

# Updating and Organizing Our Knowledge of Risk & Protective Factors For Lone-Actor Terrorism<sup>1</sup>

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**Abstract.** This chapter updates builds upon previous descriptive analyses of lone-actor terrorists, their behaviors, ideological backgrounds and degrees of ‘loneness’. It offers greater conceptual clarity, updated data and a more expansive set of variables from previous analyses. Individual vulnerability indicators examined here include potential indicators of cognitive susceptibility to moral change, and self-selection and social selection into radicalising settings, notably membership of a social network containing one or more radicalised individual. We also examine exposure settings, attack-preparation behaviors and explore sub-set analyses of the data. The analyses informed by a Risk Analysis Framework which offers a multilevel, integrated meta-model of these events and allows for the synthesis of disparate findings. The analyses provide key insights into the behaviour of lone actors, which could inform intelligence gathering and investigative practice, as such analyses already do in other crime prevention domains.

**Keywords.** Terrorism, Radicalization, Lone-Actor, Risk Factors, Protective Factors

## 1. Introduction

Although lone-actor terrorism is a longstanding historical phenomenon, quantitative studies only come to the fore in the past ten years. *Bombing Alone* by Gill et al (2014), for example, was a landmark study, which provided a thick description of the prevalence rates of risk and protective factors amongst lone-actor terrorists. This study largely was styled on Fein et al.’s (1999) description of individuals who had approached or threatened U.S. public figures. Previously, academic perspectives on this topic remained methodologically, theoretically, and empirically weak; and, therefore, largely ill-suited for policy purposes or practice. *Bombing Alone* and subsequent EU funded projects such as PRIME ([www.fp7-prime.eu](http://www.fp7-prime.eu)) and GRIEVANCE ([www.grievance-erc.com](http://www.grievance-erc.com)), provided the cornerstones for conceptual and empirical developments in our understanding of lone-actor terrorism (Bouhana, 2019; Clemmow et al., 2020a; Clemmow et al., 2020b; Corner et al, 2016; Corner & Gill, 2015; Corner et al, 2019; Gill, 2015; Gill et al., 2020; Gill et al., 2017; Gill et al., 2016; Gill & Corner, 2016; Marchment et al., 2020; Meloy & Gill, 2016). This chapter returns to the original goals of *Bombing Alone* but it does so with greater conceptual clarity, an updated database (up to 2015), an expanded set of

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variables and a slightly altered (and arguably more valid construct) definition of what constitutes a lone-actor terrorist.<sup>3</sup>

## 2. Research Design

The original *Bombing Alone* codebook was developed based on a review of literature on individuals who committed a wide range of violent and non-violent crimes, were victimized, and/or engaged in high-risk behaviours, as well as a review of other existing codebooks used in the construction of terrorism-related databases. The variables included in the codebook spanned socio-demographic information (e.g., age, gender, occupation, family characteristics, relationship status, occupation, employment), antecedent event behaviours (i.e., aspects of the individual's behaviours towards others and within their day-to-day routines), event-specific behaviours (e.g., attack methods, who was targeted) and post-event behaviours and experiences (e.g., claims of responsibility, arrest/conviction details).

Data was drawn through an exhaustive examination and coding information contained in open-source news reports, sworn affidavits and when possible, openly available first-hand accounts. The vast majority of sources came from tailored LexisNexis searches. The relevant documents across online public record depositories such as documentcloud.org, biographies, and all available scholarly articles were additional data sources.

Each observation was coded by three independent coders. After an observation was coded, the results were reconciled in two stages (coder A with coder B, and then coders AB with C). In cases when three coders could not agree on particular variables, a researcher resolved differences based on an examination of the original sources that the coders relied upon to make their assessments. Such decisions factored in the comparative reliability and quality of the sources (e.g., reports that cover trial proceedings vs. reports issued in the immediate aftermath of the event) and the sources cited in the report.

To aid coding decisions, each source was plotted on a continuum of reliability (Table 1). Court transcripts and associated documents were deemed most reliable, as these documents recorded finalizations of judicial decisions. Competency evaluations, sworn affidavits and indictments were deemed reliable, as these were carried out post arrest and prior to trial, when initial investigations had been made. Statements (verbal or written) by the terrorist/affiliated group were deemed somewhat reliable, as there may be a drive for dishonesty. Warrants and Expert Witness reports were also reasoned to be somewhat reliable, as warrants are produced prior to arrest, and like Expert Witness reports are subject to unreliability and bias. Media articles were then placed on a separate continuum within the less reliable end of the spectrum, with personal opinion blogs at the lower end, and broadsheet newspapers at the upper end.

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<sup>3</sup> This sample includes 125 individuals who engaged in or planned to engage in lone actor terrorist attacks within the United States and Europe and were convicted for their actions or died in the commission of their offence. Although this does not immediately look like a large rise from the 119 in *Bombing Alone*, there is a major difference in the composition. The 'solo terrorists' and 'lone dyads' contained within *Bombing Alone* have been dropped from the analysis.



through extensive literature searches on the state of the knowledge base of radicalisation as well as the development of a Risk Assessment Framework (Bouhana et al., 2017), later updated to the S5 Framework (Bouhana, 2019). The current dataset comprises the most comprehensive and detailed overview of open-source information on lone-actor terrorists currently available.

Given that Gill et al. (2014) concluded that demographic characteristics contribute little to nothing to the explanation of lone-actor terrorism, these were not examined. Instead we focus on indicators hypothesised to be related to the acquisition of a propensity to commit terrorist violence. We organise our findings across five domains: vulnerability, exposure, motivation and capability, leakage and preparation, and outcome.

### 3. Vulnerability Indicators

Individual vulnerability indicators examined here include potential indicators of cognitive susceptibility to moral change, and self-selection and social selection into radicalising settings, notably membership of a social network containing one or more radicalised individual.

History of violent behaviour is often considered an important risk factor for subsequent violent behaviour and is a primary indicator in many violence-related risk assessment tools (HCR-20<sub>v3</sub>, Douglas et al., 2014; MLG, Cook et al., 2013; PCL-R, Hare, 1980). Extremism based risk assessment tools also acknowledge the importance of prior violence (ERG-22+, Lloyd & Dean, 2015, VERA 2, Pressman & Flockton, 2012; TRAP-18, Meloy & Gill, 2016). Within our sample, 41.6% of lone actors had some history of violent behaviour. Deeper examination of the 'violent behaviour' dimension found that 22.4% of actors had previous military experience, 7.2% had some form of combat experience (military, insurgency, or terrorist), 26.4% had been imprisoned for criminal activities, and 10.4% had been a perpetrator of familial abuse.

Given the relatively high prevalence of violent behaviour within the sample and following the work of Lloyd and Dean (2015), Pressman and Flockton (2012) and Meloy and Gill (2016), it may be justified to expect that, in combination with multiple factors at different individual, situational and ecological levels of analysis, previous violence may be an important element for threat and risk assessment.

However, even though violence may be an important indicator for subsequent violent terrorist behaviour, the static nature of the above experiences does not allow for further examination of *when* the violent behaviour occurred and how relevant it would be for subsequent terrorist experiences.

