP-18)	Meloy	2018	*Overview*- Development of the TRAP-18 and outlines evaluation attempts to date.
	The Lone-Actor Terrorist and the TRAP-18	Meloy & Gill	2016	*Study*- Examines the criterion validity of TRAP-18.
	Time sequencing the TRAP-18 indicators	Meloy et al.	2021	*Study*- To investigate the temporal sequencing of lone actor terrorists to understand the pathway to acts of targeted violence.
	Some TRAP-18 indicators discriminate between terrorist attackers and other subjects of national security concern	Meloy et al.	2019	*Study*- To measure the construct validity of the TRAP-18 by applying the TRAP-18 to a sample of attackers and non-attackers.
	Investigating the individual terrorist in Europe	Meloy et al.	2015	*Study*- Examines the Interrater reliability of TRAP-18 and content validity.

Table 5. *Overview of Key Characteristics and Quality Assessment of the Tools*

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
Powis, Randhawa and Bishopp (2019a) **ERG22+**	To examine the construct validity and structural properties of the ERG22+.	The completed (initial) ERG22+ assessments of 171 individuals who had been convicted of Islamist extremism or an Islamist extremist-related offence in England and Wales were analysed.	Codings from each completed ERG22+ summary record sheet were entered into statistical software programmes. The twenty-two items and their scorings of either *strongly present*, *partly present* and *not present* were recorded for each case. Descriptive statistics were performed on items to look at the presence of factors across the sample. Construct validity was explored through exploratory factor analysis and multi-dimensional scaling analysis.	ERG22+ factors that were prevalent for the majority of the participants were: N*eed to redress injustice; need for identity, meaning and belonging; political and moral motivation; attitudes that justify offending*; and *access to networks, funding and equipment.* Risk factors that had the lowest prevalence were: *Need to dominate others; opportunistic involvement; mental health issues*; and *harmful end objectives. Criminal History* was rarely coded within the sample. Additional risk factors were identified in 17 of the participants, the most frequent of which were: *substance misuse* (n = 3), *family issues* (n = 3) and *physical disability* (n = 3). The study found that there was overlap between items that formed two of the ERG22+'s domains, *engagement* and *intent;* the results did not entirely support the current three-domain structure of the ERG22+. MDS analysis suggested a five-factor model to improve the construct validity of the tool, with the domains: *Motivation and Ideology; Identity and External Influence; Status and Personal Influence; Capability*; and *Criminality.* Some items within the ERG22+ may also benefit from redefining in order to support assessors: M*ental health, harmful means to an end* and *harmful end objectives.* Internal consistency of the ERG22+ was considered high (alpha of 0.80) although authors express caution	Initial screening criteria met. **Quantitative descriptive studies checklist**- relevant criteria received 'yes' rating indicating good quality. Limitations: -Focuses only on those participants identified as committing offences in support of Islamic extremism so cannot generalise to other ideological groups such as ERW. Acknowledge need for further research exploring different groups and ideologies. -Males and females were included in the study, although only a small number of females (n = 10). Items endorsed for males and females were not compared and it is possible that there are differences in motivations dependent on gender. Acknowledge the need to explore the use of the ERG22+ with female offenders. -Initial ERG22+ assessments (post-conviction) were used within the study for fair comparison, however it might be useful for future research to explore how information and coding's change over time, for example where more information becomes available, and after assessors have worked with

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
				with this given the high endorsement of certain items across cases that are non-specific, such as *ideology*. Engagement and intent domains found to have moderate internal consistency. Capability domain has low internal consistency (smallest domain with only three items). Internal consistency of proposed five-factor model ranged from high to low, with the authors concluding that some domains required further development.	the offenders for longer periods of time (more self-report data). -ERG22+ is used to assess a range of offences under the umbrella of extremist offence in England and Wales law. Participants in this study had engaged in a range of offences such as committing an act of terrorism (11%), preparatory acts (35%) and distributing terrorist material (7%). Further research would be beneficial to explore the validity of the ERG22+ across different offences (e.g., violent versus non-violent offences).
Powis, Randhawa-Horne, Elliott and Woodhams (2019b) **ERG22+**	To examine inter-rater reliability (IRR) of the ERG22+ in both research and field contexts.	*Research reliability:* Two experienced assessors independently rated 50 randomly selected cases who had previously been assessed using the ERG22+ (42 were convicted of Islamist extremism, 3 were ERW offenders, 2 were animal rights extremists and 3 were in support of other causes). Background information and case file information had been collated and provided with a blank	*Research reliability:* Casewise analysis comparing each assessor on each case – percentage agreement and a weighted Kappa. Disagreements weighted according to their squared distance from perfect agreement (due to item codes being ordinal in nature). Itemwise analysis compared each assessor on each item and scale – percentage agreement, weighted Kappa and two types of Intra-class coefficients (to estimate reliability of the single rater and measure the agreement between raters) outlined.	*Research reliability:* High levels of IRR were found between the two researchers at the casewise, itemwise and domain levels (ratings within the excellent range, weighted kappa scores between 0.81 and 1). Suggesting ERG22+ has high levels of research reliability and can produce reliable scores when used by experienced raters. *Field reliability:* Field reliability results were mixed. Overall IRR across both studies were 'moderate' to borderline 'good' but varied considerably between assessors. On average raters had higher overall percentage agreement and kappa scores against the gold standard scores for the Islamist extremist case study. May suggest this case study was easier to assess. Domains of engagement and capability varied from moderate to excellent, but the intent domain's	Initial screening criteria met. **Quantitative non-randomised studies checklist**- relevant criteria received 'yes' rating indicating good quality, however limitations are noted below. 3.4 coded as partial – limited discussion of potential confounders. Positively experience of rater was explored. Limitations: -Only 2 research experts used to test research reliability. -The use of only 2 case studies in the field reliability study. Authors acknowledge that case studies were designed to be challenging for the raters which may have impacted on the field IRR scores compared with the researchers who used real

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
		scoring sheet. All items and overall domain ratings were scored. *Field reliability:* 2 hypothetical test cases (an Islamist extremist and ERW case) were independently scored by 33 (out of 45 who were invited to take part in the study) clinicians who had previously completed ERG22+ training and compared against 'gold standard' ratings. Further analysis looked at comparisons of rater experience (experienced classed as those authoring 4 or more ERG22+ assessments and working with extremist offenders for at least 3 years).	*Field reliability:* Four forms of IRR statistics- simple percentage agreement at the itemwise level and across both cases. Weighted Kappa coefficient calculated for each item, each scale and each case to measure individual raters performance against the gold standard. Fleiss' kappa was calculated for each item, scale and overall to measure IRR across multiple raters. Two types of intra-class coefficients were also calculated to measure variance across raters (reliability of a single rater and agreement). *Experienced raters:* Split into two groups for analysis: experienced (n = 25) versus non-experienced (n = 8). Compared two groups versus the gold standard scoring and each other on both case studies.	reliability was considered poor. Three items (*harmful end objectives, over-identification with group, cause or ideology* and *harmful means to an end*) had low levels of agreement across raters. *Experienced versus inexperienced raters:* The experienced group performed significantly better versus the gold standard than the inexperienced group on the ERW case. There was no significant difference in performance between groups on the Islamist extremist case study. Authors suggest this may relate to having less exposure to ERW offenders in their everyday work and less knowledge around these offenders compared with Islamist extremist offenders. Further research suggested to explore whether ERG22+ is easier to use in some offender groups compared with others. *Overall:* Suggest that IRR could be improved with greater assessor training and better definition of terms to help with coding. Highlight importance of the expertise of the user being considered when judging the reliability of the tool.	ERG22+ cases (where background, interview and casefile information that remained and may have been written in a way that perhaps offer a clue to scoring – this is unclear without knowledge of how the information was structured). -Those invited to take part in the study had completed training on the ERG22+ between 2014 and 2016 (n= 45) – given that the ERG22+ has been in use since 2011 it is unclear why those trained prior to this date were not used; this may have made for a greater comparison of experience in terms of a greater number of ERG22+ assessments completed to classify as 'experienced'. -Limited discussion into potential confounds such as time spend on completing scoring (this may have differed between cases or across assessors). Future research may benefit from exploring field IRR using actual ERG22+ assessments as well as looking to compare IRR when assessments are completed as individuals or as a team of professionals (Multi-Disciplinary Team [MDT] working).

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
Webster et al., 2017 **ERG22+**	Process evaluation to examine the use, systems, and implementation of the pilot SRG for extremist offenders in prison and community settings. First version which later developed into ERG22+.	Scoping interviews: 4 strategic stakeholders from HMPPS (Her Majesty's Prison and Probation Service), academia and a strategic stakeholder within the probation service. Case study design – interviews with a sample of staff and offenders across geographical sites in prison and probation to explore their experiences of the SRG pilot study. 1) Staff- 15 staff across 4 sites (two high security prisons and two probation sites). Staff included strategic staff, lead assessors and co-assessors were interviewed and took part in group disucssuion as part of the evaluation. 2) Offenders- 3 males who had been assessed using the SRG from a fifth site (location not disclosed) were	Qualitative- Process evaluation framework set within a theory of change model. Depth interviews transcribed verbatim and analysed by NatCen researchers using the Framework case and theme-based approach (Richie & Lewis, 2003). This model is said to sit within thematic analysis or content analysis and "seeks to draw descriptive or explanatory conclusions clustered around themes" (Gale, Heath, Cameron, Rashid & Redwood, 2013, p. 2). The results were presented within a 'theory of change' model to help understand the delivery of the SRG and outcomes within the context of the pilot sites.	Underlying foundations supporting the SRG: -Pre-existing knowledge and the risk assessments already in place for extremist offenders -Capacity of staff to conduct the assessment -Nature and extent of pilot SRG training -The extent to which staff felt supported by key organisations -The environment within which the SRG was delivered. Process of delivery – referral, conducting assessments and partnership working: -SRG eligibility -The assessment -Model of collaborative working -Assessment items and supporting documents -Assessing risk of serious harm and reporting -Co-assessor model -Partnership working -Interface with existing risk management practices SRG perceived outcomes discussed in terms of: -Organisations- themes around robust risk assessment and resources -Staff – themes around procedural clarity and workload -Offenders – themes around improved relationships and imprisonment experience and willingness to engage. Recommendations: -Offender eligibility criteria – needs to be clear if relevant for extremists of different ideologies. The need to empirically assess if such a tool could be used to assess similar offenders e.g., gang crime, gun crime.	Initial screening criteria met. Qualitative studies checklist- All criteria received 'yes' rating indicating good quality. Limitations: -Generalisability of experiences and views – Small number of staff interviewed from 4 out of 7 pilot sites. Only a small number of offender interviews (authors note that they wanted to interview offenders across the different sites, but staff did not deem any suitable for interview). -Interviews took place in 2010 but study was only released by HMPPS in 2017. -A similar process may have been helpful for the ERG22+ roll out. Future research exploring staff's views of completing the ERG22+ and offender views on the process would offer useful insights about consistency in the processes and where improvements may need to be made.

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
		interviewed as part of the evaluation. Strategic workshop: Key strategic and operational staff involved in the pilot. Findings to be discussed and any pertinent points raised were included in the report.		-Assessor eligibility criteria – revisit which staff should be trained in SRG. Is there a need for more stringent criteria? -Training- Extend the training available to staff and how to improve training. -SRG profile- Need staff to prioritise SRG as a core feature of their work. Ensuring time ring-fenced to complete. More openness and less secrecy around SRG. -Revisions to estimate of time and resources taken to complete SRG -Review the items- Review whether some items can be collapsed to streamline the assessment where conceptual overlap occurred. Guidance needs to be appropriate for all offender groups that will be assessed using the tool. -Develop clear guidance for all stages of SRG- instructions on how to interpret the information gathered, collaborative nature and transparency in decisions made based on assessment. -Partnership working- Ensure all partners are engaged and understand aims and objectives of the framework.	
Cook, 2014 **MLG**	To evaluate the utility and reliability of the MLG though two MLG training courses for criminal justice and mental health professionals. First version of MLG.	46 criminal justice and mental health professionals from two training workshops (3 days) on the MLG. Recruited through threat assessment and mental health organisations, psychology-law graduate departments	Mixed methods: 1) Quantitative- pre- and post-training questionnaire comparisons (confidence, knowledge and competence of risk assessment for both violence in general and group-based violence [GBV]). 2) Interrater reliability- Completed 10 cases over the course of the training	1) Paired t-tests comparing attendees self-reported pre- and post-training scores on the questionnaires demonstrated significant improvements in attendees self-reported rating of confidence, knowledge, and competence of violence risk assessment and GBV. On average self-ratings of GBV risk assessment significantly increased ($p < .001$), with large effect sizes (d = -1.54 to -1.88). 2) Distribution, interrater reliability, and structural reliability of the MLG ratings ($N = 40$) examined.	Initial screening criteria met. **Mixed methods studies** checklist completed- 5.2 rated partial given the limited integration of the quantitative and qualitative components of the study in answering the research question. 5.3 partial as interpretations derived from integrating approaches could have been expanded upon. 5.4 partial given limited integration of

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
		and professional contacts of the authors doctoral thesis committee.	independently and then discussed each one in small groups (n = 4) and had to reach consensus ratings on MLG items. Intraclass Coefficient's (ICCs) calculated using a one-way random effects model, absolute agreement method. 3) Qualitative Analysis- Content analysis used to assess user feedback provided verbally within training and written in anonymous training questionnaires. 22 general comments, 23 verbatim quotations from course-end feedback session and 84 written comments analysed.	ICC's of a single rater (ICC_1) and ICC's of averaged (group) ratings (ICC_2) presented. Interrater reliabilities of individual risk items ranged from poor to excellent (single ratings, .13 to 1.00; averaged ratings, .38 to 1.00). ICC values for three items were not calculated due to insufficient variability in the ratings. Positively domains of MLG presented better ICC values: ICC's fair to excellent. Conclusory opinions: ICC's all good to excellent. Distributions (with exception of Individual domain 1 [violent behaviour]) good across possible ratings, meaning users can communicate low, moderate and high risk. Author's suggest interrater reliability consistent with other SPJ tools. Structural reliability: Suggest some support. Reliability fair to moderate at best, some support for the unique contribution of the factors in each domain identified. 3) 4 primary themes: *Process of applying the MLG* Subthemes- Need for explicit instruction, communication findings and practical applications. *Manual content* Subthemes- Additional instructions, items and typographical. *Training*	findings. 5.5 Partial given limitations below. Limitations: -Competence and knowledge of assessors is self-reported (self-report bias) this may not reflect their understanding or ability to use the MLG in the real world. -There is limited detail provided regarding the qualitative results, however themes and subthemes are stated. -Reliability analysis was based on assessors in training and therefore further analysis of more experienced assessors would be advantageous. Difficult based on results to say that the MLG is a reliable instrument based on these limited results. -Interrater reliability of individual risk item ratings ranged from poor to excellent – this may have been a consequence of the small sample size or low ICC's may be a function of the restricted range of the items. There are limited discussions about domain factors that had poor ICC values, why this might be, and potential changes to the items or MLG guidance for coding such items. -There was less discussion about the impact of the qualitative results, other than to say that there were no specific revisions made to the MLG

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				Subthemes- Format, enhanced didactics, and cases. *Global appraisals* Subthemes- Expressions of benefit and statements of future applications. Attendees provided valuable feedback for the development of the tool across a number of themes. No specific revisions to MLG made based on this feedback.	based on them. More detail would have been helpful around whether the results mirrored what was found in the quantitative analyses. - Not clear how verbal feedback was documented or recorded. Identify lack of method for collecting feedback in a group format e.g., focus group. - Relatively representative and varied staff sample. - Some participants had to miss an afternoon or day of the course although number who missed part of the course is not provided- this may have impacted their scores. - Limitations around evaluating the tool in a training setting vs. real setting and limitations with the range of cases used.
Hart et al., 2017 **MLG**	To evaluate the content of the MLG (Second Version) with two studies: Study 1: a) Interrater reliability of MLG risk ratings. b) Concurrent validity – MLG and HCR-20v3 risk ratings	Study 1: 5 open-source case studies of well-known terrorist's (diverse in terms of their nationality and extremist attitudes, role played and extent to which they operated alone) used in the Beardsley & Beech (2013) VERA study. Total of 4 graduate students coded these	Study 1: a) 5 cases assessed using MLG and HCR-20v3 by 2 trained evaluators for the MLG (second version) and 2 for the HCR-20v3. Sequencing effects minimised by each evaluator assessing cases in a different order. Evaluators were blind to each other's ratings. Afterwards, evaluators reviewed their ratings for each case and made a final set of join consensus ratings. The VERA had	Study 1: a) MLG interrater reliability between 2 trained raters. Summary risk ratings: Interrater reliability of future violence rating fell in the 'good' range. Serious physical harm and imminent violence ratings fell in the 'fair' range. -Presence ratings for MLG risk factors was in the 'excellent' range for 14 of 16 risk factors, 'good' range for one *(operating in an unstable context/ environment)*, and in the 'poor' range for one *(threatened by or in conflict with other groups)*; Average was in the 'excellent' range, Mdn ICC_1 = .95. -Total and domain scores all fell in the 'excellent' range.	Initial screening criteria met. Study 1 evaluated using **quantitative descriptive studies** criteria. Criteria 4.1 and 4.2 were given ratings of 'no' reflecting the sample used and problems with this, however it is acknowledged that this is related to the challenges of research in the area and difficulties with access and resources highlighted by the authors. Comments:

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	MLG and VERA ratings. Study 2: Conceptual analysis of the content overlap of the MLG and VERA 2.	cases using the MLG and HCR-20v3. Study 2: Not applicable.	already been coded in Beardsley & Beech's study (2 raters consensus). Analyses of interrater reliability was based on the independent ratings. ICC for single ratings (ICC_1), 2-way random effects model, absolute agreement method. Interpreted as: $<.39$ = poor, .40 to .59 = fair, .60 to .74 = good, and $\geq .75$ = excellent. b) Sample as above. MLG, VERA and HCR-20v3 item ratings converted into numbers (0 = low, 1 = moderate, 2 = high) and summed to create total and domain scores. MLG and HCR-20v3 summary risk ratings also converted into the same numerical scores. Concurrent validity based on consensus ratings. Indexed using Pearson product-moment correlations between risk ratings using MLG and those made using HCR-20v3 and VERA. Study 2: 3 researchers all familiar with VERA 2 and trained in MLG (second version), rated the content overlap risk factors on the two tools.	-Relevance ratings: 9 of 16 risk factors were in the 'excellent' range, 4 in the 'good' range and 3 in the 'poor' range. The average was classed as 'excellent', Mdn $ICC_1 = .80$. -Total and domain scores fell in the 'excellent' range apart from *Group-in-Society* domain, which fell in the 'fair' range. b) MLG versus HCR20v3: 7 of 9 correlations among summary risk ratings using both tools were large and significant and positive (would expect that anyone rated as high risk for future group-based violence on the MLG should be rated as high risk for future violence on HCR-20v3, however not necessarily true the other way around). Risk ratings: for both presence and relevance, MLG individual domain scores had positive correlations with HCR-20 v3 total and domain scores but ranges in magnitude from 'small' to 'large'. Other MLG domain's all had near-zero or negative correlations (expected as MLG individual domain were modelled after those in the HCR-20v3). None of the correlations were statistically significant. Authors suggest this may be due to restricted variability in individual domain ratings. MLG versus VERA: MLG individual scores had near-zero or negative correlations with the VERA *Contextual, Historical,* and *Protective* domain scores. Correlations with the *Attitude* and *Demographic* domains were positive and large. None were statistically significant. Only VERA *Contextual* domain scores had 'large', positive and statistically significant correlations with the MLG domain scores (with the exception of the	-Authors acknowledge change to research plan and limitations of using a small number of case studies (n = 5). -Case studies were all more serious cases with fatalities, meaning scoring variability was limited and may have contributed to non-significant correlations between MLG and HCR-20v3 domains. -No comments on any difficulties categorising any risk items which would have been helpful. Interrater reliability of the HCR-20v3 not calculated as there is extensive literature on this, however given that the HCR-20v3 is not validated for use with terrorist offenders it may have been helpful to explore firstly how challenging the case studies were to apply the HCR-20v3 to and secondly whether interrater reliability was affected. -Low ICC's and wide 95% CI values could be reflective of the lack of variability among the sample and the small sample size, which limits statistical precision. MMAT could not be applied to study 2 as this aspect was considered theoretical rather than an empirical study and did not fit any criteria of the MMAT. Comments:

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			Measured surface similarity independently (researcher A comparing MLG to VERA 2 items, researcher B comparing VERA 2 items to MLG items blindly. Consensus ratings then made between A and B. Researcher C then measured degree of overlap of each pair (0 = none, 1 = low, 2 = moderate, 3 = high).	*Individual* domain). Suggest that perhaps the content of the MLG and VERA domains is too diverse to support the formation of composite domain scores. Study 2: -Overall, there was at least low overlap among 80 pairs of risk factors out of a total of 496 possible pairs, or 16% of theoretical maximum. Overall overlap as indicated by numerical ratings was 167 out of a possible total of 496 x 3 = 1488, or 11% of the theoretical maximum. -Each of the VERA 2 risk factors had substantial overlap with one or more MLG risk factors and the overlap was consistent across VERA 2 domains. - The individual and individual-group domains of the MLG were found to overlap substantially with the VERA 2. In contrast the group and group-society domains of the MLG overlap very little with the VERA 2. -Suggest that most of what is measured by the VERA 2 risk factors is also measured by the MLG risk factors in the individual and individual-group domains, but what is measured by the MLG risk factors in the group and group-society domains is not measured by the VERA 2.	-No access to VERA 2, although researchers 'familiar' with the content. - Sheds light on the underlying concepts being examined by the different tools, which offers a useful comparison. -Highlights important differences between the tools. -Subjective measure. Unclear if author of the tool was involved in rating degree of overlap which may have introduced additional bias.
Beardsley & Beech (2013) **VERA**	To conduct a process evaluation of the usefulness of the VERA (in terms of how easily and effectively it can be applied) by applying the criteria to 5 case studies of	5 case studies of male terrorist offenders based on open-source data. Committed first extremist acts between 1968 and 1995. Lone actors, *n*=2 Fulfil position within terrorist group, *n*=3.	Open-source data from Google search engine organised around themes of background, terrorist activities and ideology. Evidence of VERA factors identified within each case and degree to which each factor was present was recorded (0, 1, or 2) and a total score for	Interrater reliability- Level of agreement between the two raters was 85.7%. Interrater reliability analyses performed for each terrorist using Cohen's Kappa revealed that every value of Kappa was 0.76 or greater (*p*< .001). High degree of consistency between the two raters. Attitude- Majority of attitude items were scored highly for all terrorists. Total scores were all high and fairly similar (Range 15-20).	Initial screening criteria met. **Quantitative Descriptive Studies** criteria measured. The study demonstrated poor quality based on the criteria receiving 3 'No' ratings and 2 'Can't tell'. Comments: -Data collected was limited in answering the research question,

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	historical terrorists. Determine whether VERA is more applicable to terrorists who work alone or who operate as part of a group.	Terrorist offence took place: US, *n*=2; Germany, *n*=1; Ireland, *n*=1; Japan, *n*=1.	each domain was provided for each case. Brief interpretation provided based on scores the cases obtained. No analysis of scores. Estimated demographic of age (as used within the VERA) provided by adding ten years onto the age each offender was arrested. Interrater reliability of two raters measured using Cohen's Kappa.	Context- Scoring of these items identified as more challenging, particularly use of websites (due to time periods of terrorists used in the study). Medium to high evidence of community support and direct contact with violent extremists identified in four cases. All cases scored medium to high ratings for anger at political decisions. Total contextual scores ranged from 2-8. Historical- Findings across historical items inconsistent. Range 1-10. Protective Factors- Inconsistent and some missing data. Total scores ranged from 0 to 7.5. Demographics- All were male and aged over 30. Three were unmarried, one was married and one's status was unknown. Factors considered equally applicable to individuals within the sample regardless of whether they worked alone or as part of a group. Concluded that majority of factors in the VERA seem to be relevant and important to risk assessment and could easily be applied across a variety of terrorists in the sample.	particularly regarding whether the VERA is more applicable to those working alone or those operating as part of a group. -Sample relevant to the target group however extremely limited, only 5 cases and chosen based on those where there was adequate information. Limited information about sample selection. -Impact on varied time span of cases on coding certain items, e.g., use of internet. More up-to-date case studies may have been helpful. -Study is not explicit enough in explaining what the VERA is intended to assess and how sample representative. -Study is solely looking at the tools ability to score known high risk individuals on risk factors yet says nothing about the VERA's ability to assign low risk scores to non-terrorist offenders.
Böckler et al. (2021) **TRAP-18**	To explore the content validity of the TRAP-18 using the following hypotheses: 1- Proximal rather than distal factors	80 individuals convicted for Islamist activities in Germany between 2006 and 2017. Identified through press releases issued by Federal Attorney General during the period.	The data set was independently rated by four scientists using the TRAP-18. These individuals were familiar with the tool and were blind to the assignment of cases to the individual groups (to reduce hindsight and observational bias).	TRAP-18 demonstrated excellent content validity on a German sample of 80 extremists. The TRAP-18 was capable of distinguishing between individuals who committed a violent Islamist act from those who had taken on a more supportive non-violent role.	Initial screening criteria met. **Quantitative non-randomised** studies checklist - relevant criteria received 'yes' rating indicating good quality. Limitations:

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	distinguish between Islamist attackers and non-attackers. 2- The indicators *pathway, identification* and *last resort* represent significant correlates for severe acts of violence and can distinguish between perpetrators and non-perpetrators. 3- Terrorist attackers and the control group will differ concerning the number of proximal factors present. 4- The TRAP-18 allows a distinction between terrorist attackers and non-attackers with high specificity and high sensitivity.	Access to files requested for 138 relevant individuals. Where files not obtained, a description was based on media/ official reports (at least two trustworthy sources). Final sample of 80 extremists (95% male, 5% female). Comparison between perpetrators of terrorist attacks (25%) compared to those convicted of propagandistic (8.8%), financial terrorist support (12.5%), Leaving country for Islamist motivation/ joining a terrorist organisation abroad (53.8%). Islamist violent extremist offenders included lone actors (35%) and those who were part of autonomous cells (65%) – given that TRAP-18 has been empirically studied on this sample.	Hypotheses 1-3 - Chi tests, *t*-tests for independent samples and ANOVAs were performed to test for significant differences between the groups. Post-hoc analyses were used to divide the sample into terrorist attackers and control group of non-violent offenders. Hypothesis 4 - Receiver Operating Characteristic (ROC) analysis performed and Area Under the Curve (AUC) was identified. ROC analysis performed based on number of factors present without weighting individual items for overall TRAP-18 and the warning behaviours separately. Extent to which TRAP-18 could correctly classify violent offenders as high-risk offenders was tested.	Significant differences between terrorist perpetrators and those convicted of nonviolent extremist offences were found – in the number of proximal warning behaviours present for terrorist perpetrators compared with non-violent offenders ($p = < .001$); the number of distal characteristics ($p = .006$) and total number of items on the TRAP-18 ($p = < .001$). Significant differences were found in proximal warning behaviours of *pathway, last resort, energy burst and novel aggression.* Theoretical assumptions of the TRAP-18 were empirically supported. Discriminant validity demonstrated. ROC analyses demonstrate specificity and sensitivity of the TRAP-18. AUC values ranged from .83 to .90 (for TRAP-18 and the warning behaviour typology as weighted and unweighted models). Risk scores allowed for a high degree of differentiation between the violent and non-violent groups. Performance was enhanced by an empirically based weighting of factors (*pathway, last resort, energy burst and novel aggression*). Values for sensitivity based on weighted scores (.80), specificity (.93), positive predictive value (.80) and negative predictive value (.93) are all promising.	-Small sample of violent offenders (20) -Study doesn't clearly explain why out of 138 relevant individuals, only 80 were used in the final sample. -large differences in amount of information available case to case. -Those who left country for Islamist motivation classed in non-violent group which may be problematic given that there is the potential that they engaged in acts of violence abroad. -Interrater reliability not completed given that it has been previously demonstrated for the TRAP-18. Authors noted difficulties from discussions with researchers around whether an item is coded as 'no' or missing data, but items in such a case were coded as no. -Confirmatory bias could not be fully excluded in the study. Authors acknowledge that the research team were not entirely impartial. -Authors identify the needs for a similar study concerning extreme right-wing samples in Germany to compliment other TRAP-18 studies as cannot generalise based on these findings.

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Brugh et al. (2020) **TRAP-18**	Report feasibility of using the TRAP-18 with open-source data. Report the distribution of ratings ('present', 'absent' and 'unknown') across items. Compare presence of TRAP-18 items and priority recommendations between lone actor samples from the US and Europe.	77 Jihadism-inspired lone actor terrorists (*US = 35; European = 38*) compiled through screening of the Western Jihadism Project database. Database compiled from publicly available information. Authors used definition of lone actor terrorists that excluded participants who received extensive support from others in their planning or were not self-directed.	Descriptive statistics and measures of central tendency for TRAP-18 item ratings overall as well as across warning behaviours and distal characteristics. Examined prevalence (frequency and percentage) of unknown ratings for each item on the TRAP-18 in their coding sample. Compared prevalence and distribution of 'present', 'absent' and 'unknown' ratings per item using chi-square tests. Pairwise comparisons of average number of items rated as present. Chi-squared analysis of prevalence of items between US and European sample.	US and European samples differed in meaningful ways (ethnicity, legality of residence, profession, conversion to Islam and criminal behaviour). *Feasibility:* Number of unknown items per case ranged from one item (5.6%) to 16 items (88.9%) out of the total 18 items. On average half of the items could not be rated for a given lone actor in the sample. 12 items were significantly more likely to be coded as 'unknown' compared to present or absent ratings. These items related to the lone actor's mental state, previous violence, interpersonal relationships, and communications. No cases where every item coded as 'unknown'. On average nine TRAP-18 items were rated as 'unknown' per case (half the items within the framework). *Fixation, directly communicated threat,* and *failure to affiliate* were coded as unknown 80% of the time. Warning behaviours more challenging to code based on publicly available information than distal characteristics. Discuss some of the challenges to completing the TRAP-18 based on public information. *Characteristics of TRAP-18:* Within the sample, three items relating to ideological motivation and two items related to planning and perpetration were more readily coded based on publicly available information. Findings support previous research that	Initial screening criteria met. **Quantitative descriptive studies** checklist- relevant criteria received 'yes' rating indicating good quality. Limitations: -Dataset uses publicly available information restricted to English language, therefore some relevant documents may have been missed e.g., interview transcripts. Authors sought reliable translations where possible and considered multiple sources. -Data may have been limited in cases where actors had not successfully carried out attacks compared to those who had caused injuries/ death due to media/ trial reporting of information. -Suggest future research should test feasibility and utility of TRAP-18 when completed by evaluators as part of their routine practice. -Sample size comparable to other studies, but small (reality of the phenomenon). -Sample only jihadist-inspired lone actors from the west and therefore results may not be generalisable to other lone actor populations or other terrorist types. Argue that it is

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				mental illness is more prevalent amongst lone actors than group-based terrorists, although there was a high prevalence of unknown ratings for mental illness.

On average, more items were rated as present (38.9%) than absent (11.1%) per case suggesting items' relevance to lone actor terrorists overall. Authors do highlight concerns about applicability of items across lone actors overall given that the range of present codes started at 1 item, with less than half of items rated as present on average.

The distal characteristics of *personal grievance and moral outrage* and *framed by an ideology* were significantly more likely to be rated as present than absent or unknown within the sample. *Creativity and Innovation* significantly more likely to be rated as absent (93.5% cases), suggesting it may not have utility in determining who will and will not attempt lone actor terrorism. *Dependence on the Virtual Community* did not appear relevant to the sample as item was as equally likely to be rated as present, absent or unknown across the cases.

Most lone actors in the sample (there were three false negatives) were recommended for active monitoring, active risk management or both (TRAP-18 priority recommendations). Two warning behaviours (*pathway* and *identification*) were coded as present over 80% of the time meaning the majority of the sample were recommended for active risk management.

Known Groups Comparison*: Fixation, Energy Burst, Leakage,* and *Dependence on the Virtual Community* more commonly present (and potentially relevant) in US lone actors than European. Hypothesise that this | crucial to complete research within ideological groups given previous research identifying differences in prevalence of TRAP-18 items across ideologies. |

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				difference may be due to the use of sting operations in US which may increase availability of information pertaining to the planning and preparation. Also differences in societal level of drivers of lone actor terrorism between US and Europe.

TRAP-18 items show some promise but overall, the TRAP-18 may lack feasibility for identifying jihadism-inspired lone actors using publicly available information alone; this was particularly the case for European actors. | |
| **Challacombe and Lucas (2018)**

TRAP-18 | To explore whether the TRAP-18 is an effective tool in postdicting violence in a sample of American sovereign citizen members.

To apply the TRAP-18 to groups of individuals who did not resort to violent behaviour. | 58 US based individuals or groups associated with the sovereign citizen movement (domestic terrorists).

Of these, 30 individuals or groups planned or committed violent/ dangerous acts; 28 individuals committed non-violent acts).

Convenience/ non-random sample.

Incidents occurring between 2004 and 2014 from systematic searches on LexisNexus, Global Terrorism Database (GTD), press releases | Discrete chi-square tests for independence on each individual item within the TRAP-18 to explore relationship with the dependent variable (whether the incidence involved violence).

Binary logistic regression analysis was performed to assess the impact of the independent variable (score of the TRAP-18 across all items) on whether the incident contained violence.

Interrater reliability was calculated for the two coders who independently evaluated the whole sample using the TRAP-18 codebook against information from the systematic searches. TRAP-18 items were coded as 'absent', | Interrater reliability: Average Cohen's kappa was 'good' for proximal warning behaviours (k = .687), 'excellent' for distal characteristics (k = .812) and 'excellent' for the entire TRAP-18 indicators (k = .757).

Results support the **criterion validity** of the TRAP-18. The TRAP-18 was able to successfully postdict violent behaviour within the sample.

Mean scores of summed 'present' variables was low for the overall sample (4.90), and for violent (7.17) and non-violent samples (2.46); standardised mean difference (Cohen's *d*) between violent and non-violence samples was 1.70.

Six proximal warning behaviours significantly postdicted violence in the sample: *pathway, identification, leakage, and last resort* were positively related to violence; *novel aggression* and *energy burst* were negatively related to violence. *Last resort* had the strongest effect size: X^2 (1, N = 58) = 27.76, *p* = .000, phi = .70. | Initial screening criteria met.

Quantitative non-randomised studies checklist- relevant criteria received 'yes' rating indicating good quality. Only partial rating related to completeness of data as identified in the limitations.

Limitations:
-Authors cite the main limitation as the lack of information; this likely impacted the number of 'present' coding's. With greater access to sensitive information results could suggest something completely different.
-Further research needed to focus on the TRAP-18's use with other types of domestic terrorism. |

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		and the Southern Poverty Law Centre.	'present' or 'unknown'. Rater 2's coding's were utilised for the analysis.	Four distal variables significantly postdicted violence in the sample: *personal grievance, framed by an ideology, greater creativity, and criminal violence* were all positively related to violent incidents. Personal grievance and criminal violence were the strongest characteristics X^2 (1, N = 58) = 14.95, *p* = .001, phi = .51; X^2 (1, N = 58) = 16.83, *p* = .000, phi = .54. Binary logistic regression assessed the impact of full TRAP-18 score on likelihood of violence occurring within the sampled incidents; the full model was statistically significant, X^2 (1, N = 58) = 33.88, *p* < .000. Suggesting the model was able to distinguish between the violent and non-violent sample. The model as a whole explained between 44.2% and 59% of the variance in the presence of violence and correctly classified 75.9% of cases. Within the current sample those with a higher TRAP-18 score were over two times more likely to be involved in a violent incident (odds ratio of 2.10). Variance in the results compared with other studies may indicate differences between domestic terrorists and traditional international terrorists. E.g., significant absence of *directly communicated threat* perhaps indicating increased impulsivity in the domestic terrorists' actions. *Virtual communities* was less prominent in the sample, suggesting that online communication might be utilised less in this population or alternatively that law enforcement may not have revealed such information.	

