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## Understanding the Causes of School Violence Using Open Source Data

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## **Purpose**

This project applied two major criminology theories to better understand the causes of school shootings. First, Sampson and Laub's (1993) developmental/life course social control perspective seems ideally suited to shed light on school violence. Few studies (e.g., Shecory & Laufer, 2008) have investigated if social control theory explains the types of violence that occur in schools. This perspective includes an extensive set of constructs designed to measure and analyze developmental patterns over the course of individuals' lives and assess the impact of precursor, enduring, and contemporaneous variables. Sampson and Laub (1993; Laub & Sampson, 2001) stress turning points that may or may not occur over an individual's life-course. If certain turning points occur, individuals become more connected to society and its institutions, have higher levels of social control, and are thus less likely to be involved in violence.

Second, we applied rational choice and situational crime prevention (SCP) perspectives to understand school shootings. These approaches highlight individual decision making and, like life course perspectives, note the dynamic nature of criminal participation. Rational choice and SCP argue that for crime to occur there must be the opportunity to commit the offense. Opportunities vary across situations, and successful interventions are often able to reduce or remove the availability of crime opportunities. Schools are controlled environments, although there are significant variations in the amount and types of control instituted at schools directed at preventing school violence. Importantly, though, research has found that more controlled environments are more successful in implementing SCP strategies (Wortley, 2002) which is why we thought it was a useful framework to complement the developmental social control perspective.

The most likely reason that life course and rational choice frameworks have not yet been systematically applied to school violence is the lack of reliable empirical data. We directly addressed this gap by creating The American School Shooting Study (TASSS),<sup>1</sup> a national, open-source database that includes all publicly known shootings that resulted in at least one injury that occurred on K-12 school grounds in the U.S. between January 1, 1990 and December 31, 2016. We created TASSS to use its unique data to take full advantage of the theoretical insights from life-course theory and SCP to expand knowledge about the causes of school shootings.

Although research on school violence has increased in the last 30 years, important gaps in our knowledge remain (Newman et al., 2004; Rocque, 2012). The growth in research has been driven in part by high levels of public concern that likely coincide with the publicity following high profile rampage shootings (Goode and Ben-Yehuda, 2009). Federal funding has begun to help in filling the empirical gaps, but only recently have researchers attempted to identify incident level attributes and develop theories to explain the etiology of school shootings (Rocque, 2012). To date, research attention on the individual, institutional, and community level causes of school violence has been hindered by a lack of valid data and appropriate comparison groups.

We therefore built TASSS and analyzed its data to accomplish three specific objectives to benefit law enforcement, school officials, policy-makers, and the social sciences:

First, we used our open source methods to empirically document the nature of the problem. While mass school shootings where current students commit the attack create public fear and receive much attention from the media and government, school violence encompasses a

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<sup>1</sup> We initially titled our database the U.S. School Shooting Database (SSDB), but subsequently changed the official name to The American School Shooting Study (TASSS) to deconflict with the name of a similar existing project.

broad variety of disparate acts. For example, cases include shootings by non-students who come onto school grounds as well as shootings occurring when school is not in session. The very public nature of school buildings, the role they play in communities, and the different kinds of shootings that occur, must be used to provide important contextual information for prevention efforts. In addition, the fact that there is no universally accepted definition of school shootings, or school violence generally, has led to confusion among both educators and policy makers in how to best address growing safety concerns. At present, even the nature and magnitude of the threat is truly unknown. This lack of information means that policy makers are often left to make decisions in a vacuum and are not able to incorporate empirically identified knowledge patterns and trends in their approaches. Our project therefore sought to clarify and categorize the types of shootings that occur in schools or on school property to help researchers and policy makers better understand the nature of the problem.

Second, we sought to provide a comprehensive understanding of the perpetrators of school shootings and highlight significant factors. Currently, there are few rigorous efforts to assess whether different types of school violence incidents, for e.g., mass and non-mass school shootings, are actually comparable. Our application of developmental social control theory and the situational perspective will further our understanding of how individuals make choices and seek out opportunities, follow divergent pathways, trajectories, transitions, and turning points, as well as how they may vary in terms of social control influences and individual contingencies that characterize their longitudinal behavioral trajectories. Because our data covers a 27-year period, we will be able to examine the impact of policy/school related changes that were implemented in response to high profile and other incidents and investigate if school shootings have increased over time as has been claimed in recent years.

Third, our data includes shooting incidents where fatalities occurred (including mass shootings or active shooters as well as cases where only a single person is killed) in addition to shooting incidents where nobody is killed and only injuries resulted. Focusing on student perpetrated shootings, we compared fatal and non-fatal attacks to identify intervention points that could be exploited by school officials, law enforcement and others to foil these offenders and/or reduce the harm caused by shootings. In addition, we distinguish shootings by school actors and those that occur on school grounds, but are unrelated to the school and its students, to improve recommendations for situational prevention.

In addition to the quantitative data collection we also crafted 30 detailed case studies that included 35 perpetrators. We selected both fatal school shootings and school shootings that only involved injuries to more deeply capture the influence of both developmental social control and situational prevention mechanisms. We crafted in-depth biographical case studies to highlight the dynamic life course pathways contributing to different school violence outcomes. We also constructed detailed narratives of each perpetrator path to the school violence incident using life history. We identified situational attributes, security gaps, and opportunities that facilitated the crime's commission. We explored how these perpetrators planned the attack, the preparatory steps they engaged in, and how they committed the shootings.

Our goal is to provide evidence-based understanding of etiological issues related to school violence by documenting where and when violence occurs and highlighting key incident and perpetrator level characteristics. We will thus help law enforcement and school administrators differentiate between the kinds of school shootings that exist, to further policy responses that are appropriate for individuals and communities.

## **Building The American School Shooting Study (TASSS)**

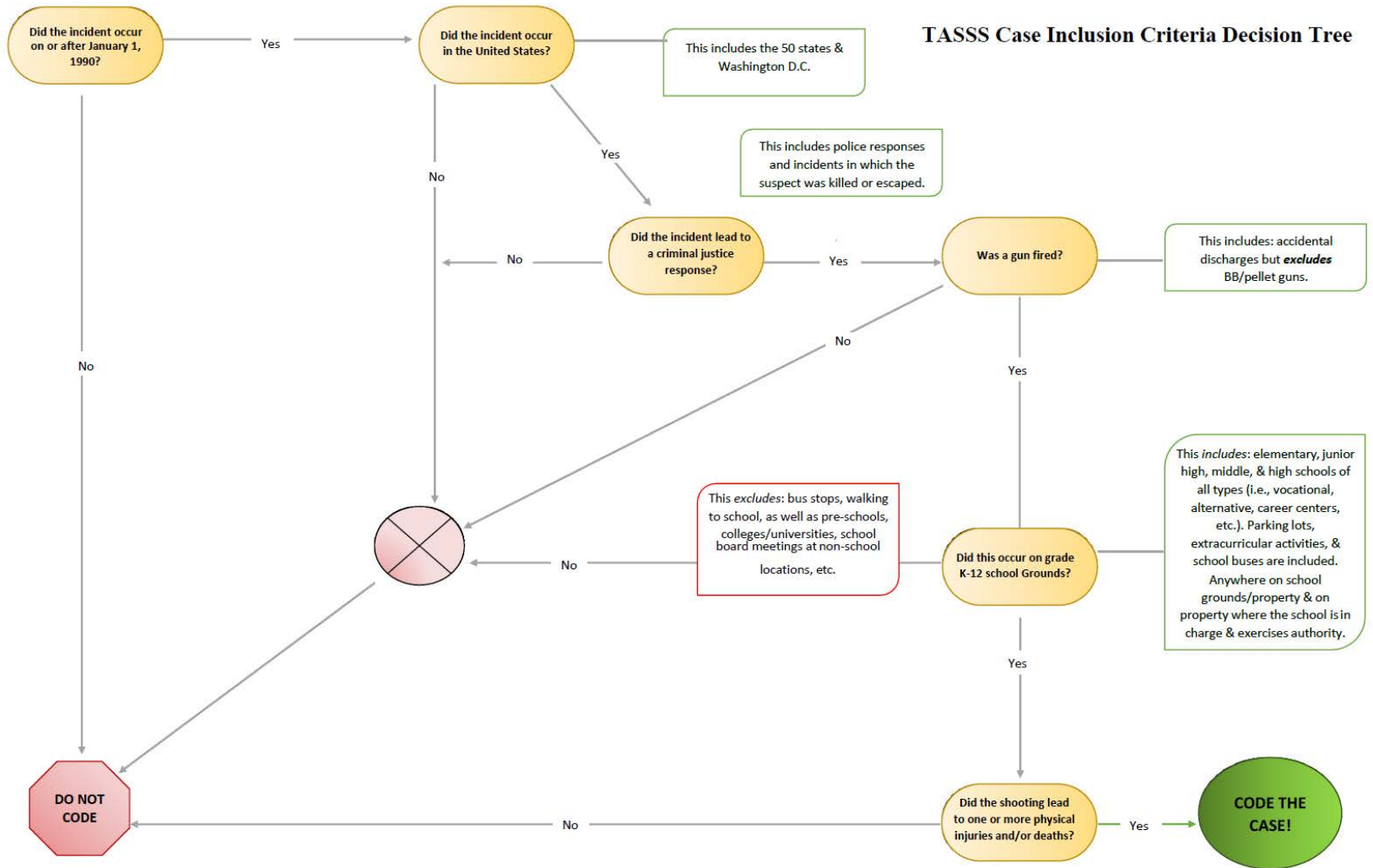
TASSS focuses on all school shootings that occurred in the United States between 1990 and 2016. We employed a data collection protocol that we have successfully used to study terrorism and similar phenomena, and that like school shootings are hard to investigate using traditional criminology sources. We used open sources, publicly available information including media reports, court records, social media and other sources. Our use of public information makes the research process more transparent and raises few IRB and privacy issues. Dugan and Distler (2016, p.192-93) note that the “ubiquity” of the news and “synergistic relationship” between the media and violence makes this method ideally suited to capture unique events. In fact, the use of open source methods has increased dramatically in the last 15 years and withstood peer-review scrutiny from both federal funding agencies and leading criminology journals (LaFree, 2011). Compared to traditional methods used to report crime, the advantage of open-sources lies in the detailed quality of the data (Ackerman & Pinson, 2016; Freilich et al., 2014; Lynch, 2018; Parkin & Freilich, 2015; Parkin & Gruenewald, 2017). Researchers can leverage this detailed information and create codebooks that directly measure important constructs related to theory rather than relying on pre-composed datasets (Lynch, 2018; Parkin & Freilich, 2015; Parkin & Gruenewald, 2017). In addition, open source materials are flexible, allowing for the extraction of both quantitative and qualitative information useful for crafting case studies. Newly created open source databases, are currently being used to study hard to reach criminal activities, and in addition to school shootings and terrorism, focus on officer involved shootings, mass shootings, serial killers, sex offenders, and cyber-crime, among other offenses. Many of these efforts are federally-funded. We next explain, step-by-step, how we built TASSS and the protocols we employed (see also Greene-Colozzi, Freilich & Chermak, in press).

### *Inclusion Criteria*

To be included in TASSS, a number of requirements must be satisfied. Figure 1 below includes TASSS's inclusion criteria decision tree that we applied to each potential incident.



**Figure 1: TASSS Inclusion Criteria Decision Tree:**



As Figure 1 illustrates six criteria must be satisfied to include a shooting in TASSS. First, the shooting must have occurred between January 1<sup>st</sup> 1990 and December 31<sup>st</sup> 2016. Second, it must have occurred in the 50 United States, including Washington DC. TASSS does not include incidents that occurred in US territories, or in other nations. Third, the shooting must have resulted in a criminal justice response. This does not mean that criminal charges must have been filed, but a formal investigation must have occurred. While incidents such as ones where a perpetrator committed suicide and did not injure others, a gun accidentally discharged, or the perpetrator escaped, may not result in an arrest and formal criminal charges, they will lead to investigations.

Fourth, a firearm must have discharged explosives to propel a projectile. Thus, TASSS excludes plots (no discharge occurred) as well as cases where the offender used a knife, blunt instruments, their fists, explosive devices, cars, a BB or pellet gun or any other non-gun weapon to cause injury or death.

Fifth, the shooting injury must have occurred at a K-12 school. This includes elementary, junior high, middle, and high schools of all types, including vocational, alternative, career centers, and private schools. We exclude shootings that occurred at colleges, universities, nurseries, or school board meetings occurring at non-school locations. We distinguished between K-12 and universities in light of the different policy implications for each of them. In addition, the shooting must have occurred on the K-12 school's grounds. The school's grounds include both inside the school building, and outside places such as yards, parking lots, etc., that are also school property. TASSS also includes shootings that occur on school buses, or at school stadiums that are not on the school's precise grounds, but where the school still has the loci of control, and exercises authority over that environment. For example, it includes football

games/basketball games/dances when they occur on or off school property, if the school has insured the event and is in control. However, TASSS does not include cases that are right next to a school, such as the sidewalk right in front of the gate, or at the corner, if they are outside the school's property. Similarly, we exclude shootings at bus stops and victims walking to and from school when they are outside school grounds.

Importantly, the shooting only has to *occur* on the school grounds, it does not have to be related to the school. In other words, TASSS will include shootings that occur in a school yard, even if the offenders, and victims are non-students, and the motive (such as a drug deal gone bad) has nothing to do with the school, so long as the other criteria are met. Similarly, it is immaterial if school was in session when the shooting occurred. TASSS includes shootings that take place both during and after scheduled school hours and when school is not in session such as the summer or winter breaks.

Sixth, the gun discharge must injure or kill at least 1 person with a bullet wound. This includes intentional shootings, accidental discharges, and suicides. However, shootings that resulted in no gun injuries or deaths, such as when a school is hit by a stray bullet, are excluded.

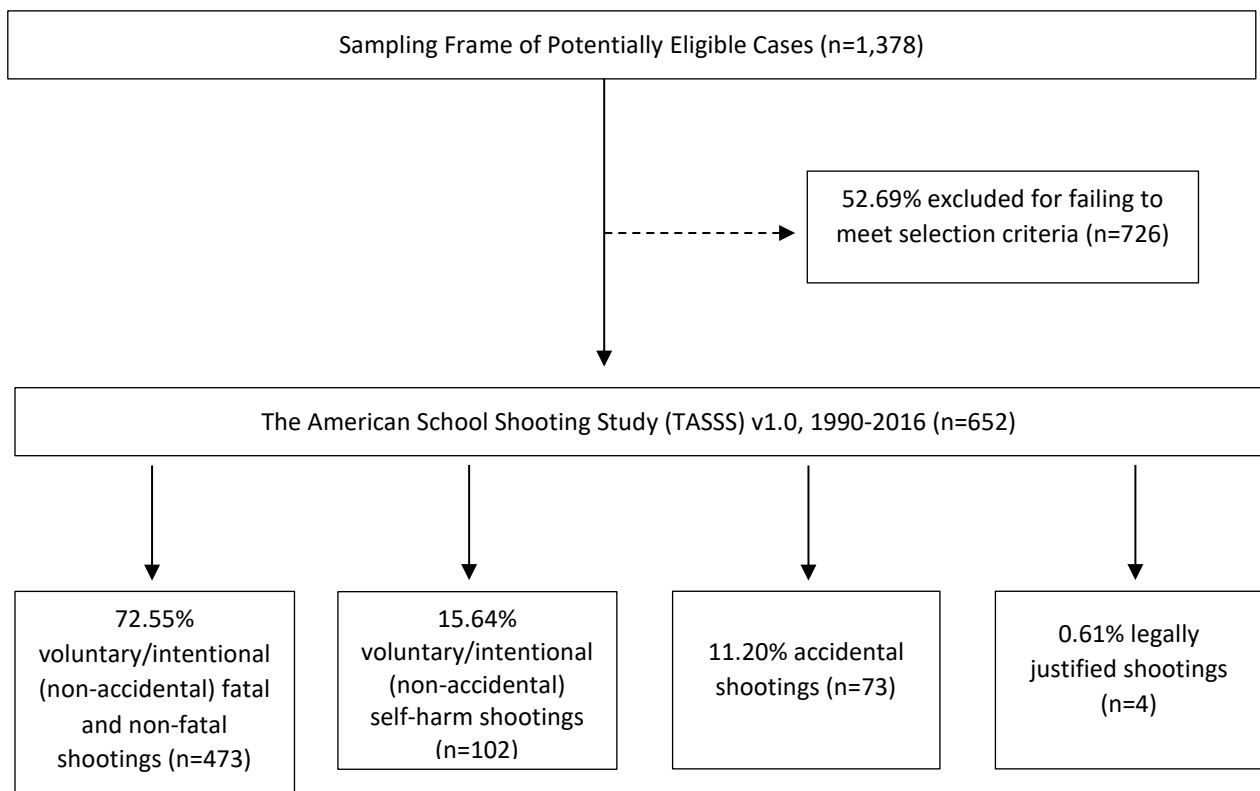
### *Identifying Incidents*

Our next step identified all school shootings that satisfied our inclusion criteria. We employed a multi-tiered effort and reviewed existing databases, chronologies and listings, official records, law enforcement reports (e.g., from the FBI; NYPD; Secret Service), scholarly works (e.g., Hagan & Pah's database; Capellan's database; K-12 School Shooting Database; schoolshootingdatabase.com; schoolshooters.info, etc.), newspaper accounts/listings (for e.g., *USA Today*; *Washington Post*), other media's listings (e.g., CNN; NBC), online encyclopedias

(e.g., Ballotpedia; Britannica; Wikipedia), blogs, and watch-groups/advocacy reports/listings (e.g., Brady Campaign; Everytown). We also comprehensively searched and scraped the Internet and conducted keyword searches using major search engines like Google, Bing, and Yahoo, and leading newspapers like the *New York Times*, to locate relevant events.

We reviewed over 35 sources to create a listing of all known school shootings that potentially satisfied TASSS’s inclusion criteria. We aimed to be as thorough as possible and to examine all sources that might contain relevant events. Our review of these sources identified 1,378 potential incidents. As Figure 2 demonstrates we excluded over 50% of them from TASSS because they failed to meet our inclusion criteria.

**Figure 2: Flow Chart of Case Identification and Inclusion for the TASSS**



Ultimately, 652 cases satisfied TASSS's inclusion criteria. Almost three quarters of these cases were voluntary intentional shootings that killed or wounded at least one person. Another almost 16% were suicide or attempted suicide only shootings, while 11% were accidental gun discharges that killed or wounded at least one person. Four incidents were ruled legally justified shootings. We discuss these events in more detail in the findings section below.

