

Journal of Threat Assessment and Management

The Feasibility and Utility of the Terrorist Radicalization Assessment Protocol (TRAP-18): A Review and Recommendations

Clare S. Allely and Sammie J. Wicks

Online First Publication, April 14, 2022. <http://dx.doi.org/10.1037/tam0000179>

CITATION

Allely, C. S., & Wicks, S. J. (2022, April 14). The Feasibility and Utility of the Terrorist Radicalization Assessment Protocol (TRAP-18): A Review and Recommendations. *Journal of Threat Assessment and Management*. Advance online publication. <http://dx.doi.org/10.1037/tam0000179>

The Feasibility and Utility of the Terrorist Radicalization Assessment Protocol (TRAP-18): A Review and Recommendations

Clare S. Allely¹ and Sammie J. Wicks²

¹ Forensic Psychology, University of Salford

² Aurora Police Department Targeted Violence Prevention, Colorado, United States

The ability to accurately predict the risk of an individual committing an act of targeted violence is likely to be impossible given the low base rate of these acts (Goodwill & Meloy, 2019). Nevertheless, prevention is possible if there is a focus on fact-based behaviors, and threat management is in place. The Terrorist Radicalization Assessment Protocol (TRAP-18; Meloy, Habermeyer & Guldemann, 2015; Meloy, Roshdi, et al., 2015; Meloy & Gill, 2016; Meloy, 2017) is a collection of 18 behavior-based warning signs for terror incidents. There are eight proximal characteristics and 10 distal characteristics. The aim of this review was to identify studies which have utilized the TRAP-18 either prospectively (operational use) or retroactively or studies which have investigated the validity and reliability of the TRAP-18. A total of 17 relevant articles were identified in the review including six case studies and 11 empirical articles.

Public Significance Statement

Six case studies were identified in this review which utilized the TRAP-18 retroactively. Eleven studies were identified in this review which utilized the TRAP-18 to retroactively evaluate terrorist incidents. The majority of studies in this review has found the focus on 18 empirically based and potentially observable patterns of behavior to be a useful approach for the early detection and case management of radicalization processes.

Keywords: TRAP-18, threat assessment, targeted violence, lone-actor terrorist, warning behaviors

The Threat Assessment Approach

The ability to accurately predict the risk of an individual committing an act of targeted violence is likely to be impossible given the, thankfully,

low base rate of these acts (Goodwill & Meloy, 2019). Nevertheless, prevention is possible if there is a focus on fact-based behaviors, and threat management is in place (Goodwill & Meloy, 2019; Meloy & Hoffmann, 2014). It is also useful to highlight how behavioral threat assessment and management (BTAM) and violence risk assessment differ. They are similar but each focuses on different aspects. The main focus of threat assessment and management is on the identification, assessment, and management of a person of concern (POC) in real time. Particular attention is given to the target, threat enhancers, threat mitigators, and the situation. On the other hand, traditional “violence risk assessment” involves the “determination of relative risk in an individual at a particular point in time by

Clare S. Allely  <https://orcid.org/0000-0001-7640-9505>
Sammie J. Wicks  <https://orcid.org/0000-0003-1676-0226>

This article was unfunded. The authors have no conflicts of interest to declare. All authors have undergone online training on the TRAP-18 in 2021 by the developer (Reid Meloy) and have the TRAP-18 manual.

Correspondence concerning this article should be addressed to Clare S. Allely, Forensic Psychology, University of Salford, Allerton Building, M6 6PU, United Kingdom. Email: c.s.allely@salford.ac.uk

determining the base rate of violence for the group within which he or she belongs” (Guldimann & Meloy, 2020, p. 160). The threat assessment and management approach is often more dynamic and urgent. Although the risk assessment approach is often more focused on static characteristics (Guldimann & Meloy, 2020), violence risk assessment tools may also consider more dynamic characteristics. However, the behavioral threat assessment should always be accompanied by a management strategy, which presents a significant difference between BTAM and traditional violence risk assessment. Professionals may employ violence risk assessment instruments and ultimately determine that there is no need to further engage with the client. Professionals employing behavioral threat assessment should employ a management plan regardless of their assessment since the two should always be used together in order to affect the dynamic factors that either enhance or mitigate future violence.

Furthermore, threat assessment differs from risk assessment in that it involves three functions: identify, assess, and manage; while violence risk assessment attempts to predict an individual’s capacity to react to situations violently (Miller, 2014). In short, threat assessment is not intended to simply determine an individual’s capacity to violence but to intervene and prevent. Although traditional violence risk assessment tools differ from threat assessment, they are not conflicting. In fact, violence risk assessment used in conjunction with a threat assessment approach may provide a more holistic picture of an individual of concern, allowing for more informed management strategies that result in positive outcomes. The complimentary nature between the two hold significant benefit for assessors and prevention practitioners as practitioners require empirically based modes of evaluation that assist them in accurately accessing persons of concern, determining risk factors, determining violent enhancers, identifying risk mitigators, triaging cases, and employing effective management strategies.

In threat assessment, it is important to be open to the wide variety of pathways and different roles in terrorism (e.g., violent actor or supporter) for a POC (Horgan et al., 2018—see also Borum, 2015). There are a variety of ways that individuals can become “involved in terrorism” and the nature of their involvement can vary. Given this, it may be useful to consider that different

individuals may pose different levels of risk depending on different roles/activities (different types of involvement) at different points in time (Borum, 2015). Additionally, Borum (2015) and others have also emphasized the importance of recognizing that large-group factors (e.g., age, education) may or may not be applicable to the individual case (Goodwill & Meloy, 2019; Horgan et al., 2018).

As pointed out by Goodwill and Meloy (2019), there have been the development of six instruments which can be used by professionals for the purposes of assessing the risk or threat of terrorist violence. These include as follows: The Extremism Risk Guide (ERG 22+), Islamic Radicalization (IR-46), Identifying Vulnerable People (IVP), Multilevel Guidelines (MLG Version 2), Terrorist Radicalization Assessment Protocol (TRAP-18), and the Violent Extremism Risk Assessment (VERA Version 2 Revised; Lloyd, 2019). This article examines the TRAP-18 and evaluates its practical utility in identifying, assessing, and managing persons of concern.

The Terrorist Radicalization Assessment Protocol (Meloy, 2017)

The TRAP-18 (Meloy, Roshdi, et al., 2015; Meloy, Habermeyer, & Guldimann, 2015; Meloy & Gill, 2016; Meloy, 2017) is a collection of 18 behavior-based warning signs for terror incidents. There are eight proximal characteristics and 10 distal characteristics. The eight proximal characteristics are those which typically are exhibited closer in time to the incident. On the other hand, the 10 distal characteristics are those which are usually developed over time and are more distantly related to the act for which there is concern (Meloy, Roshdi, et al., 2015; Meloy & Gill, 2016). While there is no universally agreed-upon definition of terrorism, the term must be defined for the TRAP-18 to be discussed and assessed (Jenkins, 1980). This article uses the United States Federal Bureau of Investigation (FBI) definition of terrorism in which terrorism is defined as the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives. This definition is used because the definition balances specificity with broadness to capture the varied targets and motivations that

an attacker may have. Furthermore, this definition is applicable to many of the cases discussed in the article and avoids the contentious discussion of state sponsored terrorism (Terrorism, 2002–2005, FBI). Finally, the creator of the TRAP-18, Dr. Reid Meloy has worked for several years alongside the FBI and acknowledges the effect that this experience may have on his own conception of terrorism. Terrorist threats have evolved from large-group conspiracies toward lone-offender attacks. These individuals often radicalize online and mobilize to violence quickly. Many of the examples explored in this article focus on lone attackers. This article uses a working definition of lone-actor terrorists developed during a definitional workshop by the Royal United Services Institute (RUSI). Lone-actor terrorism is defined 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). (Bakker & de Roy van Zuijdewijn, 2015)

The distinction that this definition makes is important. Instead arguing that lone-attackers self-radicalize and engage in planned acts of violence uninfluenced by others with shared ideologies, the definition makes it clear that lone actors do engage with others prior to an attack but are not directed by them or supported materially or logistically.

It is important to emphasize here that the TRAP-18 definitions outlined below are abbreviated and they should not be used as the basis for threat assessment without training in the use of structured professional instruments and the TRAP-18 manual (Meloy, 2017). The eight proximal warning behaviors (Meloy & Gill, 2016; Meloy, Roshdi, et al., 2015) include as follows: (a) pathway (attack research, planning, or implementation), (b) fixation (abnormal preoccupation on an individual or cause), (c) identification (self-identification as a fighter/warrior/agent of change), (d) novel aggression (an initial violent action which is unrelated to the target), (e) energy burst (an increase in the frequency or variety of behaviors which are related to the targeted individual or cause leading up to a violent incident), (f) leakage (communication to an outside party of the individual's intent for violence which can be

unconscious or conscious), (g) last resort (where the person feels that there is no other way to solve the grievance other than violence, and for that violence to be now—they feel violence is their only option), and (h) directly communicated threat (communication of violence to target or law enforcement before action; Meloy & Gill, 2016; Meloy & O'Toole, 2011; Meloy et al., 2012; Silver et al., 2018). The eight warning behaviors capture behavioral or psychological patterns which constitute change and may evidence accelerating risk—they should be considered as patterns for analysis as opposed to being discrete variables (Meloy et al., 2012). They contain dynamic as opposed to static factors. Dynamic factors tend to offer more substantial contributions to the assessment and management of short-term violence which is usually the focus of threat assessment (Douglas & Skeem, 2005; Guldemann & Meloy, 2020).

In the TRAP-18, the 10 distal characteristics focus on the individual's lone-actor status. The 10 distal characteristics include as follows: (a) personal grievance and moral outrage (confluence of factors shaping an individual to have a strong viewpoint about the targeted individual or cause), (b) framed by an ideology (justifying beliefs for action), (c) failure to affiliate with an extremist group (failure/rejection of individual with desired terrorist or other group), (d) dependence on virtual community (communication using social media and other online vectors with like-minded individuals), (e) thwarting of occupational goals (setback/failure in academic/life pursuits), (f) changes in thinking and emotions (thinking pattern becomes absolute and simplistic), (g) failure of sexual-intimate pair-bonding (individual fails to sexually or intimately bond), (h) mental disorder (historic or present major mental health disorder), (i) greater creativity and innovation (innovative terrorist action or process imitated by others), and (j) criminal violence (past criminal history; Meloy & Gill, 2016).

It is important to emphasize that the TRAP-18 should not be considered or used as a psychological test or an actuarial risk assessment instrument. The TRAP-18 is a structured professional judgment instrument, therefore, it does not have empirically derived cut-off scores, norms or scores. The number of indicators which are present in the individual should not be counted to assess risk level. However, there is no

requirement that such an instrument cannot have scores or norms to assist in professional judgment. Moreover, it is important to note that labeling an instrument as used for structured professional judgment does not mean its reliability and validity cannot or should not be assessed. For example, a person with distal characteristics, but no proximal warning behaviors, should be monitored, whereas the presence of even one proximal warning behavior would require active case management. This is, in effect, a rudimentary scoring system that can be tested for reliability and validity.

Each of the 18 indicators on the TRAP-18 are coded by the assessor as either present or absent. The assessor can also select “Unknown” if there is insufficient evidence to determine whether the indicator is present or absent. The eight warning behaviors are coded first as they are believed to be more closely related in time to the act for which there is concern. If there no warning behaviors present, the distal characteristics are then coded. The TRAP-18 behaviors are considered patterns as opposed to being discrete variables (Meloy, 2017).

The developers of the TRAP-18 view it as being a complementary tool as opposed to being a competing product to other well-established instruments such as the VERA-2 R (Pressman et al., 2016) or the ERG 22+ (Lloyd & Dean, 2011). The TRAP-18, unlike other risk assessments/tools, addresses behavioral as opposed to static risk factors (which are usually found in a person’s life history; Böckler et al., 2021). The presence of a cluster of TRAP-18 distal characteristics, coupled with the absence of all proximal warning behaviors means that the case should be monitored and reviewed on a regular basis. More active management resources are not yet warranted at this point. However, the presence of any proximal warning behaviors would mean that active management of the case is required: Face-to-face interview with the POC and/or collateral interviews with family or peers; review of records (e.g., employment, military, criminal, residence, driving, police incidents); safety plan development for school, work, home and the community at large; civil commitment, release, and discharge planning; social media monitoring; obtaining signed consents to communicate with the individual’s psychotherapist, psychiatrist or case manager to monitor progress if they are receiving mental health treatment

(Corner & Gill, 2015; Corner et al., 2016; Goodwill & Meloy, 2019; Guldinmann & Meloy, 2020; Meloy & Genzman, 2016).

In sum, the purpose of the TRAP-18 is not to predict acts of lone-actor terrorism rather to prevent them by efficiently and effectively managing risk. This is a significant distinction. While it is tempting for terrorism prevention professionals to seek a method of effectively predicting acts of future violence, radicalization, and mobilization to violence is a nuanced, complex, and highly personal experience. The ability to effectively predict future acts of terrorism based on an individual’s profile and behavior is at worst highly unlikely and at best currently unattainable. The TRAP-18 allows practitioners to analyze a subject of concern’s behavior through identified behavioral warning indicators and distinct characteristics that are repeatable (high-interrater reliability). Application of the TRAP-18 also facilitates evidenced based practice, helps assessors to identify risk enhancers, enables informed decision-making, and assists assessors in effectively managing an individual of concern so as to de-escalate them and move them down the pathway to intended violence. The TRAP-18 helps counterterrorism (CT) professionals. Through the assessment of the presence or absence of proximal warning behaviors and distal characteristics they can identify and prioritize cases (Meloy, 2017) in a more systematic (transparent) way and make any judgments more reliable (Borum, 2015).

Present Review

The aim of this review was to identify studies which have utilized the TRAP-18 either prospectively (operational use) or retroactively or studies which have investigated the validity and reliability of the TRAP-18.

