

# Scripting the Terror Contagion Hypothesis: Development of a Novel Criminal Script & Preliminary Analysis on three Terror Contagions Columbine, VA Tech, and Incel

Timothy Clancy <sup>1\*</sup> [0000-0003-4508-8299], KJ Oviatt<sup>2</sup>, Valeria Stephens<sup>3</sup>

<sup>1</sup>National Consortium for the Study of Terrorism & Responses to Terrorism (START)  
University of Maryland, College Park, MD, USA

<sup>2</sup> No affiliation, USA

<sup>3</sup> No affiliation, CANADA

\*Correspondence: timc@umd.edu

## Abstract

The terror contagion hypothesis is a novel approach to understanding public mass killing terrorism that spreads as a form of social contagion through cultural scripts. These attacks, though less frequent than other forms of mass killings, are often far more violent and target our schools, universities, grocery stores, houses of worship, and public places. In this work, we demonstrate preliminary results through two experiments that terror contagions can be differentiated from one another, as well as from all other mass killings. We conduct these experiments by developing a traditional criminology tool, a crime script, which is a model of a criminal act. By developing a very high-fidelity terror contagion script model and populating it with robust, high-quality data from two existing field-recognized data sources, we demonstrate how the Columbine-style school shooting, VA Tech, and Incel terror contagions are not only different in key ways from one another but also from all other mass shootings in the US from 1995-2022. Though these findings are not statistically significant due to the low sample size of available incidents, they demonstrate the promise of using crime scripts as a model of terror contagions to inform previously developed system dynamics computer simulation models. This improves the fidelity of the model, allows simulation of the crime script, and builds confidence in criminologists more familiar with this method than a computer simulation. This is a novel merging of criminology and system dynamic methods to address paradigmatic differences, both in general and specifically related to public mass killings.

# Introduction

In the United States, public mass killings, where four or more people are killed, represent 19% of all mass killings between 2006-2022[1] but are the most lethal of all mass killings and drive significant public fears of violence[1],[2]. The terror contagion hypothesis is a novel hypothesis for considering certain kinds of public mass killings. A terror contagion is a form of social contagion that spreads violent radicalization, leading to an attempted public mass killing. An initial seed event with high fatalities attracts significant media attention. This results in the spread of cultural scripts through media, social media, and content platforms, communicating both a violent ideology and a method of how the mass killing was conducted. Members of a high-risk population, susceptible to violent radicalization and sharing a common grievance and finding that template attractive, pick up the cultural scripts, beginning a process of violent radicalization. When some of these individuals later go on to commit similar public mass killings, they copy and distribute both ideology and method, which, given enough fatalities, are spread by the media again, creating a self-sustaining contagion. Evidence suggests between 62-72% of all public mass killing fatalities in the United States from 2006-2022, as listed in both the Mass Killing[3] and Violence Project databases[4], were caused by so-called "terror contagions."

A major implication of the hypothesis is that terror contagions should not only be distinct and differentiable from other forms of public mass killings, but they should be distinct and differentiable from each other. This concept introduces the possibility of creating "contagion profiles" that can describe a series of incidents arising from a common seed event with distinct violent ideology, template method, characteristics of a high-risk population, and specific cultural scripts. A set of testable experiments was proposed, some of which work has already begun. We pull two experiments from that list that haven't been worked on to drive this work.

Our first experiment, novel to this paper but implied in previous work, is to demonstrate using crime script analysis that terror contagions are different from one another and other forms of public mass killing. Success in this experiment would be demonstrating that not only are terror contagions different from one another in their progression along the crime script but that the cultural scripts driving the contagion also differ in how these elements are communicated.

A second experiment from the original work demonstrates that despite the distinctiveness of individual contagions, they interact with one another in the form of cultural script dialogue. When there is temporal proximity in incidents or a similar enough high-risk population, sets of cultural scripts communicated by social media can influence other populations to conduct their public mass killings, which then constitute a new seed event with enough distinction so that it spawns a new, different contagion. This would go a long way to explain the mixing of ideas and inspirations within terror contagions.

We look at three contagions across both experiments, starting with Columbine-style School Shooting (CSS) beginning with a seed event in 1998, the Virginia Tech contagion (VA Tech) beginning in 2006, and the Incel contagion beginning with a seed event in 2014. What was improvised as a school-based mass shooting by Klebold and Harris in 1998 was adopted by Cho in 2006, who sought to kill more people. However, the specifics of the 2006 incident, including differences in the perpetrator profile, stated motivations, and template method of attack, turned VA Tech into its seed event, spawning a new contagion of replications. One of those replications,

however, is the 2014 Isla Vista attack by Rodgers, in turn, itself became a crucial seed event in the formation of a third contagion known as Incel.

Our method combines foundational criminology with computer simulation. ‘Crime script analysis’ is an existing method of criminology that seeks to create ‘models’ of a given type of crime. Pulling from existing crime scripts, we develop a specific crime script for terror contagions to understand these incidents, including the deep background of the perpetrator, the immediate months leading up to the incident, the perpetrator's pathway to violence, how they conducted the incident, and the aftermath.

We then populate this new terror contagion crime script leveraging two of the respected datasets, the Violence Project on mass shootings (TVP)[4] and the Global Terrorism Dataset (GTD)[5]. We leverage existing work and terminology by relying on data sets, tying our novel crime script to existing theory and data definitions. The resulting data-populated terror contagion script helps identify how terror contagions are distinct from other public mass killings and one another but also helps isolate in what areas cultural scripts drive individual contagions and crossover between contagions. The crime script gives us a latticework or framework for associating specific cultural scripts. As crime scripts are models, they are well suited to informing further development of our existing terror contagion system dynamics simulation. This simulation already studies generic and calibrated historical contagions at an abstracted high level and can be used to examine novel contagions emerging. By informing future simulation versions with crime-script details, we can improve the model's fidelity while building confidence in the criminology community. We hope to use these simulations to eventually identify where and how to intervene in specific contagions through cultural scripts and policies already favorable in generic explorations[6].