Our review of different sources found that some incorrectly included cases that did not meet their own inclusion criteria. For example, sources commonly included shootings that occurred across the street, or a block away from the school. Indeed, one source included close to 100 events that were actually committed outside the school's grounds. While some school shootings are fluid events encompassing a series of encounters that occur in a short amount of time and span various locations, others are straightforward and it is clear where they occurred. In addition, certain sources missed incidents- that other sources captured- that actually satisfied their own criteria. This bolsters our conclusion about the importance of reviewing as many sources as possible.

A recurring issue we confronted involves school shootings that do not occur inside a school building but were committed outside. Often news reports of outside shootings refer to the school as a landmark to situate its general location for readers and are vague about details. While some stories note the shooting occurred in the school parking lot, or on the school steps; other reports are unclear and simply state the victim was "shot in front of the school" or "outside/behind the school," etc. For these ambiguous events we invested time using Google Maps, reviewing school plans and related sources, and tracking down official school and/or police statements about the shooting to identify the precise location to determine if it was

actually on school grounds. All three PIs and the project managers at each school collectively discussed and decided whether or not these ambiguous shootings occurred on school grounds.

A major issue with open source data is selection bias, whether the open source strategies are systematically excluding or only capturing certain kinds of cases, resulting in potentially biased coefficients and other misleading findings. However, studies find that using vast arrays of sources- including police and official reports, as well as academic and watch-groups sources- like we did here, along with applying clear specific inclusion criteria will enhance the data's reliability and reduce bias (Chermak et al., 2012; Dugan & Distler, 2016). Again, our cross-referencing of incidents across all the sources identified school shootings that we otherwise would have missed.

To further address possible selection bias we relied upon our search files (we discuss our search files in more detail in the next section) on each incident. Sometimes specific incident search files include articles that reference other school shootings in passing or contain a chronology or listing of school shootings. It was common for media outlets to include listings of all school shootings that occurred that year across the nation; or to provide a listing of shootings spanning a number of years for that city, state, or region. We flagged all these cases, and investigated them. Most of these shootings were either already in TASSS or failed to satisfy our inclusion criteria.

We identified 20 school shootings, however, that the search files referenced, but that were not in TASSS, or any of the sources we reviewed and that satisfied our inclusion criteria. We added these cases to TASSS. In a sense, our incident open source search files allowed us to evaluate whether our prior identification efforts (e.g., the sources we reviewed and the web-engine searches we conducted) were successful in coming close to capturing the universe of

eligible events. The 20 cases that our identification efforts missed represent a little more than 3% of all TASSS incidents (n= 652). In other words, our “new source” (i.e., TASSS incident search files) only provided a small number of events not identified in previous sources. This finding supports the notion that TASSS is approaching capturing the universe of eligible events (Chermak, Freilich, Parkin, & Lynch, 2012), though as we explain below we are more confident this is the case for fatal, as opposed to earlier non-fatal incidents.

Finally, only 2 of these 20 “new” events involved fatalities- 1 suicide, 1 homicide- and most were from the early 1990s. Thus, it appears TASSS’s methods have successfully identified almost all fatal school shootings that satisfied our inclusion criteria. This is perhaps not surprising, as we would expect school related homicides to receive attention. It also makes sense that non-fatal early 1990s cases are more likely to be missed by open sources than fatal shootings and more recent events. But, it suggests that we must be somewhat cautious in interpreting findings from non-fatal early 1990s shootings.

### *Searching Incidents (Including Offenders & Victims) and Schools*

Once we identified all shootings that satisfied our inclusion criteria, as noted, the next step was to gather all publicly available information on the event, the offenders and victims, and the school. We treated each incident, and the involved offenders and victims, as a case study with the goal of compiling all published open-source information on it. We modified and applied open source search protocols from previous work to thoroughly search these incidents. After pre-testing these protocols, we identified new, innovative, and useful sites, strategies, and web-engines, that we added to our search protocol.

Once we had exhausted this process our search protocol included over 60 web-engines grouped within a primary and secondary open-source search. These include: (1) media aggregators (e.g., Google; Bing), (2) web-based newspaper archives (e.g., newspapers.com, newspaper archive), (3) legal research services (e.g., Westlaw; Recap), (4) administrative sources (e.g., state Department of Corrections records, FBI's NIBRS and SHR, local police websites), (5) academic sources, (6) notable incident trackers, (7) people searches and white pages, (8) social media, (9) public records, and (10) criminal and background check services. **Please see Appendix 1: TASSS Open Source Incident, Offender & Victim Search Protocol.** We searched these sources using search terms to identify relevant information about each event.

Our open source searches uncovered a variety, and at times, a substantial amount of information, though of course this varied by incident. The information uncovered included media accounts; government documents; court records- indictments; appeals; Department of Correction records; videos; blogs; books; biographies, after-action reports, published interviews (both scholarly and journalistic), obituaries, photos of the offender and victim, watch-group reports, scholarly accounts, social media information, and other materials. The searchers extracted these individual articles, Webpages, and other materials and organized them into a detailed qualitative record pertaining to each school shooting. They stored this primary information chronologically within a Microsoft Word file, referred to as the "incident search file."

We also conducted separate searches to obtain all available information on each of the targeted schools. Our initial pre-tests demonstrated that only certain incident search protocol websites generated useful school information, and that additional specialized searches were also needed. For instance, school district board policies often include the dates of implementation for metal detectors, ID badges, cell phone/internet policies, CCTV cameras, and other SCP like



factors we are interested in. Another site, schooldigger.com, provides historical demographic and student/teacher ratios dating back decades, in most cases; while National Center for Educational Statistics (NCES) Express Tables, provide basic school demographics and budget information. We therefore created a separate school search protocol consisting of over 20 web-engines. **Please see Appendix 2: TASSS Open Source School Search Protocol.** The uncovered school information includes education/school documents, school and district websites, school summary /rating sites, other sources, and pictures of the school (for SCP variables). The searchers also extracted these individual articles, Webpages, and other materials and organized them into a detailed record pertaining to each school. They stored this information within a Microsoft Word file, referred to as the “school search file.”

### *Search Files Reliability*

We implemented a number of steps to enhance the quality of our search files and insure their reliability. First, we conducted systematic RA searcher trainings to ensure uniformity and reliability across searchers and research sites. All trainings included at least two in-person seminars. Project managers reviewed existing school and incident search files to familiarize searchers with each search engine and database. They also reviewed how to use connectors and commands (e.g., quotations, AND, etc.), search terms (e.g., school name, and “shoot,” etc.), and how to narrow searches to the specific locations and time periods in which the shooting occurred, to increase search yields. All searchers received the TASSS codebook, school and incident search file templates, inclusion criteria decision tree, a “search tips and tricks” document, and were taught to properly collect, organize, and store information on each shooting file. Each searcher was provided “test cases” to search and were told to record all search terms they used. Project

managers reviewed and provided feedback and instructions on improving the search. This process was repeated as many times as needed until the file was sufficient to move forward. Finally, after searchers demonstrated a firm grasp on the search protocols, and produced satisfactory test cases, they began searching continuously. We continued to spot check each search file for comprehensiveness, replicating the above process, and sending it back when necessary. We trained the searchers to “think as investigators,” to discover new and additional material about the shooting incident and the actors involved. The goal was to recreate as best we could both the crime episode from start to finish, and the offenders’ life history, including information about their families, friendship networks, communities, early childhood experiences, prior criminal and antisocial activity, negative life events, etc.

Second, and importantly, unlike other studies, we include every single piece of information, even tangential data and repeat information, related to the intentional shooting offenders, victim, incident, and school, in the search file. Our prior work has demonstrated these more thorough files are crucial in reliably capturing information. We found, for example, that as a case investigation and court proceedings progressed over time, more information became available. Some stories focused on profiling the offender or victim, and included quotes from police officers and others heavily involved in the case. At times these subsequent stories provided new information that resolved contradictory and unclear prior accounts.

Third, we addressed the potential limitation that open-source may include information of varying quality and reliability and the risk that some of this information is inaccurate (Huff-Corzine, McCutcheon, Corzine, Jarvis, Tetzlaff-Bemiller, Weller, and Landon, 2014). For example, an incident search file may contain a court decision, a watch-group report, a number of

media articles, government documents, and a blog. Sometimes these various source types contain conflicting information.

**Table 1: Source Type Reliability (descending order of reliability)**

<b>Reliability:</b> Less <-----> More	Appellate court proceedings
	Court proceedings subject to cross examination (e.g., trial transcripts)
	Court proceedings or documents not subject to cross examination (e.g., indictments)
	Corroborated information from people with direct access to information provided (e.g., law enforcement and other key informants)
	Uncorroborated statements from people with that access
	Media reports (local and major national [NYT, WSJ, WP, NPR] more reliable)
	Watch-group reports
	Personal views expressed in blogs, websites, editorials or Op-Ed, etc.

As Table 1 indicates, in these situations, we granted greater weight to the more “trusted” sources following our prior work (Freilich, Chermak, Belli, Gruenewald, and Parkin, 2014; Sageman, 2004) that ranked source types by their reliability (e.g., court document versus anonymous blog). In addition, if two media accounts disagreed, we privileged known outlets, and recognized established local outlets over other media reports. In rare cases, when we had two competing sources of equal weight, we averaged the conflicting values. We also gave more credence to reports published after the event unfolded and after the “dust settled.” Often accounts published immediately after the event included inaccurate facts, such as incorrect names and ages, that were corrected as the investigation transpired and court proceedings occurred.

Fourth, we created measurement attributes to both enhance the transparency of our search files, and to measure each individual file’s reliability. Since most of our findings focused on intentional shootings, Table 2 provides the total number and types of documents found in intentional shootings committed by known offenders (n= 354). One hundred nineteen of the intentional shootings were committed by unknown offenders.<sup>2</sup>

<b>Document Type</b>	<b>Total</b>	<b>Mean</b>	<b>Median</b>	<b>St.Dev.</b>	<b>Min</b>	<b>Max</b>
Court	709	2.00	0.00	6.77	0	76
Police	210	0.59	0.00	2.23	0	37
Other Government	443	1.25	1.00	1.73	0	19
Education/School	93	0.26	0.00	2.75	0	51
News Media	27001	76.27	25.00	174.54	0	2078
Scholarly	613	1.73	1.00	3.27	0	21
Websites	636	1.80	1.00	3.17	0	20
Other	545	1.54	0.00	4.39	0	39
<b>Total</b>	<b>30179</b>	<b>85.25</b>	<b>31.00</b>	<b>179.85</b>	<b>1</b>	<b>2091</b>

To begin, we coded the total number of unique source documents (aggregate) in each search file. As Table 2 illustrates we located over 30,000 documents on the 354 known offender intentional shootings incidents. The average search file contained over 85 documents; though there was variation across files with a range of 1 to over 2,000 documents.

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<sup>2</sup> The 119 unknown offender intentional shootings included three groups of cases: (i) *True unknown cases* where the suspects were never identified, and investigators did not know or suggest a motive for the shooting; (ii) *Unknown suspected intentional cases* also involved unidentified shooters, but investigators believed they knew the motive (e.g., gang-related, feud, argument, retaliation, etc.); and (iii) *Unnamed known intentional cases* were those characterized by a known perpetrator who was not named by investigators, most often due to their status as a minor. In these incidents, the perpetrator was identified, arrested, and adjudicated, but their identity was not shared with the media or public. We found that 44 cases were true unknowns, with no suspect identified and no apparent motive. An additional 40 cases were unknown suspected intentional, with police unable to identify a suspect, but suggesting a known motivation for the shooting. Finally, 35 cases were unnamed known intentional shootings, where the perpetrator was identified and arrested, but not named.

This is a crude measure though as it simply tallies the number of documents in the file without accounting for quality. Table 2 therefore also disaggregates the overall number of search documents to measure them by source type. It includes eight categories (police, court, other government, education/school, news, scholarly, websites, and other document types) and measures how many of each category, a search file has. An average search file includes almost 4 court, police or other government documents combined; and as Table 1 above illustrated these are considered more reliable sources. Not surprisingly, the most common type of document found were media reports and the average file included 76 news documents. Search files also usually included one scholarly document (for e.g., doctoral dissertations examining school safety, relevant information from Langman’s site; scholarly books by Newman and others) on average and close to two documents from websites.

Finally, and importantly, we measured our overall assessment of each search file’s accuracy and reliability.

<b>Table 3. Estimated Open-Source Data Quality for Intentional U.S. School Shootings Involving Publicly Known Shooters (n=354)</b>			
Number of Indicators	Reliability Assessment	N	Percent
5	Strong	40	11.30
4	Somewhat Strong	83	23.44
3	Moderate	147	41.53
2	Somewhat Weak	83	23.45
1	Weak	1	0.28
0	Unreliable	0	0.00
Indicators include: (i) Shooting clearly on school grounds (inside the building; explicitly stated as occurring on school grounds - like the parking lot; or there is picture illustrating it on school grounds & there is no contradictory information); (ii) Court opinion that contains a factual description of the case; (iii) Department of Correction or official police/government information on the offender; (iv) News or other source contains profile/background information on perpetrator or victim; (v) News articles and/or other sources contain information from key actors (investigating police; surviving victims; witnesses) that provide information close in time to the attack.			

Table 3 includes a reliability index that we created after we had already reviewed hundreds of search files and coded these cases (i.e., a sort of pre-test). We identified which

factors tended to characterize search files we had more confidence in their accuracy. These factors include the presence of court or government documents, Department of Corrections Records, and information on the life histories of offenders and victims, information close in time to the shooting, and evidence it was clearly on school grounds.

Over one third of the search files for intentional shootings committed by a known offender scored a 4 or 5 indicating somewhat strong to strong reliability. Over 75% of cases scored a 3 or higher, indicating moderate to strong reliability. Only 23% of the files were somewhat weak, scoring a 2, and only one file out of the 354 incidents had weak reliability.

In sum, the search files on the 354 known offender intentional shootings are mostly robust, many contain over 65 documents, and most score well on our reliability index. On the other hand, the search files on the 119 unknown offender intentional shootings, not surprisingly, (as well as the suicide and accidental gun discharges), had smaller search files and lower reliability. Most unknown offender intentional shootings only received a reliability score of 1 or 2 and their search files, obviously, lacked information on the offender. But, for many of these cases we were able to locate temporally appropriate information on metal detectors, lockdown drills, security guards, resource officers, locked door security, fences, and hall monitors. Overall, since our analyses focused on intentional shootings, and excluded suicides and accidents, the majority of cases in these models scored well on both the number of documents and their reliability scores.

### *Operationalizing Life Course & SCP Quantitatively: Creating Codebooks*

To answer our research questions, and achieve our objectives, we needed to assess the importance of variables associated with both developmental social control theory, and SCP. We

created codebooks on the incident, school, and offender levels. We drew from, modified, and extended the variables from the Profiles of Individual Radicalization in the U.S. (funded by NIJ) codebook to operationalize developmental social control theory for our offender codebook, and the Extremist Crime Database (supported by DHS in the past) codebook to operationalize SCP for our incident, school, and victim codebooks. We pre-tested, modified and then finalized the codebooks.

The offender-level codebook includes demographic, socioeconomic status, and personal data (e.g., abuse and psychological concerns, suicidal thoughts, whether they were ever bullied, marriage,) attributes. The incident level codebook captures event level factors like the location of the shooting, where on school grounds it occurred, time of day, type of gun used, number of shots fired, whether school was in session, and type of incident (e.g., accidental shooting, self-harm/suicide only, intentional shootings, shootings involving unknown offenders, etc.). Our school codebook, in addition to measuring characteristics of the school overall, captures if the school did or did not have resource officers; police officers; metal detectors; whether the school was a single or multi-story building; and if the school was accessible.

After an incident was searched, it was assigned to another RA for coding. Similar to searchers, we systematically trained all coders to ensure uniformity and reliability of coding. All trainings included in-person meetings where project managers reviewed TASSS's inclusion criteria, codebook and coding protocols, and a previously coded case to highlight difficult coding decisions. As with searching, coders were first provided "test cases" to code. We then carefully reviewed the coding and provided feedback. We repeated this process as necessary until the coder was ready for continuous coding.

Coders keyed values into a secure online portal (i.e., data were encrypted when entered), which required from each coder a unique log in and password to gain access. This allowed us to track who accessed the database and when, if necessary. Our data were backed up daily. We exported these data to SPSS for analyses.

Importantly, before coding, all RAs participated in a 90-minute video-conferencing call, with our data manager who trained the PIs and PhD student coders on using the online format for coding. Our data manager also created a video webinar as well as written instructions about the online coding format and process that were distributed to the PIs and the coders for future use. All coders who subsequently joined the project were provided the written instructions, and were trained by site Project Managers (PMs) on the online coding process.

The coders were trained to first check the comprehensiveness of the search file and to send it back for additional searching if needed. This provided another opportunity to capture new information and sources that may have been missed in the initial searches. All incidents that were committed by a known offender were searched a second time to insure we did not miss information. During coding, RAs assessed the level of missing data on key variables and were mandated to conduct targeted searches for those data. For instance, if offender demographic information (e.g., race, SES) was missing, RAs searched for publicly available data on the offender's parents or relatives, such as DOC records, etc. Our coders also made good use of public record aggregators and other sources to fill in missing values. These are what we refer to as highly targeted follow-up searches to reduce missing values. Of course, these efforts were more successful for some variables than others; and the degree of missingness varied across our attributes.



All coders also participated in weekly or bi-weekly meetings with their project managers. During these meetings, coders reviewed cases, and project managers addressed any questions or issues that arose and provided project updates. Prior to Covid-19, these meetings were held in person; following school closures, the meetings were moved to the Zoom platform. The meetings lasted anywhere from twenty minutes to one hour, with each RA providing a detailed update of his or her progress over the past week and mentioning any coding or cleaning questions. This was an opportunity for all RAs and the PM to discuss individual cases, generalized issues, and overall procedure. It also helped ensure that goals were met, and improved communication among the RAs, the PM, and the PIs, who were often contacted if cleaning/coding issues could not be resolved during the weekly meetings. Weekly meetings were used by the PM to provide individualized assignment updates and/or broad procedural changes to the RAs. Finally, identified issues were then shared via TASSS's listserv with all project personnel to again ensure consistency across research sites.