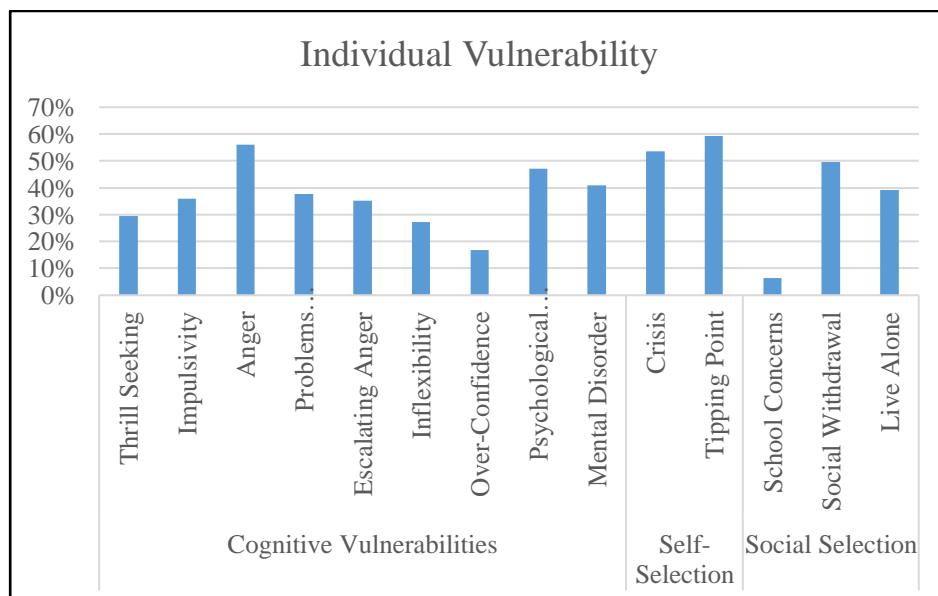
Although early childhood abuse (physical, sexual, and emotional) has been consistently linked to later onset of violent, delinquent and criminal behaviours (Haapasalo & Pokela, 1999; Lansford et al., 2007), our sample did not yield high prevalence of any history of abuse. The recorded prevalence also sits below what has been found across general population studies. Cawson et al. (2000) used an anonymous web-based interview protocol and identified that 25% of adolescents reported experiencing physical abuse from a caretaker, with 7% reporting serious abuse, 14% intermediate abuse, and 3% abusive behaviours that would be recorded as 'a cause for concern'. Cawson et al. (2000) also reported that 34% of adolescents reported emotional abuse (in the form of terrorising and psychological domination), and 6% reported some form of sexual abuse. May-Chalal and Cawson (2005) conducted face-to-face interviews

with adolescents: respondents reported a lower prevalence of 6% physical, and 6% emotional abuse. Finkelhor et al. (1990) reported a higher level of sexual abuse; 27% of women, and 16% of men reported a history of abusive behaviours.

That the current data sits lower than an expected prevalence may be due to multiple reasons: firstly, the data is gathered from open-source outlets, which can cause issues for researching sensitive topics, particularly if the actor made no disclosure, but it was reported by secondary or even tertiary sources; second, because of stigma and shame, abuse is often under reported, as Dhaliwal et al. (1996) highlight. Dhaliwal et al. (1996) drew attention to the inherent difficulties in collecting accurate abuse reports, explaining that study type (and therefore methodology) can drastically alter the reporting levels (reporting between 2.5% and 36.9%).

Abuse has also been shown to be a precursor to later onset of vulnerabilities (Anda et al., 2006). Bouhana and Wikström (2011) highlight the importance of including factors of individual susceptibility to moral change (cognitive susceptibility) when analysing radicalization. As cognitive susceptibility is defined as "an inability to cope with stress or challenging situations" (Bouhana & Wikström, 2011, p.ix;), the present analysis focused on a number of novel variables alongside variables from the original *Bombing Alone* codebook.

**Figure 1. Prevalence of Cognitive Vulnerabilities and Selection Processes**



The results highlight that across actors, there are a range of behaviours which fit within the category of cognitive vulnerabilities (susceptibility to moral change) (Figure 1). Excessive thrill seeking and impulsivity have been linked to numerous high-risk behaviours (Robbins & Bryan, 2004; Steinberg et al., 2008) and was also theorized to

increase risk of exposure to radicalising settings (a self-selection factor;<sup>4</sup> see Bouhana & Wikström, 2011; Wikström & Bouhana, 2016). Over half of actors were described as angry, with 38.8% and 35% of these individuals having problems controlling anger and exhibiting escalating anger respectively. These problems with anger may leave an individual susceptible to moral change from radicalising agents who may take advantage of the individual's anger and present seemingly viable options for reducing the discomfort created by such an emotion. It can also lead to the formation of personal preference for settings in which this anger can be expressed and alleviated (a case of susceptibility to self-selection).

Over fifty-five percent of individuals were experiencing some form of psychological crisis prior to their radicalization, and 64.2% of individuals experienced an identifiable tipping point, which propelled them towards planning and conducting an attack. Without further inferential analyses, it is not possible to determine if, as hypothesised by Bouhana and Wikström (2011), the experience of crisis or tipping point moved an individual to seek out radicalising settings, or agents, who would be sympathetic towards the actor's grievance.

Due to the age range of individuals examined within the dataset, there was a low prevalence of reported concerns regarding individual and social behaviours within a school setting. The vast majority of actors were over 30 years of age (53.8%), with only 2.6% of the cohort under the age of 18. This could indicate that as radicalization occurred in adulthood, the reporting of school concerns would be minimal, or it may be a reporting bias; as the individual was not arrested until adulthood, investigative protocol may not deem school concerns as relevant to the attack behaviour. Although high prevalence of social withdrawal (51.7%), and living alone (38.5%) may at first seem counter intuitive to social selection, it may be indicative that an individual withdraws from their normal social environment and moves toward a social environment with radicalizing features.

Religious denomination was also examined as a factor which may be indicative of an individual's susceptibility to radicalizing moral change. Within the sample, the most commonly espoused religious practice was Islam (35.2%), with 16.8% of individuals espousing Christianity. However, within the sample religious practice was unidentified in 39.2% of the sample. These results highlight the importance of considering other vulnerabilities alongside religious practice, notably as it is likely that religious practice, rather than religious affiliation, is likely to be a more relevant indicator. For example, steady practice of a mainstream religion has been associated with diminished susceptibility, while little or inconsistent practice has been associated with increased susceptibility (Bouhana & Wikström, 2011; see also D3.1).

Religious and ideological justification for beliefs and actions were also examined. Thirty-six percent of individuals within the dataset were raised in a religious household. This finding sits below the average number of individuals espousing religious beliefs gathered for European member countries (51%; Eurobarometer, 2010).<sup>5</sup> Bouhana and Wikström (2011) argue that a weak commitment to a conventional moral framework (in this case, a religious upbringing) may be a factor of susceptibility to moral change. That individuals in our sample are less likely than average to be raised in a religious household may bring some support to this hypothesis. Change in religious belief maps very closely

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<sup>4</sup> One of the purposes of the Risk Analysis Framework is to assist in interpreting the meaning of indicators which can signal the activation of more than one process.

<sup>5</sup> It is worth noting the range across countries; within the data gathered from the Czech Republic, only 16% of individuals espoused a Religious belief, whereas in Malta and Turkey, 94% of individuals did.

to a change in ideological belief (18.4% and 19.2%), but without further analyses examining how close these two experiences occur together in time and place, no further inferences are drawn here. It is also worth noting that intensification of ideological beliefs was only noticeable in less than half of the actors within the dataset. This may indicate that although individuals air their grievances and ideology with others, it is likely that the individuals consistently espouse these beliefs over a long period of time.

Each of these results represent an initial exploration into previously unexamined vulnerability factors, which may have an influence on radicalization. Further inferential analyses could be conducted to determine the temporal ordering of the experiences and behaviours, and how their interactions impact on an individual's susceptibility to radicalization (Corner et al., 2019).

An individual may encounter experiences which may make them vulnerable to radicalisation. However, without exposure to a radicalising environment, such individuals may move towards other activities. The next section examines data specifically gathered to examine exposure to radicalising settings.

#### **4. Exposure**

The most commonly cited ideologies within the lone-actor sample are Right Wing (36.0%), Single Issue (22.4%), and Religious (34.4%). Differences between ideologies will be examined later in this chapter.