Method

A total of five internet-based bibliographic databases were searched. Specifically, Journals@Ovid Full Text June 30, 2021; APA PsycArticles Full Text; APA PsycExtra 1908 to May 14, 2021; APA PsycInfo 1806 to June Week 4 2021 and, finally, Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Nonindexed Citations, Daily and

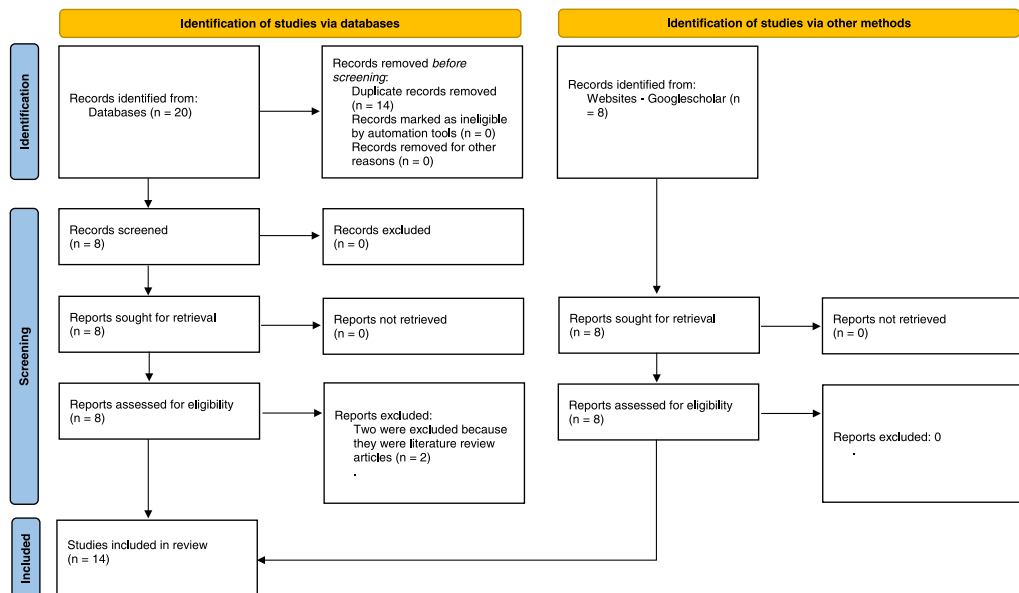
Versions(R) 1946 to July 01, 2021. The search on the five databases was carried out on 2nd July 2021. The search was not restricted by date. Search terms were applied to title. The following search criteria were entered into the six databases: TRAP-18 OR “Terrorist Radicalization Assessment Protocol.” This search returned a total of 20 articles. Following the removal of duplications ($n = 12$), there were eight articles remaining, six of which were found to be relevant for the review (two were excluded from this review because they were literature review articles). As well as the searches carried out on the five databases listed above, a number of permutations of TRAP-18 were entered into Google Scholar and searched for any potentially relevant articles which were not identified in the database searches. For instance, “radicalization assessment protocol”; TRAP-18; TRAP-18 AND “threat assessment”; TRAP-18 AND “radicalization assessment protocol”; TRAP-18 AND “actor”; TRAP-18 AND

“risk assessment”; TRAP-18 AND terrorism; TRAP-18 AND “lone actors”; trap 18 AND “exploratory test”; trap 18 AND “multidimensional scaling”; trap 18 AND “reliability and validity.” This resulted in eight further studies which were identified as being relevant to the present review (see Figure 1, for Preferred Reporting Items for Systematic Reviews and Meta-Analyses [PRISMA] Flow Diagram of this process). Therefore, a total of 14 articles were identified in this review. Finally, because this is a relatively underresearched field, the decision was made for the present systematic review to take an inclusive approach. Therefore, no exclusion criteria were applied. No restrictions were put in place for the year of publication.

On the 25th November 2021, an updated search was carried out on the same five databases used in the initial search. Specifically, Journals@Ovid Full Text November 24, 2021; APA PsycArticles Full Text; APA PsycExtra 1908 to

Figure 1

PRISMA 2020 Flow Diagram for New Systematic Reviews Which Included Searches of Databases and Other Sources



Note. From: “The PRISMA 2020 statement: An updated guideline for reporting systematic reviews” by Page M.J., McKenzie J.E., Bossuyt P.M., Boutron I., Hoffmann T.C., Mulrow C.D., et al., 2021, BMJ, 372(71), (<http://doi.org/10.1136/bmj.n71>). For more information, visit: <http://www.prisma-statement.org/>. See the online article for the color version of this figure.

November 08, 2021; APA PsycInfo 1806 to November Week 3 2021; and Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Nonindexed Citations, Daily and Versions(R) 1946 to November 24, 2021. A total of 26 articles were returned. After de-duplication, there were 10 articles. Eight of them were found in the initial search, two were new articles and added to the review (Collins & Clark, 2021; Kupper & Meloy, 2021). Another article was identified by one of the reviewers of this article (it did not have TRAP-18 in the title or any other permutation; King et al., 2018).

Review Protocol

To ensure a transparent and comprehensive report of results, this review followed the guideline outlined in the PRISMA statement in order to ensure a thorough and accurate reporting of the methodology and results. (Liberati et al., 2009; Moher et al., 2009; Page et al., 2021).

Study Selection

After carrying out the computerized search of the five databases, two reviewers independently assessed the records one by one and identified any titles which were not related to the focus of this review. In the second stage of the selection, two reviewers worked independently and assessed the records based on their titles and abstracts. The third and final stages involved the full-text screening of the records by both of the reviewers. Upon assessment, each reviewer independently made the decision as to which articles were eligible to be included in the review. There was no disagreement between the two reviewers (see Figure 1, for details of this process).

Results

A total of 17 relevant articles were identified in the review including six case studies and 11 empirical articles.

Case Studies Where the TRAP-18 Was Applied

Six case studies were identified which utilized the TRAP-18 retroactively (Böckler et al., 2015; Böckler et al., 2017; Collins & Clark, 2021;

Erlandsson & Reid Meloy, 2018; Meloy, Habermeyer, & Guldemann, 2015; Meloy & Genzman, 2016). See Table 1, for descriptive information and findings from each of these six case studies.

Six case studies examined the presence of the TRAP's eight warning behaviors. Between five and seven warning behaviors were present in each case. Four case studies examined the presence of the TRAP's 10 distal characteristics. Between seven and nine indicators were present in each case (see Table 2, six case studies and the TRAP-18).

See Table 3, for risk of bias for each of the six case studies.

Studies Which Have Utilized the TRAP-18 to Retroactively Evaluate Terrorist Incidents

Eleven empirical studies were identified which utilized the TRAP-18 to retroactively evaluate terrorist incidents (Böckler et al., 2021; Brugh et al., 2020; Challacombe & Lucas, 2019; García-Andrade et al., 2019; Goodwill & Meloy, 2019; King et al., 2018; Kupper & Meloy, 2021; Meloy & Gill, 2016; Meloy, Roshdi, et al., 2015; Meloy et al., 2019, 2021). See Table 4, for descriptive information and findings for each of the 11 empirical studies. Also, see Table 5 for the risk of bias in each of these 11 studies.

In their study, Böckler et al. (2021) looked at perpetrators of terrorist attacks and compared them to individuals who had been convicted of propagandistic and financial terrorist support and of traveling abroad to join a terrorist organization (Böckler et al., 2021). Significant differences were found by Böckler et al. (2021) between the terrorist perpetrators and persons convicted of nonviolent Islamist activities. The significant differences were in the number of TRAP-18 items and also in the proximal warning behaviors, namely, "pathway," "last resort," "energy burst," and "novel aggression." Their findings indicate that some items on the TRAP-18 may have "greater explanatory value for severe targeted violence" and are more accurate in differentiating between attackers and nonattackers. These items were "pathway" (most notably) as well as "novel aggression," "energy burst," and "last resort." Some potential limitations with their study was discussed by Böckler et al. (2021). For instance,

Table 1
Six Case Studies Which Have Utilized the TRAP-18 Retroactively

Authors	Case	Method	Main findings
Böckler et al. (2015)	Case of the Frankfurt Airport attack in 2011 in which a 21-year-old man shot several U.S. soldiers, murdering two U.S. airmen and severely wounding two others. “U,” who has Kosovan and Serbian citizenship, was born in 1990. He was the second of three children and lived in Germany since he was 5 years old. He was convicted and sentenced to life imprisonment for the murder of U.S. soldiers in two cases as well as attempted murder in three cases. He had no previous convictions. Based on psychological assessment, he was criminally liable because he had no personality disorder or mental illness.	Case study based on an extensive qualitative analysis of investigation and court files. Approx. 8,200 pages of data were analyzed which included testimonies of the perpetrator, family members, friends, acquaintances, and teachers as well as investigation reports and psychological assessments. As the authors coded the material, they focused on: 1. Sequences of biographical events in the perpetrator’s life to identify personal crises, turning points, and triggers leading to changes in his thinking, emotions, and behavior. 2. Testimonies and writings of the perpetrator himself to gain insights into his perception, self-concept, and implicit theories as well as conscious and unconscious motives for behavior. 3. The perpetrator’s habits and actions observed by the social environment to discern escalating and warning behaviors in the lead up to the attack. 4. Constant or changing social networks and social reactions that were meaningful to the perpetrator to make out associates and enemies as well as to understand exacerbating and mitigating effects on the perpetrator’s behavior, thinking, and emotions.	<i>Proximal warning behaviors</i> Pathway (e.g., consumption of jihadist material online; visiting mosques to hear radical preachers; research on ideology and former terror attacks). Fixation (e.g., fixation on personal grievances; fixation on the suffering of Muslims and the evilness of the United States). Identification (e.g., identification with jihadist ideology (duty to Jihad); identification with mujahideen; identification with ummah). Novel aggression—None Energy burst (e.g., intensification of religious practices and consumption of ideological material; upload of tons of jihadist material on computer and music-player) Leakage (e.g., chat messages which legitimize jihadist violence and glorify martyrdom; writings in chats and forums about stabbing kuffars with a knife or burning them). Direct threat—None Last resort (e.g., action imperative; felt he had to do something after viewing fake rape videos). <i>Distal characteristics</i> Personal grievance and moral outrage (e.g., Father’s disease, failure in school, disappointment of parents, loss of job, bad financial situation; moral outrage about the occupation of Islamic countries by the West). Framed by an ideology (e.g., turn toward unambiguous radical contents of jihadist ideology). Failure to affiliate with an extremist group (e.g., social fears inhibit establishment of contacts). Dependence on the virtual community (e.g., research on religion and ideology via internet; exchange about ideology mainly via chat programs and forums). Thwarting of occupational goals (e.g., failure in school; inability to find a proper position as an apprentice; expirations of employment contracts). Changes in thinking and emotion (e.g., successive socialization toward extremism; adaption of black-and-white thinking with a simultaneous decrease in tensions and ambiguity; increasing commitment to the cause). Failure of sexual-intimate pair-bonding and the sexualization of violence (e.g., never had a girlfriend or a sexual relationship; he usually invoked religious reasons as a rationalization). Nexus of psychopathology and ideology (e.g., criminal liability; fragile self-worth; inhibited social assertiveness; fragmented identity; pessimistic sentiment; clinical depression). Greater creativity and innovation (e.g., deviation from the widespread modus operandi of Al Qadaa bombings; military targets in a civilian setting; execution of the attack with a pistol and a knife). Prior criminal violence by history—None.

(table continues)

Table 1 (continued)

Authors	Case	Method	Main findings
Böckler et al. (2017)	Case of 24-year-old Anis A. who killed 12 and injured more than 50 people. On December, 19th, 2016, the perpetrator drove a truck into a Christmas market in Berlin. Anis A. was born in 1992 in the Tunisian province Kairouan, the youngest of nine children. After A.'s birth the family moved to Queslatia where his childhood was marked by severe poverty. His parents were living apart from each other. Religion did not play a big role in the family's life nor did Anis show any interest in the Quran. In October 2012, a dispute escalated; when Anis was drunk, he beat up a social worker and set the beds of the dormitory on fire. He was sentenced to 4 years in prison. He attacked prison officers and fellow inmates when in custody.	The case study is based on an extensive qualitative analysis. The source material includes: An official investigation report which was published by the responsible parliamentary committee on April, 4th, 2017 (Landtag, 2017). An official report on the state of knowledge and actions of German authorities in reference to the attacker Anis A. from April, 4th, 2011 to December, 21st, 2016. Findings from a journalism investigation team published on April, 5th, 2017. While coding the material, the authors focused on: 1. Sequences of biographical events in the perpetrator's life to identify personal crises, turning points, and triggers leading to changes in his thinking, his emotions, and his behavior. 2. Self-staging of the perpetrator himself to gain insights into his perception, self-concept, and implicit theories, as well as conscious and unconscious motives for behavior. 3. The perpetrator's habits and actions observed by the social environment to discern escalating and warning behaviors in the run up to the deed. 4. Social networks and social reactions which were meaningful to the perpetrator to make out associates and	In Anis A.'s case five categories of warning behavior were especially salient. In the following, the authors will take a closer look at them. Identification (e.g., In summer 2015, Anis A. was already a solid part of the Salafist scene around a mosque in Hildesheim which was controlled by one of the most influential ideologists of the Islamic State in Germany: The Iraqi Abu W. Abu W. and his representative Boban S. had the vision to impose Sharia Law in Germany by all means. A. was known as a devoted follower of both leaders). Fixation (e.g., Anis A. spend a lot of time in Doitmund where Abu W.'s representative Boban S. set up a prayer room. In the last months of 2015, Anis focused increasingly more on ideological topics). Leakage (e.g., Anis frequently boasted that he "wanted to do something in Germany." He said he was ready to fulfill his duty, that he would not hesitate to commit an attack, and that he would be able to access a Kalashnikov rifle without any problems. About 6 weeks before his attack, A. produced a video in which he vowed his loyalty to the Islamic State). Last resort (e.g., Anis' former lawyer reported that after his imprisonment in 2011, Anis felt desperate because he knew that there would be no more chance for him to get a residence permit in Europe). Pathway (e.g., he had visited the Christmas market at Berlin Memorial Church on November, 22nd, 2016, for the first among seven times. About 1 week before the attack he also filmed a short sequence with his mobile phone during one of his stays).

(table continues)

Table 1 (continued)

Authors	Case	Method	Main findings
Collins and Clark (2021)	This case study examines the violent Incel attack that occurred at a yoga studio in Tallahassee, Florida, on November 2, 2018, in which a 40-year-old man shot and killed two women and injured four others.	enemies, as well as to understand exacerbating and mitigating effects on the perpetrator's behavior, thinking, and emotions. This case study was based on extensive qualitative data triangulation, which stresses the importance of multiple data sources. Criminal investigative reports, employment records, and personally recorded video diary entries posted on the internet were all subject to analysis. The analyzed data sets included about 70 pages of employment records and disciplinary reports from Leon and Volusia county school districts in Florida and 51 pages of United States Army records obtained through the Freedom of Information Act. 64 pages of police report data and about 40 pages of supplemental investigative material from the Tallahassee Police Department were obtained and analyzed. These included toxicology findings, detailed crime scene analysis, and personal testimonies of the perpetrator, family members, friends, and acquaintances. Finally, over 2 hr of the perpetrator's online video diary entries were transcribed and analyzed for themes. While great efforts were made to obtain the perpetrator's personal medical	The perpetrator coded affirmatively for 5 of 8 (63%) proximal warning behaviors and 9 of 10 (90%) distal characteristics. <i>Proximal warning behaviors</i> Pathway (e.g., the perpetrator exhibited pathway warning behavior. He was a former Second Lieutenant in the United States Army with extensive tactical and weapons training and had carefully researched and planned his attack in the months preceding the attack). Fixation (e.g., the perpetrator, like other violent Incels, referenced Elliot Rodger in his online video entries). Identification (e.g., this was evident in his online writings and online video recordings, many of which denigrated women. In reference to women, the perpetrator stated, "I will be successful with females ::: if I can't be successful at being positive, I will be successful at being negative." Statements such as these indicate a progression toward and psychological desire to be a pseudocommando for the violent Incel movement). Novel aggression—absent Energy burst (e.g., the perpetrator, who was unemployed at the time of the attack, generally lived a relatively sedentary lifestyle. Closer to the time of the attack, the perpetrator drove over 4 hr on October 31, 2018, from his home to Tallahassee, stopping to purchase a yoga mat and ear protection. In the months that preceded the attack, cell phone records indicate that the perpetrator had practiced this drive at least once before the attack). Leakage—absent Last resort (e.g., an analysis of Tallahassee Police Department's police report revealed that on November 2, 2018, the perpetrator neatly organized identifying documents that included medical records, psychiatric records, military discharge paperwork, and previous employment records in the trunk of his vehicle and around his hotel room. Presumably, the perpetrator did this because he wanted to be easily identifiable to law enforcement after the attack). Directly communicated threat—absent <i>Distal characteristics</i> Personal grievance and moral outrage (e.g., he communicated regularly on the internet about the immorality of women).