### *Operationalizing Life Course & SCP Qualitatively: Case Study Protocol*

We also created a case study template to capture key constructs from both developmental social control theory and SCP. After pretesting, we modified and then finalized it. The template closely examines the dynamic life course of offenders to capture a more nuanced understanding of changes in their pathways. It also assesses the process and techniques the offender used when committing an act and assesses the presence/absence of control concepts as well as their intensity over time to contextualize the theoretical processes at work. We also used the template to explore the dynamic nature between motivations of the perpetrators and circumstances that may promote or lessen the impact of events. The template includes a chronological listing of the preparatory

and logistical steps necessary to execute the attacks and the timing of these steps in sequence to identify the opportunities the offender took advantage of. This information could be used to implement strategies to better respond to school shooters. To select incidents for the case studies, we stratified the sample into fatal (both mass and non-mass) and non-fatal events. We then selected events of each type. We wanted our cases to have heterogeneity; i.e., variation on key attributes identified by our research questions. Indeed, our selected cases included attacks that occurred both pre/post the Sandy Hook and Columbine mass shootings cases; attacks committed by extremists and non-extremists; loners as well as attacks committed by two or more offenders; and mentally ill and sane offenders, etc. **Please see Appendix 3: Case Study Template.**

### **Findings and Objectives**

We organize our findings by our 3 objectives and 5 research questions; and address each of them:

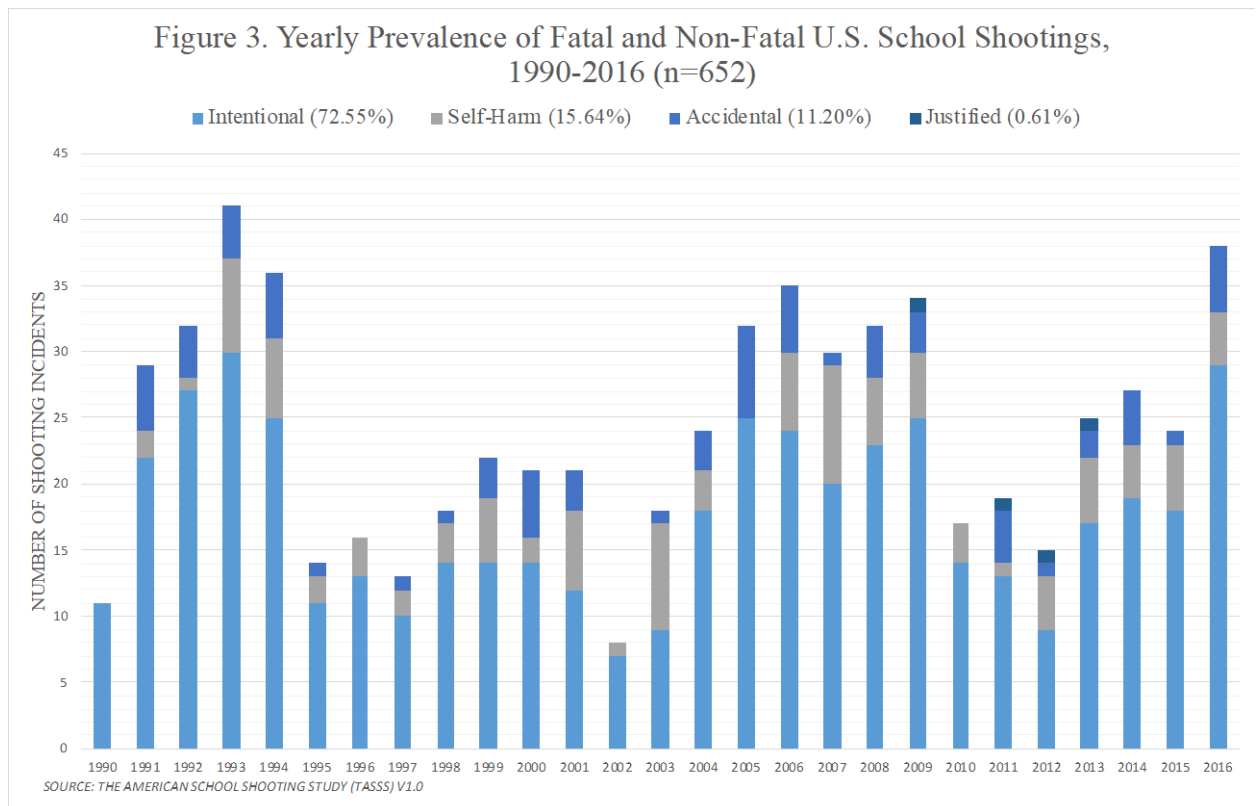
***OBJECTIVE 1: Document empirically the nature of the problem... clarify the types of school shootings occurring in schools or on school property.... create a typology of incidents so that the threat posed and harms caused by each category can be correctly identified and responded to. This will allow for the development of effective policy interventions and gives schools accurate information to ensure the safety of their students.***

***Research Question 1. How do the realities of school shootings compare to the media understanding of the seriousness of the problem? Specifically, we will document how common school shootings have been, how their patterns have changed over time, and whether there are individual and regional variations in activity. (Objective 1).***

***Research Question 2. Can school shooters be systematically located in different offender and/or offense type categories? (Objective 1).***

We first discuss the temporal distribution of school shootings. As noted, and as Figure 3 below demonstrates, we identified 652 school shootings that resulted in at least 1 injury in the

U.S. between 1990 and 2016. Again, almost three quarters of the shootings were voluntary/intentional acts (n= 473), around 15% were suicide or attempted suicide only shootings (n= 102), around 11% were accidental shootings (n= 73), and 4 shootings were legally justified acts.



As Figure 3 indicates, on average, there are around 24 intentional, suicide, and accidental school shootings each year. In fact, there has never been a year where all school shootings exceeded 41. The graph illustrates though that the number of shootings per year is not static, and there are peaks and valleys. There were only eight shootings in 2002, and eleven in 1990, while there were forty-one in 1993, thirty-eight in 2016, and thirty-six in 1994. There appears to be a slight upward tick when comparing 2010-2012 numbers to 2013-2016 numbers.

Much of the discussion on school shootings centers on intentional shootings, and not suicides or accidental discharges, and often it is those attacks targeting current students that garner the most attention.

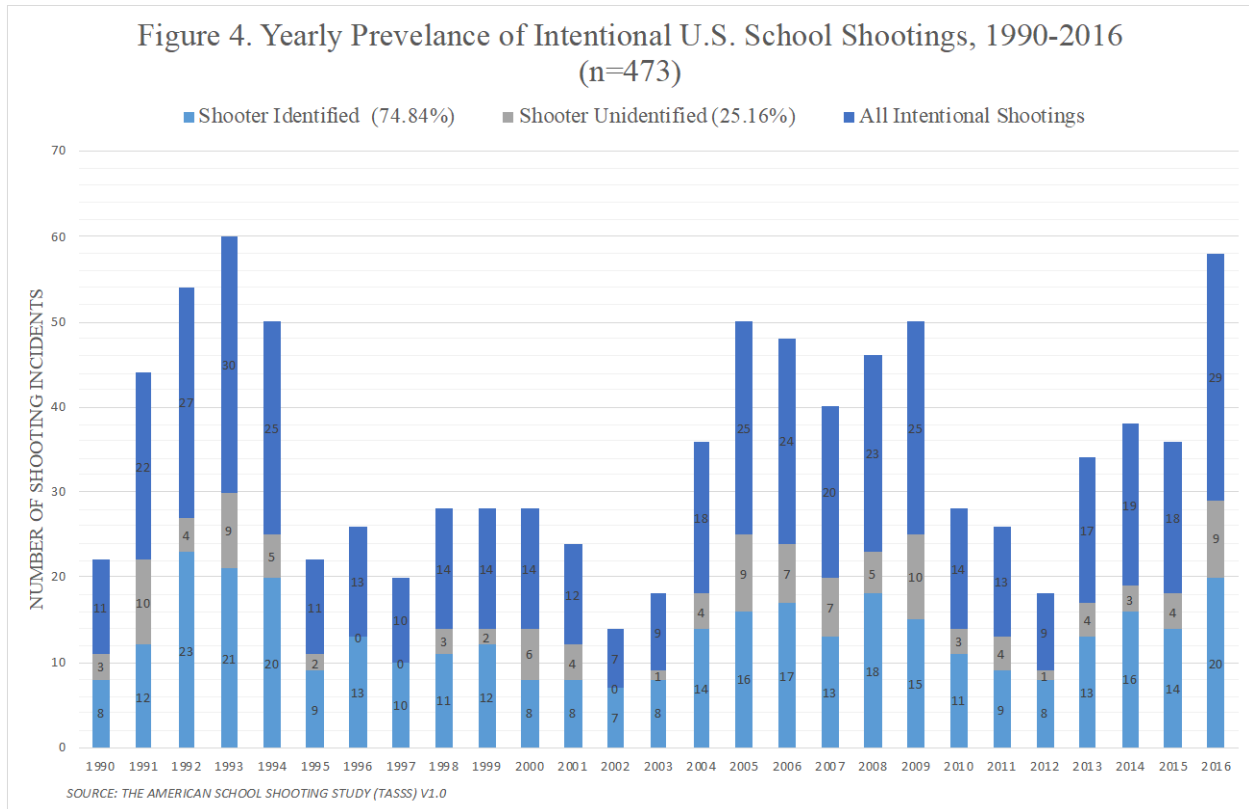


Figure 4 focuses only on the 473 intentional school shootings. On average, there are close to 18 intentional shootings each year in the U.S. These numbers also vary widely by year. There were seven in 2002 and nine in 2012, compared to thirty in 1993 and twenty-nine in 2016. Since these are low base rates, fluctuations might be expected. It is striking that over 20 shootings occurred every year from 1991 to 1994. Interestingly, only eleven shootings, a markedly lower number, occurred in both 1990 and 1995. In addition, 20 or more intentional shootings occurred every year across five years from 2005-2009. It also appears there was an increase in the number of intentional shootings from 2012 to 2016. The number of intentional school shootings in 2016 is the second highest across the 27-year time frame, only one less than the high of 30 in 1993.

Close to 74% (n= 354) of the intentional shootings (n=473) involve known offenders and on average there are 13 of these shootings each year, although this also varies widely by year. Only seven known offender intentional shootings occurred in 2002 compared to 23 in 1992. It is again striking that around 18% (n=63) of all known offender intentional killings (n= 354) occurred over three years in the early 1990s, 1992-1994.

Around 26% (n=119) of the intentional shootings were committed by unknown offenders. These yearly numbers ranged from 0 in 1996, 1997, and 2002 compared to ten in 1991 and 2009. There were fluctuations over time, as thirty-eight unknown intentional shootings occurred in the 1990s, fifty-three in the 2000s, and twenty-eight occurred between 2010 and 2016.

At first glance, the number of intentional unknown offender shootings seems unexpected. Again, these shootings included events where the suspects were never identified, and investigators did not know or suggest a motive for the shooting (n= 44), unidentified shooters where investigators believed they knew the motive (n= 40), and cases with a known perpetrator who the investigators never publicly identified most often due to the offender's status as a minor (n= 35). In these latter incidents, the perpetrator was identified, arrested, and adjudicated, but their identity was not shared with the media or public. A few incidents included victims with mild injuries, such as a slight graze from the bullet, and so it was sparingly covered. For these 119 cases we uncovered no, or very limited, information about the incident or the perpetrator, though as stated we found some information about the situational/school characteristics.

We next disaggregated the 473 intentional shootings to fatal and non-fatal events.

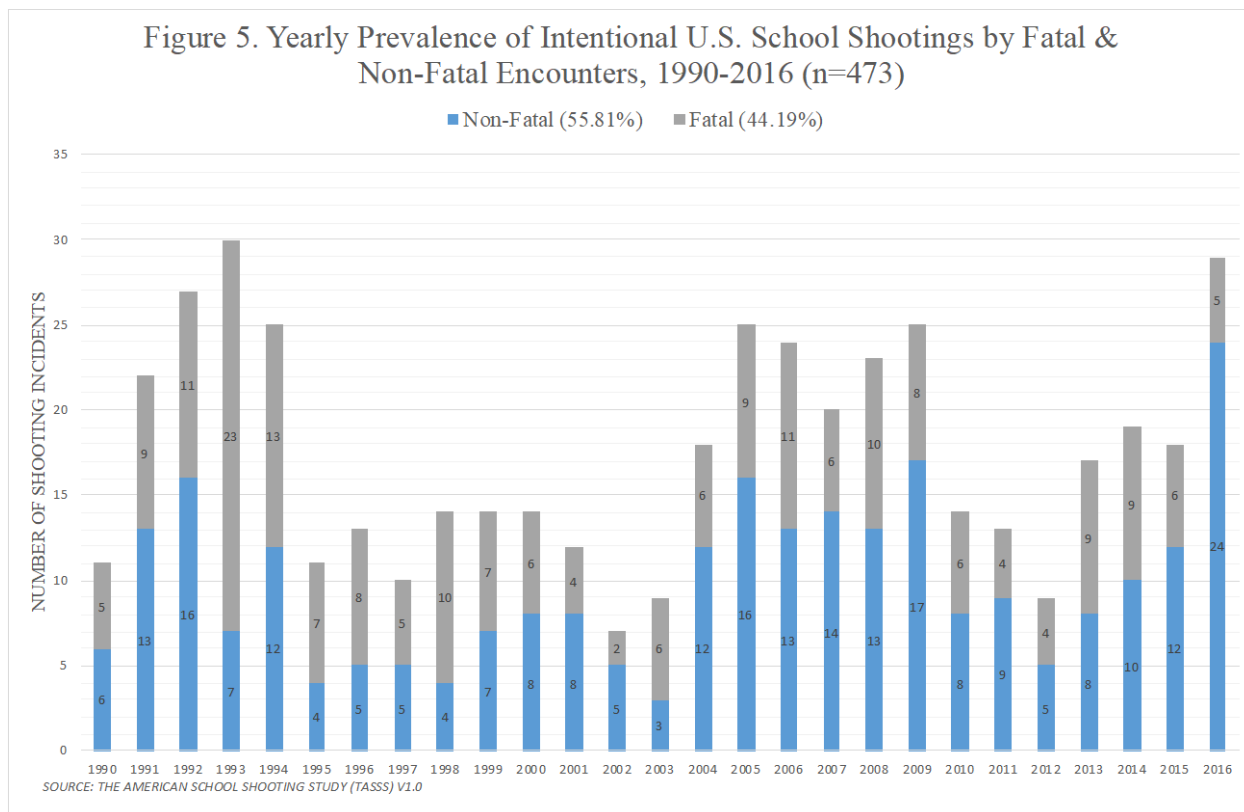
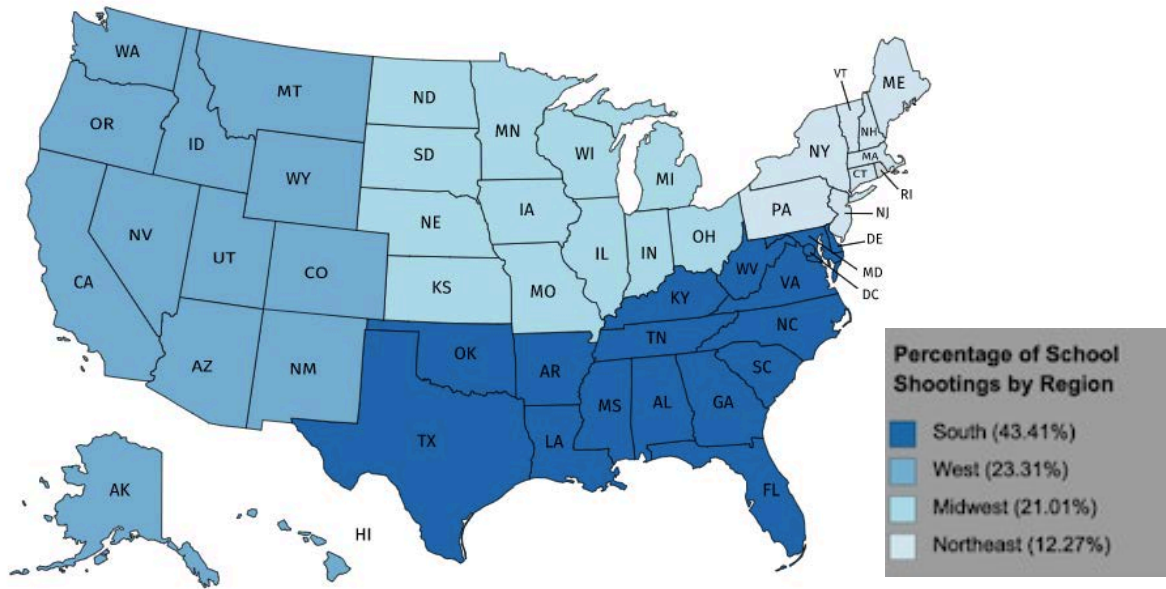


Figure 5 indicates that most intentional shootings resulted in non-fatalities. This makes sense since there are more attempted homicides than homicides every year in the U.S. Examining only the fatal intentional shootings, we find that 209 intentional shootings resulted in a death, an average of almost eight a year. We again find variation by year. There were only two fatal shootings in 2002 compared to twenty-three in 1993. Interestingly, the number of non-fatal intentional shootings has increased every year from 2012 to 2016 and doubled from 2015 (n= 12) to 2016 (n= 24).

There is also spatial variation in school shootings as they are not evenly distributed across the United States.

**Figure 6. Geographic Distribution of Fatal & Non-Fatal U.S. School Shootings, 1990-2016 (n=652)**



Map created with Mapcharts.net  
Source: THE AMERICAN SCHOOL SHOOTING STUDY (TASSS) v1.0

As Figure 6 illustrates well over three times as many school shootings have occurred in the South (over 43%) compared to the Northeast (over 12%), while the Midwest and West fall in between and have 21% and approximately 23% respectively.

We now delve deeper into the characteristics of the known, intentional school shootings (n=354). Table 4 provides the distribution of known adolescent (19 years old and younger) offender shooting incidents (n=252) compared to known adult (20 years old and older) offender shooting incidents (n=102).

**Table 4. Characteristics of Adolescent and Adult Known, Shooter Incidents**

<b>Variables</b>	<b>Adolescent (N=252)</b>	<b>Adult (N=102)</b>
<u>Severity</u>		
Fatal	117/46.4%	65/63.7%
Non-Fatal	135/53.6%	37/36.3%
<u>Number of Mass Shootings</u>		
+3 Fatal Victims	8/3.2%	3/2.9%
+4 Fatal Victims	4/1.6%	3/2.9%
<u>Location</u>		
Inside School	109/43.3%	29/28.4%
Outside School	143/56.7%	73/71.6%
<u>Timing</u>		
During School Hours	110/43.7%	28/27.5%
Before/After School Hours	142/56.3%	74/72.5%
<u>Student Status</u>		
Current Student	144/57.1%	N/A

Interestingly, Table 4 indicates that somewhat more of the adolescent perpetrated shootings were non-fatal (53.6%) compared to fatal incidents (46.4%), but most of the adult perpetrated events were fatal (63.7%).

Importantly, mass shooting homicides that occur in schools receive a tremendous amount of media attention. In fact, mass shootings like Sandy Hook, Columbine, and Parkland have become synonymous with school shootings generally. But, these well-known cases are outliers because mass homicide school shootings are exceedingly rare events. The academic literature is bewildering because there are fierce debates about what number of victims must be killed and/or injured to be categorized as a mass shooting.

