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Similar crimes, similar behaviors? Comparing lone-actor terrorists and public mass murderers

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Abstract

This article adds to the growth in data-driven analyses seeking to compare samples of violent extremists with other violent populations of interest. While lone-actor terrorists and public mass murderers are frequently treated as distinct offender types, both engage (or attempt to engage) in largely public and highly publicized acts of violence and often use similar weapons. This article investigates the (dis)similarities between both offender types. We use a series of bivariate and multivariate statistical analyses to compare demographic, psychologic and behavioral variables across 71 lone-actor terrorists and 115 public mass murderers. The results show little distinction in sociodemographic profiles, but significant differences in (a) the degree to which they interact with co-ideologues (b) antecedent event behaviors and (c) the degree to which they leak information before the attack. Overall, our data inform the emerging idea that lone-actor terrorists and public mass shooters are not distinct offender types. There is more that unites them than divides them. Although the over-arching focus of our results are on the few variables that distinguish them, the vast majority (80%+), of the 180+ variables showed no significant difference. We discuss implications for threat assessment and management in the context of these results.

KEYWORDS
crime prevention, lone actor, mass murderer, terrorism, threat assessment, violent extremism

Highlights

- We compare 71 lone-actor terrorists and 115 public mass murderers.
- Both offender types share a similar genesis and similar threat assessment approaches could apply.
- Lone-actor terrorists more likely engaged in hostile reconnaissance and verbalized intentions.
- Mass murderers more likely have a history of substance abuse, and experience recent and chronic stress.

1 | INTRODUCTION

The study of both public mass murderers and lone-actor terrorists independently emerged as two distinct fields of inquiry in the past decade. The initial distinction centered around the primacy given to offender motivation in shaping inclusion criteria. Whilst early studies of lone-actor terrorists necessitated some form of overarching political, religious, or social goal [1], similar studies of mass murderers focused on mental health histories and precipitating events [2]. As the empirical study of both criminal types developed, both are in a state of conceptual and definitional flux. Mass murder studies differ on questions surrounding offender motive [3, 4], type of weapon used [3], number of wounded [5], and number killed [5–10]. Lone-actor terrorist researchers disagree on inclusion boundaries concerning the degree of loneness during an individual's radicalization [11], ideology [12, 13], the target [14, 15], outside direction [14, 16], and the presence of mental illness [17].

Amongst these conceptual debates, both literatures are questioning whether the distinction between both offender types is so clear cut. This is true for both single case study approaches and those with a larger sample size. For example, Stern [18] questions the political motivations of the terrorist Mir Aimal Kasi. On the other hand, White [19] analyzes the social and political themes within the mass murderer Elliot Rodgers' manifesto. Gill's study [20] of 111 lone-actor terrorists suggests personal grievances and stressors often play a key role in the individual's radicalization and attack planning. On the other hand, Malkki [21] found the presence of political drivers and references to social factors in a majority of 28 rampage school shooter cases. Borum et al. [22] find this unclear distinction unsurprising: "The fundamental reason motivational analysis is so vexing is that humans are complicated. Their motivations—especially for horrific acts—are rarely pure and singular."

Comparative approaches now coalesce around the idea that little separates these offender types. Capellan compared 242 nonideological active shooters with 40 ideological active shooters. He concluded they "may be outcomes of the same social and psychological processes…part of a larger phenomenon of lone-actor grievance-fueled violence" [23 p407]. Capellan and Anisin's later study depicts the two categories as a "distinction without a difference" [24, p1]. Böckler et al. compared seven school attackers with seven Islamist attackers and concluded "it might be more from an operational perspective to discuss severe target school violence and terrorist attacks under a common concept of demonstrative violence than to artificially assign them to exclusive classes of violence" [25, p1]. This thinking has begun to seep into practice with the development of joint agency responses to counter attacks by "lone, mentally unstable individuals" [26], application of terrorism threat assessment tools to school shooters [27], and the development of a Targeted Violence and Terrorism Prevention initiative under the U.S. Department of Homeland Security.

