Crime Scene Behaviors of Rampage School Shooters: Developing Strategies for Planning, Response, and Investigation of Multiple-Victim Shooting Incidents on School Campuses

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Crime Scene Behaviors of Rampage School Shooters:
Developing Strategies for Planning, Response,
and Investigation of Multiple-Victim Shooting Incidents on School Campuses

by

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A Dissertation Presented to the
Department of Justice & Human Services
of Nova Southeastern University
in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy

Nova Southeastern University
2018
Approval Page

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Despite their almost aberrational rarity, rampage school shootings have gained national attention to an extent that would make it seem that such events are a common occurrence. Many schools—along with hospitals, businesses, and other institutions—have adopted policies, implemented training, and conducted drills for responding to such incidents. In some cases, concern over school rampage shootings has led to bad policy implementations, particularly adoption of “zero tolerance” policies that punish the slightest infractions in hopes of thwarting potential attackers, but, rather than achieving their intended goal, result in massive false positive rates with few, if any, successes and a potential for fostering violence rather than abating it.

For their part, law enforcement trainers and administrators have been caught in the rampage school shooter turmoil to such an extent that, starting with the aftermath of the 1999 Columbine High School massacre, significant paradigm shifts in policing methodology have taken effect. In order to promote more informed policy-making and training decisions by law enforcement managers, this dissertation seeks to determine through empirical study of the crime scene behaviors of rampage school shooters the extent to which law enforcement planning and training can be informed by the study of prior incidents.

Policy, training protocols, and institutional response plans have been shaped, in many cases, by a world of perception rather than reason and sound empirical evidence. This research seeks to bring clarity to the decision-making processes and provide sound empirical evidence on which to base those decisions and develop strategies for on-site protocols to help mitigate casualties, establish police response protocols, and develop post-incident investigative models.
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Chapter 1: Introduction

Background

On April 20, 1999, in an unincorporated portion of Jefferson County, Colorado, high school students Eric Harris, 18, and Dylan Klebold, 17, perpetrated a 49-minute massacre at Columbine High School killing 13 students and teachers and wounding 24 others before taking their own lives (Cullen, 2010; Erickson et al., 2001). The incident affected American society so deeply that the name “Columbine” has become synonymous with the phenomenon of school rampage shootings. “[T]he 1999 Columbine tragedy,” wrote Fox and Savage (2009), “was the watershed event in terms of national consciousness about school violence” (p. 1474). But whatever effect the massacre had on American society, Columbine brought law enforcement to a crossroads: the aftermath of the tragedy revealed the utter failure of police to respond appropriately, to rescue the wounded, to stop the perpetrators, and to save lives. Instead, people watched in horror the live news broadcasts showing dozens, perhaps even hundreds, of police staged outside the school while victims lay dying inside, never to be rescued. Disgusted citizens and victims’ family members chided police for their apparent inaction and lack of coordination. Law enforcement officials stonewalled the press and refused to cooperate with a governor’s inquiry, citing mounting lawsuits and “an on-going investigation” (Cullen, 2010; Erickson et al., 2001).

Reports surfaced of the ineffectual response by law enforcement. Deputy Neil Gardner, Columbine’s school resource officer, was called by staff to the parking lot, but he had no idea what was happening. After Eric Harris fired multiple shots at him,
Gardner returned fire, but missed. Harris and Klebold then ran inside the school, and, consistent with protocol, Gardner did not pursue them. At the time, 11 of the 13 murdered victims were still alive. It was later alleged that Gardner was not wearing his prescription eyeglasses, though what effect that had on his ability to engage Harris in a gunfight remains unclear (Cullen, 2010; Seibert, 2000).

Within two minutes, Harris exchanged fire with another deputy, and within a few more minutes, dozens of law enforcement officers had arrived, but none would enter the school until several SWAT teams arrived and eventually went in, long after the gunmen had committed suicide. The strategy had been one of “containment” and “setting up a perimeter” (Cullen, 2010, p. 56). In the wake of the shootings, law enforcement trainers and administrators came to understand that “tactical loitering” was no longer an acceptable policing strategy when facing an active shooter; such incidents would, from Columbine forward, require a paradigm shift in policing policy, one that would mandate that the first arriving officers take immediate action (Remsberg, 2013; see also Martinez, 2012; Police Executive Research Forum, 2014).

In 2002, the Jefferson County Sheriff’s Office settled a lawsuit brought by the daughter of Dave Sanders, a Columbine High School teacher who allegedly bled to death because deputies refused to allow paramedics to enter the scene and treat the dying man for hours after the shooting was over, even after law enforcement commanders were aware that both Harris and Klebold were dead. Refusing to dismiss the lawsuit, a federal judge ruled that police officials had “demonstrated a deliberate indifference toward Dave Sanders’ plight shocking the conscience of this federal court” (quoted in “Columbine
teacher’s family settles lawsuit,” 2002).

Sadly, law enforcement officials had not learned the lessons from an incident a decade prior: the massacre perpetrated by Marc Lépine at Canada’s École Polytechnique de Montréal. On December 6, 1989, Lépine killed 14 people and wounded 14 others at the college before taking his own life. Police arrived within 12 minutes of the first 911 call but waited another 14 minutes before entering, following their protocol of securing the perimeter and waiting on specially armed and trained tactical officers. While it is unclear how many lives might have been saved if police had entered sooner, Lépine was still roaming the school’s halls while officers waited outside. Though he eventually killed himself, a coroner’s report on the episode was highly critical of the police response pointing out that Lépine still had 60 rounds of ammunition on him when he committed suicide. Had he chosen to, he could have killed many more victims (Wilton, 2014).

Where Columbine set a new bar for law enforcement protocols, Sandy Hook raised the argument that even the new standard was insufficient. On December 14, 2012, 20-year-old Adam Lanza went to Sandy Hook Elementary School in Newtown, Connecticut, and opened fire, killing 20 children and six adults before committing suicide. Lanza shot his way through a floor-to-ceiling glass panel adjacent to a locked, glass door before killing the principal and school psychologist and wounding two other staff members. He went into the school office but did not notice several staff members who were hiding. Lanza then went a short distance down the hall to classroom 8 where he killed two teachers and all 15 children in the room. Moving to the next classroom—number 10—he killed two more teachers and five children before killing himself. His
rampage lasted fewer than 11 minutes (Sandy Hook Advisory Commission, 2015; Sedensky, 2013).

Where law enforcement had, following Columbine, learned to rapidly amass multiple officers and enter a school or other venue quickly to proactively engage an active shooter, Sandy Hook forced law enforcement trainers to face a new question: can police spare even precious seconds waiting on backup when a shooter is actively killing innocent people, particularly young schoolchildren? The first officer arrived at the school two minutes and 41 seconds after being dispatched, but no officer entered the building until nearly six minutes later (Montminy, Crowley, Manage, & Reed, 2013). The tragedy has prompted law enforcement trainers and policy makers to advocate for solo-officer entry: get there, get in, stop the shooter (Police Executive Research Forum, 2014; Remsberg, 2013; Wylie, 2013). Clearly, when it comes to law enforcement response to active shooter incidents—especially at schools—there exists a learning curve.

Unfortunately, police may not be as far around that curve as the repercussions from the Columbine massacre would suggest that they should now be. On February 14, 2018, gunman Nikolas Cruz killed 17 people and wounded 15 others at Marjory Stoneman Douglas High School in Parkland, Florida. In the aftermath of that tragedy, it was learned that the school’s resource officer, an armed Broward County sheriff’s deputy, waited outside the school for several minutes while gunfire was ongoing, never taking in direct action to stop the shooter. Three more deputies arrived after the shooting, but still none of them entered the school until several police officers from nearby Coral Springs arrived, bypassed the deputies, and entered the school to start rescuing victims (Berman,

Problem Statement

Two rampage school shootings in little more than a decade have brought about two major paradigm shifts in law enforcement thinking, perhaps because police are particularly bothered by the idea of officers amassing outside a school while children are being massacred inside. Before the massacre at Sandy Hook, American law enforcement officials had been seemingly oblivious to the prospects of a shooter killing children at an elementary school despite the 1996 Dunblane massacre in which 43-year-old Thomas Hamilton shot and killed 16 children and one teacher inside a gymnasium at Dunblane Primary School in Scotland (Wilkinson, 2013) and the 1989 murder of five first graders by 24-year-old Patrick Purdy on an elementary school playground in Stockton, California (Levin, 2014). Perhaps even police have difficulty accepting the possibility of such a horrible tragedy.

Each year in the United States, there are an average of 18 incidents of mass murder by firearm with an average of 85 victims killed plus many more wounded (Fox & Levin, 1998; Yount & Poston, 2012). While shocking, these incidents account for less than one percent of all homicides by firearm annually. The 35-year total from 1976 through 2010 equates to about two-and-a-half months worth of firearms homicides overall. Duwe (2007) found only 116 public mass shootings between 1900 and 1999. Dorn and Dorn (2013) calculated that any given K-12 school in the United States will experience a violent, on-campus death once every 7,150 years. Killingbeck (2002)
pointed out that the Columbine massacre was responsible for only two-hours worth of the total U.S. homicides in 1999. Still, rampage shootings engender an inordinate level of fear, concern, and political attention. Recent mass shooting incidents have reignited a national debate on gun control, school security, and mental health.

For law enforcement, responding to a rampage shooting incident presents unique challenges. Mass shooting incidents often take place quite quickly and may be completed in a matter of minutes, providing police precious little time to respond and take action to prevent casualties. Mass shootings also challenge many of the traditional tactical deployment protocols employed by law enforcement agencies because, paradoxically, traditional, sound tactics—designed to prevent deaths and injuries—result in increased casualties because of the delayed response. To some law enforcement trainers, years of emphasizing officer survival above all other considerations has caused police agencies to fail at preventing casualties in a number of active shooter cases (Remsberg, 2013).

In response to Columbine, many law enforcement agencies implemented active shooter training in which patrol officers were instructed to gather in small groups, enter the scene, and make their way quickly toward the shooter. Still, recent shootings have brought some in law enforcement to question the soundness of such a plan with regard to mitigating loss of civilian life, especially in light of the recent Sandy Hook Elementary School massacre. While the ongoing killing of innocent citizens must be dealt with quickly, when the victims are young school children, expediency is paramount, even if it risks the lives of responding officers. The dilemma of an officer facing a rampage shooter actively firing on young children is literally one of life or death. Officers must decide
whether to await the arrival of backup before entering or quickly enter and confront the shooter; to wait means to risk the lives of others, and to enter means to risk the officer’s own life. After Sandy Hook, many officers realized the answer to the question must be to risk everything to stop the shooter or forever live with the guilt of having stood outside while first graders were being slaughtered just feet away.

With such significant policy implications on the line, law enforcement managers and trainers need empirical evidence to guide their decisions, including both a reality check as to the magnitude of the problem and an effective outline of response and investigative strategies for proper planning and training.

**Dissertation Goal**

Although law enforcement policymakers have twice shifted the active shooter response paradigm following the attacks at Columbine and Sandy Hook, such changes have been done in knee-jerk reaction to real-world incidents, based largely on the media attention those incidents garnered. Little empirical research has been done for the purpose of informing policy decisions.

This mixed-methods research sets out to answer important questions such as the ones just posed. To date, little research has been conducted to assess the on-scene behaviors of rampage shooters from the standpoint of developing strategies for effectively mitigating the loss of life. The research explores patterns in the crime scene behaviors of rampage shooters with particular attention paid to shooters’ responses to environmental stimuli, the actions of others at the scene, and attempts at intervention by bystanders and law enforcement. Insofar as patterns emerge within the data, the research
goal has been to correlate those patterns into strategies and measures that can be implemented by law enforcement agencies or security managers at educational venues for the purposes of prevention, intervention, and investigation of rampage shootings. Particular emphasis has been paid to low-cost, simple security solutions and other mitigating measures that balance the need for protection against the unlikelihood of occurrence.

As a natural extension of the research, an additional goal has been to develop investigative and reconstructive models that can aid law enforcement officials in quickly getting answers, particularly where the gunman may have left behind booby traps, explosive devices, or other dangerous items at on-site or off-site locations. These investigative and reconstructive models will hopefully also provide tools to law enforcement officials to help them meet the extreme demands for information by members of the news media, political entities, and the general public following a rampage shooting incident.

**Research Questions**

The research questions to be addressed in this dissertation include:

**RQ (1)** Is there a relationship between physical security and preparedness measures at potential target locations and target selection by rampage shooters?

**RQ (2)** Is there a relationship between physical security and preparedness measures at target locations and the number of casualties in a rampage shooting event?

**RQ (3)** Is there a relationship between law enforcement response strategies to rampage shooting events and the number of casualties?
RQ (4) Are the crime scene behaviors of rampage shooters sufficiently definable such that specific response strategies are likely to be effective based on the presence of patterns in the shooters’ behaviors?

RQ (5) Can specific response strategies be used to secure potential target locations and train personnel to intervene and mitigate casualties based on the presence of patterns in the shooters’ behaviors?

RQ (6) Are the crime scene behaviors of rampage shooters sufficiently definable to provide reliable investigative and reconstructive models within the context of social control theory?

Relevance and Significance

A form of multiple homicide, mass murder is typically defined as the killing of four or more people in one event at one location (Burgess, 2006; Fox & Levin, 1998; Geberth, 1996) though some have argued the arbitrary nature of such a definition and have sought to establish a more appropriate one that takes into account the number of injured as well as the number killed (Dietz, 1986). Accounting for the number wounded provides a better framework because such a definition considers the intervening variables that may tend to prohibit the offender’s intent from becoming reality: poorly-aimed shots may fail to inflict a life-threatening injury; medical intervention may save a life that was otherwise destined to be lost; intervention by law enforcement, security forces, or a bystander may stop an intended massacre.

Mass murder’s sister in the sinister world of multiple homicide is the spree killing, an event in which an offender kills multiple victims at different locations but over
a relatively short timespan during which the offender experiences no cooling-off period (Burgess, 2006). Both mass murder and spree murder can occur in different forms. One family member may kill multiple other family members before committing suicide. A disgruntled employee may seek revenge on former coworkers. A street gang member may indiscriminately fire at rival gang members inflicting multiple casualties not only on intended targets but on unfortunate bystanders. A troubled student may inflict carnage at school during a rampage.

Of the various forms of multiple murder, the rampage shooter presents a uniquely confounding problem for law enforcement: without a finite, predefined set of targets, the shooter is likely to continue the rampage until some intervention takes place. Unlike familial, coworker, and gang shootings, rampage shooters typically seek to inflict as many casualties as possible rather than simply targeting specific individuals. The rampage shooter may not even know any of the intended victims. Unlike the serial killer, whose motives are usually sexual and private, the rampage shooter is likely motivated by publicity (Dietz, 1986).

As Fox and Levin (1998) have argued, very little attention has been given to the phenomenon of multiple homicide in criminology literature, and where such attention has been given, serial homicide has dominated as a topic of study leaving mass and spree killings to wander in a lonely dearth of research. From the point of view of the criminologist, a paucity of research on the topic of mass murder is representative of the extremely low rate with which such events occur. To the police administrator, however, research provides the underpinnings for good policy, and to the police trainers, research
provides the foundation for an effective training program.

Schools seem to present particularly attractive target locations for rampage shooters. However, even in the wake of such epic tragedies as the shootings at Columbine, Jonesboro, Virginia Tech, Sandy Hook, and Douglas High School, school officials, security specialists, and law enforcement officials have had difficulty coming to a consensus regarding what to do to prevent such massacres, and the political climate does little to improve the situation. Rampage shootings, especially the killing of 20 elementary school children and six faculty members at Sandy Hook Elementary School in Newtown, Connecticut, have only served as fodder for political agenda. Some officials push for arming teachers while others promote gun control. Some want greater mental health resources while others seek greater penalties for weapons violators. Some promote school security while others view such measures as a step toward turning schools into prisons.

Security specialists have developed action plans for active shooting incidents including **ALICE**, **The 4 A’s**, and **Window of Life** (“Is run, hide, fight right?,” 2013). While these plans present some useful ideas for active shooter response, they offer conflicting theories on how to instruct employees at a potential target location to act when faced with a rampage shooter, and none of these plans have any underpinnings in strong research of empirical data. Law enforcement and security personnel are, then, forced to choose an existing plan, adapt a new plan from existing plans, or create a wholly new plan with little supporting substantive data.

Patterns in the crime scene behaviors of rampage shooters are likely to yield
measurable probabilities of the effectiveness of certain response plans. If, for example, the data show that a plurality of rampage shooters terminate their massacres upon realizing that police are closing in, security measures may be developed to generate signals that convince a shooter that police are, in fact, near even when they are not. The research was undertaken to determine what, if any, actions taken on the part of potential victims can mitigate the probability of being targeted by the shooter; whether it is better to run, hide, or fight; whether physical security measures that tend to stop rampage shooters or mitigate casualties can be identified; if there are countermeasures that can be deployed at a target location that have a reasonable probability of stopping—or at least slowing—the shooter; if the physical design of a potential target location can help prevent loss of life during a shooting rampage; and, whether there are measures that can be implemented to make a potential target location unattractive to a rampage shooter and thus avert the tragedy altogether.

**Barriers and Issues**

Perhaps the greatest barrier to effectively conducting this research was the lack of any centralized sources of information about the crime scene behaviors of individual shooters. Obtaining information necessarily occurred in a piecemeal fashion, and data collection was a tedious, painstaking process. Data collection in rampage shooting incidents is further complicated by the fact that many rampage shooters either commit suicide or are killed in confrontations with police and, hence, take with them many of the answers about what they did and why they did it. Data collection, too, was heavily reliant on news accounts, which are plagued by inaccuracies and are biased by the degree to
which particular incidents garner media attention. Bockler, Seeger, Sitzer, and Heitmeyer (2013) pointed out that the reliability of data obtained from news reports is open to challenge, but they concluded that, in the absence of any centralized, reliable database, news reports provided a reasonable source of data.

Definitional issues also plague this type of research as there is no real consensus among criminologists and other experts regarding the defining parameters for rampage shooting incidents. If the minimum number of victims killed or wounded is arbitrarily assigned, that value may exclude cases in which a shooting was averted. A shooter may fire at multiple victims but not hit any of them. A shooter may be interrupted before anyone is shot. It is also difficult based on definitional parameters to separate shootings that involve specifically-targeted victims from ones that are randomly selected.

**Theoretical Framework**

School rampage shootings are difficult to define in terms of traditional criminological theories. Muschert (2007) points out that “[s]chool shooting incidents need to be understood as resulting from a constellation of contributing causes, none of which is sufficient in itself to explain a shooting” (p. 68; see also Bockler, Seeger, Sitzer, & Heitmeyer). Social control theory has been argued as an explanatory, if not causative, theoretical framework for the phenomenon of rampage shootings (Levin & Fox, 1996; Pittaro, 2007; see also VanGeem, 2009). To the extent that researchers and policy makers better understand the on-scene behaviors of school rampage shooters, they can make informed policy decisions to (1) influence the planning and behaviors of future shooters by imposing additional influencing factors such as better security measures; (2) develop a
more complete profile of potential offenders; (3) increase the likelihood that planned massacres will fail to generate the level of accomplishment intended by would-be perpetrators, and (4) develop an improved framework for law enforcement to intervene in such incidents and bring about an effective resolution. While the primary goal of the research was to develop law enforcement planning, response, and investigative strategies, such strategies are an important component to the social control mechanisms that can be implemented by schools as a means of preventing or otherwise mitigating the devastation of a school rampage shooting.

**Use of this Research**

The utility of this research is to aid policymakers and stakeholders in law enforcement and school security functions to better address training, planning, and preparation for the potential threat of rampage shooters on school campuses. An intended consequence of this research would be that law enforcement trainers and administrators would have increased access to guidance with respect to dealing with rampage shooters on school campuses despite the fact that few law enforcement agencies will ever experience such an event firsthand. However, it is the rarity of such events that makes this research particularly important. Even the smallest of law enforcement agencies cannot rule out the possibility that such a massacre may strike their jurisdictions, and rampage shootings are events that cannot be dealt with on the fly. Informed policy decisions will likely serve to aid affected law enforcement agencies by allowing for an effective response that mitigates casualties, streamlines investigation, and minimizes bad publicity and exposure to litigation.
Limitations and Delimitations

The most significant limitation to this research is sampling, which is complicated by the fact that the population of rampage shooters is not easily defined, the population is quite small relative to comparison populations, and unbiased random sample selection is difficult at best. There is no central data set that can be used to define the population of school rampage shooters, though a handful of data sets do exist to provide a significant sample of the population, if not the entire population. However, even those data sets are plagued by the sporadic nature of reports of school rampage shooter incidents, and the tendency is for the volume of data about specific incidents to be directly correlated to the notoriety of the incident. With regard to mass murder cases, data are generally available, but with regard to mass shootings with few casualties, incidents have a much smaller profile on the data radar. Because this research evaluated response protocols and security measures that have proven to be effective, the casualty-notoriety correlation is likely to have contributed to sampling bias: the incidents most likely to provide indications of successful response protocols are least likely to show up in the data.

This research was delimited by constraining most variables under study to boolean values. Rather than evaluate a variable based on multiple possible outcomes, the variable was separated such that each outcome was reported as a separate, independent variable. Dependence, then, was evaluated relative to other variables. Because pattern searching is accomplished algorithmically, it was unnecessary to assume dependence between variables: dependence became apparent when patterns were identified.
Definition of Terms

For the purposes of this research, the terms “mass shooting,” “rampage shooting,” and “active shooter” are effectively synonymous, though with some distinctions. A “mass shooting” is defined as a shooting incident in which multiple victims suffer gunshot wounds, though, other than an arbitrarily-defined value, there seems to be no specific threshold minimum number of victims by which to establish inclusion criteria. However, one key criterion would be that more than one victim was specifically targeted, which would exclude a number of gang-violence shootings in which multiple people may be caught in the crossfire between rival gang members. Likewise, another criterion would be that the victims are not participants in the violence, again eliminating many gang-violence episodes in which rival gang members shoot it out, often resulting in multiple casualties.

The term “rampage shooting” can be more narrowly defined because motivation is the key factor. Rampage shooters are self-serving individuals whose attacks are not aimed at furthering some broader political goal, a criterion that excludes acts of terrorism. Rampage shooters do not limit their attacks to one or a few specifically-targeted individuals, so acts of domestic and workplace violence are generally excluded, unless those acts are coupled with a broader targeting of random or symbolic individuals. Rampage shooters are generally motivated by a desire to enact revenge against a particular person or group of people, and they often kill individuals who symbolize their intended victims in what are typically well-planned episodes rather than knee-jerk, emotional outbursts (Borum, Cornell, Modzeleski, & Jimerson, 2010; Fox & Levin,

Blair and Schweitt (2014) defined the term “active shooter” to “describe a situation in which shooting is in progress and an aspect of the crime may affect the protocols used in responding to and reacting at the scene of the incident” (p. 4). Such a term is most appropriately used by law enforcement because, at the time such an incident is reported, neither casualty counts nor offender motivation are known. What is known is that an ongoing shooting is taking place, thus indicating that response time is of the essence and appropriate protocols should be implemented without delay.

Bockler, Seeger, Sitzer, and Heitmeyer (2013) considered criteria for defining “school rampage shootings” and similarly excluded acts of terrorism, gang violence, and acts of domestic violence. The researchers further constrained the definition to include only cases that (1) occurred on a school campus, (2) took place during school hours, (3) involved victims chosen by the shooter deliberately, randomly, or symbolically.

Summary

No matter the political or social landscape, active shooter events show no sign of declining in either frequency or death toll. Although such events are rare, they pose some of the greatest challenges for law enforcement because there is little time to react, to develop a plan, or to deploy resources once an attack is underway. For law enforcement, active shooter incidents result in an expansion of an already-difficult training problem: that training scenarios too often focus on events that rarely happen in real-world policing, thus displacing time that could be spent training for much more common occurrences (“Study reveals important truths,” 2005). But when it comes to active shooter events, not
training means not being prepared, and one need look no further than Columbine to understand the implications of not being ready to face that once-in-a-career event.
Chapter 2: Review of the Literature

Background

Mass shootings continue to drive impassioned public discussion on gun control, mental illness, and harsher penalties for offenders who commit crimes with firearms. Oft-heard in media and public forums are claims by politicians, lay people, and pundits that the problems of firearms violence and rampage shootings are worsening. However, neither the empirical literature nor the current data support such a conclusion.

Certainly, the empirical data point to a lessening problem of homicidal violence, not an increasing one. After reaching a low of 4.6 murders and non-negligent manslaughters per 100,000 people in 1962, the U.S. homicide rate skyrocketed to a peak of 10.2 per 100,000 in 1980, but after a brief dip followed by another peak at 9.8 per 100,000 in 1991, the rate plummeted to a low of 4.5 per 100,000 in 20131 (Federal Bureau of Investigation, 2013, 2014, 2015). (See Figure 2.1). Similarly, nonfatal violent crimes involving firearms fell from a rate of 7.3 per 1,000 in 1993 to 1.8 per 1,000 in 2011 (Planty & Truman, 2013).

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1 The murder and non-negligent manslaughter rate remained at 4.5 per 100,000 in 2014.
Figure 2.1. Rates of murder and non-negligent manslaughter in the United States from 1950 through 2010 (Cooper & Smith, 2011).

Data on homicides, suicides, and firearms deaths of youths ages 15 to 19 reflect similar patterns. Homicides in this age group jumped from levels of around 10 per 100,000 in the early 1980s to a peak of over 20 per 100,000 in 1993 and then declined to levels below 10 per 100,000 by 2004. The trend is still declining: the rate fell to 6.7 per 100,000 in 2013 (Child Trends, 2015b).
Figure 2.2. Rates of homicide, suicide, and firearms-related deaths of youths ages 15-19 in the United States from 1970 to 2013 (Child Trends, 2015b).

To be sure, homicides at school are rare. For children ages 5 to 18, school-related murders—including those occurring on campus as well as off campus on the way to or from school or at school events—accounted for no more than 1.8% of homicides for that age group with a mean of 1.3% from the 1992-1993 school year through the 2008-2009 school year (Planty & Truman, 2013; see also O’Toole, 1999; Reddy et al., 2001). Studying criminal incidents on college and school campuses for the five-year period from 2000 through 2004, Noonan and Vavra (2007) reported a total of 37 murder and non-negligent manslaughter incidents out of 193,080 reported violent crimes. Scholars have estimated that the odds of a student in a U.S. school becoming the victim of homicide at school are between one in one million and one in two million (Reddy et al., 2001).
School-associated homicides from the 1992-1993 school year through the 2009-2010 school year declined in the late 1990s, and, but for a brief increase during the 2006-2007 school year, have remained steady since (Centers for Disease Control, 2014). Furthermore, much like homicides of juveniles outside of school, homicides at school “tend to be gang related, drug related, or otherwise linked to criminal activity or interpersonal disputes where the school is simply a site of opportunity for the attack” (Borum, Cornell, Modzeleski, & Jimerson, 2010, p. 29). Multiple homicides at school are an exceedingly rare subset of an already rare population: of 109 school-related homicide events studied by the Centers for Disease Control (2008), only eight involved more than one victim. However, despite decreases in school-related single-victim homicides and school-related homicides overall, multiple victim homicide rates at school remained steady from 1992 to 2006 (Centers for Disease Control, 2008).