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Goodwill and Meloy (2019) **TRAP-18**	To demonstrate the validity of the TRAP-18 by comparing North American lone actor attackers and non-attackers using a Multidimensional scaling (MDS) analysis.	North American lone actor terrorist attackers (n = 33) and non-attackers (n = 23). Previously analysed sample from Meloy et al., 2019. Lone actors group had committed a politically motivated lethal or near-lethal attack against non-combatants between 1993 and 2015 (16 extreme right-wing, 8 single issue and 9 jihadist attackers). One case both subjects were members of the same autonomous cell. Three other cases the subjects were one member of a two-member cell. Non-random convenience sample. Attackers selected from the GTD and those known to authors, as well as new cases which occurred during the course of this study (2014-2018). Included where there was sufficient open-source	TRAP-18 indicators coded by individuals who were trained on the instrument by the second author. Coded by two individuals and consensus reached. For many cases primary source maternal was located through internet searches and included criminal investigative reports and trial transcripts etc. MDS – a multivariate statistical approach. Centroid analysis – method for exploring the case-specific level of MDS results. The location on the MDS plot is an aggregation of each offender's offence behaviours.	Results provide empirical support for the validity of the theoretical model of the TRAP-18. Most proximal warning behaviours cluster among the attackers and most are absent among the non-attackers. Distal characteristics were present across both groups. MDS: Similarity matrix using TRAP-18 indicators for all subjects was produced using Jaccard measure of association and entered into an ordinal Proxscal MDS analysis using SPSS statistics package. A two-dimensional scatterplot of variable associations was produced. Kruskal's stress function - Stress value reported as 0.0983, which represents a 'good' fit of the data (S-Stress value of 1.69%, near perfect fit). Relationships between the TRAP-18 indicators and the attacking and non-attacking individuals are visually displayed – This generally supports the theory that proximal warning behaviour tend to co-occur and are different from most of the distal characteristics, which generally co-occur less frequently with one another. Centroid analysis: Centroid value for each subject based on x, y coordinates of the TRAP-18 indicators from the MDS analysis (computed by taking the average x, y coordinate of all TRAP-18 indicators *present* for that subject). The location of each centroid is plotted on the MDS variable plot and presented within the paper. Suggests that co-occurrence among attackers and proximal warning behaviours is strong - Attackers clustered together closest to six of the proximal warning behaviours (*leakage, fixation, identification, pathway, energy burst and last resort*). *Novel aggression* and *directly communicated threats*	Initial screening criteria met. **Quantitative non-randomised studies checklist**- majority of relevant criteria received 'yes', two items coded as partial (3.1 and 3.4), noted within limitation below. Study is however exploratory analysis. Limitations: -Due to retrospective nature of data collection, the time when an indicator may have presented itself in the individual's progression was not available to the coders, therefore the sequence of indicators could not be analysed. -Further analysis would be beneficial to rule out data gathering bias and hindsight bias- double coding was however used and interrater agreement (although interrater reliability not documented). -Ecological validity – more attackers than non-attackers in the sample which does not reflect the real world. Authors also highlight that if attackers had been appropriately risk managed, they may not have gone on to attack and similarly non-attackers may have gone on to attack if not risk managed; highlights need for threat assessors to focus on behaviours in the present rather than distant and

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		data available to code the TRAP-18 variables as 'present' or 'absent'. All male with average age of 39 (range 15-88). Non-attack individuals were collated from caseloads of two major metropolitan law enforcement and mental health agencies (Canada and US). All males apart from 1 female, average age 27 (range 15-58). The groups were not matched on any dependent variables.		were remotely located on the MDS suggesting low frequency. Distal characteristics of *personal grievance and moral outrage, framed by ideology*, and *changes in thinking and emotion* were found to cluster with proximal warning behaviours and the attackers; suggests a stronger co-occurrence of these three distal characteristics in attackers compared with non-attackers and that these three distal characteristics may have special significance. Authors discuss theoretical and research-based potential reasons for these results. Comparative analyses: -The total number of TRAP-18 indicators present between attackers and non-attackers were not significantly different. -Number of proximal warning behaviours were significantly different between attackers and non-attackers [$t(54) = -2.430$, $p < 0.05$]; The number of proximal warning behaviours being higher in the attacker group. Number of distal characteristics between groups was not significantly different. -Centroid differences, in terms of distribution of case profiles, between attackers and non-attackers were significantly different. Attackers were more likely to have centroids that were negative in the x-dimension (further left on the MDS plot) than non-attackers [$t(54) = 5.96$, $p < 0.001$]. Non-attackers were more likely to have centroids that were positive in the y-dimension (further towards the top of the MDS plot) than attackers [$t(54) = 3.38$, $p < 0.01$].	static variables. Moreover, potential confounds in terms of the country of origin of samples noted (attackers were mostly US cases). -Cases were only included if there was sufficient data to code all if the TRAP-18 indicators – no consideration to why certain cases may have more information than others and the potential impact of this on results obtained. -Authors acknowledge that further research could use time sequencing analysis to determine the temporal proximity of these distal characteristics to proximal warning behaviours. Moreover, further research is needed to explore whether the three significant distal characteristics would be more suited to belonging with the proximal waring behaviours.

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
Krupper and Meloy (2021) **TRAP-18**	To examine the feasibility of coding the TRAP-18 using limited data – targeted violence manifestos completed by lone actors that planned or committed an attack.	Data identified through systematic research from a database which offers a comprehensive repository of information on United States mass shootings, studying academic literature and open-source data. Subjects included met criteria based on the attack been planned with a specific target in mind and designed to be witnessed by the public; the offender acting alone with no affiliation; and the incident motivated primarily by personal grievances and/ or violence justifying ideologies (excluded gang, organised, domestic or state-sponsored incidents). 30 lone actor attacks in one or multiple incidents across North America, Europe or Oceania between 1974 and 2021. 97% of attacks has been executed, one plot was	Applied forensic linguistic and threat assessment techniques to the content of manifestos. A conceptual content analysis was conducted to determine the existence of the TRAP-18 indicators in the violence manifestos. Descriptive and inferential statistics applied to the data. Significant differences between groups measured using Chi-Squared test, Fisher's exact test.	17 out of 18 TRAP-18 indicators were able to be quantified from the sample of manifestos. 100% of proximal warning behaviours and 90% of distal characteristics were detected within the sample of manifestos. Authors highlight that this provides support for the external validity of the TRAP-18 indicators. Feasibility of coding the TRAP-18 indicators from limited linguistic data is demonstrated. Criminal violence was the only indicator not identified in any of the manifestos; mental disorder was only coded in 10% of manifestos – possibly as the perpetrators would not discuss criminality within their manifestos as to not portray themselves in a bad light and mental disorder is hard to identify from such thin sliced data. The most prevalent indicators were *leakage* (100%) – given that the manifesto counted as leakage, *identification* (93%), *fixation* (90%), *last resort* (87%) and *framed by an ideology* (83%) – this finding was consistent with other studies on the TRAP-18. Every manifesto had at least two proximal warning behaviours, meaning that such individuals would be recommended for active risk management under the TRAP-18 guidance. **Written versus spoken communication comparisons:** Only significant difference was found between written and spoken *pathway* warning behaviour (100% of spoken manifestos include pathway indicators such as planning and preparing for the attack, compared to 46% of written documents). **Ideologically motivated versus grievance based:**	Initial screening criteria met. **Mixed methods studies checklist-** relevant criteria received 'yes' rating indicating good quality. Partial rating for 5.5 due to limitations around interrater reliability for coding. Limitations: -Hindsight bias – retrospective data. -No comparison group – discriminate or predictive validity of findings could not be tested. -Relatively small sample of 30 lone actor manifestos. For motivational comparisons groups were therefore very small. -Open-source data – potential problems with completeness or fabrication of information raised – multiple sources used to confirm contents. -Interrater reliability was not coded as only the first author coded the indicators in the manifestos given that the second author developed the TRAP-18 – subjectivity of coding, potential for confirmation bias and hindsight bias – authors attempted to minimise this though careful discussion and consensus on decisions made. -Certain exclusion criteria of study meant that some cases were excluded, particularly where the

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
		prevented by law enforcement before it was carried out. Prior to carrying out attacks, all had communicated their intent to do harm to a third party - divided into written (n= 24) and spoken (n= 6) manifestos and subject to certain criteria. Group comparisons between ideologically motivated and grievance-fuelled attacks; written versus spoken communication; and motivations for attacks (race/ ethnicity, anti-government, involuntary celibates, jihadism, idiosyncratic, misanthropy, other).		Significant differences in distal characteristics: 100% of ideologically based attacks were *framed by an ideology* compared to 38% of grievance fuelled attacks; 55% of ideologically based attacks mention *dependence on virtual community* compared to 0% of grievance fuelled attacks; 100% of grievance fuelled attacks report *failure to affiliate* in comparison to 23% of ideologically motivated. **Motivations for attacks:** *Pathway* indicators most noted in attacks motivated by jihadism (75%), misanthropy (75%) and involuntary celibates (67%). Least likely to display *last resort* behaviours are jihadists (25%). Only *threat directly communicated to target* was noted in the anti-government group (33%). *Failure of sexual pair-bonding* was 100% for involuntary celibates. *Mental disorder* is prominent in race/ ethnicity (25%) and other (20%) groups but likely underestimated due to type of data. Thematic similarities from the manifesto content across the sample were noted: -Explicit hatred toward specific target or group (97%) -Encouraging like-minded individuals to commit similar attacks (37%) -Discussion of their preferred outcome of attack e.g., death, capture or suicide (47%) -Allude to conspiracy theories (33%) -Predict reaction from media and public (30%). Overall findings suggest that the TRAP-18 is useful regardless of the mode of communication of manifesto (written or spoken), type of attack (ideologically motivated vs grievance fuelled), and primary motivation (race/ ethnicity, jihadism etc).	subject may have appeared mentally disturbed; including participants displaying signs of mental health symptoms from their writing style may have led to different findings. Given that mental health disorders are more prevalent in lone actors, this may have provided useful information for threat assessors.

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
				Authors suggest that integrating forensic linguistic analysis to manifestos or other forms of communications may assist threat assessors in detecting warning behaviours or intent of violence.	
Meloy & Gill (2016)	Explore **criterion validity** of TRAP-18 in a known-outcome study.	Applied TRAP-18 to existing dataset of 111 lone-actor terrorists from the USA and Europe who engaged in, or planned to engage in, acts of lone actor terrorism and were convicted for their actions or died during the commission of their offences. Open-source data - Identified through the academic literature, LexisNexis, and the Global Terrorism Database. All lone actors engaged in acts between 1990 and 2014.	Selected questions which addressed the 18 behavioural patterns in the TRAP-18 from a previously created codebook. Challenges to this as TRAP-18 indicators emphasise underlying motivation but coding emphasised behaviours; led to necessity of judgement and exploration; researchers conferred on choice of codebook variables. Explored prevalence of each indicator across the 111 lone-actor terrorists (frequencies where data known). Divided subjects into three different ideological groups (radical Islamic, extreme right-wing, and single-issue), and compared the frequencies of the TRAP-18 indicators across the three groups. Final analysis compared successful versus thwarted attackers across the TRAP-18 indicators.	70% of the 111 lone actors demonstrated at least half of the TRAP-18 indicators. -70% or more evidenced 4 proximal warning behaviours: *pathway, fixation, identification, and leakage.* -70% or more evidenced 4 distal characteristics: *personal grievance and moral outrage, framed by an ideology, changes in thinking and emotion,* and *failure of sexual bond pairing.* 4 out of 10 had a mental disorder. No significant differences across ideologies in terms of prevalence of indicators. Those who successfully carried out an attack were significantly more likely to display the following indicators: *failure of sexual-intimate pair bonding* ($p= .002$, $\varphi = .293$), *creativity and innovation* ($p= .045$, $\varphi = .190$), and *fixation warning behaviour* ($p= .32$, $\varphi = .204$). Those who were thwarted in their plans significantly more likely to display *dependence on the virtual community* ($p< .001$, $\varphi = .317$) and *pathway warning behaviour* ($p= .005$, $\varphi = .264$). All effect sizes were small to medium. *Virtual community* dependence- largest effect size-change in social media use over time not accounted for in the analysis- this awaits further study. Study supports the general usefulness of the TRAP-18 regardless of ideology of the individual. Some advancement of **construct validity** of the TRAP-18 (important within-group comparisons).	Initial screening criteria met. **Quantitative non-randomised studies checklist-** 3.1 and 3.4 partial rating- Given authors suggestion of a more appropriate comparison group. Some potential confounders not discussed within the research e.g., temporal, demographics of cases, US versus Europe. Comments: -Large sample, considered representative of the target population of the TRAP-18. -Data was open-source and retrospective; authors acknowledge that hindsight bias and observational bias had the potential to affect results. - Judgement needed to determine clusters of behaviours from codebook that fitted with each TRAP indicator. Authors identify that this increased subjectivity of the task. Addressed by researchers conferring on choice of codebook variables for each TRAP-18 indicator. - Instead of comparison of successful vs thwarted terrorists,

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
			Comparative analyses utilised non-parametric statistics to determine significance (Chi-Square) and phi coefficients to determine effect sizes.		authors identify that a better measure of postdictive validity would be compare the entire sample to other subjects of concern who upon investigation had no intent to attack (comparison group); none available at the time.
Meloy et al. (2021) **TRAP-18**	To investigate the temporal sequencing of lone actor terrorists to understand the pathway to acts of targeted violence.	An existing dataset of 125 lone actor terrorists spanning different ideologies (Corner et al., 2019). Data set was updated to account for new cases and removed cases that were not deemed as completely lone (dyads and those with command-and-control links). Behavioural indicators had already been formed into sequences of behaviours (first to last). Behavioural indicators were mapped onto the TRAP-18 indicators.	Time sequence analysis – Proximity coefficients used to perform quantitative behavioural sequencing (this describes closeness of two indicators in a sequence). State transition diagrams used to visually represent proximity coefficients. Arrow is shown between two nodes (indicators) when they occur next to each other in the behavioural sequence.	Overall, the sequencing within the state transition diagram supported the theoretical model of the TRAP-18 (distal characteristics preceding proximal warning behaviours and warning behaviours preceding an attack). Suggest that the present study further validates the theoretical model of the TRAP-18. One exception to this was *fixation* (proximal warning behaviour) which preceded *changes in thinking and emotion* (distal characteristic). Authors note that this may be due to both relating to cognitive changes that may develop in tandem. *Fixation* and *ideology* preceded one another relatively equally, suggesting ideological framing could cause a fixation but also ideological framing could result from fixation. Overall sample showed that *failure to affiliate with an extremist group or other group* and *criminal violence* did not have any antecedent indicators and occur first in the sequence. These two indicators preceded *mental disorder* and *framed by an ideology*. *Pathway, leakage, direct threat, last resort, identification* occur last in the sequence – *attack* being the final outcome.	Initial screening criteria met. Quantitative descriptive studies checklist- relevant criteria received 'yes' rating indicating good quality. Limitations: -Open-source data and associated potential problems with bias, unreliable and incomplete. Authors addressed as best as possible through three independent coders meeting consensus, robust data collection methods and use of multiple indicators to code TRAP-18 items. -Subjectivity - Initial dataset focused on behaviours whereas TRAP-18 focuses on underlying motivation. Authors acknowledge this meant judgment was used by researchers to identify clusters of behaviours from the codebook that aligned with TRAP-18 indicators. Authors conferred on choice of codebook variables using their expertise of the tool to select appropriate codebook variables.

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
				Potential feedback loops between *failure of sexually intimate pair bonding* and *mental illness; personal grievance* and *moral outrage* to *mental disorder; and fixation* to *framed by an ideology.* Suggest that the state transition diagram should be used in individual case analyses as it can help forecast which indicator will be likely to occur next if the individual continues to move towards an attack. Authors posited that certain indicators could be viewed as critical points for intervention (gatekeeper indicators and turning point events). However noted some instances (low occurrence) of direct routes from distal characteristics to pathway, highlighting the importance of monitoring in cases where there is the presence of distal characteristics. Results show a number of pathways that can lead to the outcome of 'attack'. Any one indicator could also lead to a variety of outcomes not shown in the diagram, for example protective indicators. Authors caution at each case being based on unique characteristics known and unknown to the threat assessor.	-Limitation of time sequence analysis – state transition diagrams do not provide information on the temporal length of each indicator. Authors acknowledge that due to cut-off's of criteria (contingency threshold and proximity coefficient filter rules) only the most robust relationships are captured across individual sequences. -Time sequence analysis is measuring temporal relationships and does not measure cause and effect, therefore does not account for mediating variables that have not been measured.
Meloy et al. (2019) **TRAP-18**	To apply the TRAP-18 to a sample of attackers and non-attackers to compare presence of proximal warning behaviours and distal characteristics	North American lone actor terrorist attackers (n = 33) and non-attackers (those deemed at risk by counterterrorism investigators but who did not mount an attack [n = 23]). Previously analysed sample from	Retrospective comparative study of two samples of convenience using the TRAP-18. Descriptive data was computed. Inferential statistical analysis – Chi square significant testing and phi coefficients to	The findings in terms of configuration of proximal warning behaviours and distal characteristics for the two groups (attackers versus non-attackers) quantitatively supports the proposed theoretical model and construct validity of the TRAP-18. Half the TRAP-18 indicators were found to be significantly different between the attacker group and the non-attacker group with medium to large effect sizes (Φ = .35-.70).	Initial screening criteria met. **Quantitative non-randomised studies checklist**- 'Yes' given for 3.2 and 3.5. 'Partial' score given for 3.1 limitations around representative sample; 3.3 – cases were only included if information was available to code all TRAP-18 items; 3.4 – confounds not

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
	between the groups. To measure the **construct validity** of the TRAP-18. Null hypothesis was that there would be no significant differences on any of the TRAP-18 indicators between the attack group and the non-attack group.	Goodwill & Meloy (2019) as above.	determine effect sizes - comparisons of frequencies of each indicator within each group. Odds ratios and confidence intervals calculated where statistically possible.	Proximal warning behaviours *pathway* (80% vs 20%, Φ = 0.70), *identification* (65% vs 35%, Φ = .35), *energy burst* (74% vs 26%, Φ = .48), *and last resort* (79% vs 21%, Φ = .57), were significantly more frequent in the attackers group. *Directly communicated threat* was significantly less frequent in the attacker group (18% vs 82%, Φ = - .46). Each proximal warning behaviour was present in the majority of attackers (apart from *novel communication* and *directly communicated threa*t); each attacker having at least one proximal warning behaviour. In the non-attackers two proximal warning behaviours occurred in the majority of subjects (*novel aggression [64%]* and *directly communicated threat 82%]*). Distal characteristics of *ideological framing* (100% vs 62%, Φ = .52), *changes in thinking and emotion* (100% vs 80%, Φ = .35), and *creativity and innovation* (53% vs 15%, Φ = .38) were significantly more frequent among attackers. *Mental disorder* (48% vs 94%, Φ = -.46) was significantly less frequent in the attackers. Each distal characteristic was present in the majority of attackers (apart from *failure to affiliate with an extremist or other group, mental disorder* and *history of criminal violence*). Most of the distal characteristics were present in the majority of non-attackers apart from *failure to affiliate* and *greater creativity and innovation.*	accounted for in design and analysis discussed below. Limitations: -Retrospective design so no inferences can be made around predictive validity. -Non-random samples, small in size (see Goodwill & Meloy, 2019 limitations) – generalisability/ representation bias. -Groups not matched. There were significant differences across some demographic variables and time frames used for the study – potential confounding variables. -Cases were only included if all items on TRAP-18 could be coded – is there something different about such cases compared to those where information was missing? -Possible time cohort effects (23-year range of attack incidents) – challenge in terrorism research given the low incidents of attacks. -No interrater reliability check-consensus was instead reached among coders who were no blind to the group assignments (potential researcher bias e.g., hindsight bias, confirmatory). -Data was not available to compare any differences in the non-attackers group between those who were successfully risk managed and those who had no intent to begin

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					with – this may have had some bearing on findings.
Meloy et al., 2015	To test the **inter-rater reliability** and **content validity** of TRAP-18 with a small sample of individual terrorists In Europe.	19 cases involving 22 individuals who carried out acts of terrorism in Europe between 1980 and 2015. Those selected did not belong to an organised terrorist group or network and had to be directly involved in the attacks. 7 of these individuals were members of 3 autonomous cells. 1 female offender included. Information gathered from online sources (newspaper archives, literature on "lone wolf" terrorism and internet search engines. Cases included where individual considered to have lethal intent and terrorist actually committed their act.	Applied Binary coding (present or absent) - notification if insufficient information. Inter-rater reliability (Cohen's kappa) calculated for warning behaviours and distal characteristics for whole sample ($n = 22$ subjects: 396 coding's). Inferential statistics testing for significance between individual terrorists and autonomous cells.	Average inter-rater reliability (two raters) was 0.90, ranged from 'good' to 'excellent' across all variables. Content validity was suggested: -Majority of individuals who acted alone were positive on 72% of the variables, and majority of individuals who acted in autonomous cells were positive on 72% of the variables. -Found that most prominent characteristics, appearing in virtually all individual terrorists were *personal grievance and moral outrage*, *framed by an ideology*, and *changes to thinking and emotion.* -No significant frequency differences between any of the variables when terrorists who acted alone were compared to those in autonomous cells, other than a history of *criminal violence* among the latter ($p = .005$, $\varphi = .70$, Fisher's exact test.). Conclusions: -Findings contribute to ecological validity of the instrument. -Appears to have promise as an investigative template and supports recommendations for further development of a SPJ instrument for individual terrorism. Suggest TRAP-18 is used in conjunction with other assessment tools e.g., MLG and VERA.	Initial screening criteria met. **Quantitative non-randomised studies checklist**- 3.1, 3.4, 3.5 - partial given small sample size for comparison, possible confounding variables not accounted for in study and potential for researcher bias in coding variables. Comments: -Sample chosen on basis of availability of open-source data and small sample acknowledged. -Potential confounding variables- such as temporal factors and cases that were included - were the cases that were able to be coded from open-source data different from others that were not included (possibly more fatalities for example)? -Comments on absence of data made particularly for *failure to affiliate with an extremist group*. For all other distal characteristics there was known data for 19-22 subjects. -Authors identify that the study does not demonstrate the ability of the TRAP-18 to distinguish between individuals who will/ will

Author(s)/ Year Related SPJ tool	Aims of study	Population	Measures/ Design	Main findings	Quality Assessment (MMAT)
					not mount a violent attack as there was no comparison group. -Authors highlight limitations well e.g., observational bias, availability bias and hindsight bias.

Overview of ERG22+

Lloyd and Dean (2015) outline the development of an empirically based assessment of risk and needs in convicted extremist offenders in England and Wales called the ERG22+. The ERG22+ is owned by Her Majesty's Prison and Probation Service (HMPPS), formally the National Offender Management Service (NOMS). The ERG22+ was developed through casework with those convicted of terrorist offences and informed by terrorism literature. The ERG22+ is designed for use with anyone convicted under terrorist legislation, which accommodates those convicted of extremist offences that fall short of extremist violence in line with UK legislation. The ERG22+ is considered to be ideologically neutral, in the sense that it can be applied to individuals whose offending is aligned to extremist ideology, including far right, Islamic extremism, animal rights activists and single issue. Lloyd and Dean (2015) do acknowledge that the ERG22+ was primarily developed to capture objectives of British Al-Qaeda influenced offenders, although state it has been found to support other extremist offenders. The tool was designed to increase confidence and understanding in front-line staff and decision makers, using an SPJ approach which offers a formulation guided assessment of risk and need over time, helping to inform effective and proportionate risk management (Lloyd & Dean, 2015).

Lloyd and Dean (2015) outline the initial draft of the ERG22+ which was called the Structured Risk Guidance (SRG). This was developed in 2009 from casework with around 20 convicted extremist offenders, with the findings cross-referenced to government-commissioned reviews of the literature on terrorist offending; an advisory group of international experts oversaw the development of the SRG (Lloyd & Dean, 2015). The SRG was piloted within custody and in the community as outlined in the small study by Webster et al. (2017) and the authors identified that the study suggested evidence of face and content validity (chapter four provides an overview of these terms). Following feedback from the

advisory group and the pilot study, as well as an increasing amount of casework with offenders, changes were made to the SRG (Lloyd & Dean, 2015). Some of the factors were streamlined and others were added, with factors clustered, based on a conceptual understanding rather than statistical analysis, under three dimensions to produce the ERG22+ in its current format (Lloyd & Dean, 2015). When formally adopted in 2011, the ERG22+ was based on empirical data from the offence accounts of upward of 40 convicted extremist offenders (Lloyd & Dean, 2015). [2] The ERG22+ is outlined in detail in chapter four.

Evaluation of the Risk Assessment Tool.

Following the ERG22+'s rollout in 2011, there were initially no published or publicly available studies outlining the tools development, which led to criticism particularly around the lack of transparency and the potential ethical implications of this (Qureshi, 2016). Positively, in 2015 Lloyd and Dean outlined the development of the ERG22+ and following this the initial pilot study by Webster et al. (2017) was also published, years after its completion.

Webster et al. (2017) outline a process evaluation of the SRG early implementation, delivery, and perceived outcomes, offering recommendations and ultimately aiming to inform the decision on further rollout of the SRG. The main themes identified within the research are displayed in Table 4. The pertinent points that the research highlighted were around capacity of staff to complete the assessment without additional resources in the suggested time frame (1.5 days); improvements that could be made to the staff training, particularly around the complexity of the SRG and a desire for more information about philosophical/ spiritual influences on behaviour; willingness of offenders to engage and time needed to develop

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[2] Approximately 30% of the total population in custody or under licence in NOMS at the time (Lloyd & Dean, 2015).

rapport; and staff concerns around the extent to which the SRG was valid with all the groups suggested within its scope ([far-right, gang and gun crime, and those perceived to have extremist views] Webster et al., 2017). Additionally, staff identified conceptual overlap between some of the items but found the different domains helpful (Webster et al., 2017). Offenders identified improved relationships within the prison and an increased willingness to engage in positive change (Webster et al., 2017).

Webster et al. (2017) offer clear recommendations based on their findings which they identify were crucial in the development of the ERG22+. Recommendations related to making offender eligibility clearer, extending staff training, changing estimates about the time taken to complete an assessment and resources needed, reviewing the overlapping items identified, and improve guidance for all SRG stages (Webster et al., 2017). As identified within Lloyd and Dean (2015), this pilot study contributed to changes to the items which came to form the ERG22+, with the introduction of the three dimensions, and was therefore an important evaluative study. It does not appear that any similar qualitative evaluation of staff and offenders' experiences of assessment with the current ERG22+ has been completed, or at least the results of such a study have not been published; such an endeavour may offer important contributions to the continued revision of the tool. Further, gaining offenders' perspectives on engaging with the current ERG22+ process would be advantageous, particularly with the increased focus on co-production within prison and forensic settings (a transparent and collaborative approach, where practitioners, the offender and their family/carers work together equally [Co-Production Collective, 2021; Prison Reform Trust, 2021]); given the potential benefits of engaging offenders in the process (Wong & Horan, 2021).

Figure 3. *ERG22+ Domains and Items (From Lloyd & Dean, 2015, p. 46)*

Engagement

1. Need to redress injustice and express grievance

2. Need to defend against threat

3. Need for identity, meaning and belonging

4. Need for status

5. Need for excitement, comradeship or adventure

6. Need for dominance

7. Susceptibility to indoctrination

8. Political/ moral motivation

9. Opportunistic involvement

10. Family or friends support extremist offending

11. Transitional periods

12. Group influence and control

13. Mental health

Intent

1. Over-identification with a group or cause

2. Us and Them thinking

3. Dehumanisation of the enemy

4. Attitudes that justify offending

5. Harmful means to an end

6. Harmful end objectives

Capability

1. Individual knowledge, skills and competencies

2. Access to networks, funding and equipment

3. Criminal history

+ Any other factor

Two further studies were identified that offer more recent attempts to evaluate the ERG22+ in its current form within HMPPS. Powis et al. (2019a) examined the construct validity and structural properties of the ERG22+, offering a five-factor model considered to improve the construct validity of the tool and suggested that some items needed redefining to offer greater clarity for assessors (*mental health, harmful means to an end* and *harmful end objectives*). Powis et al. (2019b) then offered the first examination of the ERG22+'s IRR in both a field and research context, finding high levels of IRR in the research context but mixed in the field context, with poor reliability for the intent domain. Experience of the assessor was

significantly related to greater reliability when compared to the gold standard case codings, with the authors highlighting the importance of ongoing training and monitoring for those administering the ERG22+; both studies are discussed in more detail in chapter four which offers a critique of the ERG22+.

It is positive that such studies are offering recommendations to improve the current process and are beginning to shape future potential revisions of the tool, however the studies are limited in terms of their generalisability and there is a clear need for much more evaluative work to take place. Given that the ERG22+ has now been completed with over 171 offenders within HMPSS (and regular updates are completed along the offender's sentence) there is scope for informative research to continue to take place.

Overview of the MLG

The development of the original MLG is outlined in Cook's (2014) doctoral thesis and is based on a systematic review of the group-based violence literature as well as feedback gained from 13 experts in terrorism, gangs, cults and organised crime. The majority of terrorism acts are included under the authors' concept of group-based violence. Cook (2014) identified four distinct domains within the literature which formed a nested model: *Individual risk factors, individual-group factors, group factors* and *group-societal factors*. Within Cook's (2014) paper the original MLG consisted of 20 risk factors within these domains that are coded on a three-point scale (*absent, possibly* and *present*). Each factor is coded for the recent status of the case and the previous status. Relevance of each factor for future violence is also coded in a similar way to the HCR-20v3 risk assessment tool. Formulation and risk scenarios are then developed to inform risk management plans and conclusory opinions are made about the case in terms of prioritisation, risk for future violence, risk for life-threatening violence and imminence of violence (Cook, 2014). Attempts to evaluate the MLG through two staff training events are made within Cook (2014) and it is identified that the findings

contributed to the development of the MLG. The research paper by Hart et al. (2017) evaluates the second version of the MLG and provide the domains and 16 risk factors for the second version which is currently in use (Table 5). The MLG does not include protective factors, however such factors can be considered within the risk formulation and management strategies in a similar way to the HCR-20v3.

The MLG is an open access tool which is available for purchase and does not require any specific training (Cook, 2014), however it is recommended that it is completed within a team, with at least one member being an expert on the group to which the individual belongs or ascribes to (Lloyd, 2019). The tool was developed mainly for threat assessment professionals working with a range of group-based violence cases (Lloyd, 2019). The MLG is used to evaluate pre-crime risk, identifying those who may be at risk of group-based violence (GBV), as well post-crime, to evaluate those who are known or suspected to have committed terrorist group-based violence, or to analyse the extent to which terrorist violence perpetrated by an individual should be considered group-based versus individual (Cook, 2014; Hart et al., 2017). The authors do highlight that the MLG should be used in conjunction with other relevant risk assessment tools. The tool has mainly been used in North America and Europe (Lloyd, 2019).

Table 6. *MLG Version 2: Domains and Risk Factors (Cook et al., 2014, as cited in Hart et al., 2017, p. 53*

Domain		Risk Factor
Individual	I1.	Conduct problems
	I2.	Attitude problems
	I3.	Social adjustment problems
	I4.	Mental health problems
Individual-Group	IG1.	Strong group-based identity
	IG2.	Violent role or status in group
	IG3.	Strong commitment to group
	IG4.	Negative attitude toward people outside the group
Group	G1.	History or violence
	G2.	Violent norms or goals
	G3.	Strong cohesion
	G4.	Strong leadership/ power structure
Group-Societal	GS1.	Large in size/ scope
	GS2.	Socially isolated/ isolative
	GS3.	Operating in an unstable context/ environment
	GS4.	Threatened by or in conflict with other groups

Evaluation of the Risk Assessment Tool.

Cook (2014) outlines an evaluation of the MLG's utility and reliability within two separate MLG training courses (each three days in length) offered in Canada for criminal justice and mental health professionals. The study utilised a mixed methods design to evaluate utility (Cook, 2014). Pre- and post-training questionnaire responses indicated significant perceived improvement in confidence, knowledge, and competence of GBV risk

assessment following the MLG training (Cook, 2014). On average attendees' responses indicated that they felt the course was practical for their purposes, was easy to use and to understand. Forty-Eight percent of attendees indicated they would use the MLG on religious extremism cases, with 73% indicating this as a top three rank for use in their work (Cook, 2014). Qualitative analysis of feedback about the MLG identified subthemes around the need for explicit instructions, for example: on selecting groups to assess; how to present the assessment; and practical applications, such as where to get the intelligence to rate the group characteristics (Cook, 2014). Themes around developing the manual were also highlighted, particularly adding additional instructions and guidance on the definition of violence used within the MLG (Cook, 2014). Cook identified that attendees provided valuable feedback for the ongoing development of the tool but no specific revisions to the tool were outlined in the study. Conclusions relating to utility of the MLG that were made highlight that improvement in attendees' ratings following training does not necessarily equate to improvement in skill and therefore ongoing training, supervision and collaboration with peers is recommended.

IRR of the MLG was measured based on individually completed practice cases and four small group consensus ratings for the case studies; participants were randomly assigned to practice cases which covered a range of GBV, not solely terrorism (Cook, 2014). Cook (2014) identify that practice effects were controlled for by the order that cases were given over the training course. Intraclass coefficients (ICC) were calculated and presented for single raters and averaged group ratings (see Table 4 for key results) on individual risk items, MLG domains and conclusory opinions for 10 of the cases. Cook (2014) identify that the IRR of the MLG in this study is consistent with other SPJ tools. The results also demonstrated that distributions across possible ratings was good for all but one item within the Individual domain (*violent behaviour*), showing that assessors can adequately indicate *low, moderate,* and *high* risk (Cook, 2014); some support for the unique contribution of factors in each

domain was identified, however reliability was fair to moderate. Cook (2014) highlights that cases were selected for the purposes of training and therefore further research, with a large sample of GBV cases, is needed to determine the distribution of items.

It is acknowledged that this study was the initial evaluation of the MLG after its development, however there are several limitations noted within Table 4. Positively, the study had a relatively representative staff sample, with staff attending from different backgrounds and experiences. Of course, as with any study taking place in an artificial setting, such as the training setting, there are limitations around the generalisability of findings. Future research evaluating IRR of the MLG in the professional setting, with active cases, would be beneficial. Moreover, it would be helpful for research to demonstrate whether assessors perceived knowledge and confidence in using the MLG translates to quality of completed assessments.

Hart et al. (2017) evaluated the second version of the MLG which was revised to enhance the usability of the tool by simplifying the assessment procedure. This consisted of two parts: the first a study of IRR of MLG risk ratings made by two raters on five case studies used in the Beardsley and Beech (2013) study, followed by an attempt to assess the concurrent validity of the MLG by comparing risk ratings of these five case studies using the MLG, HCR-20v3 and VERA (Hart et al., 2017). The second aspect of the evaluation involved a conceptual analysis of the content overlap of the MLG and VERA-2 involving three researchers' subjective ratings (Hart et al., 2017).