## Literature

### Terror Contagion Dynamic Hypothesis

Recent research suggested a terrorism contagion hypothesis as a model for understanding violent radicalization as a social contagion similar to the Werther effect[7]. We developed a system model of radicalization, including numerous simultaneous potential causes. Then, through a process of evaluating top-down and bottom-up causes, we narrowed those down to seven “root causes” identified as a terror contagion hypothesis depicted in Figure 1 in the form of a causal loop diagram(CLD):

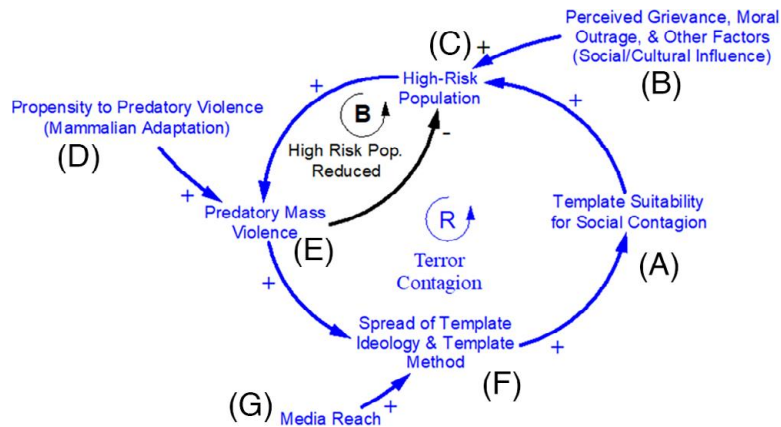


Figure 1: Terror contagion hypothesis

“... for the purpose of replicating itself, a terror contagion exists in the form of a template ideology and method suitable for social contagion Figure 1 [A]. This combined template exploits a contextual circumstance of existing grievances and moral outrage well suited for radicalizing Figure 1 [B]. The contagion’s cultural scripts communicating template information find their way to a high-risk population filtered by similarity, notoriety, and coherence biases as well as already being susceptible to violent radicalization Figure 1 [C]. The templates initiate a radicalization process which is the immediate cause for activating an existing mammalian adaptation for predatory violence Figure 1 [D]. Following the template method is the physical cause of predatory mass violence terrorism Figure 1 [E]. If following the template method generates enough fatalities, the media will disseminate cultural scripts communicating the template ideology and method Figure 1 [F] to the extent of media reach Figure 1 [G]. The spread of cultural scripts sets conditions for subsequent replication of individuals adopting the template ideology and pursuing the template method, allowing the terror contagion to become self-perpetuating Figure 1 [A] [21, p. 34].”

## Imitation, social contagion, or terror contagion?

There is strong disagreement in the literature over whether evidence of replicated elements in public mass killings are motivated by a perpetrator’s desire to pay tribute to past perpetrators through imitation or if they suggest the spread of violent social contagions, either generally through the entire population or specifically through a mechanism similar to the terror contagion we describe above. The imitation-centric perspective, arguing there is no contagion, or that any contagion influence is minimal. Alternatively, there is a traditional, contagion-centric perspective to studying public mass killings through the lens of existing research on social contagions[8]. The traditional social contagion approach employs statistical analysis of the historical record to examine the weeks following a specific public mass killing, determining whether there are significant changes indicating replications. Limiting the sample period to a few weeks is important in this perspective as the statistical definition of a social contagion specifies the few week period. Often, mass killings are pooled in this time frame, and family, felony, or public mass killings are not distinguished from one another. Repeated studies have shown no generalized social contagion effects during this short period in overall violence, specifically mass

killings [9] or even more specifically, public mass killings. However, there is often little effort to differentiate different kinds of public mass killings from one another[8], as is done in terror contagions.

Indeed, the differences between imitation, social contagion, and terror contagion perspectives arise in the form of paradigmatic conflict[10]. Both imitation and general social contagion perspectives rely on the traditional tools of sociology, criminology, and statistics and have struggled to find evidence of contagion effects [6], [7] in mass killings. The terror contagion perspective described above arises from a systems science approach and, relying on computer simulations and calculus, suggests a complex, dynamic system of violent radicalization, where, under certain conditions, a terror contagion as a specific form of public mass killing emerges [8],[9].

Calculus is used to generate behaviors of perpetrators committing public mass killings through simulation and compare to the historical record rather than statistically evaluate the historical record and distill behaviors. In contrast to traditional social contagions, this behavior reproduction means there is no time limitation on the sample period. It is the prevalence of replicated behaviors in subsequent public mass killings that determine the qualification of an incident as a terror contagion, not its proximity to the first public mass killing. If the reproduced behavior of a contagion takes months to prepare for an attack, only looking at replications within a narrow window after a public mass killing would miss subsequent contagion incidents. Likewise, special care is taken to disentangle public mass killings from family or felony and further distinguish public mass killings into specific terror contagions. Our evidence indicates that these terror contagions as distinct kinds of public mass killings but are also distinct and detectable from one another. Terror contagions possess characteristics difficult to identify using imitation-centric or traditional contagion-centric methods, which pool incidents based on a fatality count rather than a circumstance or specific evidence of the incident. What terror contagion and traditional social contagion theory have in common, however, is that both enable the inclusion of well-established forms of social contagion intervention theory into their perspectives, such as the well-accepted research centered on the media reporting of celebrity suicides and how it can increase the risk of copycat suicides (the Werther effect) or decrease it (the Papageno effect)[10, p. 34].

However, system dynamics research into the contingencies of scientific revolutions based on Khun's work found that a new theory's power of "logical force and power to explain nature[11, p. 21]" was important but not decisive to the survival of the theory. Just as important is building sustainable confidence even as the "paradigm will be extended rapidly into new terrain," causing "anomalies and disagreements" around the new paradigm to increase reducing confidence in it[11, pp. 20–21]With this in mind, we adopt some of the practices of sociology (cultural script) and criminology (crime script analysis) described below to meet the skeptics where they stand with evidence understandable in their own paradigm, not just brought from a new paradigm of simulation science.

## Cultural Scripts

Cultural scripts are abstracted and symbolic units of meta-language that transmit norms, values, and practices in ways “clear, precise, and accessible to cultural insiders [12, p. 153].” Violent cultural scripts convey the radicalizing content of template attractiveness, template ideology, and a modus operandi of the template method. Cultural-script contagions are well known to further social contagions of self-harm in suicide, also known as a Werther contagion [13], [14], as well as affective and predatory violence [15], [16],[17]. These cultural-script contagions spread through three mechanisms in the literature. First, formal and informal media broadcast cultural scripts in a one-to-many effect, causing distribution across the entire population[18]. Second, the general population filters the scripts by similarity bias to those who see themselves in its originator or content [19]. Third, the subset population is narrowed a second time by prestige bias. Those individuals view the script originator as having high status, celebrity, or, in the case of violent behavior, notoriety [20, pp. 585–560]. Throughout all three mechanisms the cultural scripts must retain a coherence of understandability to these increasingly narrowed populations. Combining self-similarity bias, notoriety bias, and coherence bias results in the overall template attractiveness of a given contagion. Finally, a fourth narrowing of the subset is on those with distal characteristics indicating a potentially higher risk for mass violence from TRAP-18. We use the term “high-risk population” to identify a generic population sharing a common grievance susceptible to violent radicalization through cultural scripts attractive to them after filtering from similarity, notoriety, and coherence biases to that population. Our definition is agnostic to any preconceived notion of terrorist demographics or specific ideology. Instead, we define susceptibility through TRAP-18, a mass violence risk-assessment tool, identifying 18 individual indicators: 10 distal characteristics and eight proximal behaviors. Distal characteristics emerge over time, while proximal behaviors appear as the individual approaches committing an act of mass violence [21, pp. 7–10]. Although any person may have one or several indicators, multiple indicators over sustained periods provide an empirical basis for a person at high risk of committing mass violence [22]. These indicators are robust across various populations, including Islamic terrorists, extreme right-wing terrorists, and single-issue terrorists for all but four TRAP-18 indicators [22, p. 6].