Compiling data from the National School Safety Center and the National Center for Education Statistics, Dorn, Satterly, Dorn and Dorn (2013) calculated that, on average, any one of the 130,600 K-12 schools in the United States would experience a violent, school-related death no more than once every 7,150 years.

According to data from the National School Safety Center, an independent, non-profit organization that was founded by presidential mandate in 1984, firearms are overwhelmingly the weapon of choice in school-associated violent deaths (Stephens, 2010).

Despite dramatic declines in homicide rates and gun violence overall, few in the public appreciate the reduction (Pew Research Center, 2013). Some scholars have blamed
the divide between homicide statistics and public perception on the extent to which media coverage influences what people believe (see Fox & DeLateur, 2014). However, the Pew Research Center (2013) found that crime-related news coverage declined from 29% of local newscast content in 2005 to 17% in 2012.

Just as public perception of violent crime has not correlated with actual homicide rates, neither the public nor scholars have come to an understanding of actual rates of mass shootings. While some scholars have reported marked increases in mass shootings and active shooter events (Blair & Martaindale, 2013; Blair, Martaindale, & Nichols, 2014; Blair & Schweit, 2014; Cohen, Azrael, & Miller, 2014; Krouse & Richardson, 2015), others have argued that there has been little upward trend (Cooper & Smith, 2011; Fox, 2015; Fox & DeLateur, 2014; Fox & Levin, 2015; Lott & Riley, 2014a).

Using a statistical process control method, Cohen, Azrael, and Miller (2014), studying mass shootings occurring in public places, found that the average time between events dropped—quite suddenly—after the September 6, 2011 massacre at an International House of Pancakes restaurant in Carson City, Nevada. In that incident, 32-year-old Eduardo Sencion opened fire on uniformed National Guard troops, killing three of them. Sencion also killed a civilian woman and wounded seven other people before killing himself (Whitcomb & Gorman, 2011). According to Cohen et al., the average time between public mass shootings following that episode dropped from an average of 200 days between shootings to an average of 64 days between shootings, a level that the researchers claimed remains to the year of publication. However, the researchers relied heavily on the data set used by Blair and Schweit (2014) for their study published by the
Federal Bureau of Investigation, which has been criticized by Fox and Levin (2015) and Overberg, Upton, and Hoyer (2013) due to errors in the data set such as including shootings that did not meet the criteria, excluding a number of shootings in the early part of the data set, and including in the data set an incident reported in the UCR as a multiple-victim homicide that was actually a cold-case arrest from an incident that took place decades earlier.

Further criticism of the findings by Cohen et al. stems from the fact that statistical process control methods were developed for use in analyzing repetitive processes, such as those occurring in manufacturing, rather than with more grossly stochastic processes such as mass shooting events. The sudden, unexplained drop in the average number of days between shootings should have queued the researchers to suspect a methodological error or problem with the validity of the underlying data given the fact that criminological phenomena rarely fluctuate so drastically and so suddenly without explanation. Neither Blair and Schweit nor Cohen et al. undertook any analysis of the endogeneity of their data. Because there is no central resource for data on mass shootings, research on the topic is fraught with sampling bias issues, which, when applied to the study of event frequency, are likely to produce significant uncertainty given the rarity of mass shooting events in the first place. In compiling their data set, Blair and Schweit relied heavily on keyword searches of news media archives. While such methodology may be appropriate for finding cases for study of other parameters, it is likely to produce a data set that has more correlation to the evolving habits of news media outlets than it does to the temporal characteristics of mass shooting events. Media reporting is not a controlled process, so
applying statistical process control methods, as Cohen et al. did, to a data set developed predominately based on media reports is likely to tell the researchers more about the frequency of news coverage than mass shootings.

Duwe (2007), studying 1,186 mass murder incidents from 1900 through 1999 identified 116 mass public shootings (i.e., mass murder incidents involving firearms that took place in essentially public locations) and found that 52% took place during the last two decades of the 20th Century.

Further complicating the study of trends and issues in mass shootings is the fact that their association with gun control polarizes the topic and connects it to political agenda. Cohen et al., for example, did their research for Mother Jones, an Internet news outlet with a history of promoting gun control, and Blair and Schweit’s research was done for the FBI at a time when the administration was pushing heavily toward imposing greater restrictions on firearms ownership.

While debate rages over recent trends in school shootings, one thing is clear: massacres and shootings at schools are not a 21st Century phenomenon (Drysdale, Modzeleski, & Simons, 2010; Langman, 2015d). On July 26, 1764, four Native American warriors shot and killed the headmaster at a school in Pennsylvania before killing nine schoolchildren with tomahawks (Dixon, 1954/2005). On April 10, 1891, the New York Times reported that an elderly man named James Foster, armed with a shotgun, opened fire on a group of young boys playing in front of St. Mary’s Parochial School in Newburgh, New York. “None of the children were killed,” the Times reported, “but several were well filled with lead” (quoted by Lorenzi, 2012; see also Holmes & Holmes,
On May 18, 1927, Andrew Philip Kehoe killed 43 people, including 38 children, by setting off dynamite at the Bath Consolidated School in Bath Township, Michigan, an event that most scholars believe left the largest death toll of any school massacre in U.S. history (Bernstein, 2009). On September 15, 1959, Paul Oregon detonated an explosives-filled suitcase inside Poe Elementary School in Houston, Texas killing himself, two seven-year-old boys, a custodian, a teacher, and his own son, seven-year-old Dusty Paul. Nineteen others were wounded (“Poe school coverage,” 2001).

School massacres are not a uniquely American phenomenon either (Bockler, Seeger, Sitzer, & Heitmeyer, 2013; Fessenden, 2000). Perhaps the deadliest school massacre in recent world history was the terrorist attack at a school in Beslan, Russia in September 2004. While parents, students, and teachers gathered at the school to celebrate the opening day of the new school year, at least 32 armed offenders took more than 1,000 hostages in a siege that lasted three days. In the end, more than 330 people lay dead (“Beslan school attack,” 2015). On May 9, 1974, three Palestinian terrorists disguised as Israeli soldiers took more than 115 hostages at a school in Ma’alot-Tarisha near Israel’s border with Lebanon, killing 22 and wounding 68 (Fishkoff, 2015). There have been school rampage shootings in other countries as well. On March 13, 1996, Thomas Hamilton, a 43-year-old former Scout leader, entered the gymnasium at the primary school in Dunblane, Scotland, and opened fire on kindergarten students, killing sixteen children and their teacher (Wilkinson, 2013). On April 26, 2002, 19-year-old expelled student Robert Steinhäuser shot and killed two students, a police officer, and 13 teachers at a school in Erfurt, Germany, and wounded one other person before killing himself (“18

In fact, in the past three decades, multiple-victim school shootings have occurred in Canada, Brazil, Australia, Germany, Finland, and France, among other countries (Gupta, 2015). A sample (Langman, 2015d) of multiple-victim school shootings over the past three decades includes several international cases:

1. December 6, 1989, École Polytechnique, Montreal, Quebec, Canada: 14 killed, 14 wounded.
2. August 24, 1992, Concordia University, Montreal, Quebec, Canada: 4 killed, 1 wounded.
3. October 20, 1994, Brockton High School, Toronto, Ontario, Canada: 2 wounded.
5. August 3, 1999, La Trobe University, Bundoora, Victoria, Australia: 1 killed, 1 wounded.
6. October 21, 2002, Monash University, Melbourne, Australia: 2 killed, 5 wounded.
7. January 27, 2003, Escola Estadual Coronel Benedito Ortiz, Sao Paolo, Brazil: 1 killed, 8 wounded.

8. September 13, 2006, Dawson College, Montreal, Quebec, Canada: 1 killed, 19 wounded.


10. September 23, 2008, Seinajoki University, Kauhajoki, Finland: 10 killed, 1 wounded.


Just as violence in U.S. schools increased in the 1990s, so, too, did it increase in schools worldwide (Agnich, 2011). Though school shootings have occurred in other countries, the United States has had by far the highest number of them (Gupta, 2015), but, when national populations are taken into account, the United States does not have either the highest mass shooting fatality rate or total victims rate; in fact, according to data analysis by Politifact, from 2000 through 2014, Switzerland, Norway, and Finland have higher fatality rates and total victim rates, though it is contextually important to recognize that the very small populations of those countries in comparison to the United States, and the rarity with which rampage shootings occur, skew the statistics because a very small number of incidents results in high casualty rates (Herring & Jacobson, 2015).
Bockler, Seeger, Sitzer, and Heitmeyer (2013) found, in sample spanning from the 1920s until 2011, 76 school rampage shootings in the United States and 44 in the rest of the world (occurring in 23 countries); hence, 63% of school rampage shootings worldwide have taken place in the United States as compared to only 37% in all other countries combined. The researchers noted that, unlike such shootings in the United States, incidents globally did not appear regularly until the late 1990s.

School rampage attacks do not require an offender with firearms (Bockler, Seeger, Sitzer, & Heitmeyer, 2013). On November 4, 2015, four students at the University of California Merced were stabbed by 18-year-old Faisal Mohammad, who was subsequently killed by campus police. Though Islamic terrorists applauded Mohammed for his actions, law enforcement officials determined that the computer science and engineering freshman had acted alone after recently having been booted from a study group. A manifesto found on his body revealed his intent to stab a specific student and then overpower a police officer and steal the officer’s firearm (“Four stabbed at UC Merced,” 2015; “Four students stabbed,” 2015; “Sheriff: California university stabber,” 2015). On April 9, 2014, 16-year-old Alex Hribal, a sophomore at Franklin Regional High School in Murrysville, Pennsylvania, wounded 20 students and a security guard in a
rampage knife attack. At least four of the victims were critically injured. The attack ended when the vice principal tackled Hribal (Hardway, 2015; McClam, 2014; Signorini & Andren, 2015).

Rampage attacks at schools using weapons other than firearms have taken place in countries where firearms are strictly controlled. China—a country that expressly bans possession of firearms by citizens—has experienced a number of deadly knife attacks at schools, perhaps as many as 28 such attacks resulting in 58 deaths and over 300 injuries since 1995. One attack at a kindergarten in China left seven toddlers and two adults dead and 11 children wounded. The attack “was China’s fifth such school rampage in less than two months” (Olesen, 2011). The problem has been so pervasive in Chinese society that government officials have taken measures such as adding security guards at schools, training school personnel to respond to knife attackers, and requiring residents who purchase knives over 15 centimeters in length to register using their national identification cards (Canaves, 2010; FlorCruz, 2010; “Who (or what) is killing China’s children?,” 2011; see also Hilal, Densley, Li, & Ma, 2014).

Japan, a country with strict firearms laws, has also experienced rampage knife attacks. On July 26, 2016, 26-year-old Satoshi Uematsu killed 19 disabled people and wounded 24 others plus two employees at a special needs facility in Sagamihara, a town about three miles from Tokyo. In a letter written months prior to the attack, Uematsu, a former employee of the facility, wrote that “all disabled people should cease to exist” (“Japan knife attacker,” 2016; see also Wang & Yamaguchi, 2016; Yamaguchi 2016a, 2016b, 2016c, 2016d). For the Japanese people, the attack echoed their sense of
vulnerability previously felt in 2001 when 37-year-old Marmoru Takuma used a knife to kill eight children and wound at least 15 people at an elementary school in Ikeda, a small town about ten miles from Osaka (Sims, 2001; Struck, 2001).

Indeed, firearms are used in only a fraction of crimes on school campuses. Studying criminal incidents on college and school campuses for the five-year period from 2000 through 2004, Noonan and Vavra (2007) reported that 3,461 crimes involved firearms while 98,394 involved personal weapons (hands, fists, etc.); 10,970 involved knives or other edged weapons; and, 2,005 involved blunt objects used as weapons. Of the 37 murders and non-negligent manslaughter incidents reported by the researchers, only 13 involved firearms. Similarly, O’Neill, Fox, Depue, and Englander (2008) reported 76 homicides on college campuses between 2001 and 2005, 52.2% of which involved firearms.

In comparison to single-victim homicides, multiple homicide events are so incredibly rare\(^2\)—perhaps even aberrational—that few researchers have devoted attention to the subject (Fox & Levin, 1998; Hempel, Meloy, & Richards, 1999). There exists a scattering of empirical literature on the topic of rampage shootings, most of which has focused on occurrence trends, behavioral risk assessment, and threat assessment with respect to potential rampage shooters rather than on target-level prevention and response. According to Fox and Levin (1998), “most of the research on multiple killing has remained anecdotal and heavily qualitative in approach . . . reflecting an abundance of

\(^2\) Mass murders represent less than one percent of all violent crimes in the United States (Hempel, Meloy, & Richards, 1999).
speculation and a paucity of hard data” (pp. 409-410). According to Fox and Levin (1998), mass murder has received the least attention in the already-thin body of research on multiple homicide in part because mass murderers often commit suicide or are killed during their rampages, leaving only sparse data behind as to their motives and methodology. Likewise, mass murder is not as sensational as serial murder and does not garner the same level of ongoing fear within the community as does a serial killer on the loose. In comparison to serial murder investigations, mass murder investigations are not terribly challenging (Fox & Levin, 1998; Fox & Levin, 2003).

While mass murder claims about twice as many recorded victims as serial murder annually, there is a much greater likelihood of serial killings being lost from the data than mass murder cases. In many instances, homicides are simply not identified as serial in nature either because investigators failed to recognize indicators that multiple homicides were perpetrated by a single offender or because homicides committed by a single offender across different jurisdictions are not linked for similarity (Fox & Levin, 1998). Serial murderers have a vested interest in concealing their crimes and remaining undetected while mass murderers rarely concern themselves with escape and often relish in the publicity they expect their crimes to receive.

Observers of media attention and public concern over mass murder events would hardly appreciate the lack of research on such killings. Much like fatal airline accidents, the consequential nature of these events is disproportional to their frequency of occurrence. While dozens of people die in motor vehicle accidents daily, fatal airline crashes involving U.S. domestic carriers have become so rare as to not even occur
annually, yet when such a tragedy happens, the news coverage will typically preempt regular programming, and significant investigative resources are expended in determining the cause. The typical traffic fatality, on the other hand, will often merit little more than a brief mention in local news media and be investigated by no more than a small handful of local police officers. Such is true of multiple homicides: the consequences of a mass murder involving a dozen victims are far more reaching than the nearly forty “routine” murders (Federal Bureau of Investigation, 2014) that take place each day. A single episode involving the murders of 20 children and six adults at Sandy Hook Elementary School in Newton, Connecticut, for example, touched off a massive public debate over the merits of gun control and the status of American society. The journalistic paradox of newsworthiness in rarity played out once more: man had bitten dog.

In fact, Fox and Levin (2015) explained that rampage shootings in a movie theater in Colorado and at Sandy Hook Elementary School became “the top news story of 2012 . . . eclipsing a hotly-contested presidential race and a massive storm along the East Coast” (p. 8) despite the fact that both the presidential election and hurricane Sandy affected hundreds of thousands—perhaps millions—more people than did all of the rampage shootings in 2012 combined. The intense media coverage of a few sensational mass murder events leads to the public perception that rampage shootings are on the rise.

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3 As of this writing, the last fatal airline crash involving a major domestic carrier occurred in November 2001 when American Airlines flight 587 crashed shortly after take-off from New York’s Laguardia Airport, killing 265 people. Since that crash, there have been several fatal crashes involving commuter airlines with significantly smaller death tolls, but even those cases have occurred at a less-than-annual frequency (Sanchez, 2013; Wilkey, 2013).
“Contrary to the relatively flat trend line in mass murder,” Fox and Levin explained, “media reports leave a different—and much more terrifying—impression” (p. 10).

Similarly, Killingbeck (2001) found that the 1999 Columbine High School massacre took second place in news coverage during that year, being bested only by the military conflict in Kosovo, despite the fact that the 16 fatal casualties at Columbine represented less than two hours worth of the 15,522 homicides that occurred that year. Killingbeck argued that media coverage, both in terms of quantity and substance, contributed to the construction of a “moral panic” regarding school violence. As O’Toole (1999) explained, “the sudden, senseless deaths of teenagers and teachers in the middle of a school day, for no comprehensible reason, is far more shocking and gets far more attention than the less extreme acts of violence that happen in schools every week” (p. 2).

Duwe (2005), noting commentators’ and scholars’ claims of an increase in mass murder during the 1960s, found that, although mass murder did not become phenomenologically more significant during the 1960s, media coverage of it did. “The overemphasis placed on the most sensational and least representative mass killings,” wrote Duwe, “has significant implications for the social construction of mass murder” (p. 60). Furthermore, researching the period from the 1960s through the 1980s, Duwe argued that through its work on multiple homicide during the 1980s, the FBI promoted increased media attention and exaggerated the prevalence of multiple murder.

Indeed, news media is a profit-driven business, and since as far back as the 1830s, media outlets have found that crime reporting sells (Duwe, 2000). “In an effort to make crime news more entertaining, and thus more appealing to consumers,” Duwe explained,
“the news media overrepresent violent, interpersonal crimes because they are dramatic, tragic, and rare in occurrence” (p. 365). Studying over 30,000 news articles from 117 different newspaper outlets covering 495 mass murder episodes over a 21-year period, Duwe found that “[d]eath toll, stranger victims, and public locations” were associated with increased media coverage, and that incidents involving firearms use, “assault weapons,” and “workplace massacres” were overrepresented in media coverage (p. 390). Gray (2014), pointing out that one has a greater likelihood of being struck by lightning than being murdered on a college campus, points to media hysteria as problematic in terms of forming public opinion with regard to the dangers associated with rampage shooters.

In the wake of rampage shootings, a number of groups ranging from news outlets to gun control groups to law enforcement to universities sought to research the issue. “[R]ather than adding clarity,” wrote Fox and Levin (2015), “these initiatives, by virtue of their varying definitions, time frames and data sources, created even greater confusion” (p. 8). Some advocacy groups have sought to show that mass shooting episodes are becoming more frequent and that they are commonly associated with the use of so-called ‘assault weapons’ and ‘high-capacity magazines’ (Cohen, Azrael, & Miller, 2014; Everytown for Gun Safety, 2015; Mayors Against Illegal Guns, 2013).

Thus, one encounters one of the greatest challenges in the study of rampage shootings: determining what data get included in the study. The answer seems to rest largely on context and research goals. For example, a study on the motivational aspects of rampage shooters would do well to define incidents by typology. Familial mass
murderers, for example, are likely motivated by different factors than killers who commit public massacres of random individuals.

Some scholars have argued the need for empirical research on averted school shootings, a topic that has gotten significantly less attention in the literature than perpetrated incidents, but even those studies have focused almost exclusively on threat assessment, sociological prevention strategies, and student-staff relationships to avert incidents before they begin (Daniels et al., 2010; Moore, Petrie, Braga, & McLaughlin, 2003; O’Toole, 2000). Almost nothing exists in the empirical literature dealing directly with physical security measures, incident-level preparedness, and law enforcement protocols aimed at preventing incidents and mitigating casualties.

There is evidence that high-profile rampage shooting incidents can spawn copycat events (Carcach, Mouzos, and Grabosky; 2002; Fox & Levin, 2003; Towers, Gomez-Lievano, Khan, Mubayi, & Castillo-Chavez, 2015; see also Moore, 2003). Some researchers have found evidence of a contagion effect resulting from publicity given to rampage shooting events. Carcach, Mouzos, and Grabosky, for example, found that, following the 1996 Port Arthur massacre in Australia in which 28-year-old Martin Bryant killed 35 people and wounded 23 others during a shooting spree at a popular tourist site in Tasmania (Grimson, 2015), firearms homicides in Australia increased for five days before returning to normal levels. Studying mass killings and school shooting incidents in the United States, Towers, Gomez-Lievano, Khan, Mubayi, and Castillo-Chavez found a statistically-significant increase in shooting events during the 13 days following a publicized shooting. Duwe (2007) has argued that very few rampage shooters are
influenced by previous shooters and found only five U.S. mass murder cases out of 909 studied that showed clear evidence of contagion effect, including Robert Smith, whose 1966 massacre at a beauty college in Mesa, Arizona was influenced by the notorious mass murderers Richard Speck and Charles Whitman, and the 2007 Virginia Tech slaughter, which was influenced by the 1999 Columbine bloodbath. However, Duwe was quick to point out that there may be other shooters who were influenced by previous massacres but simply did not leave behind evidence of such influence.

If a contagion effect exists, it lends evidence of two important issues for this research: (1) the patterns of behaviors are likely repetitive because the accomplishments of one shooter or set of shooters influence the planning and thought processes of subsequent ‘copy cat’ shooters; and, (2) mitigating the number of casualties during a rampage shooting episode may reduce the attractiveness of that episode to future rampage shooters and lessen the contagion effect.

The consequences of rampage shootings give importance to the research. The emotional response engendered in the public pushes policymakers toward knee-jerk reactions. “Although these incidents are extremely rare,” wrote Reddy et al., “they are so vexing and their impact is so great that the fear they engender can often drive radical policy change, in some cases leading to the implementation of bad policy” (p. 159). The Newtown massacre represented just 0.17% of the 14,827 homicides in the United States in 2012 (Federal Bureau of Investigation, 2013), yet no single criminal incident that year
resulted in farther-reaching policy implications than did that one tragic event.  

Newtown served to establish just how utterly unprepared policymakers were for such a tragedy. As gun control legislation embroiled Congress in a futile debate, legislators at the state level found themselves suffering severe political backlash for supporting gun control measures (Bevis, 2013; Healy, 2013) that, despite what was arguably the greatest political traction the gun control lobby had gained in two decades, resulted in exactly opposite the lobby’s intended goal: gun sales soared (Jouvenal, 2012; Pisani, 2012), the National Rifle Association increased its membership (Fox, 2013; Wing, 2013), and absolutely nothing got done in Congress with respect to curtailing the prevalence of firearms in American culture (O’Keefe & Rucker, 2013; Weisman, 2013).

Indeed, most researchers examining the matter outside the context of politically-driven agenda have concluded that there is very little evidence that gun control measures are likely to have a significant impact on mass shootings. Duwe, Kovandzic, and Moody (2002), for example, found “weak evidence” that right-to-carry laws had any impact on the number of public mass shootings. Kovandzic, Shaffer, and Kleck (2005) found that despite a number of studies that have concluded a positive correlation between gun ownership levels and gun violence, endogeneity bias, when taken into consideration, nullifies or even reverses the perceived correlation. Kleck (2009) argued that mass public

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4 The racially-charged shooting death of Black teenager Trayvon Martin by Hispanic (and described by some as White) George Zimmerman also occurred in the same year. Although it resulted in significant public discourse, and even some state-level legislative action regarding racism and murder in America, it did not propel the nation into the level of policy debate initiated following the Newtown murders.
shootings provided the ‘worst possible basis’ for proposed gun control measures such as background checks at gun shows and bans on ‘assault weapons’ because such measures are largely irrelevant in the context of multiple-victim shooting incidents. Duwe (2007) found that ‘assault weapons’ were used in only 9% of the 116 public mass shootings between 1900 and 1999 that he studied. Fox and DeLateur (2014) have similarly argued that increased background checks, bans on ‘assault weapons,’ and limits on magazine capacity would do little, if anything, to curb the prevalence of rampage shootings in the U.S. Still, in the wake of high-profile mass shooting events, the media and advocacy groups have continued to push gun control as the cornerstone topic for discussion (McConville & Lawless, 2012; LaFrance, 2015).

One of the prime difficulties in studying rampage shootings is that there exists little clarity in the empirical literature, for a variety of reasons. First, there exists no single data set from which cases of rampage shootings can be reliably extracted; while many such events appear in UCR data, others do not, forcing reliance on secondary sources such as news coverage to track down the numbers—news coverage, which, by virtue of the spectacular nature of such events and increasing public attention they receive (Fox & Levin, 2015), is likely more robust today than in decades past. Second, defining what events should and should not be included in research on rampage shootings has proven elusive, and researchers tend to include and exclude cases based on criteria that may be more arbitrary than empirically-supported. Third, the study of rampage shootings is, unfortunately, tied to broader political issues such as gun control and the mental health system that tend to instill a greater tendency for researchers to succumb to contextual and
confirmation bias.

For example, a recent FBI study (Blair & Schweit, 2014) claimed that the average annual number of mass shooting incidents between 2000 and 2013 rose from an average of 6.4 incidents per year during the first seven years studied to an average of 16.4 incidents per year during the last seven years studied, an increase that, on its face, appears suspect. Indeed, Fox and Levin (2015), Lott and Riley (2014), and a study by USA Today (Overberg, Upton, & Hoyer, 2013) have directly challenged the FBI report’s findings. Lott and Riley concluded that the FBI study had neglected to include a number of mass shooting incidents that occurred during the first half of the study period that, if included, significantly reduced the upward trend apparent in the data. Moreover, Fox and Levin, relying on data from the Supplementary Homicide Reports, have concluded that over the past three decades, there has been no upward or downward trend in the number of mass murder incidents and found only a slight upward trajectory with regard to the number of deaths from such rampages in recent years, an increase that the researchers attributed to several recent incidents with larger than average body counts. The USA Today study, which looked at mass murders (including those that did not involve firearms) from 2006 through 2011, found that the FBI data were highly inaccurate with such reporting flaws as multiple, individual homicides being reported as a single, mass murder; mass murder incidents being conversely reported as multiple, single homicides; data from Florida and tribal jurisdictions, as well as some data from Nebraska and Washington, D.C., not

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5 Indeed, with respect to school rampage shootings, the results of this research likewise challenge such findings.
included in the FBI data set; and, a case from New Jersey in which a mass murder appeared in the data, but upon verification, it was discovered that the incident actually involved arrests made for an incident that occurred more than three decades earlier.

Dietz (1986) compared various forms of multiple homicide and found common features that suggest methodological similarities in terms of psychological and criminological research. Dietz also explained that the rarity of multiple homicide events forces researchers to adopt methods that are outside of their normal habits. Hence, we face the complexity of rampage shooting research.

**Defining “Rampage Shooter”**

While the lines of distinction are not laterally discontinuous, multiple homicides are classified into three forms based on spatial and temporal span over which the killings take place: (1) serial murder, which takes place over an extended period of time and involves an emotional cooling-off period for the offender;⁶ (2) spree murder, which takes place generally at different locations over a short period of time; and, (3) mass murder, which takes place in one episode over a limited geographic area (Fox & Levin, 1998). The definitions of these terms, unfortunately, remain ambiguous.