Hart et al. (2017) concluded that there were no problems with IRR of risk ratings made and that the finding was consistent with Cook's (2014) findings and research using other SPJ tools. The comparison of the MLG and HCR-20v3 demonstrated that those who scored as high risk for future GBV on the MLG were also rated as high risk on the HCR-

20v3, an expected result given that both are measuring violence (Hart et al., 2017). Individual domain scores on the MLG had positive correlations with the HCR-20v3 total and domain scores, however these were not significant and effect sizes ranged in magnitude from small to large (Hart et al., 2017). Hart et al. (2017) highlight that this was consistent with their expectations as the individual domain of the MLG was modelled after the HCR-20v3. Hart et al. (2017) identifies that significance may not have been met due to the restricted variability in the individual domain ratings, a likely result of the limited cases used, all of which were more serious in nature with significant fatalities. The group domains of the MLG all had near zero or negative correlations with the HCR-20v3 (Hart et al., 2017). Comparison of the MLG and VERA demonstrated that the risk factors in the MLG individual domain were generally unrelated to those in the VERA. The VERA contextual domain did however have large, positive, and statistically significant correlations with the other MLG domains (Hart et al., 2017).

It was considered that the sample of five case studies was particularly problematic in terms of its initial selection in the Beardsley and Beech study (2013) being based on available open-source information and the extremely small and varied cases utilised. These limitations are acknowledged by Hart et al. (2017) and they identify having to change their initial research plan, which involved accessing sanitised material from police records to the open-source cases due to problems with police resources. The IRR results (in some cases low ICC values and wide confidence interval values) could be reflective of the lack of variability among the sample and the small sample size limiting statistical precision, although this is not commented on by the authors. Moreover, Hart et al. (2017) identify that they were unable to access the VERA-2 for use within the study and therefore had to evaluate concurrent validity based on the original VERA, which differs quite considerably to the revised version (See Table 6).

The second aspect of this study, looking at conceptual overlap of the MLG and VERA-2 offered a useful and visual way of presenting the similarities and important differences between the tools based on the concepts being examined (Hart et al., 2017). This process demonstrated that each of the VERA-2 factors has substantial overlap with one or more MLG risk factors which was consistent across VERA-2 domains (Hart et al., 2017). Hart et al. (2017) concludes that most of what is measured by the VERA 2 risk factors is also measured by the MLG in the individual and individual-group domains. It is unclear whether the MLG's authors were involved in measuring the degree of overlap between the MLG and VERA-2, if so, this may have introduced researcher bias. Moreover, Hart et al. (2017) comment on not having access to the VERA-2 for the purpose of the study and presumably therefore were unable to refer to the guidance manual which would have offered more detailed information about each item; the authors do however identify the that the coders had a good knowledge of both tools to make comparisons. Hart et al. (2017) do acknowledge that many of the VERA-2 risk factors appear more specific than the MLG factors and therefore the VERA-2 may still be useful in gaining a more detailed assessment in terrorist offenders.

Overview of the VERA

The VERA has gone through a number of updates since its initial development in 2009 (Pressman, 2009; Pressman & Flockton, 2012) to arrive at its current format, the VERA-2R. The VERA-2R was developed in 2016 and updated again in 2018 (Lloyd, 2019). The VERA-2R is a structured tool for looking at individual risk of violent extremism in youth and adults, which can be used both pre-crime and post-crime within in a range of judiciary settings including police, probation, intelligence, court and forensic mental health (Lloyd, 2019). The VERA-2R is currently in use in Europe (e.g., Netherlands), Australia, North America and South-East Asia with the assessment and training manuals being available in four languages (Lloyd, 2019). Access to the VERA-2R manual requires attendance at a

specific training course (for an overview see Lloyd, 2019) and therefore could not be accessed for the purposes of the review. It is worth highlighting that the VERA-2R includes three additional motivational indicators and 11 additional indicators relating to non-violent criminal history, personal history, and mental disorders (Lloyd, 2019). There is however no known published research specifically on the VERA-2R to date, although independent studies are referred to (Lloyd, 2019; Pressman, 2016).

In regard to the VERA, the study by Beardsley and Beech (2013) was the only published study identified within the review and related to the first version of the VERA. Two overview papers outlining the development of the VERA (Pressman, 2009) and the VERA-2 (Pressman & Flockton, 2012) were also identified.

Pressman (2009) outlines the development of the VERA by providing the literature background for the characteristics and risk factors relevant to criminal violence, violent extremism, and political violence. Pressman explores the salient differences between risk factors relevant to criminal violent offenders and violent extremists, then evaluates the most relevant existing risk of violence SPJ tools in terms of applicability to violent extremists. Finally, the paper introduces the VERA in its consultation form; an SPJ tool that the Pressman suggests is specifically relevant to assessing the risk of violent political extremism.

The items that contribute to the VERA are reportedly supported by results of research undertaken in the area of radicalisation and terrorism, collaborative work with those having operational experience with criminal violent extremists, discussions with professionals in the security and intelligence fields, and information from interviews and self-report questionnaire data on radicalisation (Pressman, 2009). The VERA is noted to include factors thought to be relevant to the process of radicalisation leading to violent extremism, as well as committed political terrorists, and is modelled on the existing violence risk assessments ([HCR-20v2 and

SAVRY]; Pressman, 2009). The items that form the original VERA are presented in Table 6. The author identifies that training is required to use this tool and training should be repeated over time. Assessors judge the presence of the 25 items as *low, medium,* or *high*; three demographic items are then scored (Pressman, 2009). The responses are then integrated to produce a final judgement rating of risk for violence, again using the *low, medium,* or *high* coding (Pressman, 2009).

Pressman and Flockton (2012) outline the second consultative version, VERA-2. The original VERA was reportedly revised following feedback from experts working in law enforcement, corrections, and forensic psychology. Furthermore, some revisions resulted from feedback obtained from those using the VERA with convicted terrorists in a high-risk correctional setting in Australia (Pressman & Flockton, 2012). The VERA-2 has 31 indicators (compared to 28 in the original VERA) which are categorised under five headings: *beliefs and attitudes; context and intent; history and capability; commitment and motivation;* and *protective factors* (Pressman & Flockton, 2012). Each indicator is rated according to criteria defined levels *(low, moderate,* or *high*) and the final judgement of risk is made after reviewing all of the available information within the assessment, rather than an additive process (Pressman & Flockton, 2012).

The VERA-2 is said to encompass all those considered as violent extremists, violent political offenders, and terrorists, and is designed to be used by trained psychologists and other professionals who monitor and manage individuals suspected or convicted of terrorist offences (Pressman & Flockton, 2012). Pressman and Flockton (2012) suggest using the VERA-2 with caution in cases where an individual is under surveillance by law enforcement. It is emphasised that the professional needs to have a knowledge of the field of terrorism and violent extremism to administer the assessment and multiple assessors should be used where possible. Pressman and Flockton (2012) suggest that the VERA-2 should be used to

complement comprehensive risk assessment, suggesting that inclusive assessment can include evaluation of cognitive functioning, personality, and clinical status as examples. The paper by Pressman and Flockton does not provide the specific evidence base for each of the VERA-2 risk indicators, the basis for the choice of indicators, and information on the wider applicability of the risk and protective factors but identifies that this information will appear in a forthcoming paper; this paper was not obtained during the review and did not appear to be published at the time.

Evaluation of the Risk Assessment Tool.

The current review identified one study evaluating the original VERA. Beardsley and Beech (2013) attempted to evaluate the usefulness of the VERA by applying the criteria to case studies of historical terrorists. Beardsley and Beech also set out to determine whether the VERA was more applicable to terrorists who work alone or who operate as part of a group. The sample used within this study consisted of only five male terrorists, with the authors identifying that the cases were intended to be varied in their motivations and roles to "prevent further restricting the scope of results" (Beardsley & Beech, 2013, p. 11). Using the information gained, the VERA factors were scored to represent presence for each terrorist case using Pressman's (2009) descriptions for each factor on a scale of *low* (0), *medium* (1) and *high* (2). Beardsley & Beech (2013) calculated a total score for each extremist in each domain of the VERA for the purposes of the study, although this does not appear to be suggested within the VERA guidance, with higher scores not necessarily equating to greater risk. Beardsley & Beech (2013) also added ten years onto the terrorist's age at arrest to get an estimated current age for the offender's post-conviction.

IRR between two raters was calculated, where ratings of low or unknown were coded as 0 and ratings of medium or high were coded as 1, with the level of agreement between the two raters was reported as 85.7% (Beardsley & Beech, 2013). Cohen's Kappa analyses for

each of the terrorists, all received Kappa values of 0.76 or greater (p< .001); with the authors concluding a good-to-high level of consistency between the two sets of ratings (Beardsley & Beech, 2013). It does not however appear that either rater had training in administering the VERA, or at least this is not explicit within the study, which may have impacted upon the results. Moreover, the limited options for coding (either scoring 0 or 1) would likely have contributed to the higher level of agreement that was demonstrated.

One area in which the study by Beardsley and Beech (2013) is particularly limited, is in its ability to answer the research aims around demonstrating utility of the VERA. The results based on the coding of each terrorist case are provided in a descriptive manner, with the authors outlining each domain in terms of the range of scored responses and ease of applying the score based on the information. Beardsley and Beech note that the majority of the cases scored highly on the attitude domain. The context domain was considered challenging to score, particularly due to the historical nature of the case studies and the availability of the internet (Beardsley & Beech, 2013). The findings across the historical items were inconsistent across cases; for protective factors the scores were again inconsistent and there was some missing data noted. Beardsley and Beech concluded that the majority of items were easy to apply to open-source cases and suggested that the VERA was a useful risk assessment guide for terrorists who work alone or within a group. Given the extremely limited sample comparing the individual versus group aspect of the research question, it does not seem possible to draw such conclusions. Moreover, the study does not speak of the ability of the VERA to predict risk, which could be measured postdictively.

Table 7. *Comparison of Items of the VERA and VERA-2 (Pressman, 2009, p. 20; Pressman & Flockton, 2012, p245)*

VERA	VERA-2
Attitude Items	**Beliefs and Attitudes**
1. Attachment to ideology justifying violence	1. Commitment to ideology justifying violence
2. Perception of injustice and grievances	2. Victim of injustice and grievances
3. Identification of target of injustice	3. Dehumanization/ demonization of identified targets of injustice
4. Dehumanization of identified target	4. Rejection of democratic society and values
5. Internalized martyrdom to die for cause	5. Feelings of hate, frustration, persecution, alienation
6. Rejection of society and values/ Alienation	6. Hostility to national collective identity
7. Hate, frustration, persecution	7. Lack of empathy, understanding outside own group
8. Need for group bonding and belonging	
9. Identity problems	**Context and Intent**
10. Empathy for those outside own group	1. Seeker, consumer, developer of extremist materials
	2. Identification of target in response to perceived injustice
Contextual Items	3. Personal contact with violent extremists
1. User of extremist websites	4. Anger and expressed intent to act violently
2. Community support for violent action	5. Expressed desire to die for cause or martyrdom
3. Direct contact with violent extremists	6. Expressed intent to plan, prepare violent action
4. Anger at political decisions, actions of country	7. Susceptible to influence, authority, indoctrination
Historical items	**History and Capability**
1. Early exposure to violence in the home	1. Early exposure to pro-violence militant ideology
2. Friends/ family involvement in violent action	2. Network (friends, family) involved in violent action
3. Prior criminal violence	3. Prior criminal history of violence
4. State-sponsored military, paramilitary training	4. Tactical, paramilitary, explosives training
5. Travel for non-state sponsored training/ fighting	5. Extremist ideological training
6. Glorification of violent action	6. Access to funds, resources, organizational skills
Protective Items	**Commitment and Motivation**
1. Shift in ideology	1. Glorification of violent action
2. Rejection of violence to obtain goals	2. Driven by criminal opportunism
3. Change of vision of enemy	3. Commitment to group, group ideology
4. Constructive political involvement	4. Driven by moral imperative, moral superiority
5. Significant other/ community support	5. Driven by excitement, adventure
Demographic items	**Protective items**
1. Sex (Male = high, Female = low)	1. Re-interpretation of ideology less rigid, de-radicalization
2. Married (less than 1 year = high)	2. Rejection of violence to obtain goals
3. Age (less than 30 = high)	3. Change of vision of enemy
	4. Involvement with non-violent, de-radicalization, offence related programs
	5. Community support for non-violence
	6. Family support for non-violence

The study by Beardsley and Beech (2013) demonstrated a poorer quality of research in comparison to other studies within this review. The main limitations identified were that the data collection method and sample was limited in answering the research questions, particularly regarding the comparison of individual versus group-based offending. The sample was considered relevant to the target group, however, was limited by the extremely small number of cases and diversity across these cases. All cases were well-known terrorists who had carried out particularly lethal offences and were likely selected as a result of the need for detailed open-source data; therefore, conclusions made can only be applied to these specific cases and may not be relevant to other terrorist offenders. The accuracy and reliability of the open-source data is likely limited given that only Google search engine was used and it is unclear if multiple sources of information were gained to offer some verification of the information or quality of information.

It is noted within Pressman and Flockton (2012) that reports received about the use of the VERA and VERA-2 with convicted terrorists have been positive and at the time research to explore the VERA-2's utility and validity were underway; the results of which may have contributed to further refinements to the approach given the rollout of VERA-2R in 2015 (with Netherlands Institute of Forensic Psychiatry and Psychology [NIFP]). One study purporting to evaluate the construct validity of the VERA-2, was identified within reference lists of key studies, however the independent study is only briefly mentioned in a book chapter and is not published anywhere in detail so could not be included within the review (Pressman & Flockton, 2014). It is worth highlighting that this study is noted to have compared terrorist offenders with non-terrorist violent offenders on a range of risk assessment tools including the VERA-2 and found that terrorist offenders were significantly lower risk in terms of general violence and criminality compared with non-terrorist violent

offenders (Pressman & Flockton, 2014). The terrorist offenders were found to be assessed as a significantly higher risk for violent extremism when assessed using the VERA-2 in comparison to the non-terrorist offenders (Lloyd, 2019; Pressman & Flockton, 2014).

Pressman (2016) notes that current version, VERA-2R, has evidence of reliability and validity from an independent study but that more data is required to offer a broader evaluation. The lack of published empirical data on validity and reliability poses similar ethical challenges to those raised with the ERG22+. Despite the independent study noted, more empirical data is required to support the ongoing development and implementation of the tool; such research would benefit from peer review.

Overview of the TRAP-18

The TRAP-18 is first outlined by Meloy et al. (2015) as an investigative template for operational purposes focused primarily on lone actors. The TRAP-18 is used in Canada, the US and Europe by counterterrorism analysts and investigators (Lloyd, 2019). It was initially specified that the TRAP-18 was not considered an SPJ instrument because of "insufficient demonstrable validity" at the time (Meloy et al., 2015, p. 141), although more recent publications now refer to the tool as an SPJ assessment tool (Meloy, 2018). The purpose of the template is to aid professionals working within mental health, criminal justice, intelligence, and security who are required to protect the public from acts of the individual terrorist, regardless of their ideological commitment (Meloy et al., 2015). The TRAP-18 is designed to aid the effective prioritisation of cases of concern; therefore, its use is within the pre-crime space to help threat assessment and counter-terrorism professionals (Meloy et al., 2019). The TRAP-18 differs from other risk assessments given its focus on behaviours of the individual and identifying patterns of such behaviours in the present moment rather than looking at future risk (Meloy et al., 2019). The TRAP-18 combines eight proximal warning factors (Meloy et al., 2012) and 10 dynamic characteristics of the lone terrorist (Meloy &

Yakeley, 2014). The proximal warning behaviours are patterns for analysis derived from the threat assessment literature. The Distal characteristics are based on psychosocial research concerning lone-actor terrorism, as well as psychodynamic formulations of clinical cases (Meloy & Yakeley, 2014). The TRAP-18 is said to be informed by psychoanalytic theory, attachment theory, social psychology, psychobiological foundations of predatory violence, theory and research on targeted violence and Gestalt psychology (Lloyd, 2019). It is suggested that the presence of distal factors would indicate the need for active monitoring, whereas presence of even one proximal warning behaviour signals a need for active risk management (Meloy & Gill, 2016; Meloy, 2018). Figure 4 provides an overview of the 18 items of the TRAP-18. Items are coded as *present, absent* or *insufficient information*.

It is recommended that consultation is sought from a professional who is of the same racial, ethical, or religious background when completing the TRAP-18 (Meloy, 2018) and information should be sourced where possible from direct interview, collateral interviews, and public records (Lloyd, 2019). Reassessment of the TRAP-18 is recommended given the dynamic nature of the warning behaviours (Lloyd, 2019).

Evaluation of the Risk Assessment Tool.

Nine studies evaluating the TRAP-18 were identified within the review, the majority of which were published from 2018 onwards. It is worth highlighting that the tools construct validity has been demonstrated within retrospective analyses using individual case studies (Goodwill & Meloy, 2019; Lloyd, 2019), however case studies were excluded from the current review in order to focus on studies involving larger sample sizes across all tools. Studies identified offer some support for the validity, reliability and feasibility of the TRAP-18 across different ideologies and locations. Feasibility studies look at whether proceeding with a certain intervention or measure is viable, as such they set the groundwork for larger or more definitive research (National Institute for Health and Care Research [NIHR], 2021).

Figure 4. *Warning Behaviour Typology and Distal Characteristics which form the TRAP-18 (From Meloy et al., 2015, p. 143-144)*

The Warning Behaviour Typology	Distal Characteristics
1.Pathway warning behaviour	Personal grievance and moral outrage
2.Fixation warning behaviour	Framed by an ideology
3.Identification warning behaviour	Failure to affiliate with an extremist group
4.Novel aggression	Dependence on virtual community
5.Energy burst	Thwarting of occupational goals
6.Leakage	Changes in thinking and emotion
7.Last resort	Failure of sexual-intimate pair bonding
8.Directly communicated threat warning	Mental disorder
	Greater creativity and innovation
	Criminal violence

Feasibility of the TRAP-18 was reported by Brugh et al. (2020) and by Krupper and Meloy (2021). Brugh et al. (2020) explored the feasibility of using the TRAP-18 with open-source data focused on 77 jihadist-inspired lone actor terrorists from the US and Europe. The study found that on average half of the TRAP-18 items could not be rated for each actor within the sample, however there were no cases where all items were coded as 'unknown'. It was identified that warning behaviours were more challenging to code based on publicly available information than distal characteristics, but positively the majority of lone actors would have been recommended for active monitoring or active risk management based on the information available (Brugh et al., 2020). Overall, the results suggested that the TRAP-18

may lack feasibility for identifying jihadist-inspired lone actors based on solely open-source data, particularly for European actors (Brugh et al. 2020). There are a number of limitations to this study however, particularly it is noted that the open-source data was gathered from one database which may have limited the available information to code the TRAP-18 items. Brugh et al. (2020) suggest that future research should test the feasibility and utility of the TRAP-18 when completed by evaluators in practice, rather than retrospectively using a case study approach. Alternatively, Krupper and Meloy (2021) were able to demonstrate feasibility of coding the TRAP-18 using limited data, but with a novel forensic linguistics approach, through the analysis of written and verbal targeted violence manifestos by lone actors who perpetrated or planned to commit an attack. The study found that all proximal warning behaviours and 90% of distal characteristics were detected within the sample of 30 manifestos; with every manifesto having at least two proximal warning characteristics meaning they would be recommended for active risk management (Krupper & Meloy, 2021). The study discusses significant differences in TRAP-18 items rated as *present* between written and verbal communication samples, ideologically motivated versus grievance fuelled attacks and a range of motivations for the attack (See Table 4). Krupper and Meloy conclude that the application of forensic linguistic analysis to limited communication information may assist threat assessors in detecting warning behaviours and that the TRAP-18 was useful across different type of attacks, different primary motivation, and with the different modes of communication analysed. The study had a number of limitations, largely the lack of comparison group to measure discriminate validity of the TRAP-18, the small sample size meaning that comparisons between motivations were based on very small numbers, and the exclusion criteria may have led to individuals with mental health disorders being underrepresented.

IRR of the TRAP-18 has been demonstrated within the studies by Challacombe and Lucas (2018) and Meloy et al. (2015). Challacombe and Lucas calculated IRR between two raters who independently coded the TRAP-18 codebook against the open-source data on 58 US based domestic terrorists. Average Cohen's kappa for proximal warning behaviours was categorised as 'good' ($k= .687$), for distal characteristics it was 'excellent' ($k= .812$), and for the entire TRAP-18 it was 'excellent' ($k= .757$) (Challacombe & Lucas, 2018). Meloy et al. (2015) calculated the IRR between two raters who completed the TRAP-18 for 22 known terrorist subjects using open-source data. IRR was calculated for the warning behaviours, distal characteristics and the whole sample with all Cohen's kappa values indicating 'good' to 'excellent' IRR; the average kappa value for the TRAP-18 was 0.90.

The review identified studies demonstrating the TRAP-18's *content validity* (Böckler et al., 2021; Meloy et al., 2015), *construct validity* (Böckler et al., 2021; Goodwill & Meloy, 2019: Meloy & Gill, 2016; Meloy et al., 2021; Meloy et al., 2019), and *criterion validity* (Challacombe & Lucas, 2018; Meloy & Gill, 2016). Challacombe and Lucas (2018) demonstrated the known groups criterion validity of the TRAP-18 by applying the tool to a sample of 58 US based individuals or groups of domestic terrorists (Sovereign Citizen Movement) and comparing scores between those who had planned or committed violent acts and those who had committed non-violent acts. Known group criterion is a "test of criterion validity involving groups between whom scores on the test should differ" (Coolican, 2018, p. 240). Challacombe and Lucas (2018) demonstrated the ability of the TRAP-18 to successfully postdict violent behaviour within the sample. Six proximal warning behaviours significantly postdicted violence, with *last resort* having the strongest effect size, as well as four distal characteristics, with both *personal grievance* and *criminal violence* having the strongest effect. When looking at the total TRAP-18 score and likelihood of violence occurring within the sample incidents, the binary logistic regression model was found to be

statistically significant, suggesting it was able to distinguish between violent and non-violence cases in 76% of cases; as a whole explaining between 44% and 59% of the variance in the presence of violence (Challacombe & Lucas, 2018). The main limitation outlined in the study was limited information obtained through open-source data which likely impacted upon the number of *present* codings within the sample. Similarly, Meloy and Gill (2016) compared lone actor terrorists who successfully carried out attacks with those who were thwarted in their plans using an existing dataset of 111 terrorists to measure postdictive validity. The study found that those successful in carrying out their attack were significantly more likely to display three indicators (*failure of sexual-intimate pair bonding, creativity and innovation, and fixation warning behaviour*), compared with those thwarted who were significantly more likely to display *pathway warning behaviour* and *dependence on the virtual community*. (Meloy & Gill, 2016). The study also demonstrated that the TRAP-18 could be utilised across ideologies given only a small number of significant differences in indicators across the three ideological groups studied (radical Islamist, ERW and single-issue). Meloy and Gill do highlight limitations with their known group analysis, suggesting that a better comparison and measure of postdictive validity would be to look at subjects of concern who upon investigation had no intent to attack; such a comparison was not available for the purpose of the study.

Böckler et al. (2021) demonstrated *excellent* content validity of the TRAP-18 with a German sample of 80 convicted Islamist extremist offenders. Moreover, finding that the TRAP-18 was successfully able to discriminate between those who committed violent acts from non-violent acts, with significant differences in the number of proximal warning behaviours and type indicated (*pathway, last resort, energy burst,* and *novel aggression*), number of distal characteristics, and total TRAP-18 items present (Böckler et al., 2021). ROC analyses also demonstrated specificity and sensitivity of the TRAP-18 based on weighted

scores (Böckler et al., 2021). Limitations of the study include the small sample of violent

offenders in comparison to the larger non-violent group and the differences across cases in

terms of available information. It is possible that the violent acts would receive greater media

attention than non-violent acts (Kearns et al., 2019), which would therefore increase available

information to support the coding of items as *present* and possibly contribute to greater

differences in presence of items between the groups; although it is not identified within the

study which cases had a greater amount of available information. Meloy et al. (2015) also

provide evidence to support the content validity of the TRAP-18 in their sample of 22 lone

actor terrorists, finding that the majority of individuals were positive on 72% of TRAP-18

items. The main limitation of the study by Meloy et al. (2015) being the lack of a comparison

group.

In terms of construct validity, Böckler et al. (2021), Goodwill and Meloy (2019),

Meloy and Gill (2016), Meloy et al. (2021), and Meloy et al. (2019) all demonstrate support

for the theoretical model of the TRAP-18 based on their results. Goodwill and Meloy (2019)

demonstrated this visually within their MDS analysis which showed that the majority of

proximal warning behaviours clustered among the attacker sample, and most were absent for

non-attackers. Moreover, three distal characteristics (*personal grievance and moral outrage,*

framed by ideology, and *changes in thinking and emotion*) were found to cluster with the

proximal warning characteristics and the attackers, suggesting they may have special

significance (Goodwill & Meloy, 2019). Meloy et al. (2021) used a time sequence analysis to

help understand the pathway to acts of violence within their existing dataset of 125 lone actor

terrorists; the results of their study supported the theoretical assumption of the TRAP-18 that

distal characteristics precede proximal warning behaviours, which precede an attack.

Overview of Methodological and Study Characteristics

The fifteen empirical studies included within the review varied in their aims, their samples, and their quality. In a review of terrorism research between 2007 and 2016, Schuurman (2018) found a focus on qualitative designs, with the majority of published research not using statistics at all; the contrary was found within this review, with only one study using qualitative methods (Webster et al., 2017) and two using a mixed method design (Cook, 2014; Krupper & Meloy, 2021). The majority of studies used qualitative non-randomised designs (Böckler et al., 2021; Challacombe & Lucas, 2018; Goodwill & Meloy, 2019; Meloy & Gill, 2016; Meloy et al., 2019; Meloy et al., 2015; Powis, Randhawa-Horne, Elliott & Woodhams, 2019). The remainder using quantitative descriptive designs (Beardsley & Beech, 2013; Brugh et al., 2018; Hart et al., 2017; Meloy et al., 2021; Powis, Randhawa & Bishopp, 2019).

When comparing the populations examined across different studies, two studies utilised staff as their main participants (Cook, 2014; Webster et al., 2017). Webster et al. (2017) is the only study where extremist offenders were interviewed; however, this was limited as only three offenders were involved in this aspect of the study. Powis, Randhawa-Horne, Elliott and Woodhams (2019) assessed IRR of staff involved in completing ERG22+ assessments to measure field reliability. The majority of studies used known outcome case studies of terrorist offenders gathered from open-source data retrospectively (Beardsley & Beech, 2013; Böckler et al., 2021; Brugh et al., 2020; Challacombe & Lucas, 2018; Goodwill & Meloy, 2019; Hart et al., 2017; Krupper & Meloy, 2021; Meloy & Gill, 2016; Meloy et al., 2021; Meloy et al., 2019; Meloy et al., 2015). Only two studies analysed risk assessments completed in a real-world setting (Powis, Randhawa & Bishopp, 2019a; Powis, Randhawa-Horne, Elliott & Woodhams, 2019b). A discussion of the benefits and limitations to open-

source data is outlined in chapter three, however given the challenges to accessing terrorist samples, such a method is often utilised.

The majority of studies used known outcome case studies of terrorist offenders gathered from open-source data retrospectively (Beardsley & Beech, 2013; Böckler et al., 2021; Brugh et al., 2020; Challacombe & Lucas, 2018; Goodwill & Meloy, 2019; Hart et al., 2017; Krupper & Meloy, 2021; Meloy & Gill, 2016; Meloy et al., 2021; Meloy et al., 2019; Meloy et al., 2015). Only two studies analysed risk assessments completed in a real-world setting (Powis, Randhawa & Bishopp, 2019a; Powis, Randhawa-Horne, Elliott & Woodhams, 2019b). A discussion of the benefits and limitations to open-source data is outlined in chapter three, however given the challenges to accessing terrorist samples, such a method is often utilised.

The majority of studies used samples with mixed ideologies represented, with only three studies focusing specifically on Islamist extremists (Böckler et al., 2021; Brugh et al., 2020; Powis, Randhawa & Bishopp, 2019a) and one focusing on an ERW domestic terrorist sample (Challacombe & Lucas, 2018). None of the studies focused specifically on group-based samples, with the majority utilising samples of lone-actor terrorists. Four studies used a combination of lone and group actors (Beardsley & Beech, 2013; Böckler et al., 2021; Challacombe & Lucas, 2018; Hart et al., 2017). Of interest, a number of studies did not identify the gender of the sample, however from those that specified, a total of 11 female extremist offenders were utilised across the studies; this of course if partly reflective of the gender differences in extremist offenders, however further research is needed specifically focused on female extremist offenders. The majority of populations studied were US and European samples, likely given that these are where the tools are largely in use, however further research would benefit from widening these samples to explore whether the risk assessment tools are suitable across cultures.

Of particular importance to the study of risk assessment tools, only five studies utilised comparison groups of *attackers* versus *non-attackers* to help demonstrate postdictive validity of the tools. It is noteworthy that these studies were all exploring the TRAP-18. As highlighted, postdictive studies have been recommended by Monahan (2012) given the identified challenges to validating such tools prospectively (e.g., offenders serving long sentences and monitoring after release). Such a method is helpful in measuring criterion and concurrent validity (Lloyd, 2019). There were limitations to the comparison groups used, however this is a positive step in the evaluation of the TRAP-18 that other measures have yet to demonstrate through published studies. Moreover, no studies within the review had used matched groups or included other groups of comparative interest, such as general violent offenders. The use of comparison groups helps to measure the effectiveness of a risk assessment tool in doing what it is designed to do, measure risk. Unfortunately, only one study was able to comment on the tools ability to correctly identify high risk individuals and low risk offenders using ROC analyses (Böckler et al., 2021), an important part of measuring the performance of risk assessment tools. A number of the authors rightly highlight some of the bias that can be introduced when evaluating measures retrospectively. Hindsight bias and observational bias can be introduced both in the initial source reporting of cases and within the coding process. Confirmatory bias, a form of cognitive bias where information that confirms existing beliefs is favoured, may also be introduced, particularly where authors of the tools are involved in such studies.

Other key limitations noted across the studies identified within this review were: generalisability in terms of the samples used and, in some cases, the small numbers used for within group comparisons; the variance in information available from open-source data; and difficulties differentiating between a coding of 'no' for presence of an item and 'unknown'. IRR was not measured in all of the studies where multiple raters were used to code known

outcome cases, instead raters coded independently and reached consensus ratings. Finally, there was a noticeable lack of control over confounding variables, with some studies making limited comment on potential confounds. Meloy et al. (2019) was the only study that explored demographic variables across groups within the sample and identified significant differences. Moreover, given the low base rate of terrorist offending, data sets are often collected over a large temporal period in order to reach the numbers of cases needed for quantitative analysis; this can also introduce confounds such as the changing geopolitical climate and changes to technology (e.g., use of the internet and social media) which may have an impact upon the radicalisation process, planning processes and the ability to execute attacks.

Comparison of Identified Risk Assessment Tools

The four risk assessment tools identified within the current review vary in terms of their intended target populations and contexts for use. The ERG22+ is designed for use in extremist offenders, which can include violent and non-violent offences. The same 22 items are however reported to be used in in the pre-crime context in the form of the Vulnerability Assessment Framework ([VAF], HM Government, 2012, 2020). The MLG can be used in both pre-crime and post-crime contexts to assess risk for group-based violence and is for individuals who are either part of a group or affiliated with a group, which can include lone actors. The VERA was initially identified for use mainly post-crime, in those convicted of violent extremism, with caution suggested in terms of pre-crime use, however the VERA-2R is identified for use pre-crime and post-crime (Lloyd, 2019). Finally, the TRAP-18 is a pre-crime tool to aid threat assessors and other law enforcement who are prioritising cases and resources in cases where there may be risk of ideologically motivated violence. The TRAP-18 was developed for use in lone-actor terrorists although research has demonstrated use with a small sample of group-based offenders (Meloy et al., 2015). All tools are considered

ideologically neutral, although further research is needed to fully determine the scope of use of these tools across ideologies, different roles within terrorist groups and with female offenders.

The ERG22+ differs to the other risk assessment tools in terms of its need to accommodate those convicted of extremist offenses that fall short of violence. Some of the risk factors that constitute the VERA-2 are considered offences in the United Kingdom that could lead to conviction, which helps to explain some the differences in terms of the breadth of risk factors utilised in both tools. Furthermore, the ERG22+, although can potentially be applied in other settings, was developed to understand engagement influences specific to extremist offenders in the UK and is ultimately based on casework with offenders from the UK. This highlights that when using risk assessment tools, it is essential to be mindful of various factors that may affect the tools applicability including, but not limited to, how terrorism and extremism are defined within the measure and variances in legal definitions across countries.

The ERG22+ and the TRAP-18 are based, to differing extents, on direct work with cases in combination with the literature on terrorism and radicalisation; the ERG22+ on British Al-Qaeda influenced extremist offenders during the Afghan and Iraqi wars, and the TRAP-18 on Meloy's experience directly and indirectly assessing foreign and domestic lone terrorists over 20 years. The VERA is a conceptual tool based mainly on violent extremism literature and consultation with experts in the area, but the tool has been piloted on extremist offenders in Australia. The MLG risk factors were derived from a systematic review of the group-based violence literature and contact with experts in a range of group-based violence offences. The use of case studies in the development of risk assessments is likely to add a richness of information that can be corroborated with the literature in the area, however there are potential limitations given generalisability beyond the cases (usually a small number) and

crucially the potential for response bias which can impact on the conclusions drawn; this may be particularly pertinent in extremist offenders where factors relating to their detention may bring in self-report bias.

The risk factors identified within the ERG22+, MLG and VERA are not weighted, with these tools all focusing on the clinician's summative judgement and risk formulation based on the constellation of risk factors identified within the risk factors. The TRAP-18 differs in this respect, as it splits risk indicators into distal and proximal, which will determine different responses, with even one proximal warning behaviour signalling the need for active risk management. Table 8 provides an overview of the tools for comparative purposes.

Comparison of Identified Risk Factors Across Instruments

The identified tools vary to some extent in terms of their theoretical underpinnings as would be expected given their focus on different populations (group-based violence, the lone-actor terrorist, those vulnerable to engagement in extremist violence, and those already convicted of extremist or violent extremist offences). Although the tools are based on different theories, are measuring risk in different ways, are intended for different target populations, used by professionals in different settings, and for different purposes, there are a number of similarities in the risk factors used across measures. Tables 9 and 10 provide a rudimentary comparison of the risk factors and indicators identified across each tool against the risk factors and indicators highlighted by RTI International (2018). This comparison is based on limited information, given that the only accessible guidance manual was the ERG22+ (under educational license). Therefore, a subjective comparison is made based on the overview information available from the papers identified within this review and information from the extremism risk assessment directory document (Lloyd, 2019).