A specific high-risk population is a smaller population nested within a larger population. The two populations may share common grievances and attractiveness to certain cultural scripts based on self-similarity, notoriety, and coherence filters. However, the smaller, high-risk population is distinguished from the larger by their susceptibility to violent radicalization expressed as having a prevalence of TRAP-18 indicators.

## Crime Script Analysis

Crime script analysis, is a criminology tool emphasizing converting incident data into frameworks to aid in “systematizing knowledge about the procedural aspects and procedural requirements of crime commission[23].” Crime scripts serve as “models” for this systemization of knowledge in two areas, including “eliciting the offender’s behavior and the rationale for their decisions...and...*organizing existing knowledge about the requirements of crime commission* such as the skills or resources that criminals need to deploy to execute a crime [24, p. 505].” In a systemic review from 1994-2018 over 416 studies containing over 100 crime scripts[24, p. 510].

This included scripts related too: “cybercrime (24 scripts) and corruption and fraud offences (23), followed by robbery and theft offences (19), drugs offences (14), environmental crime (14), violent crime (13), sexual offences (9), and other (13)[24, p. 510].” Approaching the elephant of public mass killings from this review and more recent work identifies crime script approaches for school shootings[25], violent and non-violent extremists[26], ideologically motivated mass shootings[27], vehicular ramming’s[28], incel attacks[29], and a singular script on the Norway attack of 2011[30]. All of these represent different aspects of the same elephant, for the full range of public mass killings contemplated within the terror contagion hypothesis. Studies were either limited to the method of mass killing (e.g. mass shootings or vehicular ramming), an extent of radicalization without specificity to a level of violence (e.g. violent and non-violent extremists), specific to a given ideology (e.g., incel or great white terror contagion) within terror contagion or only reviewed 1-2 incidents.

Although there is no standard method of creating crime scripts, some practices are recommended. Cornish recommends development that begins with a *universal script* that provides an organizing construct for all manner of crimes (e.g., criminal behavior), a *postscript* that is a specific form of crime (e.g., robbery), a *script* that is a specific manifestation of that specific crime (e.g., robbery from a person), and *tracks* that indicate a location or spatial information of where that crime took place (e.g., subway mugging)[23, pp. 160–163].

Unfortunately, over twenty years, the alignment to a universal script has faded, and although the use of crime script analysis has expanded exponentially, the field is “characterized by breadth rather than depth[24, p. 518].” Some crime scripts are used to study the criminal process, while others are used to create requirements for counter-measures of law enforcement or other interventions to reduce the crime in question[31].

Even among the limited set of crime scripts dealing with different aspects of mass violence or extremism, script construction has a wide variation. However, recent work[23] begins to merge a script related to extremism, adopted from Cornish’s original work[23], which reflects the long development time of radicalization risk factors that may eventually result in a crime. These are listed below in Table 1[26].

Table 1: Crime Script of Violent Extremism as Progressed from a Universal Crime Script

<b>Original Universal Crime Script (Cornish 1994)</b>	<b>Violent Extremism Script (Keatley et al. 2023)</b>	<b>Description</b>
<b>Influences</b>	Influences	Distal factors related to early youth and upbringing existed for years or decades before the incident.
<b>Warning Signs</b>	Signals	Proximal factors are apparent in the days, weeks, and months leading up to the incident.
<b>Triggering Behaviors</b>	Triggers	Exposure to influencing extremists’ rhetoric or experiences
<b>Precondition</b>	Operational	The pathway to violence in which planning and preparation begins before an incident.

<b>Doing</b>	Activity	The action taken by the extremist at the focus of the crime script analysis.
<b>Exit</b>	Withdrawal	The removal of the perpetrator from the scene of activity.

Around these emerging frameworks is a growing consensus on the kinds of data sources appropriate for crime scripts. This is important as the primary information related to public mass killings is open source:

Open-source data refers to publicly available information (Greene-Colozzi, Freilich, & Chermak, 2021), and it is the primary source for research on general mass shootings (Peterson & Densley, 2019; Silva, 2021a), terrorism (Freilich, Chermak, Belli, Gruenewald, & Parkin, 2014; LaFree & Dugan, 2007), and ideological mass shootings (Capellan, 2015; Capellan et al., 2019) [27, p. 5]

The reliability of these sources is organized along a spectrum of credibility:

As depicted, court transcripts and associated documents were deemed most reliable, as these documents recorded finalizations of judicial decisions. Competency evaluations, sworn affidavits, and indictments were deemed reliable, as these were carried out post-arrest and before trial, when initial investigations were made. Manifestos were deemed somewhat reliable, as the individual may not have been honest.<sup>62</sup> Warrants and expert witness reports were also reasoned to be somewhat reliable, as warrants are produced prior to arrest and, like expert witness reports, are subject to unreliability and bias.<sup>63</sup> Media articles were then placed on a separate continuum within the less reliable end of the spectrum; with personal opinion blogs at the lower end, and broadsheet newspapers at the upper. [28, p. 1553]

On quality assurance, the crime scripts, despite being models of criminal activity, are not treated as models capable of replicating the dynamics in question[31, p. 5] or serving as models for implementation. Rather than seeking abstracted validation, recognition should be given that crime scripts as models represent crime exists within a dynamic “given ecosystem” related to the nature of the act and “control measures are normally envisioned as candidate solutions...and according to most systems engineering frameworks...driven by stakeholder needs[31, p. 1].” Development along this front, treating crime scripts as models akin to computer simulation, has led to the proposal of quality assurance measures that are themselves compatible and arise from simulation fields[31, p. 5], even if not all crime scripts are ultimately simulated in computer models. This has resulted in one proposal of a multi-stage development process and a 12-step quality checklist, which is gaining traction as a potential common source of quality assurance[31, pp. 5–8].

