K-12 School Shootings in Context

New Findings from The American School Shooting Study (TASSS)

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SYNOPSIS

The American School Shooting Study (TASSS) is an ongoing mixed-method project funded by the National Institute of Justice to catalog US school shootings. It has amassed data based on open sources and other public materials dating back to 1990. This brief presents new insights from TASSS, diving deeper into the database’s potential to examine the locations, timing, and student involvement of youth-perpetrated gun violence.

TASSS DEFINES “SCHOOL-ASSOCIATED GUN VIOLENCE” AS:

The firing of a gun anywhere on K-12 school property, resulting in one or more gunshot injuries or fatalities, irrespective of the time of day or season.

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INTRODUCTION

Although statistically rare, fatal and nonfatal shootings in the United States at elementary, middle, and secondary schools remain important crime problems with significant public policy implications. Indeed, the impact of such violence exceeds the devastating fatalities and immense sorrow that survivors, families, and communities experience. Even one gunshot fired at a school can subject numerous individuals to the traumas of gun violence.\(^1\) Recent polls indicate that school shootings can also sway broader public views on crime, including attitudes toward violence reduction.\(^2\) As a result, school shootings have become a focal point of US politics, sparking crucial debates on the most effective strategies for preventing and responding to gun violence, both inside and outside K-12 schools.
While there has been a recent surge in school firearm violence studies, discrepancies persist in the research due to variations in definitions and datasets. Initially, our comprehension of school shootings originated from narrow studies focused on small samples of highly publicized mass killings where attackers indiscriminately fired upon multiple victims in their schools.\(^3\) By contrast, recent progress in quantitative studies and the establishment of extensive databases have provided alternative perspectives on the characteristics of school shootings more broadly.\(^4,5,6,7\) Within this domain, however, there are disparities in inclusion criteria, as some studies encompass school-related violence occurring both within and outside of school premises, leading to an inconsistent research base.\(^8\)

We created The American School Shooting Study (TASSS) in 2016 to address these incongruencies in the existing research.\(^9\) Previously, we reported findings from TASSS on the patterns and nature of US school-associated gun violence between 1990 and 2016,\(^10\) defined as the firing of a gun anywhere on K-12 school property, resulting in one or more gunshot injuries or fatalities, irrespective of the time of day or season. Our findings suggested critical nuances in school firearm violence regarding the situations they encompass, the characteristics of the perpetrator and victims, and the location of the incident on school grounds. For instance, this violence encompassed various scenarios, including interpersonal assaults, self-harm incidents where the shooter was the only victim, accidental gun discharges, and legally justified shootings. At the same time, mass casualty shootings (defined as four or more fatalities) were exceptionally infrequent, representing around 5 percent of all interpersonal assaults at schools. The other 95 percent of these shootings involved one or two victims, most of which were nonfatal incidents.

Even among the fatal and nonfatal interpersonal assaults involving known perpetrators, we found that gun violence at American schools displayed considerable variability. Although adults were responsible for almost 29 percent of such incidents, a significant majority (71 percent) involved young individuals aged between 6 and 19. Interestingly, many school shootings were carried out by individuals not enrolled in the schools, often occurring outside school buildings and outside school hours. These incidents were largely fueled by nonacademic concerns, such as personal disagreements or gang-related activities. Therefore, contrary to popular belief, multiple-victim attacks by troubled students account for just a minority of total cases. As such, it is beneficial for policymakers to differentiate between incidents of school shootings that take place within the school during school hours and those that occur outside the school buildings when the school is not in operation. Depending on the specific nature of each incident, tailored intervention strategies are essential. Just as responses to premeditated mass shootings differ from spontaneous assaults, there will be important
qualitative differences here between cases that affect how officials prepare, prevent, and respond to school shootings.

In this brief, we present new insights from TASSS, diving deeper into the database’s potential to examine the locations, timing, and student involvement of youth-perpetrated gun violence. In the end, our goal is to equip stakeholders with the essential data they need to formulate effective policies that mitigate school violence.

The American School Shooting Study at a Glance

The American School Shooting Study (TASSS) is an ongoing mixed-method project funded by the National Institute of Justice (NIJ). TASSS is among the longest-running projects to catalog US school shootings and has amassed data based on open sources and other public materials dating back to 1990. Distinguished by its comprehensiveness and rigorous methodology, the database contains perpetrator, victim, incident, and school variables on all known school shootings, defined as firearm discharges that resulted in one or more gunshot victimizations (injury or fatality) and occurred on grade K-12 school grounds from 1990 to 2016 in America. The following six criteria are used to identify school shootings included in TASSS’s database:

1. The shooting must have occurred between January 1, 1990, and December 31, 2016.

2. The shooting must have occurred in the 50 states or Washington, DC.

3. The shooting must have resulted in a criminal justice response that confirmed its occurrence and not merely an unsubstantiated rumor.