Here, we provide the number of mass shooting incidents using three and four total fatalities as the cut-off number. Table 4 demonstrates that there were eight 3+ homicide victims, and four 4+ homicide victims, adolescent perpetrated mass shooting incidents between 1990 and 2016. In addition, there were three of both 3+/4+ homicide victims, adult mass shootings during the same time period. In sum, there were eleven (3+ homicide victim), and seven (4+ homicide victim) mass shootings in the entire 27-year period we examined. On average, there is less than a



single mass homicide school shooting event every two years. Five of the mass homicides occurred in the 1990s, three occurred between 2000 and 2009, and three occurred after 2010, two in 2012 and one in 2014 (though additional events, like the Parkland shooting in 2018, have occurred after 2016).

There are several interesting findings related to the location, timing, and status of the student shooter. The majority (almost 57%) of the adolescent shooting events occurred outside a school building and only close to 44% of them occurred during school hours. Just over 57% of the adolescent school shooting incidents were committed by a current student, while the remaining were committed by non-students. When we turn to the adult perpetrated school shooting events, Table 4 indicates the findings are somewhat similar. Only 28% percent of these shooting incidents occurred in the building and during regular school hours. For the adult incidents, 28.4% were linked to domestic violence, 6.9% were linked workplace violence, and 15.7% were linked to gangs, while almost 21% of the adolescent incidents were associated with gangs. These latter findings demonstrate the disparate nature of school shootings.

***OBJECTIVE 2: Second, we sought to provide a comprehensive understanding of the perpetrators of school shootings and highlight causal factors. Currently, there are few rigorous efforts to assess whether different types of school violence incidents, for example, mass and non-mass school shootings, are actually comparable.... Our application of social control life course and situational perspectives will further our understanding of how individuals make choices and seek out opportunities, follow divergent pathways, trajectories, transitions, and turning points, as well as how they may vary in terms of social control influences and individual contingencies that characterize their longitudinal behavioral trajectories. Because our data will cover a 27-year period, we will be able to examine the impact of policy/school related changes that were implemented in response to high profile incidents, including the 1999 Columbine shooting, and investigate if school shootings have recently increased as many have claimed.***

***Research Question 3. Are there important differences between mass and non-mass shooters (also known as rampage shootings)? Here we focus on the impact of turning points and trajectories on offending activities and situational characteristics (Objective 2).***

***Research Question 4. How strongly supported are the key theories by the empirical evidence? Do these theories work better for some sub-groups compared to others? (Objective 2).***

We next explore the impact of developmental (i.e., life course) social control and situational crime prevention variables on school shooters, using two complementary designs. First, following our open source protocols outlined above, we systematically collected quantitative data to make comparisons between mass, fatal, and non-fatal shooters. Our analyses make comparisons across demographic and socioeconomic factors, family and peer connections, criminal behavior, and personal issues, such as reports of family problems, school problems, and mental health concerns. We also examine whether a number of “hard-situational prevention” strategies (e.g., use of metal detectors, police officers or school guards, accessibility to the school, etc.) impact the fatal outcome. Second, we crafted 30 case studies on school shooting events, that included 35 in-depth biographical sketches of offenders to highlight the dynamic life course pathways contributing to different school shooting outcomes. Life-course models are founded upon two central concepts: trajectories and transitions. Trajectories refer to long-term patterns of behavior whereas transitions involve specific life events occurring over shorter periods of time; and they sometimes become turning points in the life course that alter or redirect behavioral trajectories. We used the case studies to capture more nuanced understanding of such developmental changes and transitions. We also captured key situational attributes, security gaps, and opportunities that facilitated the crime’s commission in these case studies.

### *School Shooters Across the Life Course*

To examine these life course issues, we focus on the known offender intentional school shooters (n= 354), encompassing 252 adolescent (age 19 and younger) and 102 adult (age 20 or

older) school shooters.<sup>3</sup> Since the outcome of interest (fatal versus non-fatal) is dichotomous, logistic regression is the appropriate technique. For this report we ran a series of bivariate logistic regression models. We decided to highlight the descriptive results, transparently describing the likelihood that a specific attribute alone impacted the outcome. We note when an attribute is statistically significant; although an argument could be made that if we succeeded in capturing our population of interest no statistical tests are needed.

Table 5 presents the quantitative life course data for fatal, non-fatal, and mass adolescent shooters, and Table 6 presents these data for adult shooters. The first data column in each table provides the statistical result for each logistic regression that compared fatal and non-fatal shooters of each type. We first examine the adolescent school shooters.

## Adolescent School Shooters

**Table 5. Adolescent Intentional Offender-Level Variables  
(Bolded Variables with Sig. Level in Parentheses)**

Variable	All (N=252)	Fatal (N=117)	Non-Fatal (N=135)	Mass (N=8)
Current Student	57.1%	53.8%	60.0%	75.0%
Male	97.6%	96.6%	98.5%	100.0%
Age	16.1	16.1	16.2	15.63
<u>Race</u>				
White*	27.6%	27.6%	27.6%	62.5%
African American	57.8	53.4	62.1	0.0
Hispanic	9.1	10.3	7.8	12.5
Other	<b>5.6 (.02)</b>	8.7	2.7	25.0
<u>Education</u>				
Elementary	2.1%	2.3%	1.9%	0.0%
Middle School*	31.4	35.2	28.3	50.0%
High School	65.5	61.4	68.9	50.0%
Other	1.0	1.1	.9	0.0
Employed	3.0%	2.1%	.9%	12.5%
<u>Social Economic Status</u>				
Low	<b>44.4% (.001)</b>	52.0%	32.3%	28.6%
Middle	<b>44.4 (.077)</b>	40.0	51.6	42.9
High*	11.1	8.0	16.1	28.6
Psychological Issues	26.2%	30.8%	22.2%	75.0%

<sup>3</sup> Our analysis here focuses on one perpetrator per incident. The majority of incidents only involved one shooter. If there was more than one perpetrator, then we randomly selected one of the perpetrators for analysis.

Parents				
Divorced/Separated	54.0%	56.9%	50.0%	42.9%
Other Family Issues	<b>33.7% (.096)</b>	27.4%	13.3%	50.0%
<u>School Problems</u>				
Suspend/Expulsion	21.2%	23.3%	19.4%	37.5%
Failure	12.3	15.4	9.6	12.5
Gang Member	28.0%	33.3%	23.2%	28.6%
Recent Death	8.3%	10.3%	6.7%	12.5%
Social Status Loss	6.3%	6.8%	5.9%	12.5%
Peer Aggression	29.0%	34.2%	24.4%	50.0%
Criminal Record	31.3%	35.6%	27.4%	37.5%

\*Reference Category

Table 5 illustrates that approximately 57% of the adolescent school shooters were current students, the vast majority were male (97.6%) and, on average, they were 16 years old. There were only minor differences across these three variables when comparing fatal and non-fatal shooters. Seventy-five percent of the adolescent mass shooters (N=8) were current students (perhaps an indication of the opportunity fellow current students provide as potential mass victims), all were male, and they too were almost 16 years old.

Twenty-eight percent of the adolescent school shooters were White, 58% African American, 9% Hispanic, and 5.6% were other races. Non-fatal adolescent shooters were somewhat more likely to be African American, somewhat less likely to be Hispanic, and significantly less likely to be in the other race category. Most mass school shooters were White (62.5%), 12.5% were Hispanic, and two (25%) were in the other race category, though both were Native American.

Since the average age of adolescent shooters was 16, it is not surprising that most of them were in high school. Sixty-one percent of the fatal adolescent school shooters and 69% of the non-fatal perpetrators were high school students. Half of the mass shooters were in high school

and half were in middle school. Few adolescent shooters were employed at the time of the offense, which makes sense considering their student status.

Overall, a similar number of adolescent school shooters were from low or middle social economic stratum, although the results varied somewhat across types. Fatal shooters were statistically significantly more likely to be from low income stratum and significantly less likely to be from middle income stratum. This finding seems consistent with strain theory arguments (i.e., more deprived persons committing more severe- fatal- acts, than less deprived actors), though also somewhat in line with developmental social control theory. Approximately 8% of the fatal and 16% of the non-fatal shooters were from high socioeconomic backgrounds. Approximately 30% of the mass shooters were in the low or high socioeconomic stratum, and 43% were in the middle stratum.

Twenty-six percent of the adolescent school shooters had psychological problems that could be documented in the open sources. Consistent with developmental social control expectations we found evidence in the open sources that somewhat more of the fatal adolescent school shooters (31%) had psychological problems compared to the nonfatal school shooters (22%); though we must stress this was not significant. Social control life course approaches could assume youths with psychological issues would not do well in school, have more difficulty forming bonds/attachment with classmates and teachers, and be less likely to be involved in collective activities; i.e., have more time on their hands. Thus, youth with lower attachment/commitment/involvement- social control- could be more likely to commit more severe school shootings. We also found that 75% of the mass shooters had psychological problems. But these are small numbers and it could also be a selection issue in that mass shooting fatal attacks by adolescents receive astronomical media coverage, much more than

other school shootings. It is possible more reporters diligently investigated the mass shooters, and due to conventional wisdom specifically looked for mental health issues, and were therefore more likely to find evidence of psychological issues (“look & you shall find”). In other words, if the same attention and resources had been allocated for the other categories of offenders, more psychological problems might have been identified.

We also explored variations between offenders for a number of family related issues, that are often used as constructs for developmental social control theory. Fifty-four percent of the adolescent school shooters had parents who were divorced, separated or not married. We also captured other significant family problems and included these as a dichotomous measure. For example, if we documented family violence or abuse, conflict in the home or poor parenting, or other evidence of a dysfunctional upbringing, we coded this variable in the affirmative. Life course approaches might assume that adolescents with divorced/separated parents, and/or from families suffering from violence, abuse or poor parenting, could have lower levels of attachment to family and others; and do less well in school; i.e., have lower levels of commitment, and involvement. Such youths with lower levels of social control may be more likely to commit fatal shootings. Somewhat in line with these expectations, 57% percent of the fatal shooters, compared to 50% the non-fatal shooters had parents that were divorced or separated; while in the expected direction this was not significant. Surprisingly, 43% of the mass shooters parents were separated or divorced. In addition, 33% of all adolescent school shooters had some other significant family issue. Importantly, over twice as many fatal shooters (over 27%) than non-fatal shooters (13%) had additional family issues, and this was a statistically significant difference. Further, half of the mass shooters had family issues, though again this is a low N.

Over 20% of the adolescent school shooters were suspended or expelled from school at some point, and 13% suffered other failures in school, such as not passing a class or receiving school detention. Fatal shooters were just somewhat more likely to have been expelled/suspended or suffer from a failure. Nearly 38% of mass adolescent shooters were suspended or expelled, and 13% experienced some other school failure.

Almost 30% of the adolescent school shooters were gang members, and close to 30% of the adolescent shooters had criminal records. Fatal shooters (33%) were somewhat more likely to be gang members compared to the non-fatal group (23%), but this was not significant. Similarly, fatal shooters (35%) were somewhat more likely to have criminal records compared to non-fatal shooters (27%), but again this was not significant. Thirty-eight percent of the mass shooters had a criminal record.

Finally, we explored whether any shooters had any family/or close friend who had recently died, whether they had suffered a social status loss, or had suffered peer aggression: a known threatening behavior or physical aggression towards the shooters, such as making serious threats to the shooter, attacking the shooter, or shooting them. This attribute includes bullying if there was clear evidence of actual aggression or severe threats, but could also include incidents like making threats to the perpetrator, jumping them, or attacking them. If only teasing or making fun of a perpetrator occurred, we did *not* code it as peer aggression. Approximately 8% all adolescent school shooters had experienced a recent death, and the results are similar across the different categories. Just over 6% of the adolescent school shooters had suffered some loss in social status and this was similar to the other categories.

Importantly, almost 30% of the school shooters had suffered peer aggression prior to the shooting, and as developmental social control theory predicts, fatal shooters were significantly

more likely to experience peer aggression. Specifically, 35% of the fatal school shooters compared to 25% of the non-fatal school shooters had suffered from peer aggression. Further, 50% of the mass shooters had experienced peer aggression, but again these are low numbers of incidents.

### Adult School Shooters

We now turn our attention to the adult school shooters, aged 20 and older. Table 6 presents our series of bivariate logistic regression models. We again ran a series of individual bivariate models to examine the odds each offender-level variable alone for the adult (20+ years old) shooters impacted the outcome of fatal versus non-fatal events.

**Table 6. Offender-Level Variables (Adult Intentional)  
(Bolded Variables with Sig. Level in Parentheses)**

Variable	All (N=102)	Fatal (N=65)	Non-Fatal (N=37)	Mass (N=3)
Male	96.1	98.5%	91.9%	100%
Age	33.65	34.05	32.95	24.0
<u>Race</u>				
White*	34.8%	34.8%	34.8%	100.00%
African American	44.9	39.1	56.5	0.0
Hispanic	15.9	19.6	8.7	0.0
Other	4.3	6.5	0.0	0.0
<u>Education</u>				
High School	78.4%	73.8%	86.5%	66.7%
Employed	<b>25.5% (.005)</b>	35.4%	8.0%	33.3%
<u>Social Economic Status</u>				
Low	<b>42.9% (.03)</b>	44.8%	33.3%	66.7%
Middle	<b>51.4 (.03)</b>	51.7	50.0	33.3
High*	5.7	3.4	16.7	0.0
Psychological Issues	26.5%	33.8%	13.5%	66.7%
Family Issues	29.4%	33.8%	21.6%	66.7%
Gang Member	15.7%	13.8%	18.9%	0.0%
Recent Death	1.0%	1.5%	0.0%	33.3%
Social Status Loss	23.5%	27.7%	16.2%	33.3%
Peer Aggression	1.0%	6.2%	0.0%	33.3%
Criminal Record	35.3%	35.4%	35.1%	0.0%

\*Reference Category



Table 6 shows that almost all (96%) of the adults who committed school shootings were male. All three mass shooters were male, and the number of fatal shooters were somewhat more likely to be male (98.5%) compared to nonfatal incidents (91.9%). The average age of the adult school shooters was 34 years old and was similar for fatal and non-fatal shooters. The average age of the adult mass shooters was 24 years old. In addition, 35% of the known adult intentional shooters were White, 45% African American, 16% Hispanic, and 4% were another race. Non-fatal adult shooters were somewhat more likely to be African American, and somewhat less likely to be Hispanic or in the other race category. All three mass shooters were White.

Nearly 80% of adult school shooters completed high school, and like developmental control approaches predict, fewer of the fatal (almost 74%) shooters did so than the non-fatal offenders (a little over 86%), though this was not significant. Two of the three adult mass shooters completed high school. Interestingly, fatal shooters (35%) were more than four times as likely to be employed than non-fatal shooters (8%) and this was significant. One of the adult mass shooters was employed. The employment findings run counter to what social control or strain models would predict.

Forty-three percent of the adult shooters were low income, 51% were middle income, and 6% were high income. Similar to the findings of the adolescent shooters, and consistent with strain theory and perhaps social control models, more fatal shooters had low or middle income levels compared to the non-fatal shooters. Nearly 45% of the fatal shooters had low income levels, and 52% had middle income levels. Importantly, these differences are statistically significant.

Close to 26% of all adult school shooters suffered from a significant psychological issue, matching almost precisely the percentage of adolescent shooters who had experienced

psychological issues. Again consistent with the adolescent findings, more fatal shooters (34%), than non-fatal (14%) adult shooters had psychological problems. The variation between the fatal and non-fatal is, in fact, more pronounced for the adult shooters than the adolescent shooters, in the theoretically expected direction, but it is not significant. Further, close to 30% adult school shooters had a significant family issue and again converging with our theoretical expectations, a higher percentage of fatal shooters (34%) had such issues compared to non-fatal shooters (22%); though it was not significant.

Sixteen percent of the adult shooters were gang members with fourteen percent of the fatal and nineteen percent of the non-fatal shooters identified as gang members. None of the mass adult school shooters were gang members. Approximately 35% percent of the adult shooters had a prior criminal history and this did not vary across fatal or nonfatal shooters. In addition, few of the adult school shooters suffered a close death prior to committing the attack. Few adult shooters had experienced peer aggression, differing from our adolescent shooter findings; and highlighting the importance of disaggregating shooters to more closely isolate important factors for each category. It is also possible media outlets were more likely to search for and find instances of peer aggression for the adolescents if they assumed youth are more likely to be bullied.

However, almost 24% percent of the adult shooters had suffered from some loss in social status. Almost twice as many fatal adult shooters (30%) than non-fatal shooters (16%) had experienced a loss in social status. One of the adult mass shooters had a loss in social status. These findings while they match expectations of strain theory and developmental social control were not significant.

Overall, these findings imply that developmental social control may be useful to account for variation between fatal and non-fatal school shooters. As noted, a few of the conceptual attributes were statistically significant and many more were in the theoretically expected direction but were not significant. We next rely upon the case studies we crafted to further shed light on how social control constructs may have impacted school shooters.