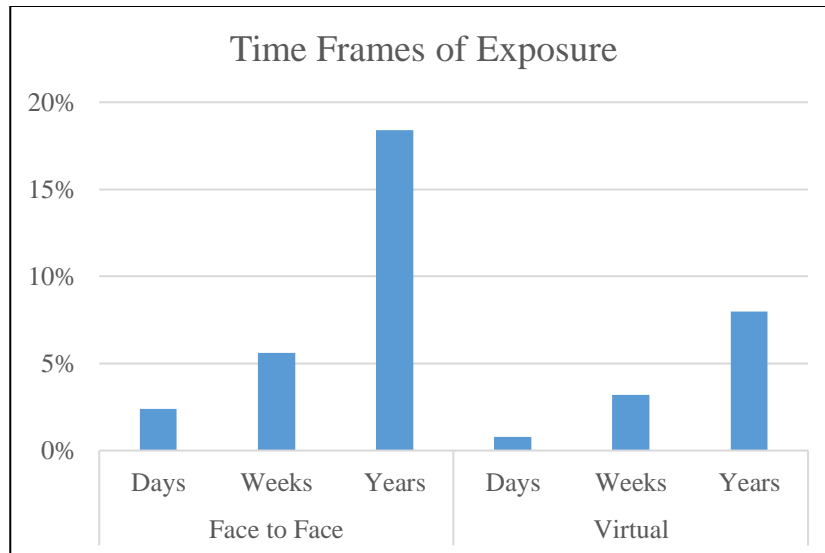
With regards to interactions with radicalizing agents, the actors within the dataset interacted with agents in both physical and virtual environments. Individuals were more likely to interact face-to-face with radicalising agents. Over thirty-eight percent of individuals used physical spaces,<sup>6</sup> whereas 30.4% utilised virtual spaces.<sup>7</sup> Of those who interacted face to face, 24% conducted these interactions on a regular basis. Whereas of the actors who conducted virtual interactions, only 12.8% of these interactions were classified as regular. The interactions were also more likely to occur over an extended period of time, which also counters the common thought that radicalisation generally occurs in a short space of time.

**Figure 2. Exposure Time Frames**

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<sup>6</sup> This figure may be skewed by the number of individuals who had family or close associates who were involved in political violence and/or criminality (24.8% of actors).

<sup>7</sup> Gill et al. (2016) found virtual spaces to include email, online discussion forums, chatrooms, and specific dedicated websites set up by the actor.

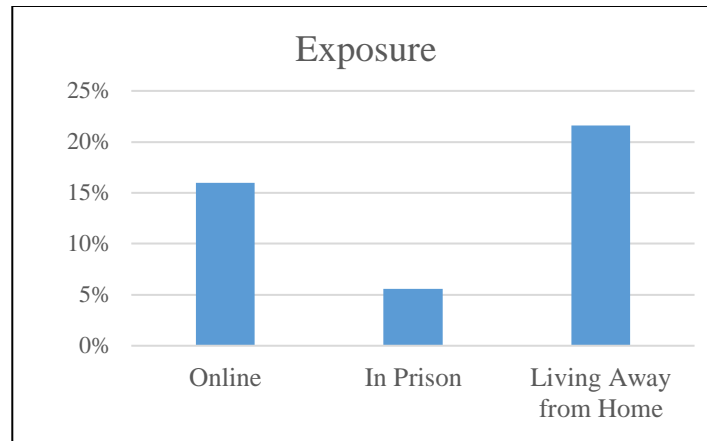


With regards to radicalizing settings, only three potential settings were positively identified as having an influence on radicalisation (Figure 3). Public discourse, government bodies, and the media all emphasise the danger of both online and prison environments as areas which radicalizing agents can exploit.

Current governmental advice emphasises the risks of online settings for radicalization (Australian Government, 2016; Department of Education, 2015); however, to date, there has been little supporting empirical evidence. Gill et al. (2017) examined the state of research concerning online radicalisation. They argued that conceptual issues, and a lack of empirical data (only 6.5% of 200 investigations utilised some form of data) have led to a large gap in the knowledge base of the true risk of online settings. The results from this dataset highlight that only 16% of individuals first experienced radicalising exposure in a setting online. This may appear to be lower than expected given current public discourse, but Gill et al. (2015) concluded that online behaviours permeate beyond radicalisation, and online settings are used across radicalisation, attack preparation, and attack phases.

**Figure 3. Exposure Settings**





Alongside online settings, there has also been much written on radicalisation within prison settings (Acheson, 2016; Bouhana & Wikström, 2011; Hamm, 2012; ICSR, 2010; Penal Reform International, 2015; RAN, n.d.), but, as with research concerning online radicalisation, due to the lack of empirical evidence, there is little consensus on the actual scope of the risk. However, recent attacks in the U.K. and Austria highlight the risk of terrorist recidivism clearly.

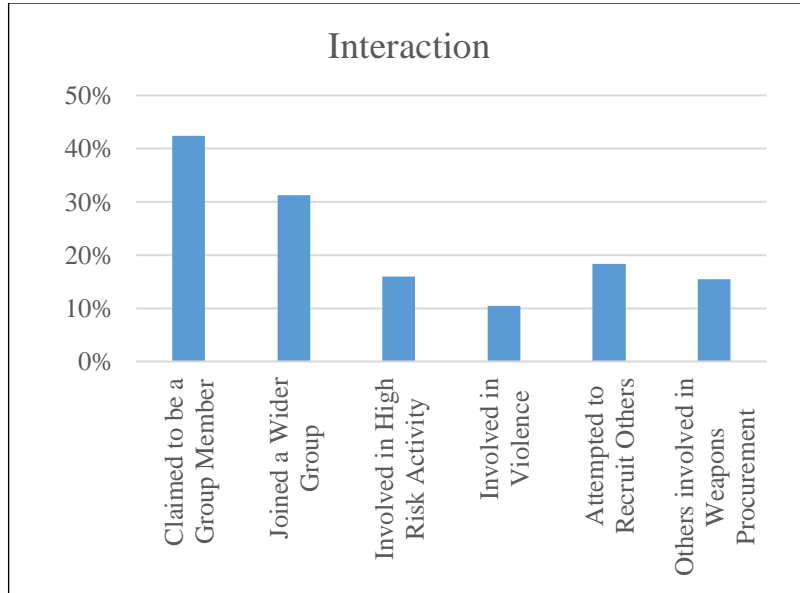
Of the three radicalising settings quantitatively explored, those living away from home and a familial network were most at risk of radicalising setting exposure.<sup>8</sup> Further empirical analyses should look to dissect this variable, and examine whether the isolation of the individual from a support network was a factor in their susceptibility to the exposure, as hypothesized.

## 5. Motivation and Capability

With regards to interactions during the attack preparation phase, although 42.4% of lone actors claimed to be a member of a terrorist group during that period, only 31.2% were confirmed as being part of a group. Of this cohort of actors, only a small proportion of individuals carried out high-risk or violent behaviour, which may have helped develop the individuals' perception of capability for their own attack. That 18.4% of actors attempted to recruit others for their attack and that 16.0% relied on others for weapons procurement highlight that a proportion of actors perceived that their capability when alone was not sufficient to implement an effective attack.

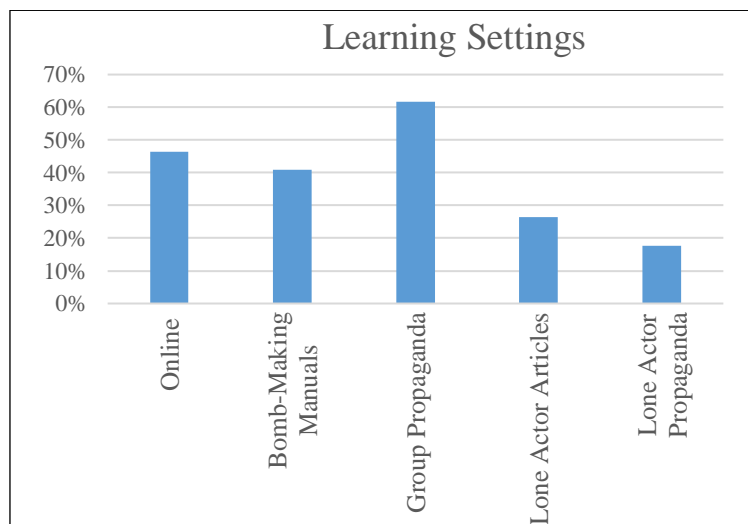
**Figure 4. Interactions with Extremists**

<sup>8</sup> This does not include incarcerated individuals, as these were coded in the variable 'prison exposure'.