### System Dynamics Simulations

Quantitative system dynamics simulations determine cause and effect[32, p. 342] through understanding feedback in complex systems [33, p. 1]. Five characteristics define system dynamics modeling from other forms. First, models are based on a causal structure with feedback so that a change to a single variable causes a chain reaction that eventually influences the first variable. Positive (reinforcing) feedback loops push a system in one accelerating direction,



leading to exponential growth. Negative (balancing) feedback loops balance the systems towards equilibrium. The interaction of these loops determines how its output behavior unfolds over time. Second accumulation and delays in these feedback loops are foundational, represented by four building blocks. Stocks accumulate over a delay. Flows determine the rate of change in stocks. Auxiliaries are stock-flow structures changing so fast that we model them as variables. Constants are stock-flow structures that change so slowly relative to the time boundary of the model that we model them as fixed. Feedback loops must include at least one stock that accumulates over a delay to avoid the error of multiple simultaneous values at a point in time. Third, these model structures are equation-based. Equations enable reproduction, comparison, and policy analysis since we can isolate leverage points in a system. Fourth, models use a continuous concept of time. Changes under a system state at a given point in time play out over the delays and accumulations represented in equations through feedback, creating the changing behavior of a system over time. The focus on equations and continuous time connects calculus philosophy to system dynamics practice. Fifth, the analysis focuses on feedback dynamics. The calculus equations integrated over continuous time create dynamics reducible to the causal feedback loops that generated them. This way, behavior links to structure and potential leverage points that might [34, pp. 4–7]adjust behavior are identified.

## Method

Our method to build confidence in the terror contagion hypothesis across both current competing paradigms involves pulling methods from both [11], computer simulations from simulation science, and crime script analysis from criminology.

To demonstrate the capability of the terror contagion to simulate historical contagions adequately, we first seek to replicate historical behavior patterns of *global* terror contagions for CSS, VA Tech, and Incel. We demonstrated this method successfully previously for both CSS and VA Tech and added Incel to our portfolio in this paper. These calibrated simulations are done at a global level based on prior work identifying suspected global terror contagion incidents, including both completed and failed, based on the criteria of whether 4+ victims were killed and are at a more aggregated level than the development of the crime scripts.

Our method of developing crime scripts is to begin with the framework of an already script for extremist activities [26]. We then modify it with the 12 quality steps of Dorrión in mind:

1. **Typology:** The type of the script should be clearly indicated: potential script, planned script or performed script; perpetrator script, victim script, control script, etc.
2. **Traceability:** All items of information should be explicitly connected to the objectives of the design problem. Dependencies between the states of the entities and activities should be clearly visible.
3. **Transparency:** The syntax and method adopted for the creation of a script should be clearly communicated, along with the data used for its generation. The criteria used for the development of the model and its calibration should also be made explicit. When multiple scripts are combined, the syntax and method of integration should be provided.

4. **Consistency:** The syntax and method adopted for the creation of a script and the integration of existing scripts should be consistently applied throughout the entire scripting process. Consistency also applies to scripts represented in a diagrammatic form.
5. **Context:** Crime and crime control are both context sensitive. A mention of the context should be added alongside the script so to allow more accurate understanding of the constraints and conditions that could impact on the effectiveness of control measures.
6. **Completeness:** Scripts should include relevant information about the elements that significantly influence the probability distribution of the consequences. Whilst it is understood that ecological models are always incomplete, the main factors of performance should be described for all modelled activities, including physical and psychological ones.
7. **Parsimony:** Scripts should not include any information about those elements that are not relevant to the stakeholders' high-level requirements.
8. **Precision:** The precision and resolution of the information included in a script should be based on the sensitivity of the control measures, and allow effective evaluation of requirements.
9. **Uncertainty:** The uncertainty about the commission of crime and its impact according to the stakeholders' criteria should be explicitly detailed.
10. **Usability:** Scripts should be comprehensive to those expected to use them. When scripts are represented using activity diagrams, both the text and symbols used should be intelligible.
11. **Ambiguity:** It should not be possible to interpret the information forming a crime script in more than one way.
12. **Accuracy:** The intrinsic and relational properties of the elements represented in a crime script should be accurately characterised[31, pp. 8–9]

Due to the complexity and difficulty of populating sufficient data into the script we envision, we break our work into three phases. Phase 1, which appears in this paper, focuses on completed public mass killings within the United States for CSS, VA Tech, and Incel. Although the number of incidents in each contagion will be fewer than the global sets we calibrated our simulations on, it corresponds with the TVP's data sets that focus solely on completed mass shootings in the United States. This not only allows us to learn incrementally but also allows comparisons between each terror contagion and the average profile of all mass shootings from 1995 to 2022 within the TVP. Phase 2 expands to an overall global scope for contagions that primarily originated or are spread through Western and English means. Phase 3 expands to include thwarted or abandoned public mass killing globally. As the TVP only analyzes completed incidents, this could be a much larger data set and provide valuable insights into the crime script to identify where and how efforts were abandoned or thwarted. For each Phase, and between Phases, we anticipate iterations on script development based both on learning as well as findings on the quality steps above[31, p. 7].

Throughout this process, we attempt, wherever possible, to link our crime scripts to foundational theories of radicalization, social contagion, and criminology for grounding and accessibility in

other fields. We also leverage the existing data and definitions found in TVP and GTD where possible. This helps reduce the needless proliferation of data schemas that confuse researchers.

## Terror Contagion Simulation

Our method of studying the impact of cultural scripts involves an existing peer-reviewed model, the terror contagion simulation (TCS). This simulation was designed to study the terror contagion hypothesis and meets DIME-PMESII military standards for simulations.[35, p. 8]. The original publications include complete model documentation and discussion[6], [36], [37]. The terror contagion simulation models a single high-risk population and its internal network dynamics within larger societal dynamics. At the beginning of the simulation, this high-risk population supports no violent ideology, nor does it employ a template method of public mass killing. If they commit violence, it is indistinguishable from normal homicidal crime and results in 1 fatality. The simulation initiates with a seed event. The seed event is a single contagion incident – a terrorist attack communicating template ideology and a template method. Each terror contagion has a specific seed event that sparks the following replication.

The simulation runs for ten years to explore the terror contagions that can spawn from this seed event. Each simulation imports a file of contagion settings to initialize key values. Contagion settings consist of the initial stock and parameter values of either a generic or researched violent ideology, including success rates and average fatality rates of template methods, factors related to the high-risk population, and the extent to which this violent ideology is or is not supported by non-state actors operating in a safe haven. Contagion settings also contain policy response options activated as switches to test policy responses against a specific violent ideology. Please see the above articles or attached supplementary materials for more information on the simulation structure, settings, details of behavior reproduction, and measuring forecast accuracy.