(table continues)

Table 1 (continued)

Authors	Case	Method	Main findings
Erlandsson and Reid Meloy (2018)	Case study of Anton Lundin Pettersson (the Kronan School attack) who murdered three people and injured another seriously on the 22nd of October 2015. As the offender was shot to death, there was no trial or judgement. Individual was a 21-year-old Swedish citizen. He was born on 22 June 1994 in Trollhättan, Sweden, as the youngest of four siblings, including his oldest	and mental health records, the data were unobtainable due to legal issues.	Framed by an ideology (e.g., due to the perpetrator's belief in the Incel movement and male supremacist ideologies, he felt justified in his actions). Failure to affiliate with an extremist group (e.g., the perpetrator was honorably discharged from the United States Army on June 9, 2010, after less than 2 years of active service). Dependence on virtual community (e.g., he publicly posted his videos, many of which discussed his hatred of women, on YouTube and received praise from others that likely rewarded and reinforced his extremist beliefs). Thwarting of occupational goals (e.g., the perpetrator worked as a substitute teacher for two different Florida school districts and was fired from both posts). Changes in thinking and emotions—absent Failure of sexual-intimate pair-bonding (e.g., in a postevent interview conducted by the Tallahassee Police Department with the perpetrator's mother, she reported that the perpetrator was "unsuccessful with romantic relationships" and had "abnormally high" standards and expectations for women). Mental disorder (e.g., in another postevent interview conducted by law enforcement, an acquaintance of the perpetrator described him as being "autistic." Evidence for anxiety was also indicated by the perpetrator's mother, who reported to law enforcement that the perpetrator had "separation anxiety."). Greater creativity and innovation (e.g., the attack at the hot yoga studio marks the first time in history that an act of gender-based targeted violence has taken place at a yoga studio). Criminal violence (e.g., on December 7, 2012, the perpetrator was arrested and charged with battery after he grabbed the buttocks of two women without consent). <i>Proximal warning behaviors</i> Pathway (e.g., started to research, plan, and prepare his attack on the Kronan school slightly more than 2 weeks earlier. He studied the route from his home to the school, he looked up when the school was closed for autumn leave, he studied pictures of the building and the facilities, the pupils, and the teachers). Fixation (e.g., was preoccupied with the belief that all the problems in Sweden and his own problems were caused by immigrants. The last 2 years, when he failed at 80 different job applications, the Muslims became his fixation and his target). Identification (e.g., Pettersson was a thin, young man who looked like a girl. But he idolized and identified with alpha males, Vikings, warlords, and body builders. He loved weapons and hung a samurai sword above his bed). Novel aggression (e.g., would use a melon and practice slicing and stabbing it with his sword).

(table continues)

Table 1 (continued)

Authors	Case	Method	Main findings
	brother and two half-brothers with whom the family had little or no contact. The mother worked as an assistant nurse, and the father worked at the Swedish Maritime Administration. They lived in a townhouse in a middle class neighborhood.	people who were not interviewed by the police and evidence that was not discovered by the police.	Energy burst (e.g., The last few weeks he was febrile, living in front of his computer, switching between planning for his attack, and surfing porn sites with shemales). Leakage (e.g., He told a young boy who was his relative that he was angry about immigration and that “one should do something.” He wrote the digital letter to his Dutch friend to say farewell less than an hour before the attack). Last resort (e.g., Pettersson could not tolerate Sweden anymore. He felt he was being forced to do something. The triggering event was the imminent loss of his temporary employment). Directly communicated threat—none. <i>Distal characteristics</i> Met criteria for 8 of 10 distal characteristics. The only two distal characteristics that were absent were a failure to affiliate with an extremist or other group, and a violent criminal history. Personal grievance and moral outrage (e.g., Pettersson never could get a permanent job. He felt humiliated, unfairly treated, and angry. He solely blamed the immigrants that came to Sweden to take the jobs (personal grievance)). Framed by an ideology (e.g., Pettersson did what the Swedish police call “copy paste,” when one concocts and mixes his own ideology. He combined the beliefs of the Sweden Democrats Party, white power, counter jihad, neo-Nazism, and the ZOG (Zionist Operated Government) conspiracy theory. He studied several mass murderers such as the Columbine killers, Anders Breivik and Elliot Rodger). Dependence on the virtual community (e.g., read a lot of comments on 4chan about loneliness, hatred, not being sure of one’s sexual identity, and wanting to commit suicide). Thwarting of occupational goals (Pettersson admired his older brother and went to the same school and received the same education. But unlike his brother, Pettersson failed to develop a career and/or pursue further education). Changes in thinking and emotion (e.g., his brother reported to the first author that Pettersson became increasingly angry in the months preceding his attack. He was chronically frustrated and would have angry outbursts, cussing the immigrants). Failure of sexually intimate pair-bonding (e.g., Pettersson never had a girl or boyfriend, and probably never had sexual contact with another person). Mental disorder (e.g., strong evidence that Pettersson was both clinically depressed and also met criteria for a diagnosis of autism spectrum disorder). Creativity and innovation (e.g., had made his own uniform and was careful with the details). Criminal history (no criminal records and nothing in the police registers). Failure to affiliate with an extremist or other group (e.g., There was no evidence of attempts to join an actual group and then being rejected, although he did suffer because he was lonely. He considered joining a shooting club but could not afford it).

(table continues)

Table 1 (continued)

Authors	Case	Method	Main findings
Meloy, Habermeyer, & Guldemann (2015)	The crimes and motivations of Anders Breivik on July 22, 2011—the Norwegian lone terrorist who killed 77 people in two separate attacks, a bombing in Oslo and a mass murder on the island of Utøya—were analyzed during his criminal trial in Norway amid a stark debate concerning his diagnosis.	The sources of data analyzed for this case study included both primary and secondary data. Specifically, the psychiatric reports generated for trial; portions of the trial transcripts; available investigative data; an extract in English of the July 22, 2001, Commission report; the English version of the prosecution indictment; and both print and electronic media. The researchers analyzed Breivik's activities and mental state through the lens of eight proximal warning behaviors of the TRAP-18.	<i>Proximal warning behaviors</i> Pathway (e.g., in 2009 he created a company called Geofarm to provide a plausible reason for the purchase of detonation devices, accelerants, and fuel for explosives). Fixation (e.g., during the previous decade before his attacks, Breivik became more and more preoccupied with his cause, and apparently decided to take violent action. His cause was strong opposition to the Islamization of Europe and the multicultural advocacy of liberal politicians and their political dominance within the Norwegian government). Identification (e.g., Breivik took photos of himself for his manifesto posted to the internet in the hours leading up to the attack. In one, he wears a dress "military" uniform with epaulets and various medals, including his personally designed insignia on his arm). Novel aggression—not present. Energy burst (e.g., Breivik appears to have become increasingly active during the 2 years before as he became more absorbed in the preparation for his attacks). Leakage (e.g., actual leakage occurred within hours of the attack when he posted his manifesto online containing the details of his preparation and planning—although it did not state his specific targets—and a 12-min-long marketing video on his Facebook page). Last resort (e.g., he wrote that "the time for dialogue is over" (p. 1377) and quoted Napoleon: "He who saves the country violates no law" (p. 684). During the trial, he exhibited his last resort mentality when he said, "I did this out of goodness, not evil. I acted in self-defense on behalf of my people, my city, my country. I would have done it again" (Breivik Testimony, 2012). Directly communicated threat—no publicly available evidence in this case that he communicated a direct threat to anyone before his attacks.
Meloy and Genzman (2016)	Case of a U.S. Army psychiatrist and jihadist, Malik Nidal Hasan, who committed a mass murder at Fort Hood, Texas, in Nov. 2009. He was 39 years old when he carried out his attack. He killed 13 and wounded 32 people. Hasan was apprehended after he was wounded by officers. He was born in Virginia on September 8, 1970. His parents had emigrated from Palestine, and	The authors studied the behaviors and mindset of a lone-actor terrorist, Malik Hasan (who happened to also be a mental health professional and a psychiatrist) through the lens of TRAP-18.	<i>Proximal warning behaviors</i> Pathway (e.g., on August 1, 2009, he bought an FN Five-Seven semiautomatic handgun. Hasan recorded a video of the store manager giving him in-depth usage and care instructions for his new purchase, and he returned nearly every week after to stockpile ammunition. He completed a concealed handgun course on October 10, 2009). Fixation (e.g., Hasan was an avid reader of online extremist materials. Most notably, the materials online from the radical cleric Anwar al-Awlaki. A wlaki, an American citizen, became a prolific al-Qaeda recruiter, propagandist, and strategist before being killed in a 2011 U.S. drone strike). Identification (e.g., Hasan printed out business cards at some point during his time at Fort Hood (July to November 2009). He identified himself as a "Soldier of Allah" with the abbreviation "SOA" after his name).

(table continues)

Table 1 (continued)

Authors	Case	Method	Main findings
	he grew up in a moderate Muslim household.		Novel aggression—no evidence of novel aggression. Energy burst (e.g., 2 days before the November 5 massacre, Hasan visited the shooting range and fired over 200 rounds. In the days and hours before his attack, he performed online searches for terms related to the Taliban and jihad.). Leakage (e.g., a fellow Fort Hood psychiatrist testified that Hasan told her a few weeks before the attack that the Army would pay if he were deployed). Last resort (e.g., on October 30, Hasan sent an email to his brother, in which he discussed the following: A resolution to a debt; the power of attorney paperwork he had filled out for his brother; and instructions on handling his affairs should he die or be incapacitated). Directly communicated threat—no evidence of a directly communicated threat. <i>Distal characteristics</i> Personal grievance and moral outrage (e.g., Hasan experienced some hostility from his fellow soldiers and complained sharply about the general mistreatment of Muslims in the military). Framed by an ideology (e.g., Hasan idolized Anwar al-Awlaki and raply consumed the extremist materials Awlaki shared online). Failure to affiliate with an extremist group—no evidence to suggest that Hasan attempted to join a terrorist group or otherwise collaborated with one. Dependence on the virtual community (e.g., Hasan was active online; he was an ardent consumer of Awlaki’s materials, frequenting Awlaki’s Web site and subscribing to Awlaki’s email service). Thwarting of occupational goals (e.g., According to Hasan’s cousin, Nader, combat deployment was Hasan’s “worst nightmare”). Changes in thinking and emotion (e.g., Hasan isolated himself from family and friends with accusations of religious failures and engaged in heated arguments about Islam with fellow worshipers, debating the meaning of jihad and the significance of being a true Muslim). Failure of sexual-intimate pair-bonding (e.g., Hasan had never been in a romantic relationship, despite investing a great deal of time and money in finding a mate). Mental disorder—Hasan did not have a diagnosable mental disorder. Greater creativity and innovation (e.g., Hasan’s attack on an U.S. Army base brought about major changes in all branches of the military and several law enforcement agencies, for America had not seen an attack like his before). History of criminal violence—no history of criminal violence was found.

Note. TRAP-18 = The Terrorist Radicalization Assessment Protocol.

Table 2
Six Case Studies and the TRAP-18

TRAP-18 Indicators	Frankfurt Airport attack (2011)	Christmas market in Berlin attack (2016)	Kronan School attack (2015)	Bombing in Oslo and a mass murder on the island of Utøya (2011)	Fort Hood, Texas attack (2009)	Attack in yoga studio in Tallahassee, Florida (2018)
Proximal warning behaviors						
Pathway	Present	Present	Present	Present	Present	Present
Fixation	Present	Present	Present	Present	Present	Present
Identification	Present	Present	Present	Present	Present	Present
Novel aggression	<i>Absent</i>	<i>Absent</i>	Present	<i>Absent</i>	<i>Absent</i>	<i>Absent</i>
Energy burst	Present	<i>Absent</i>	Present	Present	Present	Present
Leakage	Present	Present	Present	Present	Present	<i>Absent</i>
Last resort	Present	Present	Present	Present	Present	Present
Directly communicated threat	<i>Absent</i>	<i>Absent</i>	<i>Absent</i>	<i>Absent</i>	<i>Absent</i>	<i>Absent</i>
Distal characteristics						
Personal grievance and moral outrage	Present	—	Present	—	Present	Present
Framed by an ideology	Present	—	Present	—	Present	Present
Failure to affiliate with an extremist group	Present	—	<i>Absent</i>	—	<i>Absent</i>	Present
Dependence on virtual community	Present	—	Present	—	Present	Present
Thwarting of occupational goals	Present	—	Present	—	Present	Present
Changes in thinking and emotions	Present	—	Present	—	Present	<i>Absent</i>
Failure of sexual-intimate pair-bonding	Present	—	Present	—	Present	Present
Mental disorder	Present	—	Present	—	<i>Absent</i>	Present
Greater creativity and innovation	Present	—	Present	—	Present	Present
Criminal violence	<i>Absent</i>	—	<i>Absent</i>	—	<i>Absent</i>	Present

Note. TRAP-18 = The Terrorist Radicalization Assessment Protocol.

Table 3*Risk of Bias in Case Studies*

Authors	Statement of study funding	Conflict of interest statement	Affiliations of authors
Böckler et al. (2015)	Yes. The study is part of the research network incident and case analysis of highly expressive targeted violence (TARGET), which is granted by the Federal Ministry of Education and Research (BMBF) under the program Research for Civil Security II.	No statement.	Nils Böckler, Institute for Interdisciplinary Research of Conflict and Violence (IKG), Bielefeld University. Jens Hoffmann, Institute for Psychology and Threat Management, Darmstadt, Germany. Andreas Zick, Institute for Interdisciplinary Research of Conflict and Violence (IKG), Bielefeld University.
Böckler et al. (2017)	Yes. The study is part of the research network “Analyses of Extremist Aspirations in Social Networks” (X-SONAR), which is granted by the Federal Ministry of Education and Research (BMBF) under the program “aspects and measures of counterterrorism.”	Yes included: “No competing financial interests exist.”	Nils Böckler, Institute Psychology and Threat Management, Darmstadt, Germany. Jens Hoffmann, Institute Psychology and Threat Management, Darmstadt, Germany. J. Reid Meloy, Department of Psychiatry, University of California, La Jolla, California.
Collins and Clark (2021)	Not included (appears unfunded).	Yes included: “No conflicts of interest to be declared.”	Christopher J. Collins, College of Social Work, Florida State University. James J. Clark, College of Social Work, Florida State University.
Erlandsson and Reid Meloy (2018)	Not included (appears unfunded).	Yes included: “Disclosure: Dr. Meloy is the developer of the TRAP-18 and receives royalties from the training and sale of the instrument.”	Asa Erlandsson, Svensk Polis, Polhemsgatan 30, 112 30, Stockholm, Sweden. J. Reid Meloy, Department of Psychiatry, School of Medicine, University of California, San Diego, 9500 Gilman Drive, La Jolla, CA, 92093.
Meloy, Habermeyer, & Guldemann (2015)	Not included (appears unfunded).	No statement. However, does indicate within main text a few times the links author has with the development of the warning behaviors of the TRAP-18. For example, “We define each of the warning behaviors according to our previously published definitions.”	J. Reid Meloy, Department of Psychiatry, School of Medicine, University of California, San Diego, and San Diego Psychoanalytic Center, San Diego, California. Elmar Habermeyer and Angela Guldemann, Department of Forensic Psychiatry, University Hospital of Psychiatry, Zurich, Switzerland.