Further comparison is warranted to address some of the shortcomings in the earlier mentioned analyses. This article compares 115 public mass murderers and 71 lone-actor terrorists across a range of features beyond demographics and event characteristics [23], incorporating a wider set of behaviors and experiences beyond mental health histories, grievances, and strain [24] whilst also utilizing a large-n dataset [25]. We ask: what (dis)similarities are observable across both offender types and what are the implications for law-enforcement? The next section outlines the unique datasets that are used. We then turn our attention to the individual offender and then offender behavior.

2 | DATA AND METHOD

This article's data are dependent on the systematic data collection of openly available information. Previous terrorism research demonstrates richer available granular behavioral data are available for lone-actor terrorists than those who co-offend in larger groupings. For the latter, it is usually only standard sociodemographic information available from open sources [28]. The richness in available information is related to lone-actor terrorisms comparative rareness. For similar reasons, publicly available information on mass murderers is also bountiful [6]. Public mass murder is uncommon compared with other murder types in the United States. Between 1976 and 2000, the percentage of murders involving more than one victim was 3%–4% of total events per year [29]. The FBI's Supplementary Homicide Reports from 2000 to 2012 demonstrates the number of murder incidents involving four or more victims is approximately *one-tenth of one percent* of all murders.

We limit our sample to post-1990 events. Many of our original data sources are sparse before this period. The lone-actor terrorism data are an update of the data and procedures outlined in Gill et al. [30] and brings the data up to 2014. The mass murder data are outlined in a separate publication [31]. The analysis therefore compares offenders spanning 1990 to 2014 [32].

In terms of definitions, this paper is uses the same definitions as the papers which originally collected both sets of data [30, 31]. Gill et al. [30] defined terrorism as the "use or threat of action where the use or threat is designed to influence the government or to intimidate the public or a section of the public and/or the use or threat is made for the purpose of advancing a political, religious or ideological cause. Terrorism can involve violence against a person, damage to property, endangering a person's life other than that of the person committing the action, creating a serious risk to the health or safety of the public or a section of the public, or facilitating any of the above actions."

Gill et al. [31] defined mass murder as the killing of four or more people (not including the offender) at one (or multiple but geographically close) location(s) over a relatively short period of time (for further explanation of this inclusion criteria, see Ref. [30]).

To make ecologically valid comparisons, this article made a number of important decisions in its treatment of the data. First, it narrows the analysis to those who perpetrated (or planned) their violence to occur in the United States. This narrows the sample size

from the original lone-actor terrorism paper [30]. Second, the mass murderer data are solely focused on those whose incidents occur largely in public places (e.g., similar to how lone-actor terrorism often occurs). We omit homicides exclusively involving family members or intimate partner violence. Other research often treats these types of homicides as conceptually distinct from mass murder [9, 11]. Third, we excluded mass murders resulting from other underlying crimes (e.g., robbery and drug dealing), and gang or organized crime activities. The motivations are distinctively different from other forms of mass murder.[33] Finally, we only examine mass murders committed by a single perpetrator [10].

The codebook consists of over 180 variables based on a review of literature on risk factors for, and potential indicators of, mobilization to violence. Variables include sociodemographic information, pre-attack behaviors, behaviors specific to the predicate offense and postevent behaviors. Three coders independently coded each case. After an observation was coded, the results were reconciled in two stages (coder A with coder B, and then coders AB with C). In the case where three coders could not agree on particular variables, senior members of the project team resolved the differences on examining the original files that the coder's relied on to make their assessment. Such decisions were based on measures of the comparative reliability and quality of the sources (e.g., reports that cover trial proceedings vs. reports in the immediate aftermath of the event) and the source cited in the report. We do not distinguish between missing data and "no" answers. Unless otherwise reported, the analyses were conducted on full subsamples (n = 71 lone-actor terrorists and 115 public mass murderers).