Fox and Levin (1998) arbitrarily limit the definition of multiple homicide to only those cases in which four or more victims are killed “simultaneously or sequentially, by one or a few individuals attempting to satisfy personal desires such as power, profit, revenge, sex, loyalty, or control” (pp. 407-408). Levin and Madfis (2009) define mass

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⁶ A “cooling off period” is typically a period of unspecified duration during which the offender returns to a state of normal way of life (Burgess, 2006).
murder as “the antisocial and non-state-sponsored killing of multiple victims during a single episode at one or more closely related locations” (p. 1227). The researchers further limited their study to “cases in which multiple human targets were killed or injured on school property by a student or recent former student of the targeted school, where three or more victims were killed or injured” (p. 1229).

Dietz (1986), studying the psychological characteristics of multiple-victim killers, defined mass murder as “offenses in which multiple victims are intentionally killed by a single offender in a single incident” (p. 479). Dietz elected to ignore distance as a factor in classifying multiple homicides as mass murder but chose, apparently arbitrarily, to set a maximum time interval of 24 hours between killings. Pointing out that setting the minimum death threshold at three would exclude 95% of violent crimes and setting the threshold at five would exclude 99%, Dietz defined mass murder as “the willful injuring of five or more persons of whom three or more are killed by a single offender in a single event” (p. 480).

Hempel, Meloy, and Richards (1999) and Meloy, Hempel, Mohandie, Shiva, and Gray (2001) defined mass murder as an event in which a single perpetrator intentionally killed three or more other people during a single event.

Mullen (2004) provides clarity with categories of mass murders related to victimology and offender motivation: (1) victim-specific, wherein the offender kills certain individuals for a variety of motivations; (2) instrumental, wherein the offender kills victims in the furtherance of some particular personal agenda; and, (3) massacres, wherein the offender kills victims chosen mostly—if not completely—at random (though
the offender may select people who fit a particular racial, ethnic, or gender group, or meet some other criteria). These categories are not mutually exclusive: in fact, Meloy, Hempel, Mohandie, Shiva, & Gray (2001) term offenders whose motivations or victim selection changed during the course of an event as *bifurcated killers*.

While acts of terrorism have often involved mass casualty events, it is inappropriate to define a multiple homicide event as an act of terrorism despite the tendency of such acts to instill great fear and societal consequence. Multiple homicides are a self-serving form of murder intended to benefit the killer or killers rather than to serve a broader, politically-oriented motive in the way that terrorism does. However, the distinction between expressed political desires and actual political motive distinguishes acts of mass murder from acts of terrorism. Simply because a person with Islamic ties, for example, engages in an act of mass murder does not define that act as terrorism. Key to understanding the difference is a thorough analysis of the offender’s background. When a single individual carries out such a massacre, one need be suspicious of classifying the event as an act of terrorism.

Acts of terrorism, when included in data on mass murder, may tend to skew the results and generally should be excluded. Fox and Levin (1998), for example, excluded the 1995 bombing of the Oklahoma City federal building from their research “because its enormity and special character would grossly distort the statistical research” (p. 432).  

In a National Academy of Sciences report, Moore (2003) defined “lethal school
violence” as any event that involves: (1) “lethal violence,” (2) “that took place in
schools,” (3) “was committed by students of the school,” and (4) “resulted in multiple
victimizations” (p. 287, emphasis deleted). Similarly, Newman, Fox, Harding, Mehta,
and Roth (2004) defined “rampage school shootings” as events that (1) “take place on a
school-related public stage before an audience”; (2) “involve multiple victims, some of
whom are shot simply for their symbolic significance or at random”; and, (3) “involve
one or more shooters who are students or former students of the school” (p. 50). Bockler,
Seeger, Stizer, and Heitmeyer (2013) used similar criteria.

The first component of the definition is, of course, necessary to any definition of a
rampage school shooting as it sets the venue as being at school or at some school-related
event. The specification that there be an audience is vague and ill-defined. Nonetheless,
the specification that there be an audience would seem appropriate in the context of
establishing that the shooting takes place in the presence of multiple people, whether or
not some or all of those people become victims of the attack. The second point is more
poignant in its definition: multiple victims are shot with some of them shot not because
they are specifically targeted by the shooter but because they represent some symbolic
target or because they are simply chosen at random. The third point again raises some

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8 Moore noted, however, that the “committee’s application of this definition was fluid enough to
include at least one case in which no one died” (p. 287).

9 It should be noted that Newman, Fox, Harding, Mehta, and Roth were all involved in the
National Academy of Sciences research published by Moore. According to Moore, case and literature
reviews led the researchers to begin “referring to some of the . . . cases as ‘school rampage shootings’” (p.
288).
question as it necessitates that the shooter be a student or former student of that school. Such a definition would exclude, for example, cases in which a prospective student, turned down for admission to a particular school, came to inflict carnage in retaliation; a student from a rival school decided to carry out a massacre because of a perceived slight or the fact that he or she had been bullied by students at that school; or, a school staff member, bullied by students, goes on a rampage. With regard to research aimed at responding to such events as they unfold, limiting the definition based on offender background or status seems inappropriate; therefore, the broader population of rampage shooters who have carried out their massacres on school grounds or in other areas where school-related events were ongoing should be included in such research.

Langman (2009c) provided a similar definition of “rampage school shootings”: an attack that (1) is carried out by a student or former student of the school; (2) is done publicly with no intent to conceal the shooter’s identity or actions; and, (3) involves at least some randomly-selected or symbolic victims rather than strictly targeted victims. Langman argued that studying targeted and rampage shooters collectively “muddies the waters, making it difficult to draw meaningful conclusions about what type of person perpetrates a rampage school shooting” (p. 2). Langman’s definition, however, is less applicable to the current research based on its focus on shooter psychology rather than on police response.

One encumbrance in prior research on rampage shootings has been the arbitrary

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10 For example, the 2012 massacre at Sandy Hook Elementary School, which left 26 people dead, would be excluded under this criterion.
specification of a minimum body count. Despite intent to inflict maximum casualties, shooters are not fully in control of how many victims live or die (Bjelopera, Bagalman, Caldwell, Finkela, & McCallion, 2013). Shooters may miss intended targets. Gunshot wounds may be nonfatal. Medical intervention may spare the lives of some who would otherwise have died.

As Madfis (2012) explained, prior research has almost entirely ignored cases in which either the planned or attempted massacre was thwarted or when multiple victims were shot but an insufficient number of them died to meet definitional thresholds for inclusion in the research. Such exclusions, while benefiting the practicality of the research, serve only to limit data and, especially in cases of averted rampages, may serve to bias the outcome of the research. There exists scant research focusing on averted rampage shootings; those studies that do exist have focused largely on risk and threat assessment rather than on site-specific, time-of-incident measures (Daniels et al., 2007; Daniels et al., 2010; White-Hamon, 2000). Madfis also argued that there could potentially be numerous averted school rampages that were handled at the school or local level and never received national attention, thus excluding those cases from any potential research based on national data.

Muschert (2007) examined school shootings and developed several typologies to distinguish shootings for research purposes: (1) rampage shootings, which are characterized by random or symbolic targets and are perpetrated by a student or employee or former student or former employee of the school; (2) mass murders, which are carried out by a person with no affiliation with the school against symbolic targets (i.e., students
or members of the institution) for symbolic purposes; (3) terrorist attacks, which are
designed to serve some political agenda; (4) targeted shootings, in which a shooter targets
a specific individual or specific individuals to exact revenge for some real or perceived
slight; and, (5) government shootings, which are those carried out by police or other
government agents.

Heide, Eyles, and Spencer (1999) reviewed school shootings with random victims
during the 1990s utilizing five criteria: (1) multiple shots were fired; (2) the offender(s)
were enrolled as students in the school where the incident took place; (3) at least one
victim was killed or injured; (4) the victims were associated with the school; and, (5) at
least some of the victims were randomly selected. These criteria, however, allowed the
inclusion of at least one incident at a high school in Richmond, Virginia, that, according
to reports, was likely a spontaneous shooting resulting from a dispute between juveniles
rather than a planned, coordinated attack (Baker & Hsu, 1998; “Shooting at high school

**Shooters and Their Victims**

Despite media attempts to portray rampage shooters as middle-aged White males,
developing a profile based on common features of rampage shooters is a complicated,
elusive task (Langman, 2009b; Langman, 2015b; see also O’Toole, 1999). “The most
common error in discussing school shooters,” wrote Langman (2015b), “is the
assumption that they are a homogeneous group of people—that they can be lumped
together and discussed as if they were essentially the same. This assumption simply
doesn’t hold up to scrutiny” (p. 1; see also Fessenden, 2000). Langman (2015c) has
compiled a list of school shooters—currently totaling 37—who were not White males, including Seung-Hui Cho, an Asian male who, as Langman explained, perpetrated the most deadly school rampage shooting in U.S. history, the 2007 massacre at Virginia Tech. Still the myth that school rampage shooters are almost exclusively White males persists.\footnote{The myth has even been perpetuated by empirical literature involving non-random case study samples where selection bias has skewed the sample. For example, McGee and DeBernardo (1999) studied 15 cases involving 17 “classroom avenger” shooters and developed a profile reflecting that 100% of them were White males in stark contrast to more comprehensive data sets (Fox & Levin, 1998; Langman, 2015c). Other literature (Melter, 2012) has described “the typical U. S. mass murderer” as a White male, stating the statistic that “63% of offenders are [W]hite” (p. 39). In a paper discussing racial disparities in media reporting on mass shootings, Mingus and Zopf (2010), referencing studies of mass school shootings between 1974 and 2008, wrote that “[t]he majority of the shooters were [W]hite with few notable exceptions” (p. 60). The authors did not mention that Whites represent over 70% of the U. S. population (United States Census Bureau, 2016) and, thus, should make up the majority race of mass shooters.}

White males are nonetheless over-represented as mass murder offenders because they are male rather than because they are White. Rampage shooters are overwhelmingly male (Langman, 2009b; Fox & Levin, 1998). Over 94% of mass murderers have been male and nearly 64% have been White, higher percentages than single murder or any other type of multiple homicide. As a consequence, victim characteristics are likewise skewed (Fox & Levin, 1998; see also Overberg, Upton, & Hoyer, 2013). A study by the New York City Police Department (Kelly, n.d.) found that only 4% of active shooter incidents were perpetrated by females. Just under half the U.S. population are male, and over 70% are White (United States Census Bureau, 2016). Hence, males are significantly overrepresented as mass murderers, but Whites are actually slightly underrepresented. It is important to note, however, that, while mass murderers are overwhelmingly male, so...
are murderers overall. In fact, data compiled by Fox and Levin (1998) for the two decades from 1976 through 1995 showed that 94.4% of mass murder (four or more victims in a single event) offenders, 93.2% of triple murder offenders, 94.3% of double murder offenders, and 87.3% of single murder offenders were male. Studying 29 mass shooting incidents occurring between 1999 and 2012, New Jersey Regional Operations Intelligence Center (2012) reported that only one (3.4%) of the incidents was perpetrated by a female. Males, however, represent slightly less than half the U.S. population (United States Census Bureau, 2016).

Rampage school shooters are, however, not exclusively male: female shooters include Laurie Dann, who opened fired on children at Hubbard Woods School in Winnetka, Illinois, in 1988 killing one and wounding five (McCoppin & Berger, 2013); Amy Bishop, who in 2010 shot and killed three coworkers, wounded three others, and attempted to shoot a seventh during a biology faculty meeting at the University of Alabama Huntsville (Keefe, 2013; Lawson, 2014); and, Brenda Spencer, who in 1976 opened fire on a San Diego elementary school killing the principal and a custodian and wounding a police officer and eight students (Langman, 2010b; “School shooter Brenda Spencer denied parole”, 2009; “Sniping suspect had a grim goal”, 1979). Recently, authorities in Colorado arrested 16-year-old Sienna Johnson along with another female after discovering that the girls were plotting a rampage shooting at suburban Denver Mountain Vista High School. Police obtained Johnson’s journal in which she detailed her

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12 Bishop shot and killed her brother in 1986 in what was originally determined to be an accident; however, questions arose after the UAH rampage shooting, and an inquest into the 1986 shooting led to Bishop being indicted for the murder of her brother (Keefe, 2013).
plans, though Johnson was not found to actually possess any of the weapons or explosives needed to carry out her plans (Associated Press, 2016; “Denver teen charged as adult,” 2016; Padilla & Powell, 2016; Roberts, 2016). On February 23, 2016, a 14-year-old girl randomly attacked and wounded nine classmates with a knife at a high school in the Toronto suburb of Pickering, and a news report indicated that she had made social media postings in the days prior intimating her planned attack (Johnston & Fox, 2016). Whether she would have used a firearm had she had access to one remains unclear.

Rampage shooters overwhelmingly act alone. The New York City Police Department has reported that 98% of active shooter incidents studied involved a lone offender (Kelly, n.d.). Despite this statistic, perhaps the most defining school rampage shooting incident in U.S. history was the 1999 massacre at Columbine High School, which was carried out by two students, Eric Harris and Dylan Klebold (Cullen, 2010; Erickson, et al., 2001; Langman, 2008).

Notable in the research, however, is the fact that, while middle-age shooters have carried out rampages in a variety of venues, adolescent rampage shooters overwhelmingly carry out their massacres at school or school-related events (see Meloy, Hempel, Mohandie, Shiva, and Gray, 2001).

**Psychological disorders.** No study of rampage shooters should overlook the integral role that psychological disorders play in these episodes of violence. These offenders are not normal people who snapped under pressure; they are people suffering from “a long history of frustration, humiliation, and failure” and “a diminishing ability to cope” who see themselves as victims and who, in their deeply disturbed minds, see
violence as a means of gaining power and taking control of their suffering (Fox & Levin, 2003, p. 52; see also Fessenden, 2000; Fox, Levin, & Quinet, 2012; Langman, 2009c). Unlike others suffering from extreme levels of depression and low self-image who may be intropunitively violent, rampage shooters blame others for their failures and thus act out extrapunitively (Fox & Levin, 2003). School rampage shooters are no different.

“School shooters are disturbed individuals,” Langman (2009c) explained. “These are not ordinary kids who were bullied into retaliation” (p. 15). Planning and premeditation are apparent in almost every case (Band & Harpold, 1999). Mental illness plays a role in some shootings, but Duwe (2007), studying 1,186 mass murderers, conservatively estimated that about 13% had a diagnosed history of mental illness and another 15% exhibited symptoms of mental illness without any formal diagnosis.

Studying a non-random sample of 30 mass murderers, Hempel, Meloy, and Richards (1999) found that the offenders killed between three and 22 people and wounded between zero and 30. In 57% of the events, all or most of the victims were known to the offender.\(^\text{13}\) Fifty-three percent of the offenders committed suicide, 36% were captured, and 10% were killed. Though the age range spanned over 40 years, the average offender was found to be a male in his 40s with no racial or ethnic group being disproportionately represented.

Mass murderers are often erroneously viewed as individuals who “just snapped” or “went berserk” and suddenly went on a rampage (Pollack, Modzeleski, & Rooney,

\[^{13}\text{A study of mass murders occurring since 2006 carried out by USA Today also found that 57% of mass murder victims knew their killer (Overberg, Upton, & Hoyer, 2013).}\]
2008). In fact, such sudden episodic violence is rare, though many rampage killers exhibit few, if any, indicators of their plans prior to execution. To get a clearer view of just who a rampage killer is, one must be more meticulous in researching and analyzing an offender’s past behavioral and mental health history. “[B]y focusing on atypical cases of episodic violence in which bizarre and irrational behavior is profoundly implicated,” wrote Fox and Levin (1998), “provides at best a partial understanding of the etiology and character of mass homicide” (p. 431; see also Fessenden, 2000; Fox & DeLateur, 2014).

Indeed, the common image of mass murderers being “crazy people” is misplaced. When attempting to identify potential mass murderers, one should be reminded of Fox’s admonition that mass killers are “extraordinarily ordinary” (cited in Duwe, 2005, p. 68). While rampage shooters often suffer mental illness—even if undiagnosed—the targeted nature of such offenses is rarely associated with psychosis (Fox & Levin, 2003).

**Victim selection.** Mass murderers kill acquaintances and family members much more often than strangers; in fact, about 80% of mass murder victims are family members or are otherwise known to their killers (Fox & Levin, 1998). “The indiscriminate slaughter of strangers by a ‘crazed’ killer,” the researchers wrote, “is the exception to the rule” (p. 438). Fox and Levin (2003) argued that, while homicide offenders often kill family members, mass murderers are significantly more likely to kill family members than strangers.

Mass murders occur as a result of escalation of a serious argument in only about 23% of cases, despite the fact that single-victim homicides occur following a heated dispute in over 53% of cases (Fox & Levin, 1998). Mass murderers typically choose their
victims “because of what they have done or what they represent” (p. 438). Mass killers usually have “clear-cut” motives (pp. 437-438). “[A] critical condition for frustration to result in extrapunitive aggression,” wrote Fox and Levin, “is that the individual perceives that others are to blame for his personal problems. . . . [T]he mass killer comes to see himself never as the culprit but always as the victim behind his disappointments” (p. 439).

**Root causes.** Although causal factors of mass murder remain elusive in the literature, the crime seems to be rooted in psychological maladies rather than biological ones. “It remains to be seen,” wrote Fox and Levin (1998), “whether and to what limited extent biological catalysts are implicated in incidents of mass murder—a crime that tends to be methodical rather than episodic” (p. 441).

Familial mass murderers usually have either altruistic or revengeful motives: they either seek to spare their family members some perceived fate or suffering, or they kill family members out of spite, usually for perceived slights (Levin & Madfis, 2009). Hence, strictly familial mass murder episodes are generally distinct from rampage shootings in terms of both offender motivation and victimology. That said, rampage shooters have, in a number of cases, killed family members either during an episode or, more commonly, prior to one. Charles Whitman killed his mother and his wife prior to ascending the clock tower at the University of Texas at Austin to begin his deadly rampage (Lavergne, 1997); Kip Kinkel killed his parents the day before he carried out his massacre at Thurston High School in Springfield, Oregon (Langman, 2009a); and, Adam Lanza killed his mother prior to slaughtering 20 children and six adults at Sandy Hook
Elementary School in Newtown, Connecticut (Sedensky, 2013).

While adult mass murderers almost exclusively act alone, juvenile mass murderers are more likely to have an accomplice. Meloy, Hempel, Mohandie, Shiva, and Gray (2001) found that, in a sample of 34 adolescent mass murderers, one-quarter acted in tandem with another male in stark contrast to the adult mass murderers who overwhelmingly carry out their massacres alone (Fox & Levin, 2003).

Levin and Madfis (2009) looked at cumulative strain as a causal factor in mass shootings at schools and developed a sequential model to explain the buildup to violence involving five stages: (1) chronic strain, (2) uncontrolled strain, (3) acute strain, (4) the planning stage, and (5) the massacre. This model, while explanatory in criminological terms, does not address the nature of the massacre but, rather, the childhood and adolescent strains that push one toward rampage violence. The primary constraint in applying this model to real-world cases a priori, however, is that a great many juveniles suffer the same cumulative strain as school rampage shooters without becoming violent. Again, the false positive rate is exceedingly high.

Meloy, Hempel, Mohandie, Shiva, and Gray (2001) asserted that mass murders were “generally acts of predatory (instrumental) violence”—rather than affective (reactive)—that is “planned, purposeful, unemotional, shows an absence of autonomic arousal, and is not preceded by a real or perceived imminent threat” (p. 726). Such predatory violence is particularly apparent among “classroom avengers” (p. 726; McGee & DeBernardo, 1999).

**Characteristics.** Studying a sample of six school shooters, Band and Harpold
(1999) found a number of common characteristics (p. 14):

1. The offenders expressed narcissistic views but also had low self-esteem.
2. They had a real or perceived lack of familial support.
3. They had difficulty with their parents, though no evidence of actual abuse existed.
4. They perceived themselves as different from others and suffered self-loathing as a result.
5. They desired recognition and, in absence of positive recognition, sought negative recognition.
6. They had a history of displays of anger and minor violence at school.
7. They had a history of mental health treatment.
8. They were influenced by satanic or cult beliefs or philosophies.
9. They listened to violence-promoting music.
10. They were loners who performed as average students and often had an unkempt appearance.
11. They tended to dislike popular students and bullies.
12. They had an interest in previous killings.
13. They expressed a desire to kill others.
14. They sought power over others through killing because they felt powerless.
15. They exhibited no remorse after killing.
Typology. Langman (2009a), studying a non-random sample of 10 rampage school shooters who carried out massacres between 1997 and 2007, identified three typologies: (1) traumatized; (2) psychotic; and, (3) psychopathic. The traumatized shooters, which included Evan Ramsey, Mitchell Johnson, and Jeffrey Weise, all had a history of physical or sexual abuse and “had at least one parent with substance abuse problems, and each had at least one parent with a criminal history.” The psychotic shooters, which included Michael Carneal, Andrew Wurst, Kip Kinkel, Dylan Klebold, and Seung Hui Cho, all “came from intact families with no histories of abuse, parental substance abuse, or parental incarceration” and had “exhibited symptoms of either schizophrenia or schizotypal personality disorder, including paranoid delusions, delusions of grandeur, and auditory hallucinations.” The psychopathic shooters, which included Andrew Golden and Eric Harris, all had “intact families with no histories of abuse or significant family dysfunction” and “demonstrated narcissism, a lack of empathy, a lack of conscience, and sadistic behavior” (p. 81).

Lankford (2012a) studied a sample of 81 terrorist suicide attackers and rampage shooters who committed suicide during their attacks and found that both groups shared similar background characteristics, including “social marginalization, family problems, work or school problems, and precipitating crisis events” (p. 255). These findings directly challenge the conventional wisdom that suicide terrorists are “rational political actors” as compared with suicidal rampage shooters who are believed to be “mentally disturbed loners,” leading Lankford to conclude that, if many of the rampage school shooters in the

14 Langman (2010b) added five additional shooters to the sample with event years starting in 1975.
United States had grown up in, for example, Gaza or the West Bank, they would likely
have become suicide bombers (Lankford, 2012b, para. 2). Lankford’s findings suggest
that the scourge of rampage shootings in the United States vis-à-vis the almost complete
absence of suicide bombers here owes to cultural differences between American culture
and cultures in other regions of the world where suicide bombings are common but
rampage shootings are not. Larkin (2009) also likened the Columbine rampage to a
politically-motivated massacre, and illustrated how it had spawned other similar events.

Dietz (1986) classified mass murderers into three typologies: family annihilators, who
typically suffer from depression, paranoia, and substance abuse and kill multiple
family members, often in an emotional outburst; pseudo-commandos, who are often
preoccupied with weapons, death, and killing and will commit their massacres after
substantial contemplation and planning; and set-and-run killers, who typically carry out
their murders through some remote means, such as setting a fire, leaving an explosive
device to be triggered later, or tampering with products to indiscriminately poison
unsuspecting consumers. Dietz’s distinctions are critical to the study of the crime scene
behaviors of mass murderers and lend themselves to establishing a classification for
school rampage shootings. While a study on mass murder overall may rightly be designed
to include data on all incidents that meet specified criteria regarding casualties,
timeframe, and location, the distinction between the motivations of family annihilators
and pseudo-commandos necessitates, at least from a crime scene behaviors standpoint,
studying the typologies separately. Indeed, as Fox and Levin (1998) explained, rampage
killers who massacre large numbers of strangers in a public place represent only a
minority fraction of mass murderers.

Fox and Levin (1998) listed five motivations for multiple murder: (1) power, (2) revenge, (3) loyalty, (4) terror, and (5) profit. Power is often the motivation for “pseudocommando” killers—ones who dress in military-style clothing, are often obsessed with weapons and symbols of power, and who tend to slaughter victims indiscriminately. Revenge killers are usually motivated by some precipitating event such as the loss of a job or being rejected in attempts at a relationship, though they may not directly kill the object of their rage, choosing instead to kill others connected with that person, such as a husband murdering his children in an act of revenge against his wife. Loyalty killers are usually family members—often patriarchal—who kill loved ones out of a desire to spare their victims some perceived suffering. Profit killers murder witnesses to crimes or people whose deaths are likely to allow for the offenders’ monetary gain. Terror killers use mass murder as a means of making some political statement.

**Weapons.** In their study of 27 mass murder events perpetrated by adolescents, Meloy, Hempel, Mohandie, Shiva, and Gray (2001) found that only four of the events did not involve firearms; in 16 cases, firearms were the only weapons used. A *USA Today* study of mass murders occurring since 2006 found that 77% of the incidents involved firearms. Of the incidents involving firearms, 72.9% involved handguns, 18.5% involved rifles, and 8.6% involved shotguns; 58.2% of the firearms were semiautomatic and 1.3% were fully automatic (Overberg, Upton, & Hoyer, 2013).

While rampage shooters, by definition, rely on firearms as their weapons-of-choice, there is significant disparity among the types and numbers of firearms and rounds
of ammunition carried. In their study, Hempel, Meloy, and Richards (1999) found that the average mass murderer brought three weapons to carry out an attack, though they pointed out that “some brought an arsenal” (p. 220). The researchers noted a “warrior mentality” theme among the subjects in their non-random sample. Warrior types often carry weapons of little utility in a rampage, such as knives, swords, and throwing stars that serve more to feed the offender’s fantasy and warrior self-image than to facilitate a rampage.

**Outcome.** Some disparity exists in the data regarding outcome of the offender. According to data compiled by *USA Today*, about one-third of mass murder offenders since 2006 were either killed or committed suicide (Overberg, Upton, & Hoyer, 2013). Duwe (2007), studying 1,186 mass murderers between 1900 and 1999, found that 22% were killed, either by suicide or by other people, at the scenes of their massacres, and 38% were taken into custody; data were ambiguous as to outcome for the remaining 40%. However, in a report by the New Jersey Regional Operations Intelligence Center (2012), the authors studied 29 mass shooting events that occurred between 1999 and 2012 and found that 20 of the incidents (69%) ended with the offender either committing suicide or being killed by police. Where successful interventions occur, the circumstances have varied: for example, in five case studies presented by Mullen (2004), one offender intended to commit suicide but could not bring himself to do so, and efforts to get the police to kill him failed; another offender hesitated after turning his gun on himself and was tackled by a police officer; another offender was cornered and disarmed by citizens; another offender expected to be killed by police, but, when that did not happen, he failed at a suicide attempt before being taken into custody; and, another offender was tackled by
one of his victims when his firearm malfunctioned.

Where interventions occur, it is difficult to assess the degree to which those efforts spared victims. Even when offenders take their lives, investigators and experts are left only with limited proxy data from which to discern the degree to which outside influences promoted an offender’s suicide. An offender may have stopped killing because he was cornered, or because he ran out of ammunition, experienced a firearm failure, or was simply satisfied that he had completed his mission.