Table 8. *Comparison of Identified Risk Assessment Tools*

	Target Population	Content of Assessment	Assessment process	Evaluation to date (based on current review findings)
ERG22+	All convicted extremist offenders (includes violent extremism and non-violent extremist offences) in England and Wales (post-crime) – ideologically neutral. Initial assessment and then re-assessment over time to monitor for change. Potentially in cases where conviction is not for extremist offence but where significant concern of extremism involvement. Helps in terms of treatment planning and risk management. ERG22+ has been adapted for use in pre-crime space (VAF).	Individual focused but states need to consider wider social and political context. 22 risk factors under three dimensions: *engagement, intent* and *capability*, with '+' indicating that additional significant factors can be added if deemed appropriate. Developed based on interviews with British Al-Qaeda influenced offenders and informed by terrorism literature. Considers the individual pathway towards offending- case formulation approach. All factors should be considered in terms of whether risk or protective factors. Majority of risk factors are considered dynamic.	Chartered and registered Psychologists or probation officers. Experience in completing risk assessments and formulation. Two-day training is available. Guidance documentation is not available publicly, permission is needed to access outside of those working within HMPPS. Where possible involve the individual subject in the assessment process. Completed based on written case information. Multiple sources of information.	Process evaluation of first version (SRG) – See Webster et al. 2017. Construct validity and structural properties (Powis, Randhawa and Bishopp, 2019). IRR in a field and research context (Powis, Randhawa-Horne, Elliott and Woodhams, 2019).
MLG	Assess individual's risk of engaging in group-based violence, which includes terrorism – ideologically neutral. Criminal justice, security, and mental health professionals. Pre-crime or post-crime – individuals who are part of a group or affiliated with a group (including lone actors). Assist in risk management. Risk viewed as dynamic, re-assessment over time to monitor change. Recommended to use with other relevant risk assessment tools in case of terrorist violence. Age 14 or over. In use in North America and Europe.	Original MLG consisted of 20 risk factors. The second version has 16 risk factors under four domains: individual. Individual-group, group, and group-societal. Developed based on systemic literature review of group-based violence literature and feedback from 13 experts. Summary judgements and risk management plans included. Assessors can consider other case-specific factors. No specific protective factors but consider as part of formulation.	Guidance document provided. Open access tool through purchase. Training is available but not mandatory. Ideally completed in a team - Suggested to have one member who is a subject matter expert of the group the person ascribes to. Multiple sources of information used. Where possible involve the individual subject in the assessment process.	Utility and reliability (Cook, 2014) Concurrent validity, reliability, and conceptual analysis (Hart et al., 2017).
VERA	All types of violent extremists; violent offenders motivated by ideology (ideologically neutral). Professional staff including psychologists who preferably have experience in individual assessments. Post-crime in those convicted of violent extremist or terrorist designated offence, suggests used with caution in cases where individual is under	Based on violent extremism literature and consultation with experts, as well as those who had trialled the first version in high security prisons in Australia. 31 indicators in the second version under five domains: beliefs and attitudes; context and intent; history and capability; commitment and motivation; and protective factors.	Multiple assessors recommended in earlier versions. Where possible involve the individual subject in the assessment process. Used to compliment comprehensive risk assessment process. Guidance provided, first VERA is available publicly, recent versions not	Original VERA process evaluation and interrater reliability on 5 open-source cases (Beardsley & Beech, 2013). Independent studies to explore VERA-2's utility and validity but no published studies identified.

	surveillance by law enforcement but VERA-2R is for pre-crime and post-crime use. Risk viewed as dynamic, re-assessment over time recommended to monitor for change – focus is on current presentation of the individual so historical indicators are discussed in relation to this. In use in Europe, North America, Australia, South-East Asia. Youths and adults (VERA-2R).	VERA-2R (2018 version) not publicly available – three additional motivational indicators, 11 additional evidence-based indicators, a total of 34 indicators over 5 domains (Lloyd, 2019). Risk judgment statement made following review of all information. Protective factors are included. Scenario planning can be used.	publicly available, only available through attending specified training. Use multiple sources of information.	Evidence of construct validity of VERA-2 using comparison group highlighted in book chapter but not published as a study (Pressman & Flockton, 2014). VERA-2R version – no published research identified.
TRAP -18	Threat assessors, counterterrorism and other law enforcement officials who need to prioritise cases and resources based on imminence of risk. Pre-crime – those of concern for engagement in ideologically motivated violence (ideologically neutral). Focused on lone actor terrorist threat, rather than group actor terrorists, although research has demonstrated use with group-based offenders. Prevention rather than prediction. Proximal warning behaviours are dynamic risk factors. The majority of distal characteristics are static risk factors. Presence of one proximal warning behaviour signals need for active risk management. In use in Canada, US and Europe – not officially adopted by any government or agency (Lloyd, 2019).	8 proximal warning behaviours (pre-attack signals based on literature). 10 distal characteristics (theory-based, relating to mind-set of the lone-actor). Developed based on lone actor terrorism literature, authors practice experience and current research. Factors coded rather than scored and final assessment is made as to whether to monitor the case or actively manage. Protective factors not included although absence of indicators could be considered protective. Formulation question included/ scenario planning. Cases prioritised for active risk management or monitoring based on indicators coded.	Case information, public records and where possible direct interview (difficult in pre-crime case). Manual guidance provided - not publicly available. Training is available for threat assessment professionals.	Content validity with Islamist terrorists in Germany (Böckler et al., 2021). Feasibility and relevance with jihadism inspired lone actors (Brugh et al., 2020). Postdictive validity in ERW domestic terrorist sample (Challacombe & Lucas, 2018). MDS analysis comparing North American lone actor attackers and non-attackers (Goodwill & Meloy, 2019), Forensic linguistic analysis of violent manifestos to examine feasibility of the TRAP-18 with limited data (Keupper & Meloy, 2021), Interrater reliability and content validity (Meloy et al., 2015). Criterion validity, postdictive validity (Meloy & Gill, 2016). Construct validity with temporal sequencing of lone actor terrorists (Meloy et al., 2021). Construct validity by comparing North American lone actor attackers versus non-attackers (Meloy et al., 2019).

Table 9. *An Overview of the RTI International (2018, p. 5) Risk Factors for Radicalising to Violent Extremism - Overlap Across Identified Tools*

Risk Factors for Radicalising to Violent Extremism	ERG22+	MLG (2)	VERA-2	TRAP-18
Experiencing identity conflict/being a loner	●	●	●	
Feeling there is a lack of meaning in life	●		●	
Wanting status	●		●	
Failing to achieve aspirations	●	●	●	●
Wanting to belong/trouble with platonic relationships	●	●	●	
Trouble in romantic relationships	●	●		●
Desiring action or adventure/military experience	●		●	
Having experienced trauma/abuse	●			
Having mental health issues or being emotionally unstable/ troubled	●	●	●	●
Being naïve or having little knowledge of religion and ideology	●		●	
Having strong religious beliefs/extremist ideology	●		●	●
Having grievances	●		●	●
Feeling under threat	●			
Having an "us versus them" world view	●	●	●	●
Justifying violence or illegal activity as a solution to problems	●	●	●	
Having engaged in previous criminal activity	●	●	●	●
Involvement with a gang or delinquent peers	●	●	●	●
Stressors (e.g., a family crisis, being fired from a job)	●	●		●
Societal discrimination or injustice	●		●	
Exposure to violent extremist groups or individuals	●	●	●	●
Exposure to violent extremist belief systems or narratives	●	●	●	
Family members or friends in violent extremist network	●		●	

Table 10. *An Overview of RTI International (2018, p. 6) Risk Indicators - Overlap with Assessment Tools*

Potential Behavioural Indicators that an Individual is Radicalising to Violent Extremism	ERG22+	MLG (2)	VERA-2	TRAP-18
Seeking information on a violent extremist ideology	●		●	
Withdrawing from society or existing relationships	●	●	●	●
Engaging in conflict with family/others (e.g., teachers, religious leaders)	●			●
Making dramatic lifestyle changes (e.g., unexpectedly quitting work, leaving home)	●			●
Immersing oneself with violent extremist peers	●		●	●
Joining or staying in a violent extremist organization	●		●	●
Making public statements about violent extremist beliefs	●		●	●
Expressing threats or the intent to engage in terrorist activity	●		●	●
Engaging in preparatory activities related to an attack (e.g., training, obtaining weapons and materials, conducting surveillance	●		●	●
Others becoming aware of one's grievances	●		●	●

Based on this brief comparison of the four SPJ tools and their alignment with the RTI international (2018) risk factors and indicators, there appears to be considerable overlap across measures; this was to be expected considering the evidence base drawn upon to identify or cross reference risk factors. Specifically, all of the tools appear to contain risk factors or indicators relating to the individual being exposed to violent extremist groups or individuals, having engaged in previous criminal activity, having involvement with a gang or delinquent peers, having mental health issues or being emotionally unstable, failing to achieve aspirations, having an "us versus them"

worldviews, and evidence of the individual justifying violence or illegal activity as a solution to problems.

The ERG22+ and VERA-2 appear the most similar risk assessment tools in terms of the risk factors covered within their risk items. The ERG22+ does however appear to cover a broader range of the risk factors identified within the literature, which is likely due to the need to include a larger range of offences, i.e., non-violent extremist offences. The MLG's risk factors are also understandably broader given the focus on group-based violence and therefore, not solely focused on violent extremist offending. The TRAP-18 has a greater number of risk indicators in comparison to the other tools, given its focus as an investigative template for operational purposes in the pre-crime space. Moreover, the TRAP-18 risk items are drawn largely from the threat assessment literature and direct clinical work with clients from a psychoanalytical perspective.

Discussion

General Findings

The current review yielded nineteen papers, with fifteen of these being empirical studies related to the risk assessment of extremist offenders and those potentially vulnerable to engaging in extremist offences. Specific tools identified were the ERG22+, MLG, VERA (second version, although noted the VERA-2R is the current format), and the TRAP-18. What is clear across measures, from the papers identified, is that there is limited evidence of validity at present given their infancy, with all the tools representing work in progress (Lloyd, 2019) and providing caveats about the need for further validation attempts. It appears that analyses are taking place, and even within the

short time between the initial literature search and updated search (2018 to 2021), several research papers on the TRAP-18 were identified which demonstrated more sophisticated research methods (use of comparison groups to measure postdictive validity, ROC analyses); something which was lacking for the other identified SPJ tools.

Strengths and Weaknesses of the Current Review

The current review does have some potential limitations. The review is focussed solely on SPJ risk assessment tools developed to assess extremist offending risk or vulnerability towards extremist offending, therefore other risk screening tools such as the IVP were excluded. Including a wider range of risk measures may have offered useful information to inform clinical and research practice, however for comparison purposes, it was considered valuable to only include SPJ risk assessments used clinically and operationally. The current review searched for English language papers only, however given that these tools are all utilised across the US and Europe and based on the previous systematic review by Scarcella et al. (2016), it was not considered that this would have severely limited the results. The current review did offer an additional search of the main terrorism journals, as well a search of the grey literature, to ensure that all key papers in English were identified. Due to the lack of available research in the public domain, a broad inclusion and exclusion criteria was adopted, and papers were included regardless of their quality assessment findings. The MMAT does not provide cut-off scores for poor quality, instead the limitations are highlighted and commented on within the results table. The lack of a quality score for each empirical paper does make comparisons less clear-cut. As discussed, there were several key

limitations across the studies and some studies were particularly limited in terms of their measures (Cook, 2014) and sample (Beardsley & Beech, 2013; Hart et al., 2017).

It is important to highlight that manuals and guidance documentation for all of the risk assessment tools, apart from the ERG22+, were unobtainable for the purposes of the review. The ERG22+ manual was obtained under an educational license and therefore was not incorporated into the current review, although it was helpful for comparison purposes. The manuals and guidance documents would have offered more detailed descriptions of the risk assessment tools and would have likely provided greater clarity regarding the theories and literature with which the risk items were informed. Although this is understandable given the potential security implications of such risk assessments being available in the public domain, it limits the ability for researchers outside of the tool's developers and owners to be able to add to the evidence base or replicate findings; this is one key factor that has likely stalled the development of these SPJ tools.

This review identifies and compares the key SPJ risk assessment tools available specifically for extremist offending and identifying vulnerability towards extremist offending. It offers an overview of the extent, or lack of, current research demonstrating the validity of these widely used risk assessments and the main limitations of these studies. Although the specific risk assessment tools are in their infancy in terms of development and require further research to validate them adequately, the lack of published empirical evidence for three of these tools (ERG22+, VERA and MLG) raises some concerns. Particularly, given the nature of these tools in contributing to potentially life-changing judgements about the risk that a person may pose now and in the future. Positively, the TRAP-18 is demonstrating some progress in terms of demonstrating

postdictive validity of the tool and validity across ideologies, using different research methods (e.g., MDS and linguistic analysis).

Applicability of Findings and Limitations on Practice

Until recently, one of the challenges for professionals using these tools to inform decision-making was the lack of published information regarding their development. This was particularly noted for the ERG22+ and VERA. A report highlighting the ethical concerns of the ERG22+'s use prior to evaluation and peer review (Qureshi, 2016) called for the Home Office to publish the ERG22+ study in order to make it available for public scrutiny; positively, following this report the study by Webster et al. (2017) was published as well as two government papers evaluating the ERG22+ (Powis, Randhawa & Bishopp, 2019a; Powis, Randhawa-Horne, Elliott & Woodhams, 2019b). The specific evidence base for each of the VERA-2 items is not stated in the paper by Pressman and Flockton (2012) and it is suggested that this information will appear in a forthcoming paper that is not yet publicly available. This raises the debate of whether risk assessment and screening tools in the area of violent extremism and terrorism should be transparent and open to public and scientific scrutiny, or whether transparency poses significant security issues.

The findings presented offer some support for the usefulness of these measures and provide some evidence of initial validity and reliability, although these factors are minimally explored with the exception of the TRAP-18. The studies identify the clear need for continued validity attempts of these measures, as well as on-going research into the validity of identified key risk factors; this will support the development of new risk assessment tools and help to continually refine those already in use.

Implications for Future Research and Practice

It has been demonstrated that current risk assessment measures for general violence such as HCR-20v3 and Spousal Abuse Risk Assessment (SARA) do not adequately measure risk of extremist offences alone (Pressman, 2009) and therefore there is a need for more specific risk assessments to be used in combination to inform the decision-making process. Given that research is suggestive of some overlapping risk and protective factors for both extremist offending and general offending, it would seem plausible in certain cases to complete general violence risk assessment tools, such as the HCR-20v3, in combination with extremist risk assessment tools to contribute to the risk assessment process. It is suggested that assessing risk should not be "the function of one particular tool" (Hall, 2020, p. 9), however, there is no known empirical research looking at the benefits or limitations of using multiple risk assessment tools with extremist offenders and therefore this is an area for future research.

There are also a number of considerations to be raised about whether risk assessments should treat terrorists and terrorism as a single group or act, or whether risk assessments should be split to fit specific forms of terrorism (Monahan, 2012). On one hand, using definitions that are more generic offers the benefit of being able to access larger samples and therefore increase the statistical power when analysing risk assessment data (Monahan, 2012). On the other hand, it is likely that there are different risk factors that are more prevalent depending on the terrorist group, ideology or whether an individual acts alone without group membership. In addition to this, there may be distinct risk factors for initially becoming involved in terrorism compared to those who stay or continue to be involved (Monahan, 2012), as well as differences dependant on the role an individual plays in a terrorist operation (Gill & Young, 2011).

Ultimately, existing research has failed to find "valid non-trivial risk factors for terrorism" (Monahan, 2012, p.184-185). If valid risk factors are not yet identifiable, is it even possible to measure an individual's risk of terrorism accurately (Monahan, 2012)? On-going research attempting to generate empirical support for individual risk factors is therefore vital if we are to continue to develop more accurate risk assessments.

A further consideration when using these risk assessment tools, is the context within which the tools are to be used. As identified in the review, each of the measures, although based on a number of similar risk factors, are intended for use in a different context and therefore organisations using these frameworks should be aware of their intended purpose and closely follow the guidance documentation. Understanding the differences between risk frameworks is also important for professionals and enables informed decisions to be made around which frameworks work best under certain circumstances and dependent on the client group (Lloyd, 2019). In addition to this, the capacity of those identified to complete the assessment tool needs to be considered; importantly have they been given adequate guidance, time to complete assessments fully, and do they have adequate sources of information to base their decisions on? As Borum (2015a) identifies, "assessing risk and preventing involvement will require that an evaluator to understand the function and meaning of potential causes, behaviors, and roles for the individual" (p.79). Without the adequate training, awareness of ethical issues and professional boundaries, especially given the lack of rigorous empirical base to guide assessment, professionals may leave themselves vulnerable to allegations (Gudjonsson, 2009). Professional guidelines are now available to support practising psychologists involved in the field of extremism, violent extremism and terrorism (BPS, 2018) which is a welcome development.

Given that the risk assessment tools identified within this review have been used within clinical and operational contexts for some time, there is available data from scored assessments to inform further postdictive validation attempts and interrater reliability studies. Avenues of future research to support the development of the identified risk assessment tools could involve further use of MDS methods to look at factors that are more likely to co-occur together (Gill, 2015b) and explore the sequencing of behaviours in order to get a greater understanding of which risk factors tend to proceed others (Gill, 2019). Validation attempts need to further explore subset comparisons, as demonstrated through the initial TRAP-18 evaluation studies, for example comparing different ideologies, different terrorist groups and different extremist offences (Gill, 2015b).

Ultimately, the ethical dilemma of utilising measures that have not yet evidenced clear empirical support or where empirical support is based on small, non-generalisable samples weighted against having no risk assessment tools to guide decision making is difficult to resolve. It can however be argued that risk assessment tools are vital in order to help to target limited resources, to support front-line staff to spot potential signs that an individual in their care may need support, and to guide effective and proportionate decision making in those already convicted of extremist offences. As the opening quote acknowledges, risk assessment is born out of the need to prioritise and categorise risks, without such tools extremist offenders were at risk of being automatically labelled as high-risk offenders regardless of their offence or consideration of their treatability. It has been suggested that current risk assessment tools are clear in their scope and are there to guide the decision-making process, providing a valuable staring place to determine appropriate interventions and treatment

options for individuals (Van der Heide et al., 2019). As such, their use at least can offer

some hope to both offenders, that their case will be regularly reviewed and appropriate

treatments and support identified, and to the public in working towards reducing the risk

of future extremist violence occurring.

Chapter Three:

Mass Casualty Terror Events: An Exploration of Critical Personal and

Behavioural Characteristics using Multi-Dimensional Scaling Analysis

Abstract

Given the heterogeneity of extremist offenders, the importance of disaggregating such offenders for research purposes has been highlighted within the literature (Corner et al., 2016; Pelecijn et al., 2021; Victoroff, 2005). This exploratory study focuses on front-line roles, those that directly perpetrate acts of violent extremism. Further, this study looks at key individual characteristics and attack characteristics of those that carry out mass casualty terror attacks across Western Europe. Descriptive statistics are provided based on forty mass casualty attacks, with a broad Multi-Dimensional Scaling analysis (MDS) outlined for the attack characteristics of the whole sample. Given the high numbers of lone actors ($n = 34$), a more detailed Smallest Space Analysis (SSA) looking at the lone actor characteristics and attack characteristics in isolation is outlined. Within the lone actor sample, five facets emerged from the data, 'Planned Suicide Attacks', 'Political and Racial Attacks', 'Emotionally Unstable Pathway', 'Criminal Pathway' and 'Radical Pathway'. The results are discussed in relation to the current literature and are broadly supportive of a pathways approach towards violent extremism (Lloyd, 2012; Lloyd & Kleinot, 2017).

"Vehicles are like knives, as they are extremely easy to acquire. But unlike knives, which if found in one's possession can be a cause for suspicion, vehicles arouse absolutely no doubts due to their widespread use."

Exert from Rumiyah Islamic State (IS) magazine, cited in Böckler et al. 2017, p. 1

The act of terrorism involves the use of violence, or threatened violence, that is ideological in nature (Ritchie et al., 2019). However, not all acts of terrorism will result in physical harm to others and not all extremist offenders will have perpetrated violent acts. Despite terrorism accounting for less than 0.01% of deaths across Europe, the public understandably have high levels of concern about becoming a victim of terrorism; this in part may relate to the media reporting of terrorism, which often dominate news cycles (Ritchie et al., 2019). Although it is important to keep the threat of terrorism in perspective, it is of course true that terrorist attacks are highly emotive by their nature and can lead to a significant loss of innocent life. Given the widespread impact of terrorist incidents, counterterrorism has become a top priority across European countries (Council of the European Union, 2022).

Terrorism Globally

Global terrorism peaked in 2014 with terrorist violence around the world resulting in more than 44,000 deaths from almost 17,000 attacks (Miller, 2020). Positively, terrorism has been declining over the past six years, with global deaths between 2014 and 2019 reducing by half (Miller, 2020). More recent terrorist attacks have been heavily concentrated in Afghanistan, Yemen, Iraq, India and Nigeria (Miller, 2020). When looking at terrorism deaths globally, Iraq and Syria combined account for one-in-three terrorism deaths (Ritchie et al., 2019). Iraq is the country that has

experienced the most terrorist attacks consistently since 2013, with Islamic State attacks killing over 500 victims in more than 350 attacks in the year 2019 alone (Miller, 2020).

Within Western Europe, mass casualty terrorist attacks remain relatively rare despite their continuous occurrence in recent years (Miller, 2019).[3] Although terrorism is not new in Europe, the threat has evolved following the September 11th attacks in America and is now present on a more global scale (Voronova, 2021). 753 people are reported to have lost their lives in terrorist attacks that took place across the European Union (EU) between 2000 and 2018, with most fatalities occurring as a result of jihadist terrorism (Veronova, 2021). Attacks carried out by individuals with far-right, anti-Muslim, or white nationalist beliefs are however on the rise in Western Europe, accelerated by technological advances such as social media and use of gaming platforms, which have supported the connections between organisations and the ability to reach younger, global audiences (Böckler et al., 2021; Europol, 2021; Pauwels, 2021; United Nations, 2019). The most recent data from the year 2020 shows a slight decrease in terrorist attacks across the EU, possibly an impact of the pandemic, however the number of thwarted attacks has remained stable, highlighting that the threat of terrorism remains (Europol, 2021; Voronova, 2021).

As chapter one highlighted, despite the long history of terrorism our understanding of the phenomenon is always adapting over time. This is often driven by the emergence, or re-emergence, of different terrorist organisations as well as the changing tactics used in the recruitment, radicalisation, and the means of perpetrating terrorist attacks (Horgan, 2014). Within Western Europe the period beginning in the late

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[3] 2019 saw 191 attacks resulting in 18 deaths and around 100 victims (Miller, 2020).

1960's and lasting for almost 30 years, was known as 'The Troubles' in Northern Ireland (BBC, 2012). Annual deaths in the 1960's and 1970's across Western Europe, specifically concentrated in the United Kingdom, were particularly high during this period (Richie et al., 2019). The early 1990's saw the start of the peace process, ultimately leading to the Good Friday Agreement in 1998, which contributed to a reduction in annual deaths attributed to terrorism (BBC, 2012; Richie et al., 2019); A trend that has largely continued since this time (Richie et al., 2019). There are of course peaks in terrorist related deaths across Europe in certain data years due to the occurrence of mass casualty attacks, for example the Madrid train bombings in 2004, the Paris attacks in 2015, the Berlin Christmas market attack in 2016 and the UK attacks in 2017 which saw high numbers of fatalities and many more injuries (Richie et al., 2019).

One way in which terrorism has adapted in more recent history is with the promotion of leaderless resistance. Over 25 years ago the former leader of the Ku Klux Klan encouraged his followers to adhere to a model of leaderless resistance, whereby small cells and individuals were encouraged to engage in violence independently, without involvement of higher leadership or a centralised terrorist organisation (Böckler et al., 2017; Sweeney, 2019). Over time similar requests were made of other right-wing terrorist groups and across terrorist groups of different ideologies; most notably demonstrated with Al Qaida, and more recently the ability of Islamic State (IS) to inspire sympathisers to carry out violent attacks in their own countries and towards the West (Böckler et al., 2017; Michael, 2012). The leaderless resistance model has led to an increase in homegrown, lone actor, terrorist attacks, often using less sophisticated strategies whilst still having lethal consequences (Europol, 2018; 2019). Such attacks by

their nature can often present intelligence agencies with additional challenges to detection as the opening quote highlights. In the year 2020, IS and al-Qaeda continued to incite unaffiliated, lone actor attacks in Western countries, with all completed jihadist inspired attacks being carried out by lone actors with Modi operandi that tended to involve vehicular attacks, stabbing and arson (Europol, 2021). Such attacks are often guided and inspired through the internet (Böckler et al., 2017) and their media coverage can trigger copycat style attacks (Pressman, 2003). Observing the changing tactics employed by terrorist organisations and the messages that are relayed to those inspired by such groups, particularly online, is helpful in preventative counter-terrorism efforts (Voronova, 2021).

Violent Extremist Offenders

Given the clear heterogeneity of extremist offenders, the importance of disaggregating the population into smaller groups for analysis has been argued by many experts (Corner et al., 2016; Pelecijn et al., 2021; Victoroff, 2005). One way of doing this is by focusing on the roles and functions the offender plays within a group (or alone), acknowledging that it is likely that those directly involved in carrying out violent extremist acts may have different individual characteristics than say a recruiter, a bomb maker or someone who commits non-violent extremist offences, such as accessing propaganda material online or funding terrorism (Gill & Young, 2011; Horgan, 2014; Perliger et al., 2016) Moreover individuals may change roles over their terrorism career or occupy multiple roles (Taylor & Horgan, 2006). As such, it has been argued that violent extremism should be treated as a "special case of extremism" (Kruglanski et al., 2017, p. 217). In a comparison of violent and non-violent actors, Knight et al. (2019) found that violent lone and group actors had more often been

rejected by others and had experienced a personal crisis than non-violent actors. Moreover, violent lone actors often presented more frequently with psychological issues, reported sexual frustrations, problems with self-esteem and poor social skills (Knight et al., 2019). Some of the studies identified within chapter two also highlighted differences between violent and non-violent offenders within the context of validating extremist risk assessment tools (Böckler et al., 2021; Challacombe & Lucas, 2018; Goodwill & Meloy, 2019; Meloy et al., 2019.

Some studies have focused on certain terrorist roles, in particular suicide bombers (Lankford, 2014; Lester et al., 2004; Merari et al., 2009). Lankford (2014) proposes that those who commit suicide bombings have characteristics in common with those who commit suicide or murder-suicide and as such may have suicidal motives, mental health problems and personal crises. Merari et al. (2009), compared a small sample of failed Palestinian suicide terrorists to a control group of non-suicide terrorists and a group of suicide attack organisers. They found that organisers scored higher in ego strength (i.e., the ability to cope with both internal and external stress, as well as regulate emotions), with greater resources to cope with stress and help initiate and plan actions. The authors hypothesise that the suicide bomber group may be more susceptible to outside pressure given that the majority were assessed as having characteristics of cluster C, avoidant and dependent personality disorder styles. Moreover, a significant number of the suicide bomber group displayed sub-clinical suicidal characteristics, some with depression and Post Traumatic Stress Disorder (PTSD). Generalisability is clearly a limitation of such a study; however, it highlights how research that disaggregates by role can provide interesting avenues for further enquiry. It is suggested that certain symptoms or personality characteristics might also actually be attractive to

recruiters for specific roles within a terrorist group (Bubolz & Simi, 2019); this may be helpful when looking at vulnerability to extremist offending and how to intervene early. Victoroff (2005) recommends that future research explores whether different types of terrorism attract psychologically different types of individuals; such a notion could help to further develop risk assessment and treatment practices, allowing for a more tailored approach.

Models of Violent Extremism

Given the focus on prevention and management of extremist violence risk in particular, a range of theories and models have been developed across a breadth of disciplines to explain the phenomenon. As the opening two chapters surmise, violent extremism is widely explored but remains inadequately understood (Pelecijn et al., 2021). Existing models have attempted to explore *why* individuals may engage in acts of violent extremism by looking at causal factors at an individual level and the *process* of violent extremism in terms of how individual factors interact over time across different phases of engagement (Pelecijin et al., 2021). Some of these theories and models were outlined in the preceding chapters, however Pelecijn et al, (2021) offer a comprehensive, integrated model, using a theory-knitting approach to explain the process towards violent extremist offending which is helpful to summarise.

Pelecijn et al. (2021), in their integrated theoretical model of (violent) extremism, explain a dynamic and non-linear process that results in "multiple individual pathways toward (violent) extremism" (p. 14). Within their analysis, Pelecijn et al. found that pre-disposing life events, background factors and grievances; cognitive openings; identification with a violence justifying in-group; and violent ideology were

overlapping across a range of existing violent extremism models. Pelecijn et al. suggest that various external and internal factors, at the micro, meso and macro level (many of which were discussed in chapter one), can contribute to the process, but note that it is the *personal significance* of these factors to the individual that is important. Pelecijn et al. discuss how significant life experiences, which don't always have to appear to be major life events, can have a longer-term impact on an individual or can become of subjective importance to the individual at a later point in life, even if not seemingly significant to them earlier on in the trajectory; it is thus critical to understand the experience and impact of such external factors (e.g. group processes, life events) on the individual, over time.

Given that these internal psychological processes are not necessarily observable and therefore make assessing risk difficult, Pelecijn et al. (2021) note that it is of vital importance that both insider (how the process occurs/ was experienced by the individual), and outsider perspectives (visible process noted by family members, friends, colleagues, practitioners, and academic researchers) are gained in order to achieve a more complete understanding of the process towards violence extremism. The key point Pelecijn et al. make is that researchers, practitioners, and intelligence agencies need to talk to these individuals in order to explore and begin to understand how individual factors interact and how the personal significance of different predisposing life events may change the course of the individual journey towards extremist violence. This is where SPJ extremist risk assessments can be useful for practitioners through the development of a comprehensive formulation of risk co-produced from both the individual offender's perspective and the outside perspective. Researchers may benefit from studying such formulations in order to identify themes in risk factors highlighted,

as well as explore the needs that the offending behaviour may be meeting for the individual.

Lone Actor Typologies

Liem et al. (2018) identified that 79 lone actor attacks took place between 2000 and 2016 in Europe, with such acts often considered difficult to predict and thus prevent (Europol, 2021). Lone attacks can be inspired by media reporting of terrorist attacks and online propaganda. Moreover, isolated incidents may be carried out by individuals suffering from mental health problems or psychological distress who have imitated attack behaviours, but their behaviour is not linked to terrorism, which is not always clearly identifiable (Europol, 2021). Each lone actor will differ in terms of their motivations; however, it is noted that sometimes the lone actors' motivations, for example personal grievances, may be layered with political rhetoric, possibly as a means of legitimising their actions (Fein & Vossekuil, 1999; Hoffman et al., 2011; Liem et al., 2018). Increasing research is beginning to highlight that it is not always the case that lone actor terrorist attacks are more difficult to predict or prevent (Pauwels, 2020; Schuurman et al., 2017). Lone actors are rarely completely alone and have often been found to provide others with indication of their intentions, offering opportunities for detection along the trajectory (Schuurman et al., 2017).

As chapter one touched upon, those who carry out acts alone can present with different characteristics to those who offend as part of a group; this is particularly highlighted within the exploration of mental illness differences (Corner et al., 2016; Gill et al., 2019). In addition to the differences in lone actors and group actors in terms of mental disorder prevalence, personality traits, trauma and other complex psychological

needs, it is also noted that lone actors may present with features of criminality alongside (Lloyd & Pauwels, 2021). Lone actor samples have tended to have high levels of criminality (Gill et al., 2014; Spaaij & Hamm, 2015) and the nexus between terrorism in general and crime has been widely noted (Europol, 2021; Schmid, 2018). Another frequently noted finding is that lone actors tend to be older and have higher levels of unemployment (Liem et al., 2018; Pauwels, 2020).

In terms of attack characteristics, these will vary in nature from case to case, however, it is noted that lone actor attacks may be more likely to fail and less lethal than group attacks, often due to having limited resources available and therefore the use of less sophisticated methods, such as knife attacks or arson (Liem et al., 2018; Lloyd & Pauwels, 2021; Pauwels, 2020). However, this is not always the case as has been noted particularly with vehicular attacks, which have been extremely deadly at times (Pauwels, 2020). Firearms and the construction of explosive devices are sometimes the weapon of choice for lone actors, which can cause deadlier attacks (Pauwels, 2020; Schuurman et al., 2018). Lone actors may be more likely to engage in leakage behaviours, whereby information pertaining to their intent or motivation to engage in terrorist behaviour is expressed prior to their act either online or offline (Meloy & O'Toole, 2011; Lloyd & Pauwels, 2021). Schuurman et al. (2018) found that 86% of the lone actors in their sample had communicated their extremist beliefs to others online. Such behaviour along with the finding that lone actors often don't pay attention to operational security may provide greater opportunities for detection (Schuurman et al., 2018). As discussed in chapter one, lone actors are rarely completely isolative and often have some form of online or offline ties to extremist organisations or radical milieu,

which may provide motivation and encouragement to engage in acts of violence (Schuurman et al., 2018).

Given the increasing threat of lone actor terrorism across Europe, particularly perpetrated by actors adhering to jihadi and right-wing ideologies (Pauwels, 2020), there have been attempts to identify typologies of lone actor terrorists, looking at clusters of characteristics that might describe different lone actors to help with preventative or counterterrorism measures. Clemmow et al. (2019) for example identifies four typologies based on the interactions between individual factors and environmental factors in a pre-existing data set of 125 lone actor terrorists (Corner et al., 2019a); the typologies were named as *solitary, susceptible, situational* and *selection*. Within the sample, the *solitary* typology tended to present as more stable, less stressed, more alone, and with less likelihood of leakage behaviour in comparison to the other typologies, therefore being more likely to pose problems for detection at the earlier stages of the attack process (Clemmow et al., 2019). The *susceptible* typology is reflective of lone actors who may be more impulsive in nature, have impairments in executive functioning, anti-social or violent tendencies, and may be cognitively susceptible to exposure to radicalisation in the form of mental illness and psychological distress (Clemmow et al., 2019); again, such a typology might pose problems for counterterrorism given that increased impulsivity could prompt sudden attacks or changes to plans. The *situational* typology is reflective of the impact that stress can have on the lone actor, who may initially present as stable but can be impacted by situational stressors such as unemployment, relationship breakdowns or being disrespected; such stress, often referred to as a trigger event or crisis, can lead to increased emotional distress in the form of anger and desperation (Clemmow et al.,

2019). Such lone actors are likely to engage in leakage behaviour closer to the attack, possibly allowing for detection and appropriate preventative intervention such as support with developing coping skills and stress management techniques (Clemmow et al., 2019). Finally, the *selection* typology was reflective of individuals with a criminogenic propensity for violence through the presence of violence supportive beliefs; these individuals tended to appear stable, with little evidence of stressors and such individuals may be more likely to engage with like-minded individuals in both criminal and extremist settings (Clemmow et al., 2019). Such a typology is similar to those committing homicides and mass murder, whereby traits such as narcissism, sadism and lack of empathy may be noted more frequently (Clemmow et al., 2019). These lone actors may have greater capability given that they are less likely to suffer from mental illness or have problems with executive functioning and may have experience of previous violent behaviours; however, they often demonstrate leakage behaviours in the build up to the attack and therefore may be known to authorities prior to their attack (Clemmow et al., 2019). Clemmow et al. (2019) express some of the limitations to the study in terms of the use of open-source data and the coding of missing data, nonetheless their description of these four typologies offers useful insights to inform counterterrorism approaches, but crucially highlights that different interventions may be required to meet different offenders' needs; an approach that fits with the Risk-Need-Responsivity (RNR) model of general offender assessment and management (Andrews & Bonta, 2006).