## Results

### Behavior Reproduction of Global Contagions

We begin with our global contagion data set of 253 completed and failed incidents[37, p. 10]. As we have already successfully reproduced CSS and VA-Tech global contagions in prior work[34], we add Incel to our portfolio of behavior reproductions. These results are presented in Table 2 by comparing the 10-year historical record of completed incidents and fatalities vs. simulated results for the three contagions. A key note is that this is using our larger global data set where completed incidents in the historical data are any incident where one or more people were injured or killed. This differs from our narrower Phase 1 data set for crime script development. We only compare fatalities, however, because our simulation does not track injuries as it does not appear to be a driving measure of media attention [6]; since simulation runs are for ten years, the “historical record” compared against is only the first ten years of a contagion. This is immaterial for most contagions. But for Columbine, which has a current duration of 24 years, the “historical record” only includes the 25 incidents identified in the data through 2009. The full 24-year duration of the contagion has over 75 incidents in our dataset.

Table 2: Behavior Reproduction & Forecasting Accuracy Measurements

	CSS		VA-Tech		Incel	
	Incidents	Fatalities	Incidents	Fatalities	Incidents	Fatalities
10yr Historical Record	25.0	109.0	6.0	79.0	11.0	63.0
Simulated	19.0	155.3	6.0	112.1	9.0	43.0
MAE	0.1	0.8	0.0	0.5	0.1	0.5
MSE	0.0	1.1	0.0	1.0	0.0	0.8
$U^m$	0.1	0.1	0.1	0.0	0.1	0.1
$U^s$	0.0	0.0	0.0	0.2	0.0	0.1
$U^c$	0.9	0.9	0.9	0.8	0.9	0.8

For more detail on behavior reproduction and forecasting accuracy measurement, the reader is referred to the supplementary material.

Two key challenges arose in the calibration of the Incel Contagion. First, we discovered that the graphical function used to determine media broadcasts based on the number of fatalities in the simulation is very sensitive to low-fatality seed events. Both the exploratory contagion model and all previously calibrated contagions we’ve studied had seed event fatalities over ten: 13 for Columbine, 33 for VA Tech, and 68 for GWRT[37]. With Incel, the Isla Vista incident caused only six fatalities. Still, the nature of the attack and its subsequent high media profile and attractiveness to a given high-risk population (e.g., the Incel community) resulted in greater than normal coverage and subsequent spread. We originally attempted to adjust for this by modifying the graphical function or media broadcast based on fatalities 6-8 the same as 9 in the graphical function. However, this then increased the media coverage of every other subsequent Incel attack, creating unrealistic results. Instead, we artificially increased the number of fatalities to 13, the same as Columbine. Also, we ran into the same challenge with Incel as we did GWRT, namely that all incidents we have in our dataset were successful, giving an unrealistic Template Method Out the Door (OTD) success rate = 1. As we did with GWRT in the prior paper, we adjusted this to the standard OTD success rate of 84% as determined by prior analysis of 4,600 terror incidents in the US & WEUR from 1995-2018.

These adjustments mean that the MSE results and prior caveats made in past work and supplementary materials should be considered very preliminary. We hope, however, that the current work, establishing a contagion crime script and linking it to which cultural media scripts best spread the contagion, will help in situations like this. Moving away from a fatalities-only perspective driving cultural script spread at a more nuanced spread of cultural scripts, especially within primed high-risk communities, such as was the case for the Isla Vista Incel attack.

## Constructing the Terror Contagion Crime Script

Our proposed contagion crime scripts contain nine categories designed specifically for the terror contagion hypothesis. We begin with the violent extremism script recently proposed and then expand upon it as necessary to create the necessary framework for aligning the procedural factors related to social contagions of cultural scripts. As cultural scripts can play key roles in both the

radicalization process and after the incident itself, even including the outcome in death, trial, or imprisonment of the perpetrators, and these seem to differ between terror contagions, we have expanded the ‘scenes.’ We have also added adequate locations for thwarted, abandoned, or otherwise failed attempts, as this is a key insight into determining successful crime reduction strategies.

Table 3: Proposed Terror Contagion Crime Script

<b>Original Universal Crime Script (Cornish 1994)</b>	<b>Violent Extremism Script (Keatley et al. 2023)</b>	<b>Terror Contagion Crime Script Scene</b>	<b>Terror Contagion Crime Script Sub-Scene</b>	<b>Purpose</b>	<b>Theoretical Basis in Literature</b>
		-1	Summary Description		
		0	Inclusion Criteria		
<b>Influences</b>	Influences	1	Influences	Distal factors related to early youth and upbringing existed for years or decades before the incident.	TRAP-18 Distal Factors
<b>Warning Signs</b>	Signals	2	Signals	Proximal factors are apparent in the days, weeks, and months leading up to the incident.	TRAP-18 Proximal Factors
<b>Triggering Behaviors</b>	Triggers	3	Template Attractiveness	The factors of perpetrator susceptibility to social contagion may have contributed to their radicalization by cultural scripts.	Social Contagion (e.g. Werther)
<b>Precondition</b>	Operational	4	Operational	The pathway to violence in which planning and preparation begins before an incident.	
<b>Doing</b>	Activity	5	Incident	The actions taken by the extremist at the focus of the	

				crime script analysis beginning with anything with the first act of action, going “out the door,” and then to the conclusion of the incident.	
<b>Exit</b>	Withdrawal	7	Outcome	The removal of the perpetrator from the scene of activity through death, trial, imprisonment, or the ongoing status of criminal investigations.	
		8	Sources	Transparent provision of ranked sources that were included in creating the record.	

For each of the terror contagion crime script stages, we created sub-stages and corresponding stages, we created sub-stages, and these are listed below.

<b>Terror Contagion Crime Script Stage Name</b>	<b>Terror Contagion Crime Script Sub-Stage Name</b>
<b>-1 Summary Data</b>	
<b>0 Inclusion Criteria</b>	
<b>1 Influences</b>	1A Personal grievance and moral outrage 1B Framed by an Ideology 1C Failure to Affiliate with an Extremist or Other Group 1D Dependence on the Virtual Community 1E Thwarting of Occupational Goals 1F Changes in Thinking & Emotion 1G Failure of Sexual-Intimate Pair Bonding 1H Mental Disorder 1I Greater Creativity & Innovation 1J History of Criminal Violence
<b>2 Signals</b>	2A Pathway to Violence 2B Fixation