4. A firearm must have discharged explosives to propel a projectile. Thus, TASSS excludes plots (no discharge occurred) and cases where the perpetrator used non-gun weapons.

5. The shooting injury must have occurred on the K-12 school’s (both public and private) grounds, either inside the school building or outside in yards or parking lots that are also on school property.

6. The gun discharge must have injured or killed at least one person with a bullet wound.
We reviewed over 40 databases—surpassing every other open-source database of its kind—to identify 1,378 potential incidents for inclusion (Figure 1). Studies have shown that using multiple sources like this to develop a framework of eligible cases improves data quality.\textsuperscript{12} We iteratively vetted every case, ultimately excluding 726 that failed to meet TASSS’s inclusion criteria. As a result, the database houses information on 652 qualifying school shootings covering a range of scenarios.

Most school shootings were interpersonal assaults (54 percent), though some were self-harm incidents where the shooter was the only victim (16 percent), accidental gun discharges (11 percent), and legally justified cases (1 percent). An additional 18 percent involved unnamed shooters or unsolved crimes (n=119). These fall into two groups: (1) truly unknown (n=84), where the suspects were never identified, and in some cases, investigators did not know a motive for the shooting (n=44), and (2)

\textbf{FIGURE 1.} Snapshot of TASSS v.1.0 Data Collection Process

\begin{itemize}
  \item School shootings found during the initial search process (1,378)
  \item School shootings included in TASSS, 1990 – 2016 (652)
  \item Final list of known interpersonal school shootings (354)
\end{itemize}

\textbf{NOTE:} There were 263 adolescent shooters linked to 253 youth-perpetrated shootings and 110 adult shooters linked to 101 adult-perpetrated school shootings.
cases involving a known perpetrator who was not named by investigators, usually due to their minor status (n=35).

One distinct strength of TASSS compared to other databases is that it relies on a wide range of open sources to gather information on every school shooter involved in interpersonal gun assaults in the database. Using various Boolean search terms across more than 60 unique databases and search engines, TASSS researchers extracted project-relevant open-source materials uncovered during the search process. The goal was to identify and collect every publicly available document that mentioned the shooting, school, perpetrators, or victims.

These sources were compiled into a rich collection of qualitative case files, totaling over 90,000 pages of material and more than 30,000 unique documents, chronologically detailing how individuals become involved in gun violence at American schools. The case files include local and mass news media (e.g., print, online, and television transcripts), official records (e.g., police and department of corrections files), court documents (e.g., indictments, trial transcripts, complete records), scholarly materials (e.g., case studies, journal articles, books), websites, social media, and governmental reports. While not every case file’s breadth of information is equal, nearly all contain two or more open-source documents. In fact, just under 90 percent have 10 or more documents, and 35 percent have over 50, exceeding other databases. Moreover, most case files include several different source types (e.g., newspapers plus court documents) and contain relevant facts gathered from a bevy of unique informants (e.g., police, prosecutors, parents, shooter’s self-report), enhancing the database’s depth, quality, and integrity.

TASSS researchers have used these rich textual data to extract quantitative variables into an electronic database. These data were triangulated via multiple sources and only the most credible information was ultimately stored in the database. We systematically documented the data’s reliability, finding that nearly all variables examined had substantial reliability.13, 14
Data and Analysis for the Current Policy Brief

This policy brief focuses on the 263 youth perpetrators, ages 6 to 19, who were involved in 253 American school shootings between 1990 and 2016. We are particularly interested in data concerning the locations, timing, and student status of these youth-perpetrated shootings. Our analysis uses descriptive statistics to report the variables’ distributions within this population and across time.

Findings

Among the 263 youth, an overwhelming 97 percent were male. The mean age of a school shooter in our study was 16. Regarding race and ethnicity, 58 percent were identified as Black, a group overrepresented compared to the broader US youth demographic, which accounts for around 15 percent of the population. White perpetrators constituted around 28 percent of the youth perpetrators studied, 9 percent were Latino/a/x, and 6 percent belonged to other racial/ethnic categories, such as Asian/Pacific Islander and Indigenous peoples of the Americas. Youth perpetrators identified in the TASSS case files shot 589 individuals, and more than half of the shooters (58 percent) were associated with nonfatal incidents. Just nine adolescents were implicated in seven school-based mass homicides during the study period.