According to Gill and Corner (2016), "lone actor attacks are rarely sudden and impulsive, although anecdotal evidence of recent ISIS-inspired attacks suggests this may be changing. All studies agree that preparatory conduct is typical, though the degree to which individuals engage in it varies" (Spaaij, 2010, 2012, p. 694). The initial descriptive results from our data suggest that lone-actors prepare for their attack in multiple ways across multiple settings (Figure 12).

**Figure 5: Learning Settings**



Across the cohort, actors used a range of materials for researching their attack. Over 43% of actors accessed online environments when preparing for their attack. In an examination of the dataset by Gill et al. (2016), online learning behaviours were found to include the consumption of extremist media (videos, lectures, photographs), resource preparation (weapon instructions, poison manuals, surveillance advice, body disposal, area maps, personal details of targets). Within this dataset, 40.8% of individuals were found to have used bomb-making manuals (both physical and online). The highest proportion of propaganda consumption concerned material produced by terrorist groups (61.6%), whereas consumption of lone-actor propaganda and information was less than half this figure. This result may be indicative of the important role of connections to radicalising agents, who are part of a wider group, or it may be representative of the current spread of ISIS' influence.

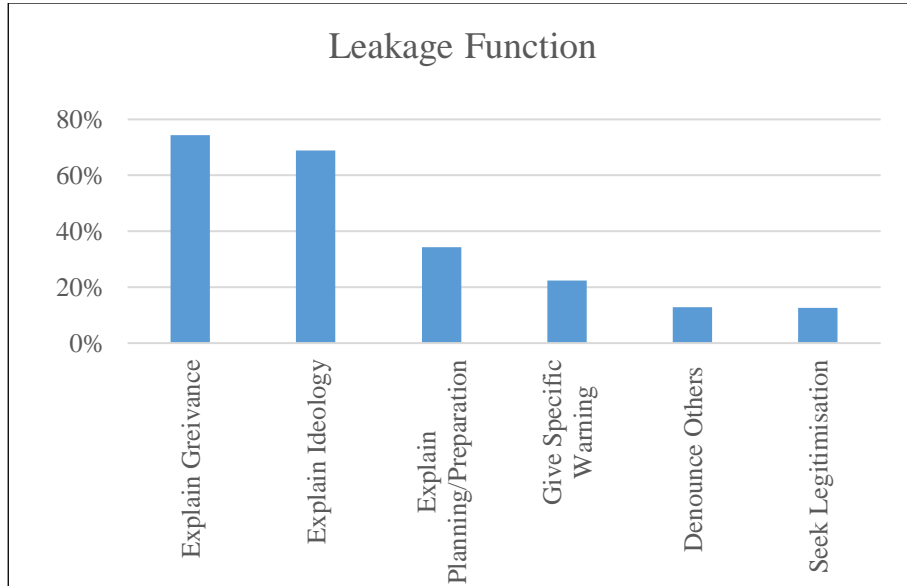
Actors used a range of cognitive and physical resources when planning and preparing for their attack, which likely participated of the maintenance of their motivation supported by the perception of their continuing capability to act successfully. Interestingly, only a small percentage of actors made financial plans for the post-attack space. Cognitive preparation for attack is highlighted in the number of individuals who stockpiled weapons for their attack (53.6%).

The results also describe the physical resources the actors used and developed. Over 22% of actors took part in physical training activities in the preparation and planning, with 7.2% increasing their physical activity and exercise regime. Over 27% of actors conducted dry runs of their attack prior to the attack. The same proportion travelled during their preparatory activities. Each of these behaviours are indicators of accrued social resources. Further inferential analyses are used further on to examine how social, physical, and cognitive resources contribute to motivation emergence and maintenance via capability perception.

## **6. Leakage and Preparation**

The role of social resources in motivation emergence and maintenance can be further investigated by examining actor leakage. As in Gill et al. (2014), there were high levels of leakage from the actors. Over 58% of actors produced letters of written statements, 48.8% made verbal statements to their family or friends, and 44.8% made verbal statements to a wider audience. Further analysis highlights that actor leakage served a variety of functions. The majority of actors spoke to others to air their grievance (74.4%) or ideology (68.8%), explaining their motivation for their future attack. Sixty-four percent of actors told others about their desire to cause harm to others (Figure 6).

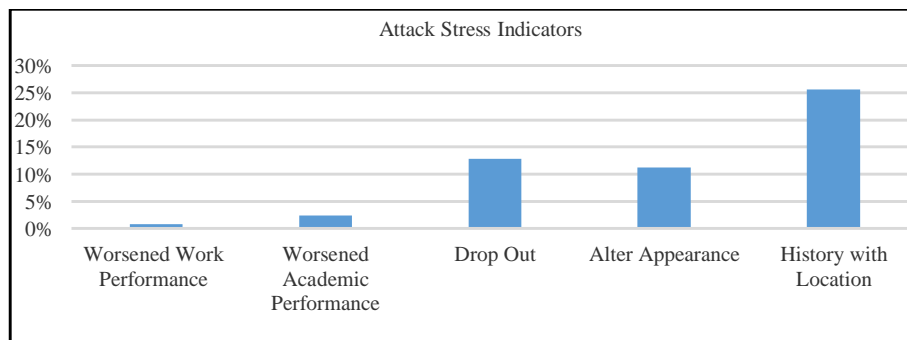
**Figure 6: Leakage Functions**



A very small proportion of actors (12.8%) denounced others who reported to share the ideology of the actor. Over 12% of actors sought out religious/ideological leaders to seek legitimisation for their future actions. A small proportion of actors (34.4%) spoke to others regarding their plans and preparatory activities with 22.4% of actors making a specific warning regarding their attack plans.

Finally, several indicators were examined, which were hypothesized to be associated with the cognitive stresses brought on by the perspective of carrying out a terrorist attack and other indicators, such as change in appearance or familiarity with the attack location (Figure 7). The latter variable was the most prevalent of this set of indicators; it could be hypothesized that familiarity with attack location participates of capability perception (e.g., knowledge of security measure and escape routes), hence of motivation maintenance and therefore likelihood of acting upon intent.

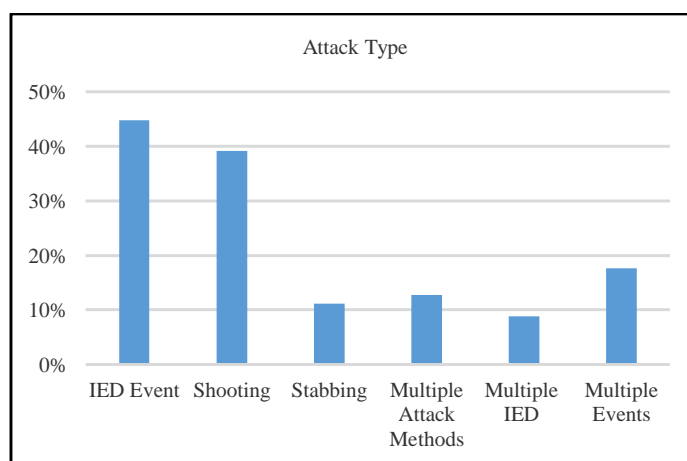
**Figure 7. Attack Stress Indicators**



## 7. Outcome

Less than two thirds of actors (60%) carried out a violent attack. This may be indicative of the role crucial of situational opportunity in action, as 88% of those who were not able to carry out a violent attack made plans to do so. Opportunity perception is, like motivation, a situational mechanism, which interacts with capability perception to maintain or disrupt the motivation to act in such a way that intent translates (or not) into behaviour. The results also show that for 49.6% of individuals who did commit an attack, following apprehension evidence emerged to suggest that they had coherent plans for further attacks.