## Case Studies and Developmental Social Control

**Table 7: TASSS Case Studies (30 incidents; 35 offenders)**

Case	Type (F=Fatal; M=Mass; NF=Non-Fatal)	Temporal (PreC=Precolumbine; PostCPreSH=After Columbine, Before Sandy Hook; PostSH=After Sandy Hook)	Ideologically Motivated (Y/N)	Loner Actor (Y/N)	Mental Illness (Y/N)	Bullied (Y/N)	Intentional Targets (Y/N)	Current Student (Y/N)
10685	F	PostSH	N	N	N	N	N	N
10685	F	PostSH	N	N	Y	N	N	N
10685	F	PostSH	N	N	N	N	N	N
10685	F	PostSH	N	N	N	N	N	N
10685	F	PostSH	N	N	N	N	N	N
10084	F	PreC	N	Y	N	N	Y	Y
11034	F	PostCPreSH	N	Y	Y	N	N	Y
10852	F	PostCPreSH	N	Y	N	N	N	Y
10763	F	PostCPreSH	N	Y	Y	N	Y	Y
10735	F	PostCPreSH	Y	Y	Y	N	Y	Y
10631	F	PostCPreSH	N	Y	Y	Y	N	Y
10046	F	PreC	N	Y	Y	N	Y	N
10148	F	PreC	N	N	N	N	Y	Y
10632	M	PostCPreSH	N	Y	N	N	Y	N
10244	M	PostCPreSH	N	Y	Y	Y	Y	Y
10950	M	PostSH	N	Y	N	N	Y	Y
10855	M	PostCPreSH	N	Y	Y	N	Y	Y
10516	M	PostCPreSH	Y	Y	Y	N	N	Y
10094	NF	PreC	N	Y	Y	N	Y	Y
11004	NF	PostSH	N	Y	N	N	N	Y
10523	NF	PostCPreSH	N	Y	N	N	Y	N
10911	NF	PostSH	N	Y	N	Y	N	Y
10882	NF	PostSH	Y	Y	N	Y	Y	Y
10875	NF	PostCPreSH	N	Y	Y	Y	N	Y
10732	NF	PostCPreSH	N	Y	Y	N	N	Y
10675	NF	PostCPreSH	N	Y	Y	N	N	Y
10428	NF	PostCPreSH	N	Y	Y	N	Y	Y
10346	NF	PostCPreSH	Y	N	N	N	N	N
10346	NF	PostCPreSH	Y	N	Y	N	N	N
10253	NF	PostCPreSH	N	Y	Y	N	N	Y
10246	NF	PostCPreSH	N	Y	Y	Y	Y	Y
10329	NF	PostCPreSH	N	Y	Y	N	Y	Y
10019	NF	PreC	N	Y	N	Y	Y	Y
10123	NF	PreC	N	Y	Y	Y	N	Y
101563	NF	PostCPreSH	N	Y	N	Y	Y	Y
<b>Total</b>	<b>35</b>	<b>PRE C: 6 POSTC-PRE-SH: 20</b>	<b>5</b>	<b>27</b>	<b>18</b>	<b>9</b>	<b>17</b>	<b>25</b>

Table 7 summarizes and provides background information on the case studies. We crafted 30 case studies on school shooting events, and on the 35 offenders who committed these shootings. Thirteen of the school shooters committed fatal attacks, including five mass shooting attacks, and 17 were involved in non-fatal incidents. These incidents were spread relatively evenly across the time focus of our study. Six of the perpetrators committed school shootings prior to the notorious 1999 Columbine mass shooting, 20 perpetrators acted post-Columbine, but pre-2012 Sandy Hook, while nine offenders committed their shootings after the horrific 2012 Sandy Hook attack. Twenty-five of the perpetrators were current students, 27 were lone actors, and 18 suffered from some mental illness. Five of the 35 perpetrators committed the attack to wholly or partly further extremist ideologies, and 17 attacked a specific target.

**Table 8: Developmental Social Control Indicators**

Case	Type	Risk	Parent	School Performance (at time of shooting)	Criminal History	Gang Connection	Drug/Alcohol Abuse	Mental Health/Psychological History
10685	F	3	Unknown	Unknown	Violent history; arrested for rape of child	Yes (Ms-13)	Yes. (Cocaine, Marijuana, Alcohol abuse)	Unknown
10685	F	6	Single	Poor	Violent history; robbery, assault, theft, and weapons	Yes (Ms-13)	Yes. (Cocaine, Marijuana, Alcohol abuse)	Yes (Severe cognitive impairment)
10685	F	3	Married	Fair	Violent history; robberies	Yes (Ms-13)	Yes. (Cocaine, Marijuana, Alcohol abuse)	Unknown
10685	F	5	Single	Poor	Violent history; robberies	Yes (Ms-13)	Yes. (Cocaine, Marijuana, Alcohol abuse)	Unknown
10685	F	4	Divorced	Fair; "class clown"	Violent history; robberies	Yes (MS-13)	Yes. (Cocaine, Marijuana, Alcohol abuse)	Unknown
10084	F	3	Divorced	Unknown	Violent/nonviolent history; robbery, mvt	None	None	Yes (Physically abused)
11034	F	5	Divorced	Poor	Violent history and extensive delinquent record; assault, murder suspect	None	Yes (Alcohol and Drug abuse; Marijuana, OxyContin, Valium)	Yes (At age 11, admitted to mental health facility; sociopath; suicide ideation)
10852	F	4	Divorced	Poor; suspended and disruptive in class	Nonviolent history; trespass, speeding	None	Yes (Synthetic Marijuana)	No (but committed suicide)

10763	F	2	Separated	Good	None	None	None	Yes (Sexually molested at age 6; anger management, withdrawn, mood swings, self-harming)
10735	F	2	Divorced	Good (grades declined before shooting)	None	None	None	Yes (Anger management)
10631	F	3	Divorced	Poor student (Behavior problems; learning disabilities; confrontations with teachers and students)	None	None	None	Yes (Physically abused by father; Behavior Issues; ADHD; Self-Harming behaviors; Lashes out at others. On/Off medication. Medication appeared to help but his Dad would take him off it).
10046	F	1	Married	Unknown	None	None	None	Yes (Long history of mental illness, paranoid-complained of being poisoned)
10148	F	4	Divorced	Fair (Bounced around schools and had issues, but did not have attendance or disciplinary problems at alternative school)	Violent/nonviolent history; weapons, drugs, probation violations	Yes (Joined at 13; Sister claimed fringe member, but motive here was gang related)	Yes (Marijuana Use)	None
10632	M	1	Married	N/A	None	None	None	Yes. (Depression)
10244	M	2	Divorced	Good. (Generally, good student, but moved Freshman year and started hanging with the "wrong crowd" and grades and behavior deteriorated)	None, but suspected of molesting 12yo	None	Yes (Cocaine, Heroin, Pills, Alcohol abuse)	Yes (Suicidal thoughts shared with girlfriend/former girlfriend; "increasingly unhappy"; Depressed)
10950	M	0	Married	Good.	None	None	None	None (although committed suicide after the shooting)
10855	M	3	Separated	Good	Violent/nonviolent history; Assault, traffic.	None	None (Marijuana/pain killers in prison, no evidence before shooting. Mother was alcoholic; brother died of overdose)	Yes (Significant, symptoms of schizophrenia, lost touch with reality, hallucinations, depression, fantasies)
10516	M	4	Divorced	Poor (moved around a lot of schools)	None	None	Yes (Marijuana use)	Yes. (Depression; Suicidal attempts. Hospitalization. Prescribed Prozac).
11004	NF	4	Divorced	Poor	None	None	Yes. (Diagnosed with ADHD when he was 6 and started to take Vyvanse. At 11, he was prescribed Adderall. Would save pills (up to 10) and take them all at once. Admitted doing this night before shooting)	Yes. (Wrote a suicide note a few months before the shooting but flushed it down the toilet. A guidance counselor found a note crumpled in Hancock's backpack on the day of the shooting that said: "If God was real, he'd kill me to protect you." ADHD.
10523	NF	4	Married	N/A	Nonviolent history; Disorderly conduct	None	Yes (Alcohol abuse)	Yes (Anger management, attempted suicide after event)
10094	NF	3	Divorced	Poor (problem student)	None	Possible, but not clear	None	Yes (Suicidal thoughts, mother brought to hospital but he was not admitted because did not actually try to kill himself)

10911	NF	0	Married	Good	None	None	None	None
10882	NF	2	Divorced	Good	None	None	None	Yes (bipolar, antisocial, narcissistic).
10875	NF	3	Divorced	Poor. (moved to alternative school where he did better but had problems when went back to high school)	None	None	None	Yes (ADHD, suicidal thoughts in elementary school, depression)
10732	NF	3	Unknown	Unknown	Violent history; domestic violence	None	Yes (Cocaine, hydrocodone, oxycodone, Alcohol abuse)	Yes (Depressed; committed suicide after the event)
10675	NF	3	Divorced	Poor (Motive was because teacher told parents about his performance)	None	None	None	Yes (Depressed)
10428	NF	3	Divorced	Poor (Poor attendance; behavioral problems)	None	None	None	Yes (Removed from school for behavioral problems; treatment facility; depressed. Wanted to die by cop).
10346	NF	4	Divorced	Poor (had learning disability)	Violent/non-violent history; Had no prior convictions but arrested for document forgery, struck an officer in military, abducted children and was the "DC sniper"	None	None	Yes (Suspected of having PTSD)
10346	NF	3	Separated	Good. (Brilliant/smart student, and excelled in school).	Violent history; this event was part of the DC Snipers killing/shooting spree.	None	None	Yes (Reactive attachment; dissociative disorder. Attempted suicide on two occasions)
10253	NF	4	Separated	Poor (Grades dropped)	Violent history; assault	None	None	Yes (Traumatized as child from abuse; depression; suicidal)
10246	NF	1	Married	Good	None	None	None	Yes (Suicidal and traumatized by being bullied at two schools; on anti-depressants)
10329	NF	4	Single (deceased)	Good grades	Violent history; armed robbery	Yes	None	Yes (Serious mental illness, including hospitalization)
10019	NF	2	Separated	Good (Grades dropped right before the shooting)	None	None	None	Yes (Seriously bullied; made him socially isolated; traumatized him).
10123	NF	3	Divorced	Poor (Behavioral issues and had learning disability)	None	None	None	Yes (severely emotionally disturbed)
10563	NF	1	Single	Good	None	None	None	None
<b>Total</b>			<b>22 Divorced/separated ; 7 Married; 4 Single Parents; 2 Unknown</b>	<b>Good: 12 Fair: 3 Poor: 14 Unknown or N/a: 6</b>	<b>Violent: 14 Non Violent: 2</b>	<b>Yes: 7 No: 27 Not Clear: 1</b>	<b>Yes: 13 No: 22</b>	<b>Yes: 25 No: 10</b>

Table 8 shows how the offenders fared across six key social control indicators (family, school performance, criminal history, involvement in gangs, drugs/alcohol abuse, and mental health issues). Our case studies focused on many of the same social control variables we quantitatively examined above, such as parental divorce and/or separation, problems with school, mental illness and psychological problems, prior crime or criminal justice involvement, substance abuse and gang involvement. Twenty-six of the perpetrators were raised in a single parent household or their parents were divorced or separated. Over half of the perpetrators performed poorly in school at the time of the offense. Many of these perpetrators struggled academically, they received poor grades, had learning disabilities, disrupted class, had issues with teachers and other students, were suspended, expelled, or punished for misbehavior. Several of adolescent offenders attended multiple schools and their transition to a new school resulted in behavioral problems at home and school. Sixteen of the 35 perpetrators had a criminal history, and in fact, many of them had a violent criminal history. These perpetrators were arrested or convicted of armed robberies, rape, aggravated assault, and murder. Nine of the 13 fatal perpetrators had a criminal history, and 8 of them had violent histories. Only one of the mass shooter perpetrators had a violent criminal history. Six of the 17 non-fatal perpetrators had a criminal history, and five of them had committed a violent crime.

Seven of the perpetrators had previous gang connections (5/7 were tied together as part of the same incident). Thirteen perpetrators abused alcohol or drugs. Twenty-five perpetrators had mental health issues, ranging from severe cognitive impairment, to suicidal ideation, to anger management and mood swings, depression and anxiety, and Post-Traumatic Stress Disorder. Six of the 13 fatal perpetrators, 4 of the five mass shooters, and 14 of the 17 non-fatal perpetrators had mental health issues.

As Table 8 indicates, in the third column we scored each offender on these six social control deficiencies. We then categorized offenders into high risk, aka lower social control (4-6 indicators,) versus low, risk aka higher social control (1-3 indicators).

**Table 9: Case Study Offenders' Level of Risk**

Type of Shooting	Low Risk	High Risk
Fatal	53.8% (N=7)	46.2% (N=6)
Mass	80% (N=4)	20% (N=1)
Non-Fatal	70.5% (N=12)	29.4% (N=5)

Table 9 summarizes these risk scores for fatal, non-fatal, and mass shooters. A similar number of the fatal shooters were categorized as high (N=6) and low (N=7) risk offenders. Forty-six percent of the fatal shooters were considered high risk, and half of these high-risk offenders had evidence of 5 or 6 of the social control deficiencies. In contrast, and as developmental social control theory would expect, most non-fatal shooters were low risk. Approximately 71 percent of the non-fatal shooters were low risk and 29% were high risk. None of the non-fatal shooters had evidence of more than four of the social control deficiencies. Interestingly, four of the five mass shooters in our case studies are classified as low risk offenders. One of the five mass shooters had no evidence of any of these social control deficiencies.

**Table 10: Key Life Events**

Case	Type	Event 1	Event 2	Event 3	Event 4
10685	F	Entered country illegally	Kicked out of apartment	Joined gang	Married and had child
10685	F	Joined gang; Jumped into gang at age 13	Mother saved up money to bring to US	Dropped out of school in 10 <sup>th</sup> grade	Violent criminal history that started 2 years before incident
10685	F	Joined the gang.	Immigrated from Honduras		
10685	F	Joined the gang. Brother was gang member	Dropped out of school at 15		



10685	F	Joining the gang/group was critical; appeared to be a reluctant participant and was pressured.	Brought into the gang by his cousins		
10084	F	Parents abused him	Spent time in foster care	Convicted of robbery/MTV and spent time in youth detention facility	Argued with victim about a girl
11034	F	Parents had addiction issues	Divorced	Time in mental health facility	Spent time in alternative school then pulled out
10852	F	Parents split and lived in different towns	Mother kicked him out senior year and moved to a new town	Suspended for 19 days from school for criminal trespass.	
10763	F	Molested at Age 6	Father sent to prison when 14	Moved in full time with grandparents	Started dating fellow student, who broke up with her
10735	F	Parents divorced; very unstable living situation	Physically abused by father and sexually abused at age 9	Heated argument with victim	Exposed to white supremacy
10631	F	Parents' divorce; lifelong physical abuse by father; sexual abuse by stepbrother when stay with mother	Suspension/detention from school	Learned about Columbine from classmates	Bullied by other students and was bullied
10046	F	Serious mental health issues			
10148	F	Joined gang at age 13; motive for shooting was gang related	"Deuce Killers Day"-day where gang targets rivals	Multiple arrests for firearm possession	Visited terminally ill grandfather; recognized a classmate as member of rival gang
10632	M	Daughter miscarriage	Recent dreams about molesting young girls like he thought he had done to young relatives 20 years ago	Colorado killing (possible partial copycat)	
10244	M	Moving from Maryland to California was important.	Good experienced at first school, but had issues with hanging around delinquent peers at new school	Significant drug/alcohol use	Concerned about being bullied, accused of molesting 12 year old girl; broke up with his girlfriend, disabled friend died in an accident.
10950	M	Suspended from football team	Broke up with girlfriend		
10855	M	Parent's Divorce	Living with grandparents	Went to alternative school	Arrested for assault
10516	M	Father killed by police; Mother severely injured in car accident; lived with grandparents	Interacted frequently with Nazis in Internet	Columbine-was fascinated with Columbine	Enrolled in Homebound program; Suicide attempt
11004	NF	Fought with his father the night before the incident because he spent the weekend away from the family with his great-grandmother.	Struggling in school and his grades were dropping. This was a constant source of conflict.	Found out that his girlfriend was cheating on him and they ended their romantic relationship (few months before)	Approximately 2007: Hancock's father was awarded full custody. At some point in this time period, his biological mother was arrested for and convicted of drug related crimes and served time in prison.
10523	NF	Attended party, got drunk, threatened to shoot victim	Road rage incident	Numerous incidents for student on football team	Physical fight with coach
10094	NF	Sent to principal's office for dress code violation	Parent's divorced	Sent to live with his father to help with behavioral issues; sent back to live with mom	
10911	NF	Bullied at school; parents did not do much in response			
10882	NF	Bullied for good part of his academic career	Suspended for saying going to bring gun to school	Came out as gay; suspended for saying going to bring gun	
10875	NF	Parents' Divorce	Uncle committed suicide	Transferred out of alternative school to regular high school	
10732	NF	Major surgery, became addicted to painkillers	Behavior erratic, wife moved out and then filed for divorce	Police called to house for domestic issues, filed for civil	

				order of protection; wife filed for divorce	
10675	NF	Parents' divorce; father moves to another state, mother gets custody	Teacher calls parents to say performing poorly in school		
10428	NF	Parents divorced when young	Behavioral problems in school led to him being homeschooled	Went to mental health treatment facility	Broke Up with Girlfriend
10346	NF	Mother died when young; went to live with abusive in-laws.	Converted to the Nation of Islam	Served in military; overseas in Desert Shield and Storm	Lost custody of his children (who he had abducted)
10346	NF	Mother abusive, frequently moved. Very unstable.	Mother paid to get out of country.	Converted to Islam at about age 15.	
10253	NF	Rejected from the Navy	Did poorly on math exam and started skipping classes	Arrested for assault	Father abuse him and mother
10246	NF	Bullied at current and former school	Sister diagnosed with blood disease 2 weeks prior to shooting	Fighting with the victim for weeks	
10329	NF	Students bullied girlfriend	Mother deceased at age 10	Diagnosed with mental illness	Convicted of armed robbery at age 15
10019	NF	Students consistently bullied shooter	Grades had recently dropped	Parents were "inadequate"	
10123	NF	Bullied by other students and physically assaulted	Emotional disturbed	Student had behavioral problems	Moved to new school
10563	NF	Beaten up by victim & victim sister day before shooting	Offender, mother, and others quoted in open sources allege severe bullying; prosecutor disagrees.		

Table 10 includes a listing of key events that occurred in each of the shooter's lives.

Every case study shooter seemed to experience an impactful event in the period leading up to the shooting. Some experienced other key events in the past. Many of these key events seems to converge with developmental social control theory's turning points or key transitions, discussed above.

Most shooters had disruptive family lives, and key events often were associated with family dysfunctions. These impactful events included parental divorce and separation, but also physical and sexual abuse, parental drug abuse, parental offending and imprisonment for a variety of crimes, and parental and other family deaths. A number of shooters had unstable living arrangements, and they often changed schools; this transition seemed particularly stressful for them. Some shooters pointed to specific events that occurred, such as being sent to the principal's office for a dress code violation, suspension for a violation, or failing an examination, that caused a downward spiral that pushed them to commit the shooting. Other key events

included gang involvement (joining or participating) and criminal activities. Five of the 17 non-fatal shooters were bullied close to the shooting, but only one of the 13 fatal shooters was bullied.

We conclude by briefly reviewing two case studies as illustrative examples to highlight how developmental control constructs might impact whether the offender commits a fatal versus a non-fatal shooting attack. The first case involves a 17-year old offender with weak levels of social control who committed a fatal attack. The offender entered a school cafeteria, sat down at a cafeteria table and pulled out a .22-caliber handgun. He also had a knife. The offender raised the gun and fired 10 shots at a group of students killing three, seriously injuring two others, while a third other student suffered minor injuries.

This offender had a chaotic upbringing and ultimately was raised by his grandparents. His mother struggled with alcoholism, and was charged with domestic violence at least twice when he was a baby; she was briefly incarcerated as a result. The offender's father also had a violent criminal history, and was arrested several times, including for assaulting his mother, assaulting a police officer, and attempting to suffocate another woman he had married. The father was charged with attempted murder and was sentenced to four years in prison. Multiple neighbors and teachers mentioned that the grandparents did a good job in raising the children, but they had difficulty keeping up with the kids. The offender's older brother was addicted to heroin and prescription drugs, was arrested multiple times for crimes connected to his addiction, overdosed multiple times, and died less than ten months after the shootings occurred.