	2C Identification 2D Novel Aggression 2E Energy Burst 2F Leakage 2G Last Resort 2H Directly Communicated Threat 2I Proximal Trigger (Days-Weeks-Months Specify in Incident Initiation)
<b>3 Template Attractiveness:</b>	3A Self Similarity 3B Notoriety 3C Coherence
<b>4 Operational:</b>	4A Pathway to Violence: Research & Planning 4B Pathway to Violence: Substantive Steps 4C Pathway to Violence: Weapon Acquisition for Weapons #1-9* 4D Pathway to Violence: Non-Weapon Material Acquisition 4E Abandoned or Thwarted After Substantive Steps on Pathway to Violence but Prior to Initiation
<b>5 Incident:</b>	5A Incident: Initiation of Violence or other Activities pre-OTD to the PMK 5B-J Incident Data for Locations #1-9* 5K-T Incident Modus Operandi for Locations #1-9* 5? Incident Property Damage for Locations #1-9* 5U-AD Template Method for Weapons #1-9*
<b>6 Incident Conclusion:</b>	6A Incident Conclusion Summary
<b>7 Outcome</b>	7A Outcome Summary 7B-J Trial Outcomes for Perps 1-9* 7K-S Trial Outcomes for Accomplices 1-9* 7T Cultural Script Transmission at Time of Incident 7U Cultural Script Transmission at 5 Years After Incident
<b>8 Sources</b>	8A TVP Version Consulted 8B GTD Version Consulted 8C FBI Annual Report Consulted 8D Court Transcripts (Most Reliable) 8E Govt Investigation Report 1 8F Govt Investigation Report 2 8G Govt Investigation Report 3 8H Witness/Event Videos 8I Researcher Data Set 1 8J Researcher Data Set 2 8K Researcher Data Set 3 8L Peer-Reviewed Work 1 8M Peer-Reviewed Work 2 8N Peer-Reviewed Work 3

	8O Perpetrator Manifesto 8P Perpetrator Videos 8Q Media High Quality: 8R Crowdsourced Transparent Datasets 8S Media Low Quality: 8T Media: Personal Blogs, Opinions 8U Media: Forums 8V Addl Source 1 8W Addl Source 2 8X Addl Source 3 8Y Addl Source 4 8Z Addl Source 5
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The resulting crime script database is large in number of fields, with over 1,400 per incident. Many of these fields are because of the extra detail we have added to the analysis of each location, weapon, and modus operandi used in each incident. For example, without extension, the database can handle up to nine perpetrators, nine accomplices, nine locations, and nine weapons. There are over 16 individual data fields for each weapon covering how it was obtained, how it was used, and the specific make and model. There are over 50 individual data fields for each location, including specific details of the location and what occurred at that location, including perpetrator, bystanders, and law enforcement actions.

## Populating Terror Contagion Crime Script with US Completed Public Mass Killings Data

Although the number of fields can seem daunting, we found more benefits than costs in using this level of detail. First, we believe this level of detail gives the necessary fidelity to understand each incident and terror contagion accurately. Furthermore, terror contagion incidents are a very small population to track through this method. In Phase 1, with a date range beginning in 1995, the advent of the internet, we have identified only 41 suspected terror contagion public mass killings in the US and another ~130 suspected attempts that met the substantive steps threshold but did not result in four or more fatalities. Based on prior research, we suspect the global population of 230 completed Western/English-originated or spreading terror contagions and estimate about 200-300 additional thwarted attempts at most. This gives us a finite list of contagions to map, most of which have occurred in the past. Furthermore, the majority of these incidents only involve a few weapons, 1-2 locations, and only a single perpetrator. However, the database is capable of extending to more complicated scenarios, such as the Las Vegas 2017 public mass killing that included 24 weapons brought to a single location or complex multi-location attacks such as the Isla Vista 2014 attack.

Another benefit of this method, demonstrated in this paper, is that by fusing the extensive data sets of TVP and GTD into a single product with additional fields, we can quickly compare terror contagions not just among one another but to broader sets of mass shootings or even terrorism. In the analysis below, for example, we compare selected elements of our terror contagion crime



scripts between the three contagions and as well against the 133 mass shootings in the TVP that meet the same criteria as occurring between 1995-2022 and killing 4+ victims. From the 41 suspected terror contain incidents, we identified nine incidents within the CSS contagion, four for VA Tech, and four for Incel. Obviously, any of these sample sizes are too small to establish statistical validity, a common challenge in studying public mass killings, which is rare. However, we believe that even with this caveat, the use of populating criminal scripts with contagion at this level of detail shows preliminary promise.

Table 4: Preliminary Results on Script Influences: Personal Grievance and Outrage

<b>Script Scene</b>	<b>Sub-Scene</b>	<b>Sub-Scene Element</b>	<b>All Mass Shootings (N=133)</b>	<b>CSS Contagion (N=7)</b>	<b>VA Tech Contagion (N=4)</b>	<b>Incel Contagion (N=4)</b>
1 Influences	1A Personal grievance and moral outrage	Racism	8%	57%	50%	100%
		Religious hate	4%	29%	0%	50%
		Misogyny	2%	29%	50%	75%
		Homophobia	8%	29%	0%	25%
		Employment issue	20%	0%	25%	0%
		Economic issue	8%	0%	0%	0%
		Legal issue	10%	0%	0%	0%
		Intimate Partner/Family Relationship Issues	13%	0%	0%	0%
		Interpersonal conflict (not intimate partner /family)	19%	0%	0%	0%
		Fame-seeking	8%	29%	25%	75%
	Generalized Anger	5%	14%	75%	50%	
	1D Dependence on Virtual Community	Website or chat room postings relating to hate or hate groups	4%	14%	25%	75%
	1H Mental Disorder	Suicidality	33%	86%	100%	100%
		Hospitalization: Voluntary	2%	0%	0%	0%
Hospitalization: Involuntary		19%	29%	50%	25%	
Mandatory Prior Counseling		9%	29%	50%	0%	

Table 5: Preliminary Results on Script Signals: Fixation & Identification

<i>Script Scene</i>	<i>Sub-Scene</i>	<i>Sub-Scene Element</i>	<i>All Mass Shootings (N=133)</i>	<i>CSS Contagion (N=7)</i>	<i>VA Tech Contagion (N=4)</i>	<i>Incel Contagion (N=4)</i>
2 Signals	2B Fixation	Inability to Perform Daily Tasks	24%	43%	75%	25%
		Losing Touch with Reality	30%	14%	75%	50%
	2C Identification	Interest in Past Mass Violence	30%	71%	75%	75%
		Relationship with Past Shooters	12%	29%	25%	25%
		Relationship Indicates Identification	NA	14%	25%	25%
		Notable or Obsessive Interest in Firearms	38%	86%	25%	75%