**Violent video games.** One background factor that dominates the profiles of rampage school shooters is a history of frequent playing of violent video games. Clearly, playing violent video games cannot be viewed as causal with regard to violent rampages: millions of consumers of violent video games never turn to violent rampages as an outlet for their stresses and frustrations; in fact, as Langman (2009c) explained, those few who do can be viewed as aberrational rather than normal (see also Ferguson, 2008; Ferguson, Coulson, & Barnett, 2011; Fox & DeLateur, 2014). Violent video games, however, are a common thread among rampage school shooters, and such media seem to serve as a sort of pornography for those obsessed with death and killing. “They do not just play violent video games,” Langman explained. “They become obsessed with them” (p. 8).

Media depictions of violence, Langman (2009c) explained, may also serve to feed the rampage shooter’s violent fantasy and may even provide “guidelines or scripts for killers to follow” (p. 8). By legitimizing violence and giving status to those who perpetrate it, Langman argues, violent media feed the would-be killer’s desire for power and make violence appear to be a legitimate means of achieving it. Still, there exists no
real consensus in the empirical literature as to extent to which playing violent video games affects the behavior or decisions of school rampage shooters.

**Warning signs and indicators.** Band and Harpold (1999) provided the following list of “general warning signs or personal background indicators” for school shooting offenders (p. 12):

1. a history of violence;
2. a close family member who has committed a violent act;
3. a history of alcohol or drug abuse;
4. a precipitating event, such as a failed romance or the perception of a failed romance;
5. the availability of a weapon or the means to commit violence;
6. a recent attempt to commit suicide or an act of violence;
7. a lack of coping skills or strategies to handle personal life crises with no controls to prevent anger or positive ways to release it; and,
8. no apparent emotional support system.

**Characteristics of the Events**

In their study of a non-random sample of 30 mass murder events, Hempel, Meloy, and Richards (1999) found that 37% took place at the offenders’ workplaces, 20% on public streets, 13% at schools, and 13% at the offenders’ homes with the rest occurring at other public locations. The median length of time for the events was 20 minutes. Ninety percent took place on a weekday, and 93% took place between the hours of 6:00 a.m. and
6:00 p.m. A study by the New York City Police Department found that 29% of active shooter incidents studied took place at school (Kelly, n.d.).

**Prevalence of Rampage Shooting Incidents**

Mass murder incidents in the United States occur about once every two weeks. Fox and Levin (2003) found that during the period from 1976 through 1999, there were 599 mass murder episodes in the United States by 826 offenders claiming 2,800 victims, an average of over 100 victims annually.\(^{15}\) A recent *USA Today* study of mass murders occurring since 2006 found that 1,331 victims had been killed in 271 incidents, 205 of which involved firearms (Overberg, Upton, & Hoyer, 2013).

Meloy, Hempel, Mohandie, Shiva, and Gray (2001) concluded that their non-random sample of 34 offenders involved in 27 events represented “most of the universe of adolescent mass murderers . . . in North America in the past half century” (p. 720). While the sample spanned from 1958 to 1999, nearly 52% of the cases occurred between 1995 and 1999.

A study by *USA Today* of mass murders (including ones not involving firearms) occurring since 2006 found that massacres occurring in public places accounted for about one in six mass murder episodes; 52% of cases involved familial mass murders, 12% arose out of burglaries or robberies, and 21% were classified as other or unknown circumstances (Overberg, Upton, & Hoyer, 2013). Several researchers have found that mass murders have not shown a significant upward or downward trajectory over as long a

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\(^{15}\) The 1995 bombing of the Oklahoma City federal building claimed 168 victims in a single incident.
period as the past three decades (Fox & Levin, 2005; Overberg, Upton, & Hoyer, 2013).

Fox and Levin (2003) found that, while violent crime tends to be more prevalent in urban locales, mass murder occurs more frequently in small towns and rural settings. Furthermore, while murder rates are higher in the South, mass murder rates are not.

**Homicides on Campus**

Fox, Levin, and Quinet (2005) posited an interesting juxtaposition: while rates of juvenile and school campus violence were decreasing in the 1990s, the phenomenon of rampage school shootings was making its first real appearance in American culture, and an appearance it indeed made. Particularly on middle and high school campuses, the number of reported rampage shootings on campus surged in the 1990s. Similarly, the number of rampage shootings on college campuses increased during the 2000s (Fox & Savage, 2009).

Schools, especially high schools and colleges, are particularly at risk for rampage shooting events for a number of reasons: (1) students fall within the age range during which violence is most prevalent; (2) students are exposed to considerable social and academic stressors; and, (3) campuses are more open, particularly at the college level where students are able to come and go at will (Heilbrun, Dvoskin, & Heilbrun, 2009).

On college and university campuses, an average of 10 homicides were perpetrated annually between 2001 and 2005, the majority of which involved acquaintances or were drug-related. Firearms were used in only 52% of those murders (Fox & Savage, 2009).

Researchers have noted an interesting phenomenon with regard to school rampage shootings: they occur almost exclusively in suburban and rural schools (Moore, Petrie,
Braga, & McLaughlin, 2003; Newman, Fox, Harding, Mehta, & Roth, 2004). Rampage shooters on school campuses have shown distinctly different offender characteristics than shooters in other geographic locations, particularly with regard to age and motivation (Fox & Savage, 2009). With respect to rampage shooting incidents on college and university campuses, Fox and Savage (2009) found that graduate students were disproportionately represented as offenders: of the 14 incidents the researchers studied, eight were committed by current or former graduate or professional students as compared to only three that were perpetrated by undergraduate students and three by outsiders.

Fox and Savage (2009) examined rampage shootings on college campuses following the 2007 Virginia Tech massacre. In particular, they examined whether task force recommendations put forth in the wake of such tragedies would have a beneficial effect on campus security. Fox and Savage found that, while some recommendations were valid and appropriate, others may be detrimental to the college campus environment. Fox and Savage identified as problematic the implicit assumption that security and prevention strategies effective at the secondary school level would likewise be effective on college campuses. They identified “differences in assailant motivation and setting” as factors that must be considered when adapting prevention and response measures (p. 1465).

Harding, Fox, and Mehta (2002) researched methodological issues regarding the study of school rampage shootings given the rarity of their occurrence. The researchers argued that a significant problem in studying mass shootings at schools is “defining the relevant universe of cases that can realistically be called rampage school shootings” (p.
They examined epistemic uncertainty associated with small sample sizes, inability to clearly define the population under study, and inability to obtain useful comparison samples. In many cases, the number of potential independent variables exceeds the number of data points resulting in underdetermined systems making it difficult to assess the complex web of causation.

Heide, Eyles, and Spencer (1999) looked at school shootings from the beginning of the 1990/91 school year through the end of the 1997/98 school year and proposed a typology of school shootings “that aims to put the phenomena of school shootings in a scientific framework where it can be objectively investigated” (p. 174). Petee and Padgett (1999) looked at “the context of mass murder occurring in both public and private settings in the United States between 1975 and 1999” (p. 211). Nykodym, Patrick, and Mendoza (2011) examined response options for universities and the effect of multiple independent variables, including factors associated with economic downturn experienced over the last several years.

**Prevention and Response**

Perhaps H. L. Menken (n.d.) best summed the issue: “For every complex problem there is an answer that is clear, simple, and wrong.” Indeed, as O’Toole (1999) explained: “In a knee-jerk reaction, communities may resort to inflexible, one-size-fits-all policies on preventing or reacting to violence” (p. 2). Still, poor policy decisions in the aftermath of rampage shootings continue.

Preventing rampage shootings from occurring in the first place is certainly preferable to responding to such an incident when it does take place. A study by the New
York City Police Department (Kelly, n.d.) found 31 cases in which school shooting plots had been foiled prior to being carried out. Still, prevention is only one layer of protection, and clearly many shootings have not been prevented.

Fox and Savage (2009) have suggested that “an atmosphere of fear” has led some colleges and universities to adopt measures that “go beyond what is reasonable” and “do more harm than good” (p. 1466). Unfortunately, there are no simple answers as to what measures are appropriate for school and law enforcement officials to take to prevent rampage shootings and other violence.

Prevention of a rampage shooting requires officials to gain intelligence of the impending plot and intervene before the shooting starts. Unfortunately, there are no failsafe measures that can prevent every rampage shooting. Risk assessment tools are difficult to employ. The aberrantly small population of school rampage shooters means that such tools are likely to produce an alarmingly high rate of false positive indicators. And, the accuracy of risk assessment tools is barely greater than mere chance. Threat assessment protocols, on the other hand, target specific threats rather than individual characteristics to assess the legitimacy of a potential threat and provide specific information from which investigators and school officials may act. “The question is not whether the student might be at increased risk for engaging in some form of aggressive behavior during adolescence,” wrote Reddy et al. (2001), “but rather whether he or she currently poses a substantial risk of harm to another identified or identifiable person(s) at school” (p. 160).

**Risk assessment.** Risk state may be defined as an individual’s propensity to
become involved in violence at a given time, based on particular changes in biological, psychological, and social variables in his or her life (Skeem & Mulvey, 2002). Central to this construct is a recognition that risk factors vary in the extent to which they are changeable, ranging from highly static variables (e.g., gender, race, history of violence) to highly dynamic ones (e.g., substance use, weapon availability) (Heilbrun, 1997; see also Kazdin, Kraemer, Kessler, Kupfer, & Offord, 1997; Kraemer et al., 1997). Static risk factors describe an individual’s risk status, whereas a combination of static and dynamic factors describes an individual’s risk state (Douglas & Skeem, 2005, pp. 349-350).

Most risk assessment tools have been developed with the assumption that they will be applied to make single-point predictions of violence (i.e., release decisions), although some risk assessment models attempt to integrate the concepts of reassessment and dynamic risk (Andrews & Bonta, 1994; Douglas, Webster, Hart, Eaves, & Ogloff, 2001; Grann et al., 2005; Grann, Belfrage, & Tengstrom, 2000; Webster, Douglas, Eaves, & Hart, 1997).

While retrospective profiling is often used in the investigation of violent crimes, prospective profiling to identify the risk an individual may pose with respect to targeted violence at a school provides little promise of being effective. Prospective profiling techniques lack the sensitivity and specificity to provide any scientific reliability to the process of identifying a very small group of potential rampage shooters out of a population of tens of millions of students. Fox has described the problem of detecting actual killers from among the thousands of non-killers who fit the profile as being “a very large haystack and very few needles” (quoted in Duwe, 2005; see also Bjelopera,
Questions also exist as to the accuracy of current rampage school shooter profiles. The FBI, for example, developed a profile based on only six school shootings while other researchers found over 40 school shooting cases during the last two decades of the 20th Century (Band & Harpold, 1999; Reddy et al., 2001). The school shooter profile developed by the FBI, relying on a sample of only six shooters, mistakenly determined that all were white males (Band & Harpold, 1999); however, three of the six shooters were actually not white males: one was African American, one was Hispanic, and one was a Native American (Reddy et al., 2001). In fact, Langman (2015c) has published a list of 37 school shooters who were not white males. Pollack, Modzeleski, and Rooney (2008) wrote that there is “no useful or accurate ‘profile’ of students who engaged in targeted school violence” (p. 3).

Langman (2005) explained the problem of attempting to profile potential rampage shooters:

There is no typical demographic profile of a school shooter. Some come from intact families and some from broken homes. Some are excellent students, and some are poor students. Some are bullies, and some are not. Some are victims of bullying, and some are not. Some use drugs, and some do not. Most are male, but some are female. Thus, profiling is not a productive course to pursue in identifying potential school shooters. (p. 1)

**Threat assessment.** Certainly, the prospect of a lone gunman opening fire on a school campus, randomly killing strangers, was not at the forefront of Americans’ collective consciousness in 1966—even if it should have been. During the first quarter of
that year, 25-year-old Charles Whitman, after killing his wife and his mother, went to the
University of Texas at Austin and ascended the clock tower, armed with three rifles, a
shotgun, and three handguns. After killing three people inside the tower, Whitman spent
the next 96 minutes sniping at victims on the ground, killing 11 and wounding 32 before
being killed by police (Lavergne, 1997). Beside having written about his violent
thoughts, Whitman told multiple acquaintances that he wanted to shoot people from the
tower, and he even confessed to a psychiatrist, who noted that Whitman was “oozing with
hostility,” that he was “thinking about going up on the tower with a deer rifle and start
shooting people” (Healy, 1966, pp. 1-2; see also Burgess, 2006).

Twenty-five-year-old Canadian Kimveer Gill shot 19 people at Dawson College
in Montreal in 2006. Prior to his rampage, Gill had posted disturbing, death-laced
messages of violence and despair on various websites. He even posted 51 photographs of
himself posing with firearms and wearing a black trench coat reminiscent of those worn
by Eric Harris and Dylan Klebold during their infamous rampage at Columbine High
School in Littleton, Colorado (Alfano, 2006; Langman, 2009c).

Threat assessment is not centered on profiling offender characteristics but, rather,
concerned with specific, overt behaviors that may indicate a person’s intent to engage in
violence. “Any student can make a threat,” explained Borum, Cornell, Modzeleski, and
Jimerson (2010), “but relatively few have a persisting violent intent that leads them to
engage in the planning and preparation necessary to carry out an attack” (p. 31). Threat
assessment is not used to predict violence; it is used to detect impending violence before
it takes place. Whereas risk assessment is actuarial, threat assessment is investigative.
O’Toole (1999) explained that there is an inequality among threat makers: they are not they same, but despite the unlikelihood that a threat maker will actually become violent, all threats must be taken seriously and investigated properly. Key to threat assessment is understanding the difference between verbalizing a threat and actually posing a threat. “Any student can make a threat,” explained Borum, Cornell, Modzeleski, and Jimerson (2010), “but relatively few have a persisting violent intent that leads them to engage in the planning and preparation necessary to carry out an attack” (p. 31; see also Heilbrun, Dvoskin, & Heilbrun, 2009; Reddy et al., 2001). Langman (2005) explained that “the more detailed the plan and the more accessible the means, the greater the risk” (p. 2).

A number of researchers have provided threat assessment warning indicators (Borum, Cornell, Modzeleski, and Jimerson, 2010; Meloy, Hempel, Mohandie, Shiva, & Gray, 2001; Meloy, Hoffmann, Guldimann, & James, 2011; Meloy, Hoffmann, Roshdi, & Guldimann, 2014; Reddy et al., 2001; Vossekuil, Fein, Reddy, Borum, & Modzeleski, 2004). Borum et al. provided a list of eleven investigative questions for assessing threats of targeted violence in schools (p. 32):

1. What are the student’s motives and goals?
2. Have there been any communications suggesting ideas or intent to attack?
3. Has the student shown inappropriate interest in school attacks or attackers; weapons; or, incidents of mass violence?
4. Has the student engaged in any attack-related behaviors?
5. Does the student have the capacity to carry out an act of targeted violence?
6. Is the student experiencing hopelessness, desperation, or despair?

7. Does the student have a trusting relationship with at least one responsible adult?

8. Does the student see violence as an acceptable, desirable, or exclusive way to solve problems?

9. Is the student’s conversation consistent with his or her actions?

10. Are other people concerned about the student’s potential for violence?

11. What circumstances might affect the likelihood of an attack?

O’Toole (1999) proposed a threat hierarchy in which threats are classified at levels of either “low,” “moderate,” or “high” threat. Threat content, O’Toole explained, should be evaluated based on the specificity and plausibility of the threat; the emotional content of the threat; and, the existence of precipitating stressors in the threat maker’s life. Verlinden, Hersen, and Thomas (2000) expanded the classifications to include “very high” threat as an additional category.

Hempel, Meloy, and Richards (1999), studying a non-random sample of 30 mass murder offenders, found that only 20% of them had directly threatened their victims, which implies that reliance on such threats as the sole indicator of future violence would yield a false negative rate of 80% (see also Heilbrun, Dvoskin, & Heilbrun, 2009). Still, taken into context, threats made either directly to a potential victim or to a third party can be reliable predictors of an impending rampage shooting. Studying 30 adult and 34 adolescent mass murderers, Meloy, Hempel, Gray, Mohandie, Shiva, and Richards (2004) found that 66% of adult and 58% of adolescent mass murderers made verbal or written
threats, most often to third parties. Some of the threats were specific, some were
generalized, and some were mixed. Likewise, however, Meloy et al. found a potential
false negative rate of 42% for adolescent and 80% for adult mass murderers because no
threat was communicated directly to targeted individuals.

One particular challenge in identifying potential rampage shooters is the inherent
lack of emotion that most mass murderers exhibit. In their study of 34 adolescent mass
murderers, Meloy, Hempel, Mohandie, Shiva, and Gray (2001) described the typical
offender as “emotionless” and explained that, if any emotion is exhibited at all, it is likely
to be an expression of happiness or pleasure (p. 726).16 “The importance of this finding,”
they wrote, “is that it suggests that the adolescent mass murderer is opportunistic rather
than impulsive, and will not show any sudden or highly emotional warning signs” (p.
727). In contrast to the oft-seen profile of the single victim homicide offender whose
violence is affective, impulsive, and unplanned, the mass murderer will often appear to be
quite calm and collected, a product of the intense planning and preparation that often
precedes a massacre.

Fox and Savage (2009) argued that, while threat assessment protocols have a
place in violence prevention strategies, the rarity of rampage shootings complicates
prediction of occurrence and threatens to yield an “exceedingly high” number of false
positives. “[W]hereas threat assessment can be highly effective,” wrote Fox and Levin,
“it should not be the only method of violence prevention utilized by an institution” (p.

16 The researchers pointed out the potential connection between exhibitions of happiness and the
killer’s sadistic desire to inflict pain on others.
1471). Some people make threats they have no intention of carrying out, while others who have strong intentions to perpetrate violence may never make a threat (Langman, 2009c). Threat assessment protocols, therefore, are unlikely to be failsafe (see Kleinfield, Buettner, Chen, & Stewart, 2015).

Fox and DeLateur (2014) explained that the warning signs of an impending rampage shooting are not easily seen in foresight, and they argued that it is mythical to believe that paying greater attention to those warning signs will allow for the identification of would-be mass killers before they carry out their massacres. “If anything,” wrote Fox and DeLateur, “these indicators are yellow flags that only turn red once the blood has spilled and are identified in the aftermath of tragedy with crystal-clear hindsight” (p. 133). Langman (2009b) echoed that sentiment. Pointing out that concerns voiced by Eric Harris’s English teacher at Columbine High School about a paper he wrote were not acted on by school officials or Harris’s parents, Langman explained that, in hindsight, the indicators may seem clear, but in foresight they are often ignored because innocuous explanations exist. Prior to carrying out his 2007 massacre at Virgina Tech, Seung-Hui Cho wrote an essay that “caused enough concern that he was referred for an evaluation,” but still no official action was taken to prevent the rampage (Langman, 2012b, p. 4).

Despite strong and specific threat indicators months before Charles Whitman carried out his massacre, no action was taken to stop him. A subsequent report by a governor’s commission focused on a brain tumor discovered during Whitman’s autopsy, and even made recommendations that news media “review their own role and attitude in
obtaining and disseminating information concerning acts of violence,” but made no recommendation regarding threat assessment or the fact that Whitman had communicated his plan to a school psychiatrist (Blumberg et al., 1966, p. 15). In the 21st Century, unlike in 1966, threat assessment protocols have been codified, and school officials have a much greater level of awareness of the warning signs (Cornell, 2009; Fein, Vossekuil, Pollack, Borum, Modzeleski, & Reddy, 2002). However, as Harwood (2007) explained, there are no national standards for threat assessment teams, though both the Federal Bureau of Investigation and the United States Secret Service have published reports providing guidance to school and law enforcement officials.

The specificity of the threat is a key component to appropriate assessment. Michael Carneal, for example, wrote a story about a rampage shooting in which the killer was named Michael and the victims in the story were named for actual students. He also told fellow students that “something big” was going to happen, specifically referencing the day that the shooting actually took place. Nobody took him seriously (Langman, 2009b).

Scholars have also argued the need for defragmented documentation in school settings. In the case of Michael Carneal, multiple teachers witnessed disturbing events involving the would-be killer, but, in isolation, none of the events were serious enough to warrant the type of intervention that was needed. In absence of a central reporting system, no single person had a complete picture of the boy’s troubling pattern of behavior. For threat assessment protocols to work, the observations of multiple faculty members must come to a single processing point so that the full depth and breadth of the student’s
behavior can be assessed (Langman, 2009b; Newman, Fox, Harding, Mehta, & Roth 2004).

Successful interventions do occur, and sometimes plots are foiled within days or even hours of the shooting rampage taking place. On October 28, 2015, police and FBI agents in Michigan arrested Ryan Stevens, 18, Lamar Dukes, 15, and Cody Brewer, 15, after school officials became aware of threats made on social media website Instagram that a plot had been hatched to shoot people at Linden High School and nearby Linden Middle School in Argentine Township, Michigan. According to police, when the trio, who had access to firearms, were arrested, the plot was only two days from being carried out (“Three teens arrested,” 2015; Vinograd, 2015; Worland, 2015).

Reviewing news accounts of 28 averted school shootings, Daniels et al. (2007) found that the most common reason for preventing the shooting rampage was that other students told school personnel or police about a potential incident (n = 16, 57.1%). Eight of those cases involved friends alerting officials after the would-be perpetrators revealed their plans. Two cases involved students recruited to be part of the plot alerting authorities. Similarly, seven of the 28 plots were discovered by attentive administrators who received intelligence on the plots either by hearing chatter among students or by observing suspicious behavior on the part of a would-be perpetrator. Four more incidents were uncovered by staff members who overheard rumors. Five plots were discovered by police based on tips, and two more were uncovered following an arrest of the would-be perpetrator on unrelated charges.

Using semi-structured interviews, Davis et al. (2010) found that school climate
can affect the willingness of students to alert school officials of potential future violence, and they recommended that school officials work diligently to foster positive relationships with students and “break the code of silence” that exists between students and school personnel (p. 91).

Increasingly, social media have played key roles in the detection of potential rampage shooting plots. Cohen-Almagor (2014) found evidence of premeditation in the social media postings of several rampage shooters and argued for the development of monitoring protocols for Internet sites to detect potential killers prior to loss of life. She found, for example, that 16-year-old Jeff Weise, who killed nine people and wounded five during a 2005 massacre at Red Lake Senior High School in Minnesota, had posted certain key indicators on a social media site on which he listed his occupation as “doormat” and his interests as “military, high schools, death and dying.” He also described himself as having “16 years of accumulated rage suppressed by nothing more than brief glimpses of hope, which have all but faded to black. I can feel urges within slipping through the cracks, the leash I can no longer hold” (p. 2). A number of rampage shooters, including Kimveer Gill, who killed one person and wounded 20 others at Dawson College in Montreal, Canada, and Seung-Hui Cho, who killed 32 and wounded 17 at Virginia Tech in 2007, had posted photos of themselves on social media sites posing with weapons and wearing tactical attire (see Langman, 2012b).

Threat assessment protocols have been shown to be effective at reducing violence and student disciplinary problems. Studying the effects of the adoption of the Virginia Student Threat Assessment Guidelines at 23 high schools, Cornell, Gregory, and Fan
(2011) found that, in comparison to a control group of 26 schools, institutions that implemented the guidelines experienced a 52% reduction in long-term suspensions and a 79% reduction in bullying infractions during the year following implementation as compared to the prior year.

**Security measures.** “In the short term, access control and close surveillance may calm the fears of an anxious public,” wrote Fox and DeLateur (2015). “In the long run, it is equally important to avoid transforming our public spaces into fortresses.” Likewise, Fox and Savage (2009) suggested that “tight security measures . . . appropriate for middle and high schools” where attendance is compulsory, when implemented on college or university campuses, “could create an environment so distasteful to student prospects as to encourage them to look for options elsewhere” (p. 1474). Bridges (1999), however, argues that security measures need not be prison-like.

In response to the perceived epidemic of rampage shootings, a number of security measures have been put in place at schools around the country. Security badges, for example, are used to distinguish those who belong versus those who do not, but such a measure assumes, incorrectly, that the greatest danger of violence is posed by strangers rather than students or others known to the school. Likewise, surveillance cameras, while important for monitoring campus and responding to emergencies, will do little to dissuade the would-be shooter because such individuals have no concern for carrying out their rampages concealed from public view; quite the contrary, with rampage shooters, the more attention their massacres receive, the more satisfied they are. Metal detectors as well have limits in that, while they may serve to prevent targeted violence episodes that
require the shooter to reach an intended victim undetected, rampage shooters are likely to
begin shooting before reaching the metal detectors and, especially if unchallenged by
armed security, will simply shoot their way past a checkpoint (Langman, 2009b). Fox and
DeLateur (2015) pointed out that, in the case of Mitchell Johnson’s and Andrew Golden’s
1998 rampage at their high school in Jonesboro, Arkansas, the offenders simply pulled a
fire alarm and waited for their victims to amass outside before opening fire, thereby
defeating any physical security measures that were in place.

One aspect that critics of physical security measures often overlook is the fact that
no single measure is sufficient to prevent violence, but an approach that involves
multiple, redundant layers of security can reduce the likelihood of violence. Lieutenant
Colonel Dave Grossman, who has become known for his study of the psychology of
killing, asserts that the first step in preventing deaths from school rampage shootings is to
overcome denial: too often, parents, school officials, and even police officers deny that
violence can occur in schools. Likening the prevention of violence to the prevention of
fire, Grossman gives the fire prevention experts an “A+” grade for having prevented fire
deaths in U.S. schools for over a half century. Schools, as Grossman points out, are filled
with fire prevention measures: fire-retardant materials, sprinklers, fire hoses, fire
extinguishers, fire hydrants, fire alarms, designated no-parking fire zones, lighted fire-
exit signs, battery-powered emergency lights, and mandatory fire drills—redundant,
layered fire prevention measures. But, as Grossman explains, security measures for the
prevention of violence in schools have not followed suit, largely due to the paradoxical
denial mentality in which talk of taking steps to prevent violent deaths in schools is often
met with resistance, while talk of removing fire prevention measures from schools would likely be met with equal—if not greater—resistance.

In Grossman’s view, there exists conflict in public perception between the need for fire safety measures and the need for violence prevention measures. Fire safety measures are typically welcomed by parents and school officials, while violence prevention measures are often criticized. Grossman equates such seemingly-contradictory attitudes as being due to denial in which people’s fear of violence causes them to deny it rather than face it and take measures to prevent it. “Are these fire guys paranoid?” Grossman has asked. “No! . . . Because this fire guy has redundant, overlapping layers of protection, not a single kid has been killed by school fire in the last 50 years! But you try to prepare for violence—the thing much more likely to kill our kids in schools—and people think you’re paranoid. . . . They’re in denial” (Wylie, 2010).