More broadly, McCauley and Moskaleno (2020) identified two possible profiles of lone-actor terrorists which they called Disconnected-Disordered (DD) and Caring-Compelled (CC). The DD lone actors tended to be socially disconnected loners, often

experiencing grievances, depression or other mental health problems, broken relationship ties and were considered more likely to have had weapons training (McCauley & Moskaleno, 2020). McCauley and Moskaleno (2020) suggest that such lone actors may present with similar characteristics to assassins or school shooters, however it may be the way in which this grievance is expressed that determines whether such an act is considered as terrorism or not; they note that future research is needed to explore similarities and differences between these forms of violence. In contrast, the CC profile are those lone actors who do not have signs of mental illness and are not alone but still engage in terrorist violence; the CC lone actors are considered to have acted due to emotions brought about by caring greatly about the suffering of others (sadness, anger, or outrage) and therefore feeling they have a moral obligation to attack perpetrators of violence against those that are cared about (McCauley & Moskaleno, 2020). Such typologies again reflect the different pathways that may contribute towards violent extremist offending and broadly align with ideas of a more psychologically distressed pathway, a criminal or opportunistic pathway and a moral pathway (Lloyd, 2019).

Given the differences identified both across the broader lone actor and group actor typologies, as well as between those who engage in violence and those who commit non-violent extremist offending, it is argued that there needs to be a shift "toward constructing multidimensional and disaggregated studies of terrorist profiles" (Perlinger et al., 2016, p. 227). Although Gill et al. (2014) cautions against an over-reliance on the use of profiles given that many individuals may share characteristics with violent extremist offenders but not engage in such offences themselves. Gill and Young (2011) do however note that the profiling approach when disaggregating

extremist offenders into specific role types can provide useful insights to inform counterterrorism efforts, for example by suggesting what roles an individual might take up following recruitment. Horgan et al. (2018) shares enthusiasm that recent research has given way to "more fruitful approaches" in attempting to differentiate terrorists across ideologies and between lone and group actors (p. 84). Similarly, Lester et al. (2004) notes that there are indications that psychological profiles might be possible in the form of disaggregated typologies of different terrorist subtypes. This could include the lone actor typologies described by Clemmow et al. (2019) and McCauley and Moskaleno (2020), as well as looking more specifically at different roles. It is noted that such a task relies on studies using detailed biographical information (Lester et al., 2004).

Attack Behaviours and Violent Extremist Characteristics

In 2018 and 2019, two-thirds of terrorist plots were thwarted within the EU (Europol, 2021). Unfortunately, not all attacks will be successfully thwarted given some of the issues discussed regarding the use of simple, less detectable methods; the impulsive nature of some attacks; the operational security measures that some offenders are able to employ, particularly with the greater use of encrypted communication systems; and at times leakage behaviours going unreported (Dudenhoefer et al., 2021; HM Government, 2018). Moreover, given the sheer volume of cases that intelligence agencies have to contend with at any one time, as well as the thousands of subjects who have previously been involved in active investigations, it is a seemingly impossible task to ensure that none of these individuals successfully carry out acts of violent extremism. Yet, reducing the number of successful attacks and limiting the casualties clearly remains a top priority within counterterrorism.

Given that research to date shows there is no consistent profile of violent extremist offenders (Gill et al., 2014), it has been suggested that when focusing on counterterrorism and prevention of extremist offences, it may be more helpful to focus on the offenders' behaviours, rather than their individual characteristics (Gill, 2019). Behaviours are more easily observable than individual characteristics and therefore helpful in terms of risk assessment and prioritisation of cases by intelligence services. However, as Pelecijn et al. (2021) highlight, internal experiences are also important to explore if we want to expand knowledge of key individual characteristics; such an understanding is needed to support early intervention once a vulnerable individual is identified and in the treatment of offenders with the aim of reducing recidivism.

Aims of the Current Research

The present research offers an exploratory analysis of successfully completed terrorist attacks (true positives) taking place across Western Europe over a 20-year period using a multi-dimensional scaling analysis (MDS). The events included have all resulted in multiple casualties and are therefore reflective of some of the most severe forms of violent extremism. This focus, purely on violent extremist offenders that were successful in nature and attacks causing multiple casualties, fits with the recommendation for disaggregating terrorist offenders by roles (the focus in this case being those directly involved in carrying out the attack) and ultimately violent offenders. Moreover, exploring mass casualty terrorist events in isolation appears to be a novel approach, given that other analyses of terrorist events and actors known to the author have not focused specifically on those perpetrating the most harmful of attacks, a clear priority for counterterrorism. Both the key behaviours noted within these attacks, as well as some of the individual characteristics of those directly involved in carrying

out the attack will be analysed; therefore, offering some exploration of both internal and external characteristics as recommended by Pelecijn et al. (2021). The study ultimately seeks to identify whether certain features within mass casualty terror events and their perpetrators occur together, with the aim of contributing to the terrorism literature supporting detection and early intervention.

Despite the exploratory nature of the research, it is hypothesised that discrete underlying factors within the data may be indicative of the different pathways towards violent extremism previously reflected in the literature, for example a criminal pathway and a psychological distress pathway (Lloyd, 2012; Lloyd & Kleinot, 2017). Moreover, it is expected that more sophisticated weapon choice, such as bombing, will be more likely to co-occur with greater planning and connection to a terrorist group (less isolated offenders), whereas more impulsive acts may be more frequently co-occurring with less sophisticated methods such as melee weapon attacks or vehicular attacks. It is also hypothesised that within the lone actor sample, there will be a number of actors who have known psychiatric histories, signs of psychological distress and suggestions of past trauma experiences, consistent with the research outlined in chapter one. It is speculated that the underlying factors that emerge from the data will help to drive future hypotheses and research ideas, adding to the literature base around risk assessment and management of extremist offenders and those vulnerable to engagement. This research will also offer further exploration of the use of MDS methodology specifically applied to terrorist samples.

Method

Sample and Procedure

The Global Terrorism Database (GTD) developed by the National Consortium for the Study of Terrorism and Responses to Terrorism (START, 2019) was used to identify terrorist attacks that took place across Western Europe between 1998 and 2018, covering a 20-year period. The definition of terrorism employed by the GTD is outlined in chapter one, but it is worth highlighting that the GTD codebook identifies that there is definitional overlap at times between terrorism and other forms of conflict and that cases are included within the dataset where they meet the codebooks basic definition of terrorism; where there are questions over how such an attack is classified, it is suggested that this will be documented within the dataset (START, 2021).

Given that terrorism is a high-impact, low-likelihood event, researchers tend to have to collect data over a longer time period to ensure numbers large enough for analysis (Horgan et al., 2016). The problem with this is that temporal factors can influence the findings and are sometimes neglected to be commented on within the research discussions (Horgan et al., 2016; Meloy et al., 2019). Certain behaviours may increase or decrease over time rather than remaining stable. For example, changes in technology might influence planning or leakage behaviour, and specific geopolitical world events lead to a fluctuation in certain types of terrorist events. Given the impact of temporal factors, whilst acknowledging the low numbers of offenders for analysis, a balance was sought between the time frame used within the data collection and gaining an appropriate number of cases to analyse using an MDS analysis.

The focus on Western European terror events for this analysis was chosen to improve the generalisability of the findings. It is acknowledged that there will be differences in terrorism taking place in other parts of the world given a range of factors such as, geographical location, history, population demographics, media reporting of terrorism, terrorism laws (including differences in the categorisation of terrorism), access to weapons and differing counterterrorism approaches (Oliverio, 2009; Koehler, 2016). Moreover, unfortunately terrorism research has been limited in its exploration of differences in terrorism across different regions of the world, but some data has demonstrated differences in lethality of attacks and weapons used in different geographical locations (Englund, 2018). Of course, even when focusing on events across Western Europe there will still be differences between countries.

Once all Western European terror attacks were highlighted within the GTD dataset for the period specified, attacks were then filtered based on the numbers of casualties and fatalities. Within the present study events were considered as 'mass casualty' when three or more individuals, excluding perpetrators, were injured, or killed within an attack. There is no universal definition of mass casualty events, however studies of mass murderers often classify multiple victims as three or four people (Horgan et al., 2016). Media reporting of terrorist attacks also tends to be more extensive in cases where there were more injuries and fatalities (Kearns et al., 2019; Richie et al., 2019). Given the rarity of mass casualty events, a cut-off of three victims was utilised within this study, with the hope of this being enough to warrant media coverage, whilst still low enough to include a wider sample of attacks.

Once a list of mass casualty terrorist events across Western Europe had been compiled, open-source data was collated relating to each event through tailored search

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strings using the LexisNexis database available through the University of Birmingham's library portal. Additional sources were gained from online reputable news sources based on tailored searches using the Google search engine (focused largely on mainstream tabloid newspapers), peer-reviewed journal articles outlining these attacks or offenders, the book by Gill (2015) and court transcripts where available. Open-source data has been widely utilised in the study of terrorism (Brugh et al., 2020; Challacombe & Lucas, 2018; Clemmow et al., 2019; Corner & Gill, 2015; Goodwill & Meloy, 2019; Meloy & Gill, 2016; Krupper & Meloy, 2021). Despite having limitations, the use of open-source data has contributed to important findings in the area (Clemmow et al., 2019). Where there was limited open-source information available for events, these were excluded from the analysis, a potential limitation of the study.

Measures and Coding

A preliminary coding framework was designed based on the existing literature, particularly looking at items within existing extremist risk assessment tools outlined in chapter two such as the TRAP-18 and the ERG22+, as well as the wider theoretical elements and typologies. The development of the codebook was an emerging process, with the framework being refined as the events were reviewed in order to consider commonly identified themes. The items within the coding framework (Appendix D) were loosely structured under overarching themes which included *key event details, assault type, planning, individual characteristics, motivation,* and *intent*. Items were largely dichotomous categorical variables coded as either 'yes' for presence or 'no' indicating that there was no evidence to suggest presence of the item. This is an important distinction to make, given that it can be difficult when using open-source data to differentiate between missing data from the reporting of an event and an item that

would be coded as a definite 'no' (Clemmow et al., 2019). In addition to these dichotomous variables, other items were incorporated for use within the descriptive analysis; these were either at the interval level of data (age of perpetrator, number of victims), descriptive level (such as country of birth) or involve categorical data with more than two levels (such as justification of violence categories and location targeted). The codebook offers a description of each variable and how to code the item to support a more standardised coding approach. A coding table for data extraction was produced for each event, with each variable name and the associated coding made based on a review of the identified open-source information.

In total 40 events were coded and included within the final data set, of these, 34 events were perpetrated by one key perpetrator (the lone actor sample) and six were carried out by more than one key perpetrator. It is noted that some of the events were coded differently to the structure of the GTD, in that where a perpetrator attacked multiple locations this was condensed into one event for analysis purposes and coded to highlight that the attack took place over multiple locations; the multiple locations within the GTD may be coded as separate events. Items were coded as present based on at least two independent sources presenting the information in order to reduce the impact on inaccurate information, apart from in the case of court transcripts where more detailed information was available. Given the time restraints of the study, five of the events were second coded by another researcher to provide a measure of inter-rater reliability; Cohen's Kappa was calculated for the dichotomous variables within the whole dataset and for each of the five events.

Statistical Analysis of the Dataset

Given that most of the events identified and included within the study were perpetrated by a single actor, with only six events having multiple perpetrators, it was not possible to complete an MDS analysis with the purpose of comparing the lone actors to the group actors as initially hoped. Therefore, a frequencies analysis of the full data set and of the lone actor data set in isolation was completed initially to determine the characteristics of the dataset and provide useful descriptive statistics. Following this, two non-metric MDS analyses were completed. The first analysis, using the PROXSCAL programme in SPSS (IBM, 2020), incorporated attack specific dichotomous variables from the full data set to look for any general patterns across the mass casualty terrorist attacks, this included the lone and group variables to see where they co-occurred with other variables. Given the potential for bias within the full sample solution due to the limited group perpetrated attacks included within the analysis, a more in-depth Smallest Space Analysis, or SSA (Guttman 1968) was then conducted using the Hebrew University Data Analysis Program (HUDAP) for the lone perpetrator events in isolation ($n = 34$); this included both dichotomous attack characteristics and several individual characteristics. SSA is ideal for eliciting facets within the data as part of an exploratory analysis; the interpretation of emerging facets should be based on the theoretically supported literature base on violent extremism, particularly lone-actor terrorism.

MDS is a form of multivariate analysis technique and "refers to a family of models by means of which information contained in a set of data is represented by a set of points in a space. These points are arranged in such a way that geometrical relationships such as distance between the points reflect the empirical relationships in

the data" (Coxon, 1982, p. 1); this distance is referred to as a Euclidean space (Bishopp & Hare, 2008; Groenen & Borg, 2013). The points are displayed in a visual map, wherein those variables that more often co-occur are plotted closer together (Meloy et al., 2018). Themes or facets are subjectively identified by the researcher based on these visual maps and existing theory (Guttman, 1982).

MDS is an exploratory technique that has been successfully applied within investigative psychology, being utilised in a range of studies exploring typologies and frequencies of specific criminal behaviours (Goodwill & Meloy, 2019); these have included sexual offending (Canter & Heritage, 1990) and hostage taking (Wilson, 2000). Furthermore, studies have now started to utilise MDS within terrorism research which has already offered useful insights (Goodwill & Meloy, 2019; Horgan et al., 2016; Horgan et al., 2018; Powis et al., 2019a).

Given that MDS solutions "are attempts to fit items to dimensional structures in Euclidian space" (Bishopp, 2003 p. 132) a degree of stress will be associated with the process. Goodness of fit is explored through this stress index, with Kruskall's *stress* (*stress 1*) being one such indicator commonly used (Bishopp, 2003; Goodwill & Meloy, 2019). Stress scores range between 0, which indicates a perfect fit, and 1, indicating the worst possible fit. The smaller the stress index, the better the data is considered to fit within the model (Mair et al., 2016), with stress scores greater than 0.20 considered poor (Kruskall, 1964). There is however some disagreement within the literature, with it being noted that interpretability is the most important consideration in MDS, and fit judgments should not be based entirely on stress scores as such a cut-off may be considered oversimplistic (Mair et al., 2016; Shye, 1988). Stress will increase when more variables are used within an analysis, and this does not necessarily automatically

mean that the results are uninterpretable, in fact larger set sizes can be advantageous (Hout et al., 2018). One way in which stress can be reduced is by adding dimensions, however as the number of dimensions used increases, the ability as humans to interpret such data is reduced (Bishopp, 2003); therefore, data within MDS is generally analysed within either a two-dimensional space or three-dimensional space.

Results

Inter-Rater Reliability

Inter-Rater Reliability (IRR) was calculated for the dichotomous variables across five cases between two raters. Total Kappa value for all five cases is .75 with a significance of $< .001$, representing moderate agreement between raters (Pallant, 2007). All cases achieved moderate to good IRR. Items where there appeared to be discrepancies between the raters included poverty/ financial problems and evidence of a tipping point; this may reflect the subjective nature of the coding for these items and as such they were not included within the MDS analysis but are discussed within the descriptive information.

Descriptive Results

Mass Casualty Full Sample

The sample consisted of 40 mass casualty events which were coded on a total of 91 variables. All events were carried out by male perpetrators with ages ranging from 17 to 57 years old. The age categories for the sample are shown in figure 5, demonstrating higher frequencies in the 18-25 age range and over 30's age range. Attacks most frequently occurred in the evening (32.5%), followed by the late afternoon

(17.5%), and as noted the majority of the sample (85%) committed the acts alone. Attacks took place across 11 countries: Belgium, Denmark, England, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, and Switzerland. Figure 6 shows the frequencies of the specific locations targeted within the full sample; in 27.5% of the sample multiple sites were targeted. Spree assaults, which involved melee weapon attacks (45%) and/or firearms (47.5%) occurred in 52.5% of the attacks; vehicular attacks occurred in 25% of attacks; and bombing occurred in 22.5% of attacks. The largest proportion of the attacks (30%) resulted in between three and five victims (casualties and fatalities combined), however 20% of attacks led to over 100 victims. Crosstabulation demonstrates that, as expected, attacks with the highest category of victims (100+) involved bombings in 75% of cases and vehicular attacks in 25% of cases. Attacks with the lowest victim category (three to five victims) involved spree assaults in 91.7% of cases and vehicular assaults in 8.3% of cases.

In terms of targets, the majority of attacks targeted civilians (82.5%), 35% targeted the military or police and 7.5% targeted government officials. 25% of attacks appeared to have a failed target, whereby the perpetrators had made reference to who the intended target of their attack was, and this target was either not at the scene or not harmed.

Figure 5. *Age Categories of Key Perpetrators of Mass Casualty Events*
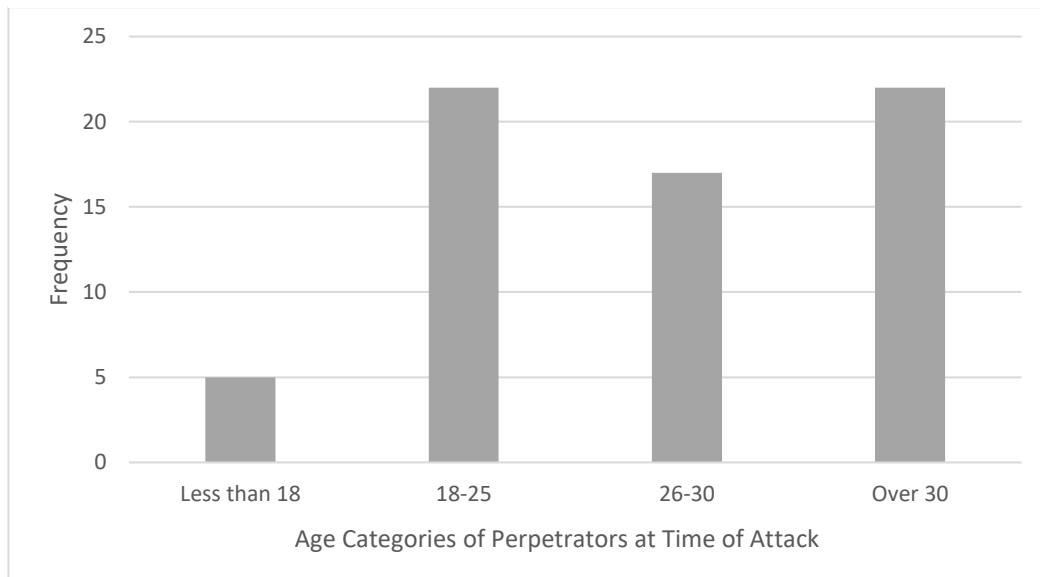
When looking at attack planning, 32.5% of attacks were classified as impulsive in nature, whereas 27.5% of attacks presented with evidence suggestive of detailed plans. Reconnaissance of the scene or of target identification was evident in 47.5% of attacks. Of interest, the target location appeared to be well-known to the perpetrator(s) in 77.5% of cases, although this was based on the perpetrator(s) having lived in the area which does not necessarily imply that they knew the location well but would fit with concepts of geographical profiling (Rossmo, 2018). Interestingly, in 55% of cases attacks were coded to demonstrate that perpetrators were known to authorities in some form prior to the attack taking place, suggesting that earlier detection may have been possible. In 50% of cases a group claimed responsibility for the attack; in the majority of these cases this was Islamic State (42.5%). In terms of evidence of ideology, in most cases perpetrators evidenced jihadist ideologies (65%), 15% of cases involved perpetrators with suspected right-wing ideologies and 20% had no clear evidence of

ideology based on the available data. Finally, some form of leakage behaviour was documented in 42.5% of cases.

Figure 6. *Locations Targeted Across Mass Casualty Events*
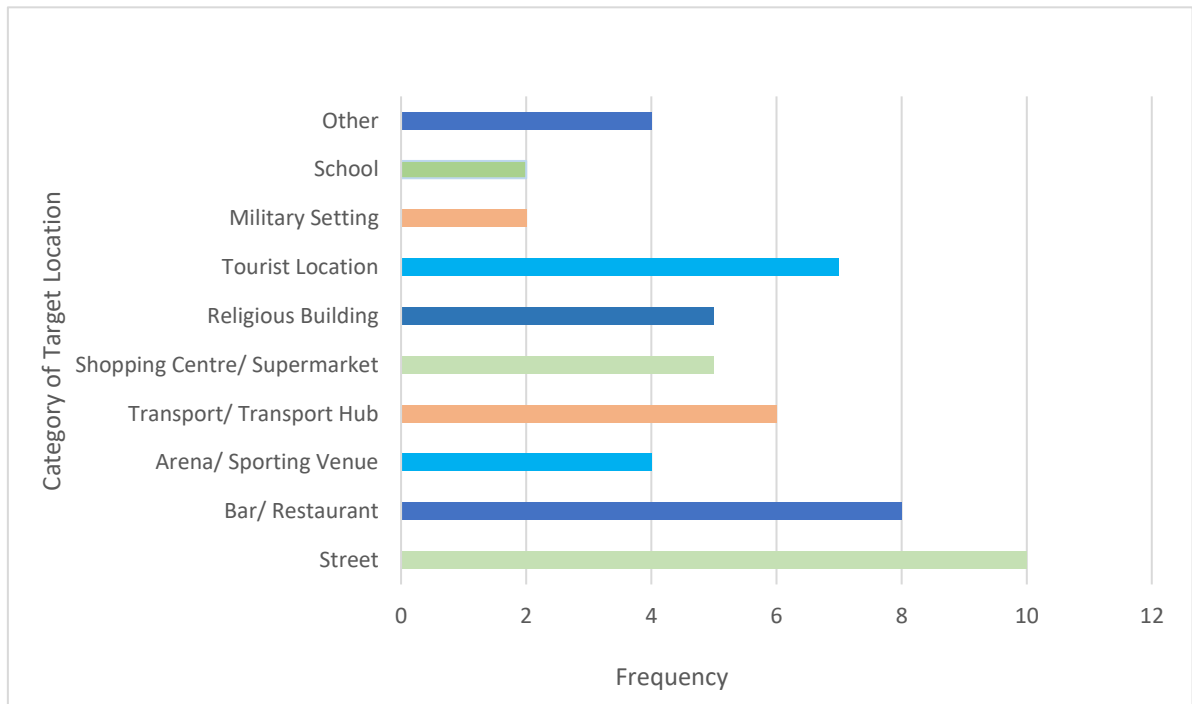
Lone Sample

Given that the majority of attacks included in the analysis were perpetrated by lone actors, it was not possible to compare features of lone actor attacks to group perpetrator attacks within the analysis in a meaningful way as initially planned. Therefore, a separate dataset was created focusing on the 34 attacks from the full dataset where a lone perpetrator carried out the attack. This male only sample had a mean age of 31 years old, ranging between 17 and 57 years old. The most frequent age bracket of the lone actors in the current sample was over 30 years old (41.2%), followed by the 18-25 age bracket (35.3%). Spree attacks remained the most frequent type of attack

(58.8%), followed by vehicular (23.5%) and bombing (17.6%). 35.3% of attacks were

categorised as impulsive in nature, with 26.5% having evidence of detailed plans.

Reconnaissance of the target location or victim target occurred in 50% of cases.

Assistance was provided to the key perpetrator in 32.4% of cases. Of interest, in 17.6%

of cases the perpetrator had contact with a terror group or handler and 32.4% had some

evidence of previous training. The majority of events were characterised by minimal

(44.1%) to no (14.6%) evidence of planning, with only 38.2% categorised as well-

planned. 73.5% of perpetrators were homegrown, which was classified by country of

birth or where the perpetrator had lived before the age of 16 years old. 67.6% of cases

involved individuals born in Europe (including Britain). Other individual and attack

characteristics of the lone sample along with their frequencies are outlined in Table 11.

MDS Analysis

Frequencies were explored to identify which dichotomous variables met the

inclusion criteria for analysis (frequencies greater than 10% and no more than 80%).

These cut off limits were used to avoid including items which occur too frequently

within the data set and therefore are not discriminating and those which are too

infrequent (particularly given the small sample size) and may therefore skew the MDS

analysis (Bishopp, 2003). Some variables were excluded from the MDS analysis given

that their coding was either ambiguous, or it was considered that there were other

variables included that would overlap too greatly and potentially skew the MDS

analysis.

Table 11. *Frequency Distributions of Individual and Attack Characteristics in Lone Actor*

Perpetrated Mass Casualty Events

Feature	% Occurrence
Recent Crisis/ Tipping Point	88.2%
Personal Grievance Expressed	82.4%
Evidence of Radicalisation	79.4%
Evidence of Clear Ideology	79.4%
Poverty/ Financial Problems	70.6%
Evidence of Potential Trauma or Adverse Life Experiences	67.6%
Leakage	67.6%
Justification Expressed During or After	64.7%
Extremist Propaganda Found	61.8%
Radicalised Online	58.8%
Evidence of Mental Health Symptoms Presence	55.9%
History of Substance Use	52.9%
Criminal Convictions	50.0%
Known to Authorities	47.1%
History of Violence	44.1%
Affiliation to Terror or Extremist Group	44.1%
Inspired by Terror Group	44.1%
Justification Expressed Prior	44.1%
Family/ Friend Influences	41.2%
Electronic Messages Indicating Attack	41.2%
Religious/ Moral Justification	41.2%
Escaped after Attack	38.2%
Time in Prison	38.2%
Juvenile Delinquency	38.2%
Captured during Attack	32.4%
Evidence of Psychiatric History	29.4%
In a Relationship/ Has Children	29.4%
Refugee/ Asylum including Pending or Rejected	23.5%
Second Generation Migrants	20.6%
Radicalisation in Prison Setting	20.6%
Radicalised Abroad/ Travelled Abroad	20.6%
Drugs used Prior to Attack	20.6%
Personal Grievance/ Moral Justification	20.6%
Killed by Officials During Commission	17.6%
Immigrant background	17.6%
Contact with Terrorist Group Prior	17.6%
Died in Commission of Attack	11.8%
Radicalisation in Religious Setting	11.8%

Thematic Structure of the Mass Casualty Dataset

Figure 7 shows the full sample two-dimensional MDS solution containing 21 attack characteristics. The *raw stress* of the MDS solution was 0.05, with a Kruskall *stress* score of 0.24 for the two-dimensional analysis. Although using a three-dimensional analysis would have reduced this stress score, the two-dimensional analysis was considered more interpretable for the purposes of offering a general overview of the samples attack characteristics and was therefore adopted. Tucker's coefficient of congruence, a measure of the meaningfulness of the interaction of the data, was 0.97; results over 0.95 demonstrating a good outcome. Dispersion Accounted For (DAF), a measure of whether the data set is normally distributed, was 0.94. These outcomes are suggestive of an interpretable analysis.

Figure 7. *Two-dimensional MDS Solution Containing 21 Attack Characteristics from the Overall Mass Casualty Sample of 40 Events*
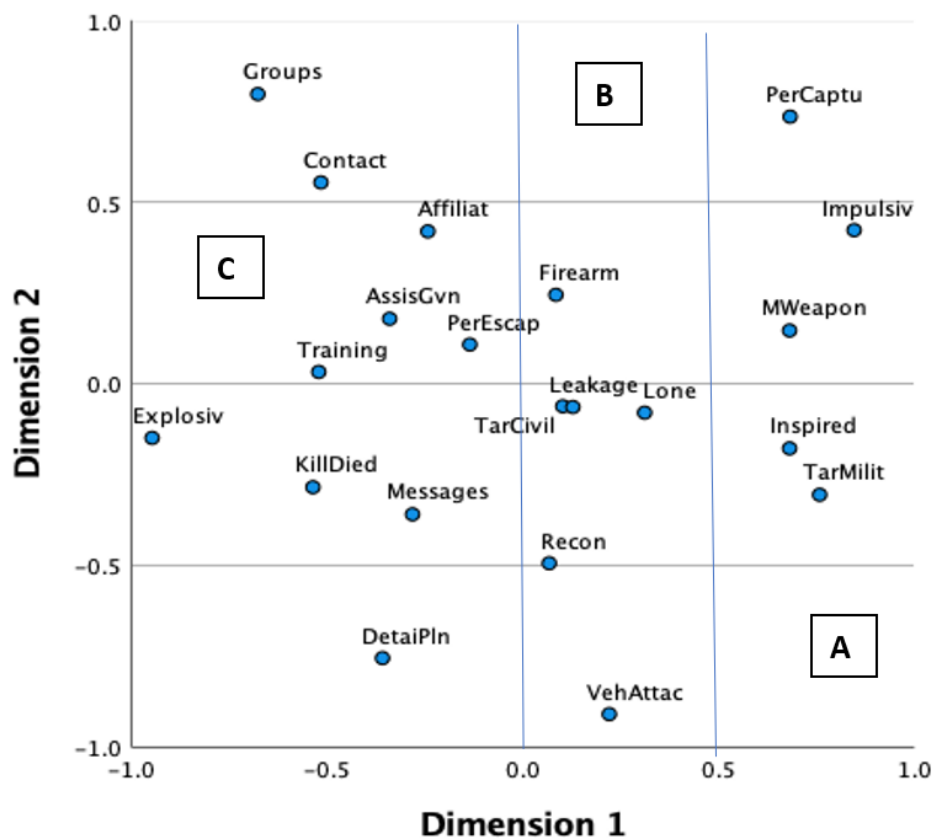
The MDS scatterplot can be broadly split into three facets using Axial partitioning (Groenen & Borg, 2014). Firstly, to the right of the scatterplot, labelled facet A, there is a cluster of variables including *melee weapon use, inspired by a terrorist group, targeted the military, impulsive attack* and *perpetrator captured.* The co-occurrence of these variables within the dataset and their proximity to the lone actor variable fits with theories of lone actor terrorist attacks, whereby melee weapon attacks are often reflective of less sophisticated attack methods. It is therefore logical that such attacks co-occurred with attack perpetrators that are inspired to act rather than having had direct contact with the terrorist group. Within the sample these melee weapon attacks also tended to co-occur with marked impulsivity and with perpetrators being captured following the act; suggestive of less planning and resources potentially being involved. Such attacks within the dataset tended to result in the least casualties in comparison to other methods.

In the middle of the scatterplot, facet B, the variables of *vehicular attacks, use of firearms, targeting civilians, evidence of leakage,* and *reconnaissance* are presented alongside *lone actor perpetrator*. The co-occurrence of these variables within the dataset may be reflective of increasing sophistication and planning in comparison to facet A. It could be hypothesised that vehicular attacks may co-occur more frequently with reconnaissance as perpetrators may test a travel route out or plan a route prior to their attack to ensure maximum impact, whether in terms of number of casualties or targeting a location of interest.

On the left side of the MDS plot, facet C, includes the variables *use of explosives, perpetrator killed or died, perpetrator escapes attack, contact with terror group, detailed planning, evidence of prior training, assistance given, affiliated to a*

terrorist or extremist group, and electronic messages indicating attack. This facet also includes the variable *groups*, although given the rarity of group attacks in the dataset interpretations of this variable's location in relation to other variables needs to be interpreted with caution. Facet C is interpreted as the more lethal, planned and connected attack style, with attacks involving the use of explosives being responsible for the highest level of casualties (over 100) in 75% of cases. The clustering of these variables is suggestive of attacks that tend to involve a wider terrorism network, detailed planning, training, and greater communication in the lead up to an attack.

Leakage, targeting civilians, lone actor and *perpetrator escaping* are located in the centre of the scatterplot, suggesting that out of the variables analysed in the full sample, these were the most frequently occurring.

Thematic Structure of the Lone Actor Sample

Figure 8 represents a three-dimensional MDS solution (SSA) of the lone actor sample (*n* = 34) containing 31 attack behaviours and individual characteristics. Given that the variables are dichotomous in nature a Jaccard coefficient was selected for the analysis. A three-dimensional solution was employed to optimise the fit of the variables and ensure a lower level of stress; a Guttman's coefficient of alienation of 0.14 (stress score) was obtained for the three-dimensional solution. Centroid lines were drawn using polar partitioning (Groenen & Borg, 2014). Five facets emerged from the data labelled: 'Planned Suicide Attacks', 'Political and Racial Attacks', 'Emotionally Unstable Pathway', 'Criminal Pathway' and 'Radical Pathway'.

Figure 8. *A Three-Dimensional Smallest Space Analysis Solution for the Lone Actor Data Set*
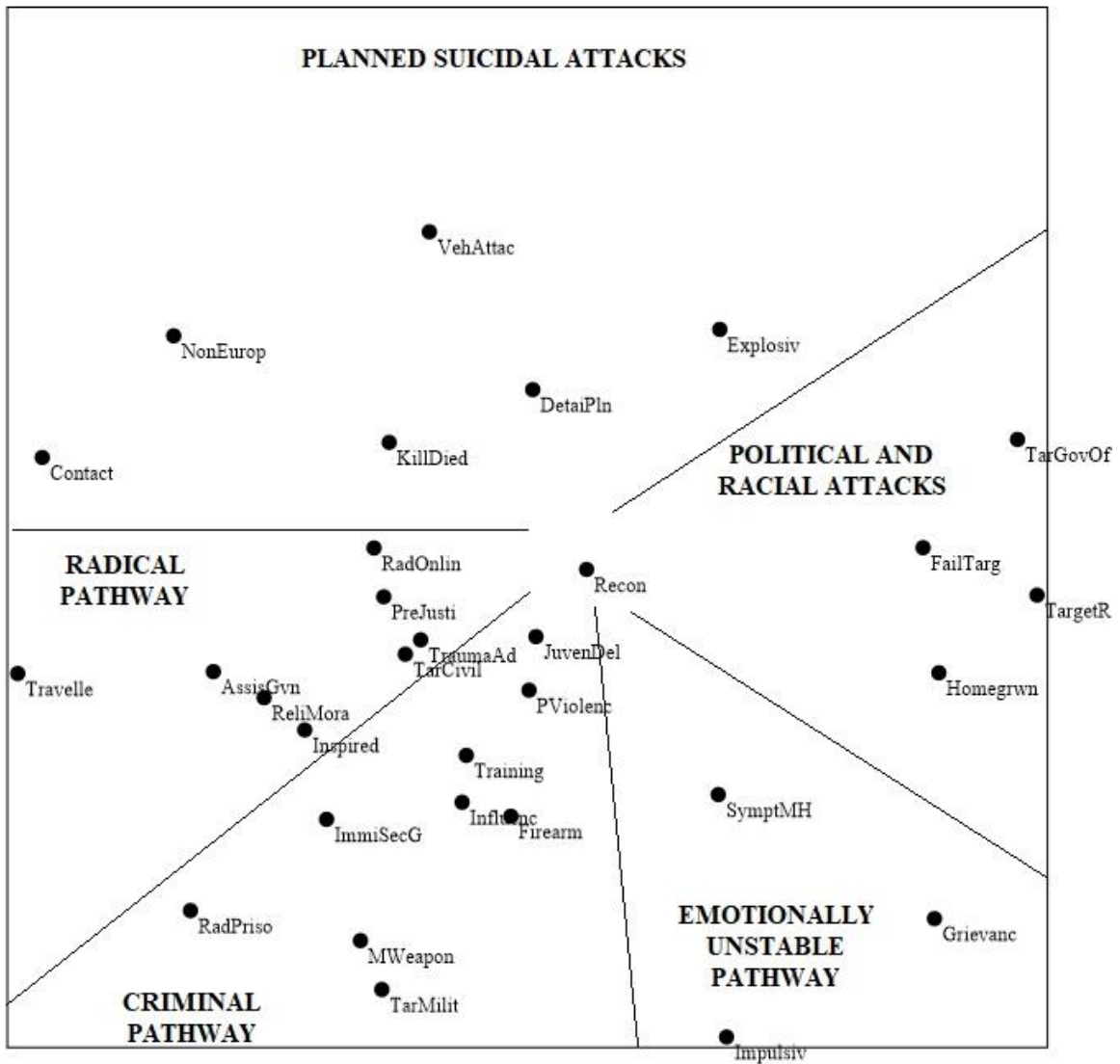
The first two facets, 'Planned Suicide Attacks' and 'Political and Racial Attacks' can be viewed as two broad attack types. The 'Planned Suicide Attacks' facet includes behaviours such as *vehicle attacks* (VehAttac), the *use of explosives* (Explosiv), *contact with a terrorist group* (Contact), *detailed planning* (DetailPln) and the *perpetrator being killed* by officials or dying in commission of the act (KillDied). In terms of individual characteristics, this facet included *non-European actors* (NonEurop). This facet represents the deadliest of the mass casualty attacks given that explosives and vehicular attacks within the sample tended to lead to the highest

number of casualties. The 'Political and Racial Attacks' facet includes the behaviours of *targeting government officials* (TarGovOf), *targeting based on race* (TargetR) and *failed target* (FailTarg). Failed target reflects acts where a specific target is identified within planning or after commission of the act that was unsuccessfully injured in the attack or present at the attack location. This facet includes *home grown* actors (Homegrwn), those who were born or lived in the country that was targeted during their childhood. It is noted that *reconnaissance* (Recon) is in the centre and spans these facets, suggesting it is common to both attack types.