Note. TRAP-18 = The Terrorist Radicalization Assessment Protocol.

those who left the country for Islamist motivation were put into the control (nonattacker group) and it is possible that violence could have been carried out abroad in some of these individuals. Indeed, in

the sample of those who left Germany for Islamist motives, there were nine persons involved in acts of war or who used weapons of war. Despite this potential limitation, Böckler et al. (2021) made

Table 4
Studies Which Have Utilized the TRAP-18 to Retroactively Evaluate Terrorist Incidents

Authors	Sample characteristics	Aim of the study/hypothesis	Findings
Böckler et al. (2021)	German sample of perpetrators who were convicted for Islamist activities between 2006 and 2016. (<i>n</i> = 80) 76 male (95%) and four female (5%). Average age at the time of the crime/ time of conviction is 21.64 years (<i>SD</i> = 4.73), age range 14–38 years old.	Perpetrators of terrorist attacks were compared to persons who have been convicted of propagandistic and financial terrorist support and of joining a terrorist organization abroad. Hypothesis 1: Proximal rather than distal factors distinguish between Islamist attackers and nonattackers. Hypothesis 2: The factors “pathway,” “identification,” and “last resort” represent significant correlates for severe acts of violence and distinguish between perpetrators and nonperpetrators. Hypothesis 3: Terrorist attackers and the control group differ concerning the number of proximal factors present. Hypothesis 4: The TRAP-18 allows a distinction between terrorist attackers and nonattackers with high specificity as well as high sensitivity.	<i>Overall Sample Findings</i> Most frequent behavioral patterns found in the sample (<i>n</i> = 80) include “framed by an ideology” (92%), “changes in thinking and emotion” (84%), and “identification” (78%). Among the least frequent behaviors are “failure to affiliate with an extremist group” (3%), “mental disorder” (5%), “directly communicated threat” (8%), “creativity and innovation” (13%), “novel aggression” (13%), and “energy burst” (19%). <i>Subgroup Findings</i> [Comparison between the attackers and the control group, consisting of the financial supporters, propagandists, and those who have left the country]. Significant differences in the proximal warning behaviors exist for the factors “pathway” (<i>p</i> < .001), “novel aggression” (<i>p</i> = .004), “energy burst” (<i>p</i> = .004), and “last resort” (<i>p</i> < .001), with moderate effect sizes for each factor. A difference between the groups with respect to the distal characteristics was found for “creativity and innovation” (<i>p</i> = .011). The violent offenders differ significantly from the nonviolent offenders in terms of the number of proximal warning behaviors present (<i>p</i> < .001), the number of distal characteristics (<i>p</i> = .006), and the number of factors of TRAP-18 as a whole (<i>p</i> < .001). The individual groups (financial supporters, propagandists/recruiters, travelers, and violent perpetrators) differ in regard to the number of proximal warning behaviors, with only the violent perpetrators differing significantly from the financial supporters (<i>p</i> = .002). No significant group differences with regard to the individual distal characteristics. Number of total TRAP-18 factors differs significantly between the violent perpetrators and the financial supporters (<i>p</i> = .009) and the travelers/persons leaving the country (<i>p</i> = .012). The values for sensitivity (<i>se</i> = .80), specificity (<i>sp</i> = .93), positive predictive value (<i>pp+</i> = .80), and negative predictive value (<i>p−</i> = .93) are extremely promising.

(table continues)

Table 4 (continued)

Authors	Sample characteristics	Aim of the study/hypothesis	Findings
Brugh et al. (2020)	<i>Lone-actor terrorist data set</i> 77 jihadism-inspired lone-actor terrorists and reports on the feasibility and relevance of the framework overall and compared between lone-actor terrorists in the U.S. ($n = 35$) and Europe ($n = 38$). <i>U.S. and European subsamples</i> Lone actors were included in either the U.S. ($N = 34$) or European subsample ($N = 38$) if their primary country affiliation was in the U.S. or Europe. Primary country affiliation was assigned based upon the country in which the individual spent the most time in the 6 months prior to their radicalization or participation in terrorist activity.	This study was guided by three research objectives: 1. To apply the TRAP-18 to a sample of jihadism-inspired lone-actor terrorists and report on the feasibility of using the framework with publicly available information. 2. To describe the characteristics of the framework and distribution of ratings across items. 3. To compare lone-actor terrorists from the U.S. and Europe in terms of the presence of TRAP-18 items and priority recommendations.	<i>Feasibility</i> The number of items rated as unknown per case ranged from just one item (5.6%) to 16 items (88.9%) out of the 18 total possible items. There were no cases for which every TRAP-18 item was rated as either present, absent, or unknown. So, for all cases, there was some distribution of items across the possible ratings. Examining the prevalence of unknown versus absent or present ratings revealed that coders were significantly more likely to mark 12 of the TRAP-18 items as unknown than as present or absent. These indicators were: Fixation, novel aggression, energy burst, leakage, last resort, directly communicated threat, failure to affiliate, thwarting of occupational goals, changes in thinking and emotion, failure of sexually intimate pair-bonding, mental disorder, and criminal violence. Among these items, three were rated as unknown over 80% of the time (fixation, directly communicated threat, and failure to affiliate). The item energy burst was rated unknown in just under half of the cases, which indicates possibility of improving the feasibility of coding this item with minor adjustments to the definition/available information. Nine TRAP-18 items, on average, were rated as unknown by the coders per case. Consideration of items within the subcomponents suggest that warning behaviors were more challenging to rate than were Distal Characteristics. Out of the eight warning behaviors, coders rated an average of five items—or almost two-thirds (62.5%)—as unknown per case. Number of warning behaviors items rated as unknown per case ranged from none to all eight items (i.e., 0.0%–100.0%). Out of the 10 Distal Characteristics, coders rated an average of five items (50.0%) as unknown per case. Among Distal Characteristics, number of items rated as unknown across all cases ranged from 0 to 9 (0.0%–90.0%). <i>Characteristics of TRAP-18 Assessments Overall</i> Coders rated an average of about seven out of 18 items as present (38.9%, $M = 6.61$, $SD = 2.71$, $Mdn = 7.00$, mode = 4.00) and about two items as absent (11.1%, $M = 1.88$, $SD = 1.15$, $Mdn = 2.00$, mode = 1.00) per case. Number of items rated as present per case ranged from one to 12 (5.5%–66.6% of the possible 18 items), while the number of items rated as absent ranged from 0 to 7 (0.0%–38.8%). Among the eight warning behaviors items, coders rated an average of three items as present (37.5%, $M = 2.96$, $SD = 1.53$, $Mdn = 3.00$, mode = 3.00) and less than one item as absent (12.5%, $M = 0.40$, $SD = 0.67$, $Mdn = 0.00$, mode = 0.00) per case.

(table continues)

Table 4 (continued)

Authors	Sample characteristics	Aim of the study/hypothesis	Findings
Challacombe and Lucas (2019)	The sample consists of 58 U.S. based individuals or groups associated with the sovereign citizen movement. Of these, 30 individuals or groups planned or committed violent or dangerous actions, and 28 individuals committed nonviolent criminal actions. All incidents occurred between 2004 and 2014. Incidents classified as violent included shootings,	The primary research question was whether the TRAP-18 is an effective tool in postdicting violence in incidents involving members of the sovereign citizen movement.	Among the 10 Distal Characteristics items, coders rated an average of four items as present (40.0%, $M = 3.65$, $SD = 1.79$, $Mdn = 4.00$, mode = 3.00 and 4.00) and one item as absent (10.0%, $M = 1.48$, $SD = 0.80$, $Mdn = 1.00$, mode = 1.00) per case. <i>Known Groups Comparison: U.S. and European Lone Actors</i> A significantly higher average number of items were rated as present among U.S. lone actors ($M = 7.29$, $SD = 2.55$, $Mdn = 7.00$, mode 7.00, range 1.00–12.00) as compared to European lone actors ($M = 5.74$, $SD = 2.60$, $Mdn = 6.00$, mode = 4.00, range 2.00–11.00). A significant difference was found in the average number of items rated as unknown. Distribution of ratings significantly differed between U.S. and European lone actors on two items: Energy Burst and Leakage. Coders rated Energy Burst as present for a greater percentage of U.S. lone actors (58.8%) than European lone actors (34.2%). Leakage was rated as present for a greater percentage of U.S. lone actors (35.3%) than European lone actors (13.2%). Ratings for two other items—fixation and dependence on the virtual community—showed a similar (but not significant) trend of being rated present more frequently for U.S. lone actors compared to European lone actors. A significant difference was found in the proportion of U.S. lone actors and European lone actors recommended for Active Monitoring. Majority of U.S. lone actors were coded as meeting the criteria for Active Monitoring ($n = 29$, 85.3%) compared to just under two-thirds of European lone actors ($n = 23$, 60.5%). No significant difference in the proportion of U.S. and European lone actors recommended for Active Risk Management was found. So, while the differences observed in the present, absent, and unknown item ratings appears to affect Active Monitoring priority recommendation, no such impact on the Active Risk Management priority recommendation. Six proximal warning behaviors and four distal behaviors showed significant association to the incidents containing violence. Among the six significant proximal behaviors, four (pathway, identification, leakage, and last resort) were positively related to violence, and the other two (novel aggression and energy burst) were negatively related to violence. Novel aggression showed the weakest effect size, followed by energy burst and then leakage. Pathway and identification showed nearly similar effect sizes and last resort had the strongest effect size. Among the four significant distal characteristics, all four were positively related to violent incidents. Thwarting of occupational goals had a medium effect size. Framed by an ideology had a strong effect size. Both personal grievance and (table continues)

Table 4 (continued)

Authors	Sample characteristics	Aim of the study/hypothesis	Findings
García-Andrade et al. (2019)	standoffs, high-speed pursuits, or threats, and the violent sample represented 10 individuals killed and 15 injured. For nonviolent incidents, the researchers identified individuals who had committed or were believed to have committed a crime of a nonviolent nature (e.g., paper terrorism). 44 male patients with a mean age of 42.9 years ($SD = 14.0$).—patients with severe mental illness in a situation of social exclusion, and with a prison history. Of the total sample, 16 patients (36.4%) were Spanish, 8 (18.2%) were from North Africa, 9 (20.5%) from Sub-Saharan Africa, 7 (15.9%) from Europe (not Spanish), 3 (6.8%) from Asia, and 1 (2.3%) from Central America. Most patients had a diagnosis of schizophrenic spectrum disorder ($n = 29$; 65.9%), 3 (6.8%) had a diagnosis of delusional ideas disorder, 2 (4.5%) affective disorder, 3(6.8%) personality disorder, 1 (2.3%) organic mental disorder, 4 (9.1%) substance abuse disorder, and 2 (4.5%) personality disorder.	Aim of this study was to examine the predictive validity of TRAP-18 in a sample of patients with severe mental illness in a situation of social exclusion, and with a prison history. The authors set out to evaluate the capacity of total TRAP-18 scores to predict future extremist acts of violence.	criminal violence were the strongest of the distal characteristics. Remaining five variables were not significant. The TRAP-18 model, in total, was able to distinguish between the individual cases within the sample that were violent and nonviolent. The model as a whole explained between 44.2% (Cox and Snell R2) and 59% (Nagelkerke R2) of the variance in the presence of violence, and correctly classified 75.9% of cases. Those with a higher TRAP-18 score were over two times more likely to be involved in a violent incident. Of the total sample of 44 patients, 13 had committed a further violent act, and 31 had not. Of the 13 recidivists, only two had committed a repeat act of violence that was extremist in nature. There was a statistically significant difference in the total score of the TRAP-18, $t(44) = 5.22$; $p < .001$, between the groups. Those who had committed a new act of violent extremism (average range = 43.0) differed significantly ($p = .004$; $U = 904$) and identically in their scores both in the distal subscale (distal characteristics scale), and the proximal subscale (proximal warning behavior scale), compared to the group with no violent extremism (average range = 21.52). <i>Predictive validity of the TRAP-18</i> The total score of the TRAP-18 significantly predicted repeat violence extremist in nature (AUC 1.00, $p = .018$). The distal subscale of the TRAP-18 and the proximal subscale of the TRAP-18 are also significant separate predictors of future repeated violent acts of an extremist nature (with an AUC .98 and $p = .021$ for both subscales). <i>Overall</i> The TRAP-18 has potential validity in predicting future acts of violent extremism by subjects with a prison history.
Goodwill and Meloy (2019)	<i>Terrorist attack sample</i> 33 lone-actor terrorists—subjects who committed a politically motivated lethal or near-lethal attack against non-combatants in North America between 1993 and 2015. There were 16 extreme right wing, eight	This study focused on the analysis of data on a sample of North American terrorist attackers and nonattackers using the TRAP-18 using a multivariate statistical approach (multidimensional scaling, MDS) in order to visualize potential	The total number of TRAP-18 indicators present between attackers and nonattackers were not significantly different. However, the number of proximal warning behaviors of attackers were found to be significantly different from and greater than, $t(54) = -2.430$, $p < .05$, that of the nonattackers. Distal characteristics between attackers and nonattackers were not significantly different. MDS provides a visualization of the relationship between the TRAP-18 (table continues)

Table 4 (continued)

Authors	Sample characteristics	Aim of the study/hypothesis	Findings
	single-issue (usually antiabortion), and nine jihadist attackers. This was a nonrandom sample of convenience. Cases were included if there were sufficient open-source data to code the TRAP-18 variables as either present or absent. All attackers were male. Average age: 39 years old ($SD = 15.8$, range 15–88). Attacks occurred across the U.S. ($n = 31$) and Canada ($n = 2$). <i>No-attack sample</i> Nonrandom sample of convenience comprising 23 subjects selected from the caseloads of two major metropolitan law enforcement and mental health agencies, one in Canada ($n = 10$, the no-intent cases) and one in the U.S. ($n = 13$, the risk-managed cases) between 2012 and 2016. Average age of the nonattackers was 27 years ($SD = 11$, range 15–58).	clustering (co-occurrence) of TRAP-18 risk factors. This approach will advance the quantitative analysis of operationally relevant and behaviorally observable indicators for use by law enforcement and counterterrorism professionals and their consultants.	indicators and the attacking and nonattacking subjects. The visualization of co-occurrence of all of the TRAP-18 indicators generally supports the theory that proximal warning behaviors will cluster together (co-occur) and are different from most of the distal characteristics, which tend to co-occur less readily with each other. It appears from the MDS analysis that the attackers cluster, and that they cluster closest to six of the proximal warning behaviors, with the exception of novel aggression and directly communicated threat which suggests that co-occurrence among the attackers and proximal warning behaviors is strong, which is not as evident in the nonattackers. The remote location of novel aggression may be due to its low frequency. The very remote location of directly communicated threat may be the result of its negative correlation with attackers and very low frequency. Three distal characteristics (personal grievance and moral outrage, ideological framing, and changes in thinking and emotion) were found to cluster with both the proximal warning behaviors and the attackers.
King et al. (2018)	In February 2017, we analyzed the files of 40 offenders in Bavarian prisons who had been assigned an Islamism-related security label. These labels are primarily assigned on the basis of information from the intelligence services regarding involvement with Salafist or Jihadist networks or on observations made by prison staff, for example, if materials distributed or symbols used by such groups were found.	The main research question was whether prisoners classified as members of the “Salafi scene” and those associated with terrorism are distinct groups and which characteristics differentiates them best, but also to find shared characteristics. The authors aimed to find out how well the current gold-standard risk procedures can be applied to prisoner files if no other source of information is available.	Overall, a substantial number of indicators could be coded in only 50% of the cases or less. This was true for 27.8% of the indicators taken from TRAP-18. The average percentage of indicators not assessable from the files ($N = 40$) for the TRAP-18: TRAP-18 (complete)— $M = 38.06$ ($SD = 22.59$) Proximal warning behavior— $M = 41.25$ ($SD = 30.51$) Distal characteristics— $M = 35.50$ ($SD = 22.07$) The results suggest that with VERA, ERG 22+, and TRAP-18, there are instruments available that offer a valuable guideline when it comes to assessing risk of violent extremist offending.