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Location, Timing, and Student Status of Youth-Perpetrated School Shootings

Most youth perpetrators initially opened fire outdoors (58 percent) rather than inside the school building (42 percent). The most common outdoor locations were schoolyards and parking lots, accounting for around 32 percent and 21 percent of incidents, respectively. Indoor locations ranged from lunchrooms (6 percent) to classrooms (6 percent) to hallways (18 percent) as the most common areas within the school building. Other inside locations typically included gymnasiums, offices, and stairwells. At the same time, child and adolescent school shooters (ages 6 to 19) primarily committed violence outside school hours (57 percent), usually around school drop-off and pick-up times. Interestingly, most outdoor shootings were committed outside of scheduled school hours (77 percent). At the time of the incident, about 55 percent of these adolescent shooters were registered students at the school they targeted.

Figure 3 portrays the school shooting incidents’ locations and timing, distinguished by the perpetrator’s student status. Predictably, individuals not enrolled at the targeted schools gravitated towards perpetrating violence in external spaces outside school hours, while enrolled students tended to commit violence within school buildings and during school hours. These patterns indicate possibly distinctive risks to school safety that merit deeper exploration.

FIGURE 3. Shooting Location and Timing by Student Status

Individuals not enrolled at the targeted schools gravitated towards perpetrating violence in external spaces outside school hours, while enrolled students tended to commit violence within school buildings and during school hours.
Inside Versus Outdoor Locations

While we can identify no clear time trend in the distribution of inside versus outdoor locations by year (Figure 4), two observations stand out. First, shootings inside school buildings were more prominent in the early 1990s, with a noticeable decline from the early 2000s onwards. Conversely, the 2010s saw a minor uptick in outdoor shootings.

Dissecting these observations reveals important differences in shooting locations regarding the circumstances surrounding these events. For instance, proportionately more outdoor (23 percent) versus indoors (12 percent) locations stemmed from suspected gang-related activity, escalating interpersonal disputes or conflicts (25 percent outdoors vs. 18 percent indoors), reactions to immediate provocations such as physical altercations or heated arguments (14 percent vs. 7 percent), and other criminal conduct like robberies (7 percent vs. 3 percent). On the other hand, indoor locations compared to outdoor locations were more associated with targeted shootings involving revenge or responses to grievances (28 percent indoors vs. 19 percent outdoors) and incidents related directly to the school, such as anger over grades (9 percent vs. 4 percent).16

FIGURE 4. Shooting Outdoors vs. Inside the School Building
During School Versus Nonschool Hours

Like the patterns observed in school shooting locations, no definitive time trend can be discerned concerning the timing of these incidents upon looking at the annual distribution of shootings happening not during school hours as compared to those occurring during school hours (Figure 5). However, a subtle increase in incidents happening outside school hours can be noted between 2008 and 2016. In contrast, the frequency of such episodes during school hours appears to have reduced and stabilized over time.

FIGURE 5. Shootings Outside School Hours vs. During School

Contrasts in the circumstances surrounding these incidents, based on the timing of the shootings, also echo the patterns previously noted. We found that shootings occurring outside of standard school hours were more associated with gang-related activity, dispute escalations, reactionary violence, and criminal activity.
**Students Versus Nonstudents**

The most significant divergence in the annual changes in school shootings perpetrated by students and nonstudents occurred between 1991 and 1999 (Figure 6), with more gun assaults being committed by students enrolled in the targeted schools. From 2000 to 2016, the gap between students and nonstudents narrowed to maintain a relatively steady ratio.

*FIGURE 6. Nonstudent- vs. Student-Perpetrated Shootings*

Upon further analysis of these trends, we discovered that student and nonstudent perpetrators were distinctly linked with various circumstances surrounding the incidents. Notably, nonstudents were involved more frequently in suspected gang-related (28 percent vs. 11 percent) and other criminal activities (10 percent vs. 1 percent), leading to gun violence on school grounds. On the other hand, students, compared to nonstudents, were more often connected with revenge and grievance-oriented attacks (27 percent vs. 17 percent) and conflicts related to school (10 percent vs. 0 percent). Both groups exhibited similar proportions regarding escalating disputes and reactions to situational provocations that led to gun violence.
Takeaways for Policymakers