Indeed, according to the National Fire Protection Association (2013), no fire in a U.S. K-12 school has claimed 10 or more lives since the tragic 1958 fire at Our Lady of the Angels Catholic school in Chicago killed 92 children and three nuns and injured dozens more. A 13-year-old later confessed to starting the fire in the school’s basement, though he later recanted his confession and was found not guilty of starting the fire. The official cause of the fire remains undetermined (Babcock, 1959; “Boy admits fire fatal to 95,” 1962; Groves, 2008).

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17 The NFPA database includes only fires that claimed 10 or more lives. This research turned up no cases of loss of life due to fire in U.S. K-12 schools subsequent to the Our Lady of the Angels fire.
Punitive measures and zero tolerance. Zero tolerance policies aimed at punishing every breech of school policy connected with a potential for violence became the norm following Columbine and a number of other high-profile school rampage shootings in the 1990s. Despite being tied to federal educational legislation and having been adopted by nearly 75% of schools, there is a dearth of evidence of their efficacy (Borum, Cornell, Modzeleski, & Jimerson, 2010).

Langman (2009c) asserted that, in practice, zero tolerance policies often result in “inappropriate responses to innocuous situations” because of a “failure to distinguish actual threats from non-threats” (p. 186). Punishment, moreover, as Langman explained, can have a detrimental effect in violence prevention in that it may serve to increase rage while doing nothing to mitigate the underlying issues driving the individual toward violence. Expelling or suspending a student from school can also lead to increased unsupervised periods and a compounding of a troubled student’s already prevalent feelings of isolation. “A student threatening mass murder is a student in crisis,” explained Langman. “Simply getting such youths out of school by suspension or expulsion does nothing to resolve the crisis” (p. 187; see also Heilbrun, Dvoskin, & Heilbrun, 2009).

“[B]y and large, the response to school rampage as a social problem,” wrote Madfis (2012), “has been to predict it with risk assessments, punish anything resembling it (such as weapons violations and threatening comments) with harsh zero tolerance policies and transfers to the justice system, deter it with police officers and cameras, and make it more difficult to accomplish through target hardening procedures like locked doors and metal detectors” (p. 57). “[M]ore ameliorative forms of school violence
prevention” have been largely ignored by policymakers and school administrators in large measure, Madfis explained, due to the fear engendered by the few highly-publicized anecdotal examples of rampage shootings that, based on media reports, create the illusion that such incidents are rampant. The net effect of such approaches tends to be a focus on preventing extraordinarily rare events while neglecting more ordinary and common forms of school violence.

**School response protocols.** Schools have an obligation to protect students, faculty, and staff from foreseeable dangers, including the threat of violence. Not only does violence on campus expose educational institutions to liability, it potentially has a negative effect on enrollment, student performance, and institutional prestige. As such, school officials must be prepared, to whatever extent preparation for such a rare event is reasonable. “There is a significant difference between awareness and readiness,” wrote Greenburg (2007). “Simply providing information to increase awareness of a problem and potential solutions does not ensure preparedness or appropriate response in a crisis” (p. S58).

A number of programs have been developed to establish a framework for training faculty, staff, and students how to respond in the event of a campus attack. Such programs, while varying significantly in certain aspects, have common features. Each program, for example, includes evacuation as a potential response, though some programs prioritize other responses such as campus lockdown procedures over evacuation. Fighting back is even a response included, controversially, in some programs (“Is ‘run, hide, fight’ right?,” 2013; see also Healthcare and Public Health Sector
ALICE, an acronym for “alert, lockdown, inform, counter, evacuate,” is an active shooter countermeasures program developed and marketed by the Ohio-based ALICE Training Institute. The company describes ALICE as a non-sequential “list of options that can be used to stay safe in the highly unlikely event of a violent intruder” (ALICE Training Institute, n.d.). ALICE is one among several commercially-marketed training programs for preparing for an active shooter event. Window of Life, developed by Georgia-based non-profit Safe Havens International is “an approach that can help people better understand how to make notifications and take protective actions” by following a four-step response: (1) “protect yourself,” (2) “protect others,” (3) “protect the place,” and (4) “notify public safety” (Dorn, 2014). “Run, hide, fight” is another commercially-available training program for active shooter incident preparation that encourages victims of an active shooter to first try to escape, then try to hide, and, if still under attack, attack the shooter (“Is ‘run, hide, fight’ right?,” 2013; “Run, hide, or fight,” 2015). Critics of these plans have argued that sequential steps negate the nuances each scenario is likely to bring: run, hide, fight, for example, could prompt potential victims to leave a place of safety and, perhaps inadvertently, move to a position of danger because they choose to flee rather than remain in a locked-down room. Others question the idea of remaining locked in a room where one might be waiting to go to slaughter. But as Albrecht (2014) explained, “Run when it’s safe to run. Hide where it’s safe to hide. Fight if you or others around you have no other options” (p. 3). Some police and school security experts advocate as a last resort a “swarming” approach in which a large group of potential
victims overwhelm a shooter, first by throwing books or other items at the shooter before physically assault the perpetrator (Dorn & Satterly, 2012).

“[O]ur society often embraces—and even demands—extreme responses to extreme and aberrational behavior,” wrote Fox (2007). “Such actions, in hindsight, aren’t always prudent.” Security measures at schools are all too often implemented by school administrators rather than by school security experts. Such measures may be more “feel good” than effective. In one survey of school security experts, more than half of the experts (62.5%) surveyed believed that unmonitored security cameras were the most significant security measure on which dollars were wasted.18 The experts also pointed to a number of common security breaches—mostly human failures—that contribute to significant breeches of security at schools: gaps in student supervision, people propping open doors, staff members not wearing visible identification badges, visitors being allowed entry without proper screening, and improper or ineffective emergency procedures and security plans. When surveyed, the experts pointed to unsupervised visitor access as the most common school security breech, followed by presumptuous staff, improper access control, failing to secure doors, and lack of training. Many of the experts believed that, rather than spending dollars on security technology, schools should spend it on training staff and faculty members (“Security experts,” 2013).

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18 Despite this consensus, security companies continue to promote security camera systems specifically for active shooter events (see, for example, Bliesner & Armes, 2015). According to Borum, Cornell, Modzeleski, and Jimerson (2010), little research has been done to determine the efficacy of security cameras at schools, though the authors argued that there is some evidence of their efficacy in other institutional settings.
Many competing considerations necessarily affect the proper development of response plans for implementation on school campuses. No two schools are alike: buildings, neighborhoods, resources, and student and staff characteristics vary—in some cases widely. The age and motivation of the likely offender must be considered when developing a response plan (Fox & Savage, 2009). Good contingency plans should also consider that an offender may alter routes of egress from school buildings. Seung-Hui Cho, for example, chained exit doors. Jiverly Wong blocked a door with his vehicle. Charles Whitman barricaded the door to his sniper’s nest. Shooters may also tamper with phone lines or take other measures to hamper communications (Langman, 2015a). Planning for such contingencies should be part of a more global all-hazards strategy as well because fire, natural disaster, and other hazards could likewise block exits or hamper communications.

Fox and Savage (2009) explained that differences in campus layout (sprawling universities versus single-building schools) complicate matters with respect to developing response plans: the one-size-fits-all model simply does not work.

Lockdown plans, while widely used, may not be effective in all cases. Fox and Savage (2009) argued that, due to the relatively short time frames of most active shooter events, lockdown procedures might not be implemented quickly enough to prevent a massacre, and the sprawling nature of university campuses makes lockdowns impractical, if not unnecessary. Lockdowns might even increase the danger posed by a rampage shooter. “Although a gunman loose on campus grounds may not be able to enter classrooms and other buildings,” wrote Fox and Savage, “so too would potential victims
be left stranded without refuge if stalked by the shooter” (pp. 1469-1470).

Still, lockdowns are currently a component of most plans advocated by security experts, and they could result in significant mitigation of casualties. In the Sandy Hook Elementary School massacre, for example, Adam Lanza had only to breech a tempered glass window to enter the school before killing 20 children in two classrooms. In the first classroom, which was occupied by 15 children and two teachers, Lanza killed every single occupant in the room. In the second classroom, Lanza killed only five children and two teachers while nine children escaped. Lanza then committed suicide. Police had already arrived at the school, though no officers entered the school before Lanza ended his rampage by shooting himself (Sandy Hook Advisory Commission, 2015). Had the second (or even the first) classroom been locked and secured such that Lanza could not enter, many lives might have been saved. “The room does not have to be Fort Knox,” wrote Grossman (2000). “It just has to slow down an intruder/shooter long enough for the police to arrive and respond.”

One key concept discussed in the literature is that early recognition is important for successfully locking down classrooms or buildings to prevent access by a shooter, as well as to otherwise proactively intervene in a potentially dangerous situation (‘Is ‘run, hide, fight’ right?,” 2013). On December 8, 2009, Jason Hamilton, a student at Northern Virginia Community College, carried a .30-06 Springfield caliber bolt-action rifle onto the school’s Woodbridge campus and opened fire in his mathematics classroom. Hamilton’s math professor, who noticed the gunman approaching, told her students to evacuate before taking cover behind her desk. Hamilton fired two shots at the professor
without wounding anyone, but after the rifle malfunctioned, he put it down and waited outside the classroom for police to arrive. Hamilton was arrested and eventually pled guilty to charges including the attempted murder of his professor (Barakat, 2011; Northern Virginia Community College, 2010; Urbina, 2009). Hamilton carried the rifle to class in a hockey bag, and as a lieutenant from the college’s police department explained, a student carrying a hockey bag to a math class was out of the ordinary and provided, albeit subtly, a warning sign that something was amiss (“Is ‘run, hide, fight’ right?,” 2013).

Early recognition initiates response protocols, and the sequence of those protocols can affect the outcome provided that school officials are able to take appropriate measures quickly. Dorn (2014) points out that, while notifying police is a critical step in effectuating a response to an active shooter, it should not be the top priority; precious seconds may be lost to dialing 911 rather than taking protective measures that might provide better mitigation of injuries. Dorn’s Window of Life concept prioritizes one’s response: protect yourself, protect others, protect the place, notify public safety. Technology can also play a role: at least one company has developed a mobile device application that lets teachers and other staff members quickly notify police of an active shooter incident (Bush, 2013).

Likewise, mass notification systems are faced with the same limitation, as well as the risk that such notifications, if used too often, will be ignored by students and staff, thus adding to the delay (Fox & Savage, 2009).

Controversially, some response programs include a fight/counter/defend
component in which school officials—and sometimes even students—are taught to actively engage perpetrators, but not all experts agree as to the wisdom of such a plan (Dorn, 2010; Dorn & Satterly, 2012). Pointing to shooting cases such as the 1997 attack by Luke Woodham at Pearl High School in Mississippi (Hewitt, 1997; Sack, 1997a; Toppo, 2014) and the 2010 case involving Bruco Eastwood at Deer Creek Middle School in Colorado (Riccardi, 2010), Dorn and Satterly (2012) have argued that, in some cases, actively engaging a perpetrator may reduce casualties. Indeed, other shooting rampages have ended when a bystander actively engaged the shooter. In 1999, Seth Trickey was apprehended by science teacher Ronnie Holuby after wounding four students at Fort Gibson Middle School in Oklahoma (Ruble, 1999). In 1998, 14-year-old Andrew Wurst, after shooting and killing shot and killed science teacher John Gillette at an eighth-grade dance at a banquet hall called Nick’s Place in Edinboro, Pennsylvania, and was subsequently apprehended at gunpoint by the venue’s owner (DeJong, Epstein, and Hart, 2003). In 1998, 15-year-old Kip Kinkel, who murdered his parents prior to killing one student and wounding 23 others at Thurston High School in Springfield, Oregon, was tackled by several classmates and was taken into custody (“Teen jailed after Oregon high school shooting spree,” 1998). And, on April 27, 2015, a student firing gunshots inside the cafeteria at North Thurston High School in Lacey, Washington, was taken into custody after being tackled by teacher Brady Olson before anyone was shot (“School shooter apprehended,” 2015).

Still, confusion persists as to when to engage. Following the Newtown massacre, security experts found that teachers and others were misapplying the principles of their
training opting, when quizzed as to their response choices, to attack the gunman rather than attempt to escape or secure their classrooms to prevent the shooter from gaining access to the students (“Is ‘run, hide, fight’ right?,” 2013). Ironically, the facts of the Newtown massacre provide anecdotal evidence of the futility of an unarmed response to an active shooter. The school’s principal, Dawn Hochsprung, and psychologist, Mary Sherlach, were killed when they confronted the gunman, Adam Lanza, in a hallway as Lanza entered the school (Sandy Hook Advisory Commission, 2015), which leads to the obvious concern that staff and faculty cannot effectively save students’ lives when they cannot even save their own.

Dorn (2010) has argued that other hazards such as tornadoes and earthquakes may pose a much greater likelihood of threat than active shooters in many parts of the country, and spending time teaching students and teachers how to physically fight an offender may not be the most efficient use of training time, which may be better spent focusing more broadly on an all-hazards approach. Similarly, drawing on the authors’ collective experiences in assessing school readiness, a report for the Maine Department of Education (2014) reflects concern that “schools that focus intently on preparing for active shooter incidents may actually be less prepared for active shooter incidents” as well as other emergencies than are schools that take a broader, all-hazards approach to emergency preparedness (p. 10). “Focusing intently on active shooter events,” the authors wrote, “can be compared to a person who likes to sail in the ocean focusing on how they would survive a shark attack while not taking the time to learn how to swim” (p. 11). Indeed, the rarity of school rampage shootings belies the common notion of the ubiquity
Popularity of particular prevention and response measures is not necessarily an indicator of their effectiveness. As Fox and Savage (2009) argued, “some common strategies are not necessarily productive and may even potentially have negative consequences” (p. 1466). Fox (2008) has even suggested that focusing too much on response measures can create a climate of fear that may actually contribute to the risk of a rampage shooting by fueling the fantasies of potential copycats (see also Fox & Savage, 2009). “[T]here are a few students,” Fox wrote, “for whom the notion of wreaking havoc on their schoolmates may seem like an exhilarating idea.” While Fox’s position may well be more scholarly opinion than empirically-derived conclusion, his sentiment is quite logical: there is a limit beyond which security measures are likely to be counterproductive and detrimental to the educational environment.

One key concept necessary for proper development of response measures is that differing populations may require different approaches. Where Run Hide Fight might work well on high school and college campuses, the plan assumes that individuals implementing it are able to act autonomously. When that is not true, such as in an elementary school or special needs facility, the plan may not work (“Is ‘run, hide, fight’ right?,” 2013).

Schools—particularly those serving grades K through 12—may face special considerations in planning for crisis response due to having a population of special needs students, and such considerations can impact the response plan for active shooter incidents. Where evacuation is the primary response, the time required to mobilize
special needs students may expose them to too much risk of encountering the perpetrator or otherwise being caught in the kill zone. It may be necessary to maintain a separate roster of special needs students to quickly determine where they are and what level of assistance they require (Cannaday, Wright, Cox, Cave, & Cundiff, 2007).

While some experts argue that including students in active shooter drills could contribute to emotional distress and make students unjustifiably anxious about active shooter events, others argue that including children contributes to the success of active shooter drills. Following a live active shooter drill at a middle school in Winter Haven, Florida, controversy swirled because faculty, students, and parents were kept in the dark about the realistic drill until after it took place, prompting one editorialist to compare the drill to conducting fire drills with real fire (“Active shooter drill,” 2014). Bridges (1999) specifically cautions against using surprise drills in which staff or students are not given previous warning that the drill is going to take place. Fox and Savage (2009) suggested that the “limited risk” of active shooter events makes it “unwise, potentially traumatizing, and simply counterproductive” to include students in drills associated with active shooter plans. They also suggested that training students on active shooter response may produce the unintended consequence of making students and parents believe that an actual active shooter incident is much more likely than it really is.

On the other hand, Wylie (2013) chronicled an active shooter drill at Pompano

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19 Some pediatric hospitals use color-coded wrist bands and chart indicators to quickly match a child to the correctly sized equipment in the event of an emergency. School officials planning for crisis response could use a similar process to assign color-coded indicators to special needs students based on their required level of assistance.
Beach High School carried out by the Broward County (Florida) Sheriff’s Office and argued that not including children in the drills is essentially a denial of the full breadth of “stranger danger” about which children are routinely taught. The Pompano Beach drill was especially realistic: blanks were fired to produce realistic gunfire sounds, students were adorned with imitation injuries courtesy of make-up artists, imitation explosive devices were staged and disabled by members of the bomb squad, and the police helicopter was used to drop SWAT team members onto the roof of the school. Unfortunately, the law enforcement and school officials involved in planning the drill apparently did not recognize the immense benefit of recruiting a research team to follow up with the students to investigate the degree to which participation in the drill affected students. Hence, no solid empirical research exists on which to base the decision to include or exclude students from active shooter drills.

Given the rarity of active shooter events, it is reasonable to question the propriety of expending precious institutional resources preparing for an event that is unlikely to happen. As such, some experts advocate an “all-hazards” approach in which training and preparation for active shooter events is implicitly part of a more global strategy for dealing with a plethora of potentially hazardous situations such as tornadoes, earthquakes, hazardous materials spills, and fires (Dorn & Satterly, 2012; Dorn, 2010; “Is ‘run, hide, fight’ right?,” 2013; O’Neill, Fox, Depue, & Englander, 2008).

Response to an actual incident will likely involve multiple agencies, including police, fire-rescue personnel, and school officials. It is important to delineate each agency’s responsibilities in an emergency so that implementation is effective and
efficient: command structures, areas of responsibility, and lines of communication need to be established beforehand, and stakeholders should outline responsibilities in a memorandum of understanding (Band & Harpold, 1999).

Law enforcement officials have been advising school administrators to prepare a “crisis response box” to quickly and efficiently provide emergency responders with pertinent information to aid in response planning and management. Such a box might contain such items as aerial photos of the campus and its surroundings; maps of the campus, to include traffic patterns, access points, and secured areas; blueprints or building floor plans that provide detailed information about the layout of facilities on campus; a current and complete roster of students and staff, to include their scheduled locations and identifying photos; clearly-labeled keys to allow access to all buildings and rooms on campus with a legend to allow responders to quickly identify which key accesses a specific building or room; documentation providing specific fire and intrusion alarm deactivation procedures; a map providing the locations of all fire extinguishers, hoses, valves, and sprinklers, along with detailed shutoff procedures; water, gas, and electricity layouts, access locations, and shut off procedures; cable television, satellite, and Internet deactivation procedures; on- and off-campus contact procedures for key administrators, incident command staff, maintenance staff, security personnel, and medical staff; the locations of designated command post and staging areas; and, a list of students with special needs. In addition, school officials should be able to quickly provide an up-to-date attendance roster to make it possible to efficiently account for all students (Cannaday, Wright, Cox, Cave, & Cundiff, 2007; Lockyer & Eastin, n.d.).
**Law enforcement response.** While rampage shooting events are extremely rare, law enforcement officials must still train for them in order to respond effectively. Training for rare events is nothing new for police, who regularly train for deadly force encounters, something that the vast majority of police officers will never experience (Fairburn & Grossman, 2000).

From the law enforcement perspective, key duties at the scene of a rampage shooting include: (1) stop the shooter; (2) rescue wounded victims; (3) prevent further violence; (4) remove students and staff from the crime scene; (5) secure the crime scene and protect physical evidence; and, (6) investigate the incident thoroughly. Law enforcement plans must be developed cooperatively with school officials to determine such courses of action as reunification of students with their families and protocols for returning control of sections of the school to school officials once investigative efforts in those areas have been completed. Because the law enforcement burden following a rampage shooting is great, police officials would do well to avoid accepting responsibility for roles that are tangential to law enforcement duties. Grief counseling, release of students from school, parental notification, and other such duties rightly belong in the hands of school administrators, with the possible exception of next-of-kin notification for deceased victims, which may rightly fall under the purview of law enforcement, if for no other reason than to assure that no parent is incorrectly told that his or her child has been killed. Even the dissemination of public information by law enforcement should be limited to those matters related to the key duties of responding police. In keeping with established incident command protocols, clearly defining areas of
responsibility for police, medical, and school officials serves to mitigate the potential for miscommunication or implementation of conflicting response protocols (Cannaday, Wright, Cox, Cave, & Cundiff, 2007).

Increasingly, particularly following the 9/11 terrorist attacks, law enforcement officials are employing intelligence-led policing models to make better use of available social and technological resources for the purpose of gaining insight into criminal enterprises and conspiracies. While these techniques have proven helpful in some cases, their utility in averting rampage shootings is limited, in large measure because the small population of incidents disables the use of geographic predictions, and the solitary nature of the crimes inhibits the ability of law enforcement to infiltrate potential plots beforehand (Bjelopera, Bagalman, Caldwell, Finkela, & McCallion, 2013).

One issue of controversy is the need to assign police officers to schools for security purposes. While some experts and scholars argue that having a police officer on campus provides a critical reduction in law enforcement response time to an active shooter incident, others argue that school resource officers do not prevent mass shootings and are likely to be targeted by shooters because of their prominent visibility. Fox and DeLateur (2015), for example, have argued that the massacre at Columbine High School was not prevented despite there being a school resource officer on duty at the time; however, they did not point out that the officer was not on campus when the shooting started, and, after exchanging gunfire with the perpetrators outside the school, the officer followed what was then standard police protocol for such incidents: he waited outside and summoned additional officers, in particular tactical officers who did not enter the
school until hours later (Cullen, 2010). Law enforcement response tactics were significantly altered following the Columbine tragedy because, from that experience, law enforcement managers and trainers became aware of just how deficient the police response had been (Harwood, 2007; Martinez, 2012; Remsberg, 2013).

Police response to a rampage shooting is contingent upon the training and resources available to responding officers. In a report making recommendations for Massachusetts institutions of higher education, O’Neill, Fox, Depue, and Englander (2008) pointed out that only one-third of campus police officers carry firearms, and the authors recommended that all school police be armed and appropriately trained.

Police response time has been a topic of concern in a number of studies that have looked at multiple-victim shooting incidents at schools (Drysdale, Modzeleski, & Simons, 2010; Ergenbright & Hubbard, 2012). Langman (2015a) pointed out that active shooter incidents do not always end quickly: many do, but many do not. Studying the on-scene behaviors of 48 school shooters, Langman determined that 81% of incidents ended with the offender either committing suicide, being killed by police, surrendering, or being apprehended on site. Fifteen percent fled the scene but were quickly apprehended, and only 4% were on the run for an extended period of time. Langman also found that 44% of the shooters took their own lives. Only one shooter in the sample—Charles Whitman—was killed by police, but as Langman pointed out, evidence found after the attack indicated that Whitman intended to die during his attack, and his death may well have been a ‘suicide by cop’ scenario. In Langman’s sample, 23% of perpetrators surrendered to police, 15% were apprehended by citizens, 13% surrendered to citizens, and 8% were
apprehended by police. Studying 34 adolescent and 30 adult mass murderers, Meloy, Hempel, Gray, Mohandie, Shiva, and Richards (2004) found that 66% of the adult but only 14% of adolescent perpetrators committed suicide or were killed by police. Similarly, a report by the Pennsylvania State Police (n.d.), evaluating rampage shooting incidents occurring in the U.S. between 2002 and 2012, showed that 45% of active shooters were apprehended, 43% committed suicide, 8% were killed by law enforcement, and 4% escaped.

A report by the Police Executive Research Forum (2014) took the issue further looking at offender outcome as a function of police response. Studying 84 active shooter incidents from 2000 to 2010, the researchers separated offender outcome based on whether or not police arrived prior to the rampage ending and found that 51% of the incidents ended after police arrived while 49% ended prior to police arrival. In cases in which the shooting ceased prior to police arrival, 51% of the attackers committed suicide, 10% fled the scene, 7% were shot by victims or bystanders, and 32% were subdued. In cases in which the shooting ceased after police arrived, 30% committed suicide, 14% surrendered, 40% were shot by police, and 16% were subdued.

Langman (2015a) explained that, while the rate of police-resolved incidents was nearly equal to the rate of civilian-resolved incidents—31% and 28%, respectively—many of the perpetrator suicides occurred only after police had arrived at the scene, and in some cases police had exchanged gunfire with the perpetrator. Accounting for these cases, Langman concluded that police were involved in resolving 56% of the active shooter incidents. A significant number of shooters engaged police with gunfire: 23%
fired at police; 8% wounded or killed a police officer. In 19% of the attacks, police fired at the perpetrators.

Prior to Columbine, police officers across America had been trained to isolate a shooter and call for tactical team response. Columbine proved to be the watershed event that led law enforcement trainers and administrators to adopt a new paradigm: rapidly assemble a small force of first-responding officers, enter the scene, and stop the perpetrator. While the new paradigm was a substantial improvement over the prior one with regard to mitigating casualties, the massacre at Sandy Hook awakened law enforcement officials once again to the need for a rapid police response, and many trainers began to advocate for solo-officer entry in which the first arriving police officer should enter the scene and get to the shooter as quickly as possible, despite the risk: 75% of solo-officer entries during an active shooting resulted in a confrontation between police and the perpetrator, and one-third of solo officers entering an ongoing shooting scene were shot by the perpetrator (Police Executive Research Forum, 2014).

Active shooter incidents are often tied to other crimes. A number of shooters killed family members or others prior to carrying out their rampage massacres. Some shooters went on sprees, fleeing their original rampage scenes only to commit more murders at other locations. Seung-Hui Cho killed two people in a dormitory, left campus, and returned several hours later to launch what became the deadliest school shooting in U.S. history. Hence, it is important for police to view any campus shooting in which the perpetrator is still outstanding as a potentially ongoing incident. Even in cases where the perpetrator’s disposition is known, there may be additional crime scenes about which
police have not been notified (Langman, 2015a).

In his sample, Langman (2015a) found that five (10%) of the shooters held hostages, although most of them did so only briefly. Two of those shooters were overpowered by hostages, and the other three released all of their hostages with no further violence. Another shooter used a bystander as a human shield. Additionally, five shooters (10%) had explosives either at the scene, left in a vehicle, or at their homes. Hence, first responders should be prepared to deal not only with the armed perpetrator but also with explosive devices that may have to be deactivated or destroyed.

It is important that law enforcement and school officials learn to differentiate between types of shooting events and react accordingly (Greenburg, 2007). For example, on November 10, 2015, when a student at a high school in Lecanto, Florida shot himself in front of a teacher and more than 20 fellow students during an English class at the school, officials responded with a total lockdown of the school, and police employed active shooter response protocols that included bringing an armored vehicle to the campus (Salinger, 2015; Solomon, 2015; Zogbaum, 2015). Such a response is disproportional to the isolated nature of the event. Indeed, suicides occur frequently at all sorts of locales, yet the response in this case was heavily dictated by the fact that it occurred on a school campus amidst a heightened national fear of school rampage shootings. Officials apparently were concerned that another shooter might be on campus, but such an occurrence would be entirely unprecedented: rampage shootings involving multiple perpetrators are an extremely rare subset of an already rare population, and an incident in which a shooter commits suicide without threatening or shooting anyone else
in conjunction with a rampage shooting simply does not exist in the literature on mass shootings. “We went into active shooter mode right when we knew what was going on,” a police spokeswoman said in reference to how police handled the incident. “We definitely train for this” (Solomon, 2015, emphasis added). Despite knowing “what was going on,” police “went into active shooter mode.” Clearly, when it comes to official response, the mere idea that a shot has been fired in a school engenders the fear of an active shooter, even though most school shootings are not associated with rampage shooters.