Table 6: Preliminary Results Script Signals: Leakage

<i>Script Scene</i>	<i>Sub-Scene</i>	<i>Sub-Scene Element</i>	<i>All Mass Shootings (N=133)</i>	<i>CSS Contagion (N=7)</i>	<i>VA Tech Contagion (N=4)</i>	<i>Incel Contagion (N=4)</i>
2 Signals	2F Leakage	Leakage Prior to Act	46%	100%	75%	50%
		Leakage How: In person	23%	14%	0%	0%
		Leakage How: Letter	<1%	0%	0%	0%
		Leakage How: Other writing	3%	14%	50%	25%
		Leakage How: Phone / text	4%	14%	25%	0%
		Leakage How: Internet / social media	8%	57%	0%	25%
		Leakage How: Other	<1%	0%	0%	0%
		Leakage Who: Mental health professional	<1%	0%	25%	25%
		Leakage Who: Immediate family	2%	0%	25%	25%
		Leakage Who: Spouse/Partner	10%	14%	25%	0%
		Leakage Who: Police	<1%	0%	0%	0%
		Leakage Who: Coworker/supervisor	7%	0%	0%	0%
		Leakage Who: Friend/neighbor	2%	14%	0%	0%
		Leakage Who: Classmate	5%	29%	0%	0%
		Leakage Who: Teacher/school staff	<1%	0%	25%	0%
		Leakage Who: Service Personnel Waitstaff/Bartender/Clerk	<1%	0%	0%	0%
		Leakage NonSpecific (Hinted Major Event)	31%	14%	25%	0%
		Leakage Specific to Generalized Threats of Violence	26%	57%	50%	50%
		Leakage Specific to Threatened Act of Terrorism	NA	29%	0%	0%

Table 7: Preliminary Results Script Template Attractiveness: Self Similarity

<i>Script Scene</i>	<i>Sub-Scene</i>	<i>Sub-Scene Element</i>	<i>All Mass Shootings (N=133)</i>	<i>CSS Contagion (N=7)</i>	<i>VA Tech Contagion (N=4)</i>	<i>Incel Contagion (N=4)</i>
3 Template Attractiveness	3A Self Similarity	Age (Average)	33.4	19.3	28.5	22.00
		White	47%	71%	50%	100%
		Black	21%	14%		25%
		Latinx	11%			
		Asian	6%		75%	25%
		Native American	2%	14%		
		Biracial		0%	25%	50%
Immigrant	17%	0%	75%	25%		

Table 8: Preliminary Results Script Operational: Pathway to Violence

<i>Script Scene</i>	<i>Sub-Scene</i>	<i>Sub-Scene Element</i>	<i>All Mass Shootings (N=133)</i>	<i>CSS Contagion (N=7)</i>	<i>VA Tech Contagion (N=4)</i>	<i>Incel Contagion (N=4)</i>
4 Operational	4A Pathway to Violence	Significant Prior Planning	33%	86%	75%	75%

Table 9: Preliminary Results Script Incident: Template Method Weapon Summary

<i>Script Scene</i>	<i>Sub-Scene</i>	<i>Sub-Scene Element</i>	<i>All Mass Shootings (N=133)</i>	<i>CSS Contagion (N=7)</i>	<i>VA Tech Contagion (N=4)</i>	<i>Incel Contagion (N=4)</i>
5 Incident	5A Template Method Weapon Summary	Count of Firearms (Mean)	2.3	3	2.75	2.5
		Count of Firearms (Min)	1	1	2	1
		Count of Firearms (Max)	24	5	4	5
		Evidence of Other Weapons (%)	45%	100%	100%	75%

Table 10: Preliminary Results Script Incident Conclusion: Conclusion Summary

<i>Script Scene</i>	<i>Sub-Scene</i>	<i>Sub-Scene Element</i>	<i>All Mass Shootings (N=133)</i>	<i>CSS Contagion (N=7)</i>	<i>VA Tech Contagion (N=4)</i>	<i>Incel Contagion (N=4)</i>
6 Incident Conclusion	6A Conclusion Summary	Victims Killed Mean	7.6	14	14	9.75
		Victims Killed Min	4	5	5	5
		Victims Killed Max	60	27	33	17
		Victims Wounded Mean	13.4	14	14	10
		Victims Wounded Min	0	1	4	1
		Victims Wounded Max	867	23	21	17

## Discussion

Our first experiment was to demonstrate that terror contagions can be distinguished from one another and from all other forms of mass killings. We think we had preliminary success in this, though again, we do not have statistical confidence due to the low number of incidents in each sample.

The first difference we found between all mass killings and suspected terror contagion incidents may be key in helping identify terror contagion incidents from other public mass killings. Establishing inclusion criteria can be difficult, especially if relies on the cooperation or legacy tokens of perpetrators who may be dead or have left nothing behind. However, we found that evidence of significant prior planning was much higher in all terror contagions; 75-86% vs. only 33% in all mass shootings. This may have been driven by the nearly doubled interest in past mass violence (71-75% vs. 30%.) Likewise, at least in the terror contagions included in this experiment, perhaps because of that planning and interest in prior events, perpetrators brought non-firearm weapons 100% of the time, whereas this only occurred 45% of the time in all mass shootings. The motivations of terror contagion perpetrators differed as well. All three terror contagions were much more likely to be motivated by racism (50-100% vs. 8%), misogyny (29-75% vs. 2%), and fame-seeking (25%-75% vs. 8%) than the set of all mass killings. Certain motivations were contra-indicated for terror contagion as well. We found no terror contagion incidents in our experiments motivated by economic, legal, intimate partner family, or interpersonal conflict, whereas these motivations existed for 8%, 10%, 13%, and 19%, respectively, for mass killings. However, as motivation is contextually specific to the template ideology, these findings should be taken with care as a terror contagion with an ideology more explicitly tied to economic issues, such as the Great White Replacement Theor contagion, may have more motivation in these areas. When suspected terror contagion perpetrators leaked indications of an upcoming incident, they were twice as likely to hint at generalized violence (50-57% vs. 26%.) We also found that terror contagion perpetrators were far more likely to be suicidal (86%-100% vs. 33%) and far more likely to depend on a virtual community (14%-75% vs. 4%).

Our second experiment was to demonstrate how terror contagions influence and interact with one another, spawning replications that, in turn, became their own seed events. It's long been known of the linkage of methods between these events. The CSS seed event in 1999 started as an attempted bombing at a high school that morphed into a roaming mass shooting but stayed contained at that location. The VA Tech seed event in 2006 began with an initiation killing of individuals in a dorm room; the perpetrator then paused to release media materials before replicating an improved version of the CSS mass shooting at a university facility. The Incel attack in 2014 began as an attempted replication of VA Tech. The perpetrator began by killing his roommates, paused to release media materials and his manifesto, and then targeted a university sorority house. When that failed he improvised a vehicular rampage combined with mass shooting which has now become the distinctive method of many Incel attacks.

But despite method differences, these public mass killings are often grouped as if arising from the same high-risk population who is simply picking different methods. However, through our populated terror contagion crime scripts, we've now shown how key shifts in self-similarity, motivation, and other key factors accompanied this transmission and alteration of the template method.