**Figure 8: Attack Type**



Of the 69 individuals who carried out an attack, 36% killed others in the attack and 44% injured others in their attack. This lethality is in line with the claims of Appleton (2014) and highlights the risk of dismissing lone actors as amateur, disorganized and limited (Europol, 2012). Indeed, more recent attacks that have occurred in Europe in the last years challenge this perception (Borger, 2015; Chrisafis et al., 2016; Dearden, 2016).

Past research generally concurs that a low level of planning and attack sophistication characterizes the weapons and methods used in lone-actor attacks (Ackerman & Pinson, 2014; Appleton, 2014; Bakker & de Graaf, 2010; Barnes, 2012; Jaspardo, 2010). That 44.8% of lone actors carried out an IED event, whereas only 11.2% carried out a stabbing attack, also speaks to support this perception. IED events are notoriously more difficult to perpetrate than attacks using other, less sophisticated weaponry. IED attacks require more planning; the acquisition of multiple, specific ingredients, the space to assemble the device, and the knowledge and skills, or the potential to acquire such for accurate assembly and ignition, whereas knives are much easier to acquire; for instance, most households will have at least one knife.

Higher than expected sophistication levels are demonstrated across other indicators. Almost 13% of actors utilised multiple weapon types during their attack (e.g. Pavlo Lapsyn perpetrated a fatal stabbing, before leaving IED devices at three mosques in the West Midlands in the UK). Alongside this sophistication in weaponry, 17.6% of actors carried out multiple, separate attacks. The most prominent example being Anders

Breivik's bombing attack on a government building in the centre of Oslo, before his shooting attack on Utøya Island.

Although the descriptive statistics highlight very little difference in the chosen attack location, 25.6% of individuals had a history with their chosen location and a large proportion (60.8%) of the locations were in a public space. This supports the findings of Horgan et al. (2016), who, when comparing lone-actors and mass murderers, identified that both types of actors, despite common perceptions, often had personal connections to their intended target. Alongside this, despite the view that mass murderers carry out attacks on those close to them, Horgan et al. (2016) identified that lone actors and mass murderers were equally likely to carry out their attacks in a public place. Horgan et al. (2016) suggest that this was to ensure that the attack was noticed and had more impact.

Lone-actors were more likely to target people than property and private citizens were the most commonly selected target group (51.2%). Spaaij (2010; 2012) explains that this pattern may be explained by the protective features that surround government and business targets. Gill and Corner (2016) assert that attacks on higher value targets such as government or businesses may require a higher level of sophistication to overcome potential obstacles and reach the end point of a successful attack. This sophistication may require a larger capability with regards to individual skills, social networks, and life experiences (Jackson & Frelinger, 2009).

Given that earlier results highlighted a comparatively high level of weapons sophistication, it would be expected that there would be a higher number of attacks against higher value targets than the results demonstrate. However, once again this suggests that the interaction of capability and opportunity perceptions plays a crucial role in the decision of lone actors regarding if and where to attack.

With regards to apprehension, 32.3% of individuals were caught prior to their attack. Within the general cohort, 16% were arrested following monitoring by authorities. Within the cohort of actors who were apprehended following their attack, 25.6% were unable to get away from the scene of their attack. This may be initially counterintuitive given the previous results which show that the majority of attacks were in public places which are characterized by a relative lack of supervision compared to higher value targets. It would be expected that attacks in public spaces would demonstrate a lower level of guardianship and that authorities may be delayed in getting to the attack scene, enabling a getaway. However, these results may be explained with reference to attacks where members of the public apprehend the individual during the event. An example of this comes from the case of Ayoub El-Khazzani, who during his attack on the Thalys train from Brussels to Paris was subdued by a group of off-duty members of the U.S. Armed Forces and by civilians.

With regards to those actors who managed to get away from the scene of their attack, there was evidence of pre-planning in 16.8% of cases, suggesting greater sophistication during the attack planning phase, at least for a minority of offenders.

Fitting with the results regarding the radicalization and attack planning phases, specifically surrounding leakage and expressions of ideological commitment and intent, 46.4% of actors made verbal claims and 29.6% made written statements claiming responsibility for the attack. These post-attack 'leakage' results suggest that, when isolated from the environment which was helping to maintain their ideological commitment and motivation to act (through apprehension and incarceration), lone actors will continue to express sentiments to attach meaning to their actions and avoid being perceived as 'crazy' (Corner et al., 2016; Spaaij, 2015).

## **8. Statistical Analyses**

The above descriptions expand significantly on the work of Gill et al. (2013) and Horgan et al. (2016) in that it examines radicalization indicators and social and situational experiences of lone actor extremists in greater detail. Just as notably, the descriptive analysis here validates the common assertion that there is no general 'profile' of lone actor terrorists. The diversity of the individuals and experiences within the sample would, at the outset, seem to hamper further analytical procedures.

However, it has been hypothesized that identifying empirical, distinct subgroups of lone actors could lead to the identification of statistical outcomes that are useful for prevention initiatives. The PRIME Risk Assessment Framework predicts (and was designed to address the fact) that indicators of vulnerability, exposure, motivation and capability emergence and maintenance, among others, will be unstable across contexts but may be somewhat consistent within more narrowly defined groupings.

The following analyses use quantitative methods to identify meaningful indicators within their corresponding domains, informed by the Risk Assessment Framework. Here, we focus upon differences across ideologies. Across the field of terrorism studies, terrorist groups are often distinguished across ideologies (Gill et al., 2014). Examining motivational differences in this cohort could highlight significant differences across radicalization, attack preparation, and attack phases. As noted in the descriptive analysis, the three most prevalent ideologies within the sample are right wing, single issue and religiously inspired.

Table 3 sets out significant behavioural differences between ideologies within each RAF domain. Variables where no significant differences were identified are not reported.

**Table 3. Comparative Bivariate Analyses of Indicators Between Ideological Contexts**

	Right Wing (N = 45)	Single Issue (N = 28)	Religious (N = 43)
<b>Sociodemographics</b>			
Born in Country of Attack	93.2%	82.1%	51.2%***
Raised in Country of Attack	95.5%	85.7%	53.5%***
Parents Born in Country of Attack	40.9%	42.9%	7.0%***
<b>Vulnerability</b>			
Military at Time of Attack	0.0%	0.0%	11.6%***
Raised in Religious Household	13.3%	35.7%	65.1%***
Religious Conversion Prior	0.0%	25.0%	37.2%***
Religious Intensification	2.2%	25.0%	62.8%***
Ideological Conversion Prior	13.3%	10.7%	32.6%**
Live Alone at Radicalization	11.1%	10.7%	39.5%**
Thrill Seeking Prior to Radicalization	44.4%*	17.9%	20.9%
Over-confidence Prior to Radicalization	17.8%	32.1%*	7.0%
Individual Degraded	8.9%	7.1%	27.9%***
Individual Target of Prejudice	13.3%*	28.6%	32.6%
Individual Disrespected	11.1%	17.9%	37.2%**
Expressed Desire to Hurt Others	73.3%*	64.3%	53.5%
Contradictory Behaviour	13.3%	3.6%*	20.9%
Upcoming Life Change	8.9%	7.1%	18.6%**
<b>Exposure</b>			
Seek Legitimation	8.9%	10.7%	20.9%*
Fundraising for Legal Network	13.3%	7.1%	2.3%*
Fundraising for Illegal Network	0.0%	0.0%	4.7%*
<b>Motivation and Capability</b>			
Obsessed with Event/Phenomena	17.8%	25.0%	39.5%*
Learn through Virtual Sources	44.4%	21.4%	67.4%**
Bomb Manuals in Home	55.6%**	35.7%	27.9%
Clear out Bank Accounts Prior	2.2%	0.0%	7.0%*
Stockpile of Weapons	71.1%***	57.1%	33.6%
Command and Control Links	4.4%	0.0%	20.9%**
Read Materials about Lone-Actor Terrorists	37.8%*	17.9%	20.9%
Read Lone-Actor Propaganda	28.9%	14.3%	7.0%**
<b>Leakage and Preparation</b>			
Denouncing Others who Share Ideology	8.9%	7.1%	23.3%*
History with Event Location	17.8%	42.9%*	25.6%
Others have Knowledge of Planning/Preparation	37.8%	17.9%	46.5%*
Others Involved in Weapons Procurement	4.4%**	21.4%	27.9%
<b>Outcome</b>			