(table continues)

Table 4 (continued)

Authors	Sample characteristics	Aim of the study/hypothesis	Findings
Kupper and Meloy (2021)	Files consisted of one female and 39 male inmates (average age 28.83 years, $SD = 7.58$). In ambiguous cases, an expert on Islamic studies from the Ministry of Justice was consulted for further assessment, which was then used as a basis for the classification.	The authors extracted indicators from publications on VERA, ERG 22+, and TRAP-18.	17 out of 18 TRAP-18 indicators (94%) were able to be coded in the manifestos. Proximal warning behaviors ranged from 2 to 7, with an average of 4.5. The average number of distal characteristics was 3.8 across the sample. 100% of proximal warning behaviors and 90% of distal characteristics, with criminal violence being the only behavior that was not apparent in any manifesto. The most frequent proximal warning behaviors are leakage (100%), identification (93%), fixation (90%), and last resort (87%); the least frequent ones are novel aggression (7%) and directly communicated threat (3%). The most prevalent distal characteristics are changes in thinking and emotion (93%), framed by an ideology (83%), and personal grievance and moral outrage (53%). The least common indicators are failure of sexual pair-bonding (13%), creativity and innovation (13%), mental disorder (10%), and criminal violence (0%). Three perpetrators showed signs of paranoia in their communications. 100% of spoken manifestos were found to include features of research, planning, preparing, or implementing the attack (pathway) compared to 46% of written documents. 92% of written manifestos show evidence of a violent action imperative (last resort). However, 67% of perpetrators signal last resort in verbal recordings. 67% of spoken manifestos allude to having been rejected by an extremist group or humanity in general (failure to affiliate) in contrast to 38% of written narratives. 50% of authors of written communications discuss their use of the internet for virtual learning or interaction prior to the act of violence (dependence of virtual community). 0% of spoken manifestos include this indicator. The only significant difference was between the written and spoken pathway warning behavior.
	The final sample consisted of 30 attacks that were carried out by a single protagonist in one or multiple incidents across North America, Europe, or Oceania between 1974 and 2021. United States ($n = 25$), Canada ($n = 1$), Germany ($n = 2$), Finland ($n = 1$), and New Zealand ($n = 1$). Methods included shootings, bombings, stabbings, vehicle ramming, an aircraft crash, and a hostage taking. 29 out of 30 lone offenders executed their attacks (97%), while one plot (Jared Cano) was interdicted by law enforcement before the perpetrator could carry out their attack. The final data set of targeted violence manifestos included written ($n = 24$) and spoken ($n = 6$) communications.	The aim of this retrospective study is to examine if a behavior-based threat assessment instrument, such as the TRAP-18, can be applied to a thin slice of data using only language evidence compiled by the perpetrator. In this unique approach, the notion of applying forensic linguistic and threat assessment techniques to the content of a manifesto is tested to identify if it can further validate the proximal warning behaviors and distal characteristics of the TRAP-18.	
Meloy, Roshdi, et al. (2015)	Sample of 22 individuals who carried out acts of terrorism in Europe between 1980 and 2015. 21	The aim of this study was to test the interrater reliability and content validity of the TRAP-18 with a	Mean interrater reliability was 0.895 and ranged from good to excellent across all variables. Specificity was not tested because there was no nonterrorist comparison group. (table continues)

Table 4 (continued)

Authors	Sample characteristics	Aim of the study/hypothesis	Findings
Meloy and Gill (2016)	(95.5%; $n = 22$) of the offenders were male, and one was female (4.5%). Average age = 31 years ($SD = 7.97$; $n = 22$, range 21–50). Among terrorists who acted alone, average age was 30 ($SD = 9.14$; $n = 15$, range 21–50 years). Terrorists within the autonomous cells had an average age of 28 ($SD = 4.85$; $n = 7$, range 22–38).	small sample of individual terrorists in Europe.	Content validity was suggested by the findings. The majority of individual terrorists who acted alone were positive on 13 of 18 variables (72%) and most of the individual terrorists who acted in autonomous cells were positive for 13 of 18 variables (72%). Only significant difference between the groups was the history of criminal violence among all of the members of the autonomous cells, and only one out of five of the individual terrorists.
	111 lone actors from the U.S. 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 offenses. This sample spanned a 25-year period (1990–2014), and was further divided according to ideological motivation (radical Islamism, right-wing extremism, and single-issue extremism) and whether the terrorist act was thwarted or successful.	The aim of this study was to present an investigative template which may eventually provide a reasonable assessment of risk of lone-actor terrorism, based upon the recommendations of Monahan (2012, 2016) and incorporating work on proximal warning behaviors for targeted violence and distal characteristics of the lone terrorist.	70% of the lone-actor terrorists were positive for at least half or more of the indicators. One individual displayed 16 of the 18 indicators, one scored 15 out of 18, five scored 14 out of 18, another five scored 13 out of 18, 11 scored 12 out of 18, 18 scored 11 out of 18, 25 displayed 10 indicators, 12 displayed half of the indicators. When the sample was divided into Islamic extremists, right-wing extremists, and single-issue terrorists, there were no significant differences across all 18 indicators except for four (personal grievance and moral outrage, dependence on the virtual community, thwarting of occupational goals, and fixation). Islamic extremist lone actors were significantly more likely to display dependence on the virtual community than the single-issue terrorists. Extreme right-wing lone actors were significantly less likely to exhibit personal grievance and moral outrage, thwarting of occupational goals, and fixation warning behaviors when compared to both the Islamic extremists or the single-issue terrorists. Single-issue lone actors were significantly less likely to display dependence on virtual communities compared to the Islamic extremists.
Meloy et al. (2019)	Two nonrandom samples of convenience. Subjects who had carried out a lethal terrorist attack in North America between 1993 and 2016 ($n = 33$),	The study compares a group of individual terrorists who mounted an attack with a group of individuals who posed a national security concern but did not attack.	When the sample was divided according to successful versus thwarted attackers, the successful attackers were significantly more fixated, creative, and innovative, and failed to have a prior sexually intimate pair-bond. They were significantly less likely to have displayed pathway warning behavior and be dependent on a virtual community of like-minded true believers. Effect sizes were small to medium (0.190–0.317). Half the TRAP-18 indicators were found to be significantly different between the samples with medium to large effect sizes (.35–.70). The proximal warning behaviors of pathway, identification, energy burst, and last resort were significantly more frequent among the attackers, and directly communicated threat was significantly less frequent.

(table continues)

Table 4 (continued)

Authors	Sample characteristics	Aim of the study/hypothesis	Findings
	and subjects who were identified as a national security concern, and were either successfully risk managed for at least 2 years, or determined upon investigation to have no intent to mount an attack, were not risk managed, and did not mount an attack during the same period of time ($n = 23$). All the attackers were male, and the average age was 39 years old ($SD = 15.8$; range = 15–88).	The null hypothesis was that there would be no significant difference on any of the TRAP-18 indicators between the terrorist attack group and the no attack group. This is a disconfirming hypothesis which challenges the authors' theory that the TRAP-18 indicators would discriminate between attackers and nonattackers and would be a useful structured professional judgment instrument for threat assessors.	The distal characteristics of ideological framing, changes in thinking and emotion, and creativity and innovation were more frequent among the attackers, and mental disorder was significantly less frequent. <i>The five warning behaviors found to be significantly different between the groups</i> Pathway—80% of the attackers were coded on this variable, only 20% of the nonattackers were. Identification—65% of the terrorists were coded on identification, only 35% of the comparison group were. Energy burst—74% of the attackers evidenced this, only 26% of the nonattackers did. Last resort—79% of the attackers evidenced this only 21% of the nonattackers. Directly communicated threat—the nonattackers were more likely to threaten the target than the attackers (82% vs. 18%). <i>The four distal characteristics found to be significantly different between the groups</i> Ideological framing—more frequent among the attackers when compared with the nonattackers (100% vs. 61%). Changes in thinking and emotion—significantly more prevalent among the attackers (100%) than the nonattackers (80%). Creativity and innovation—significantly more frequent among the attackers (53%) than the nonattackers (15%). Mental disorder—significantly less frequent (48%) in the attackers when compared with the nonattackers (94%). <i>Overall</i> Each proximal warning behavior was present in most attackers—exceptions being novel aggression (36%) and directly communicated threat (18%). Every attacker had at least one proximal warning behavior. Each distal characteristic was present in most of the attackers, with the exception of failure to affiliate with an extremist or other group (12%), mental disorder (48%), and history of criminal violence (43%). Among the nonattackers, only two of the proximal warning behaviors occurred in most of the subjects: Novel aggression (64%) and directly communicated threat (82%). Most of the distal characteristics were present among most of the nonattackers, with the exception of failure to affiliate with an extremist or other group (32%) and greater creativity and innovation (15%). Overall, there was a generalized sequence of indicators moving from distal characteristics to proximal indicators in line with the conceptualization of the TRAP-18 as an individualized threat management tool. Nearly all the distal characteristics, based upon the directionality of the sequencing and the
Meloy et al. (2021)	The sample for this study was based on an existing data set of 125 lone-actor terrorists (Corner et al., 2019). 122 males and three females.	This study looks at the temporal sequencing of 125 lone-actor terrorists, with purported ideologies ranging from Extreme Right Wing	(table continues)

Table 4 (continued)

Authors	Sample characteristics	Aim of the study/hypothesis	Findings
	61 were U.S. citizens and 64 were non-U.S. citizens.	(XRW) to Islamic Jihadist terrorism, in order to add to the current understanding regarding the generalized pathway to acts of targeted violence.	proximity coefficients, were found to be antecedent to proximal warning behaviors. The only exception being fixation (a proximal warning behavior) which precedes the distal characteristic of changes in thinking and emotion. Three TRAP-18 indicators (energy burst, creative and innovative, and novel aggression) fell below the contingency threshold (≥ 3) and/or proximity coefficient (>0.5) filter rules adopted in this study and, as a result, were not included in the state transition diagram. However, these three indicators may be quite relevant in an individual case. Note: The proximity coefficient quantifies how indicators within a behavior chain occur temporally in relation to one another. In other words, the proximity coefficient describes the “closeness” of two indicators in a sequence.

Note. AUC = area under the curve. TRAP-18 = The Terrorist Radicalization Assessment Protocol; VERA = Violent Extremism Risk Assessment; ERG 22+ = Extremism Risk Guide.

the decision to include these individuals into the nonattacker group (control) as their role in attempted acts of killing could not be proven in court (Böckler et al., 2021).

Findings from the study carried out by Challacombe and Lucas (2019) suggest that, overall, the warning indicators displayed by domestic terrorists (or sovereign citizens) are potentially different from the warning signs exhibited by traditional international terrorists. Additionally, they suggest that the absence of proximal warning behavior, fixation, may be explained by the fact that it is difficult for raters/assessors to clearly identify fixation behaviors in the nonviolent sample based on open-source information Challacombe and Lucas (2019) point out one of the main potential limitations with their study, which is due to it being a retroactive evaluated incident, is the lack of information (Challacombe & Lucas, 2019).

The study by Goodwill and Meloy (2019) highlights the issue that because the data collection was conducted retroactively, the time when proximal warning behaviors or distal characteristics started to present themselves in both groups was unavailable to the coders. This meant that analysis could not be performed looking at the sequence of when the TRAP-18 indicators first presented themselves in the individuals, for example. Time sequencing of these factors is argued to be an important research approach to studying acts of terrorism (Corner et al., 2019). Such research can show the range of causal pathways to an attack. However, it is possible that the assignment of risk factors to distal or proximal could in itself implicitly connote temporality given the “exhaustive nature of the data collection process” (p. 531). In their study, Goodwill and Meloy (2019) quantitatively showed that with the TRAP-18 there are two superordinate factors, proximal warning behaviors and distal characteristics. They also found in the attackers proximal warning behaviors are present but are largely absent in the nonattackers, while in both the attackers and nonattackers, distal characteristics were present. An interesting finding from this study was that three of the distal characteristics (personal grievance and moral outrage, ideological framing, and changes in thinking and emotion) were found to cluster with the proximal warning behaviors and also the attackers. This indicates that there is a stronger co-occurrence of these three distal characteristics in attackers

Table 5
Risk of Bias in Studies Which Have Utilized the TRAP-18 to Retroactively Evaluate Terrorist Incidents

Authors	Small sample size	Possibility of retrospective, hindsight bias and/or confirmatory bias (or availability bias)		Blinding of assessors	Interrater reliability	Statement of study funding	Conflict of interest statement	Affiliations of authors
		Yes.	No.					
Böckler et al. (2021)	Yes. The total sample of 80 persons is well suited for statistical analysis, but the number of terrorist attackers ($n = 20$) is still quite small.	Yes. “Using TRAP-18, the data sets were independently rated by four scientists who were familiar with the instrument but <i>blind to the assignment of cases to the individual groups</i> . This procedure was intended to reduce especially the number of hindsight and observational bias.”	No. It states in the article that “interrater reliability was not systematically checked in our study. Nevertheless, some coding test runs were performed, which were discussed in the research team afterward. It turned out that it was sometimes difficult for the coders to decide whether factors were not fulfilled, i.e., to code as ‘no,’ or whether the information necessary to evaluate the factor was simply not available in the data material (‘missing’).”	Yes. This article is part of the BMBF project X-SONAR (“Extremist Tendencies in Social Media Networks: Identification, Analysis, and Management of Radicalization Processes”) with the funding codes 13N14235 to 13N14240. The project is funded as part of the BMBF’s “Civil Security—Aspects and Measures of Counter-Terrorism” call for proposals under the Federal Government’s “Research for Civil Security” program.	Mentioned in the body of article ... “Although much effort has been made to reduce hindsight and observational bias, confirmatory bias cannot be fully excluded in this study. It should be made clear at this point that our research team was not entirely impartial about the usefulness of TRAP-18 or the warning behavior typology. In particular, the first and last two authors of this study have been publishing on both topics for quite some time—including publications with the developer of TRAP-18 itself.”	Institute Psychology and Threat Management, Darmstadt, Germany. Association of European Threat Assessment Professionals, Darmstadt, Germany. Institute for Interdisciplinary Research on Conflict and Violence, Bielefeld University.		
Brugh et al. (2020)	Yes.	Not stated.	Yes. “The TRAP-18 was coded for all 77 lone actors. A random subset of 20 lone actors (26.0% of our analytic sample) was assessed by all coders to assess inter-rater reliability.”	Yes. This material is based on work supported in whole or in part with funding from the Laboratory for Analytic Sciences (LAS). Any opinions, findings, conclusions,	Yes statement included. No potential conflict of interest was reported by the author(s).	Christine Shahan Brugh, Laboratory for Analytic Sciences, North Carolina State University, Raleigh, NC, USA Sarah L. Desmarais and Joseph Simons-Rudolph, Department		
(table continues)								

Table 5 (continued)

Authors	Small sample size	Possibility of retrospective, hindsight bias and/or confirmatory bias (or availability bias)	Blinding of assessors	Intrater reliability	Statement of study funding	Conflict of interest statement	Affiliations of authors
Challacombe and Lucas (2019)	Yes.	Yes.	Not stated.	Analyses revealed excellent inter-rater reliability ($\alpha = .950$). ^a	or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the LAS and/or any agency or entity of the U.S. Government.	Not included.	of Psychology, North Carolina State University, Raleigh, NC, USA
				Yes. “Two raters evaluated the whole sample ($N = 58$; 1,044 codings) using the TRAP-18 codebook against information from the dossiers. After reviewing Meloy and Gill (2016) and Gruenewald et al. (2013), a psychology graduate student (Ariana Fisher; Rater 2) and the primary researcher (Rater 1) completed the ratings independently. Average Cohen’s kappa was good for the proximal characteristics, $k = .687$, and excellent for the distal characteristics, $k = .812$. The average for	Not included.	Not included.	Darin J. Challacombe, Department of Psychology, Fort Hays State University. Paul A. Lucas, Department of Government and Justice Studies, Appalachian State University.