Harwood (2007), referencing spree killings such as the 2007 Virginia Tech massacre in which the shooter, Seung-Hui Cho, killed two people in a dormitory building two-and-a-half hours before gunning down thirty more in the building that housed the university’s engineering program, argued the distinction between an isolated incident and a continuing active shooter threat may pose a difficult practical matter.

Technology may play a key role in responding to active shooter incidents. For example, mobile device technology now gives security and law enforcement officers a more robust real-time communications ability than existed in years past; officers can track each other’s locations, receive blue prints of buildings, stream live surveillance video, and communicate via text messaging using handheld devices. Other technology in use in some locations are surveillance video systems that employ computer software to examine the behavior of individuals and alert security personnel when a potentially threatening behavior is observed (Harwood, 2007).

Rampage shooting incidents do not fall neatly into a small set of predefined categories. Variances in offenders’ modus operandi make predicting all possible scenarios
complicated at best. Protocols should, therefore, be considered as basic starting points rather than comprehensive plans. School faculty and officials should be empowered to make real-time decisions autonomously for the protection of people and assets under their respective control because contingencies may cut decision-makers off from subordinate personnel either through the inability to establish lines of communication, the absence of the empowered personnel from campus, or the actions of the offender who may target administrative personnel at the onset of an attack.20 “Response plans cannot be strict chain-of-command protocols that gridlock in the absence of key hierarchical personnel,” wrote Buerger and Buerger (2010). “Authority and responsibility must be fluid and flexible” (p. 5). Critical decision-making must take place within the first 30 seconds of an attack; therefore, all school employees must be trained and empowered to act in the event that a rampage shooting unfolds (Maine Department of Education, 2014).

**Theoretical Framework**

Social control theory has been argued as an explanatory, if not causative, theoretical framework for the phenomenon of rampage shootings (Levin & Fox, 1996; Pittaro, 2007; see also VanGeem, 2009). According to Pittaro, little research into the etiology of rampage shootings on school campuses had been done prior to the infamous 1999 Columbine High School massacre. Pittaro argued that school shooters are a small subset of the much larger population of school offenders, but, unlike the dominant profile for delinquents in schools, rampage shooters are far less likely to either fit a standard...
Hirschi (1969) outlined four social bond elements that he associated with delinquency: attachment, commitment, involvement, and belief. Hirschi controversially argued that social class was not a factor in delinquency, an argument that has proven applicable to the study of school rampage shootings. Though Hirschi later revised his theory (Gottfredson & Hirschi, 1990), the core understanding that social factors influence the behavior of school rampage shooters has not been lost on modern day researchers (Pittaro, 2007).

The extent to which researchers and policy makers better understand the on-scene behaviors of school rampage shooters, the more that informed policy decisions can influence the planning and behaviors of future shooters by imposing additional influencing factors such as better security measures, a more complete profile of potential offenders, an increased likelihood that planned massacres will fail to generate the level of accomplishment intended by would-be perpetrators, and an improved framework for law enforcement to intervene in such incidents and bring about an effective resolution. While the primary goal of the research is to develop law enforcement planning, response, and investigative strategies, such strategies are an important component to the social control mechanisms that can be implemented by schools as a means of preventing or otherwise mitigating the devastation of a school rampage shooting.

**Conclusion**

The literature review covered in this chapter points to the fact that little formal
research has been carried out with respect to informing policy decisions based on empirical data regarding the crime scene behaviors of school rampage shooters. Research with respect to prevention has mostly focused on intervention through risk and threat assessments. There exists no central repository into which data on incidents of school rampage shootings have reliably been collected, particularly with respect to collecting detailed information about the on-scene behaviors of the offenders.
Chapter 3: Methodology

Understanding the crime scene behaviors of school rampage shooters presents unique methodological challenges. There are no models for this type of research. The mostly closely related phenomenology that has been studied is the crime scene behaviors of sexually-motivated murderers wherein specified crime scene behaviors have been coded dichotomously to identify clustering of behaviors that can be associated with particular typologies in an effort to validate investigative profiling models (Kocsis, Cooksey, & Irwin, 2002). This research, however, focuses not on behavioral profiling, as would be useful in studies aiming to validate models for identifying potential threats prospectively, but, rather, on the correlation of the crime scene behaviors of rampage school shooters to response strategies that could be used by officials with responsibility for potential target locations, particularly law enforcement personnel charged with responding to such incidents should they occur. In that context, this type of research has no published precedent.

A mixed-methods research approach was employed. First, a plethora of crime scene behaviors apparent in the sample were coded dichotomously to operationalize the variables for quantitative analysis. The data were searched for patterns to detect and measure the prevalence of certain identifiable patterns (if any existed), and specific variables and clusters of variables have been presented using appropriate descriptive statistics to determine the frequency with which specified crime scene behaviors occur during school rampage shooting events. Second, cases were qualitatively to better understand the overarching contextual issues that affected both the behaviors of the
perpetrator and the response strategies by law enforcement. A case-study approach is most suited to this type of research because of its ability (1) to answer “how” and “why” questions, (2) to provide a methodology that does not require the researcher to manipulate subject behavior, (3) to examine contextual parameters that do not allow for quantitative analyses, and (4) the phenomenological and contextual boundaries are unclear (Baxter & Jack, 2008).

**Participants**

The target population for this research consisted of offenders who have perpetrated shooting rampages at primary, secondary, or post-secondary school campuses, facilities, or events. The extremely small population of offenders meeting these criteria precluded the effective use of random sampling, but did make possible the employment of a sample size that approached the actual population size. Albeit non-random, the sample is likely closely representative of the actual population because of the inclusion of nearly all of the population of offenders meeting the research criteria.

To obtain the sample, multiple existing databases

21 were queried and vetted for inclusion criteria. To assure the completeness of the sample, the various databases were cross-referenced under the assumption that multiple, independent databases are unlikely to have ignored large numbers of relevant cases simultaneously. Omissions from the databases stem from differing sampling methodologies, and, therefore, differ to some

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21 The databases queried for this research include ones maintained by Stanford University, the Brady Campaign to Prevent Gun Violence, Dr. Peter Langman, Mother Jones, [www.shootingtracker.com](http://www.shootingtracker.com), and Wikipedia. The databases were used to identify cases for inclusion in this research, and all data were cross-referenced with other sources to confirm validity.
extent, but do not differ systematically, thereby mitigating systematic sampling errors.

This research focused on data analysis rather than on collection of new data; therefore, the researcher has been the only participant. Data from known, publicly-available sources was collected, assembled into a cogent, operationalized format, and analyzed using spreadsheets and R Studio, a statistics and data analysis-oriented software package.

**Instruments**

Once the sample of offenders was established, each offender’s case was researched via publicly available sources to build a comprehensive database with over 100 fields (variables) per offender. Sources used included available government and official reports relating to the incidents; journal articles in which the incidents have been cited and discussed; reputable journalistic sources including national and local print and online news sources; books written by known scholars on the topic of mass shootings; and books written by reputable journalists on specific cases. The majority of the fields in the database were coded dichotomously with boolean true/false values to indicate the presence or absence of specified behaviors, actions, or conditions relevant to the research. A code book (see Appendix A) defining criteria for each field was developed to provide the researcher with appropriate guidelines for defining data.

**Procedures**

First, all offender cases were researched using publicly available sources (e.g.,

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22 In computer science terms, boolean valued variables are dichotomous variables that possess a true/false, on/off, yes/no value.
official reports, case studies published in journals, journalistic accounts, etc.) in an effort
to answer each of the over 100 questions included in the data set. Second, the data set
was parsed by means of multiple condition spreadsheet and R computer language
functions to process the data, provide appropriate descriptive statistical analyses, and
visualize the data. Third, quantitative data analysis revealed the prevalence of both
individual variables (i.e., crime scene behaviors) and clusters of related behaviors, which
became apparent via data visualization such as histograms and bar charts. Fourth,
qualitative analyses of the data provided a deeper understanding of the phenomenology of
the crime scene behaviors of rampage school shooters by examining the apparent links
between the actions taken by bystanders, security personnel, and law enforcement
officers and the outcome of the offender, the number of casualties, and the duration of the
event.

**Computer Use in Analysis**

There are two software packages of utility to this research: Apple Numbers
spreadsheet application and R Studio, a statistical programming language. Both
applications offer a robust toolset for statistical and data analysis, as well as tools for data
visualization. Using these programming applications, the 101 variables and 78 shooters
used in this research can be efficiently analyzed by implementing simple, custom
functions to calculate descriptive statistics, check for specified patterns in the data, and
determine the extent to which multiple specified conditions occurred across samples.
Data visualization tools available in both applications allow for rapid development of
scatter plots, bar charts, and other visualizations of the data to aid in the analysis of the
data with regard to the various parameters studied. The computer analysis in this research is nothing sophisticated; instead, it is simple application of off-the-shelf tools that make efficient work out of the analysis of a large data set.

**Data Analysis**

Research on rampage school shootings is plagued by potential sampling bias issues. There exists no single, comprehensive database from which incidents can be drawn, and sampling is often accomplished using a combination of journal articles; monographs; official government crime and mortality data; reports by government agencies, independent research organizations, and advocacy groups; and, news accounts (Bjelopera, Bagalman, Caldwell, Finkela, & McCallion, 2013). As such, it is nearly impossible to identify the complete universe of such episodes, in particular those that involve small body counts, those that resulted in no deaths whatsoever, and those that were averted outright.

One of the main concerns with regard to sampling bias in the study of rampage school shootings is the fact that the most extreme cases receive the most attention and, thus, provide the most residual documentation regarding the cases themselves, not only in quantity of coverage, but in depth and breadth of coverage as well. Particularly where qualitative analyses are concerned, differentials in the documentation associated with individual cases can potentially bias data analysis, which is of particular concern when evaluating the ability of specific security and response protocols to mitigate rampage shooting incidents. The cases that receive the greatest coverage represent systemic failures, not successes; therefore, cases that provide greater context for mitigation
strategies are underrepresented in the data. Exclusion of those events from the data set creates a researcher’s paradox: the cases most representative of the intended goal of the research are the cases least likely to show up in the data.

Moreover, Huf-Corzine et al. (2014) found, in comparing news media coverage of mass murders to official sources such as the Supplemental Homicide Reports and National Incident Based Reporting System, that “certain types of incidents, especially those involving Black offenders . . . are systematically overlooked by the national media” (p. 118). However, the researchers did not investigate the extent to which such media bias affects reports of mass murder on school campuses.

Harding, Fox, & Mehta (2002), discussing the merits of qualitative research methods for studying rare events, pointed out the case definition problem associated with school rampage shootings. “The definition used to identify a positive case can have a significant impact not only on our assessment of how rare the event actually is,” they wrote, “but also on the substance of the theory that is subsequently developed to explain the phenomenon” (p. 177). The researchers further explained that “there is no consistent definition of school shootings or population of events called school shootings in what little empirical work exists” (p. 178). Harding et al. also argued the problem associated with defining ‘non-event’ cases to serve as controls for studying school rampage shootings in order to compare independent variables between cases that resulted in a rampage shooting against those with a different outcome.

The small number of cases of school rampage shootings available for researchers to study, furthermore, presents what Harding et al. have identified as the degrees of
freedom problem: given the small sample size and the large number of independent variables to be tested, isolating the effect of any one variable is difficult at best. Clustering of variables, then, strengthens the validity of the research by isolating the occurrence of variables both individually and in related groups to determine the cause-and-effect relationships between crime scene behaviors and outcome of the event, if any such correlation exists.

Harding, Fox, and Mehta (2002) explained that, with regard to rampage shooting events, it is difficult to discern differences in the underlying cause, what is known as the different causes problem. As the researchers explained, though the events may appear to be similar in nature, the underlying causes may differ, particularly where contagion effect exists. While in one case, the shooter likely planned the massacre uninfluenced by others, in the other case, the shooter may have adapted some or all of the original shooter’s philosophy and modus operandi. The effect on crime scene behaviors, then, is that some offenders may behave more randomly than others. What may appear in the data as indicative of a pattern of behavior may in fact be random behavior by one offender that has been copied by others. Hence, the reliability and predictive value of the data may be compromised by the fact that new random behaviors by one offender subsequently spawn other offenders who copy those behaviors making it appear that those behaviors are less random than they really are, a cycle that can continue to evolve and thus negate the predictive validity of research models.

The data set for this research, which consists of 102 different variables and descriptors for each of 78 school rampage shooters, likely encompasses a substantial
portion of the population of rampage school shooters in the United States and Canada to
date. Hence, the sample-to-population ratio is quite high, though it is impossible to
calculate with any certainty because of the collective ignorance of researchers in this field
as to the total number cases of school rampage shooters, particularly those whose attacks
resulted in small casualty numbers.

Assembled in spreadsheet format, the data set provides boolean- or nominal-valued
fields for several dozen characteristics of the shooter, the event, the outcome, and
the surrounding circumstances. A detailed codebook has been developed to supplement
the data set (see Appendix A).

In this case, the data set was decontextualized into coded values that represent
specified behaviors or conditions present during each rampage shooting attack (Ayres,
Kavanaugh, & Knafl, 2003). Parameters were coded either dichotomously (boolean
values) or nominally to operationalize the data into components that can be quantitatively
analyzed. Individual parameters will be evaluated quantitatively to determine overall
prevalence of those parameters in the crime scene behaviors of rampage shooters, but
further investigation will be carried out by searching across cases and parameters to
identify the prevalence of patterns within the data set through data visualization. Studying
crime scene behaviors of sexual homicide offenders for the purpose of determining the
utility of analyzing those behaviors to develop offender profiles, Kocsis, Cooksey, and
Irwin (2002) used a similar coding scheme in which they dichotomously coded various
crime scene and offender parameters and analyzed the data for the presence of clustering
that could be associated with specific offender types. Data visualization was likely used
in their study through multidimensional analysis to plot and identify data clusters that could be associated with particular offender typologies.

Trochim (1989) provided a model for using pattern matching as a means of validating theories in program evaluation. Trochim’s model begins at the theoretical realm and moves through conceptualization to the development of a theoretical pattern. Contemporaneously, data are gathered and organized into an observed pattern. Pattern matching is then used to compare the observed pattern to the theoretical one in order to either validate or invalidate the latter.

Where patterns of behaviors exist, research findings provide greater clarity as to the nature of the crime scene behaviors of rampage shooters with regard to both the predictability and consistency of particular behaviors. From those findings, conclusions can be developed as to the utility of formulating preparation, response, and investigative protocols based on the behaviors of past rampage school shooters.

Within-case analysis provides a means of validating data findings in small-sample research. Pattern matching, process tracing, and causal narrative techniques, for example, have been identified as useful research tools (Harding, Fox, & Mehta, 2002). For this research, data analysis will be accomplished using custom-built algorithms in R, a computer programming language designed for statistical data analysis. The data set will be analyzed for the emergence of patterns that, in turn, will allow for a determination as to the extent to which various factors affect incident outcome.

In addition to quantitative data analysis, qualitative review of specific cases will also be used to gain a better understanding of the relevant parameters and their effect on
event outcome. This research follows an explanatory-sequential mixed methods approach (Cameron, 2009; Ivankova, Creswell, & Stick, 2006) in which the data set has been operationalized for quantitative analysis, and then, based on those findings, individual cases have been qualitatively assessed to determine how the crime scene behaviors of school rampage shooters affect the potential outcome of a shooting incident vis-à-vis established security and response protocols.

Further complicating matters is the potential that crime scene behaviors of school rampage shooters have changed over time. However, the explanatory sequential mixed methods approach allows for temporal sampling within the data set in conjunction with qualitative analysis of cases from earlier time periods vis-à-vis those from later time periods (Meyer, 2001).

The qualitative analysis in this research follows a grounded theory approach: data analysis was carried out for the purpose of establishing theories regarding both the nature and predictability of the crime scene behaviors of school rampage shooters and the efficacy of associated and proposed preparation, response, and investigative protocols. Johnson (1997) provides a model for assessing the validity structure of qualitative research and specifically addresses the use of pattern matching as a tool for “[p]redicting a series of results that form a ‘pattern’ and then determining the degree to which the actual results fit the predicted pattern” (p. 283).

**Research Questions**

Data analysis methods used for each research question are as follows:

RQ (1): **Is there a relationship between physical security and preparedness**
measures at potential target locations and target selection by rampage shooters? For this question, the prevalence of security measures in place at the target locations were calculated to determine if there is any statistical support for the use of the security measures to prevent rampage shooting events. The prevalence of security measures (controlled access, gun-free zone designation, presence of security personnel, etc.) individually and in groups was calculated. Prevalence values at or near 50% give rise to the conclusion that no correlation exists. Values below 50% provide evidence that such a negative correlation, with the strength of the correlation increasing with lower prevalence values (i.e., the more cases where security measures were not present, the more likely it is that locations were targeted due to lax security). Assessment of this variable, however, was hindered by the researcher’s ignorance of the prevalence of security measures at other potential target locations in the offender’s immediate geographical area.

RQ (2): Is there a relationship between physical security and preparedness measures at target locations and the number of casualties in a rampage shooting event? For this question, the prevalence of security measures in place at the target locations were calculated to determine if there is any statistical support for the use of the security measures to mitigate casualties during rampage shooting events. The prevalence of security measures (controlled access, gun-free zone designation, presence of security personnel, etc.) individually and in groups was calculated against the number of casualties for each event. Standard hypothesis testing using a Welch t-test based on the number of casualties at venues with security measures compared to venues without security measures allowed for appropriate assessment of the likelihood that security
measures can mitigate casualties.

RQ (3): Is there a relationship between law enforcement response strategies to rampage shooting events and the number of casualties? For this question, casualty numbers were assessed on five parameters (police responded, police confronted the offender, police apprehended the offender, police shot the offender, and police killed the offender) using standard analysis of variances methods.

RQ (4): Are the crime scene behaviors of rampage shooters sufficiently definable such that specific response strategies are likely to be effective based on the presence of patterns in the shooters’ behaviors? For this question, it was necessary to evaluate the individual prevalence of various behavioral variables, as well as in clusters, to identify patterns of behaviors that may be used for planning and response measures by law enforcement (see Data Analysis, supra).

RQ (5): Can specific response strategies be used to secure potential target locations and train personnel to intervene and mitigate casualties based on the presence of patterns in the shooters’ behaviors? This question was evaluated using qualitative research methods to identify components of the crime scene behaviors of rampage shooting offenders that can be correlated to the identified strategies and current law enforcement training and protocols. The evidence was evaluated to determine if there is support for the current plans, if there is evidence that other, non-current plans might be effective, or if there is no support for the idea that specific training or response strategies are likely to be effective at mitigating casualties in rampage school shooting events.

RQ (6): Are the crime scene behaviors of rampage shooters sufficiently
definable to provide reliable investigative and reconstructive models within the
context of social control theory? This question was evaluated using qualitative research
methods to identify components of the crime scene behaviors of rampage shooting
offenders that can be used to develop investigative and reconstructive models that can be
used by law enforcement investigators in the aftermath of a rampage school shooting
event. The evidence was evaluated to determine if there are aspects of the crime scene
behaviors of school rampage shooters that allow for the development of such models.

Limitations

Perhaps the greatest limitations to this research are (1) the absence of any central
database of cases fitting the research criteria and (2) the significant reliance on sources
for which accuracy cannot be verified. The former have been mitigated by including a
sample that approaches the entire population of offenders under study. The latter has been
mitigated as much as possible by cross-referencing sources in hopes of detecting
inconsistencies, though it should be noted that case studies published in journal articles
often rely on news accounts, and news accounts published by different outlets often rely
on information obtained by a single source (such as Reuters or Associated Press), so
cross-referencing does not necessarily assure accuracy. However, absent the laborious, if
not impossible, task of vetting every detail through official sources, case studies and
news accounts may be the only practical way of accomplishing this research.

Conclusion

The research goals and methodology for this dissertation have been delineated in
this chapter. In the next chapter, the results of this research will be covered, to include an
in-depth discussion of the data collection and analysis methodologies. The data fields selected for analysis (see Appendix A) will be discussed, and the pattern-matching methodology will be covered. Data results, both quantitative and qualitative, will be presented with interpretive discussion.

The final chapter of this dissertation will focus on conclusions that can be drawn from the data and recommendations that can be made from both policy and research standpoints. Much of the focus of this chapter will be on applying what was learned through the data collection and analyses processes to law enforcement planning and training.
Chapter 4: Results

Descriptive Statistics

The non-random sample selected for this research included 78 school rampage shooters and 76 rampage shooting episodes that resulted in 257 victims killed and 387 wounded in the United States and Canada. Two of the events—the 1998 rampage at Westside Middle School in Jonesboro, Arkansas, and the 1999 massacre at Columbine High School in Littleton, Colorado—were perpetrated by two offenders each. An average of three people were killed and five wounded per shooter. Shooting episodes were most likely to result in only one death and two injuries by gunfire. Some shootings resulted in no deaths, and others resulted in no victims wounded. One shooting ended with 32 victims killed, another with 31 victims wounded (Figure 4.1). The 17 shooters that killed no victims wounded between one and six ($\mu = 2.7$).

<table>
<thead>
<tr>
<th></th>
<th>Killed</th>
<th>Wounded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>257</td>
<td>387</td>
</tr>
<tr>
<td>Mean</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Median</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Mode</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>StdDev</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Min</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Max</td>
<td>32</td>
<td>31</td>
</tr>
</tbody>
</table>

Figure 4.1. Overall casualties.

The sample was limited to a 30-year timespan to mitigate the likelihood that including events more distant in time would create sampling bias issues based on the apparent paucity of information related to older cases. Therefore, cases occurring
between January 1, 1988 and December 31, 2017 were included in statistical calculations involving temporal trends. However, two cases from 2018—the January 23, 2018 shooting rampage at Marshall County High School in Benton, Kentucky, and the February 14, 2018 massacre at Marjory Stoneman Douglas High School in Parkland, Florida—were included in the dataset due to their relevance as current shooting events, but both were excluded from calculations involving temporal trends because of sensitivity of those calculations to inclusion of a partial year.

In order to focus on school rampage shootings, certain criteria were implemented for screening cases for inclusion in the dataset:

1. All shooting episodes in the sample occurred, at least in part, on a school campus \(^{23}\) or at a school event that took place off campus.
2. Shooting incidents were included only if (1) they involved two or more victims being shot \((n = 72)\)\(^{24}\), (2) the perpetrator(s) fired shots with apparent intent to shoot multiple victims \((n = 5)\), or (3) the perpetrator(s) fired random shots with the apparent intent to shoot multiple victims \((n = 1)\).
3. While other studies have set thresholds on number of victims killed or higher thresholds on total number of victims, the threshold was set at two victims (if

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\(^{23}\) School campus criteria included elementary, middle, and high schools, as well as colleges/universities, and trade/technical schools. One episode occurred at a non-school venue where an ESOL class was being taught because the shooter, a former student, specifically targeted that class.

\(^{24}\) Cases were eliminated when, though more than one person was shot, the circumstances of the shooting made clear that the shooter’s intent was to target one individual but others were hit with errantly fired bullets.
based on victim count) in order to exclude more common acts of single-victim homicides but not reject large victim count episodes that could be representative of cases in which rampages were mitigated by intervention.25

4. Acts of politically-motivated terrorism and acts of targeted domestic violence that did not involve additional randomly-selected victims were excluded from the data set. Acts apparently related to gang violence, drug activity, or criminal enterprise were also excluded.

The databases queried for this research included ones maintained by Stanford University, the Brady Campaign to Prevent Gun Violence, Dr. Peter Langman, Mother Jones, www.shootingtracker.com, and Wikipedia. While it is unlikely that the sample includes every shooting incident that meets the inclusion criteria, the sample likely includes nearly all of the population of shootings, thus mitigating potential sampling bias issues associated with the non-random sampling process.

Shooting incidents occurring in the United States and Canada were included as it became apparent during the research process that obtaining reliable English-language reports on cases outside of the two countries might pose a sampling bias issue. While Canada’s firearms laws are generally more strict than those in the United States, cultural and geographic similarities made inclusion of Canadian school rampage shooting cases plausible and reasonable. In all, the sample included 72 shooting episodes in the United States and four in Canada (Figure 4.2).

25 Limiting the cases to those involving four or more victims killed, for example, would have reduced the number of shooters in the dataset from 78 to 20.
Figure 4.2. Descriptive statistics of shooting episodes in the United States versus Canada showing number and rate of shootings, victims killed, and victims wounded. The population average was estimated by taking the mean of the estimated populations in 1988 and 2018 (i.e., linear interpolation).

During the sample period, the United States suffered 237 people killed and 352 wounded in school rampage shootings. Canada suffered 20 people killed and 35 wounded. While the United States had 18 times the number of school rampage shooting episodes as Canada during the sample period, the per capita rate of shooting episodes for the United States was just under twice the rate for Canada. In the United States, the per capita rates of people killed and wounded were 1.2 and 1.1 times the rate for Canada, respectively. In other words, while school rampage shootings were nearly twice as likely to occur in the United States, the rates of casualties, both killed and wounded, were only slightly higher in the United States than in Canada.

Canadian school rampage shooters closely mirrored U.S. shooters in terms of casualties. In the United States \((n = 74)\), there were a mean of 3.2 people killed per shooter and 4.8 people wounded. In Canada \((n = 4)\), there were a mean of 5.0 people killed per shooter and 8.8 wounded, 1.6 and 1.8 times the U.S. averages, respectively. However, the differences in the number killed \((p = 0.605)\) and wounded \((p = 0.450)\) were not statistically significant.

The vast majority of school rampage shooting episodes in the sample were low-
casualty incidents. Out of 78 shooters, 68 (87.2%) killed between zero and five victims, five (6.41%) killed between six and ten victims, two (2.56%) killed between 11 and 15 victims, and three (3.85%) killed 16 or more victims (Figure 4.3). Similarly, 57 (73.1%) shooters wounded between zero and five victims, nine (11.5%) wounded between six and ten victims, six (7.69%) wounded between 11 and 15 victims, and five (6.41%) wounded 16 or more victims (Figure 4.4). None killed more than 32 victims nor wounded more than 31.