In general, the public tends to think that extreme cases of mass violence represent what is typical about school shootings. These events are so rare yet discussed so extensively that they drive and influence society’s responses to these crimes. This is problematic for two reasons. First, although there is a growing body of literature on school violence and school shootings, only a few experiments have been published evaluating different types of interventions. Second, research, such as the findings published here, indicates that school shootings are much more varied than we might expect if considering only mass school shootings. The number of injured and killed, the locations and timing of the shootings, and the shooters’ statuses (current student or not, juvenile or adult) vary tremendously. Another interesting challenge that policymakers must consider is that school violence does not occur in a vacuum; instead, it is impacted by similar drivers that explain the amount and type of violence occurring off school grounds. Thus, there is some value in developing a broad range of policy solutions implemented in a way that overlaps with other interventions to respond to community violence. We conclude with some considerations related to various promising strategies.
Protective measures consistent with situational crime prevention (SCP) theory are undoubtedly promising. SCP refers to a set of strategies aimed at preventing specific types of crimes, like school gun violence, by directly modifying and managing the physical environment and changing the perception of potential offenders about their chances of being caught. Instead of focusing on aggressive drives and motivations, SCP concentrates on the immediate conditions that present opportunities for violence to occur.\textsuperscript{18} Limitations on access to school buildings, classrooms, and the use of security personnel are widely adopted techniques but also differentially implemented and hard to evaluate. In addition, as many shootings occur in locations or at times that fall outside when these techniques might be effective, it is important to consider extending such measures to other locations (e.g., school fields and parking areas), and restricted access to school premises should be 24/7.

Furthermore, our findings also suggest the need for a multifaceted approach to managing threats from students and nonstudents. It would be helpful to broaden the discussions about school risks and be informed of what is occurring in the community. Schools could think about working with law enforcement and community organizations to address the broader issue of gun violence, which often originates outside school property due to interpersonal conflicts, gang-related, and other criminal activities. Such approaches speak to better assessing the threat environment and problem areas that need to be assessed. Empirically backed strategies like Project Safe Neighborhoods,\textsuperscript{19} multiagency community initiatives,\textsuperscript{20} focused deterrence,\textsuperscript{21} and targeted police patrols\textsuperscript{22} may effectively reduce violent gun incidents and potentially reduce school-related shootings. However, it is crucial to note that increased law enforcement interaction could contribute to the school-to-prison pipeline and racial/ethnic disparities in juvenile punishment, so more holistic and equitable nonlegal approaches are still needed.\textsuperscript{23}

Indeed, more resources should be allocated to identify and manage potential conflicts before they escalate into violent confrontations. School threat assessment and management intends to pinpoint and address alarming behaviors, including escalating interpersonal conflicts and criminal/gang-related activity before they escalate to violence. These are promising tools for crafting actionable plans to support those at risk for violent actions.\textsuperscript{24} This approach delves deep into the root causes of worrisome behaviors, distinguishing genuine safety threats and formulating tailored plans for at-risk students. Such plans help to ensure they receive the necessary care and services without resorting to punitive actions like suspensions or expulsions that can exacerbate adverse life outcomes and racial disparities. With its proactive nature, threat assessment offers one avenue to mitigate potential violence before it takes form, positioning it as a strategic choice against school shootings. There is a higher likelihood of recognizing and reporting troubling behaviors in school environments—with teachers, administrators, and peers closely observing students. Threat assessment, a continually evolving field backed by rigorous empirical study, offers a solid basis for action plans. Concurrently, schools could also benefit from integrating counseling, mediation, or other conflict resolution tools to tackle these challenges more effectively.
In sum, a multifaceted approach that considers the unique timing, location, and perpetrator-related trends of school shootings will be crucial in mitigating and preventing future incidents. Such a strategy would require collaboration among schools, community organizations, law enforcement agencies, and policymakers, with the collective aim of ensuring the safety of our schools and equitable treatment of at-risk individuals.


11. TASSS’s public data are available via the Inter-university Consortium for Political and Social Research (ICPSR), part of the Institute for Social Research at the University of Michigan.


15. Some shootings involved multiple individuals who fired guns during the incident.

16. We adjusted the proportions shown to account for missing values as needed in our comparisons of inside versus outdoor locations, during school versus nonschool hours, and students versus nonstudents. To adjust the data, we fit a logistic regression model, correlating neighborhood factors and indicators of open-source quantity (e.g., the total number of documents) and reliability (TASSS’s reliability score) with the likelihood of missing values on each of the variables (1=missing, 0=not missing). We predicted the probability of missingness for each incident to weigh the cases and compute the proportions shown. Hence, the “adjusted” data is analogous to sampling weights (i.e., the reciprocal of the adjusted probability), offering a more accurate representation of the recognized US school shootings population.


ABOUT THE REGIONAL GUN VIOLENCE RESEARCH CONSORTIUM

The Regional Gun Violence Research Consortium is a coalition of gun violence researchers and practitioners from eight states and territories (CT, DE, MA, NJ, NY, PA, PR, RI) that seeks to inform policymakers and the public by providing evidence-based, data-driven policy recommendations to disrupt the cycle of firearm-involved homicides, suicides, and injuries. The Consortium approaches the study of gun violence with the belief that:

+ Gun violence is a public policy problem.
+ State and local governments are key in the fight to reduce firearm-involved deaths and injuries.
+ We need to better understand the nuances of state law- and policy-making to effectively combat gun violence.

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