	Right Wing (N = 45)	Single Issue (N = 28)	Religious (N = 43)
Stabbing Attack	4.4%	3.6%	23.3%*
Government Target	13.3%	28.6%	37.2%*
Business Location	4.4%	50.0%***	16.3%

The results suggest that there are differences across indicators between ideological contexts in the data. Within the sociodemographic domain, the greatest number of significant differences between ideologies is found between religiously inspired individuals and the other two ideologies examined.

Religiously inspired individuals were significantly less likely to be born or raised in the country of their attack (Fishers Exact Test (31.707),  $p = 0.000$ , Fishers Exact Test (23.869),  $p = 0.000$ ). Their parents were also significantly less likely to be born in the country of the individual's attack (Fishers Exact Test (44.496),  $p = 0.000$ ). With regards to vulnerability, religiously inspired individuals were also significantly more likely to be raised in a religious household (Fishers Exact Test (26.750),  $p = 0.000$ ). Alongside these results, religiously inspired individuals were significantly more likely to be enrolled in a military entity when they carried out their attack (Fishers Exact Test (12.564),  $p = 0.001$ ). These results are not surprising as research suggests that ideological motivations are intrinsically linked to specific historical, social, and cultural contexts (Bhui et al., 2012). Within the cohort of religiously inspired individuals therefore, it is expected that their cultural and familial backgrounds and early and later life experiences heavily influence their ideological direction. However, there are also a subset of individuals who do not fit within this group, as those with a religiously inspired ideology were also significantly more likely to undergo a religious and/or ideological conversion ( $\chi^2(27.065)$ ,  $p = 0.000$ , Fishers Exact Test (13.490),  $p = 0.006$ ), and experience an intensification of their religious beliefs (Fishers Exact Test (43.143),  $p = 0.000$ ).

Of interest here, as in the other categories, is the disentanglement of the mechanisms underpinned by each indicator (i.e. marker; see D3.1), some of which, as suggested by the RAF, may indicate a (long-term or transient) susceptibility to moral change, a susceptibility to self- or social selection into radicalizing settings, or all of those at given times or in given environments. Different markers should be expected to rise to significance in different contexts largely due to selection effects.

Indeed, other ideological groups demonstrated higher prevalence in specific vulnerabilities. Individuals who espoused a right wing ideology were significantly less likely to be a target of prejudice (Fishers Exact Test (9.513),  $p = 0.035$ ), more likely to demonstrate thrill seeking behaviours ( $\chi^2(9.872)$ ,  $p = 0.041$ ) and more likely to have a history of violent behaviours (Fishers Exact Test (9.855),  $p = 0.024$ ). Individuals who espoused a single-issue ideology were significantly more likely to have a history of over confidence or self-aggrandizement (Fishers Exact Test (11.116),  $p = 0.023$ ) and were less likely to carry out behaviours or express sentiments that contradicted their ideology (Fishers Exact Test (11.629),  $p = 0.011$ ). These behaviours suggest that those with a single-issue ideology were perhaps more highly committed to their beliefs.

Individuals with a religiously-inspired ideology emerged as a singular group with regards to vulnerability indicators. They were significantly more likely to live alone at the time of radicalizing exposure (Fishers Exact Test (18.147),  $p = 0.001$ ), be degraded (Fishers Exact Test (17.853),  $p = 0.000$ ), to have been disrespected (Fishers Exact Test

(17.999),  $p = 0.001$ ), and to appear obsessed with specific events or phenomena (Fishers Exact Test (12.082),  $p = 0.020$ ).

Again, from an analytical perspective, these features may characterize individuals more susceptible to exposure to religiously radicalizing settings as opposed to other kinds of ideologically radicalizing settings. Much more work should be carried in the understudied effect of selection effects in radicalization, which the PRIME RAF hypothesized as the key process explaining group differences in lone actor characteristics.

With regards to exposure, further differences emerged within the radicalization phase. Religiously-inspired individuals were significantly more likely to seek legitimization from epistemic, religious, or ideological influencers (Fishers Exact Test (10.339),  $p = 0.026$ ). In spite of this, religiously inspired individuals were also significantly more likely to denounce others who shared their ideological and/or religious beliefs (Fishers Exact Test (10.936),  $p = 0.018$ ), a behaviour not rare among the newly committed or converted. Although a proportion of religiously-inspired individuals approached figureheads, this group was significantly less likely to engage in fundraising activities for legal networks (Fishers Exact Test (9.403),  $p = 0.034$ ) and significantly more likely to fundraise for illegal networks (Fishers Exact Test (9.136),  $p = 0.020$ ). These results highlight the need to further examine the environments in which radicalizing settings emerge and exposure occurs. Differences in activity fields and selection factors are again hypothesized as key in the explanation of group differences.

Religiously-inspired individuals were also significantly more likely to be expecting an imminent change in their routines (e.g., eviction, loss of job), which their attack interrupted (Fishers Exact Test (10.132),  $p = 0.018$ ). These types are "turning points" are common to the religious conversion and new religious movement literature (see Bouhana & Wikström, 2011 for a synthesis). That these individuals would seek to avoid this change is reflected (through imprisonment or death) in the likelihood that these individuals would clear out their bank accounts in the runoff (Fishers Exact Test (9.037),  $p = 0.025$ ). Additionally, religiously-inspired offenders were significantly more likely to learn through online resources (Fishers Exact Test (17.493),  $p = 0.001$ ), have shared details of their planning/preparation with others (Fishers Exact Test (8.212),  $p = 0.044$ ), and have command and control links with others (Fishers Exact Test (13.912),  $p = 0.002$ ), all markers of steps taken to maintain their capability and motivation, potentially to address a deficit in their own (cognitive) resources. Evidence of wider network involvement within religiously-inspired actors is reflected in a lack of examination of lone-actor propaganda (Fishers Exact Test (12.718),  $p = 0.008$ ), which is often published to encourage others to act alone.

Conversely, individuals espousing a single-issue ideology appear "non-specific", in that their behaviours across domains are rarely significantly different from other ideologies. Single issue inspired actors were significantly more likely to have a history with their attack location (Fishers Exact Test (11.613),  $p = 0.032$ ), which is not unexpected given the often-personal nature of their ideology, which was reflected in some of the in-depth case studies carried out in WP5. They were also least likely to learn through online resources.

Contrary to the attack preparation behaviours noted within the religiously-inspired cohort, right-wing inspired actors were significantly more likely to prepare in isolation. They were more likely to read materials concerning other lone-actor terrorists (Fishers Exact Test (10.523),  $p = 0.017$ ), and they were less likely to involve others in their weapons procurement (Fishers Exact Test (13.881),  $p = 0.003$ ). Right-wing inspired actors were also more likely to prepare attacks requiring a higher level of sophistication.

They were significantly more likely to use bomb manuals when planning (Fishers Exact Test (13.117),  $p = 0.005$ ), and have a stockpile of weaponry (Fishers Exact Test (14.048),  $p = 0.004$ ).