**Figure 4.3.** Histogram of the number of victims killed by each shooter.

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26 The numbers of victims killed and wounded during the two episodes in which shooters acted in pairs were tabulated separately.
Looking only at Canadian school rampage shooters, three (75%) killed five or fewer victims while one (25%) killed 14 victims, and two (50%) wounded only one victim each while the other two (50%) wounded 14 or more.

School rampage shootings were most likely to occur on high school campuses. Out of the 76 rampage shooting episodes in the data, 35 (46.1%) occurred on high school campuses, 22 (28.9%) occurred at colleges, 10 (13.2%) occurred at middle schools, seven (9.2%) occurred at elementary schools, and three (3.9%) occurred at other schools.

Although more shooting episodes occurred at high schools, rampage shooters on college campuses were somewhat deadlier. Shooters on college campuses killed a mean
of 4.9 victims while shooters on high school campuses killed a mean of 2.3 victims. However, the difference was not statistically significant on a 95% confidence interval ($p = 0.101$).

In comparison to the overall sample, there was no difference in the number of victims killed or wounded except with respect to middle school shooters, who killed and wounded fewer victims on average than were killed and wounded by the shooters overall.\footnote{The catch-all “other” category included two schools: the West Nickel Mines Amish school where Charles Roberts killed five students and wounded five others and the American Civic Association in Binghampton, New York, where adult English-as-a-second-language students were attacked by former student Jiverly Wong who killed 13 people and wounded four.}

<table>
<thead>
<tr>
<th>School Type</th>
<th>Shooters</th>
<th>Percent</th>
<th>Killed</th>
<th>Wounded</th>
<th>Mean Killed per Shooter</th>
<th>Mean Wounded per Shooter</th>
<th>Killed p =</th>
<th>Wounded p =</th>
</tr>
</thead>
<tbody>
<tr>
<td>College/University</td>
<td>22</td>
<td>28.2%</td>
<td>108</td>
<td>117</td>
<td>4.9</td>
<td>5.3</td>
<td>0.318</td>
<td>0.814</td>
</tr>
<tr>
<td>High School</td>
<td>36</td>
<td>46.2%</td>
<td>81</td>
<td>165</td>
<td>2.3</td>
<td>4.6</td>
<td>0.201</td>
<td>0.743</td>
</tr>
<tr>
<td>Middle School</td>
<td>11</td>
<td>14.1%</td>
<td>11</td>
<td>33</td>
<td>1.0</td>
<td>3.0</td>
<td>0.00161</td>
<td>0.0218</td>
</tr>
<tr>
<td>Elementary School</td>
<td>7</td>
<td>9.0%</td>
<td>39</td>
<td>63</td>
<td>5.6</td>
<td>9.0</td>
<td>0.541</td>
<td>0.341</td>
</tr>
<tr>
<td>Other School</td>
<td>2</td>
<td>2.6%</td>
<td>18</td>
<td>9</td>
<td>9.0</td>
<td>4.5</td>
<td>0.385</td>
<td>0.599</td>
</tr>
</tbody>
</table>

\textit{Figure 4.5.} Shooting episodes and casualties based on type of school. Statistical p-values represent probability that killed and wounded means are the same for the respective type of school as they are for the overall sample.

**Demographics**

School rampage shooters have consistently been overwhelmingly male. Of the 78 shooters in the sample, 73 (93.6\%) were male and only five (6.4\%) were female. Males killed more ($\mu = 3.4$ versus $\mu = 1.4$, $p = 0.0211$) and wounded more ($\mu = 5.2$ versus $\mu = 2.2$, $p = 0.496$) victims than females.

With respect to ethnicity, non-Hispanic Whites were not overrepresented in the
sample with a representative factor of 1.02. Blacks and Hispanics were underrepresented with representative factors of 0.67 and 0.36, respectively. Native Americans, Asians, and other ethnicities were overrepresented with representative factors of 4.93, 2.25, and 4.27, respectively.

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Number</th>
<th>Percent</th>
<th>Percent of Pop.</th>
<th>Rep. Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>49</td>
<td>62.8%</td>
<td>61.3%</td>
<td>1.02</td>
</tr>
<tr>
<td>Black</td>
<td>7</td>
<td>9.0%</td>
<td>13.3%</td>
<td>0.67</td>
</tr>
<tr>
<td>Native American</td>
<td>5</td>
<td>6.4%</td>
<td>1.3%</td>
<td>4.93</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5</td>
<td>6.4%</td>
<td>17.8%</td>
<td>0.36</td>
</tr>
<tr>
<td>Asian</td>
<td>10</td>
<td>12.8%</td>
<td>5.7%</td>
<td>2.25</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>2.6%</td>
<td>0.6%</td>
<td>4.27</td>
</tr>
</tbody>
</table>

Figure 4.6. Ethnic breakdown of shooters.

While the mean and median ages of the shooters were 23 and 18, respectively, the shooters in the sample were most likely to be 14. The youngest was 11, and the oldest was 62.

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28 Representative factors were calculated by dividing the percent of shooters in the respective ethnic category by the percent of the current U.S. population in that category.
Of the 78 shooters in the sample, 62 (79.5%) shot at least one student and 46 (59.0%) shot at least one faculty or staff member. To further refine those numbers, 31 shooters shot students but not faculty or staff members, 15 shot faculty or staff members but not students, and 31 shot both students and faculty or staff members. Shooters who killed only students were no more deadly than shooters who killed only faculty or staff members \((n = 31, \mu = 2.0 \text{ and } n = 15, \mu = 1.5, \text{ respectively}; p = 0.403)\) but were more likely to wound victims \((\mu = 6.1 \text{ and } \mu = 1.3 \text{ respectively}; p = 0.00187)\). Shooters who shot both students and faculty or staff members were deadlier than shooters who shot only students \((n = 31, \mu = 5.5 \text{ and } n = 31, \mu = 2.0, \text{ respectively}; p = 0.0195)\) and shooters

Figure 4.7. Histogram of shooter ages.
who only shot faculty or staff members ($\mu = 5.5$ and $\mu = 1.5$, respectively; $p = 0.00652$). Shooters who shot both students and faculty or staff members wounded more victims than shooters who only shot faculty or staff members ($n = 31$, $\mu = 5.6$ and $n = 15$, $\mu = 1.3$, respectively; $p = 4.82 \times 10^{-5}$) but not more than shooters who only shot students ($\mu = 5.6$ and $\mu = 6.1$, respectively; $p = 0.798$).

Selection of students versus faculty members may, in some cases, have roots in the factors that gave rise to the shooter’s rampage. When students perpetrate a rampage, they may be focused on perceived slights by other students with no particular animosity toward faculty members. Seth Trickey, for example, shot four other students, but dropped the gun when confronted by a teacher who then subdued him.

The vast majority of the shooters ($n = 55$, 70.5%) shot both male and female victims. Fourteen shooters (17.9%) shot only male victims, and nine (11.5%) shot only female victims. It is important to note that, while several shooters targeted people of a specific gender, the data may not reliably provide a picture of gender-based targeting. Some shooters simply hit only people of a specific gender, such as Brendan O’Rourke, whose rampage at Kelly Elementary School in Carlsbad, California resulted in two female students wounded, though he apparently fired randomly at students on a playground without specifically targeting only girls. Similarly, Marc Lépine, who killed 14 victims and wounded 14 others at École Polytechnique in Montreal, Canada, left a manifesto indicating his intent to kill women, but he inadvertently shot four male students in the process. Such cases were rare, however, as a qualitative assessment of the data
makes clear that very few shooters intentionally targeted victims of a specific gender.

Eight shooters (10.3%) killed at least one person prior to perpetrating their rampage. Most of the victims killed prior to the rampage were family members or roommates. In some cases, the victims were killed a short time before the rampage began; in other cases, the victims were killed the day before the rampage.

Forty-four (56.4%) of the shooters shot only randomly selected victims without having targeted any specific individuals. Fifteen (19.2%) shot only specifically targeted victims. Nineteen (24.4%) shot both specifically targeted and randomly selected victims.

Out of the 22 college shooters, eight (36.4%) were current students, five (22.7%) were former students, three (13.6%) were current employees, one (4.5%) was a former student and former employee, and five (22.7%) had no affiliation with the school. Of the 36 high school shooters, 30 (83.3%) were current students, four (11.1%) were former students, one (2.8%) was a current employee, and one had no affiliation with the school. Out of the 11 middle school shooters, eight (72.7%) were current students, two (18.2%) were former students, and one (9.1%) had no affiliation with the school. Out of the seven elementary school shooters, six (85.7%) had no affiliation with the school, and one (14.3%) was a former student. Out of the two other school shooters, one was a former student and the other had no affiliation with the school.

**Temporal Trends**

Time of day was coded has “Early Morning” (4:00 a.m. to 8:00 a.m.), “Morning” (8:00 a.m. to noon), “Afternoon” (noon to 4:00 p.m.), “Late Afternoon” (4:00 p.m. to 8:00 p.m.), “Evening” (8:00 p.m. to midnight), and “Night” (midnight to 4:00 a.m.)
Nearly half of all school rampage shooters in the sample ($n = 38$) attacked during morning hours, and nearly one-third ($n = 27$) attacked during afternoon hours, a result that was expected owing to the fact that school campuses are most heavily populated during those times. No quantitative variables were operationalized to explain the underlying cause of morning hours being more likely than afternoon hours for school rampage shootings to occur. Shooters who attacked during morning hours killed a mean of 3.5 victims and wounded a mean of 4.9, while shooters who attacked during afternoon hours killed a mean of 2.3 victims and wounded a mean of 4.5. The differences between the numbers of victims killed and wounded were not statistically significant ($p = 0.223$ and $p = 0.791$, respectively). Of the 10 shooters who killed more than five victims, one attacked during early morning hours, six during morning hours, one during afternoon hours, one during late afternoon hours, and one during evening hours. It should be noted that the shooter who attacked during early morning hours—Seung-Hui Cho who killed 32 people at Virginia Tech in 2007—killed his first two victims during early morning hours but did not resume his shooting spree until more than two hours later during morning hours.
School rampage shooting episodes were most likely to occur on weekdays, a result that is not surprising considering that most K-12 schools are closed on weekends, and colleges are much more densely populated during the week. Only two episodes occurred during the weekend, both which occurred on a Saturday and both involved either a prom or dance event outside of normal school hours. With respect to particular days of the week, episodes were not more likely to occur on any given weekday. While the highest number of shooting episodes occurred on Fridays ($n = 18, 23.7\%$) and the lowest number of shooting episodes occurred on Thursdays ($n = 12, 15.8\%$), the difference was not statistically significant ($p = 0.308$).
Figure 4.9. Shootings episodes by day of the week.

To consider the temporal trends with respect to the rates of school rampage shooting episodes, rates of victims killed, and rates of victims wounded in the United States, the 70 shooting episodes that occurred between January 1, 1988 and December 31, 2017 were calculated on a per capita basis with the estimated U.S. population for each respective year (shootings per one million population). Two of the 30 years (1990 and 2000) experienced no school rampage shootings. A number of years experienced only one per year. The maximum number of school rampage shootings per year was six (2014). The mean number of shootings per year was 2.3, and the median number was 2.0. The per capita rate of school rampage shooting episodes trended slightly upward over the 30-year period ($R = 0.137$). When broken down by decade, the per capita rate of school rampage shootings climbed during the first decade ($R = 0.408$), declined over the second decade ($R = -0.050$), and climbed again over the most recent decade ($R = 0.240$).

Figure 4.10. The rate of school rampage shootings in the United States from January 1, 1988 through December 31, 2017 ($R = 0.137$).
There were a total of 218 people killed by school rampage shooters in the United States during the 30-year period with three years (1990, 2000, and 2004) experiencing no deaths due to school rampage shootings. The highest number of people killed in one year was 36 (2012), the year in which Adam Lanza killed 20 children and six faculty members at Sandy Hook Elementary School. The per capita rate of victims killed by school rampage shooters annually has trended upward ($R = 0.262$) across the full 30-year sample period, but when broken down by decade, the rate climbed over the first two decades but declined slightly over the most recent decade ($R = 0.295, R = 0.381$, and $R = -0.115$, respectively).

There were a total of 323 people wounded by school rampage shooters in the United States during the 30-year period with two years (1990 and 2000) experiencing no shooting episodes and thus no wounded victims. The highest number of people wounded in one year was 38 (1998), the year before the infamous massacre at Columbine High School. The per capita rate of victims wounded by school rampage shooters annually has trended somewhat downward ($R = -0.179$) over the 30-year sample period, having declined over the first two decades but climbed slightly over the most recent decade ($R = -0.390, R = -0.473$, and $R = 0.077$, respectively).

When assessing the deadliness of school rampage shootings over time, it is important to consider Charles Whitman’s massacre at the University of Texas at Austin in 1966. Though, having occurred over 50 years ago, the rampage was not included in the dataset for this research, it stood as the deadliest school rampage shooting until the 2007 Virginia Tech massacre, and today remains the third deadliest school rampage shooting in U.S. history (Ahmed, 2018).
At first blush, one may be tempted to correlate the increase in the fatality rate with the perceived increase in the prevalence of what the media have termed “assault rifles,” but the data simply do not bear such a conclusion out. Broadly defining the term “assault rifle” for the purpose of this research to mean any centerfire, semiautomatic rifle, only 15 shooters (19.2% of shooters of the 78 shooters in the U.S. and Canada) used an assault rifle (13 in the United States and two in Canada). Across the 30 years of the sample, the rate of assault rifle usage increased at best only slightly ($R = 0.087$). Nine shooters (11.5%) used other types of rifles, 13 (16.7%) used shotguns, and 49 (62.8%) used

Figure 4.11. Annual per capita rates of school rampage shooting episodes, victims killed, and victims wounded in the United States during the 30-year period spanning from 1988 through 2017.

**Firearms**

Centerfire rifles use larger caliber ammunition, including the .223 Remington cartridge used in the now-infamous AR-15 rifle. The common usage for the term “assault rifle” is generally more narrowly defined to certain types of semiautomatic rifles. For this research, small caliber, rimfire rifles were placed in the generic “rifle” category because, in many cases, it was difficult to discern if a .22 caliber rifle used by a particular shooter was semiautomatic, lever-action, or bolt-action.
handguns. Some shooters used more than one type of firearm. While the rate of assault rifle usage ticked only slightly upward, the rate of rifle usage declined significantly ($R = -0.240$), and the rate of shotgun usage increased modestly ($R = 0.076$). In stark contrast, however, the rate of handgun usage climbed significantly ($R = 0.275$). The use of semiautomatic handguns increased most significantly ($R = 0.337$), indicating that semiautomatic handguns played a much greater role in the increased lethality of school rampage shootings than did semiautomatic rifles. None of the shooters in the sample used a fully-automatic firearm.

![Figure 4.12. Firearm types used by individual shooters annually.](image)

Though the rate of semiautomatic rifle usage did not correlate to the rate of fatalities, shooters who used such firearms killed and wounded more people than shooters who did not. Shooters who used semiautomatic centerfire rifles ($n = 15$) killed a mean of 6.1 victims and wounded a mean of 8.3, while shooters who did not use such weapons ($n = 63$) killed a mean of 2.6 people and wounded a mean of 4.2. While shooters with semiautomatic centerfire rifles killed nearly two-and-a-half times and wounded nearly
twice as many people on average as did shooters who did not use such firearms, on a 95% confidence interval the differences were not statistically significant ($p = 0.104$ and $p = 0.0993$, respectively).

Still, the deadliest school rampage shooting in U.S. history—the massacre at Virginia Tech that left 32 victims dead—was perpetrated with semiautomatic handguns, not rifles. In all, 43 (55.1%) shooters used only handguns to perpetrate their rampages. Shooters who used semiautomatic handguns but not semiautomatic centerfire rifles ($n = 34$) killed a mean of 3.9 victims and wounded a mean of 4.6 victims while shooters who did not use semiautomatic firearms ($n = 28$) killed a mean of 1.1 victims and wounded a mean of 2.6 victims. On a 95% confidence interval, the differences were statistically significant ($p = 0.0108$ and $p = 0.0453$, respectively).

Shooters who used semiautomatic firearms ($n = 50$), including pistols, rifles or both, killed a mean of 4.5 victims and wounded a mean of 6.3 while shooters who did not use semiautomatic firearms ($n = 28$) killed a mean of 1.5 victims and wounded a mean of 2.6. The differences were highly significant ($p = 0.000464$ and $p = 0.001506$, respectively). Shooters who used semiautomatic firearms killed 4.1 and wounded 2.4 times as many victims as did shooters who did not use semiautomatic firearms. Shooters who used semiautomatic centerfire rifles killed 1.6 and wounded 1.7 times as many victims as did shooters who used semiautomatic pistols (but not semiautomatic centerfire rifles), and killed 5.5 and wounded 3.2 times as many victims as did shooters who did not use semiautomatic firearms.

Most of the shooters ($n = 43, 55.1\%)$ brought only one firearm, 19 (24.4%)
brought two, eight (10.3%) brought three, and eight brought four or more.\textsuperscript{31} Six (7.7%) of the shooters brought firearms to the scene that they did not carry with them. No shooter carried more than five. Twelve (15.4%) shooters discharged two firearms\textsuperscript{32}, two (2.6%) discharged three firearms, and only one shooter discharged four firearms. None discharged more than four. Twenty-one (26.9%) shooters brought firearms that they did not use during their attacks. No shooters acquired firearms or ammunition at the scene, which means that the probability that armed security or school personnel would be overpowered and disarmed by a rampage shooter is remote, which is not surprising in light of the fact that rampage shooters almost always plan their rampages in advance and rarely act spontaneously.

Thirty-two (41.0\%) of the shooters reloaded their firearms during their rampages. Shooters who reloaded killed more victims than shooters who did not ($\mu = 5.8$ and $\mu = 1.6$, respectively; $p = 0.00358$) and wounded more victims ($\mu = 8.7$ and 2.4, respectively; $p = 6.76 \times 10^{-5}$). Seventy-five percent of the shooters who reloaded used semiautomatic firearms while 56.5\% of the shooters who did not reload used semiautomatic firearms. Shooters who reloaded were more likely to carry (53.1\% versus 34.8\%) and discharge (31.3\% versus 10.9\%) multiple firearms than were shooters who did not reload. Shooters who reloaded were less likely to be stopped by an unarmed citizen than were shooters

\footnote{\textsuperscript{31} Andrew Golden and Mitchell Johnson, who together perpetrated their massacre at Westside Middle School in Jonesboro, Arkansas in 1998, brought 13 firearms between them.}

\footnote{\textsuperscript{32} Some of the shooters who discharged two firearms, such as Adam Lanza who massacred 20 children and six faculty members at Sandy Hook Elementary School, used the second firearm only to commit suicide.}
who did not reload ($\hat{p} = 12.5\%$ and $\hat{p} = 41.3\%$, respectively; $p = 0.0127$). Shooters who reloaded were no more likely to be stopped by police intervention than were shooters who did not reload ($\hat{p} = 31.3\%$ and $\hat{p} = 23.9\%$, respectively; $p = 0.646$).

Likewise, shooters who reloaded were not more likely to end their rampages by committing suicide than were shooters who did not reload ($\hat{p} = 40.6\%$ and $\hat{p} = 21.7\%$, respectively; $p = 0.122$).

Of the 78 shooters, 23 (29.5%) fired between one and five shots, 21 (26.9%) fired between six and 10 shots, 19 (24.4%) fired between 11 and 25 shots, three (3.8%) fired between 26 and 50 shots, six (7.7%) fired between 51 and 100 shots, and six fired between 101 and 200 shots. No shooter fired more than 200 shots. Five shooters (6.4%) staged weapons, ammunition, or gear.

**Physical Security**

With respect to physical security measures, out of the 78 shooters in the sample, only eight (10.3%) of them perpetrated rampages at venues to which their access was restricted and only three (3.8%) forced entry into the school. Moreover, 35 (44.9%) of the shooters were already at the scene in the normal course of business when they launched their attacks.

Of the 76 schools in the sample, reports indicated that only 20 (26.3%) had armed

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33 One of the arguments that has been made with respect to limiting the capacity of firearms magazines has been the contention that forcing a shooter to reload more often would increase the likelihood that someone could overpower the shooter. The data contradict such a premise.

34 Because reports were not always specific as to the number of shots fired, the ranges denoted were used to operationalize the variable.
security and 15 (19.7%) had only unarmed security, though it is important to note that there is likely significant error in these numbers because news reports in most of the cases made no mention of whether any security personnel were present when the shooting rampages took place.

**Crime Scene Behaviors**

Some shooters made their approach apparent by wearing tactical attire or displaying visible weapons, thus providing school personnel with some opportunity to detect an impending rampage. Seventeen (21.8%) shooters approached with visible weapons but did not wear tactical attire, four (5.1%) wore tactical attire but did not approach with visible weapons, and 17 (21.8%) did both. In all, 21 (26.9%) shooters wore tactical attire, and 34 (43.6%) shooters approached with visible weapons. It should be noted, however, that even when shooters approached with visible weapons, there was often little time for school personnel to respond before gunfire erupted. Seven shooters who were at the scene during the normal course of business prior to the attack approached with visible weapons. Only 15 (19.2%) shooters made some type of verbal announcement before firing. Thirteen shooters (16.7%) fired shots that were apparently not aimed at any person.

Five (6.4%) of the shooters perpetrated at least part of their rampages as barricaded snipers. Two of them—Andrew Golden and Mitchell Johnson—perpetrated their episode together after activating the school’s fire alarm and then firing from nearby

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35 Shooters were listed as having approached with visible weapons if they unveiled their weapons and approached the location where the shooting began with some appreciable time delay before starting to fire.
woods at students who went outside. Two others also carried out their rampages from sniper positions. One shooter, Biswanath Halder, began his rampage by killing a professor and a student inside the school before barricading himself, engaging in a shootout with police, and then committing suicide.\footnote{The infamous rampage by former Marine Charles Whitman at the University of Texas at Austin was also perpetrated from a sniper’s position atop the campus’s clock tower; however, the episode occurred in 1966 and was, therefore, not included in the sample. Also, Douglas High School shooter Nikolas Cruz attempted to gain access to an upper stairwell to snipe at students below but was stopped by hurricane-rated glass.}

Nineteen (25.0\%) of the schools had armed security personnel on campus when the shooting took place, 15 (19.7\%) had unarmed security, and 42 (55.3\%) had no security personnel on campus. With respect to casualties, there was no statistically significant difference between numbers of victims killed or wounded with either armed security, unarmed security, or no security present. When armed security personnel were present, shooters killed a mean of 4.6 victims and wounded a mean of 5.5. When unarmed security personnel were present, shooters killed a mean of 3.7 victims and wounded a mean of 5.1. When no security personnel were present, shooters killed a mean of 2.5 victims and wounded a mean of 4.6. However, when the means were compared using a Welch t-test, there was no statistically significant difference between the number of victims killed with armed security versus no security ($p = 0.257$), unarmed security versus no security ($p = 0.329$), or armed security versus unarmed security ($p = 0.648$). Likewise, there was no statistically significant difference between the number of victims wounded with armed security versus no security ($p = 0.576$), unarmed security versus no security ($p = 0.511$), and armed security versus unarmed security ($p = 0.129$).
security \((p = 0.766)\), or armed security versus unarmed security \((p = 0.826)\). It should be noted, however, that there was a great deal of uncertainty in determining whether or not security personnel were present at a school when a rampage shooting occurred. Where no evidence existed in sources from which to infer the presence of security, it was assumed that no security personnel were present. Given the lack of statistical significance and the fact that cases in which school security intervention ended the rampage were noted in the data, it is unlikely that the uncertainty with respect to this variable affected the outcome.

The research data paint a clear picture that police intervention saves lives in school rampage shootings. In cases in which the shooter was stopped by police intervention (i.e., by gunfire, physical force, or confrontation), rampage shooters on average killed one-third as many victims as they did when they terminated their massacres by suicide, flight, or weapon issues (i.e., a malfunction or depletion of ammunition), with average death tolls of six victims versus two, respectively. Out of the 78 shooters in the sample, 21 (26.9%) were stopped by police intervention, having killed an average of two people, whereas 23 (29.5%) committed suicide having killed an average of three people; six (7.7%) fled or simply stopped having killed an average of five people; and three (3.8%) experienced a firearm malfunction or ran out of
ammunition having killed an average of seven people.\textsuperscript{37}

Shooters who were stopped by police intervention \((n = 21)\) killed a mean of 2.4 victims while shooters who were not stopped by any form of intervention \((n = 32)\) killed a mean of 6.3 victims. On a 95% confidence interval, there was a statistically significant difference in the numbers of victims killed \((p = 0.030)\). However, when it came to the number of victims wounded, the difference was less apparent. Shooters who were stopped by police intervention wounded a mean of 4.8 victims, while shooters whose rampages were not stopped by any form of intervention wounded a mean of 6.3 victims \((p = 0.357)\).

Police intervention, however, was not the winner with respect to saving lives: intervention by unarmed citizens was. Unarmed citizens stopped 23 (39.5\%) shooters, as many as stopped their rampages by committing suicide. However, when unarmed citizens intervened, the shooters killed an average of only one person. When school rampage shooters ended their rampages voluntarily or by firearm malfunction or ammunition depletion, they killed six times as many people on average as did shooters who were stopped by the intervention of unarmed citizens.

Shooters who were stopped by unarmed citizens \((n = 23)\) killed a mean of 1.0

\textsuperscript{37} In what has become one of the pivotal and most notorious school rampage shootings, Nikolas Cruz, who killed 17 people at Marjory Stoneman Douglas High School in Parkland, Florida, fired 150 rounds from his AR-15 semiautomatic rifle before it malfunctioned, rendering the firearm inoperable. Cruz discarded the weapon, along with 180 rounds of live ammunition, and fled the scene after blending in with students (“Shooting suspect Nikolas Cruz had swastikas on ammunition magazines,” 2018; Nehamas & Smiley, 2018).
victims while shooters who were not stopped by any form of intervention \((n = 32)\) killed a mean of 6.3 victims. The difference was statistically significant \((p = 0.00169)\). With respect to victims wounded, the difference was less pronounced. Shooters who were stopped by unarmed citizens wounded a mean of 3.3 victims while shooters who were not stopped by intervention wounded a mean of 6.3 victims \((p = 0.0779)\).

Intervention by unarmed citizens saved lives when compared to intervention by police. Shooters who were stopped by police intervention killed twice as many people as shooters who were stopped by unarmed citizens \((\mu = 2.4 \text{ and } \mu = 1.0, \text{ respectively; } p = 0.0410)\) but did not wound significantly more victims \((\mu = 4.8 \text{ and } \mu = 3.3, \text{ respectively; } p = 0.335)\).