Next to the planned suicidal attacks facet is the 'Radical Pathway' facet. This proximity indicates that the variables within the radical pathway facet may be considered more closely related to the planned suicidal attack type than to the political and racial attack type. Behaviours included within this facet are *targeting civilians* (TarCivil); *travelling or being radicalised abroad* (Travelle); *gaining assistance* from a larger terrorist network or criminal network for funding or accessing equipment (AssisGvn); *justifying the act* prior to its occurrence, for example by making a public statement, recording a video, or writing a letter (PreJusti); and *exposure to online contact* that may have contributed towards radicalisation (RadOnlin). In terms of individual characteristics, this facet includes those *inspired* by a terror group (Inspired) rather than necessarily having direct contact; a history of experiencing *adverse life experiences* or potentially traumatic experiences (TraumaAd); and *religious or moral justification expressed* either during the act or following commission (ReliMora). Unsurprisingly, cross tabulation highlights that 60% of actors with a jihadist ideology expressed religious and/ or moral justification, whereas only 16.4% of actors presenting with right-wing ideologies expressed this justification for violence.

Next to the 'Political and Racial Attack' facet lies the 'Emotionally Unstable Pathway', suggesting that the variables within this facet are more closely related to this attack type. Behaviours and personal characteristics included within the 'Emotionally Unstable Pathway' are *impulsivity* (Impulsiv), which represents a lack of planning; symptoms of *mental illness* (SymptMH); and *expressing grievances* (Grievanc). This facet broadly mirrors *the susceptible* typology outlined by Clemmow et al. (2019), whereby individuals may be more cognitively susceptible to radicalisation towards violent extremism due to the presence of mental health symptoms and are characterised as more impulsive in nature, possibly with executive functioning problems (problems with planning, impulsivity, and other frontal lobe tasks) and violent tendencies. This facet may be reflective of differing responses to proximal crises which were present within the majority of the sample (88.2%). Cross tabulation demonstrates that 50% of lone actors with right-wing ideologies expressed justification based on personal grievances, whereas 5% of individuals with jihadist ideologies expressed such justification.

The final facet is labelled as the 'Criminal Pathway'; this is located between the 'Emotionally Unstable Pathway' and 'Radical Pathway'. Behavioural variables within this facet include use of *firearms* (Firearm), *melee weapons* (MWeapon); and *targeting the military* (TarMilit). Individual characteristics within the criminal pathway facet include a history of *juvenile delinquency* (JuvenDel); *previous violence* (PViolenc); *prior training* (Training); *family and peer group influences* (Influenc); *radicalised in prison* (RadPriso); and lone actors who were classified as *immigrants or second-generation immigrants* (ImmiSecG).

While the variables are organised within distinct facets that are readily interpretable, these should not be considered as distinct types, and individuals may display features from more than one pathway, and differing pathway combinations may lead to similar outcomes. Exploring this further in a larger sample of lower impact events and mass casualty events would be beneficial.

Although only a small number of individuals from an immigrant background or second-generation immigrants will go on to perpetrate acts of terrorism, the finding that this item is co-occurring within the data closer to juvenile delinquency, influential family and peers, as well as trauma and adversity may be worth further exploration. Research has explored factors that may increase second-generational immigrants' openness to messages from terror networks using a social identity framework; this recognises that exploration into in-group/ outgroup identification and cultural identity, particularly the ability to understand both cultural identities, as well as parental, cognitive and other social factors may be important (Stroink, 2007). Moreover, cognitive dissonance theory, which relates to "psychological discomfort caused by inconsistent cognitions" (Nilsson, 2022, p. 93) and can result from collective identities, has been used as a possible explanation for why a small number of second-generation immigrants might engage in terrorist behaviours.

In relation to trauma, much research highlights the potential impact of trauma experiences on development, particularly trauma occurring in childhood and adverse childrearing experiences, which can lead to problems regulating emotions, a heightened threat response and difficulties within relationships, all of which could contribute to juvenile delinquency (Bernhard et al., 2018) and future behavioural problems like offending or engaging in terrorist behaviour (See chapter one). Trauma experiences,

particularly more pervasive trauma experiences, can lead to distress symptoms that can include re-experiencing the trauma experiences, problems with negative self-concept (a negative sense of self) and emotion dysregulation (Cloitre et al., 2021). It is important to highlight that trauma experiences are subjective and therefore what is experienced as traumatic for one individual may not be for another. Given that the data used in this analysis is based on open-source data, interpretations of potential traumatic experiences are made by the researcher and therefore bias may have been introduced into the analysis; nonetheless the high prevalence of possible traumatic experiences warrants further exploration.

The criminal pathway may link to both broad attack types. Given the facets location it could be that the criminal pathway could include individuals who have expressed grievances, perhaps following a tipping point event and others who are more religiously or morally motivated to act. The variables within the criminal pathway, particularly juvenile delinquency and previous violence are located near to the variable trauma/ adversity and as such may be more aligned with theories of general offending. The criminal pathway appears similar in nature to the *selection* typology documented by Clemmow et al. (2019) which reflected individuals with a criminogenic propensity for violence, possibly through violence supportive beliefs, who may engage with like-minded individuals in criminal or extremist settings.

Discussion

This research was considered exploratory in nature, given its focus solely on the attack and individual characteristics of those 'true positives' who carried out mass casualty acts of terrorism. Thus, the research aimed to identify certain features across these mass casualty attacks that tend to co-occur together and those which do not, with

the hypothesis that underlying factors within the data may be reflective of different pathways towards violent extremism highlighted elsewhere in the literature (Clemmow et al., 2019; Lloyd, 2012). Within these pathways, it was hypothesised that there would be a subset of individuals who would present with mental health symptoms or diagnoses, trauma histories or psychological distress, based on previous research (Corner et al., 2016; Gill et al., 2019; Lewis & Marsden, 2021). Finally, it was hypothesised that less sophisticated attacks, such as those involving melee weapons would cluster with items like impulsivity and inspired attackers, whereas more sophisticated attacks involving explosives would likely cluster with items around detailed planning, contact with terror groups and assistance.

The results of the MDS analysis on the lone actor sample revealed five facets of mass casualty lone actor terrorists: 'Planned Suicide Attacks', 'Political and Racial Attacks', 'Emotionally Unstable Pathway', 'Criminal Pathway' and 'Radical Pathway'. The indication of a planned suicide attack facet and political and radical facet would benefit from a more detailed inspection of a greater number of cases; this could likely provide a broader spectrum of event outcomes underpinned by the dimensions of planning versus impulsive and minor to major severity incidents.

The clustering of items within each of these facets offers support to the pathways approach to violent extremism given the emergence of a criminal pathway facet, a radical pathway facet and an emotionally unstable facet. These facets broadly mirrored the lone actor typologies outlined by Clemmow et al. (2019), particularly in terms of the *susceptible* typology's similarity with the 'Emotionally Unstable Pathway' facet and the *selection* typology's similarities with the 'Criminal Pathway' facet.

The results of both MDS analyses highlighted different clusters of items dependent on the type of weapons employed by the actors. As such, the data suggests that spree type attacks, involving melee weapons or sometimes firearms, may represent less sophisticated attacks, where the perpetrator may be more impulsive in carrying out the attack, may be inspired rather than affiliated with a terrorist group and may present with some level of instability, possibly due to psychological distress. Attacks often considered more deadly in nature, particularly those involving the use of explosives tended to co-occur with items relating to greater planning, reflective of stability, contact with a terror group and training or travel abroad.

The results of this data set highlight comparatively high levels of psychiatric histories, mental health symptoms and trauma experiences. The presence of these items fits with the literature outlined in chapter one. It is noted that within the sample 10 lone actors (29.4%) presented with a psychiatric history, the majority of which included evidence to suggest time spent within a psychiatric facility or treatment with prescribed medication. A closer inspection of the descriptive data for those with psychiatric histories, shows that four lone actors were documented as having mental health diagnoses relating to depression and/or suicidal episodes, one individual was noted to have depression alongside early stage psychosis, a further two had diagnoses relating to psychotic illnesses (although one was drug-induced psychosis), one lone actor had psychosis and narcissistic traits and there was one lone actor with a diagnoses of narcissistic personality disorder. Nineteen lone actors (55.9%) presented with some evidence of documented mental health symptoms despite not necessarily having a formal diagnosis prior to the attack. Finally, 23 lone actors (67%) coded as present for evidence suggestive of potential trauma experiences and the majority of the sample (30

lone actors, 88.2%) presented with evidence suggestive of recent crisis, transitional

period or tipping point event prior to them carrying out the attack.

Of interest, leakage behaviours were frequently reported within the data set

(67.6%), as well as electronic messages (58.8%) online radicalisation (58.8%) and

expressed grievances (82.4%). 47.1% were known to authorities at some point prior to

their attack, although not all would have been known to intelligence services; this figure

offers some hope for the earlier detection of some of those on a trajectory towards

extremist violence and a number of avenues for monitoring signs of risk increasing.

Limitations of Research

As touched upon, this study has several limitations that need to be considered

when making assumptions based on the data. Firstly, open-source data was used to code

items for each event. There are a number of potential limitations that can occur as a

result of using an open-source dataset. Firstly, data may not always be accurate,

particularly when accessing sources on the internet or using newspaper articles. Within

the current study, information varied in its extensiveness and possible accuracy. For

example, it was noted that where court transcripts were available, rich information made

coding these events simpler based on the extent of the information available. Challenges

to the use of open-source data in this research were particularly noted during Google

searches of some events, often with search results being limited by data protection law

in Europe; this meant that a limited number of sources were identified in some cases

making coding certain events difficult. Only reputable newspaper sources, court

transcripts or research papers outlining the case were used to code items. Newspaper

articles are not immune from inaccuracies and bias and therefore drawing on multiple

sources to code each item aimed to reduce the likelihood of inaccurate reporting being responsible for the coding of an item as much as possible.

Due in part to the challenges of gaining enough open-source information, around 80 events were not included within the analysis; this in part related to names not being released in cases where mental health problems were suspected, juvenile offenders, or cases where a larger terrorist group carried out an attack and individual perpetrators were not accounted for. Ultimately, those events that were excluded based on a lack of available open-source information could well be different to those that were included. Research on media reporting bias in terrorism highlights that attacks where more people are killed, where the perpetrator is arrested and where the perpetrators are Muslim will tend to gain more media coverage (Horgan et al., 2016; Kearns et al., 2019; Richie et al., 2019). Related to this point, the treatment of missing information as 'no' codings within the analysis has a bearing on the assumptions made based on the findings. As identified within previous research, certain information will tend to be underreported within media accounts (availability bias). Sources will often focus on proximal characteristics such as recent unemployment or relationship breakdown, tending to be less likely to outline distal characteristics such as childhood factors. Certain characteristics such as Mental health symptoms are often underreported within open-source data (Gill et al., 2020) and sources are unlikely to comment on the absence of an indicator or risk factor. Definite 'no' answers were therefore rare within the data set. Coding items as 'yes' for presence and 'no' to reflect there is not enough evidence to suggest a 'yes' coding is used in other research papers successfully (Clemmow et al., 2019; Gill et al., 2014), however the limitations must be acknowledged. The data should

be interpreted recognising that certain information may be coded as 'no' due to missing information rather than the characteristic being absent.

The coding of certain items within the data set, for example mental health symptoms and trauma experiences, tended to require subjective ratings from the researcher. To reduce the impact of researcher bias on the results, a portion of the events were second rated by another researcher and inter-rater reliability (IRR) measured; it may however have been more beneficial to second code all events and consensus ratings made where there were discrepancies; this would help to reduce rater bias and subjectivity. It is important to also emphasise that when interpretating whether an event in a person's history could be classified as 'traumatic' or a crisis/ tipping point, that it is the individual's experience and interpretation of the event which is important. With the use of open-source data, the individual's interpretation of such events was generally not available and therefore the researcher's is required to make assumptions about the impact of such; as such researcher bias cannot be ruled out in these items. The results found in terms of mental health symptoms and trauma experiences may therefore be an over- or under-representative of prevalence within the population studied; nonetheless, the high frequency of such findings within the exploratory study warrants further research.

Given the exploratory nature of the study, a comparison group was not employed in this analysis. Further analysis of mass casualty attackers may benefit from having a suitable comparison group, for example a group of non-violent extremist offenders or violent criminal offenders. Finding a suitable comparison group has its challenges and given the areas highlighted within this analysis around criminality, violence history, mental health, and psychological distress, it would be likely that

suitable comparison groups would share many features of the mass casualty terrorist offender population.

Finally, despite the 20-year temporal span employed, only 40 attacks could be included in analysis; given the small number of group attacks suitable for inclusion in the analysis, a detailed comparison of lone and group actors could not be completed, an omission which is unfortunate. Other studies have highlighted difficulties with obtaining open-source data for groups which contributed to additional group attacks not being included within the analysis. Given the small numbers and the lack of a comparison group, it is difficult to extrapolate findings. Nonetheless, the findings do pose thought-provoking routes for further research in the area, particularly where researchers have access to closed source data.

Recommendations for Future Research and Implications for Practice

The findings from this study identify the need for further research to understand the relationship between trauma experiences and engagement in violent extremist acts. Trauma is increasingly becoming the focus of research and discussion within the general offending literature and across forensic settings but remains poorly understood in the context of terrorism. Given that trauma is a personal experience that differs from individual to individual the best way of understanding its impact is by talking to offenders or those considered vulnerable to engagement in extremist offending and gaining their subjective experiences. This information can be captured within judiciary settings, for example when completing SPJ risk assessments. Such assessments often require the assessor to complete a formulation of the individual's risk, which generally should involve the offender (except in the pre-crime space e.g., TRAP-18). Moreover,

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these methods could also better capture mental health symptoms and diagnoses in a range of violent and non-violent extremist offenders to offer more detailed information using formal psychological assessment. In keeping with the recommendation made by Douglas et al. (2009) and Gill and Corner (2017), it will be helpful for research to continue to focus in on particular mental health diagnoses, but also symptoms that may be present in individuals that may have avoided diagnoses (possibly due to their asylum status, immigration or cultural factors as outlined in chapter one). Of course, as this research highlights, a number of extremist offenders will die in the commission of their attack and therefore accessing detailed biographical information will rely on family and friend interviews which poses its own challenges.

Given the high frequencies of personal grievances, crisis events and adverse experiences noted in mass casualty perpetrator dataset, it seems imperative that interventions for offenders, as well as early intervention methods, are tailored to the individual's presenting needs. Often given the nature of the crime, terrorist offenders or those considered to be on a trajectory towards extremist violence will be considered high risk offenders and perhaps presumed to be untreatable and often given long prison sentences; it is important that further research investigates the responsivity to treatment of violent extremist offenders in particular. Considering the different pathways and trajectories that are apparent in the lead up to engaging in extremist violence, it is highly unlikely that the same preventative methods are going to meet the needs of every individual and more tailored approaches are likely to be needed (Dalgaard-Nielsen, 2010).

Additionally, radicalisation in prison remains an area of ongoing concern (Europol, 2021) and as this study showed 38.2% of the lone actors had spent time in

prison, 20.6% showed signs of radicalisation in prison and 38.2% of the sample had signs of juvenile delinquency. Given the shorter sentences served, there is a risk that offenders could be further radicalised within prison, particularly where extremist offenders are placed together. Such experiences could contribute to recidivism, although further exploration of recidivism in extremist offenders is needed. Such an endeavour is however a challenge based on the low number of offenders released from serving these sentences and the potential surveillance placed upon such offenders following release.

The facets that emerged within the current study demonstrate heterogeneity even within a lone actor sample of mass casualty violent extremists across Western Europe. The facets demonstrated offer helpful insights into avenues for future research around the further development and refinement of the SPJ risk assessments outlined in chapter two and within the subsequent chapter. Greater exploration of mental health symptoms specifically associated with increased vulnerability to radicalisation or engagement in extremist violence needs to occur in order to offer greater specificity to current risk assessment guidelines that employ mental health as a broad assessment item (e.g., ERG22+ and VERA).

Finally, more in depth exploration of the relationships between the pathways identified within the current study and other possible pathways would be fruitful for future research. With sufficient data, perhaps through access to closed sources to enable a larger dataset, the relationship of these different pathways to different terrorist outcomes could be explored.

Chapter Four:

The Use of the Extremist Risk Guidance (ERG22+) within England and Wales: A

Critique of the Guideline's Psychometric Properties

"Psychologists' reports, based on the ERG, are now being used within legal cases in

order to make decisions. This is of concern, as they are being made on the basis of a

'science' that has never been properly scrutinised".

(Quershi, 2016, p. 51)

The year 2017 is said to have marked the beginning of a "significant shift" in the

nature of the terrorist threat to the UK, with five fatal terrorist attacks taking place

across Manchester and London; the Westminster attack being the first to cause multiple

fatalities since the London tube bombings in 2005 (HM Government, 2018, p. 8). It was

also reported that four extreme right-wing terror plots and ten Islamist-inspired plots

were foiled (Sandford, 2018). The identified level of threat to the UK from international

terrorism has remained above *substantial* since levels were first published in 2006,

meaning an attack is considered likely (MI5, 2021). Islamist terrorism, originating

largely from Salafi-Jihadi movements, is deemed the principal threat to the UK (HM

Government, 2018). Extreme right-wing (ERW) terrorism is described as "a growing

threat" (HM Government, 2018, p.8), with numbers of prisoners holding far-right

ideologies increasing gradually over the past four years (Home Office, 2019, 2021).

Moreover, Northern Ireland related terrorism is still considered a "serious threat to the

UK" (HM Government, 2018, p.19). To reduce the risk to the UK from acts of

terrorism, changes have been made to the law leading to the creation of several offences

under the Terrorism Acts of 2000 and 2006 (The Crown Prosecution Service [CPS],

2017). Extremist offences within the UK are defined as "any offence committed in

association with a group, cause or ideology that propagates extremist views and actions

and justifies the use of violence and other illegal conduct in pursuit of its objectives"

(Bennett, 2012, p.2). Consequently, extremist offences also include non-violent acts

such as dissemination of terrorist publications (CPS, 2017; Powis et al., 2019a). It cannot, therefore, be assumed that all those who are serving sentences under current legislation would have "gone on to commit an offence that would cause serious and significant harm" (National Offender Management Services [NOMS], 2011, p.10).[4]

In response to these legal changes, and as a result of the increasing need to supervise foreign fighters returning to the UK from Syria and Iraq, there has been a rise in the number of individuals convicted under terrorism legislation and entering the prison service (Al-Attar et al., 2019; Powis et al. , 2019a).[5] There is a need to effectively manage and rehabilitate extremist offenders in order to reduce the risk of recidivism, especially considering that a number of offenders will be serving relatively short prison sentences.[6] Furthermore, there is a greater focus on the potential for radicalisation to occur whilst in custody and therefore a need for UK prison's to monitor and manage this risk (Murray, 2014; Rushchenko, 2018; Silke, 2014). Pertinent to this population, is the need to ensure that risk is proportionately managed, rather than all offenders being automatically categorised as high risk due to the nature of their offence (Al-Attar et al., 2019; Lloyd & Dean, 2015). This is where the risk assessment process plays a key part.

As highlighted in chapter two, risk assessment tools help to support practitioners with the decision-making process around the management and rehabilitation of offenders. However, as previously identified, risk assessment has also been utilised in the 'pre-crime' space as a way of assessing vulnerability towards an individual engaging

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[4] The majority of those sentenced under England and Wales' terrorism legislation are sentenced for non-violent offences (Home Office, 2019, 2021; Knudsen, 2018).

[5] As of 31st December 2020, there were 209 individuals being held in custody in Great Britain for terrorism-related offences (Home Office, 2021).

[6] In the year prior to 30th September 2020, a total of 42 prisoners held for terrorism-related offences were released from custody in Great Britain; 45% of sentences in 2020 were less than 4 years in length (Home Office, 2021).

in extremist offending. Risk assessment in the pre-crime space underpins the UK

Government's Prevent strategy, part of its overall counter-terrorism strategy –

CONTEST. The strategy aims to "prevent people from being drawn into terrorism"

(Home Office, 2021, para 5) through early identification, assessment, and intervention

in the form of Channel, a key component of Prevent (Pettinger, 2019). The Extremist

Risk Guidance (ERG22+; NOMS, 2011) is a Structured Professional Judgement (SPJ)

tool currently used across law enforcement and correctional agencies in England and

Wales, to assess risk and need in those convicted of extremist offences (Lloyd & Dean,

2015). The need for a specific risk assessment tool became pertinent to Forensic

Psychologists working within prisons with extremist offender populations, a number of

whom had identified that with the expansion of crimes included under the 2006 terrorist

legislation, the use of generic violence risk assessment tools were limited in their ability

to capture the breadth of risks now needed to be explored (Knudsen, 2018; Lloyd &

Dean, 2015). Additionally, the same ERG22+ risk factors, in the form of the VAF, are

used to assess individuals referred to Channel (HM Government, 2012, 2020; Knudsen,

2018).

It is important to scrutinize the ERG22+'s development and validation given that

it has been used to assess all those convicted under terrorist legislation in England and

Wales since its development in 2011 (Powis et al., 2019a); this includes individuals

from a range of extremist affiliations with violent and non-violent offending behaviours,

as covered under the Terrorism Acts (Lloyd, 2019). As this thesis has emphasised, our

understanding of specific terrorism and extremism risk assessments, and importantly the

risk and protective factors identified within the literature that have contributed to these

assessments, remains in its infancy. The ERG22+ has thus received criticism,

particularly for its use within the pre-crime space, as evidenced in the opening quote (Qureshi, 2016; Royal College of Psychiatrists [RCPSYCH], 2016). It is therefore important for such a tool to be able to demonstrate its efficacy and be open to scrutiny in order to improve public and professional confidence it its use.

Overview of the Tool

The ERG22+ is outlined as an "empirically based", ideologically neutral, manualised assessment of risk and needs in convicted extremist offenders (Lloyd & Dean, 2015, p. 41). It focuses on producing an individual case formulation, with the combination of identified factors suggested to tell the individuals engagement story (Lloyd & Dean, 2015). One of the aims of the ERG22+ is to "assess the extent to which an individual is engaged or committed to an extremist group, cause or ideology, and is motivated to offend on their behalf" (Lloyd, 2019, p. 13). Given that the ERG22+ is not an actuarial measure, it was not developed to predict recidivism or measure an individual's guilt (Lloyd, 2019), rather it is a tool that can support decision making and allocation of resources around effective risk management and treatment plans (Lloyd & Dean, 2015). According to Lloyd and Dean (2015), the tool is designed to "increase understanding and confidence among front-line staff and decision makers" (p. 41) and is said to provide "a balanced and objective approach to risk assessment and management that is free from bias" (Lloyd, 2019, p. 17). Given the range of dynamic risk factors that contribute to the ERG22+, it is suggested that changes in risk can be monitored over time, therefore contributing to the evaluation of intervention programs designed to reduce risk (Lloyd, 2019). The ERG22+ should supplement other assessments and should not be used alone to assess extremist offender's risk (Herzog-Evans, 2018; NOMS, 2011).

The ERG22+ was developed by two experienced Forensic Psychologists working within the National Offender Management Service (NOMS), now known as Her Majesty's Prison and Probation Service (HMPPS). The ERG22+ remains the intellectual property of HMPPS and although educational licenses are available, the tool is not available for casual use. Training is provided through HMPPS, and they are responsible for the ongoing development of the tool (Lloyd, 2019); such development is important given that the population for whom the ERG22+ was initially developed is likely to continue evolving, particularly given the rise in right-wing extremist offenders (Home Office, 2019, 2021; Lloyd, 2019).

In its current form, the ERG22+ consists of twenty-two items that are considered to bear on the three dimensions of *engagement*, *intent*, and *capability*.[7] The items included within the ERG22+ were initially identified through functional analysis (identifying the needs the offending behaviour is meeting for an individual) of around twenty British Al-Qaeda influenced extremist offenders. This casework, informed by the terrorism literature and an expert advisory group, contributed to the first version of the tool, the Structured Risk Guidance (SRG), and was expanded over time to include over forty convicted extremist offenders.[8] In addition to the twenty-two items, the assessment also accommodates any other factors that might appear relevant to the individual's risk formulation, such as previous trauma, poor paternal relationships, or failure to meet family expectations (Herzog-Evans, 2018). The additional items are depicted by the "+" suffix and, according to Lloyd and Dean (2015), allows for the possibility of other factors emerging through case work and the growing evidence base

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[7] See Chapter Two for a list of the 22 factors.
[8] Chapter 2 discusses the SRG and early development of the ERG22+ in more detail.

to be included. Protective factors are not considered separately within the ERG22+, but rather each of the twenty-two items may also be protective in nature for some individuals (Lloyd, 2019). Guidance suggests that the assessor should expand on protective factors within their formulation, for example considering contextual circumstances, relationships or individual attributes that may reduce an individual's risk (NOMS, 2011).

Administering the ERG22+

The ERG22+ is generally used to assess an extremist offender within the first twelve months of their sentence (Lloyd, 2019) and, where possible, should be completed collaboratively (Lloyd, 2019); collaborative risk assessment and formulation being a catalyst for change and transition, promoting engagement and contributing to desistence from offending (Beech & Mann, 2002; Kemshall, 2011; Moore & Drennan, 2013). Completing the initial ERG22+ tends to be done retrospectively, in that it focuses on factors considered to be associated with the individual's offence; any subsequent assessments will then monitor these factors for changes over time (Knudsen, 2018). The ERG22+ should only be completed by qualified psychologists or experienced probation officers who have experience of completing complex risk assessments and have attended a two-day ERG22+ training event (Lloyd, 2019; NOMS, 2011). The training involves discussions around the history of the ERG22+, a review of the key literature, intended use, factors considered within the assessment, and how to report findings (Lloyd, 2019). A qualitative evaluation of the first version of the ERG22+ (SRG) recommended that a single lead assessor should complete the assessment but consult other staff for further information and opinion (Webster et al., 2017).

Reliance on one assessor in risk assessments may introduce bias, because assessors will have different knowledge bases, cultural and social backgrounds, as well as varied personal and professional experiences which may influence their scoring of items or the weighting attributed to certain risk factors (Geraghty & Woodhams, 2015; Gill et al., 2020). Moreover, assessors will not be immune from the impact of terror attacks on society, particularly through the media reporting of such events (British Psychological Society [BPS], 2018) which, as discussed in chapter one, is also not immune from bias. In terms of risk assessment, such impact may lead to risk aversive practices and may ultimately contribute to variations in case formulation and differing opinions on how to manage an individual's case. New ethical guidelines for practitioners therefore highlight the need for practitioners to retain an "objective and proportionate approach to this task" (BPS, 2018, p. 11); this is where the use of peer supervision amongst practising psychologists and those completing risk assessment and intervention with extremist offenders is key (Al-Attar et al., 2019). Moreover, regular training updates that involve a greater emphasis on understanding differing ideologies, the changing political context, as well as other contextual factors, should be available to assessors. The importance of using multiple sources of information to inform decision making and seeking guidance from other professionals within the risk assessment process should not be underestimated (DH, 2009).

The assessor uses the twenty-two factors to guide their individual formulation and help them to consider the contextual factors and personal attributes that may have contributed to the individuals offending, as well as developing an understanding of the function behind the person's behaviour (Lloyd & Dean, 2015). The presence of each factor is considered, with a coding of 'not present', 'partly present', 'strongly present',

or 'protective' given and documented on the record sheet (Powis et al., 2019a; NOMS, 2011). The engagement and intent domains are also given an overall judgement rating of 'low', 'medium', or 'high' to signify the overall strength of the individual's engagement or intent. The capability domain is given a judgement rating of 'minimal', 'some', or 'significant' to signify capability to carry out an extremist offence (NOMS, 2011).

Given the idea of different pathways towards engagement in extremist offending that is reflected within the ERG22+, not all items will be relevant to each offender and therefore a composite score is not yielded (Lloyd & Dean, 2015); this is consistent with the SPJ approach where higher test scores do not necessarily reflect a higher level of the clinical problem (Dickens & O'Shea, 2016; Hart & Logan, 2011). Within the ERG22+ it is the constellation of proposed risk items that contribute to the individual case formulation, which is key to developing hypotheses about the individuals' risk and need (Lloyd & Dean, 2015). The case formulation is then used to inform risk decisions, risk management strategies, and guide the treatment plan (Lloyd & Dean, 2015). Given the idiosyncratic nature underlying risk in extremist offending and notwithstanding the likely differences in risk factors depending on the type of offence committed, an approach that does not rely on a single score appears sensible in terms of the ERG22+'s current scope of use within a UK offender population.

To provide structure and guidance for the clinician, the ERG22+ guidance manual contains a description of each item and gives examples to help the assessor determine the factors presence or absence (NOMS, 2011). The manual does offer some information about the evidence base for each item and discusses the idea of different pathways, focusing on the opportunistic (criminal) and political (moral) pathways

(chapter two). A summary record sheet is also provided to assist assessors in viewing which items were coded as present or protective. It is documented that a review and update of the ERG22+ by the HMPPS is pending (Knudsen, 2018; Lloyd, 2019). Given that the assessment and manual have not appeared to have been updated since the ERG22+ was first developed in 2011, they would likely benefit from refinement based on the findings of studies relevant to the validity and reliability as they are conducted.

A Three-Dimensional Model

The ERG22+ clusters factors under three domains: *engagement,* with thirteen factors; *intent*, with six factors; and *capability*, with only 3 factors (NOMS, 2011; Powis et al., 2019a). The factors were grouped under these domains based on a conceptual understanding of their relationship to risk and need rather than through statistical analysis (Lloyd & Dean, 2015). The separation of items into the engagement and intent domains was based in part on the developer's consideration of Ajzen and Fishbein's (1980) Theory of Reasoned Action (TRA), in which it is suggested behaviour is primarily determined by intention (Lloyd & Dean, 2015). The developers highlight the need to tease out factors associated with attitudes towards offending, from push or pull factors that may motivate offending (Lloyd & Dean, 2015; NOMS, 2011). Some individuals may appear to be engaged with a group, cause, or ideology, but may not be willing to offend, whereas others may be engaged and willing to offend but lack capability. Individuals can also shift from engagement to intent over time (Herzog-Evans, 2018), or alternatively some individuals may be in the process of disengaging from extremist offending. Therefore, consideration of all domains is important in informing the overall judgement of risk (Lloyd & Dean, 2015).

Engagement

 Engagement within the ERG22+ is the process of becoming involved with an extremist group, cause, or ideology (Lloyd & Dean, 2015). The ERG22+'s focus on psychological processes at the individual level in explaining engagement, has been criticised by some for not specifically capturing the wider political and societal context (Knudsen, 2018; Quershi, 2016). Micro (individual), meso (political) and macro (societal) levels of analysis are widely referred to in the radicalisation and wider terrorism literature, with all considered important within the context of risk for extremist offending (Koomen & Van Der Pligt, 2016; McCauley & Moskalenko, 2008; Noricks, 2009; Qureshi, 2016; Vergani et al., 2018). The developers of the ERG22+ do state the need for assessors to incorporate contextual factors into individual assessments and highlight that the absence of a specific item relating to this within the ERG22+ may have been an "omission" (Lloyd & Dean, 2015, p. 43). Nonetheless, there appears to be minimal guidance to support the assessor in incorporating contextual factors into their risk assessment and it is unclear if the training covers the importance of contextual factors in any depth. As such, the individual assessor is responsible for acknowledging the political, cultural, and societal contexts relevant to the specific offender and keeping up to date with the changing political landscape.

Intent

 The *intent* domain within the ERG22+ explores the mind-set associated with a readiness to carry out or contribute to an extremist offence (Lloyd & Dean, 2015). Intent is the "end point of an engagement process if uninterrupted" (Lloyd, 2019, p. 14). Early evaluations of the ERG22+ have made suggestions on how to improve the intent domain. A recent inter-rater reliability study by Powis et al. (2019b), described within

this chapter, suggests that the definitions of some items within the intent domain may benefit from greater clarification and differentiation to improve inter-rater reliability among clinicians within their sample. The intent domain also focuses on psychological indicators of risk, such as the way the individual perceives the world, rather than behavioural risk indicators, which have been argued to be more helpful in preventing terrorism (Gill et al., 2019). The lack of any items that represent clear risk behaviours (indicators) that the individual has posed, leaves it to the assessor's judgement and interpretation of the information to make hypotheses about the risk the individual may pose in the future. Furthermore, when considering the use of these factors within the VAF, it has been argued that the assessment of broad psychological factors gives way to everyday presentations becoming national security concerns (Pettinger, 2019).

Capability

   Capability to contribute to an extremist offence considers the offenders skills, background and contacts to measure their potential ability to carry out an act of terrorism and cause serious harm (NOMS, 2011); this domain is therefore considered to be a more operational, rather than clinical, indicator (Lloyd, 2019). Recent terrorist attacks, particularly those using vehicles, illustrate that advanced resources are not necessarily required to cause significant damage and loss of life. Such shifts make assessing capability quite a challenge. Nevertheless, Lloyd and Dean (2015) suggest that capability remains an important consideration within the risk assessment process; this is an area that may need updating as changes to terrorism tactics emerge over time.

   The ERG22+ has had limited published evaluation attempts since its development and roll out. There are two known published evaluation attempts to date

which have made suggestions on how to further develop the tool. It is therefore possible

that with further empirical research, revisions to the ERG22+ may be made, potentially

leading to changes in the items, the way items are clustered under domains and to the

domains themselves.

Evaluation of the ERG22+

A good psychological measure is said to have certain characteristics which

include: being at least an *interval scale,* where differences between scale points are

equal; being *valid*, meaning the assessment measures what it sets out to measure; being

reliable, the extent to which measures can be repeated with similar results;

discriminating, so that it achieves a good spread of scores; and be standardised in order

to interpret the scores the individual receives in comparison to others (Coolican, 2004;

Kline, 2015). Unlike actuarial approaches which are purely statistically driven (Sheldon

& Howells, 2017), SPJ approaches combine the flexibility for practitioners to apply

their judgement to a case, with the restraints of an evidence-based structure (Sheldon &

Howells, 2017). Thus, the SPJ approach does not necessarily lend itself fully to the

standards of psychometric assessments, for example often using ordinal or categorical

level rating scales rather than interval level. However, increasing research is supporting

the view that SPJ assessments of risk can have the psychometric properties of reliability

and validity, both of which are important (Hart & Logan, 2011). It is therefore crucial to

evaluate such measures according to these criteria to ensure that they are "appropriate

and scientifically sound and the conclusions we draw on the basis of scores on these

instruments are as accurate and meaningful as possible" (Hunsley & Allan, 2019, p.21).