With regards to the "outcome" domain, religiously-inspired individuals were significantly more likely to carry out a stabbing attack (Fishers Exact Test (8.678),  $p = 0.011$ ). With regards to target choice, religiously-inspired offenders were significantly more likely to choose a government target ( $\chi^2(6.679)$ ,  $p=0.037$ ), whereas individuals espousing a single-issue ideology were significantly more likely to target a business ( $\chi^2(23.075)$ ,  $p = 0.000$ ).

## 9. Conclusion

This chapter presents updated findings and conceptual developments on lone actor extremist events, which have occurred during the period 1990-2015 in Western Europe and the US. The analyses are descriptively rich and complementary, informed by a Risk Analysis Framework which offers a multilevel, integrated meta-model of these events and allows for the synthesis of disparate findings. However, the analyses are more or less static descriptions of the population under study (descriptive, inferential). That they are static does not mean they are without value. Inferential analyses, while identifying some key differences between groups of actors, demonstrate why risk factor-based risk assessment must be context-limited, which is an important point with genuine, practical implications. The analyses provide key insights into the behaviour of lone actors, which could inform intelligence gathering and investigative practice, as such analyses already do in other crime prevention domains.

Our analysis confirms two principles commonly held in the research field (Borum, 2011). First, there are multiple pathways into violent extremism. Typically, multiple factors contribute to a single individual's pathway into lone-actor terrorism. These factors come from multiple levels of influence. These factors and their relative causal weight differ between individuals who become violent extremists. Individuals with very different initial states can experience different processes and still end at the same end outcome of violent extremism. In parallel research fields, this is known as the principle of equifinality. Second, different people with similar initial states may produce different outcomes. Additionally, the impact of experiencing a single factor may impact upon an individual's development in very different ways. In parallel research fields, this is known as the principle of multifinality (Borum, 2011). These should be two of the starting principles for risk assessment and management of violent extremism.

To go beyond the state of the art, further analyses can be conducted to produce sequential and predictive models. Corner et al. (2019) do so through the development of state transition diagrams. This work delivers a visually-striking synthesis of our analytical, qualitative and quantitative insights into these events. As the purpose of these techniques is not to produce static pictures, it goes without saying that such analyses can always be refined and built upon. A further future application could be the use of Bayesian Networks. A key advantage of Bayesian Networks is their ability to integrate data with human expertise. This can be achieved using the notion of an informative prior (Castelo & Siebes, 2000), whereby a model is constructed and then updated when more data become available using Bayesian updating techniques, resulting in a posterior model. This would augment the actuarial knowledge represented by the analysis presented here with in-depth knowledge from subject matter experts. While the data

collection for this analysis was guided by a synthesis of expert knowledge, in future this could be taken further to refine Bayesian Networks. Likewise, real-time information about ongoing cases can be fed into Bayesian Networks to recalculate probabilities in light of new data. This means that the work presented here has the potential to inform the design of real-time tools such as more complex and comprehensive Terrorism Risk/Threat Assessment instruments for use, for example, in investigative settings, though much more technical work and validity assessments would have to be completed to deliver this contribution.

## References

- Acheson, I. (2016). *Summary of the main findings of the review of Islamist extremism in prisons, probation and youth justice*. Ministry of Justice. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/547032/acheson-review-summary-aug-2016.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/547032/acheson-review-summary-aug-2016.pdf)
- Ackerman, G. A., & Pinson, L. E. (2014). An army of one: Assessing CBRN pursuit and use by lone wolves and autonomous cells. *Terrorism and Political Violence*, 26(1), 226-245. <https://www.tandfonline.com/doi/abs/10.1080/09546553.2014.849945>
- Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C., Perry, B. D., Dube, S. R., & Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood: A convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience*, 256(3), 174-186. <https://doi.org/10.1007/s00406-005-0624-4>
- Appleton, C. (2014). Lone wolf terrorism in Norway. *The International Journal of Human Rights*, 18(2), 127-142. <https://doi.org/10.1080/13642987.2014.889390>
- Australian Government. (2016). *Radicalisation and the internet*. Living Safer Together. [www.livingsafetogether.gov.au](http://www.livingsafetogether.gov.au)
- Bakker, E. & de Graaf, B. (2010). *Lone wolves: How to prevent this phenomenon?* The Hague: International Centre for Counter-Terrorism.
- Barnes, B. (2012). Confronting the one-man wolf pack: Adapting law enforcement and prosecution responses to the threat of lone wolf terrorism. *Boston University Law Review*, 92(1613).
- Borger, J. (2015, January 13). PM: France 'still under threat from attacks by Paris gunmen's associates'. *Guardian*. <https://www.theguardian.com>
- Borum, R. (2011). Radicalization into violent extremism I: A review of social science theories. *Journal of strategic security*, 4(4), 7-36. <http://dx.doi.org/10.5038/1944-0472.4.4.1>
- Bouhana, N. (2019). *The moral ecology of extremism: A systemic perspective*. UK Commission for Countering Terrorism. <https://www.gov.uk/government/publications/the-moral-ecology-of-extremism-a-systemic-perspective>
- Bouhana, N., & Wikstrom, P-O. W. (2011). *Al Qai'da-influenced radicalisation: A rapid evidence assessment guided by Situational Action Theory*. RDS Occasional Paper 97. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/116724/occ97.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/116724/occ97.pdf)
- Castelo, R., & Siebes, A. (2000). Priors on network structures. Biasing the search for Bayesian networks. *International Journal of Approximate Reasoning*, 24(1), 39-57. [https://doi.org/10.1016/S0888-613X\(99\)00041-9](https://doi.org/10.1016/S0888-613X(99)00041-9)
- Cawson, P., Wattam, C., Brooker, S., & Kelly, G. (2000). *Child maltreatment in the United Kingdom: A study of the prevalence of abuse and neglect*. NSPCC Research Findings: NSPCC Inform.
- Chrisafis, A., Fischer, S., & Rice-Oxley, M. (2016, July 15). France stunned after truck attacker kills 84 on Bastille Day in Nice. *Guardian*. <https://www.theguardian.com>
- Clemmow, C., Bouhana, N., and Gill, P. (2020). Analysing person-exposure patterns in lone-actor terrorism: Implications for threat assessment. *Criminology and Public Policy*, 19(2), 451-482.
- Clemmow, C., Schumann, S., Salman, N. S., & Gill, P. (2020). Risk factors and indicators for engagement in violent extremism: The base rate study. *Journal of Forensic Science*, 65(3), 865-881. <https://doi.org/10.1111/1745-9133.12466>