Below, we undertake a series of bivariate and multivariate analyses. The next section outlines the significant bivariate (e.g., chi-square, Fisher's exact tests) results.

3 | RESULTS

3.1 | Bivariate analyses

3.1.1 | Sociodemographic characteristics

Lone-actor terrorists and mass murderers could not be distinguished based on age. The whole sample averaged 34 years. Similarly, lone-actor terrorists and mass murderers could not be distinguished based on gender. Males heavily dominate both offence types with only three females making the public mass murderer offender subsample. There was also little difference in terms of relationship status at the time of the predicate offense. The majority of both were single (37% and 43%, respectively), whilst smaller numbers were married (19% and 17%) or divorced (16% and 13%).

Lone-actor terrorists (n = 48), however, were significantly more educated than mass murderers. Two-thirds of lone-actor terrorists vs only 24% of mass murderers took part in some form of university education.

3.1.2 | Behavioral differences

Next, we explore behavioral differences across lone-actor terrorists (LA) and mass murderers (MM). Table 1 highlights significant differences. We group behaviors into three categories: group-related, antecedent attack-related, and leakage-related behaviors.

3.1.3 | Group-related activities

Lone-actor terrorists were significantly more likely to (a) try to recruit co-offenders; (b) interact with co-ideologues both virtually and in-person; (c) produce letters and/or public statements prior to the attack; and (d) recently join a wider movement.

3.1.4 | Antecedent attack behaviors

Lone-actor terrorists were significantly more likely to (a) have military and combat experience; (b) criminal convictions; (c) experience a tipping point in their violent radicalization; (d) change address prior to their attack; (e) live alone and be socially isolated; (f) engage in dry runs/hostile reconnaissance; (g) demonstrate that their anger is escalating; and (h) possess a stockpile of weapons. Mass murderers were significantly more likely to (a) have a history of substance abuse, (b) experience being degraded, treated poorly by others, or be a victimized in the build-up to their violent event, (c) have problems with personal relationships, (d) experience both recent and chronic stress, and (e) have a history with the event location.

Notably, there was no significant difference between lone-actor terrorists and mass murderers in terms of prevalence of mental health disorders (39% vs. 41%), and the experience of financial problems in the 2 years prior to the predicate offense (both 25%).

3.1.5 | Leakage-related behaviors

Lone-actor terrorists were significantly more likely to (a) verbalize intent to commit violence to friends/family/wider audiences, (b) have others aware of their grievance, (c) express a generalized desire to hurt others, (d) have others involved in procuring weaponry, and (e) have others aware of their attack planning.

There was no significant difference between lone-actor terrorists and mass murderers in terms of making specific pre-attack warnings (26% vs. 19%).

3.2 | Multivariate analyses

The variables from Table 1 were entered into a series of regression analyses. Tables 2–4 outline these results. Model 1 analyses group-related behaviors using a logistic regression (public mass murderers = 1) (Table 2). The analysis showed that in combination,