When the ERG22+ was first utilised in 2011, there was one documented evaluative

study referenced, the process evaluation of the SRG by Webster et al. (2017), however

this was not published until 2017. Since then, two known published studies specifically assessing the reliability and validity of the ERG22+ have become available and will be outlined below alongside suggestions for future areas of research.

Validity

Validity refers to the extent to which a test measures what it was intended to measure (Coolican, 2004). Validity can be demonstrated in a variety of ways including *predictive validity,* which reflects correlations between the test taken at a certain period of time and a later criterion; *concurrent validity,* meaning how well the test correlates with other known valid measures; *content validity,* reflects agreement on how well the items represent the construct being assessed; *face validity,* which reflects how well the assessment appears (to the user) to measure what it says it will measure; and *construct validity,* the extent to which items within a test encompass the theoretical construct being investigated (Coolican, 2004; Kline, 1986). The ERG22+ has limited evidence of validity to date, with one published study examining its construct validity identified. Given that other similar risk assessment tools also have limited validated attempts, it is not possible to examine concurrent validity at present. The remaining areas of validity will be briefly discussed, focusing on areas for future examination and acknowledging where assessing validity may be more challenging than with other forms of SPJ risk assessment.

Predictive validity is often considered the gold standard for risk assessment instruments (Douglas & Reeves, 2010; Lloyd & Dean, 2015). Predictive validity is measured using correlations between the test and an outcome variable (Kline, 1986); in risk assessment, this is often an assessment's ability to predict recidivism (future risk of violence or future extremist offending). Monitoring recidivism rates in extremist

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offender populations poses challenges. Firstly, the level of surveillance and restrictions placed on extremist offenders upon release is likely to reduce their ability to reoffend. Offenders may also remain involved in terrorism, but withdraw from the front-line roles, making detection less likely. Moreover, those in front-line roles, such as the perpetrator of a targeted attack, are likely to be killed while committing their offence, or to be serving extremely long periods in custody which will affect the recidivism data collected (Lloyd & Dean, 2015). Extremist offenders may also go on to commit other offences, not relating to terrorism. Notwithstanding the fact that the numbers of extremist offenders, let alone those who re-offend, are extremely low which makes a predictive validity study difficult to complete.[9] [10] It is therefore suggested that solely pursing predictive validity of the ERG22+ is not realistic at this time (Lloyd & Dean, 2015).

Given that SPJ risk assessments are focussed on managing and preventing risk, rather than predicting risk, it is suggested that a more useful focus would be on the ERG22+'s contribution to decision-making that maintains desistance from extremist offending (Lloyd & Dean, 2015; Sheldon & Howells, 2017). An important component of this decision-making process is the risk formulation. Future research may benefit from evaluating the quality of ERG22+ formulations using quality assessment measures and then comparing quality with related outcomes (see Gill et al., 2020). Such research could help to inform the training and supervision of assessors using the ERG22+. This

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[9] Recidivism data suggests that the rate of re-offending in extremist offenders is significantly lower than rates in conventional offenders (Hodwitz, 2021; Silke & Morrison, 2020).

[10] 47% of adult offenders are reconvicted within one year of being released from prison (Lyon, 2021). In comparison, terrorist offenders released from prison in England and Wales between January 2013 and December 2019 had a reconviction rate of 3.06% (UK Parliament, 2021).

area has not yet been explored through published or openly available research at present but further explorations of how the ERG22+ effectively contributes to decision making would be advantageous.

The ERG22+ is considered to have a degree of *convergent validity*, because there is overlap between some of the factors on the ERG22+ and other assessments that are used in terrorist or extremist risk assessment (chapter two outlines this overlap).

Face validity is concerned simply with whether the test appears to measure what it is supposed to, especially to those using the test (Kline, 1986). Lloyd and Dean (2015) suggest that the widespread use of the ERG22+ is demonstrative of its face validity and utility and that the process evaluation by Webster et al. (2017) also offers some evidence of this through its interviews with staff implementing the initial SRG version. The tools widespread roll out, prior to any known validity studies, is likely to be due, in part, to the need to have a tool in place to support those working with the increasing number of extremist offenders, rather than no tool. As such, it is perhaps too early to suggest that the tool has face validity. Process evaluations offer a means of gaining assessors views of how the assessment process works, why it works and under what conditions (Gill et al., 2020). Conducting further process evaluations within HMPPS, as well as Channel, of the current version of the ERG22+ and of the VAF would be advantageous.

Construct validity refers to the "extent to which the measure 'behaves' in a way consistent with theoretical hypotheses and represents how well scores on the instrument are indicative of the theoretical construct" (Hays & Reeve, 2008, p. 246). *Content validity* establishes that the items within the instrument are a sample of the "universe in

which the investigator is interested" (Cronbach & Meehl, 1955, p. 282). The constructs

underlying extremism within the ERG22+ are multidimensional, being drawn from

social psychology literature and "psychologically described features of motivation and

intent" (Powis et al., 2019a, p. 4). It is however important to acknowledge that many

factors in the ERG22+ (as well as other SPJ assessment tools in this area) are not yet

established as either correlates or predictors of risk and as highlighted, the low base rate

of extremist offenders, let alone those who go on to re-offend, means validating their

role is unlikely to be possible for some time (Lloyd, 2019).

Powis et al. (2019a) present the first study examining the construct validity of

the ERG22+ and its structural properties using exploratory factor analysis and Multi-

Dimensional Scaling analysis (MDS).[11] Completed ERG22+ assessments of 171

individuals who had been convicted of an Islamist extremism or Islamic extremist-

related offence in England and Wales were analysed. The study did not entirely support

the current three-domain structure of the ERG22+ as overlap between items that formed

the engagement and intent domains was identified (Powis et al. (2019a). Powis et al.

(2019a) instead suggest a five-factor model with the domains: *Motivation and Ideology;*

Identity and External Influence; Status and Personal Influence; Capability; and

Criminality. Powis et al. (2019a) suggest that by re-structuring the ERG22+ in this

format, it would improve the construct validity of the tool as each item under the

domain would be measuring the same overall construct. The authors also highlight the

need to redefine some of the items within the ERG22+ to reduce ambiguity and support

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[11] Chapter Two describes this study in more detail.

assessors in their formulation of risk (mental health, harmful means to an end and harmful end objectives).

The main limitation of this study was the focus on Islamist extremist offenders as they formed the largest group who had been assessed using the ERG22+. Further research confirming that these domains exist in other groups of extremist offenders is recommended (Powis et al., 2019a). As the ERG22+ was developed, in part, from case studies with British Al-Qaeda offenders, further research demonstrating the construct validity of the ERG22+ with ERW offenders, far left and single-issue offenders, as well as offenders categorised as holding Islamist extremist views that may be inspired by groups other that Al Qaeda, is necessary once more data becomes available. Without further research examining this, it is difficult to evaluate whether or not the ERG22+ has a place in assessing offenders other than those classified as Islamist offenders, particularly as the terrorism literature has also largely focused on Islamist extremism and may not be generalisable to other forms of terrorism. Similarly, recent research shows some potential differences between those acting alone compared with group offenders, particularly in terms of mental illness prevalence, age, criminal history, relationship status and ideological belief systems (Corner & Gill, 2015; Corner et al., 2016; Gill, 2015; Gill et al., 2014; Pantucci et al., 2015). It is currently unknown if the ERG22+ factors and domains apply equally to group or lone actors, whether they can be effectively applied to females as well as males, and whether they are effective in assessing younger individuals. [12] Efforts are reportedly being made to explore, from completed ERG22+ assessments, which factors are generic or specific to different types

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[12] The majority of those referred to Prevent and discussed at Channel panels are ages 20 years and under, with around 25% being under 15 years old (Home Office, 2020).

of extremist offenders (Lloyd & Dean, 2015); this may lead to further refinement of the ERG22+ and potentially consideration of the need to have separate factors for different extremist offender populations. Nevertheless, as Knudsen cautiously suggests, "any benefit associated with the 22 indicators, however, would seem conditioned on them being reserved for the uses, target groups and assessors they were originally created for" (2018, p. 14). As such, the VAF's use within the counter-terrorism context could be considered to go beyond the scope of the original tools' development (Qureshi, 2016).

In summary, initial attempts to demonstrate validity of the ERG22+ are limited, with only one published study to date (Powis et al., 2019a). Despite some of the challenges to demonstrating validity in terrorism risk assessment, further research is needed as highlighted above. As with all risk assessments in this area, greater empirical research exploring the factors which are considered to contribute to terrorism risk, as well as protective factors, is needed. Only with greater research demonstrating that identified factors are causal and therefore valid risk indicators, can validity be fully determined (Lloyd, 2019).

Reliability

A test is said to be reliable if it can demonstrate *internal consistency*, whereby items in the measure tap into the same domain and correlate with each other; *test-retest reliability*, which refers to the variation of scores for the same subject across time (Kline, 1986); and *inter-rater reliability*, which refers to variability across different assessors using the same test (Kline, 2000). Knowing that a test is reliable prior to its use is important, as this means that the assessor can attribute any changes in coding (or scores) over time to the individual, rather than the potential for the test itself, or the assessor, to be contributing to these changes. This is particularly key in terms of risk

assessment and management, given that the ERG22+ was designed to help evaluate interventions aimed at reducing risk within the prison service. As with other SPJ tools, it is difficult to meaningfully assess test-retest reliability in the ERG22+ because of the dynamic risk factors it largely encompasses and therefore the ability for risk and protective factors to fluctuate over short periods of time. Internal consistency and inter-rater reliability are instead focused on in the proceeding discussion.

It has been suggested by advocates of the SPJ approach that *internal consistency* is less of an issue in SPJ risk assessment tools such as the ERG22+, than within psychometric tools, due to the items within such measures not contributing to form an overarching, unitary, construct in the same way as personality assessments may (Douglas & Reeves, 2010; Lloyd, 2019). Propensity for terrorism, or propensity for extremist offending are not unitary constructs that can be measured by a single scale (Lloyd, 2019). Items within each of the three domains that make up the ERG22+ are likely to apply differently depending on the individual's offence, their psychology, and their experiences (Lloyd, 2019) and therefore may instead be viewed as separate constructs (Douglas & Reeves, 2010). Exploring an assessments internal consistency can however provide useful data when looking at how to refine an assessment; this is the context in which Powis et al. (2019a) measured the internal consistency of the ERG22+ as part of their examination of the assessments construct validity and structural properties.

The study by Powis et al. (2019a) described above, reported high internal consistency on the ERG22+ (Cronbach's Alpha coefficient of 0.80). The authors express caution with the result, highlighting that it may be affected by items that were frequently present across cases, for example, 'ideology', and 'identity, meaning and

belonging'. Such items were highly endorsed across the sample but are broad in nature and therefore attracted multiple different responses. For example, although many offenders endorsed ideology, not all offenders subscribed to the same ideologies (Powis et al., 2019a). Powis et al. (2019a) also analysed internal consistency across each of ERG22+ domains of engagement, intent and capability. The engagement and intent domains were found to have *moderate* internal consistency (coefficients of 0.65 and 0.79, respectively) and the capability domains internal consistency was considered *low* (0.46). Given that short measures tend to have lower internal consistency (Kline, 1986), it is unsurprising that the capability domain, which only consists of three items, would have the lowest coefficient. The authors also measured the internal consistency of their suggested five-factor model (described below under validation) and demonstrated levels of internal consistency ranging from high to low, concluding that some domains required further development, possibly by expanding items within the smaller domains (Powis et al., 2019a).

In determining internal consistency, Kline (1986) points out that the samples used must be "representative of the population for whom the test is designed and sufficiently large enough to be statistically reliable" (p. 15); the recommended minimal sample size of 100 is suggested. Powis et al. (2019a) identify that they chose offenders who were classified as Islamic extremist offenders as this was the largest group that had been assessed using the ERG22+ at the time. It is possible that the results may not be generalisable to those who have offended on behalf of another group, cause, or ideology. It is, however, worth highlighting that the majority of those in custody as of

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June 2021 were categorised as holding Islamist-extremist views.[13] As more assessment data becomes available for increasing numbers of extremist offenders within HMPPS with differing ideologies, it would be beneficial to repeat such research to explore whether internal consistency is similar in all cases where the ERG22+ is suggested for use.

Ensuring *inter-rater reliability* is of paramount importance for extremist risk assessment tools like the ERG22+, given the potential implications the assessment results can have on the type of supervision the individual is subject to and the interventions that are recommended to support risk reduction (Powis et al., 2019b). Inter-rater reliability helps to establish whether different assessors completing the ERG22+ with the same available information will come to the same results. If assessors are coming to different conclusions, then this could have implications for those being assessed in terms of their treatment and risk management. Inter-rater reliability can be calculated using different statistical methods depending on the data for analysis, such as measuring simple percentage agreement, to more complicated analyses such as Cohen's kappa, Fleiss kappa and Intra-Class Coefficient (ICC) (Fleiss, 1971; Shrout & Fleiss, 1979). Coefficient values greater than .70 are viewed as necessary for good inter-rater reliability (Kline, 2000); Fleiss (1986) provides a classification which suggests that values greater than 0.75 can be considered excellent, with values less than 0.4 considered as poor.

The authors of the ERG22+ acknowledge that assessment of inter-rater reliability was missed from the initial pilot study (Lloyd & Dean, 2015). To date, one

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[13] 70% of offenders categorised as holding Islamist-extremist views, and 22% holding Extreme Right-Wing ideologies (Home Office, 2021).

known study exploring the inter-rater reliability of the ERG22+ has recently been published. Powis et al. (2019b) sought to establish both the research reliability and the field reliability of the ERG22+. The research reliability was examined by two experienced raters[14] independently rating fifty, randomly selected, cases who had previously been assessed using the ERG22+. Of the cases, 42 were individuals convicted of Islamist extremism, three were ERW offenders, two animal rights extremists and three extremist offenders in support of other causes (Powis et al., 2019b). Powis et al. (2019b) had access to the background information, the interview with the offender and case file information that had been collated, with blank scoring sheets being provided for scoring all items and overall domain ratings. Field reliability, aimed to look at inter-rater reliability in typical users (clinicians working with the extremist offender population) using two hypothetical test cases which were scored by each clinician (Powis et al., 2019b). One test case was based on an ERW case and one on an Islamist extremist case. Thirty-three clinicians who had previously completed ERG22+ training took part in the study and were asked to independently complete the scoring sheet for both cases (Powis et al., 2019b). Inter-rater reliability was analysed in terms of overall agreement between the raters and the extent to which raters agreed with a gold standard rating that was produced (Powis et al., 2019b). Further analysis looked at comparing more experienced assessors (those who had completed four or more ERG22+ assessments and had worked with extremist offenders for at least three years) with those recently trained in the ERG22+.

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[14] Having more than five years' experience in using the ERG22+ as well as research experience with extremist offenders (Powis et al., 2019b).

In terms of research reliability, Powis et al. (2019b) found high inter-rater reliability between the two experienced raters across the three domains and for each of the items within the ERG22+ (scores all within the excellent classification, between 0.81 and 1). Furthermore, analysis across the fifty cases also fell within the excellent range, above 0.90 for the majority of cases (Powis et al., 2019b). The field reliability aspect of the study produced more varied results with overall inter-rater reliability across both case studies classified as moderate to borderline good (Powis et al., 2019b). The ERW case study produced lower levels of reliability in the less experienced raters, with the authors suggesting that this may be due to lower numbers of convicted ERW offenders and therefore less exposure to assessing risk in these cases; Powis et al. (2019b) recommend further research into ERW offenders to improve understanding of this group. This finding may signal that the ERG22+ is easier for assessors to use in the context of Islamist extremist offenders in comparison to other ideologies, although further research would be needed to clarify this. Given that the ERG22+ was developed based on the terrorism literature which is largely biased towards Islamist extremism and functional analysis of British Al' Qaeda influenced offenders, it could be hypothesised that the tool is better suited to assessment of Islamist extremists.

Further research is needed to explore the reliability and validity of the ERG22+ across offenders based on ideology. In terms of the ERG22+ domains, reliability for engagement and capability were between moderate to excellent across both cases, however the intent domain had consistently poor coefficients (Powis et al., 2019b). The authors suggest three of the items within the intent domain (*harmful end objectives*; *over-identification with group, cause or ideology*; and *harmful means to an end*) had

particularly low levels of agreement across raters and therefore may benefit from some amendment and clarification within the manual (Powis et al., 2019b).

Powis et al. (2019b) highlight that the results from both aspects of the study suggest that the assessors experience, knowledge, and expertise is particularly important when judging the reliability of the tool. This would fit with previous comments made regarding the onus on the assessors to maintain a grasp of the political, cultural, religious, and social contexts that contribute to an individual's assessment. Powis et al. recommend that ongoing top-up training, increased supervision, as well as periodic assessment of performance, may be beneficial for assessors' development. Powis et al. do however acknowledge that within the field study the use of two case studies as opposed to real ERG22+ assessments may have impacted upon the results; with the case studies being designed to be challenging for assessors and may have potentially been more ambiguous to rate. The information available to the assessors within the research aspect of the study may have been better organised under the relevant items, given that it was already collated as part of the assessment process, perhaps aiding the scoring of items for the researchers in comparison to the field participants. It may also be the case that the nature of the information provided could have offered some suggestion of the original assessors rating, perhaps making consistent coding across the researchers more likely; this is unclear from the information provided within they study (Powis et al., 2019b). Future research could look at field inter-rater reliability using actual ERG22+ assessments.

In summary, initial attempts to examine the reliability of the ERG22+ suggest that it is a reliable tool for use with extremist offenders and that it meets some of the criteria of a good psychometric measure as set out by Kline (2015). The study by Powis

et al. (2019a) demonstrated good overall internal consistency of the ERG22+ but highlighted low internal consistency of the capability domain, with the authors suggesting future potential structural changes to ERG22+ which may improve its internal consistency (expanded on below). The second study by Powis et al. (2019b) looked at inter-rater reliability of the ERG22+ and concluded that it demonstrates *good* inter-rater reliability overall, but that reliability could be improved with ongoing assessor training and some items within the assessment being better defined. Further research is needed to assess the inter-rater reliability of the ERG22+ items and domains across different settings, particularly within the community where the ERG22+ factors in the form of the VAF are used. This is important in offering evidence to support the assessment's utility in the pre-crime, community setting and contribute to ongoing refinement of both the ERG22+ and VAF.

Discussion

Both reliability and validity of an assessment needs to be established to demonstrate that it is meaningful and useful for practitioners (Tavakol & Dennick, 2011). The ERG22+ shows some promise from initial reliability and validity studies, however more research is needed to further establish these criteria and possibly refine the assessment. Tests are said to require periodic revision on the basis that they are highly sensitive to bias from cultural and societal factors (Coolican, 2004).

A particular challenge to assessing risk in extremist offenders in a reliable and valid way is the heterogeneity of those for whom the assessment is intended to assess (Powis et al., 2019a). Different pathways towards engagement; ideologies, groups, or motivating factors; type of extremist offence; and the individual's role, all need to be considered (Borum, 2015; Powis et al., 2019a). Given that the ERG22+ is broad in its

current prescribed usage (ideologically neutral, gender neutral, no age limit, lone-actors or group offenders, violent or non-violent extremist offenders) it is imperative that continued validity and reliability studies are carried out to ensure that one assessment tool can be applied appropriately and meaningfully in all of these cases; with the data available at present, it is too early to ascertain this. Given the widespread use of the ERG22+ prior to any published examination of its reliability and validity, it is important to now evidence progress in this area. As the opening quote cautions, this is key in ensuring that assessments like the ERG22+, where used alongside other risk assessment tools in legal cases, have the scientific evidence base to stand up to scrutiny and be used appropriately.

Finding the right balance of assessing risk in the area of terrorism is difficult. One the one hand, there can be substantial consequences for an individual, as well as their families and friends, who are assessed as at risk of future offending, both post-conviction and within the pre-crime space (Quershi, 2016). Conversely, there may be catastrophic consequences if an individual is not viewed as at risk of extremist offending and then goes on to commit, or contribute in some way towards, an act of terrorism; as seen more recently with the Manchester arena attacker, Salman Abedi. It can be argued that doing nothing is not an ethical option (Al-Attar et al., 2019). It is therefore key for practitioners to be aware of the intended purposes of the tool they are using, its limitations and the implications of findings, and to make these explicit when interpreting the results to other professionals.

The ERG22+, like other similar measures in the area of terrorism and extremist offending, is relatively new and is only recently at a stage where it has sufficient implementation to be able to begin to confirm validity, reliability, and effective

application (Kessels, 2014). As more empirical studies are conducted, eventually

leading to validation of risk factors and protective factors, revisions to the ERG22+ are

likely. Further, the application of the ERG22+ across extremist ideologies and in both

prison and community settings needs to be examined further. It is hoped that agencies

such as HMPPS and the Home Office, will be willing to allow open scrutiny of their

findings, but also allow researchers to support validation attempts where appropriate.

Chapter Five:

Discussion

"As I try to visualize a terrorist, I see no face. If I try harder, then I see the terrorist

within."

Gavrielides (2018), p. 46

Aims of Thesis

Efforts to prevent and combat terrorism are a top priority globally, with a focus

on addressing the conditions that support the spread of terrorism (United Nations,

2022). There is a need to continually explore the effectiveness of counterterror

measures; adapting processes and practices in light of developing theory, increased

empirical evidence and changes in global terrorism patterns. Global agencies highlight

that when counterterror measures are implemented poorly, they can be

counterproductive (Council of Europe, 2022; United Nations, 2022). The emergence of

specific SPJ risk assessment tools for use with extremist offenders, and for pre-empting

risk in the those considered vulnerable to engagement, are one such example of how

counterterrorism and offender rehabilitation are adapting. Such tools help prioritise

intelligence information in the pre-crime space, monitor changes to risk in extremist

offenders (violent and non-violent) and help to identify treatment and interventions that

aim to reduce the risk of future offending. Given the urgent need for such risk

assessments, their development and implementation prior to extensive validation

attempts have raised some criticism, notably in the case of the ERG22+ (Qureshi, 2016;

RCPSYCH, 2016). SPJ risk assessment does however offer huge potential to collate

information from a range of sources; monitor changes in risk over time; develop greater

understanding of the functions behind the individuals risk behaviour, particularly

through the formulation process; and help in the prioritisation of resources in terms of

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risk management and intervention. Prior to the use of risk assessments specific to extremist offenders, there was a greater tendency for risk aversive practices and for treating all extremist offenders as equally 'high risk' when this is not the case (Al-Attar et al., 2019; Lloyd & Dean, 2015; Van der Heide et al., 2019). Therefore, risk assessments can be a vital tool in assisting intelligence services and practitioners in their decision making, but importantly they can benefit the recipient of the assessment by ensuring they are given the right level of support and intervention to reduce risk.

This thesis sought to explore the current use of SPJ risk assessment tools that have been widely implemented for use with extremist offenders or those considered vulnerable to engagement, in particular drawing together validation attempts to date, criticisms, and future directions. It is recommended that such risk assessments should allow for additional indicators to be added with the emerging empirical data (Council of Europe, 2016). In contribution to the emerging literature, which highlights the importance of disaggregating extremist offenders (Corner et al., 2016; Pelecijn et al., 2021; Victoroff, 2005), this thesis also reports an exploratory analysis focusing solely on the perpetrators of mass casualty terrorist events across Western Europe, specifically exploring the perpetrator and attack characteristics of a lone actor sample. This exploratory analysis supported the identification of future research needs to inform current risk assessment practices.

Summary of Findings

Chapter One

Chapter one provided an overview of the literature on terrorism, particularly identifying a number of challenges to its study, particularly definitional problems.

Furthermore, placing a wide variety of behaviours under the term 'terrorism' could be considered an oversimplification. The words of Schmid and Jongman (1988) resonated, with them noting that the terrorism literature is one area of the social sciences where a vast amount is written, based on only a small amount of research. Navigating the terrorism literature can be overwhelming, with a wealth of information available from a multitude of disciplines and the contribution of more established literature bases. Despite noted critiques of the literature base in terms of the limited use of empirical data historically, it is positive that studies are demonstrating a shift towards more improved methodologies, more cross professional working and sharing of information, improved transparency, and greater challenging of the literature and guidelines through peer review (Horgan, 2014; Moskalenko & McCauley, 2020).

Chapter Two

Chapter two outlined a systematic literature review, which focused on identifying key SPJ risk assessment tools as outlined. Four SPJ tools were included within the review (ERG22+, TRAP-18, VERA and the MLG) with a total of 19 articles meeting the inclusion criteria, 15 of which were empirical studies attempting to validate one of these tools. This review highlighted several key points:

- The balance between transparency of risk assessment tools and the need to preserve their secrecy for fear of security implications has started to shift towards greater openness, however initially the lack of published information contributed to critique of risk assessment implementation.

- SPJ risk assessment tools have several benefits and have demonstrated validity in the general violence literature. It is important to remember their worth, particularly for practitioners working directly with offenders in terms of prioritising treatment needs and best supporting the offender to reduce future risk.

- The empirical literature on the tools identified varies in terms of quality, quantity and how available such literature is for peer review. The review identified the TRAP-18 as having the most published data on its validity to date and this has rapidly expanded over the last two years. The ERG22+ is beginning to make progress, however this research has been undertaken by researchers within HMPPS and would benefit from joint working between external researchers and practitioners to reduce potential bias. The review identified limited literature regarding the MLG for use with extremist offenders, however the tool is designed for violent group offenders more broadly. The VERA had the least publicly available research, with one available study identified within the review relating to the first version of the tool and additional studies not publicly available at the time.

- A key challenge to the validation of risk assessment tools is gaining access to closed-source data and the limited cross professional sharing of information. Tools could be developed much quicker and effectively if researchers and practitioners could work together to help develop understanding about risk and protective factors and apply closed-source data to risk assessment tools to measure postdictive validity.

- Greater research focusing on risk factors and of key importance, protective factors, is needed. Further studies need to identify base rates for risk factors in the general population to be able to compare to different offending populations, as at present it is unclear how distinguishing certain risk factors are (Clemmow et al., 2020).

Chapter Three

Chapter three focuses specifically on terrorism occurring within Western Europe. Open-source data were collected on the attack characteristics and the key perpetrators of identified attacks, focusing on the front-line terrorist role. Key findings from the research highlighted five facets of lone actor mass casualty terrorist attacks which emerged from the data: 'Planned Suicide Attacks', 'Political and Racial Attacks', 'Emotionally Unstable Pathway', 'Criminal Pathway' and 'Radical Pathway'. These facets were broadly supportive of a pathways approach view of violent extremism with clusters of items relating to more criminogenic factors; those suggestive of more impulsive, grievance fuelled attacks, possibly co-occurring with mental health symptoms; and those more radical in nature, inspired by terror groups with exposure to radicalisation online, moral or religious justification expressed and with assistance provided in the planning or procurement of weapons.

When looking at the full data set (*n* =40) of lone and group perpetrators combined, 67.5% of cases demonstrated some form of leakage behaviour. Grievances were expressed in the majority of cases (85%) and 55% of cases were known to authorities in some form; such data is reassuring in terms of prevention opportunities. Of the sample, 52.5% had a criminal history, 27.5% had a psychiatric history, 47.5%

presented with symptoms of mental health problems but did not necessarily have a diagnosis, 70% had experienced adverse life events or possible trauma experiences and 85% had experienced a recent crisis or tipping point event. The high rates of mental health symptoms were expected given the literature on mental health, particularly for mass casualty offenders and lone actor offenders (Corner et al., 2016; Gill & Corner, 2017; Gruenewald et al., 2013; Weenink, 2015, 2019).

Chapter Four

Chapter four focused on the UK's perspective on counterterrorism and on the role out of the ERG22+ risk assessment in England and Wales in 2011. The development of the ERG22+ and recent validation efforts were discussed, along with a critique of the tool. The ERG22+, along with the governments Prevent agenda, have prompted criticism given the lack of empirical data supportive of their use and concerns about the impact on Muslim members of the community in particular (Quereshi, 2016). This thesis has identified some of the leaps in progress that terrorism research and particularly risk assessment development is making, however the limitations must be openly discussed and work to address these limitations needs to continue. The benefits of risk assessment tools are well known, and it is therefore of paramount importance that these existing tools continue to strive towards improvement, empirical backing and increased usability for the assessor, with regular refinement based on the developing literature base. Based on the critique of the ERG22+ it is recommended that further research is conducted using the available data. Exploration of the ERG22+'s use with non-violent offenders compared with violent extremist offenders would be beneficial in informing future revisions of the tool and in identifying whether certain items within the tool are more pertinent to violent or non-violent offenders. Furthermore, focusing on the

use of both qualitative and quantitative research methods to analyse risk formulations would be beneficial in gaining a greater understanding of risk factor clusters. Finally, explorations of assessors experiences of completing the ERG22+ and how improvements can be made would be helpful in informing any future revisions of the tool; such research is not to open the tool up to criticism but to develop the tool further in a way that aids those completing such assessments and those interpreting the results of such risk assessments.

Strengths and Limitations

This thesis has sought to bring together relevant literature and empirical data on the use of some of the key SPJ risk assessment tools developed for use with extremist offenders or those vulnerable to engagement as well as reviewing the empirical studies that demonstrate their validity at present. The research element of this thesis has contributed to the current literature base by focusing on individual and attack characteristics of mass casualty event perpetrators in isolation. The items and the emerging facets offer useful guidance on some of the areas for future research focus, particularly in terms of mental health and trauma. The research also supports the pathways process approach towards violent extremism, in which multiple pathways, each with a complex set of interacting risk and protective factors can lead towards or away from violent extremism (Bartlett et al., 2010; Gill et al., 2021; McCauley & Moskalenko, 2008; Taylor & Horgan, 2006).

The limitations of this thesis must be noted. In terms of quality assessment of research papers within the systematic literature review, a more descriptive overview of limitations for each study was considered more appropriate. This meant that quality

score comparisons could not be made between the studies. In terms of the research outlined within this thesis, key limitations are the small number of mass casualty violent extremist offenders included in the analysis. This was in part due to the time frame restricted on the data set, the focus on Western European attacks and the difficulties with obtaining detailed open-source data. The limitations of open-source data are outlined within chapter three, however many studies within the terrorism field have employed the use of such data which has offered useful contributions. A comparison group, such as comparing to non-violent extremist offenders, or a general violent sample would have helped in exploring the pattern and presence of the individual characteristics outside of the mass casualty attack perpetrator sample. At the time of the study a suitable comparison group was not available, but this may be a fruitful addition to future research. Given these limitations, the generalisability of the findings is therefore limited, and further research would be beneficial to expand on the findings.

Recommendations for Future Research

The findings reported in this thesis highlight the importance of continued SPJ risk assessment revision and validation research. These tools offer a great opportunity to pool information that can also be used to explore the prevalence of risk and protective patterns across different offences, ideologies, and countries in greater numbers. The following general recommendations are made based on the findings of this thesis:

- Postdictive validity studies have been successfully utilised to assess the TRAP-18, however there is limited use of this method for other risk assessment tools. Although the TRAP-18 differs in terms of its use in the pre-crime space, such

validation methods may still offer useful development insights for the other SPJ tools.

- Further research into how current SPJ tools are implemented is crucial. In particular, the strengths and limitations of Multi-Disciplinary Team (MDT) completion versus a single assessor, how co-produced risk assessments are with the offender or vulnerable individual and how this process can be improved, and the challenges that assessors face when completing assessments and how the process can be enhanced where required.

- In accordance with recommendations made by Gill (2020), research exploring the quality of risk formulations would be beneficial to the ongoing refinement of risk assessment practices; furthermore, the information contained within these risk formulations can offer valuable insights into the clustering of risk and protective factors for individuals.

- Research highlights the importance of disaggregating extremist offenders, given differences between lone actor and group perpetrators (Corner & Gill, 2013). At present, the risk assessment tools presented are relatively generic in scope, but it may be that with greater empirical evidence, it is considered that more tailored risk assessments are needed.

- MDS can be successfully utilised with extremist offending data to help in developing typologies of extremist offenders and attack characteristics. Further research exploring and comparing pathways to extremist offending may be fruitful. Intelligence services could make use of such analyses given their access

to closed source data that would ensure the development of more accurate typologies.

- Less is known about ERW offenders which may impact on assessors completing risk assessments on those with ERW ideologies. Further research comparing ideologies would be advantageous, particularly given that all of the SPJ tools within this review were for use across ideologies. Certain risk or protective factors may be more prevalent across offenders holding different ideologies which would have important implications for assessment and intervention.

- More research is needed involving extremist offenders as well as those brought into services due to concerns around vulnerability. We cannot presume to understand someone's internal world; therefore, without talking to individuals directly we are missing vital information.

- Given concerns raised about younger people gaining access to extremist information through social media and gaming platforms, further research exploring some of the processes of radicalisation in younger people would help to inform preventative measures.

- Research on female extremist offenders is limited and given the low numbers of female offenders, the use of these risk assessment tools with this population needs further exploration.

- Research exploring the impact of bias within extremist risk assessment and how this can be reduced will help to improve the risk assessment process. It is acknowledged that research to date has heavily been focused on Islamist offenders. Such knowledge can also inform assessor training.

- All four of the SPJ's identified within the review have an item pertaining to mental disorder within the assessment. At present, this item is likely to be broad in nature, however, the completion of these risk assessments offers ample opportunity for data collection around symptom clusters using psychological and psychiatric assessment tools. By combining samples through cross research and practitioner working, samples sizes could be improved, and the results would contribute to developing understanding of how mental health impacts on individuals, both in terms of engagement within extremist offending but also following extremist offending.

- Trauma informed care and research into the impacts of trauma, particularly within offending populations, is prevalent and this literature base appears to have a great deal to offer in terms of our understanding of terrorism. More research looking at the individual's experience of trauma is needed as at present the majority of literature is theoretical in nature when applied to extremist offenders (Lewis & Marsden, 2021).

- Research is needed to explore the potential benefits or limitations of combining extremist risk assessment tools. The use of 'multiple tools' is recommended by the extremist SPJ tools identified, however there is no guidance as to which tools may complement one another. Moreover, there is also no known research demonstrating whether combining extremist risk assessment tools with general offending risk assessment tools, such as the HCR-20v3 (for violent offending), offers more effective risk management and treatment outcomes. This area could for example be researched within HMPPS where both the ERG22+ and HCR-20v3 risk assessments are likely to be utilised regularly. Based on the findings in

chapter two, it may be suggested that the MLG could be used in combination with the ERG22+ and/or VERA-2 (possibly VERA-2R) in cases where the offenders have engaged in group-based violence in the context of terrorism to offer a more in-depth risk assessment process.

- Finally, there needs to be more research looking at differences and similarities across violent and non-violent extremist offenders. At present within England and Wales, both are assessed using the ERG22+. These completed assessments offer valuable information to begin to look at the presence of risk items in both of these comparison groups, as well as gain more descriptive information around for example mental health diagnoses.

Recommendations for Future Practice

- To improve reliability of risk assessment tools, training assessors is particularly key. Useful avenues for evaluation include exploring assessors understanding of the terrorism literature across different extremist offender groups and evaluation of training programmes to ensure that detailed political, historical, cultural, and social contextual issues are discussed, as well as the importance of bias within the literature. The benefits of top-up training for assessors are also important to acknowledge, given the changing terrorism landscape.