(table continues)

Table 5 (continued)

Authors	Small sample size	Possibility of retrospective, hindsight bias and/or confirmatory bias (or availability bias)	Blinding of assessors	Intraclass reliability	Statement of study funding	Conflict of interest statement	Affiliations of authors
García-Andrade et al. (2019)	Yes.	Yes.	Not required—one group only.	the entire TRAP-18 was excellent, $k = .757$. For the analyses, Rater 2's codings were utilized."	Not included.	Yes included. States: "The authors have no conflict of interests to declare."	Programa de Atención Psiquiátrica a Enfermos Mentales Sin Hogar, Madrid, Spain. Instituto de Psiquiatría y Salud Mental, Hospital Clínico San Carlos, Madrid, Spain. Departamento de Medicina Legal y Psiquiatría, Facultad de Medicina, Universidad Complutense de Madrid, Madrid, Spain. Instituto de Investigación Sanitaria San Carlos (IdISSC), Madrid, Spain. Centro Penitenciario de Segovia, Segovia, Spain. Centro de Salud Mental Alcorcón, Alcorcón, Madrid, Spain. Centro Penitenciario Madrid VII—Estremera, Madrid, Spain.

(table continues)

Table 5 (continued)

Authors	Small sample size	Possibility of retrospective, hindsight bias and/or confirmatory bias (or availability bias)	Blinding of assessors	Intrater reliability	Statement of study funding	Conflict of interest statement	Affiliations of authors
Goodwill and Meloy (2019)	Yes.	Yes.	No. <i>Terrorist attack sample</i> JRM consulted with the defense, prosecution, or law enforcement in five of the attack cases; and in several other additional cases, the TRAP-18 was coded by the actual investigator on the case, who, postresolution, provided case data to the research team. JRM worked with Ms. Jacqueline Genzman in the coding of the rest of the terrorist attackers, and any questions were resolved through analysis of each subject's behavioral patterns, and their	Mentioned briefly but not detailed. It states: "...mitigation measures were taken, such as double-coding, interrater agreement, case discussions among the researchers"	Not included.	No statement included. However, the article does state in the main body that: "TRAP-18 indicators were coded by those who were trained on the instrument by the second author (JRM), either in person or through online training available at gifrime.com."	Servicio de Psiquiatría, Hospital Universitario La Paz, Madrid, Spain. Departamento de Medicina Legal, Facultad de Medicina, Universidad Autónoma de Madrid, Madrid, Spain. Clínica Médico Forense, Madrid, Spain. Alasdair Goodwill, Ryerson University, Toronto, ON, Canada. J. Reid Meloy, University of California, San Diego, CA, USA.

(table continues)

Table 5 (continued)

Authors	Small sample size	Possibility of retrospective, hindsight bias and/or confirmatory bias (or availability bias)	Blinding of assessors	Intrater reliability	Statement of study funding	Conflict of interest statement	Affiliations of authors
King et al. (2018)	Yes.	Yes.	goodness of fit with the 18 indicator descriptions in the manual (Melo, 2017) until consensus was reached.	Yes. TRAP-18 Interrater Reliability Coefficient = 0.83	Yes funding statement provided: "We would like to thank the National Centre for Crime Prevention (NCCP) in Germany (German: Nationales Zentrum für Kriminalprävention) for the funding of our research project."	None stated.	Sonja King, Department of Psychology, University of Erlangen-Nuremberg, Germany. Johann Endres, Criminological Research Unit of the Bavarian Prison System, Germany. Marian Schwab, Mark Stemmler and Lora Lauchs, Department of
			<i>No-attack sample</i> The Canadian sample was coded by Detective Gwyn Amat and Dr. Melinda Morgan. Consensus was reached on each of the indicators through the same procedure outlined above. The U.S. sample was coded by JRM and Dr. Maria Martinez, and consensus was reached on each of the indicators.				

(table continues)

Table 5 (continued)

Authors	Small sample size	Possibility of retrospective, hindsight bias and/or confirmatory bias (or availability bias)	Blinding of assessors	Intrater reliability	Statement of study funding	Conflict of interest statement	Affiliations of authors
Kupper and Meloy (2021)	Yes.	Yes. It does state the following: "The second author is the developer of the TRAP-18 itself, which could raise concerns of confirmation and hindsight bias. We sought to minimize this with careful assessments, discussions, and consensus reached on whether or not the language of the manifestos met the definition of the various TRAP-18 indicators."	Not stated.	No.	Not included.	Yes included. "J. Reid Meloy receives income from the training and distribution of the TRAP-18 through J. Reid Meloy, license to Multi-Health Systems (www.mhs.com)." Also states within the main body of the article: "The first author of this paper completed the 6-hr TRAP-18 online training to become proficient in the use of the instrument, which was developed by the second author and first published in Meloy, Roshdi, et al. (2015)."	Psychology, University of Erlangen-Nuremberg, Germany. Andreas Arnborst, German National Centre for Crime Prevention, Germany. Julia Kupper, Independent Researcher, Los Angeles, California, United States. J. Reid Meloy, Department of Psychiatry, University of California, San Diego, United States.
Meloy, Roshdi, et al. (2015)	Yes.	Yes.	No. One group that was subgrouped according to: Individual	Yes. Mean interrater reliability was 0.895 and ranged from good to excellent across all variables.	Yes. This article was written as a part of the interdisciplinary project "Incident and	No statement included. However, in the main body of the article it is stated that the authors were developers of the	J. Reid Meloy, Department of Psychiatry, School of Medicine, University of California, San Diego (table continues)

Table 5 (continued)

Authors	Small sample size	Possibility of retrospective, hindsight bias and/or confirmatory bias (or availability bias)	Blinding of assessors	Intrater reliability	Statement of study funding	Conflict of interest statement	Affiliations of authors
Meloy and Gill (2016)	Yes.	No.	Terrorists and Autonomous Cells.	No.	Case Analysis of Highly Expressive Targeted Violence" (TARGET), which is sponsored by the Federal Ministry of Education and Research, 2013–2016.	TRAP-18 . . . "With these issues in mind, we introduce the Terrorist Radicalization Assessment Protocol (TRAP-18), an investigative template for operational Purposes" and "Other normal cognitive biases may also have influenced the results, such as confirmatory bias on the part of the researchers who coded the cases and interpreted the data, who all have a personal stake in previous publications concerning the warning behaviors."	Diego. Karoline Roshdi, Justine Glaz-Ocik, and Jens Hoffmann, Institute of Psychology and Threat Management, Darmstadt, Germany.
	Yes.	No. The article does acknowledge that: "The authors were not unaware of group membership."					
		Yes.	No.	"There was no independent determination of interrater reliability, only careful discussion and consensus."	No statement included.	No statement included. Although the statement below is included in the "Limitations" section . . . " . . . confirmatory bias may be present in this study given the desire of Meloy to empirically buttress the TRAP-18."	J. Reid Meloy, Department of Psychiatry, University of California, San Diego. Paul Gill, Department of Security and Crime Science, University College London.

(table continues)

Table 5 (continued)

Authors	Possibility of retrospective, hindsight bias and/or confirmatory bias (or availability bias)		Blinding of assessors	Interrater reliability	Statement of study funding	Conflict of interest statement	Affiliations of authors
	Yes.	No.					
Meloy et al. (2019)	Yes.	No. “The coders were not blind to the group assignments for the subjects, and in some cases were intimately familiar with the subjects, introducing questions of various researcher bias in the study (anchoring, hindsight, confirmatory, availability, etc.).”	No. “There was no quantitative determination of interrater reliability.” “Agreement was reached among coders through discussion and consensus.” “The U.S. sample was coded by R. Meloy and Maria Martinez, and consensus was reached on each of the indicators.”	No statement included.	Yes included. “J. Reid Meloy is the owner and developer of the TRAP-18 and derives income from the sale of the TRAP-18 Manual as well as the trainings for the instrument.”	J. Reid Meloy, Department of Psychiatry, University of California, San Diego. Alasdair M. Goodwill, Department of Psychology, Ryerson University. M. J. Meloy, Department of Psychiatry, University of California, San Diego. Gwyn Amat, Calgary Police Service, Calgary, Alberta, Canada. Maria Martinez, Los Angeles County Department of Mental Health, Los Angeles, California. Melinda Morgan, Calgary Police Service. The following statement is also included: “We thank Jacqueline Genzman, Lynne Bibeau, Tony Beliz, Kostas Katsavdakís, Todd Darrah, SSA Jeff Cugno, the Calgary Police Service Counterterrorism	

(table continues)

Table 5 (continued)

Authors	Small sample size	Possibility of retrospective, hindsight bias and/or confirmatory bias (or availability bias)	Blinding of assessors	Interrater reliability	Statement of study funding	Conflict of interest statement	Affiliations of authors
Meloy et al. (2021)	Yes.	Yes.	Not required—one group only.	Yes. “Robust data collection methodologies and provisions to ensure intercoder reliability can mediate many of these concerns, as in the present study.”	No statement included.	No statement. However, in the article previous articles relating to the development of the indicators of the TRAP-18 are referred to. For example, “More complete elaboration of the proximal warning behaviors and distal characteristics can be found at Meloy (2017), Meloy and Gill (2016), and Meloy and Holzer (in press).”	Intelligence Detail, and the Los Angeles County Department of Mental Health School Threat Assessment Response Team for their very important contributions to this study.” J. Reid Meloy, Department of Psychiatry, University of California, San Diego. Alasdair Goodwill, Department of Psychology, Ryerson University. Caitlin Clemmow, Department of Security and Crime Science, University College London. Paul Gill, Department of Security and Crime Science, University College London.

Note. TRAP-18 = The Terrorist Radicalization Assessment Protocol; BMBF = Federal Ministry of Education and Research.

compared to nonattackers. It is interesting to note here that these three distal characteristics are all related to motivation. These behaviors are also closely associated with political and social action, both violent and nonviolent. Political and social motivations are commonly included criteria in defining terrorism as seen in Alex Schmid's exhaustive study of the definitional problem of terrorism (Schmid, 2016). This also seemingly reflects a particular understanding of terrorist violence underpinned by social identity theory and social movement theory. This observation is significant in that the instrument, seemingly, intentionally skews toward ideological and identity-based violence. Due to information limitations, threat assessors may initially be unaware of whether a client has constructed a particular social identity and therefore may be unsure as to whether the instrument's use is appropriate. Clustering of these "strong" distal characteristics should indicate the likely presence of proximal warning behaviors to the threat assessor. If these three "strong" distal characteristics are exhibited it would indicate a greater likelihood of there being proximal warning behaviors present than any of the other seven distal characteristics (mental disorder, history of criminality, failure to affiliate with an extremist or other group, greater creativity and innovation, dependence on the virtual community, failure of sexually intimate bonding, and thwarting of occupational goals; Goodwill & Meloy, 2019).

Meloy et al. (2019) found that, in the attackers compared to the nonattackers, the proximal warning behaviors of pathway, identification, energy burst, and last resort were significantly more frequent, and directly communicated threat was significantly less frequent. In the majority of the attackers, each proximal warning behavior was present—with the exceptions being novel aggression (36%) and directly communicated threat (18%). At least one proximal warning behavior was identified in every attacker in the sample. Only two of the proximal warning behaviors (novel aggression and directly communicated threat) occurred in most of the nonattackers. Meloy et al. (2019) outlined some of the potential limitations with their study. There may be issues with regards to representation bias and selection bias as the samples were relatively small and nonrandom. Also, there was significant time frame and demographic differences between the attackers and the nonattackers (and they

were also not matched). Therefore, the possibility that other unknown factors could have contributed to the differences in the TRAP-18 findings cannot be ruled out. Meloy et al. (2019) pointed out in their article that they "did not have sufficiently reliable data to determine whether or not the attackers had been risk managed" (pp. 107). They further go on to say that they also did not "have sufficient sample sizes to compare any differences between those nonattackers who were successfully risk managed, and those who had no intent to begin with" (pp. 107). Because of this, they needed to collapse these two groups (nonattackers who were successfully risk managed and those who had no intent to begin with) into what became their one comparative "non-attack" group (Meloy et al., 2019).

The study by Meloy and Gill (2016) found that the TRAP-18 appears to have utility as an investigative template and organizing tool for threat assessment professionals. One of the findings from this study was that the successful attackers were significantly more fixated, creative, and innovative, and failed to have a prior sexually intimate pair-bond when compared to the thwarted attackers. It was also found that they were significantly less likely to have exhibited pathway warning behavior and be dependent on a virtual community of like-minded true believers. This is an interesting finding regarding the differences between the successful versus thwarted attacks. However, Meloy and Gill (2016) point out that these differences need to be considered in light of the possibility that the TRAP indicators which discriminated between the successful versus the thwarted attackers may be a product of artifacts which are currently unknown. Whether the individual ends up in the thwarted or successful attacker category may be influenced by a range of unknown factors (e.g., preemptive policing, tips, luck) and may not be related to the five TRAP indicators which discriminated between the two groups (Meloy & Gill, 2016).

Meloy, Habermeyer, & Guldimann (2015) found good-to-excellent interrater reliability and content validity with the TRAP-18 when applied to a small sample of individual terrorists in Europe—both lone actors and members of autonomous cells. They state that one of the potential limitations with their study is that the information that they gathered was secondary (e.g., internet search engines, online newspaper articles) and not primary (e.g., court records,

psychological assessment report, police investigative reports), which may impact on the reliability and validity of the findings. However, in order to address this, the researchers confirmed all data from a minimum of two independent sources (Meloy, Roshdi, et al., 2015). In their independent study, García-Andrade et al. (2019) found that the TRAP-18 could be a useful tool for assessing the risk of terrorist radicalisation in the mentally ill patient, particularly in the group of people with severe mental illness in situations of social exclusion and with a prison record, who have an increased potential risk of terrorist radicalisation as lone actors. Only two patients (of the 13 repeat offenders) were identified as having carried out a further extremist violent act. Nevertheless, the findings from this study suggest a significant difference in terms of the total score (number of indicators present or absent) on the TRAP-18 (and on the subscales of proximal warning behaviors and distal characteristics) between the groups with and without extremist violence. Specifically, the extremist violence group were found to have significantly higher scores (number of indicators on the TRAP-18 present). Another interesting finding from this study was that the total score of the TRAP-18 was superior to that of the two subscales of proximal warning behaviors and distal characteristics (separately) with regards to predictive precision of future acts of extremist violence (García-Andrade et al., 2019).