TABLE 1 Results from the bivariate analyses

Variable	χ^2	LA %	MM %	P	Odds ratio	95% confidence interval	
						Lower	Upper
Group-related activities							
Tried to recruit others	20.822	23.9	2.6	0.000	0.085	0.024	0.303
Interacted with co-ideologues face-to-face	35.690	43.7	7.0	0.000	0.096	0.041	0.228
Virtually interacted with co-ideologues	20.822	23.9	2.6	0.000	0.085	0.024	0.303
Letters/public statements prior to attack	46.045	59.2	12.2	0.000	0.096	0.046	0.199
Recently joined wider movement	22.458	32.4	6.1	0.000	0.135	0.054	0.337
Antecedent attack behaviors							
University experience	8.334	43.7	23.5	0.004	0.396	0.209	0.749
Military experience	4.855	32.4	18.3	0.028	0.466	0.235	0.926
Military at incident	Fisher's	8.5	0.9	0.008	0.095	0.011	0.807
Combat experience	Fisher's	11.3	1.7	0.014			
Criminal convictions	4.028	57.5	42.6	0.045	0.543	0.299	0.988
Tipping point	6.006	62.0	43.5	0.014	0.472	0.258	0.864
Changed address	14.238	67.6	39.1	0.000	0.308	0.165	0.574
Live alone	7.561	43.7	24.3	0.006	0.415	0.220	0.782
Substance abuse	5.785	26.8	44.3	0.016	2.181	1.148	4.142
Socially isolated	11.620	50.7	26.1	0.001	0.343	0.184	0.641
Dry runs	31.568	33.8	3.5	0.000	0.071	0.023	0.215
Degraded	10.206	16.9	39.1	0.001	3.161	1.531	6.525
Ignored/treated poorl	4.742	14.1	27.8	0.029	2.352	1.075	5.147
Helpless victim	3.298	11.3	21.7	0.069	2.188	0.927	5.163
Problems with personal relationship	21.506	26.8	61.7	0.000	4.416	2.314	8.427
Escalating anger	3.875	40.8	27.0	0.049	0.534	0.285	1.001
Recent stress	5.126	39.4	56.5	0.024	1.996	1.093	3.645
Chronic stress	22.575	26.8	62.6	0.000	4.583	2.399	8.753
History with event location	44.994	29.6	79.1	0.000	9.028	4.575	17.815
Stockpile	7.285	52.1	32.2	0.007	0.436	0.237	0.801
Leakage-related behaviors							
Verbalize intent to family/friends	13.984	59.2	31.3	0.000	0.315	0.170	0.582
Verbalize intent to wider audience	6.021	49.3	31.3	0.014	0.469	0.255	0.862
Aware grievance	21.241	80.3	46.1	0.000	0.210	0.105	0.419
Desire to hurt others	7.995	69.0	47.8	0.005	0.412	0.221	0.767
Others involved procured weaponry	8.134	21.1	7.0	0.004	0.279	0.112	0.698
Others aware of planning	8.719	36.6	17.4	0.003	0.364	0.184	0.721

Abbreviations: LA, lone-actor terrorists; MM, mass murderers.

the independent variables significantly impacted on whether the individual was a lone-actor terrorist or a public mass murderer [$\chi^2(5) = 68.510$; $p < 0.001$]. Three of the variables (face-to-face interaction, virtual interaction, and producing letters post-event) remained significant.

Model 2 analyses antecedent-event behaviors using a logistic regression (see Table 3). The analysis showed that in combination, the independent variables significantly impacted on whether the individual was a lone-actor terrorist or a public mass murderer [$\chi^2(19) = 169.313$; $p < 0.001$].

Model 3 analyses leakage related behaviors using a logistic regression (see Table 4). The analysis showed that in combination, the independent variables significantly impacted upon whether the individual was a lone-actor terrorist or a public mass murderer

TABLE 2 Logistic regression analysis of group related behaviors

Variable	B (SE)	Sig.	Lower	Exp (B)	Upper
Recently joined a wider group	−0.431 (0.739)	0.559	0.153	0.650	2.763
Face-to-face interaction with co-ideologues	−1.403 (0.665)	0.035*	0.067	0.246	0.906
Virtual interaction with co-ideologues	−1.848 (0.740)	0.013*	0.037	0.158	0.672
Tried to recruit others	−1.381 (0.774)	0.074	0.055	0.251	1.145
Produced letters post-event	−2.270 (0.566)	0.000***	0.034	0.103	0.314
Constant		0.000		4.375	

*≤0.05; ***≤0.001.

$[\chi^2(7) = 61.558; p < 0.001]$. Only two of the variables remained significant (whether the individual produced letters prior to the attack and whether the individual had help in procuring weaponry).