Importantly, the offender did not have much of a work history but was previously involved with the criminal justice system. The offender was arrested for assaulting his Uncle, but he pled guilty to disorderly conduct. He also was charged as a juvenile for punching another

teenager in the face, and at another point received a traffic citation. The offender also suffered from mental health issues. A psychiatrist testified that he would lose touch with reality, have auditory hallucinations, depression, and involuntary fantasies. The offender also suffered symptoms of schizophrenia and was known to suffer from migraine headaches that caused him to miss school and suffer symptoms of depression.

In short, the offender faced multiple obstacles, his family life was “tumultuous,” including parents with significant criminal histories and addiction problems, an unstable family situation, an older brother who battled addiction and was frequently involved in criminal justice system, and he himself had a violent criminal past. These are exactly the factors, that social control frameworks discussed above argue weaken a person’s attachment to others and society and lower their stake in conformity. These factors could be related to more severe school shooting outcomes. In fact, friends of the of the offender’s family concluded that the “family turmoil definitely took a toll on the offender.” and “He tried so hard to be normal. He had to see his brother in and out of rehab and jail. He just sat there and watched. It’s really hard to be normal around that.”

The second case study involves a 12-year-old offender who committed a non-fatal shooting, wounding three. This offender seemed to have fewer risk factors, more attachments and higher levels of social control. This offender opened fire at a crowd of students in a school’s gym, firing three rounds of birdshot that injured two students and a school security guard. The attack lasted ten seconds. An eighth-grade social studies teacher approached the offender and convinced him to put the gun down.

The offender’s family included his married parents, grandparents, and a 16-year-old brother. The family appeared to be tightknit and well-connected to the community. In fact, a

senior pastor at their church said the offender's parents "...are wonderful parents who loved their kids..." Further, the father of one shooting victim stated that "...the XX's are good people." The offender also appeared to be close to his grandmother. One friend of the offender stated the offender was "loud and not afraid to be himself. He was an amazing friend." Another student said the offender "always tried to make us laugh. He wasn't very funny, but we still laughed with him." Other students/classmates described him as smart and bookish. In fact, an aide to the offender's second-period language arts teacher recalled him as "really smart, nice with everyone." The offender also participated in social activities and was a percussionist in the school band, attended bible school and played sports with other children from his bible class and church. In addition, there was no record of any mental illness prior to the school shooting, although a subsequent lawsuit filed by his parents alleged that the offender had a "mental disorder or developmental disability" but not much else is known about this allegation. Finally, the offender did not have any history of drugs or alcohol.

Thus, aside from possibly suffering bullying, this offender did not exhibit any of the social control deficiencies seen in the above case study. In fact, both the offender and his family appear integrated into the community, the offender did well in school, attended church, played sports, and had friends, all indicators of attachment, commitment, and higher levels of social control. As noted, consistent with developmental social control theory, this offender committed a less severe shooting, only causing injuries, and importantly, listened to the teacher and stopped the attack when asked to do so.

***OBJECTIVE 3: Third, our data includes shooting incidents where fatalities occurred (including mass shootings or active shooters as well as cases where only a single person is killed) in addition to shooting incidents where nobody is killed and only injuries resulted. Focusing on student perpetrated shootings, we compared fatal and non-fatal attacks to***

*identify intervention points that could be exploited by school officials, law enforcement and others to foil these offenders and/or reduce the harm caused by shootings... .... We will also conduct 30 detailed case studies and compare 15 fatal school shootings to 15 school shootings only involving injuries to capture the influence of both developmental social control and situational prevention mechanisms. We crafted in-depth biographical case studies to highlight the dynamic life course pathways contributing to different school violence outcomes. We also constructed detailed narratives of each perpetrator's leading to the school violence incident using life history. Since many of the variables of interest can change over time (an offender grows up in a two parent household until a divorce, but later the mother is remarried, etc.), we crafted case studies to capture a nuanced understanding of such changes. We will identify key situational attributes, security gaps, and opportunities that facilitated the crime's commission.*

.....

*Research Question 5. What are the situational circumstances that differentiate shooting incidents where fatal and non-fatal shootings occurred? Are hard or soft interventions more effective? If so, for what type of school violence incidents? Who is best suited/positioned for designing the necessary interventions to reduce/prevent these attacks, and harms caused by such attacks? (Objective 3)*

## **Situational Crime Prevention (SCP) and School Shooters**

This section explores whether situational factors differentiate fatal and non-fatal shooting incidents. Similar to the previous section, we ran a series of bivariate logistic regression models, one for each individual attribute alone to determine if it increased the odds that a non-fatal as opposed to fatal shooting had occurred. We first present the results for the adolescent school shooters, followed by the adult school shooters. We complete this section by, again, using our case studies as illustrative examples to contextualize the quantitative findings.

SCP models argue that understanding how the offender carries out the crime can be used to craft interventions to prevent offending. As SCP's popularity and its use has increased, a growing number of strategies have been implemented that reduced crime (Guerette & Bowers, 2009; Weisburd et al., 2006). Examples of SCP interventions used to respond to school violence include school resource officers, buzzer systems, locked doors, picture ID requirements, and metal detectors, among others.

**Table 11: Situational Crime Prevention (SCP) Variables (Adolescent Intentional)**  
**(Bolded Variables with Sig. Level in Parentheses)**

<b>Variable</b>	<b>All (N=252)</b>	<b>Fatal (N=117)</b>	<b>Non-Fatal (N=135)</b>	<b>Mass (N=8)</b>
Metal Detector	<b>16.7% (.08)</b>	12.8%	20.0%	12.5%
School Guard	35.3%	35.9%	34.8%	50.0%
School Officers	<b>37.3% (.05)</b>	32.5%	41.5%	25.0%
School Barriers	27.4%	24.8%	29.6%	0.0%
School Accessible	55.2%	56.4%	54.1%	54.5%
School Multibuilding	32.9%	34.2%	32.9%	37.5%
School Multistory	<b>52.4% (.02)</b>	41.9%	61.5%	62.5%
Bystanders Present				
1-10 Bystanders	43%	50.0%	35.7%	25.0%
11-50 Bystanders	32.5%	29.3%	35.7%	50.0%
50+ Bystanders*	24.5%	20.7%	28.6%	25.0%

\*Reference Category

Table 11 includes SCP variables for the adolescent school shootings and shows whether they had a statistically significant impact in decreasing the odds the shooting was fatal. Seventeen percent of the schools had metal detectors in place prior to the shooting, 35% had guards, and 37% had officers. Prior to the shooting, 55% of the schools limited access by funneling visitors through a single door, using buzzer systems for entry, and/or requiring identification into the school. We also examined the schools' physical layout, including whether there were multi-buildings on the same campus, and if the school was more than one story. Thirty-three percent of the schools had multiple buildings, and 52% had more than one story. We also captured the number of bystanders present at the time of shooting and recoded this number into three categories: 1-10 bystanders, 11-50 bystanders, and over 50 bystanders. Forty-three percent of the shootings had fewer than ten bystanders, almost 33% had between eleven and fifty bystanders, and 25% had over fifty bystanders.

SCP models would expect schools that had these measures in place would be more likely to have non-fatal as opposed to fatal shootings. For example, metal detectors make it more difficult to smuggle in weapons into the building, and presumably may make offenders uneasy

even if they succeed in bringing a gun into the building. These offenders might then commit more rushed, less “effective” shootings that cause less harm. The presence of police officers, and school resource officers (SROs) should deter/prevent shootings from occurring. In addition, for those shootings that do occur, trained police and SROs might disrupt the attack while it is unfolding, increasing the odds no deaths occur, and decreasing the number of casualties. Similarly, multi-story and multiple buildings on campus should result in less person density. In both cases, students, teachers, and others- potential victims- are spread across different floors/buildings, all with additional entry/exit points, and places to hide. These factors should mitigate the harms that shooting might cause increasing the odds a non-fatal incident with fewer casualties occur (Freilich, Chermak & Klein, 2020).

Further, these interventions, though geared towards protecting inside the school, may also safeguard the outdoor school grounds. Police and resource officers are mobile, may also patrol outside and be within easy access of the school’s yard, perimeter, or parking lot. Metal detectors and similar strategies could result in a “more secure” climate that extends to the entire school grounds.

Converging with SCP expectations, metal detectors were present in 20% of the non-fatal shootings compared to 13% of fatal shootings, and this difference is modestly significant.<sup>4</sup> In addition, and again in line with SCP, schools with non-fatal shootings were more likely than fatal shootings to have school police officers and school barriers, but this difference was neither large

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<sup>4</sup> Klein’s (2020) dissertation that also used TASSS data to examine the impact of metal detectors on adolescent shooters found that they were “proportionately and statistically similar across fatal and non-fatal events.” Klein operationalized metal detectors as present if they were operational at the time of the shooting. We operationalized metal detectors as present if the school had them (regardless of whether they were in use at the time of the shooting). We assume that the mere presence of a detector sends a message the school is more secure than other locations. Many offenders make hasty decisions, relying upon faulty information, under charged circumstances (i.e., bounded rationality), thus the mere presence of detectors could impact the situation. On the other hand, Klein assumed detectors would have limited to no impact on events occurring when school is not in session and/or the detectors were not used.



nor statistically significant. Police officers were more likely to be present in the non-fatal shootings than the fatal attacks and this was statistically significant. Importantly, almost 62% of the non-fatal shootings occurred in multi-story buildings compared to 42% percent of the fatal shootings and this difference was statistically significant.

Although the number of mass shootings is small, the presence of the SCP variables was similar to the overall totals. Metal detectors were present in approximately 13% of the schools that had a mass shooting. Interestingly, a school guard or school officer was present in 75% of the adolescent perpetrated mass shootings. Fifty-five percent of the schools had limits on accessibility, 38% occurred at schools with multiple buildings, and 63% occurred at multistory buildings.

Although our focus in this section is on the situational opportunity structure for adolescent shooters, we also briefly examine the impact SCP factors on adult offender shooting events.

**Table 12: Situational Crime Prevention (SCP) Variables (Adult Intentional)**  
(**Bolded Variables with Sign. Level in ( )** )

Variable	All (N=102)	Fatal	Non-Fatal	Mass
Metal Detector	4.9%	15.0%	5.4%	0.0%
School Guard	24.5%	24.6%	24.3%	0.0%
School Officers	19.6%	18.5%	21.6%	0.0%
School Barriers	26.5%	24.6%	29.7%	33.3%
School Accessible	<b>66.7% (.04)</b>	69.2%	62.2%	33.3%
School Multi-building	32.4%	32.3%	32.4%	0.0%
School Multistory	54.9%	52.3%	59.5%	33.0%
Bystanders Present				
1-10 Bystanders	69.7%	70.7%	66.7%	0.0
11-50 Bystanders	26.8	26.8	26.6	66.6%
50+ Bystanders*	3.6	2.4	6.7	0.0

\*Reference Category

Table 12 demonstrates that 5% of the schools where an adult perpetrated shooting occurred had metal detectors, 25% had school guards, 20% had school officers, 27% percent had school barriers, 67% had limited school accessibility, and 55% occurred in a multi-storied school. Seventy percent of the adult perpetrated shootings occurred with 1-10 bystanders, 27% percent had 11-50 bystanders, and 3.6% had more than 50 bystanders.

Metal detectors were somewhat more likely in schools that experienced a fatal shooting, but most of the other situational strategies were evenly distributed across schools with fatal or non-fatal shootings. It is somewhat surprising that schools that had accessibility limits were more likely to have fatal compared to non-fatal shootings. Few situational variables were present in the schools that adults targeted for mass shootings, but there were only three adult mass shootings. None of these schools had metal detectors, school guards, school officers, or multi-buildings, possibly indicating they were “easy” targets for a mass attack. Finally, only one of the schools had school barriers, limited accessibility and was multi-storied.

We conclude this section by again using our 30 case studies to further illuminate how situational factors could impact school shootings. We first focus on the SCP measures in place in these 30 schools.

**Table 13: SCP Measures in Place Before Shooting**

Case	Type	MD	ID	Officers	CEA	CCTV	Drills	CPP	Uniforms	BP	Other
10685	F										X (Schoolyard that was in need of repair; two cameras overlooking the yard were broken; security lights were broken; holes in fence; gate to schoolyard was open; bullet holes in wall)
10084	F										
11034	F			X		X	X				
10852	F		X	X		X	X				X (tip line; communication plan)
10735	F			X	X				X		X (locks)
10631	F						X				
10046	F										
10148	F										
10763	F	X		X		X					X (tip line)
10632	M							X			
10143	M			X						X	X (threat reporting system)
10950	M					X	X				X (communication plan)
10855	M					X	X				X (communication plan)

10516	M	X		X		X					X (crisis management plan; locked classroom doors)
11004	NF			X		X					
10523	NF										
10094	NF										X (counseling for students)
10911	NF			X		X	X				
10882	NF			X	X						X (threat assessment)
10875	NF			X		X	X				
10732	NF			X	X	X					
10675	NF							X			X (rapid response)
10426	NF				X						X (Hall monitors)
10346	NF										
10253	NF			X						X	X (threat reporting)
10246	NF				X	X					X (telephone hotline; book bag ban)
10019	NF										
10123	NF			X							
10329	NF	X	X	X	X				X		
10563	NF								X		X (The dress code forbids earrings on boys or ``unnatural hair colors."  Parents serve 20 hours a year, monitoring the cafeteria, chaperoning events, making sure students hand in homework)
<b>Total (number of YES)</b>		<b>3</b>	<b>2</b>	<b>14</b>	<b>6</b>	<b>11</b>	<b>8</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>19 (other measures)</b>

**MD: Metal Detector; CES: Controlled Entry Access; CPP: Cell Phone Prohibition; BP=Bully Prevention**

Table 13 highlights that a number of the schools had SCP like measures in place before the shooting. But this varied greatly across the schools. Three of the schools had metal detectors, two had a picture identification system for entry, 14 schools had police officers or security guards or resource officers, six schools had controlled access, 11 had cameras, eight had lock down drills, two schools prohibited cell phones, two required uniforms and had bully prevention programs. There were also a variety of additional measures in place in certain schools, before any shootings, including tip lines, communication referral systems, and threat assessment systems.

As noted, SCP's key claim is that opportunity is a cause of crime, in that offenders take advantage of an existing opportunity to successfully commit the crime (Clarke 2012). Once these opportunities are identified, interventions could be designed to remove the opportunities and thereby prevent the crime or mitigate its harm.

**Table 14: Criminal Opportunities**

Case	Type of Case	Opportunity
10685	F	Schoolyard was known for criminal activities and as a hangout as it was difficult to be seen from the street; it was run down.
10084	F	Stole father's gun; no security measures in place at school prior to the shooting.
11034	F	Brought to office because suspected of having gun. He pulled it out and shot and killed/injured victims
10852	F	Took father's gun, suspended from school but was able to get back into the school with the gun
10763	F	Found gun behind grandparent's couch; school had a system of wandung students but student was not wanded.
10735	F	Took gun from unlocked cabinet; No metal detectors; No bag searches.
10631	F	Stole guns from father, although were in locked cabinet/room. Confronted by teachers when coming into school but still was able to enter
10046	F	School had no control access or any security measures in place. Perpetrator walked easily into the school.
10148	F	School was in strip mall and shooter (and the public) had uninhibited access to classroom
10632	M	One police official stated offender had easy access to the schoolhouse (unlocked; no security place)
10244	M	Father showed shooter key to gun cabinet; mentioned to multiple students that he was going to shoot up the school
10950	M	Walked into cafeteria without interference
10855	M	Gun was available in grandfather's barn, shooting started in cafeteria where he and other students waiting for a bus to transport to alternative school
10516	M	Walked into school after shooting unarmed security guard; tried to enter several classrooms but were locked; entered a classroom that was not locked
11004	NF	Took gun from his great grandmother house; brings it into school in his knapsack without issue; no security measures in place
10523	NF	Walked onto campus/athletic field office without issue
10094	NF	Stole a gun and kept in his room for at least 2 weeks. Sawed off the shotgun. Walked into the school and principal's office without any restriction.
10911	NF	Student walked straight into gym and opened fire as classes began that day.
10882	NF	Unlocked side gate allowed for entrance, supposed to be manned by security officer
10875	NF	Took gun from father because stepfather's guns were locked. Brought shotgun into school, assembled in bathroom; carried for several class periods
1073)	NF	Got into the school by coincidence, doors automatically opened when shooter stepped on door
10675	NF	Stole gun from stepfather; hid in field by the school and went out to shoot
10426	NF	Walked into school without being stopped or questioned
10346	NF	Outside target, bus/car line. Spent evening in woods prior to taking shot in sniper's nest.
10253	NF	Took guns from home
10246	NF	Took gun from home, practiced shooting targets with father. No metal detectors
10329	NF	Bypassed metal detectors by going in side door; Hid gun in Fire Extinguisher box
10019	NF	The day before the shooting the offender accessed his father's keys to open his father's case to take one of his guns and 18 rounds of ammunition. Appears he took gun straight into school no searches; no detectors; no guards.
10123	NF	Stole gun from unlocked drawer; Entered the school without incident; Brags and shows gun to other students.
10563	NF	Obtained gun (not clear how). No adults on bus aside from driver (no supervision). Brought gun on bus without incident even though had fought the day before and made threats

Table 14 summarizes the main opportunities we identified in each of the 30 case studies. One recurring opportunity involved offenders entering the school (or a bus), with a gun, without any incident. The majority of these offenders encountered no restrictions or obstacles, and simply walked in. In a couple of cases the offender avoided the potential obstacle (e.g., used side door with no detector; an assigned guard was not in place). Other opportunities included: adolescents successfully gaining access to firearms (usually legal guns); attack sites that had no officers, guards, or few adults present; and offenders entering unlocked as opposed to locked rooms where they then committed the shooting.