- The applicability of extremist risk assessment within forensic mental health settings should also be explored. At present, within England and Wales, HMPSS own the copyright for the ERG22+ and as such the tool is largely used within prison settings. Given that some patients within forensic mental health settings may be vulnerable towards future engagement in extremist offending or have

current risks potentially relevant to extremist offending, there needs to be improved access to such risk assessment tools for professionals working within these settings.

- Further assessment of extremist offenders in terms of their mental health and trauma histories may help to identify appropriate treatment interventions within prison settings and help to inform the overall literature on the prevalence of such factors.

- The current risk assessments discussed within this thesis all have items pertaining to mental health which are broad in nature; by completing more empirical research into how mental disorder and improved mental health can contribute towards, or protect against, extremist offending, guidance on the relevance of mental health can be developed and treatment targeted more specifically.

Conclusions

SPJ risk assessments can be valuable tools in supporting practitioners to make difficult decisions around risk assessment, management, and intervention and therefore it is a priority that continued resources are put into ongoing development of these tools and research to support this development. Completed risk assessment tools to date offer the opportunity for continued learning to take place, in the form of assessor development and training, evaluating the formulation process and in highlighting challenges to completing detailed risk assessments given time constraints and other factors. There is the opportunity for a more balanced approach to the transparency of findings in a way that maintains the security and safety of the public which we are

beginning to see. Furthermore, there are ample opportunities for cross-sharing of information in a confidential manner that retains the human rights of those assessed but supports the future of risk assessment in this area. Ultimately, the benefit of this is that assessments can be improved and be of greater benefit to those being assessed and for the practitioners using the tool.

This thesis has highlighted research demonstrating that extremism risk needs to be understood on an individual level as well as across the wider macro and meso levels. This requires a range of expertise across disciplines to bring together knowledge and empirical data. Extremist offending, particularly violent extremism, is understandably often viewed as a high risk, inexcusable and an incomprehensible form of offending. Research is beginning to develop a greater understanding of those that go on to commit extremist offences, particularly violent extremism; the risk factors that appear relevant to engagement are factors that any of us could experience. It is therefore imperative that we begin to look beyond the idea of extremist offenders as being abnormal, to understanding the wider impact of the community, historical factors, political factors, counterterrorism measures, media reporting of events and societal factors. Without considering these wider factors, alongside the individual factors, we can never truly understand extremist offending or prevent future harm to others.

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Appendix A: Details of Search Syntax for Specific Databases

Conducted on 20th October 2018

Ovid PsycINFO

Search Strategy:

1. exp EXTREMISM/

2. exp Radical Movements/ or exp Extremism/ or exp Terrorism/

3. "violent extremism".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

4. "extremism".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

5. "terrorism".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

6. "extremist".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

7. "terrorist".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

8. 1 or 2 or 3 or 4 or 5 or 6 or 7

9. exp "TOOL USE"/ or exp Screening Tests/

10. exp Measurement/

11. "framework*".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

12. "assessment*".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

13. "measure*".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

14. "assessment tool*".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

15. exp Risk Assessment/

16. "risk assessment*".mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

17. 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16

18. 8 and 17

19. limit 18 to (peer reviewed journal and english language and yr="2001 -Current")

ProQuest Applied Social Sciences Index and Abstracts (ASSIA) and ProQuest National Criminal Justice Reference Service (NCJRS)

Searched for:
ab(extremis* OR terroris* OR "violent extremism" OR "radical movement*") AND ab(tool* OR framework* OR model* OR assessment* OR measure* OR "risk assessment*" OR "screening test*" OR measurement* OR "assessment tool*" OR "need* assessment*") AND la.exact("English") AND pd(20010101-20181020)

Limited by:

Date:
From January 01 2001 to October 20 2018

Language:
English

Databases:
Applied Social Sciences Index & Abstracts (ASSIA)

Web of Science

TITLE: (extremis* OR terroris* OR "radical movement") *AND* **TITLE:** (tool* OR framework* OR model* OR assessment* OR measure* OR risk near/1 assessment OR assessment near/1 tool)
Refined By: **DOCUMENT TYPES:** (ARTICLE) AND **LANGUAGES:** (ENGLISH)

Appendix B: Overview of Papers that were Unobtainable at the Time of Review

Author (date) of publication	Title of publication	How identified	Type of article
National Offender Management Service. (2011).	ERG 22+ structured professional guidelines for assessing risk of extremist offending	Contact with experts	Unpublished Government Document; Educational license does not cover use within the current review but was available to the author.

Overview of Papers Accessed in Full that were Excluded due to not Meeting the Inclusion Criteria

Author (date) of publication	Title of publication	Reason for exclusion	Method of study identification
Bhui et al. (2020)	Assessing risks of violent extremism in depressive disorders: Developing and validating a new measure of sympathies for violent protest and terrorism	Not SPJ measure. Looks at sympathies for violent protest and terrorism as opposed to risk of engaging in extremist offences	Web of Science
Bockler et al. (2015)	The Frankfurt airport attack: A case study on the	Single case study	PsycINFO database

	radicalization of a lone-actor terrorist		
Bockler et al. (2017)	"Jihad against the enemies of Allah": The Berlin Christmas market attack from a threat assessment perspective	Single case study; Looks at proximal warning behaviours in isolation, not applying the overall TRAP-18	PsycINFO database
Cole et al. (2009)	Guidance for identifying people vulnerable to recruitment into violent extremism	Outlines the Identifying Vulnerable People (IVP) which is a screening tool	Contact with expert
Collins and Clark (2021).	Using the TRAP-18 to identify and incel lone-actor terrorist	Single case study	PsycINFO database
Egan et al. (2016)	Can you identify violent extremists using a screening checklist and open-source intelligence alone?	Study explored the effectiveness of the IVP which is a screening tool	PsycINFO database
Ehsan et al. (2021)	Development and validation of Risk Assessment Tool for Extremism (RATE) for young people in Pakistan	SPJ tool not outlined	Web of Science database

Guldimann and Meloy (2020)	Assessing the threat of lone of lone-actor terrorism: the reliability and validity of the TRAP-18	Overview document of current research on TRAP-18	PsycINFO database
Herzog-Evans (2018)	A comparison of two structured professional judgment tools for violent extremism and their relevance in the French context	Review/ comparison document	Contact with expert
Hoffman et al. (2011)	Attacks on German public figures, 1968-2004: Warning behaviours, potentially lethal and non-lethal acts, psychiatric status, and motivations	Looks at warning behaviours in isolation. Not evaluating the TRAP-18 as a risk assessment tool	Reference list
Kebbell and Porter (2012)	An intelligence assessment framework for identifying individuals at risk of committing acts of violent	Reviews literature/ theories but not a specific risk assessment tool or an attempt to validate an existing tool	Systematic search of databases

	extremism against the west		
Logan and Lloyd (2018)	Violent extremism: A comparison of approaches to assessing and managing risk	Review paper discussing current risk assessment and management and offers recommendations	Reference list
Meloy and Genzman (2016)	The clinical threat assessment of the lone-actor terrorist	Single case study	PsycINFO database
Meloy et al. (2014)	Some warning behaviors discriminate between school shooters and other students of concern	Looks at warning behaviours in isolation. Not evaluating the TRAP-18 as a risk assessment tool	Reference list
Qureshi (2016)	The 'science' of pre-crime: The secret 'radicalisation' study underpinning Prevent	Critique's the ERG22+. Review document	Google Search
RTI International. (2018).	Countering violent extremism: The application of risk assessment tools in the criminal justice and rehabilitation process: Literature review	Review document	Google Search

Sarma, K. S. (2017).	Risk assessment and the prevention of radicalization from nonviolence into terrorism	Review document	Web of Science database

Appendix C: Mixed Methods Appraisal Tool (MMAT), version 2018

Category of study designs	Methodological quality criteria	Responses			
		Yes	No	Can't tell	Comments
Screening questions (for all types)	S1. Are there clear research questions?				
	S2. Do the collected data allow to address the research questions?				
	Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.				
1. Qualitative	1.1. Is the qualitative approach appropriate to answer the research question?				
	1.2. Are the qualitative data collection methods adequate to address the research question?				
	1.3. Are the findings adequately derived from the data?				
	1.4. Is the interpretation of results sufficiently substantiated by data?				
	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?				
2. Quantitative randomized controlled trials	2.1. Is randomization appropriately performed?				
	2.2. Are the groups comparable at baseline?				
	2.3. Are there complete outcome data?				
	2.4. Are outcome assessors blinded to the intervention provided?				
	2.5 Did the participants adhere to the assigned intervention?				
3. Quantitative non-randomized	3.1. Are the participants representative of the target population?				
	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?				
	3.3. Are there complete outcome data?				
	3.4. Are the confounders accounted for in the design and analysis?				
	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?				
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the research question?				
	4.2. Is the sample representative of the target population?				
	4.3. Are the measurements appropriate?				
	4.4. Is the risk of nonresponse bias low?				
	4.5. Is the statistical analysis appropriate to answer the research question?				
5. Mixed methods	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?				
	5.2. Are the different components of the study effectively integrated to answer the research question?				
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?				
	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?				
	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?				

Note. From Hong et al., (2018). *Mixed Methods Appraisal Tool (MMAT), Version 2018 User guide*. Retrieved from http://mixedmethodsappraisaltoolpublic.pbworks.com/w/page/24607821/FrontPage

Appendix D: Data Extraction Form for Empirical Papers

Author(s)/ Year of publication	
Risk Assessment Tool Evaluating	
Aims/ Design	
Participants	
Analysis	
Results/ Conclusions	
Key Strengths and Limitations/ Quality Assessment	

Appendix E: Data Extraction Table Focused on the Risk Assessment Tools Identified Within the Review

Name of tool/ Authors of tool	
Title of paper	
Authors	
Number of items/ risk factors	
Target population	
Mode of completion	
Purpose of measure	
Evaluation	
Comments on theory and item selection	

Appendix F: Coding Framework

Variable, SPSS Variable Name, Coding Instructions

Key perpetrators – Defined in this research as any person with a front-line role in perpetrating the terrorist incident. Therefore, it is those individuals who commit the attack or are directly involved logistically in carrying out the attack. For the purposes of this research, key perpetrators do not include the wider group or cell (if applicable) that may carry out other roles, such as, bomb making or acquiring weapons unless they are also directly involved in perpetrating the attack.

EVENT KEY DETAILS

1. Event Identification number (*EventID*) - *Descriptive Variable*
Incidents included within the data set are recorded using the following system:

   - First 5 letters refer to the country the incident took place in.
   - Next 4 numbers – year of the incident.
   - Last number – case number to highlight when more than one incident in a country occurred in the same year. 0 is given where no other incidents occurred in the same year in a given location (within the data set). Multiple incidents occurring in a given location, during the same year, are given a numerical code (1, 2, 3, 4 etc).

2. Date of first attack (*Date) – Numeric Variable*

The numeric date of the month the incident took place (DD.MM.YEAR). Where an incident occurs over an extended period, the date the incident was first initiated is documented.

3. Time of first attack *(TimeFA) – Categorical Variable*

The time of the initial incident (meeting the data set criteria) is categorised under the following (Time recorded as local time):
   - A coding of 1 is given for early morning (07:00 – 10:00)
   - A coding of 2 is given for late morning (10:01 – 12:00)
   - A coding of 3 is given for early afternoon (12:01 – 15:00)
   - A coding of 4 is given for late afternoon (15:01 – 18:00)
   - A coding of 5 is given for evening (18:01 – 23:59)
   - A coding of 6 is given for overnight (00:00 – 06:59)
   - A coding of 9 is given where time estimate is unknown.

4. Event Type Description *(TypeD) – Descriptive Variable*
A brief descriptive of the event is given – Maximum 5000 characters

EVENT LOCATION

5.   Location of first attack: Town/ Region *(Location) – Descriptive Variable*

A descriptive of where the event took place. If this was over multiple towns, record each along with the overall region.

6.   Country – Descriptive Variable

The name of the country where the event took place.

7.   Targeted Multiple sites *(TMultSit) – Categorical Variable*

Did the perpetrator(s) commit the act in multiple targeted location sites. This item refers to targeted sites, therefore if further incidents relate to the perpetrator(s) fleeing the scene and/ or avoiding capture then this is instead coded under item 11. In cases where there were multiple perpetrators, did the attacks take place in multiple locations?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

8.   Target Place Type *(TPlace) – Categorical Variable*

Where did the event take place? If multiple locations, code all that apply (each coded as a separate variable up to three).

- A coding of 1 is given for a 'town/ urban centre'
- A coding of 2 is given for a 'government building'
- A coding of 3 is given for 'other'
- A coding of 9 is given for 'unknown'.

9.   Specific Locale *(SLocale) – Categorical Variable*

Specific location of the event/s. If multiple locations, code all that apply (each coded as a separate variable up to three).

- A coding of 1 is given for 'street'
- A coding of 2 is given for 'bar/ restaurant/ pub/ café'
- A coding of 3 is given for 'arena/ sporting venue'
- A coding of 4 is given for 'transport terminus' e.g. airport, train station
- A coding of 5 is given for 'transport' e.g. bus, tube, train, plane

- A coding of 6 is given for 'shopping centre/ supermarket'
- A coding of 7 is given for 'school'
- A coding of 8 is given for 'Religious Building (inside or outside)'
- A coding of 9 is given for 'Tourist Location'
- A coding of 10 is given for 'Media building'
- A coding of 11 is given for 'Military/ Police Setting'
- A coding of 12 is given for 'Other'.

10. Target Place2 *(TPlace2) – Categorical Variable*

Coded as above in item 9, for additional target locations.

11. Specific Locale 2 *(SLocale2) – Categorical Variable*

Coded as above in item 10, for additional target locations.

12. Target Place 3 *(TPlace3) – Categorical Variable*

Coded as above in item 9, for additional target locations.

13. Specific Locale3 *(SLocale3) – Categorical Variable*

Coded as above in item 10, for additional target locations.

14. Event Evolved *(Evolved) – Categorical Variable*

Did perpetrator/s move locations as the event evolved, rather than specifically targeting additional areas? An example would include, moving across streets when the police arrive or fleeing from the scene and engaging in further acts of violence.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

PERPETRATOR(S) / GROUP FACTORS (DESCRIPTIVE)

15. Age of Perpetrator/s *(AgePerps) – Numeric*

16. Age category of Lone Actor (*AgePerp1) – Categorical Variable*

What age bracket does the perpetrator fall into? For Group attacks additional variables for each key perpetrator will be coded in the same way.

- A coding of 1 is given for age <18 years old
- A coding of 2 is given for 18-25 years old
- A coding of 3 is given for 26-30 years old
- A coding of 4 is given for >30 years old
- A coding of 9 is given for 'unknown'.

ASSAULT TYPE AND OUTCOMES

17. Attack Type *(AttackType)*

What category best describes the type of attack carried out?

- A coding of 1 is given for a 'Spree Assault' – this describes attacks where melee weapons (for example knives) were used without a vehicular assault or bomb (also include firearms under this category).
- A coding of 2 is given for a 'Vehicular Assault' – this describes an attack where a vehicle is used as the primary weapon e.g. driving into crowds. The actor can combine with weapons but for the purpose of coding this will fall under a 2.
- A coding of 3 is given for a 'Bomber/ Explosive Assault' – this describes attacks where an explosive device was used regardless of whether other weapons were also used.

18. Melee Weapon Attack *(MWeapon) – Categorical*

Did the event involve the use of a weapon (other than firearms and explosives) to target people e.g. knives, blunt object, hands, feet, suffocation device. Only include weapons used in the attack. Any additional weapons found on persons or in vehicles that were viable but not used should be coded as other.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

19. Vehicular Attack *(VehAttac) – Categorical*

A vehicle used in the incident to harm others. Do not include acts where explosives used within vehicles (these are coded under explosives). This item is purely for incidents where vehicles are driven into victims. Only include weapons used in the attack.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

20. <u>Firearms</u> *(Firearm) – Categorical*

A weapon used which is capable of firing a projectile (as coded in GTD). Only include weapons used in the attack. Any additional weapons found on persons or in vehicles that were viable but not used should be coded as other.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

21. <u>Explosives</u> *(Explosiv) – Categorical*

Were explosives used within the incident? Can include grenades, homemade explosive devices, projectiles, suicide (vests, belts), vehicle bomb, remote device, other explosives. Only include weapons used in the attack. Any additional weapons found on persons or in vehicles that were viable but not used should be coded as other. Fake suicide belts would be coded under fake weapons.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

22. <u>Undetonated Explosives</u> *(UndetExp) – Categorical*

Were undetonated devices found at the scene? Include where controlled explosions were carried out by Police.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'.

23. <u>Fake Weapons</u> *(FakeWeap) – Categorical*

Were fake weapons used within the incident? This could include fake suicide vests/ belts, fake firearms etc.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'.

24. Other Weapons Not Categorised *(OtherWea) – Categorical*

Were any other weapons used that do not fit under previous coding categories. Code as present in cases where any additional weapons were found on persons or vehicles, that were viable but not used.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

25. Total Victims *(TotVictim) – Categorical*

How many victims were there as a direct result of the incident, this is the number of casualties (injured) and fatalities combined. This does not include perpetrators.

- A coding of 1 is given for 5 or less victims
- A coding of 2 is given for 6 to 10 victims
- A coding of 3 is given for 11 to 20 victims
- A coding of 4 is given for 21 to 50 victims
- A coding of 5 is given for 51 to 100 victims
- A coding of 6 is given for over 100 victims

26. Number of Casualties *(NCasualt) – Numerical*

How many people were injured as a result of the incident? Only include physical injury, not emotional/ mental health impact. Does not include perpetrators. If numbers reported in multiple sources differ, take an average of available responses.

27. Number of Fatalities *(NFatalit) - Numerical*

How many people died as a result of the incident? Does not include perpetrators. If numbers reported differ, take an average of available responses.

28. Attacked Civilians *(TarCivil) - Categorical*

Were civilians targeted and harmed during the incident?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

29. Attacked Police / Military personnel *(TarMilit) – Categorical*

Were Police or Military personnel targeted and harmed during the incident?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'.

30. Attacked Government Officials *(TarGovOf) - Categorical*

Were Government Officials targeted and harmed during the incident?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

31. Hostages Taken *(HosTaken) – Categorical*

Did the perpetrator/s take any hostages, or attempt to take hostages, during the act or immediately following the act?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

32. Target Description *(TarDescr) – Descriptive*

Did the perpetrator/s appear to target a particular ethnic or social group. Examples can include tourists, ethnic minority groups, media representatives, royal family, police, military, children and western civilians etc. If expressed target prior or after the event include this here even if failed to harm target.

33. Failed Target *(FailTarg) – Categorical*

Was there evidence to suggest that the perpetrator(s) had a planned target that was unsuccessfully harmed during the event? An example could be where the perpetrator(s) target an event where they believe a particular individual will be attending but they are not in attendance or where the initial target is unsuccessfully harmed in the event.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

34. Level of Harm *(LevHarm) – Categorical*

Level of harm caused by the incident/ perpetrator(s) is coded as:

- A coding of 1 is given for 'Casualties <10, no fatalities'
- A coding of 2 is given for 'Casualties (10 or more), no fatalities'

- A coding of 3 is given for 'Fatalities <10 with/without additional casualties'
- A coding of 4 is given for 'Multiple fatalities (10 or more) with/ without additional casualties'.

35. Perpetrator Escaped *(PerEscap) – Categorical*

Did the perpetrator(s) attempt to avoid arrest or detection by fleeing the scene after the act? Code this item in cases where the perpetrator is killed or captured by officials at a later time following fleeing the scene.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

36. Perpetrator Captured *(PerCaptu) – Categorical*

Were the perpetrator(s) arrested/ captured during commission of the act.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

37. Perpetrator Killed by Officials *(PerKill) – Categorical*

Were the perpetrator(s) killed by officials during commission of the act. Do not code those that fled and were killed at a later date.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

38. Perpetrator died in commission of the act (*PerDied*) – *Categorical*

Were the perpetrator(s) killed in the process of carrying out the attack or from injuries sustained during attack. An example would be a perpetrator who dies when detonating an explosive vest (Martyrdom). Does not include where perpetrators are killed by officials.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

PLANNING – Code as present if noted in any members of the group/ individual perpetrators

39. Impulsive Attack *(Impulsiv) – Categorical*

Did the attack appear to have little to no planning involved?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

40. Detailed plans found *(DetaiPln) – Categorical*

Were detailed plans found, for example maps of the attack location/ area, manuals related to the attack or any items pertinent to the planning of the attack. Item suggesting that the act was well planned, rather than impulsive in nature.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

41. Reconnaissance *(Recon) – Categorical*

Have specific targets been identified or is there evidence that the perpetrator has researched targets prior to the act. The perpetrator(s) have been observed at the target location or close to the target location to conduct a practice run leading up to act.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

42. Location well-known to perpetrator(s) *(LocKnown)– Categorical*

Is the target location close to the perpetrators home address (within the same town or city) or a location known to the perpetrator through their other activities such as work, leisure, previous address or education?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

43. Assistance provided *(AssisGvn) – Categorical*

Does the perpetrator appear to have access to a larger terrorist network or criminal network in which funding and equipment is provided to help prepare for the incident? Have others outside of the key perpetrators (those directly committing the attack) assisted in providing funds, weapons, vehicles etc.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

44. Procured Vehicle for Attack *(ProVehic) – Categorical*

Have the perpetrators stolen or hired a vehicle for use within the terrorist incident?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

45. Used Own Vehicle *(OwnVehic) – Categorical*

Have the perpetrators used their own vehicle to facilitate the terrorist incident?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

46. Handler / Contact with Terror Group *(Contact) – Categorical*

Has the perpetrator(s) appeared to have contact with a handler or direct contact with a terrorist group in the lead up the incident?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

47. Previous Training *(Training) – Categorical*
Does the perpetrator(s) appear to have had any prior training that may have assisted them in carrying out their act, for example, weapons training or military experience?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

48. Level of Planning *(Planning) -Categorical*

How thorough has the planning been for the incident? Is there evidence of planning prior to the incident and if so, categorise the extent based on the following categories:

- A coding of 0 is given for 'None' – There is no evidence of any planning, appears relatively impulsive.
- A coding of 1 is given for 'Minimal' – There is some evidence of planning but this is not particularly sophisticated or detailed e.g. acquired weapons but limited plans of how to execute incident or of location.
- A coding of 2 is given for 'Well Planned' – There is evidence of detailed planning, for example maps, locations visited, preparing weapons, thinking through get-away plan etc.

PERPETRATOR CHARACTERISTCS/ PUSH AND PULL FACTORS

49. Perpetrator(s) Birth Country (*PNation*) – *Descriptive Category*

What country was the perpetrator born in. Just focus on birth country as opposed to where the perpetrator grew up.

50. Homegrown (*Homegrwn*) – *Categorical Category*

Were any of the perpetrators born in the country that was targeted within the incident or had lived in the target country since childhood (16 years or below)? If group actors and Yes for presence, provide a percentage of perpetrators classified as homegrown.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

51. Perpetrator(s) European Citizens - Include UK – *(PEuropea) – Categorical Category*

Were any of the perpetrator's European citizens? Include the UK within this category. Citizens are defined as, "a person who is a member of a particular country and who has rights because of being born there or because of being given rights, or a person who lives in a particular town or city" (Cambridge Dictionary). Coding for this category follows the GTD countries list (GTD, 2017).

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

Western Europe
Andorra, Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Gibraltar, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, Vatican City, West Germany (FRG)

Eastern Europe
Albania, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Czechoslovakia, East Germany (GDR), Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Serbia-Montenegro, Slovak Republic, Slovenia, Soviet Union, Ukraine, Yugoslavia

52. Perpetrator(s) Citizen of Middle Eastern & North Africa Country *(PMEaster)* – *Categorical Category*

Were any of the perpetrator's citizens of countries within the middle east? Coding for this category follows the GTD countries list (GTD, 2017).

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

Middle East & North Africa
Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, North Yemen, Qatar, Saudi Arabia, South Yemen, Syria, Tunisia, Turkey, United Arab Emirates, West Bank and Gaza Strip, Western Sahara, Yemen

53. Perpetrator(s) Immigrant *(PImmigrnt) – Categorical Category*

An immigrant is defined as a person who has come to a different country in order to live there permanently (Cambridge Dictionary).
- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

54. Perpetrator(s) Refugee / Asylum Seeker *(PAsylum) – Categorical*

A refugee is defined as, "a person who has escaped from their own country for political, religious, or economic reasons or because of a war" (Cambridge Dictionary). An asylum seeker is defined as, "someone who leaves their own country, often for political reasons or because of war, and who travels to another country hoping that the government will protect them and allow them to live there" (Cambridge Dictionary).
- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

55. Perpetrator(s) Second Generation Migrant *(SeDMigra) – Categorical*

A person who was born in and is residing in a country that at least one of their parents previously entered as a migrant (European Commission, 2022).
- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

56. Rejected or pending Immigration or Asylum status *(RejAsylm) – Categorical*

Did the perpetrator(s) have their immigration or asylum application rejected or were they pending a decision on whether this would be granted?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

57. Perpetrator(s) Potential Trauma Experiences/ Adverse Life Experiences *(TraumaAd) – Categorical*

Has the perpetrator appeared to have experienced grievances, societal discrimination, or injustice historically? Is there evidence to suggest that the perpetrator may have had experiences that could be potentially traumatic either in childhood or during adulthood prior to the act? Consider events such as death, abuse, neglect, racism, witnessing violence, divorce, war, poverty, asylum process, household dysfunction, substance abuse within the household.

Without understanding the persons perspective, it is difficult to confirm that an experience will be traumatic to that individual, therefore results pertaining to this item should be treated with caution. Hypotheses drawn will be used to inform future research avenues.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

58. Recent Crisis/ Tipping Point/ Transitional Period *(TipPoint) – Categorical*

Evidence of a crisis, increased stressors or evidence of psychological distress in the lead up to the act (proximal stressor rather than distal). Consider chronic stress (build-up of stressors) as well as recent stressor and any signs of desperation. Examples include, recent break-down in relationship, loss of employment, police investigation, death of family member/ friend. Is there evidence to suggest a change in emotions leading up to the act. This may include signs of increased anger, emotional dysregulation, or signs of mental health instability. Has the perpetrator made a sudden observable change in the lead up to the act that may have been observed by others, for example, quitting work, leaving home, change to hobbies or behaviours?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

59. Perpetrator(s) Evidence of Poverty / Financial Problems/ Relative Deprivation *(RelDepri) – Categorical*

Is there evidence to suggest that the perpetrator(s) experienced poverty, relative deprivation, or financial problems in the lead up to the incident. This can include unemployment.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

60. Perpetrator(s) Psychiatric History *(PsychHis) – Categorical*

Did the perpetrator have a diagnosed mental health condition prior to the act? This item can include personality disorder diagnoses and developmental disorders such as Autistic Spectrum Disorders. Has the perpetrator been admitted for psychological treatment previously (do not include post attack)?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

61. Perpetrator(s) Suspected Mental Disorder/ Symptoms of Mental Disorder *(SymptMH) - Categorical*

Is there evidence to suggest that the perpetrator may have experienced symptoms of mental illness that was either undiagnosed at the time of the act (due to lack of contact with mental health services) or of a lesser degree than to warrant a formal diagnosis? Include any comments on personality disorder and developmental disorders that were undiagnosed prior to act. Any suggestions of suicidal thoughts, depression, anxiety documented. Following the attack was the perpetrator assessed as having a mental disorder, for example court psychiatric assessments or Hospital Order given for treatment.

This is speculative and based on available reports, therefore firm conclusions cannot be drawn based on this item, however, can inform future research avenues.
- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

62. Perpetrator(s) Substance Use History *(SubstUse) – Categorical*

Does the perpetrator(s) have a known history of illicit substance use. Alcohol only to be included where there is evidence suggestive of alcohol disorder. Include use of anabolic steroids, mistreatment of prescription medication as well as illegal substance use (based on UK law).

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

63. Criminal History *(Criminal) – Categorical*

Does the individual or group members have a history of criminal convictions or multiple arrests. Do not include singular arrests for which no convictions. Delinquency can be coded separately.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

64. History of Violence (PViolenc) – Categorical

Does the perpetrator(s) have a history of engaging in violence behaviour, other than violent extremism? Examples may include, violent crime, violence during childhood and domestic violence.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

65. Time in Prison (Prison) - Categorical

Has the perpetrator(s) spent time in prison at any point prior to the incident?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

66. Juvenile Delinquency (JuvenDel) - Categorical

Are there signs of delinquent, challenging or anti-social behaviour from a young age (below 18)?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

67. Relationship/ Has Children (InRship) - Categorical

Was the perpetrator(s) in a relationship at the time of the act? Is the perpetrator known to have any children at the time of the act?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

68. Known to authorities (KnowAuth) - Categorical

Are any of the key perpetrators known to the authorities or on a watchlist either at the time of the incident or at any point leading up to the incident?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

69. Linked to other terrorist attacks (LinkAtta) – Categorical

Are any of the key perpetrators linked to any other terrorist attacks that have been committed either prior to or following the incident.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

MOTIVATION

70. Affiliation to Specific Terrorist or Extremist Group *(Affiliat) – Categorical*

Does the perpetrator(s) have a known affiliation with a specific extremist or terrorist group? Can include groups classified as extremist in nature as opposed to those solely on the proscribed terrorist group list. This item refers to a specific connection with the group as opposed to inspired by the group.

The link below offers a list of proscribed terrorist groups or organisations for reference:

https://www.gov.uk/government/publications/proscribed-terror-groups-or-organisations--2/proscribed-terrorist-groups-or-organisations-accessible-version

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

71. Group Name *(GrpName) – Descriptive*

What is the name of the extremist or terrorist group that the perpetrator is reported to have an affiliation with?

72. Inspired by Terror Group *(Inspired) – Categorical*

Only code as present if the perpetrator appears to be inspired (for example called to arms) by a group classified as a terrorist organisation according to the UK Government (https://www.gov.uk/government/publications/proscribed-terror-groups-or-organisations--2/proscribed-terrorist-groups-or-organisations-accessible-version). Do not code if the perpetrator has affiliation to the terrorist group.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

73. Group Claimed Responsibility *(ClaimRes) – Categorical*

Did a terrorist group claimed responsibility for the act after its commission even if their involvement was not proven?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

74. Description of group that Claimed Responsibility – *Descriptive*

What is the name of the group/s that claimed responsibility?

75. Extremist literature / Propaganda *(Propagan) – Categorical*

Is there evidence to suggest the perpetrator(s) has extremist literature or propaganda material in their possession. This can include online or in person, for example, posting on social media, documents on their computer or other devices, or physical materials.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

76. Family / Friend Influences *(Influenc) – Categorical*

Is there evidence to suggest that the perpetrators family or close friends also belonged to the same movement or network or shared the same ideology.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

77. Evidence of Radicalisation *(Radicali) – Categorical*

Is there evidence to suggest that the perpetrator(s) went through a process of radicalisation? Radicalisation is defined as "the process by which a person comes to support terrorism and extremist ideologies associated with terrorist groups" (HM Government, 2021, Glossary of terms).

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

78. Radicalised in Religious Setting *(RadRelig) -Categorical*

Is there evidence to suggest that the perpetrator(s) may have been radicalised in a religious setting?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

79. <u>Radicalised In Prison</u> *(RadPriso) – Categorical*

Is there evidence to suggest that the perpetrator(s) may have been radicalised in prison?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

80. <u>Radicalised Abroad / Travelled</u> *(Travelled) - Categorical*

Is there evidence to suggest that the perpetrator(s) may have been radicalised abroad or travelled in the lead up to the incident for what has been suggested as training or preparation?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

81. <u>Radicalised Online</u> *(RadOnlin) – Categorical*

Does the perpetrator(s) appear to have been exposed to content online that may have contributed towards radicalisation?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

82. <u>Evidence of Clear Ideology</u> *(Ideology) - Categorical*

Is there evidence of a clear terrorist ideology? Definition of terrorist ideology provided below.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

Definition from Ackerman and Burnham (2021):

"Ideology is a system of societal beliefs that is judgmental of the way things are and/or ought to be, is generally intended to be propagated, and claims exclusive explanatory power within the domain it encompasses" (p. 1166).

"Violent adversarial ideology as an ideology that enunciates specific grievances, delimits enemies, and legitimates violence against those enemies" (p. 1169).

"Terrorist ideology simply as a violent adversarial ideology which explicitly permits the use of terrorism" (p. 1170).

83. <u>Ideological Category</u> (IdeolCat) – Categorical

Categorise the individual or group based on their ideological motivation where applicable.

- A coding of 0 is given for 'No clear ideology or motivation' – This does not mean it is unknown, it is in cases where the group or individual do not appear to hold an ideological motivation.
- A coding of 1 is given for 'Jihadist terrorism'
- A coding of 2 is given for 'ethno-nationalist and separatist terrorism'
- A coding of 3 is given for 'Left-wing and anarchist'
- A coding of 4 is given for 'right-wing terrorism'
- A coding of 5 is given for 'single-issue terrorism'
- A coding of 6 is given for 'other'
- A coding of 9 is given for 'unknown'.

84. <u>Drugs Used Prior to Incident</u> *(DrugPre) – Categorical*

Any evidence of illicit substances or alcohol use in the hours leading up to the attack that may potentially have an impact on functioning. Do not include previous substance use. Examples may include illegal drugs, anabolic steroids, or alcohol use.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

85. <u>Personal Grievance or Moral Outrage Expressed</u> *(ExpGriev) – Categorical*

The perpetrator(s) has voiced grievances or expressed moral outrage at certain situations that appear relevant to their subsequent role within the violent extremist incident. These expressions will have occurred prior to the incident. These may be personal or political. This may be in any form of communication, for example, online, in person or written communication.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

INTENT

86. <u>Contact with terrorist group prior</u> *(ContactG) – Categorical*

Did the perpetrator(s) have contact with a terrorist group prior to the incident?

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

87. <u>Electronic Messages Indicating Attack</u> *(Messages) - Categorical*

Were messages identified that signalled an attack? Examples include perpetrators sending messages discussing the planning or some element of the target, or online messages (social medial, discussion forums etc.) expressing that violence might be coming.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

88. Leakage *(Leakage) – Categorical*

The perpetrator(s) made comments to others (those outside of the terrorist group or cell if applicable) which may have indicated aspects about the plot or the perpetrator(s) potential risk of causing harm leading up to the act? This item relates to the perpetrator(s) divulging information that could suggest their motivation or capability to carry out an act. This can cover a spectrum of behaviours such as expressing support for an ideology, discussing preparation for the attack or intent to attack (Gill et al., 2014; Meloy & O'Toole, 2011). This item is only coded if the communication was known or could have been known by others prior to the attack.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

89. Justification Expressed Prior *(PreJusti) – Categorical*

Did the perpetrator/s make some form of prior public statement about the act, justifying or condoning the act. For example, recording a video or writing a letter.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

90. Justification Expressed During or After Attack *(PostJust) – Categorical*

The perpetrator/s made a statement regarding justification for act either during or following its commission. This may include a statement made by the perpetrator in court or to the Police.

- A coding of 0 is given for 'No'
- A coding of 1 is given for 'Yes'

91. Justification Category *(JustiCat) – Categorical*

Based on the available information, what category does the justification expressed best fall under?

- A coding of 0 for 'None expressed'
- A coding of 1 for 'Personal Grievance Against Others'

- A coding of 2 for 'Personal Grievance with Moral Justification''
- A coding of 3 for 'Political/ Moral Justification'
- A coding of 4 for 'Moral with Religious Justification'
- A coding of 5 for 'Religious Justification'
- A coding of 6 for 'Other/ denied attack'
- A coding of 9 for 'Unknown'. 'Religious Justification'