4 | DISCUSSION

Overall, our data inform the emerging idea that lone-actor terrorists and public mass murderers are not distinct offender types. There is more that unites them than divides them. Although the over-arching focus of our results are on the few variables that distinguish them, the vast majority (>80%), of the 180+ variables showed no significant difference. For the most part, they are similar people, with similar mobilization pathways, committing similar forms of violence, with slightly dissimilar motivational structures. Even motivational structures are difficult to demarcate. Although lone-actor terrorists are ideologically influenced, in many cases we see these influences combine with deeply personal grievances to shape aspects of their decision-making. Although mass murderers frequently harbor some form of personal grievance, we often see the perpetrators frame their respective grievances in politicized language, or find others adopting these grievances in the aftermath of the initial attack. For example, in the months after his attack, Elliot Rodger seemed to resemble a typical public mass murderer driven by a highly idiosyncratic, albeit politicized, motivation. Since then, he has come to be seen as more of a terrorist because of his connections to the incel movement, which he helped bring to the awareness of a wider audience. The broader social and political context that follows such an act of violence has a major impact on how we immediately define them. Today's mass murderer, might be another tomorrow's terrorist.

Borum, Fein and Vossekuil's championing of a dimensional approach to understanding lone-actor terrorism is key here and instructive of our findings [34]. They make the case that instead of focusing on typologies of lone-offender terrorists (e.g., based on whether the offender received material support or acted under a formal command and control structure), it may be more useful to view (a) the degree of loneness the offender exhibited, (b) the degree of external direction the offender received, and (c) the depth of their political motivation, as continuums. "Analyzing cases by their features, rather than by their types, might better aid the investigative process, particularly if each dimension is linked to a key facet of the attack and tracked across the spectrum of attack-related activity

from idea to action" [34 p. 104]. Loneness measures independence of activity. The loneness continuum plots the degree to which offenders received assistance in initiating planning, preparing for, and executing the attack. Direction measures the level of autonomy the lone actor displayed in decision-making. It plots the degree to which the offender received instruction or guidance on issues concerning whether to attack, what to target and the attack type to deploy. The motivation continuum plots the degree to which the action is primarily ideologically or personally driven. Borum et al. make the case that very few offenders will be placed on the extremes of a continuum but are likely to be found somewhere in between.

Between polar opposites, we see much convergence between lone-actor terrorists and mass murderers. They inhabit similar spaces. This finding may have important implications for law enforcement and threat assessment professionals. For example, when encountering a potential offender who appears to be motivated only by an ideologically based grievance, an investigator should not be surprised by a lack of evidence that others were aware of any planned attack (half of lone-actor terrorists were just as "lone" as the nonideologically motivated public mass murderers). Similarly, in the aftermath of a public mass murder not "claimed" by any terrorist organization, investigators should not discount the possibility that the offender was motivated at least in part by political, religious, or ideological concerns in choosing the target (over a quarter of public mass murderers had some form of ideological aspirations, albeit poorly articulated, fanciful, or lacking a wider milieu of support).

Where we do see consistent differences between the two categories relates to leakage. This, we feel, is directly linked to wider supportive ecologies and the opportunities to leak they provide. Naturally, ideologies have bigger followings than idiosyncratic personal grievances. Where there is a large (physical or virtual) presence of co-ideologues, there is a greater likelihood of some form of leakage occurring. What we found in this regard is true for 1990–2014. However, there is no guarantee, it will stay this way for two reasons. First, some forms of (attempted) shootings traditionally thought of as (attempted) public mass murder are gaining much wider support online. This is true for school shootings [35], "targeted individuals" [36], Incels [37], and various forms of conspiracy theories that cross the Rubicon into inspiring political violence (e.g., QAnon [38]). As these locales grow, it will likely foster more leakage behaviors amongst the few who mobilize to violence. Second, other online affordances such as live streaming violent events may have the opposite effect and