**Table 15: Leakage**

Case	Type of Case	Leakage	How Leaked?	How Long Before Shooting?	Did Share Leakage with Anyone?
10685	F	No			
11004	NF	Yes	Told 2 friends about gun; Showed them gun in the bathroom	Told friends 2 hours before; showed gun 5-10 minutes before.	No
10632	M	No			
10523	NF	Yes	Other people attending a party	Night before shooting	No, just thought he was drunk
10084	F	Yes	Called victim by phone; Told friend	2 days before; day of	No
11034	F	Yes	Showed gun to other students	1 hour	Yes. Reason he was brought to principal's office
10852	F	No			
10763	F	Yes	Texted intent to shoot/kill; Showed gun and told plan to friends	Night before; Couple hours	No
10735	F	No			
10631	F	Yes	Mentioned that the principal was not going to survive to friends	6 days; 2 days	No
10046	F	No			
10148	F	Yes	Threatened the victim a few days prior; told other gang members	Few days	No
10244	M	Yes	For at least month, made threats to multiple friends and other saying he was going to bring a gun to school	One month	No; thought he was not serious
10950	M	No			
10855	M	No			
10516	M	Yes	Discussed directly with friend; recruited friends to be accomplices	One year; months	No; No
10094	NF	No			
10911	NF	No			
10882	NF	Yes	Talked about it with friends and others near him when discussed	1 year and day before	Yes, and did a threat assessment of him. He was interviewed. Determined he was not a threat.
10875	NF	Yes	Text, Internet, Direct communication with friends	Night before; day of	No
10732	NF	No			
10675	NF	Yes	Showed bullet to students at lunch	2 hours	No
10426	NF	Yes	Sent picture to ex-girlfriend holding gun; texted a couple of friends to leave school	Couple of days; Right before	No; No
10346	NF	No			
10253	NF	Yes	Threatened other students who made him angry, saying he wished he could do a Columbine-like attack; students reported to teachers	2 months	Yes. Teachers/principal
10246	NF	No			
10329	NF	No			
10019	NF	Yes	Brought gun to school; Threatened to shoot a teacher & other students; Told best friend and showed gun to others	2 weeks	No, thought he would never carry out the threat, was "too nerdy"
10123	NF	Yes	Mentioned to multiple students and showed at least 4 the gun	4-5 hours	No
10563	NF	Yes	Made threats after being beaten up by victim; told others	1 day	Not clear; driver did report fight & school administrators were planning to talk to offender/victim in school; but shooting occurred before that on bus on way to school
<b>Total</b>		<b>Yes: 17</b>			<b>Yes: 3</b>

Table 15 focuses on leakage, whether offenders “leaked” or provided warning that they intended to commit the school shooting. We identified whether leakage occurred, and if so how the leakage occurred, how long it occurred before the shooting, and what, if any, response the leakage engendered. We found leakage in a majority of the case studies. In 17 out of the 30 shootings the perpetrator broadcasted or leaked their intention to commit the school shooting and some offenders did so on multiple occasions. Some publicized their intentions generally on the Internet or social media, but most communicated directly with someone they knew. Some offenders warned their friends to stay away from the school when the event was going to occur. Some perpetrators explained their intentions directly to a group of students and even showed them the gun the day of the shooting. Most leakage occurred the day of or the day before the shooting. Unfortunately, only three of the warning were acted upon. The most common reasons for not acting was thinking the offender did not mean it, was joking or making it up, or was a not a real threat.

Similar to the developmental social control section, we next use two case studies, one fatal and one non-fatal, to illustrate in more detail how situational factors could impact the outcome. The first case involves an adult offender who committed a mass shooting attack at a rural Amish multi-grade school. This shooting claimed five lives, wounded five others, and the offender committed suicide.

The offender was “rational” in the sense that he spent a week planning and preparing for the attack. The preparations included gathering supplies including wood planks, stun gun, K-Y jelly (a sexual lubricant), a 9 mm handgun, 12-gauge shotgun, .30-06 bolt-action rifle and about 600 rounds of ammunition and other hardware and tools to barricade doors.

Importantly, the attacked school had no security in place. It was a small one room building in a rural community close to farmland and fields. The school had no electricity, no modern plumbing, no phone, no metal detector, no police, no private security guards or any other measures in place. The school doors did have a lock, but the doors were kept unlocked when class was in session. The school was in "running distance" of a phone if one was needed. In fact, the police were alerted to the standoff when those who escaped from the schoolhouse ran to a nearby home and had the police called.

The offender lived very close to the school and knew that it had young girls (who he was targeting) and that it was not well protected. One police officer explained: "The location, the school, was probably chosen because it provided a close opportunity, you know, an opportunity to attack where he knew he had young kids..... seems as though he wanted to attack young, female victims, and this is close to his residence.... plus this school - it's a one-room schoolhouse. You can get to it easily. It's not really secured like maybe another school in a school district would be." He added "I think that was really the focus, a place he could get into and out of."

The next case involves a 15-year old student who shot and wounded another student in the cafeteria. Nobody was killed in this shooting. This offender also planned the shooting and in fact "leaked" his intentions before the shooting; unfortunately, he was not taken seriously. The offender usually lived with mother and was unable to access his step-father's gun. However, at the end of summer vacation he stayed at his father's house. The offender took advantage of this opportunity to take his father's gun from the basement without his father knowledge. After the shooting the authorities found a note in the offender's pocket where he thanked his father for providing him the opportunity to access the gun. Inside the cafeteria the offender fired 2 shots at

a nearby table and severely wounded the 17-year-old victim. The shooting incident only lasted seconds. A guidance counselor saw the offender draw the gun and along with a math teacher, and an assistant principal tackled the offender. The school resource officer then immediately arrested and handcuffed the offender.

This case illustrates that the offender took advantage of the opportunity to obtain a firearm. He was unable to access his step-father's secured gun, but while at his father's took his gun that was not secured. Importantly, the school did not have a metal detector and he had no problems in bringing his gun into the building. But, his school did have a resource officer; and he committed the shooting in a venue where that officer and other school employees were present. Thus, the entire shooting only lasted seconds. The school employees acted as guardians and short circuited the attack constraining the number of shots fired to two, quickly disabling the offender, and limiting the casualties to one severely wounded with no fatalities. The resource officer immediately arrested the offender.

### **Discussion and Conclusion**

This study examined school shootings in the United States between 1990 and 2016. We had three objectives. First, we sought to identify all shootings and outline how they varied spatially and temporally. We also aimed to categorize them to help researchers and policy makers better understand the nature of the problem. Second, we relied upon Sampson and Laub's (1993) developmental/life course social control perspective to provide an understanding of the perpetrators of school shootings and highlight potential risk factors. This theory highlights social control constructs and assesses how people's level of connection to society and its institutions evolve over time and how this may result in violence. Third, we applied situational crime



prevention (SCP) perspectives to understand school shooting outcomes (fatal versus non-fatal shootings versus mass attacks). SCP argues that for crime to occur there must be the opportunity to commit the offense. We therefore compared fatal and non-fatal attacks to identify the opportunities- intervention points- that could be used to devise strategies to prevent attacks and/reduce the harm caused by shootings. Our goal is to enhance understanding of etiological issues related to school violence by documenting where and when violence occurs and highlighting key incident and perpetrator level characteristics.

To achieve these three objectives, we used open sources to build The American United States School Shooting Study (TASSS) that we could analyze quantitatively. TASSS is a national, open-source database that includes all publicly known shootings that resulted in at least one injury that occurred on K-12 school grounds in the U.S. between January 1, 1990 and December 31, 2016. We also used the raw open source data to craft 30 in depth case studies (12-15 pages each) including 35 offenders to contextualize the quantitative analyses of our two theoretical approaches to further illuminate how their causal mechanisms might unfold.

We relied upon similar data collection methods we previously used to create open source terrorism and extremist crime databases. Importantly, in September 2019, we were invited to attend and present at the National Institute of Justice's Topical Meeting on Rare Incident Data Collection Models in San Antonio. The focus of this two-day meeting included select research teams employing open source data collection strategies and highlighted opportunities and challenges. A number of the issues raised included measurement issues and strategies to increase the reliability of open source data.

We devised clear inclusion criteria and reviewed over 35 of sources and conducted a variety of web-engine searches to identify close to 1,400 potential shootings that might satisfy

our inclusion criteria. We created protocols to prevent Type 1 and Type 2 errors and ultimately found that 652 events satisfied our inclusion criteria.

Our search protocols mined the Internet and we collected over 30,000 documents on the school shootings we identified. The search files for the intentional shooting committed by known offenders contained on average over 65 documents and scored well on our reliability index. The unknown offender intentional shootings, suicides and accidents had smaller search files and lower reliability scores (1s or 2s). We used the search files to code the attributes in our codebook and to craft our in-depth case studies.

We begin by addressing our first objective that emphasizes describing the school shooting problem over 27 years from 1990 to 2016. Since research on school violence has been stymied until now by a lack of systematically collected data, in some ways these descriptive findings are the most relevant. LaFree (2019) in talking about terrorism (another rare event plagued by weak data until recently) argued that simply accurately describing the phenomenon is an important contribution. He explained that when the Global Terrorism Database was created almost 15 years ago: “Many of the most important policy questions we face[d were].... descriptive... no one on the planet could tell how many... attacks were occurring... ? ... Were the total number of attacks going up or down? What regions... had the most frequent attacks? ... I still remember when we were finally able to produce our first version of the GTD, which covered the years 1970 to 1997—seeing the trend lines made me feel like the rocket scientists from NASA must have felt when they watched astronauts walking on the moon.” The literature on school shootings confronts similar challenges that we hope to begin addressing with our data.

We identified 652 school shootings that occurred in the United States between January 1<sup>st</sup> 1990 and December 31<sup>st</sup> 2016. On average, around 24 school shootings occurred each year. the

highest number of all school shootings in a single year is 41. We found that over 25% of incidents involved suicides and accidental discharges. This was initially somewhat surprising, but upon reflection perhaps expected since it appears these types of cases receive less media attention.

Intentional school shootings receive the most attention and we identified 473 (75% of all shootings) of them. On average, around 18 intentional school shootings occur each year. Three hundred fifty-four of these intentional shootings were committed by known offenders, on average 13 a year. One hundred nineteen of the intentional shootings were committed by unknown offenders, around five a year. We found more information on the known offender intentional shootings and their search files had higher reliability scores. We found less information on unknown offender intentional shooting cases, and they had lower reliability scores. But, we were able to locate information about many of the schools where these shootings occurred. Importantly, intentional school shootings (n= 473) match regular violence as most are non-fatal events. Almost 56% of all school shootings result in no deaths, and over 44% (n= 209) are homicides. Around 8 fatal intentional school shootings occur on average a year. Adults commit more fatal school shootings, while adolescents commit more non-fatal attacks. Perhaps the adult shooters are more “capable,” more determined, and having greater exposure to firearms and more experiences generally, are better “trained” for these types of attacks.

In terms of temporal variation, while all school shootings seem to have increased in the last years of our study this was not consistent. Interestingly, non-fatal intentional shootings did increase toward the end of our study; in fact, they increased every year for the last 5 years and doubled from 2015 to 2016 (from 12 to 24). The most fatal intentional shootings in a single year occurred in 1993 (n= 23). Over 22% of all fatal school shootings from this entire 27-year-period

under study occurred over the three years of 1992- 1994 (n= 47). On the other hand, during the last three years of our study (2014-2016), 20 fatal school shootings occurred.

Overall, the 1990s had the most fatal shootings in our study compared to the 2000's and 2001-2016. Future research could address if improved medical care, faster response time, and changes in policy related to police response contributed to the consistent increase in non-fatal shootings from 2012-2016, while fatal shootings have not followed that pattern.

Thus, fatal school shootings are not at an all-time high, and do not appear to be steadily increasing. In some ways TASSS decade trends are not surprising since they seem to match general violence trends. For instance, violence generally and youth violence specifically in America has dropped significantly since 1993. As we elaborate below, perhaps many school shootings are acts of regular youth violence that are occurring on the school grounds.

Mass homicide school shootings are outliers. But, of course, even one is too many as they devastate students, families and communities. We identified 11 over the 27 years of our study; less than one every 2 years. In addition, mass shootings are mostly evenly distributed across the 3 decades of our study. Again, despite the media portrayal and perhaps the public perception, mass homicide school shootings like Columbine and Sandy Hook are rare events and did not increase either from the 1990s to today; or in the recent years before 2016.

Overall, the numbers of all school shootings (n= 652), intentional shootings (n= 473), and fatal intentional shootings (n= 209) appear lower than expected. These are numbers for a 27-year period. It is common for the U.S. to suffer from over 14,000-15,000 homicide events in a single year. Similarly, school shooters make up a tiny percent of the overall student body, and most students with any of these identified risk factors do not commit school shootings.

Like terrorism though, and other seemingly random rare events, school shootings garner much attention and often cause public fear. After all, high profile school shootings impact not just the affected students, their families, teachers, and the local community but many others too such as first responders, parents and students across the nation, police, nurses, religious leaders, counselors and community members.

In addition to temporal variation, we found that school shootings varied spatially. The South had over three times as many school shootings over as the Northeast. It is possible, that some of these differences are due to variation in situational and related opportunity factors, cultural influences, or structural characteristics. There is similar variation across each of the 50 United States, and future research could investigate why this is so.

Intriguingly, we found that sizable numbers of school shootings were committed outside the school building (in the yard, parking lot, or grounds in front or behind the school), by non-students, during non-school hours (when school was not in session) and are sometimes motivated by non-school issues such as gang disputes. Collectively, these findings imply that a large number of school shootings are actually non-school related. These shootings may represent community violence generally that is spilling onto the school grounds. Thus, there may be a need for additional initiatives, (such as school and community partnerships to address wider social problems), besides those geared to the school classrooms, and hallways when school is in session (like metal detectors, school resource officers).

As noted, we also found that 25% of school shootings are not intentional shootings versus others but are suicides and accidents. This highlights the importance of disaggregating school shootings, like we did here. Our future plans include creating a more formal typology of incidents so that the threat posed and harms caused by each category can be responded to. This

will allow for the development of effective, more refined/targeted policy interventions and gives schools and communities accurate information to ensure the safety of both their students, and the wider community members.

We next address our second objective. Again, we applied developmental social control theory to better understand the perpetrators of school shootings. We focused on 252 adolescent school shooters and 102 adult school shooters. Adolescent shooters were mostly male, with an average age of 16. Most were not employed, around 25% had psychological issues, and as noted above around 30% had criminal records and around 30% were gang members, again indicating some shootings may be “regular” youth violence from the community spilling onto the school’s grounds. Fatal shooters were more likely to be low income.

Consistent with developmental social control theory’s arguments over twice as many fatal shooters than non-fatal shooters had additional family issues, and this was a statistically significant difference. In addition, around 30% of all adolescent shooters suffered from aggression from their peers, and this was more common for the fatal offenders. Other social control variables were not significant but were in the expected direction.

Our case studies dug deeper into the open sources and illustrated a series of risk factors, often indicating lower social control, that spanned across our offenders, including both fatal and non-fatal shooters. Importantly, all the persons in TASSS are offenders who committed school shootings. Developmental social control theory while useful to account for variation across fatal and non-fatal offenders, is better designed for differentiating offenders from non-offenders, in this case, non-offending students.

Only around 25% of the adult school shooters were employed at the time they committed the attack. While this did not vary across fatal and non-fatal shooters it still stands out because it

is much lower than the general male population. It is possible a lack of employment distinguishes adult school shooters from similarly situated adult non-school shooters, as strain and other criminology theories would expect. This is an issue that future research could address if the proper control samples are collected.

Our third objective focused on better understanding school shooting events. We investigated if SCP related strategies were more likely to result in non-fatal outcomes. We again examined a number of variables across the adolescents and the adult cases. Our goal is to assist law enforcement and school administrators devise policy responses that are appropriate for their students and communities.

We found that consistent with SCP claims schools with adolescent shootings that had police officers, or their building was multi-story, increased the odds that they would experience a non-fatal, as opposed to a fatal, shooting. We also found that metal detectors also possibly increased the odds (modestly significant) it was a non-fatal shooting (but see Klein 2020). Paradoxically metal detectors increased the odds it was a fatal attack for the adult school shooters. Other SCP attributes were not significant but were in the expected direction. We also relied upon our case studies to further illuminate how SCP mechanisms could impact the shooting's outcome. Our case studies highlighted the key role of opportunities. Many offenders were able to enter the school with a gun unmolested and without any restrictions at all. Others accessed firearms while they were underage.

Similar to prior research, the case studies showed that many offenders leaked their intentions. Over 50% in fact provided prior warning or made threats that they would commit the shooting. Unfortunately, most of the warning were ignored. Indeed, over 80% of the time the

warnings were not acted upon, usually because the recipient of the leakage did not take the threat seriously.

Finally, again as noted above, in one sense all of the incidents in TASSS were successful because a school shooting occurred. A “purer” test of the efficacy of SCP interventions like metal detectors, cameras, guards, officers, etc., would compare attacked versus non-attacked schools. Another strategy is to compare foiled school shooting plots to the completed shootings in TASSS, to investigate if situational interventions identified the weapon or shooter prior to completion. This is a key avenue for future research to pursue.