- Cook, A. N., Hart, S. D., & Kropp, P. R. (2013). *Multi-level guidelines for the assessment and management of group-based violence*. [Unpublished Manuscript]. Mental Health, Law, and Policy Institute, Simon Fraser University.
- Corner, E., Gill, P., & Mason, O. (2016). Mental health disorders and the terrorist: A research note probing selection effects and disorder prevalence. *Studies in Conflict and Terrorism*, 39(6), 560-568. <https://doi.org/10.1080/1057610X.2015.1120099>
- Dearden, L. (2016, June 10). Brussels attacks: New suspect arrested on suspicion of 'terrorist murders' in Isis massacre. *Independent*. <https://www.independent.co.uk/news/world/europe/brussels-attacks-new-suspect-arrested-suspicion-terrorist-murders-isis-massacre-a7074421.html>
- Department of Education. (2015). *The use of social media for online radicalisation*. Home Office.
- Dhaliwal, G. K., Gauzas, L., Antonowicz, D. H., & Ross, R. R. (1996). Adult male survivors of childhood sexual abuse: Prevalence, sexual abuse characteristics, and long-term effects. *Clinical Psychology Review*, 16(7), 619-639. [https://doi.org/10.1016/S0272-7358\(96\)00018-9](https://doi.org/10.1016/S0272-7358(96)00018-9)
- Douglas, K. S., Hart, S. D., Webster, C. D., Belfrage, H., Guy, L. S., & Wilson, C. M. (2014). Historical-Clinical-Risk Management-20, Version 3 (HCR-20 v3): Development and overview. *International Journal of Forensic Mental Health*, 13(2), 93-108.
- Duwe, G. (2000). Body-count journalism: The presentation of mass murder in the news media. *Homicide Studies*, 4(4), 364-399. <https://doi.org/10.1177/1088767900004004004>
- Duwe, G. (2005). A circle of distortion: The social construction of mass murder in the United States. *Western Criminology Review*, 6(1), 59-78.
- Europol. (2012). *TE-SAT 2012: EU terrorism situation and trend report*. European Police Office.
- Fein, R. A., & Vossekuil, B. (1999). Assassination in the United States: An operational study of recent assassins, attackers, and near-lethal approachers. *Journal of Forensic Science*, 44(2), 321-333. <https://doi.org/10.1520/JFS14457J>
- Finkelhor, D., Hotaling, G., Lewis, I. A., & Smith, C. (1990). Sexual abuse in a national survey of adult men and women: Prevalence, characteristics, and risk factors. *Child Abuse & Neglect*, 14(1), 19-28. [https://doi.org/10.1016/0145-2134\(90\)90077-7](https://doi.org/10.1016/0145-2134(90)90077-7)
- Gill, P., & Corner, E. (2016). Lone-actor terrorist target choice. *Behavioral Sciences and the Law*, 34(5), 693-705. <https://doi.org/10.1002/bsl.2268>
- Gill, P., & Horgan, J. (2013). Who were the volunteers? The shifting sociological and operational profile of 1240 provisional Irish Republican Army members. *Terrorism and Political Violence*, 25(3), 435-456. <https://doi.org/10.1080/09546553.2012.664587>
- Gill, P., Corner, E., Conway, M., Thornton, A., Bloom, M., & Horgan, J. (2017). Terrorist use of the internet by the numbers: Quantifying behaviors, patterns & processes. *Criminology and Public Policy*, 16(1), 99-117. <https://doi.org/10.1111/1745-9133.12249>
- Gill, P., Corner, E., McKee, A., Hitchen, P., & Betley, P. (2019). What do closed source data tell us about lone actor terrorist behaviour? The preliminary findings from project regulus. *Terrorism and Political Violence*, 0(00), 1-28. <https://doi.org/10.1080/09546553.2019.1668781>
- Gill, P., Horgan, J., & Deckert, P. (2014). Bombing alone: Tracing the motivations and antecedent behaviors of lone-actor terrorists. *Journal of forensic sciences*, 59(2), 425-435. <https://doi.org/10.1111/1556-4029.12312>
- Gill, P., Horgan, J., Corner, E., & Silver, J. (2016). Risk factors and lone actor violent events: The problems of low base rates and long observational periods. *Journal of Threat Assessment and Management*, 3(3-4), 165-173. <https://doi.org/10.1037/tam0000066>
- Gill, P., Silver, J., Horgan, J., & Corner, E. (2017). Shooting alone: The pre-attack experiences and behaviors of U.S. solo mass murderers with implications for threat assessments. *Journal of Forensic Sciences*, 62(3), 710-714. <https://doi.org/10.1111/1556-4029.13330>
- Haapasalo, J., & Pokela, E. (1999). Child-rearing and child abuse antecedents of criminality. *Aggression and Violent Behavior*, 4(1), 107-127. [https://doi.org/10.1016/S1359-1789\(97\)00027-X](https://doi.org/10.1016/S1359-1789(97)00027-X)
- Hamm, M. S. (2008). Prisoner radicalisation: Assessing the threat in U.S. correctional institutions. *NIJ Journal*, 261, 14-19. <http://www.ncjrs.gov/App/publications/abstract.aspx?ID=246039>
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality and Individual Differences*, 1(2), 111-119. [https://doi.org/10.1016/0191-8869\(80\)90028-8](https://doi.org/10.1016/0191-8869(80)90028-8)
- ICSR. (2010). *Prisons and terrorism: Radicalisation and de-radicalisation in 15 counties*. Kings College London.
- Jackson, B. A., & Frelinger, D. R. (2009). *Understanding why terrorist operations succeed or fail*. RAND.
- Jasparro, C. (2010). Lone wolf – The threat from independent jihadists. *Jane's Intelligence Review*.
- Lansford, J. E., Miller-Johnson, S., Berlin, L. J., Dodge, K. A., Bates, J. E., & Pettit, G. S. (2007). Early physical abuse and later violent delinquency: A prospective longitudinal study. *Child Maltreatment*, 12(3), 233-245. <https://doi.org/10.1177/1077559507301841>

- Lloyd, M., & Dean, C. (2015). The development of structured guidelines for assessing risk in extremist offenders. *Journal of Threat Assessment and Management*, 2(1), 40-52. <https://doi.org/10.1037/tam0000035>
- Marchment, Z., Bouhana, N., and Gill, P. (Forthcoming). Lone actor terrorism: A residence-to-crime approach. *Terrorism and Political Violence*. <https://doi.org/10.1080/09546553.2018.1481050>
- May-Chahal, C., & Cawson, P. (2005). Measuring child maltreatment in the United Kingdom: A study of the prevalence of child-abuse and neglect. *Child Abuse & Neglect*, 29(9), 969-984.
- Merari, A. (1978). A classification of terrorist groups. *Terrorism*, 1(3-4), 331-346.
- Penal Reform International. (2015). *Preventing radicalisation in prisons: Developing a coordinated and effective approach*. Penal Reform International.
- Petee, T. A., Padgett, K. G., & York, T. S. (1997). Debunking the stereotype: An examination of mass murder in public places. *Homicide Studies*, 1(4), 317-337. <https://doi.org/10.1177/1088767997001004002>
- Pressman, D. E., & Flockton, J. (2012). Calibrating risk for violent political extremists and terrorists: The VERA 2 structured assessment. *The British Journal of Forensic Practice*, 14(4), 237-251. <https://doi.org/10.1108/14636641211283057>
- RAN (n.d.). *Dealing with radicalisation in a prison and probation context: Practitioners working paper*. Radicalisation Awareness Network. [https://ec.europa.eu/home-affairs/sites/homeaffairs/files/what-we-do/networks/radicalisation\\_awareness\\_network/ran-news/docs/ran\\_p\\_and\\_p\\_practitioners\\_working\\_paper\\_en.pdf](https://ec.europa.eu/home-affairs/sites/homeaffairs/files/what-we-do/networks/radicalisation_awareness_network/ran-news/docs/ran_p_and_p_practitioners_working_paper_en.pdf)
- Robbins, R. N., & Bryan, A. (2004). Relationships between future orientation, impulsive sensation seeking, and risk behavior among adjudicated adolescents. *Journal of Adolescent Research*, 19(4), 428-445. <https://doi.org/10.1177/0743558403258860>
- Spaaij, R. (2010). The enigma of lone wolf terrorism: An assessment. *Studies in Conflict and Terrorism*, 33(9), 854-870. <https://doi.org/10.1080/1057610X.2010.501426>
- Spaaij, R. (2012). *Understanding lone wolf terrorism: Global patterns, motivations, and prevention*. Springer.
- Steinberg, L., Albert, D., Cauffman, E., Banich, M., Graham, S., & Woolard, J. (2008). Age differences in sensation seeking and impulsivity as indexed by behavior and self-report: Evidence for a dual systems model. *Developmental Psychology*, 44(6), 1764-1778. <https://doi.org/10.1037/a0012955>
- Vossekuil, B., Fein, R. A., Reddy, M., Borum, R., & Modzeleski, W. (2002). The final report and findings of the Safe School Initiative. *US Secret Service and Department of Education*. <https://www2.ed.gov/admins/lead/safety/preventingattacksreport.pdf>
- Wikström, P-O H. & N. Bouhana (2016). Analyzing radicalization and terrorism: A Situational Action Theory. In D. LaFree, & J. D. Freilich, (Eds.), *Wiley Handbook of the Criminology of Terrorism* (pp. 175-186). Wiley.