TABLE 3 Logistic regression analysis of antecedent event behaviors

Variable	B (SE)	Sig.	Lower	Exp (B)	Upper
University experience	−2.836 (0.902)	0.002**	0.010	0.059	3.44
Military experience	−3.129 (0.952)	0.001**	0.007	0.044	0.283
Criminal conviction	−3.410 (0.955)	0.000***	0.005	0.033	0.215
Recent address change	−2.562 (0.815)	0.002**	0.16	0.77	3.81
Tipping point experienced	−1.724 (0.770)	0.025*	0.039	0.178	0.807
Lived alone	0.618 (0.778)	0.427	0.404	1.856	8.531
History of substance abuse	3.593 (1.003)	0.000***	5.085	36.328	259.515
Socially isolated	−1.807 (8.72)	0.038*	0.030	0.164	0.907
Experienced being degraded	2.207 (8.58)	0.010*	1.689	9.084	48.857
Experienced having a promise broken	3.050 (2.963)	0.303	0.064	21.120	7023.44
Experienced being ignored	−0.153 (1.094)	0.889	0.101	0.858	0.7321
Experienced others not caring for them	1.720 (1.017)	0.091	0.761	5.585	41.000
Felt helpless	−0.783 (1.019)	0.442	0.062	0.457	3.368
Problems with personal relationships	1.877 (0.755)	0.013*	1.489	6.537	28.690
Evidence anger was escalating	−2.964 (1.035)	0.004**	0.007	0.052	0.393
Experienced a recent stressor	1.880 (7.67)	0.014*	1.457	6.552	29.474
Experienced chronic stress	1.398 (0.633)	0.027*	1.170	4.045	13.986
History with attack location	3.570 (0.861)	0.000***	6.570	35.533	192.181
Stockpile of weapons	−2.475 (0.849)	0.004**	0.016	0.084	0.444
Constant	2.328 (1.025)	0.023		10.260	

*≤0.05; **≤0.01; ***≤0.001.

lessen the prevalence of leakage behaviors. If one consistent reason for leaking intent is to let others know "why" the violence had to happen, a livestreamed claim of responsibility immediately prior to the violence (as seen in Christchurch) may be far less risky for perpetrators attempting to avoid upstream detection by police and intelligence agencies.

5 | CONCLUSION

This article adds to the growth in data-driven analyses comparing samples of violent extremists with other violent populations of interest [39]. The results demonstrate that many major potential risk factors (e.g., existing mental disorders) are just as common among and between lone-actor terrorists and mass murderers. This has major implications for practice and justifies the development of multi-agency approaches that do not discriminate between motivational drivers of violence. Threat/risk assessment and management guidance documents could be equally applicable to both forms of attacker and indeed have already been validated by the Risk Management Authority (e.g., TRAP-18). Different forms of interventions may also be equally suitable. For example, by targeting the social and individual determinants of who crosses the threshold into targeted violence in public spaces, it will aid

TABLE 4 Logistic regression analysis of leakage related behaviors

Variable	B (SE)	Sig.	Lower	Exp (B)	Upper
Produced letters prior to the attack	−2.253 (0.439)	0.000***	0.044	0.105	0.248
Made verbal statements to family about intent	−0.634 (0.436)	0.146	0.226	0.530	1.246
Made verbal statements to wider audience	0.556 (0.447)	0.214	0.726	1.743	4.184
Others aware of grievance	−0.543 (0.473)	0.251	0.230	0.581	1.467
Expressed a desire to hurt others	−0.020 (0.423)	0.962	0.428	0.980	2.244
Other individuals helped procure weaponry	−1.274 (0.587)	0.030*	0.089	0.280	0.883
Other individuals aware of attack planning	−0.293 (0.469)	0.532	0.297	0.746	1.871
Constant	1.881 (0.351)	0.000		6.559	

*≤0.05; ***≤0.001.

upstream prevention. Policies that encourage early reporting of warning signs of imminent violence can have an equal impact. Interventions that target the ease of access to weaponry used for such mass violence will equally impact all forms of public violence. Interventions which target harden, and aim to disrupt, deter, and deny hostile behavior will also have similar impacts regardless of the motive driving the violence.

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