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## Appendix 1: TASSS Open Source Incident, Offender & Victim Search Protocol

OPEN-SOURCE INCIDENT, OFFENDER, & VICTIM SEARCH PROTOCOL	
PRIMARY Search Engines & Sources:	URL:
<i>Public Information Aggregation Services</i>	
<b>1. Lexis-Nexis Academic (Nexis-Uni):</b>	<i>Accessed via University library services</i>
<p><b>NOTE:</b> Lexis-Nexis Academic or Nexis-Uni can be accessed via University library services. The RAs are responsible for limiting the source material to the location of the case and then searching using specific keywords and use connectors. RAs must search all of the following options:</p> <p><b>NEWS</b> &gt;&gt; For Lexis-Nexis to return the most relevant results, it is important to search news sources that are specific to the region where the incident occurred. This is important because the default Lexis-Nexis search only searches major world publications, ignoring smaller, localized publications that cover “typical” criminal acts.</p> <p><b>LEGAL</b> &gt;&gt; federal and state cases (the link is on the top left), and then, as appropriate, search through FEDERAL, SPECIFIC STATE, BOTH, OR OTHER, i.e. where the crime was prosecuted, from the drop-down menu. We are interested in all court documents (i.e., indictments, injunctions, complaints, briefs, decisions, appeals, etc.).</p>	
<b>2. ProQuest (John Jay’s “Criminal Justice Periodicals”):</b>	<i>Accessed via University library services</i>
<b>3. Google (general):</b>	<a href="https://www.google.com/">https://www.google.com/</a>
<b>4. Google (news):</b>	<a href="https://news.google.com/?hl=en-US&amp;gl=US&amp;ceid=US:en">https://news.google.com/?hl=en-US&amp;gl=US&amp;ceid=US:en</a>
<b>5. Google (video):</b>	<a href="https://www.google.com/videohp">https://www.google.com/videohp</a>
<b>6. Google (images):</b>	<a href="https://www.google.com/imghp?hl=en">https://www.google.com/imghp?hl=en</a>
<b>7. Yahoo:</b>	<a href="https://www.yahoo.com/">https://www.yahoo.com/</a>
<b>8. Bing:</b>	<a href="https://www.bing.com/">https://www.bing.com/</a>
<b>9. Dog Pile:</b>	<a href="https://www.dogpile.com/">https://www.dogpile.com/</a>
<i>Online Newspaper Archive Services</i>	
<b>10. News Bank (MSU Library Access):</b>	<a href="http://infoweb.newsbank.com.proxy1.cl.msu.edu">http://infoweb.newsbank.com.proxy1.cl.msu.edu</a>
<p><b>NOTE:</b> First, sign into the MSU library system in one window/tab. Then, in a separate window/tab, type the link above. Once you access the newsbank website, filter by country, state, specific newspaper/source, and finally the date to search and find the specific articles. Please also use this website to search ALL remaining regional/local newspapers in which the shooting took place for additional information on the incident, suspects, and victims.</p>	
<b>11. Newspapers.com:</b>	<a href="https://www.newspapers.com/">https://www.newspapers.com/</a>
<p>Username: <a href="mailto:nadine.connell@utdallas.edu">nadine.connell@utdallas.edu</a>            Password: schoolshooting</p>	
<b>12. News Library:</b>	<a href="https://nl.newsbank.com/nl-search/we/Archives?p_product=NewsLibrary&amp;p_action=keyword&amp;p_theme=newslibr">https://nl.newsbank.com/nl-search/we/Archives?p_product=NewsLibrary&amp;p_action=keyword&amp;p_theme=newslibr</a>

	<a href="#">ary2&amp;p_queryname=4000&amp;s_home=home&amp;s_sources=location&amp;p_clear_search=&amp;s_search_type=keyword&amp;s_place=&amp;d_refprod=NewsLibrary</a>
<p><b>NOTE:</b> News Library will place the original search terms in their search box, but you will have to click on the "search" button to initiate the search. You should not pay for articles yet. Instead, the abstract should be cut &amp; pasted into the MS word search file. Then, use Lexis-nexis, Proquest, News Bank, Newspapers.com, or Newspaper Archive to locate and download the full article. RAs must investigate whether articles found through News Library are also available from these engines.</p>	
<b>13. Newspaper Archive:</b>	<a href="https://newspaperarchive.com/">https://newspaperarchive.com/</a>
<b>Legal and Court Research Services</b>	
<b>14. Westlaw:</b>	<a href="https://signon.thomsonreuters.com/">https://signon.thomsonreuters.com/</a>
<b>15. RECAP:</b>	<a href="https://www.courtlistener.com/recap/">https://www.courtlistener.com/recap/</a>
<b>16. State and County Courts Websites:</b>	<i>Accessed via Google, Yahoo, Bing, and Dogpile specific searches.</i>
<p><b>NOTE:</b> Search for the specific court case/record. Download the court records, if available. If not available, RAs must record the court record information and notify the PIs.</p>	
<b>Government and Law Enforcement Sources</b>	
<b>17. USA.gov:</b>	<a href="https://www.usa.gov/">https://www.usa.gov/</a>
<b>18. Police Foundation:</b>	<a href="https://www.policefoundation.org/">https://www.policefoundation.org/</a>
<b>19. PERF:</b>	<a href="https://www.policeforum.org/">https://www.policeforum.org/</a>
<b>20. Critical Incident and After-Action Reports:</b>	<i>Accessed via Google, Yahoo, Bing, and Dogpile specific searches.</i>
<b>21. FBI UCR SHR (fatal cases):</b>	<i>Download data series from ICPSR. Match on incident date and location. Match on offender, victim, incident characteristics.</i>
<b>22. FBI NIBRS (fatal and non-fatal cases):</b>	<i>Download data series from ICPSR. Match on incident date and location. Match on offender, victim, incident characteristics.</i>
<b>Scholarly and Academic Sources</b>	
<b>23. Gun Violence Archive:</b>	<a href="http://www.shootingtracker.com/">http://www.shootingtracker.com/</a>
<b>24. Google Scholar:</b>	<a href="https://scholar.google.com/">https://scholar.google.com/</a>
<b>25. School Shooters Info:</b>	<a href="https://schoolshooters.info/browse-library">https://schoolshooters.info/browse-library</a>
<b>SECONDARY Search Engines &amp; Sources:</b>	<b>URL:</b>
<b>Notable Incidents Tracking Services</b>	
<b>26. Every Town Research:</b>	<a href="https://everytownresearch.org/">https://everytownresearch.org/</a>
<b>27. Angels of Columbine:</b>	<a href="http://www.columbine-angels.com/">http://www.columbine-angels.com/</a>
<b>28. K-12 School Shooting Database:</b>	<a href="https://www.chds.us/ssdb/">https://www.chds.us/ssdb/</a>
<b>29. NNDB:</b>	<a href="https://www.nndb.com/">https://www.nndb.com/</a>

31. Homeland Security Digital Library:	<a href="https://www.hsd1.org/">https://www.hsd1.org/</a>
NOTE: While Homeland Security Digital Library is normally password protected; on JOHN JAY’S CAMPUS searchers can access it (from any college computer) without a password. However, off John Jay’s campus a password is required. Thus, all searchers must email the Homeland Security Digital Library to request personal account and receive a password.	
<b>People Searches and White Pages</b>	
32. Spokeo:	<a href="https://www.spokeo.com/">https://www.spokeo.com/</a>
33. Veromi:	<a href="https://www.veromi.com/">https://www.veromi.com/</a>
34. Peek You:	<a href="https://www.peakyou.com/">https://www.peakyou.com/</a>
35. Any Who:	<a href="https://www.anywho.com/whitepages">https://www.anywho.com/whitepages</a>
36. White Pages:	<a href="https://www.whitepages.com/">https://www.whitepages.com/</a>
37. The 411:	<a href="https://www.411.com/">https://www.411.com/</a>
38. Zaba Search:	<a href="https://www.zabasearch.com/">https://www.zabasearch.com/</a>
39. Virtual Gumshoe:	<a href="https://virtualgumshoe.com.cutestat.com/">https://virtualgumshoe.com.cutestat.com/</a>
40. Residential White Pages:	<a href="http://whitepages.com/neighbors">whitepages.com/neighbors</a>
<b>Social Media Sources and Search Engines</b>	
41. PIPL:	<a href="https://pipl.com/">https://pipl.com/</a> <a href="https://www.skipease.com/search/pipl/">https://www.skipease.com/search/pipl/</a>
42. Facebook:	<a href="https://www.facebook.com/">https://www.facebook.com/</a>
43. Twitter:	<a href="https://twitter.com">https://twitter.com</a>
44. Instagram:	<a href="https://www.instagram.com/">https://www.instagram.com/</a>
45. Pinterest:	<a href="https://www.pinterest.com/">https://www.pinterest.com/</a>
46. Linked-In:	<a href="https://www.linkedin.com/">https://www.linkedin.com/</a>
47. Blogger.com:	<a href="https://www.blogger.com">https://www.blogger.com</a>
48. Word Press:	<a href="https://wordpress.com/">https://wordpress.com/</a>
49. Technorati (social media portal):	<a href="https://technorati.com/">https://technorati.com/</a>
<b>Public Record Search Engines and Obituaries</b>	
50. Legacy:	<a href="http://www.legacy.com/">http://www.legacy.com/</a>

<b>51. Find a Grave:</b>	<a href="https://www.findagrave.com/">https://www.findagrave.com/</a>
<b>52. National Archives:</b>	<a href="https://www.archives.gov/personnel-records-center">https://www.archives.gov/personnel-records-center</a>
<b>53. BRB Publications:</b>	<a href="http://www.brbsub.com/">http://www.brbsub.com/</a>
<b>CRIMINAL ACTIVITY (Prior &amp; Subsequent):</b>	<b>URL:</b>
<b>54. Department of Corrections Websites (STATE and COUNTY):</b>	<i>Accessed via Google, Yahoo, Bing, and Dogpile specific searches.</i>
<p><u>NOTE:</u> First, search the state and/or county (where the crime was committed) DOC website. These websites contain information about the state or county's inmates, such as an offender's date of birth, and the history of all the charges they have been convicted of in the state, and how long they have been in prison. For example, for the state of Ohio the site is <a href="http://www.drc.state.oh.us/OffenderSearch/Search.aspx">http://www.drc.state.oh.us/OffenderSearch/Search.aspx</a> - type in the name of your suspect. HOWEVER, data are not available on people that have left the system.</p>	
<b>55. Local Police Websites:</b>	<i>Accessed via Google, Yahoo, Bing, and Dogpile specific searches.</i>
<p><u>NOTE:</u> Identify the arresting/main investigatory law enforcement agency, or the law enforcement agencies in which the suspect has lived, and locate its website. Next, search for specific police reports pertaining to the suspect(s). Download the arrest reports/records, if available. If not available, RAs must record the information and notify the PIs.</p>	
<b>56. Black Book</b>	<a href="http://www.blackbookonline.info">www.blackbookonline.info</a>
<p><u>NOTE:</u> Black Book Online only allows coders to search for the web sites of public institutions in specific geographic areas that contain public information. Once connected to these sites, the coders can then search by specific names for suspects and victims.</p>	
<b>57. NCSC:</b>	<a href="https://www.ncsc.org/">https://www.ncsc.org/</a>
<b>58. Vine Link:</b>	<a href="https://vinelink.com/#/home">https://vinelink.com/#/home</a>
<b>59. Inmate Locator:</b>	<a href="http://www.theinmatelocator.com/">http://www.theinmatelocator.com/</a>
<b>60. Federal BOP:</b>	<a href="https://www.bop.gov/inmateloc/">https://www.bop.gov/inmateloc/</a>
<b>61. Mugshots:</b>	<a href="https://mugshots.com/">https://mugshots.com/</a>
<b>62. National Sex Offender Website:</b>	<a href="https://www.nsopw.gov/">https://www.nsopw.gov/</a>
<b>63. Been Verified (limited access):</b>	<a href="https://www.beenverified.com">https://www.beenverified.com</a>
<b>64. Lexis Advance (limited access):</b>	<a href="https://advance.lexis.com">https://advance.lexis.com</a>

## Appendix 2: TASSS Open Source School Search Protocol

PRIMARY Search Engines & Sources:	URL:
<p><b>NOTE:</b> TASSS collects information from both the present and at the time of the incident (i.e., incident date). You <b>MUST</b> search for the school in each news database 1-3 years before and after the school shooting. It is also helpful to do a general search of the school name and to use terms like "security" or "safety" or "policy" or "budget."</p>	
<b>1. Lexis-Nexis Academic (Nexis-Uni):</b>	<i>Accessed via University library services</i>
<b>2. ProQuest (John Jay's "Criminal Justice Periodicals"):</b>	<i>Accessed via University library services</i>
<b>3. Google (general):</b>	<a href="https://www.google.com/">https://www.google.com/</a>
<b>4. Google (news):</b>	<a href="https://news.google.com/?hl=en-US&amp;gl=US&amp;ceid=US:en">https://news.google.com/?hl=en-US&amp;gl=US&amp;ceid=US:en</a>
<b>5. Google (video):</b>	<a href="https://www.google.com/videohp">https://www.google.com/videohp</a>
<b>6. Google (images):</b>	<a href="https://www.google.com/imghp?hl=en">https://www.google.com/imghp?hl=en</a>
<b>7. Yahoo:</b>	<a href="https://www.yahoo.com/">https://www.yahoo.com/</a>
<b>8. Bing:</b>	<a href="https://www.bing.com/">https://www.bing.com/</a>
<b>9. Dog Pile:</b>	<a href="https://www.dogpile.com/">https://www.dogpile.com/</a>
<i>Online Newspaper Archive Services</i>	
<b>10. News Bank (MSU Library Access):</b>	<a href="http://infoweb.newsbank.com.proxy1.cl.msu.edu">http://infoweb.newsbank.com.proxy1.cl.msu.edu</a>
<p><b>NOTE:</b> First, sign into the MSU library system in one window/tab. Then, in a separate window/tab, type the link above. Once you access the newsbank website, filter by country, state, specific newspaper/source, and finally the date to search and find the specific articles. Please also use this website to search ALL remaining regional/local newspapers in which the shooting took place for additional information on the incident, suspects, and victims.</p>	
<b>11. Newspapers.com:</b>	<a href="https://www.newspapers.com/">https://www.newspapers.com/</a>
<p>Username: <a href="mailto:nadine.connell@utdallas.edu">nadine.connell@utdallas.edu</a>            Password: schoolshooting</p>	
<b>12. News Library:</b>	<a href="https://nl.newsbank.com/nl-search/we/Archives?p_product=NewsLibrary&amp;p_action=keyword&amp;p_theme=newslibrary2&amp;p_queryname=4000&amp;s_home=home&amp;s_sources=location&amp;p_clear_search=&amp;s_search_type=keyword&amp;s_place=&amp;d_refprod=NewsLibrary">https://nl.newsbank.com/nl-search/we/Archives?p_product=NewsLibrary&amp;p_action=keyword&amp;p_theme=newslibrary2&amp;p_queryname=4000&amp;s_home=home&amp;s_sources=location&amp;p_clear_search=&amp;s_search_type=keyword&amp;s_place=&amp;d_refprod=NewsLibrary</a>
<p><b>NOTE:</b> News Library will place the original search terms in their search box, but you will have to click on the "search" button to initiate the search. You should not pay for articles yet. Instead, the abstract should be cut &amp; pasted into the MS word search file. Then, use Lexis-nexis, Proquest, News Bank, Newspapers.com, or Newspaper Archive to locate and download the full article. RAs must investigate whether articles found through News Library are also available from these engines.</p>	

<b>13. Newspaper Archive:</b>	<a href="https://newspaperarchive.com/">https://newspaperarchive.com/</a>
<b>14. Google Images/Earth</b>	<a href="https://images.google.com/">https://images.google.com/</a>
<b>COMPREHENSIVE School Sources:</b>	<b>URL:</b>
<b>15. NCES Express Tables (use exact incident school year)</b>	<a href="https://nces.ed.gov/ccd/elsi/expressTables.aspx">https://nces.ed.gov/ccd/elsi/expressTables.aspx</a>
<b>16. School Digger</b>	<a href="https://www.schooldigger.com/">https://www.schooldigger.com/</a>
<b>17. State Report Cards</b>	<a href="https://nces.ed.gov/globallocator/">https://nces.ed.gov/globallocator/</a>
<b>18. State Department of Education and District Websites</b>	<i>Accessed via Google, Yahoo, Bing, and Dogpile specific searches.</i>
<b>School Sources for RECENT Cases:</b>	<b>URL:</b>
<b>19. Public School Review</b>	<a href="https://www.publicschoolreview.com/">https://www.publicschoolreview.com/</a>
<b>20. Private School Review</b>	<a href="https://www.privateschoolreview.com/">https://www.privateschoolreview.com/</a>
<b>21. US News</b>	<a href="https://www.usnews.com/education/best-high-schools">https://www.usnews.com/education/best-high-schools</a>
<b>22. Great Schools</b>	<a href="https://www.greatschools.org/">https://www.greatschools.org/</a>
<b>23. Niche</b>	<a href="https://www.niche.com/k12/search/best-schools/">https://www.niche.com/k12/search/best-schools/</a>



## Appendix 3: TASSS Case Study Template

### 1. SAMPSON & LAUB'S DEVELOPMENTAL SOCIAL CONTROL

#### **GENERAL:**

*For the following, please provide a bulleted list of any relevant information in these areas related to the perpetrator (if multiple perpetrators, please complete template for each offender):*

- A. Overview of the Incident/Event*
- B. Birth and Family (i.e. where/when were they born; who is in their extended family and what is their brief work, criminal, and violence history)*
- C. Education*
- D. Work*
- E. Friends*
- F. Social Activities*
- G. Mental Health*
- H. Drug/Alcohol Abuse*
- I. Romantic experience; particularly any marriages or divorces*
- J. Military Experience*
- K. Criminal History and Legal Troubles*
- L. Gang or Extremist Connections*
- M. Prison experience*

**SPECIFIC:**

1. **List all of the reasons mentioned why the perpetrator might have committed the crime? (For e.g., bullied; revenge, thrill, fame, mental illness, etc.).**
  - a. **What was the most important/emphasized reason?**
  
2. **Were there any changes that occurred within perpetrators life?**
  - a. **0-1 months before?**
  - b. **2-5 months before?**
  - c. **6-12 months before?**
  - d. **1-2 years before.**
  - e. **Other**
  
3. **Were there any key events that occurred within the perpetrators life (such as death of a loved work one; significant work related issue, etc)?**
  - a. **0-1 months before?**
  - b. **2-5 months before?**
  - c. **6-12 months before?**
  - d. **1-2 years before.**
  - e. **Other**
  
4. **Were there any online usage/engagement changes that occurred within perpetrators life?**
  - a. **0-1 months before?**
  - b. **2-5 months before?**
  - c. **6-12 months before?**
  - d. **1-2 years before.**
  - e. **Other**
  
5. **Please provide specifics if any of the following factors were mentioned in the materials.**

*NOTE: For all questions below please note if there were (yes/no) any changes over time. If yes, please specify & describe.*

- a. **Negative social interaction with peer group?**
  
- b. **Negative familial development (divorce, death of parent, etc)?**
  
- c. **Negative romantic/personal relationships?**

***d. Individual failure or successes at any pro-social activity***

- 1 Sports***
- 2 Employment***
- 3 School***
- 4 Military***
- 5 other***

- a. Did anyone encourage them to respond violently? If so, please describe who & how (if possible)***
- b. Do they socialize frequently with other peers?***
  - 1. Are the relationships below primarily on- or off-line?***
- c. Is the individual strongly attached with their parents/grandparents?***
- d. Is the individual strongly attached with other family members?***
- e. Is the individual married/in a relationship?***
- f. Is the individual strongly attached with religious groups or leaders?***
- g. Is the individual strongly attached to teachers?***
- h. Is the individual strongly attached to peers (i.e., do they have a strong peer group)?***
  - i. Is the individual connected to gangs?***
  - ii. Is the individual connected to extremist groups?***

- i. Are the preponderance of individuals in this peer group involved in delinquent activities? To what extent of seriousness were these activities (i.e. mostly misdemeanors or felonies)?*

**2. Provide details about their criminal justice experience. Number and types of charges, punishments, behavior in correctional facilities, etc.**

**3. Provide details about their medical history.**

**4. Provide details about their psychological history / record of mental illness. Make sure to note precise sources for each specific claim (so we can differentiate between verifiable/non-verifiable assertions)**

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## **II. SITUATIONAL CRIME PREVENTION (SCP) ISSUES**

*For the following, please provide a bulleted list of any relevant information about the school where the event occurred:*

*A. Size/Demographic of the School.*

*B. Community Information*

*C. Where in School Occurred?*

*D. Safety/security measures in place when the incident occurred?*

*E. Safety/security measures in places after the incident?*

*F. Describe physical grounds.*

**G. Please review the open source information for this incident and create narrative and chronological listing of all steps that were necessary for the attack to occur. In addition, highlight what, if any, role social media, online activity, surveilling, firearms/shooting training, and/or logistical infrastructure, may have played in planning/committing the attack**