CSS perpetrators were younger (avg 19.3 years), more white (71%), with no biracial perpetrators (0%) or immigrant perpetrators (0%.) VA Tech, whose seed replicated Columbine's template method but was perpetuated by an older immigrant Asian with clear mental health disorders set a new type of self-similarity for the VA Tech contagion containing older (avg. 28.5 years) more Asian (75%) more biracial (25%), and more immigrant (75%) perpetrators. Incel, which spawned from an attempted replication of the VA Tech attack by a biracial Asian immigrant, emphasized biracial identity as much as involuntary celibacy in his manifesto, and it shows in the self-similarity, which is more biracial than either CSS or VA Tech (50%) but less immigrant (25%). Self-similarity also shows up in the distal influences, with mental health appearing more frequently for VA Tech both in involuntary prior hospitalization (50% vs. 29% for CSS and 25% for Incel) and mandatory prior counseling (50% vs. 29% for CSS and 0% for Incel.)

This tracing of transmission also carries through in the motivations conveyed by the template ideology. VA Tech and Incel were both more likely to be motivated by grievance than CSS, and Incel perpetrators were often just more than VA Tech perpetrators. All contagions had some motivations by racism but in CSS and VA Tech, this is 50% and 57% respectively, rising to 100% in Incel. Misogyny, which became known in Incel contagions but was a key factor in VA Tech as well, figured more prominently in VA Tech 50% and Incel 75% than in CSS 29%. Generalized anger was much higher in Incel and VA Tech (50-75%, respectively) than in CSS (14%). And Incels seem more driven by a motivation to seek fame (75%) than either CSS (29%) or VA-Tech (25%.) The usage of website and chat groups tracks with this division. CSS perpetrators were dependent on a virtual community, engaging in chat groups or websites only 14% of the time. This propensity doubled with VA Tech up to 25% and increased to 75% for Incels, which are well known for making use of chat groups and internet discussion forums. This finding may be influenced in that both VA Tech and Incel contagions began later than CSS, closer to widespread

adoption of social media and internet usage. However it may also indicate the more socially isolated nature of the high-risk population susceptible to this contagion.

The two experiments show preliminary promise in building confidence for the terror contagion hypothesis and improving methods to study them. The terror contagion hypothesis, building off of prior work in celebrity suicide contagion, predicts that despite media attention on any one public mass killing it will only spread within those who have sufficient attractiveness (e.g., self-similarity bias, notoriety bias, and coherence bias) who may then adopt the template ideology as a motivation and template method as a means of acting on those beliefs. Demonstrating that terror contagions break off and spawn new contagions based on differences in attractiveness to these high-risk populations, even as the original terror contagion continues, is key.

Understanding that terror contagions are distinct and different from both one another, and other forms of public mass killings is important for developing policies to counter them. Part of this problem, identified in other research into the contingencies of terror contagions found that because of their distinctive nature terror contagions did not require a large high-risk population to begin or sustain them. A global population as small as a few hundred to a few thousand with self-similarity and shared grievance connected by the internet was sufficient to sustain a contagion over years, even if individual incidents were widely spaced apart[36].

This was supported by later research confirming popularly debated policies to counter public mass killing contagions ranging from gun control, hardening facilities, arming or training bystanders, even in ideal circumstances, failed to overcome the power of a terror contagion following specific templates honed over years[6] though they may have benefits to other forms of risk.

However, that same research found that countering terror contagion using a contagion containment strategy to identify cultural scripts and prevent them from reaching a susceptible high-risk population, when combined with focused deterrence and counter-radicalization to reduce the high-risk population was effective even in worst case scenarios[6].

Suppose terror contagions can be profiled and distinguished from one another as well as other mass killings and their criminal scripts linked to terror contagion-specific cultural scripts. In that case, this raises the potential to custom tailor interventions to the specific profiles of a given contagion. It also raises the possibility of evaluating new public mass killings to see if they are at higher or lower risk of spreading as a contagion. Finally, threat assessment aids can be developed with law enforcement to evaluate and prioritize risk assessment to identify those who may belong to a given high-risk population and manifest influences, signals, and operational behaviors of pursuing a terror contagion public mass killing.

## Conclusion

In this work, we conducted two experiments based on earlier predictions suggested by the terror contagion hypothesis. First, terror contagions could be distinguished from other forms of mass killings. Second, terror contagions informed and influenced one another over time as

replications of prior seed events themselves became new seed events, establishing important and discernible differences in template attractiveness, template ideology, and template methodology.

We demonstrated that although the Columbine-style School Shooting (CSS) contagion spawned the VA Tech contagion, that event was different enough to become its seed event with discernible differences in the high-risk population, especially in areas such as age, race, mental health, and immigration status. This builds confidence in an early terror contagion prediction that like follows like, and crossover can occur when one replication becomes more attractive for a different high-risk population, creating its contagion. The VA Tech contagion itself spawned a replication in the Isla Vista incel attack, which became the seed event for the Incel Contagion. Not only are all three of these contagions different among themselves in key ways, but they are also discernible in key details from the total set of mass shootings in the US over a similar period. We believe we may have identified markers that can distinguish a suspected terror contagion incident from other forms of mass shooting or other public mass killings. Such killings do not rely on the perpetrator to have left manifestos, writings, or be alive to support investigations after the fact. The key limitations in this finding is that they are preliminary in nature, and not statistically established. Due to the low sample size of each contagion, ranging between 4-7, means that normal measures of statistical significance are not appropriate. Other methods, such as Incident Rate Ratio (IRR) analysis or other small-sample validation methods will have to be used, or more contagion incidents identified, to build further confidence in these findings.

However, a key contribution of this effort was in order to conduct these experiments, we began a preliminary but crucial effort to link fundamental criminology approaches to the complex systems and computer simulation analysis of prior terror contagion work. This novel blending of methods builds confidence in traditional criminology fields to our findings while also providing a bridge to improve both the computer simulation model and the terror contagion crime script.

This was only Phase 1 of our agenda of work in this regard, focused only on a limited set of public mass killings we have identified that occurred in the United States between 1995-2022 and resulted in 4+ victims killed. In Phase 2, we intend to expand to a global scope to include suspected terror contagion incidents that have killed 4+ victims originating within the Western/English sphere. In Phase 3, we hope to expand the dataset again with failed attempts that were thwarted or abandoned before killing 4+ victims.

In previous work, we have shown how an abstracted method of contagion containment, focusing on intervening at the level of cultural scripts that fuel the contagion, may be effective at reducing this form of violence. This work advances that effort by identifying the specific parts of a criminal script in the progress of a terror contagion for intervention and creating a framework to associate the cultural scripts that drive those pieces forward.



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