Meloy et al. (2021) found that nearly of all the distal characteristics are antecedent to the proximal warning behaviors on the TRAP-18. The only single exception to this was the proximal warning behavior of fixation. The indicator fixation was found to precede the distal characteristic of changes in thinking and emotion. Meloy and colleagues suggest that one possible explanation for this observed temporal reversal may be due to the fact that both of these indicators reflect cognitive changes in thinking that may be challenging to identify when they first developed (or ended) accurately—the temporal sequence of these indicators, in other words. This study did find that there were roughly similar number of instances of fixation preceding ideology and ideology preceding fixation which indicates that ideological framing may cause a fixation which is pathological or ideology framing may result from a pathological fixation. Meloy et al. (2021) also states that their finding would indicate that

pathway, leakage, and on in some cases, directly communicated threat may be critical points for intervention. One key potential limitation with the study by Meloy et al. (2021), which they acknowledge in their article, is that the sequence analysis they carried out “does not account for mediating variables that could be in the sequence but have not been measured” (p. 15). Time sequencing explores the temporal relationship between variables, it does not explore cause and effect. Time sequencing also does not measure the duration which an indicator is exhibited/present or the time that the presence of an indicator begins and ends. Rather, time sequencing is a “before and after” method which is used to “quantify data and understand their meaning” (Meloy et al., 2021).

Only one of the 11 empirical articles investigating the TRAP-18 found some potential limitations with it (which will be discussed within the context of the methodological limitations of the study itself; Brugh et al., 2020). Brugh et al. (2020) were the first to investigate the feasibility and applicability of the TRAP-18 to a sample of only jihadism-inspired lone actors and to compare lone actors who endorse the same ideology across two sociopolitical contexts. This study is also the first to investigate the priority recommendations provided by the TRAP-18. Overall, this study indicates that the TRAP-18 indicators are relevant for lone-actor terrorists given the higher number of indicators rated as present compared to absent. However, the finding that there was, on average, a range of indicators rated as present starting at just one and less than half of items rated as present, may suggest some issues regarding the applicability of the TRAP-18 indicators across lone actors. Specifically, findings from this study showed that the majority of the lone actors in this study were still recommended for Active Monitoring or Active Risk Management (the TRAP-18 framework’s two priority recommendations) even though a number of the indicators on the TRAP-18 were given a rating of unknown. It could be argued that all individuals in this study should have received at least one of the priority recommendations given that they were all known lone-actor terrorists. However, three false negatives were produced following the TRAP-18 framework. False negatives are individuals who were involved in the planning or perpetration of a lone-actor terrorist plot but were not recommended for any

of the priority categories. One of the possible explanations for these false negatives is that the three individuals in this study had exhibited indicators which are currently not included on the TRAP-18. Another explanation may be that the authors applied too rigorous an interpretation of “clustering” for the Active Monitoring priority recommendation.

Findings from the study by Brugh et al. (2020) also showed that two to four of the indicators on the TRAP-18 (fixation, energy burst, leakage, and dependence on the virtual community) may be more commonly present and potentially of greater relevance for the U.S. lone actors when compared to the European lone actors. This may be explained by the fact that nine of the U.S. lone actors, compared to only one of the European lone actors, involved sting operations which produce all of information on various items related to the TRAP-18. Or the difference between the United States lone actors and the European lone actors may be due to the significant influence of Western (most notably, American) researchers in the terrorism field (Brugh et al., 2020). The findings by Brugh et al. (2020) also indicated that there are potential challenges in completing the TRAP-18 when only relying on publicly available information. Specifically, they found that only four of the 18 indicators (pathway, identification, personal grievance, framed by ideology) were rated present more often than absent or unknown. The TRAP-18 indicators were also found to be of more relevance to the United States lone actors, who had a higher average number of indicators rated as being present. This may be due to the way that these cases are reported on in their respective geographical contexts (United States and Europe). Much of the research in this area relies on open-source data which include the news. In this study, 12 out of the 18 TRAP-18 indicators (half were proximal warning behaviors and half were distal characteristics) were rated as unknown more often compared to present or absent. Generally, these 12 low-feasibility indicators reflected details regarding the mental state of the lone actor (fixation, energy burst, last resort, changes in thinking and emotion, and mental disorder), prior violence (novel aggression and criminal violence), vocational success (thwarting of occupational goals), interpersonal relationships (failure of sexual-intimate pair-bonding and failure to affiliate with an extremist or other group) and communications (leakage,

directly communicated threat). Given that there are less proximal warning behaviors ($n = 8$) compared to distal characteristics ($n = 10$), it would appear that proximal warning behaviors may be more difficult to rate based on information which is publicly available which is unsurprising given the tendency for distal characteristics to reflect historical information which is typically documented. In this study, indicators which reflect planning or preparation for an attack (pathway and creativity and innovation) and the ideological motivation of the individual (identification, personal grievance and moral outrage, and framed by an ideology) were coded more easily by assessors. This would indicate that information regarding these elements are more likely to be captured in public records when compared to information about the social and interpersonal context of the individual. This led the authors to suggest that the TRAP-18 may be more suitable for postdictive (retrospective) analyses when there exists a significant amount of information publicly available (e.g., court document, psychiatric reports, substantial levels of report in the media on the case).

However, there are a number of potential limitations with this study by Brugh et al. (2020) that need to be considered in relation to their findings. The focus of this study on jihadism-inspired lone-actor terrorists means that lone actors across a range of ideologies was not explored with the TRAP-18 in terms of the relevance of the items and priority recommendations from assessments. Some other limitations with this study include the fact that only information which was publicly available was used to populate the data set in this study and the information was somewhat restricted to sources which were written in English. These limitations may mean that more accurate coding on all of the TRAP-18 indicators may have been possible if the researchers had access to all of the relevant documents or testimony, for instance. Some of the indicators on the TRAP-18 (such as changes in thinking and emotion) may only be possible to complete as being present or absent (for example) following an interview with the POC or based on information obtained from close family or friends (Brugh et al., 2020).

In terms of risk of bias, four of the six case studies (Böckler et al., 2017; Erlandsson & Reid Meloy, 2018; Meloy, Habermeyer & Guldman, 2015; Meloy & Genzman, 2016) and six of the 11 empirical studies (Goodwill & Meloy, 2019;

Kupper & Meloy, 2021; Meloy, Roshdi, et al., 2015; Meloy & Gill, 2016; Meloy et al., 2019, 2021) were co-authored by the developer the TRAP-18 (Dr. Reid Meloy). The large number of studies carried out to date involving the developer of the TRAP-18 is reflective of the fact that the TRAP-18 is a relatively newly developed tool and it not as well known yet among various researchers and professionals as a result.

Discussion

Six case studies were identified which utilized the TRAP-18 retroactively (Böckler et al., 2015; Böckler et al., 2017; Collins & Clark, 2021; Erlandsson & Reid Meloy, 2018; Meloy, Habermeyer, & Guldemann, 2015; Meloy & Genzman, 2016). Eleven studies were identified which utilized the TRAP-18 to retroactively evaluate terrorist incidents (Böckler et al., 2021; Brugh et al., 2020; Challacombe & Lucas, 2019; García-Andrade et al., 2019; Goodwill & Meloy, 2019; King et al., 2018; Kupper & Meloy, 2021; Meloy et al., 2019; Meloy & Gill, 2016; Meloy, Roshdi, et al., 2015; Meloy et al., 2021). All studies in this review involved TRAP-18 indicators being assessed and coded based on past events. This retroactive study may result in hindsight or confirmation bias during the application of the TRAP-18 to the case (Goodwill & Meloy, 2019). Another potential limitation of all the studies carried out is the retrospective analysis of data which already exist (nonoperational use of the TRAP-18) means that no follow-up research or additional information can be obtained. Future research could explore the utility of the TRAP-18 in operational, prospective, use. Another source of bias with all the studies included in this review is overconfidence that the data are complete.

The majority of studies in this review have found the focus on 18 empirically based and potentially observable patterns of behavior to be a useful approach for the early detection and case management of radicalization processes. Studies identified in this review have also found the TRAP-18 to have excellent interrater reliability (e.g., Challacombe & Lucas, 2019; Meloy, Roshdi, et al., 2015) and criterion validity on samples of individual terrorists and autonomous terrorist cells (e.g., Meloy, Roshdi, et al., 2015; Meloy & Gill, 2016;). The findings from the five case studies published to date have also found the

TRAP-18 to have utility (Böckler et al., 2015; Böckler et al., 2017; Erlandsson & Reid Meloy, 2018; Meloy & Genzman, 2016; Meloy, Habermeyer, & Guldemann, 2015).

Only one study identified potential challenges with completing the TRAP-18 when relying only on public information. Specifically, they found that only four of 18 indicators on the TRAP-18 (pathway, identification, personal grievance, framed by ideology) were rated present more often than absent or unknown. Their findings indicated that there is a greater relevance of TRAP-18 items to U.S. lone actors, when compared to the European jihadism-inspired lone actors. The U.S. lone actors had a higher average number of items rated present (Brugh et al., 2020). The findings by Brugh et al. (2020) show that there are potential challenges in completing the TRAP-18 when only relying on publicly available information. Specifically, they found that only four of 18 items (pathway, identification, personal grievance, framed by ideology) were rated present more often than absent or unknown. They also found that there was a higher average number of indicators rated as present in the U.S. lone actors indicating that the indicators in the TRAP-18 have a greater relevance to this particular population.

As a threat assessment instrument, the TRAP-18 is designed for use with persons who have been identified because of some kind of threatening or concerning behavior. We do not know how this population of individuals would differ from potential terrorists who do not come to the attention of a threat assessment team. One implication of this observation is that retrospective studies of persons who committed a terrorist act are not necessarily comparable to individuals who come to the attention of a threat assessment team.

This review identified six case studies of high-profile terrorist attacks in which the TRAP-18 was applied retroactively. It is important to acknowledge the limitations of this approach since the case study researchers could select cases that seemed to match the TRAP-18 criteria, giving an inflated impression of validity. Another limitation is that most the studies in this review rely on secondary sources such as news reports that might not have detected or revealed some of the proximal warning signs or distal factors—retrospective case studies are vulnerable to hindsight and confirmatory bias. Additionally, all 11 empirical studies identified in this review were

retrospective studies that compared persons who committed violence terrorist attacks with a comparison group, typically individuals with similar political or religious views who did not commit a violent attack. The studies use small samples of convenience, with statistical analyses of limited power and without the ability to replicate findings that might be produced by using so many predictors in relatively small samples.

Limitations

Measures were taken to minimize the risk of missing relevant articles. Nevertheless, the possibility of missing eligible articles can never entirely be excluded.

Clinical and Legal Implications

As previously pointed out by Guldemann and Meloy (2020), the application of instruments like the TRAP-18 is just the first stage. For threat management to be effective and successful it requires an interdisciplinary approach involving collaboration and discussion between police, law enforcement, forensic, and general mental health professionals as well as other experts. The developers of the TRAP-18 (e.g., Meloy, Roshdi, et al., 2015; Meloy, 2017) recommend that it is used in conjunction with other assessment tools, such as the MLG for the Assessment and Management of Group-Based Violence (MLG; Cook et al., 2013) and the VERA (Pressman, 2009) as multimethod assessment practice provides increased accuracy (Meloy, Roshdi, et al., 2015).

One of the empirical studies identified in this review (Guldemann & Meloy, 2020) highlighted that any given case is much more complex than is suggested by empirical results or analogies. The clustering of three “strong” distal characteristics (personal grievance and moral outrage, ideological framing, and changes in thinking and emotion) with the proximal warning behaviors in the study carried out by Goodwill and Meloy (2019) would indicate that active management of the case is required even when no proximal warning behaviors are present. This conclusion is significant in that the presence of proximal warning behaviors indicates potential imminence, a determining factor in how to triage cases and determine resource allocation. Furthermore, having an agreed-upon method of determining imminence in the management of persons of concern is

paramount to the very multidisciplinary collaborative practices that Meloy and colleagues proposed. The strength that multidisciplinary approaches have is that they leverage diverse professional perspectives and methods and means for management. But this instrument has further utility regarding resource allocation in threat investigations and management.

The instrument’s use of 18 distinct warning behaviors may assist threat investigators and evaluators in determining their data collection requirements. Although there are benefits to collecting as much data as possible on a POC as it may aid on providing the most holistic picture of the individual, their behavioral history, the risk of violence that they pose, their behavioral trajectory, and potential mitigation strategies. However, the amount of data that an evaluator may access through open-source methods, criminal justice databases, financial sources, mental health, and medical records can be overwhelming and take significant time to organize and evaluate delaying the implementation of interventions, a significant concern when there is imminent threat to life and danger to public safety. Utilizing the 18 proximal and distal warning behaviors may assist in determining what types of information will be of value and streamline the collection process.

Furthermore, this instrument is not used to provide a clinical diagnosis and is used to identify behaviors and characteristics, making it accessible to mental health professional and public safety officials. Therefore, it lends itself to be widely used across professional disciplines engaged in threat management, especially public safety professionals with limited to no clinical experience. Since clinical experience is unnecessary in the application of the instrument, the findings from an assessment can be produced during clinical proceedings, and the instrument’s validity ensures that its use is defensible in criminal proceedings.

Future Research Directions

The Need for More Independent Research Investigating the Utility of the TRAP-18

Research exploring the TRAP-18 is still relatively in its infancy. There is a need for additional research by more independent groups with independent samples in order to further investigate if the TRAP-18 is effective (Meloy, Roshdi, et al.,

2015; Meloy & Gill, 2016). Such independent research is encouraged to have larger samples and known outcome (postdictive) designs (Meloy & Gill, 2016) and also larger, prospective research studies (García-Andrade et al., 2019). There is also a need for more studies in which the instrument is evaluated within an operational context such as the 2019 TRAP-18 study involving data from Canada and the United States (Meloy et al., 2019). This would require operational entities such as law enforcement and mental health professionals to make their data publicly available while respecting anonymity and client confidentiality.

Need to Investigate and Identify Possible Protective Factors

One possible limitation of the TRAP-18 is that there is an absence of any possible protective factors (Goodwill & Meloy, 2019). Research exploring and identifying some of the key protective factors would be useful and could potentially be integrated into the TRAP-18 assessment. Gill (2015) has also highlighted the lack of understanding around protective factors. Importantly, Gill points out that there is a focus on identifying “risk factors” only and this approach may lead to confirmation bias. Research is required to try and identify the relevant protective factors. Protective factors can be individual factors (e.g., attitudes, self-control, personality factors), peer factors (e.g., close relationships with noncriminal peers, prosocial norms within peer group, number of affective relationships), and family factors (e.g., highly connected to family; Gill, 2015). Conversely, peer and familial factors demonstrate how potential protective factors may also present as risk factors (high levels of connectivity within unstable homes, trauma bonding within familial violence, familial ties to extremist networks).

Possible Unknown and Potentially Redundant Existing Indicators on the TRAP-18

Related to the absence of protective factors, there may also exist other factors/indicators (both proximal warning behaviors and distal characteristics) that have been systematically overlooked which are more relevant to European lone actors compared to U.S. lone actors. Research investigating risk factors

for engaging in terrorism, to date, does not appear to explore both “individual-level and environmental or situational characteristics” which is particularly critical to do in research involving comparisons between terrorist actors across a range of geographic regions. Supporting the importance of addressing this gap in the research, studies have identified differences in terms of the societal-level drivers of lone-actor terrorism between the U.S. and Europe (Brugh et al., 2020). There may also be variables that contribute as much content validity to understanding the problem of individual terrorism as those within the TRAP-18 that have yet to be identified more generally as well. Meloy, Habermeyer, & Guldemann, (2015) have also asserted that there may be redundancy among the 18 variables which is something which needs further exploration (Meloy, Roshdi, et al., 2015).

Evaluating the Utility of the TRAP-18 in the Context of Routine Practice

The feasibility and utility of the TRAP-18 should be further explored when it has been completed by a sample of evaluators in the context of routine practice. To date, research has only tested the feasibility and utility of the TRAP-18 in the context of research (by researchers). If future studies are carried out by researchers they should not only rely on publicly available information (public records) but also other data sources (e.g., collateral informants, interviews with family, friends, coworkers; Brugh et al., 2020). Studies, to date, investigating the TRAP-18 have relied predominantly on secondary information (e.g., internet search engines, online newspaper articles) and to a significantly less extent (if at all) primary information (e.g., court records, psychiatric reports, police investigative reports). The heavy reliance on secondary data reduces reliability and validity of the study.

Exploring How Evaluators Make Decisions About Priority Recommendations Using the TRAP-18

The study by Brugh et al. (2020) points to the need for further study to investigate prevalence of the TRAP-18 priority recommendations (how assessors make decisions regarding these) and how others may interpret and apply “clustering.” In their article Brugh and colleagues recommended

that one of the first steps should be to not apply such a rigid definition across all cases (as they did in their own study) in order to afford discretion and reduce the likelihood of a false negative. Research could, therefore, examine how others interpret and apply “clustering” (Brugh et al., 2020).

Exploring Differences in the TRAP-18 Indicators Depending on Variables (e.g., Type of Terrorism and Ideology)

Additionally, empirical research is also needed to explore whether there are differences in TRAP-18 indicators depending on the “country of origin, sampling or analysis” (Goodwill & Meloy, 2019). The feasibility and utility of the TRAP-18 on a range of types of domestic terrorism is another useful area for further research (Challacombe & Lucas, 2019). Further research also needs to explore whether there are differences in the TRAP-18 depending on the type of ideological framing the individual has embraced. For example, the presence of beliefs that justify the terrorist’s intention to act whether a religious or political belief system single-issue conflict or an idiosyncrasy (García-Andrade et al., 2019).

Should the Three Distal Characteristics (Personal Grievance and Moral Outrage, Ideological Framing, and Changes in Thinking and Emotion) Be Included in the Proximal Warning Behavior Section?

Goodwill and Meloy’s (2019) finding of three distal characteristics (personal grievance and moral outrage, ideological framing, and changes in thinking and emotion) which could be more pragmatically belong with the proximal warning behaviors needs further study (Goodwill & Meloy, 2019).

Cultural and Political Considerations

In examining the utility of the TRAP-18, an area of concern arises. How applicable are the 18 warning behaviors and indicators across cultures, political beliefs, and identities? Assessors and prevention practitioners must assess and manage individuals of concern across a diverse spectrum of cultural backgrounds, political affiliations, and identities (ethnic, racial, gender, and religious). Therefore, in identifying areas for future research, it becomes apparent that the TRAP-18 ability to

assess individuals across cultures effectively should be evaluated. Several of the eight proximal warning behaviors question the instrument’s ability to achieve this goal. For example, fixation and identification may be the result of an individual’s identity, cultural background, and the lived experience of their identity group. Individuals from nations that were once colonial holdings may fixate on causes such as imperialism and apartheid based on a shared identity and cultural memory. Furthermore, they may identify with anticolonial figures who engaged in violence to liberate their countries from colonial powers. Individuals may dress like these “heroic figures” due to a sense of national pride rather than displaying an indicator that they are on the pathway to violence. The issue of cultural reference and cultural sensitivity can be observed when examining the 10 distal characteristics. Personal grievance, thwarting of occupational goals, and criminal violence may be significantly influenced at the individual level by societal factors such as intergenerational familial criminal activity and access to employment based on discrimination.

These examples demonstrate challenges that may exist in applying this instrument across cultures and the need for further study. The fact that the instrument is a structured professional judgment should be taken into account when constructing future studies. Some of the concerns might be addressed if the assessor using the TRAP-18 has a high level of cultural competence and sensitivity regarding the culture of the individual whom there are accessing. However, conversely, the problem may be made worse if the assessor is not culturally oriented to the identity of the individual that they are accessing. Since the population of individuals who have engaged in acts of lone-actor targeted violence and terrorism is diverse, further research in this area is imperative.

Conclusion

The aim of this review was to identify studies which have utilized the TRAP-18 either prospectively (operational use) or retroactively or studies which have investigated the validity and reliability of the TRAP-18. A total of 14 relevant articles were identified in the review including six case studies and 11 empirical articles. The majority of studies in this review has found the focus on 18 empirically based and potentially observable patterns of behavior to be a useful approach for the

early detection and case management of radicalization processes.

References

- Bakker, E., & de Roy van Zuijdewijn, J. (2015). *Lone-actor terrorism: Definitional workshop* [Royal United Services Institute (rusi.org). Countering lone-actor terrorism series no. 2. https://static.rusi.org/201512_clat_definitional_workshop.pdf
- Böckler, N., Allwinn, M., Metwaly, C., Wypych, B., Hoffmann, J., & Zick, A. (2021). Islamist terrorists in Germany and their warning behaviors: A comparative assessment of attackers and other convicts using the TRAP-18. *Journal of Threat Assessment and Management*, 7(3–4), 157–172. <https://doi.org/10.1037/tam0000150>
- Böckler, N., Hoffmann, J., & Meloy, J. R. (2017). “Jihad against the enemies of Allah”: The Berlin Christmas market attack from a threat assessment perspective. *Violence and Gender*, 4(3), 73–80. <https://doi.org/10.1089/vio.2017.0040>
- Böckler, N., Hoffmann, J., & Zick, A. (2015). The Frankfurt airport attack: A case study on the radicalization of a lone-actor terrorist. *Journal of Threat Assessment and Management*, 2(3–4), 153–163. <https://doi.org/10.1037/tam0000045>
- Borum, R. (2015). Operationally relevant research and practice in terrorism threat assessments. *Journal of Threat Assessment and Management*, 2(3–4), 192–194. <https://doi.org/10.1037/tam0000046>
- Breivik Testimony. (2012, April 18). New York Times (p. A9).
- Brugh, C. S., Desmarais, S. L., & Simons-Rudolph, J. (2020). Application of the TRAP-18 framework to US and Western European lone actor terrorists. *Studies in Conflict and Terrorism*. Advance online publication. <https://doi.org/10.1080/1057610X.2020.1758372>
- Challacombe, D. J., & Lucas, P. A. (2019). Postdicting violence with sovereign citizen actors: An exploratory test of the TRAP-18. *Journal of Threat Assessment and Management*, 6(1), 51–59. <https://doi.org/10.1037/tam0000105>
- Collins, C. J., & Clark, J. J. (2021). Using the TRAP-18 to identify an incel lone-actor terrorist. *Journal of Threat Assessment and Management*, 8(4), 159–173. <https://doi.org/10.1037/tam0000167>
- Cook, A., Hart, S., & Kropp, R. (2013). *Multi-level guidelines for the assessment and management of group-based violence*. Mental Health, Law, and Policy Institute, Simon Fraser University.
- Corner, E., Bouhana, N., & Gill, P. (2019). The multifinality of vulnerability indicators in lone-actor terrorism. *Psychology, Crime & Law*, 25(2), 111–132. <https://doi.org/10.1080/1068316X.2018.1503664>
- Corner, E., & Gill, P. (2015). A false dichotomy? Mental illness and lone-actor terrorism. *Law and Human Behavior*, 39(1), 23–34. <https://doi.org/10.1037/lhb0000102>
- 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>
- Douglas, K. S., & Skeem, J. L. (2005). Violence risk assessment: Getting specific about being dynamic. *Psychology, Public Policy, and Law*, 11(3), 347–383. <https://doi.org/10.1037/1076-8971.11.3.347>
- Erlandsson, Å., & Reid Meloy, J. (2018). The Swedish school attack in Trollhättan. *Journal of Forensic Sciences*, 63(6), 1917–1927. <https://doi.org/10.1111/1556-4029.13800>
- García-Andrade, R. F., Rendón-Luna, B. S., Prieto, B. R., Martínez, V. V., de Meneses, E. M. T., & Rodríguez, E. F. (2019). Forensic-psychiatric assessment of the risk of terrorist radicalisation in the mentally ill patient. *Spanish Journal of Legal Medicine*, 45(2), 59–66. <https://doi.org/10.1016/j.reml.2019.01.003>
- Gill, P. (2015). Toward a scientific approach to identifying and understanding indicators of radicalization and terrorist intent: Eight key problems. *Journal of Threat Assessment and Management*, 2(3–4), 187–191. <https://doi.org/10.1037/tam0000047>
- Goodwill, A., & Meloy, J. R. (2019). Visualizing the relationship among indicators for lone actor terrorist attacks: Multidimensional scaling and the TRAP-18. *Behavioral Sciences & The Law*, 37(5), 522–539. <https://doi.org/10.1002/bsl.2434>
- Gruenewald, J., Chermak, S., & Freilich, J. D. (2013). Distinguishing “loner” attacks from other domestic extremist violence: A comparison of far-right homicide incident and offender characteristics. *Criminology & Public Policy*, 12(1), 65–91.
- Guldimann, A., & Meloy, J. R. (2020). Assessing the threat of lone-actor terrorism: The reliability and validity of the TRAP-18. *Forensische Psychiatrie, Psychologie, Kriminologie*, 14(2), 158–166. <https://doi.org/10.1007/s11757-020-00596-y>
- Horgan, J., Shortland, N., & Abbasciano, S. (2018). Towards a typology of terrorism involvement: A behavioral differentiation of violent extremist offenders. *Journal of Threat Assessment and Management*, 5(2), 84–102. <https://doi.org/10.1037/tam0000102>
- Jenkins, B. M. (1980). *The study of terrorism: Definitional problems*. RAND Corporation. <https://www.rand.org/pubs/papers/P6563.html>
- King, S., Endres, J., Schwaß, M., Stemmler, M., Lauchs, L., & Armbrorst, A. (2018). Prisoners with Islamist relations: Are prisoner files a valuable data source for individual assessment and for research?. *International Journal of Developmental Science*, 12(1–2), 129–141. <https://doi.org/10.3233/DEV-170243>
- Kupper, J., & Meloy, J. R. (2021). TRAP-18 indicators validated through the forensic linguistic

- analysis of targeted violence manifestos. *Journal of Threat Assessment and Management*, 8(4), 174–199. <https://doi.org/10.1037/tam0000165>
- Landtag. (2017). *Zwischenbericht des Parlamentarischen Untersuchungsausschusses V zu dem Auftrag des Landtags Nordrhein-Westfalen vom 15* [Interim report of the Parliamentary Committee of Inquiry V on the mandate of the North Rhine-Westphalia state parliament of 15].
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. *PLOS Medicine*, 6(7), Article e1000100. <https://doi.org/10.1371/journal.pmed.1000100>
- Lloyd, M. (2019). *Extremism risk assessment: A directory. Full report*. Centre for Research and Evidence on Security Threats (CREST). <https://crestresearch.ac.uk/download/2404/19-019-01.pdf>
- Lloyd, M., & Dean, C. (2011). *ERG 22+ structured professional guidelines for assessing risk of extremist offending*. Ministry of Justice. National Offender Management Service. Offender Services and Interventions Group.
- Meloy, J. R. (2017). *The TRAP-18 manual version 1.0*. Global Institute of Forensic Research.
- Meloy, J. R., & Genzman, J. (2016). The clinical threat assessment of the lone-actor terrorist. *The Psychiatric Clinics of North America*, 39(4), 649–662. <https://doi.org/10.1016/j.psc.2016.07.004>
- Meloy, J. R., & Gill, P. (2016). The lone-actor terrorist and the TRAP-18. *Journal of Threat Assessment and Management*, 3(1), 37–52. <https://doi.org/10.1037/tam0000061>
- Meloy, J. R., Goodwill, A., Clemmow, C., & Gill, P. (2021, June 28). Time sequencing the TRAP-18 indicators. *Journal of Threat Assessment and Management*, 8(1–2), 1–19. <https://doi.org/10.1037/tam0000157>
- Meloy, J. R., Goodwill, A. M., Meloy, M. J., Amat, G., Martinez, M., & Morgan, M. (2019). Some TRAP-18 indicators discriminate between terrorist attackers and other subjects of national security concern. *Journal of Threat Assessment and Management*, 6(2), 93–110. <https://doi.org/10.1037/tam0000119>
- Meloy, J. R., Habermeyer, E., & Guldemann, A. (2015). The warning behaviors of Anders Breivik. *Journal of Threat Assessment and Management*, 2(3–4), 164–175. <https://doi.org/10.1037/tam0000037>
- Meloy, J. R., & Hoffmann, J. (Eds.). (2014). *International handbook of threat assessment*. Oxford University Press.
- Meloy, J. R., & O'Toole, M. E. (2011). The concept of leakage in threat assessment. *Behavioral Sciences & the Law*, 29(4), 513–527. <https://doi.org/10.1002/bsl.986>
- Meloy, J. R., Roshdi, K., Glaz-Ocik, J., & Hoffmann, J. (2015). Investigating the individual terrorist in Europe. *Journal of Threat Assessment and Management*, 2(3–4), 140–152. <https://doi.org/10.1037/tam0000036>
- Meloy, R. J., Hoffmann, J., Guldemann, A., & James, D. (2012). The role of warning behaviors in threat assessment: An exploration and suggested typology. *Behavioral Sciences and the Law*, 30(3), 256–279. <https://doi.org/10.1002/bsl.999>
- Miller, A. (2014). Threat assessment in action. *Monitor on Psychology*, 45(2), 37. <https://www.apa.org/monitor/2014/02/cover-threat>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *Annals of Internal Medicine*, 151(4), 264–269, W64. <https://doi.org/10.7326/0003-4819-151-4-200908180-00135>
- Monahan, J. (2012). The individual risk assessment of terrorism. *Psychology, Public Policy, and Law*, 18(2), 167–205. <https://doi.org/10.1037/a0025792>
- Monahan, J. (2016). The individual risk assessment of terrorism: Recent developments. In G. LaFree & J. Freilich (Eds.), *The handbook of the criminology of terrorism*. Wiley. <https://doi.org/10.1002/9781118923986.ch34>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., & Moher, D. (2021). Updating guidance for reporting systematic reviews: Development of the PRISMA 2020 statement. *Journal of Clinical Epidemiology*, 134, 103–112. <https://doi.org/10.1016/j.jclinepi.2021.02.003>
- Pressman, D. E. (2009). *Risk assessment decisions for violent political extremism 2009–02*. Public Safety Canada.
- Pressman, D. E., Duits, N., Rinne, T., & Flockton, J. S. (2016). *VERA-2R violence extremism risk assessment version 2 revised: A structured professional judgment approach*. Nederlands Instituut voor Forensische Psychiatrie en Psychologie. NIPF.
- Schmid, A. P. (2016). Defining terrorism. *Combating Transnational Terrorism*, 1–16. <https://doi.org/10.11610/ctt.ch01>
- Silver, J., Horgan, J., & Gill, P. (2018). Foreshadowing targeted violence: Assessing leakage of intent by public mass murderers. *Aggression and Violent Behavior*, 38, 94–100. <https://doi.org/10.1016/j.avb.2017.12.002>
- Terrorism. (2002–2005). *U.S. Department of Justice. Federal Bureau of Investigation*. <https://www.fbi.gov/stats-services/publications/terrorism-2002-2005>

Received September 15, 2021

Revision received December 10, 2021

Accepted February 14, 2022 ■