Two shooters \((2.6\%)\) were stopped by armed citizens, having killed an average of two people. One of those shooters, Andrew Wurst, killed one person and wounded three others at an eighth-grade dance at a private venue before being stopped by the venue’s owner who was armed with a shotgun. Another shooter, Luke Woodham, killed three people and wounded seven before he was stopped by an assistant principal who retrieved a pistol from his vehicle and confronted the gunman. Neither citizen fired a single shot. Shooters who were stopped by an armed citizen \((n = 2)\) killed a mean of 2.0 victims while shooters who were not stopped by any form of intervention \((n = 32)\) killed a mean of 5.6 victims. The difference was not statistically significant on a 95% confidence interval \((p = 0.0644)\).

Because it was difficult in many cases to discern the duration of the shooting episodes, times were ranged using an integer coding:
1: \( t \leq 5 \text{ min} \)
2: \( 5 \text{ min} < t \leq 10 \text{ min} \)
3: \( 10 \text{ min} < t \leq 30 \text{ min} \)
4: \( 30 \text{ min} < t \leq 60 \text{ min} \)
5: \( t > 60 \text{ min} \)

The integer values representing each range were operationalized to allow for average time range computations to provide some meaningful way of evaluating the differences in episode times. The time range data show that, while police intervention led to significantly fewer fatalities than did suicide, flight, or firearms issues, shooters stopped by police intervention had the highest time values of the sample (Figure 4.9), suggesting that fatality rates are not as strongly linked to police intervention as average killed numbers suggest but instead indicate that cases in which police were able to intervene involved shooters who carried out their rampages at a slower pace than shooters who committed suicide. However, looking at the numbers of wounded victims helps solidify this conclusion. Shooters who were stopped by police intervention wounded a mean of 4.8 victims and shooters that committed suicide wounded a mean of 6.5. Shooters who were stopped by unarmed citizens carried out their rampages for significantly less time than did shooters who were stopped by police intervention and wounded a mean of 3.3 victims. Therefore, shooters who were stopped by police intervention were no more likely to wound victims than were shooters who were stopped by suicide \((p = 0.382)\) or by unarmed citizen \((p = 0.335)\).

In all, 46 (59.0%) shooters were taken into custody, 28 (35.9%) committed suicide, and five (6.4%) were killed by police. Though 10 (12.8%) shooters fled the scene
of their rampage, none escaped alive. Four (5.1%) shooters fled the scene but later committed suicide at another location.\footnote{These numbers are independent of the numbers with respect to how each shooter’s rampage was ended. One shooter fled and four committed suicide after intervention by police, and one shooter committed suicide after intervention by an unarmed citizen.}

![Table 4.13. Statistics with respect to how each shooter’s rampage was terminated. Note that the time and average number of shots fired variables were operationalized from ranged values (see discussion above).](image)

<table>
<thead>
<tr>
<th>Rampage Terminated</th>
<th>Number of Shooters</th>
<th>Percent</th>
<th>Killed</th>
<th>Average Killed</th>
<th>Wounded</th>
<th>Average Wounded</th>
<th>Time Range</th>
<th>Shots Fired Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicide</td>
<td>23</td>
<td>29.5%</td>
<td>141</td>
<td>6</td>
<td>149</td>
<td>6</td>
<td>2.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Unarmed Citizen</td>
<td>23</td>
<td>29.5%</td>
<td>24</td>
<td>1</td>
<td>76</td>
<td>3</td>
<td>1.3</td>
<td>1.7</td>
</tr>
<tr>
<td>Armed Citizen</td>
<td>2</td>
<td>2.6%</td>
<td>4</td>
<td>2</td>
<td>10</td>
<td>5</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Firearm</td>
<td>3</td>
<td>3.8%</td>
<td>22</td>
<td>7</td>
<td>32</td>
<td>11</td>
<td>1.7</td>
<td>3.7</td>
</tr>
<tr>
<td>Fled</td>
<td>6</td>
<td>7.7%</td>
<td>16</td>
<td>3</td>
<td>20</td>
<td>3</td>
<td>1.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Police</td>
<td>21</td>
<td>26.9%</td>
<td>50</td>
<td>2</td>
<td>100</td>
<td>5</td>
<td>2.2</td>
<td>2.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intervention vs. Non-Intervention</th>
<th>Number of Shooters</th>
<th>Percent</th>
<th>Killed</th>
<th>Average Killed</th>
<th>Wounded</th>
<th>Average Wounded</th>
<th>Time Range</th>
<th>Shots Fired Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>46</td>
<td>59.0%</td>
<td>78</td>
<td>2</td>
<td>186</td>
<td>4</td>
<td>1.8</td>
<td>2.3</td>
</tr>
<tr>
<td>No Intervention</td>
<td>32</td>
<td>41.0%</td>
<td>179</td>
<td>6</td>
<td>201</td>
<td>6</td>
<td>1.6</td>
<td>2.9</td>
</tr>
</tbody>
</table>

\textit{Figure 4.13}. Statistics with respect to how each shooter’s rampage was terminated. Note that the time and average number of shots fired variables were operationalized from ranged values (see discussion above).

Of the 21 shooters who were stopped by police intervention, ten (47.6%) were shot by officers, five of them fatally. Three of the shooters who were shot by police subsequently committed suicide, and the other two were taken into custody. Additionally, police fired shots at three of the shooters who were stopped by police intervention, one of whom subsequently committed suicide. In all, police gunfire stopped 13 of the 21 shooters (61.9%). None of the shooters who were stopped by police intervention escaped.

In cases when police intervention stopped the shooter, whether the police fired upon the shooter or not, there was no statistically significant difference in the number of
victims killed or wounded. Shooters who were fired upon by police \((n = 13)\) killed a mean of 2.5 victims while shooters who were not fired upon by police \((n = 8)\) killed a mean of 2.1 victims \((p = 0.686)\). Similarly, shooters who were fired upon by police wounded a mean of 5.1 victims, and shooters who were not fired upon by police wounded a mean of 4.3 victims \((p = 0.708)\).

For purposes of this research, two categories were operationalized as boolean factors with respect to spree shootings. Shooters whose total rampage included a break in time with no cooling-off period were coded as “Spree.BreakInTime == TRUE” while shooters who perpetrated a rampage that took place partially on a school campus and partially off a school campus were coded as “Spree.MultipleLocations == TRUE” in the dataset. Shooters who killed family members prior to their rampage were not coded as spree killers on the basis those killings, but were coded as spree killers if they met the definition of apart from those killings.

Only five \((6.4\%)\) of the 78 shooters met the definition of either type of shooting spree. Four \((5.1\%)\) perpetrated shooting sprees that occurred partially off campus, and only one \((1.3\%)\) of the 78 shooters perpetrated a spree killing with a break in time between killings. Seung-Hui Cho, who, in 2007, massacred 32 people at Virginia Tech in what stands as the deadliest school rampage shooting in U.S. history, killed his first two victims in a dormitory more than two hours before launching his full-scale attack. Responding to the first two killings, police thought they were dealing with a lover’s quarrel and, unaware of what Cho would do just a few hours later, had not taken steps to prevent the massacre.
Only one-third \((n = 26)\) of the shooters carried out rampages while moving about campus. The remaining two-thirds carried out their rampages in one basic location on campus, e.g., a single classroom, lunchroom, or hallway.

Out of the 78 shooters in the sample, only 32 (41.0\%) had some prior history of mental illness, even if it had not been formally diagnosed. Only 16 (20.5\%) had a history of prior violence. Three (3.8\%) had been the subject of a prior risk assessment, and four (5.1\%) had been the subject of a prior threat assessment.
Chapter 5: Discussion

Summary of Study

This research has examined 76 school rampage shooting episodes involving 76 shooters, 257 victims killed, and 387 victims wounded over a 30-year period in the United States and Canada. For each of the 78 shooters, 102 variables were tracked based on a coding system listed in Appendix A. The data were examined using a common spreadsheet application and the R Studio application. R is a statistics and data analysis programming language that allows from large datasets to be parsed rapidly to statistical calculations. Means and proportions were compared using the t.test and prop.test functions in R to calculate appropriate p-values. Various combinations of the variables were evaluated with respect to answering the six research questions posed in this study.

Results and Discussion

While gun control is beyond the scope of this research, types of firearms were studied because there are important implications for law enforcement when it comes to weapon selection by rampage shooters. In particular, weapon selection is important to officers who provide school security (such as school resource officers) because they are generally mobile on foot throughout the school and may not have quick access to a patrol vehicle that can house weapons such as patrol rifles and shotguns, forcing an officer to take action against a rampage shooter with only the officer’s sidearm. Where there are concerns about officers needing quick access to patrol rifles or shotguns, consideration should be given to securing such firearms at location within the school that would be readily accessible to the officer or security personnel, though nothing in this research
should be used to support an argument that officers at schools need to have such firearms accessible. Weapon selection decisions must be made on a case-specific basis. Given that most uniformed law enforcement officers in the United States currently carry semiautomatic sidearms, the data do not support a conclusion that pistol-armed officers are likely to be outgunned by a rampage school shooter. Indeed, more than half of the shooters used only handguns, and only about one-fifth used a semiautomatic centerfire rifle.

It should be noted that, because firearms usage was not the focus of this research, no effort was made to explore the phenomenology or endogeneity of these variables. Therefore, it would be inappropriate to formulate policy decisions or implement gun control legislation on the basis of this research. What is not indicated in this research is whether casualty rates are directly tied to firearm selection or whether there is some intervening variable such as shooter motivation. It may well be the case that shooters who were particularly motivated to inflict mass casualties selected semiautomatic firearms at a higher rate. However, it remains unclear in the research data whether those motivated shooters would have inflicted similar casualties had they used other types of firearms. Given the fact that high casualty rates were quite rare among the shooters in the research sample, conclusions drawn on the basis of casualty rate may be fraught with error and should be viewed cautiously.

Based on news reports, it was difficult to ascertain whether or not firearms were restricted at any given school, but as firearms are largely prohibited in K-12 schools throughout the country, it was assumed that they were unless evidence to the contrary
existed. In all, only 11 of the 76 venues likely did not restrict firearms. While gun rights advocates might be tempted to argue these findings in favor of allowing firearms in schools, such a conclusion is well beyond the scope of this research, and the accuracy of the data with respect to firearms restrictions is questionable. However, this research does support the conclusion that laws and school policies restricting the possession of firearms on campus do little to dissuade the would-be rampage shooter. Lawmakers and school administrators should objectively assess the permissibility of firearms on campus on a case-by-case basis rather than assuming that restrictive policies are necessarily warranted. Likewise, policymakers would be wise to understand that, particularly with respect to rampage shooters, laws that prohibit firearms—as well as those that prohibit murder and attempted murder—do not typically dissuade would-be perpetrators.

**Research Question 1**

With respect to whether or not there is a negative correlation between physical security and preparedness measures at potential target locations and target selection by rampage shooter, the data provide limited insight. From a quantitative perspective, physical security measures—apart from airport-like screening of all people entering the school—would seem tenuous at best. Because only eight shooters were restricted from accessing the rampage venue and only three forced entry, measures designed to keep intruders out would be largely ineffective in school rampage shooting cases. The vast majority of shootings are perpetrated by students or staff members who have access to the venues. Still, anecdotal examples provide some context for school security measures. For example, when Adam Lanza killed 20 students and six faculty members at Sandy Hook
Elementary School, he only had to breach a full-height glass panel adjacent to a glass
door to gain access to the school. Conversely, when Kevin Neal went on a shooting spree
in Corning, California, he used his vehicle to ram a gate at Rancho Tehama School in an
effort to gain access. Hearing approaching gunfire, staff members locked the school doors
and prevented Neal from getting in. Despite firing numerous shots at the school from
outside, Neal wounded only one student inside. When police killed Neal, he still had
numerous rounds of ammunition in his possession.

Despite a few anecdotal examples, there exists little evidence in the research data
from which to conclude that increasing school security measures with respect to keeping
outsiders from gaining access would do much to reduce the number of school rampage
shooting episodes. It is unlikely, given the fact that most school rampage shootings are
perpetrated by insiders, that school security measures designed to limit access would
affect target selection for more than a small handful of shooters. However, none of the
reports with respect to any of the in-house shootings indicated that the shooter had to
bypass security screening, so there remains the possibility that such screening could limit
a shooter’s ability to gain access to a school (see discussion in next section).

**Research Question 2**

With respect to whether there is a negative correlation between physical security
and preparedness measures at target locations and the number of casualties in a rampage
shooting event, the data again provide little insight. The data in this research lead to the
conclusion that physical security and preparedness at schools can save lives, but the
options to do so may be limited. Given the fact that the overwhelming majority of the
shooters were not restricted from accessing the school, physical security measures such as improved locks, layered doors, shatter-resistance glass, fences, and limited access points would have done nothing to prevent the shooters from carrying out their rampages. Still, two of the deadliest shooting episodes provide anecdotal evidence that such measures could be effective. Adam Lanza massacred 20 children and six faculty members at Sandy Hook Elementary School after forcing entry through a window. In the massacre at Marjory Stoneman Douglas High School, Nikolas Cruz attempted to access a third-floor stairwell with apparent intent to fire at students from a high perch, but hurricane-rated glass stopped his bullets and perhaps kept him from killing many more victims. When Kevin Neal rammed his vehicle through a gate and tried to get into Rancho Tehama School, he was stopped by the locked doors that had been secured by staff members seconds before he tried to enter the building. But given the fact that the vast majority of school rampage shootings are perpetrated by people who belong inside the school, the only realistic physical security measures that would stop or significantly reduce such events are those that would prevent firearms, especially handguns, from being brought into schools. School administrators, security personnel, and law enforcement officials must decide, on a case-be-case basis, whether such measures are warranted and to what extent they should be implemented. The utility of such measures, too, would be limited by the extent to which they could be implemented on a given campus. Sprawling university campuses, for example, would be much more difficult to secure than would single-building schools where access could be limited to a small number of entrances.
As presented in Chapter 4, handguns were used by nearly two-thirds of school rampage shooters and were used exclusively by more than half. Handguns are easier for a shooter to conceal, and, in a number of cases, students prepared to perpetrate rampage shootings arrived at school in a normal fashion, carrying their firearms into the school concealed inside a backpack or other innocuous package. Some shooters similarly brought rifles to school concealed.\(^{39}\) School faculty and security personnel should be especially alert for suspicious packages carried by students entering school buildings. While full-blown security screening may be unjustified, searching unusual packages may be prudent. Schools can also reduce the need for large backpacks by replacing paper textbooks with electronic versions, stored on tablets. As such technology continues to improve, schools could move entirely to tablet-based resources, which would make backpack bans considerably more feasible, thus cutting down on the necessity for security screening. Randomized security screening may provide some deterrence, but to what extent remains unclear from the data in this research. Whatever screening measures a school implements, however, it must be understood that such measures can only be effective if overall physical security measures prevent a shooter from smuggling firearms in another way, such as stashing them outside a door to be retrieved after the shooter passes through a security checkpoint undetected. Even door alarms may not be effective as the shooter would likely be able to retrieve the firearms and start shooting before any staff or faculty could respond to the alarm.

\(^{39}\) Michael Carneal, for example, brought a .22 caliber pistol and a duffle bag containing two shotguns to school.
Research Question 3

The data indicate that there is a negative correlation between law enforcement response strategies to rampage shooting events and the number of casualties. When shooters were not stopped by any form of intervention, they killed nearly two-and-a-half times as many people as when they were stopped by police. Still, police intervention could be improved and has the potential to save even more lives. While police intervention saved lives, intervention by unarmed civilians saved even more. Shooters were not stopped by intervention killed five-and-a-half times as many victims as shooters who were stopped by unarmed citizens, and shooters who were stopped by police killed nearly two-and-a-half times as many. Shooters who were stopped by unarmed citizens had their rampages terminated more rapidly than shooters who were stopped by police, a finding that suggests that if police response times to school rampage shootings could be reduced, more lives would be saved.

To be effective, though, law enforcement officers must be guided to take action as rapidly as possible, often counter to standard policing practices. When a gunman entered Marjory Stoneman Douglas High School in Parkland, Florida, killing 17 students and faculty and wounding 15 others, a Broward County sheriff’s deputy assigned as a school resource officer failed to intervene and waited outside for several minutes while gunfire was ongoing. Further reports indicate that as many as three more deputies arrived and failed to enter the school after gunfire had ceased. Officers from nearby Coral Springs Police Department, who were not even within their city’s jurisdictional limits, arrived and bypassed the county deputies, entering the school to begin rescuing the wounded. The
shooter, Nikolas Cruz, as it turned out, had fled the school. He was captured near the
school by Coconut Creek police officer Michael Leonard. In the shooting’s aftermath,
critics blasted the Broward County Sheriff’s Office for what many perceived as a colossal
failure, not only because deputies failed to engage the shooter but also because deputies
had received nearly two dozen calls regarding Cruz and his brother over the previous
decade but had done nothing to prevent the massacre from being perpetrated in the first
place. There were additional reports that the same school resource officer who failed to
enter when the shooting was ongoing had refused to provide information to child welfare
investigators about Cruz during a previous investigation. In fact, prior to the shooting
rampage, the Broward County Sheriff’s Office, the Florida Department of Children and
Families, the Broward County School District, and the Federal Bureau of Investigation
had all been made aware of Cruz’s potential threat as a rampage shooter, yet little had
been done to stop him. The FBI admitted that they had received a tip warning them that
Cruz might perpetrate a rampage shooting, yet that tip was never funneled to field agents,
and no action was taken to validate the tip or warn local law enforcement or school
officials. Reports also have indicated that the Broward County Sheriff’s Office had
received a similar tip. The aftermath of the incident led to heated criticism of the Broward
County Sheriff, not only by media pundits and politicians, but by police officers and
administrators around the country. Some social media commentators have referred to
“Coward County,” and Florida’s governor, among many other voices, called for the
sheriff to step down (Berman, 2018; Elsesser, DiPentima, & Winston, 2018; Karimi &
Lynch, 2018; “Officer who caught Parkland shooter honored,” 2018; Merelli, 2018;
The Douglas High School shooting stands as at least an anecdotal testament to the fact that preventative measures are far from failsafe. Despite tips directly indicating that Cruz was likely to become a school rampage shooter weeks before the massacre took place, systemic failures overshadowed what retrospectively seems obvious: that Nikolas Cruz was an armed powder keg waiting to go off. But this episode brought with it another systemic failure, one which will likely place the episode in the historic annals of pivotal school rampage shootings from a law enforcement perspective. Given the overwhelming likelihood of false positive responses based on tips to law enforcement, the failure on the part of law enforcement to intervene and perhaps prevent the Parkland massacre can be viewed through a contextual lens that perhaps makes some sense, even if it is difficult to comprehend. However, the fact that an armed deputy, more than two decades post-Columbine, could stand outside the school while students and faculty were being slaughtered, raised a certain level of disgust among the law enforcement community. Reports that three other deputies followed suit gave rise to the perception of institutional failures with respect to policy and training. Beyond the reputational damage not only to the Broward County Sheriff’s Office, but to law enforcement across the nation, the political backlash and potential for civil liability cannot be ignored. Multiple law enforcement agencies have been sued by survivors or by deceased victims’ families for failure to act, and one of the most colossal of such cases—the massacre at Columbine High School—led to sweeping reform with respect to law enforcement training on active shooter incidents throughout the country.
Some of the police intervention cases involved off-duty police officers who happened to be at the school when the shooting took place, and several others occurred when on-duty police officers were present at the school when the shooting began. A rampage shooting at Appalachian School of Law, for example, was ended when two off-duty police officers, both of whom were students at the school, went to their respective vehicles, retrieved their firearms, and confronted the shooter. Whether casualties in that shooting would have been lower had the two officers been carrying their firearms on their persons remains unclear. Likewise, shooter Jakob Wagner brought a semiautomatic rifle to a high school prom, apparently intent on killing numerous victims. Instead, he was quickly killed by a police officer assigned to patrol the parking lot having only wounded two students. He was armed with enough ammunition to have killed numerous victims.

Most of the police interventions, however, occurred after police responded to 911 calls, which means that some time lapsed between the onset of the rampage and police intervention. One notable example of police intervention was the case of Myron May, whose rampage at Florida State University left three people wounded. Police received the first call at 12:25 a.m. and reported May killed (by police) at 12:28 a.m. (Papy, 2015). However, it is important to note that, although multiple officers arrived quickly, May left the building and was encountered by officers outside. The extent of May’s rampage and the rapidity of police intervention may have been quite different had May been mobile inside the building. May’s rampage also took place late at night when only a small number of students were studying in the library where May launched his attack. Given the fact that nearly one third of the shooters were stopped by unarmed citizens, it is
reasonable to conclude that if police officers had at least been on campus near the shooter when the rampage began, police intervention would likely have been more effective.

While the data made clear the conclusion that police intervention saves lives, what remains unclear is why the rate of victims killed was lower in cases in which unarmed citizens intervened versus cases in which police intervened while the rate of victims wounded remained at similar levels. Cases involving police intervention lasted much longer than cases involving unarmed civilian intervention, so one would intuitively expect that casualties would be greater in terms of both the rate of victims killed and wounded when police intervention stopped the shooter. One possible explanation for this disparity is that shooters who were stopped by police operated at a slower pace than did shooters who were stopped by unarmed citizens—and certainly slower than shooters who committed suicide. Given the fact the police intervention was nearly as successful as intervention by unarmed citizens at mitigating casualties but did so over a significantly longer time period, it stands to reason that if police intervention occurred more rapidly, even more casualties could be prevented.

The data paint one clear picture: rapid intervention saves lives and reduces casualties. Therefore, policies and training that tend to restrict officers from making solo entries to go after a shooter are tantamount to trading the lives of victims in order to potentially save the lives of officers. Police administrators and trainers—and indeed line-level police officers who may respond to a school rampage shooting—must make decisions with regard to solo entry versus awaiting backup centered on this understanding. Officers, administrators, and trainers must also be cognizant of the fact
that school rampage shooters overwhelmingly act alone; therefore, a solo-officer entry to confront a shooter means that any confrontation between the police and shooter is likely to be *mano a mano*, or at least gun to gun.

A solo officer entering a building at the sound of gunfire inside is one issue; officers entering a building after gunfire has ceased is another. There were no operationalized variables in this research from which one could scientifically evaluate the efficacy of officer entry once the shooting has ceased with respect to saving lives. Qualitatively, no episodes in the sample involved a shooter ambushing a police officer, but it is unclear whether ambush cases may have occurred if police had arrived and entered the venues more quickly than they did. Officer injuries were not widely reported, so it is unclear how many officers, were wounded in the 13 cases in which police gunfire took place, though at least one case involving an officer who was present when the shooting erupted led to the officer being wounded. The officer, who survived the shooting, then killed the perpetrator.

**Research Question 4**

While psychological profiling was not a component of this research, certain factors were included in the data with respect to the potential for averting shootings before the perpetrator arrives at campus armed and ready. However, as with findings by other researchers, the data in this case—at least qualitatively—did not support a conclusion that prospective psychological profiling of potential school rampage shooters would be likely to stop more than a fraction of these episodes. Indeed, the psychology of school rampage shootings has proven to be quite complex. Some shooters, at least
retrospectively, met the criteria for some Axis I mental disorder; others simply did not. Some shooters came from abusive homes; others did not. Some shooters had been traumatized; others had not. Some shooters had been bullied; others were bullies themselves. Some shooters were popular kids; others were marginalized. Some shooters exhibited obvious signs of psychopathy; others were simply scared kids who sought to use their rampage shooting episode as a means of gaining power. In short, many of the shooters would have been difficult to distinguish from any other student prospectively without expending significant resources delving into the backgrounds of virtually every student and faculty or staff member at a school. Still, there are indicators that, when observed by properly trained school personnel—including law enforcement officers assigned to schools—can provide insight into the possibility of a particular student being a candidate for carrying out a rampage shooting, but relying on such indicators as a primary means of averting school rampage shootings is prone to high levels of Type I error and risks sweeping numerous students and faculty or staff members into suspicion for what was, in fact, innocuous, though perhaps ill-conceived, behavior.

The crime scene behaviors of the shooters were equally complex. Some shooters were obviously quite motivated and left high body counts to prove it. Some shooters were simply scared kids who sought to use a firearm as a means of gaining power and attention—a way out of their perceived plight. Still, the picture with respect to how shooter motivation correlates to body count is unclear. When 14-year-old Jess Osborne opened fire on students and teachers at Townville Elementary School, he had boasted of his intention to kill more victims than Adam Lanza did at Sandy Hook Elementary School
and hoped to “kill around 50 of 60 [people]. If I get lucky maybe 150” (quoted in Cox, 2018). Indeed, Osborne paints a picture of the complexity of school rampage shooter psychology: despite showing an apparent lack of empathy for other people, Osborne, unlike many other shooters who, like some serial killers, engage in acts of animal abuse, hugged all of his animals after killing his father and before heading the school to try to kill as many people as possible (Tron, 2018).

Research Question 5

This research indicates that it is unlikely that predictive response strategies can be used to secure potential target locations and train personnel to intervene and mitigate casualties. At the onset of this research, is was hoped that the data would reveal patterns of behavior that would allow for response strategies have some underpinning in the likely behaviors of a shooter such that a limited punch list of possible responses could be laid out. However, the rampage shooters in the sample simply did not follow any kind of predictive playbook. Some shooters mobilized, killing victims throughout the venue; others remained in one location. Some shooters simply gave up upon being confronted by a faculty or staff member; others killed anyone who confronted them. Some shooters targeted specific individuals; others killed whoever happened to be nearby. Some shooters spared the lives of certain victims; others did not. Some shooters announced their presence before opening fire; others said nothing at all. Some shooters dressed in tactical attire, donning vests or fatigues or trenchcoats; others wore regular clothes and looked like regular people. Some committed suicide, some fled the scene, some simply gave up when confronted, and some shot it out with police. In short, no trends appeared
that would allow for any meaningful predictive response strategy to be developed.

**Research Question 6**

While the crime scene behaviors of rampage shooters were not grossly predictable, they do provide some reliable underpinnings for developing investigative and reconstructive models. School type can provide an indication as to the shooter’s affiliation with the school. When the shooting occurred at a college or university, the shooter was more likely to be a current or former student than a current or former employee ($\hat{p} = 63.6\%$ and $\hat{p} = 18.2\%$, respectively; $p = 0.00579$). When the shooting occurred at a high school, the shooter was almost guaranteed to be a current student ($\hat{p} = 83.3\%$ and $\hat{p} = 16.7\%$ respectively; $p = 5.92 \times 10^{-8}$). When the shooting occurred at a middle school, the shooter was in all cases a current or former student with current students being most probable ($\hat{p} = 72.7\%$ and $\hat{p} = 18.2\%$ respectively; $p = 0.0323$). When the shooting occurred at an elementary school, the shooter was most likely to have no affiliation with the school ($\hat{p} = 85.7\%$ and $\hat{p} = 14.3\%$, respectively; $p = 0.0325$). Hence, investigators have a place to begin searching with respect to identifying a shooter.

In almost all cases, the shooter fired no more than 25 rounds, thus limiting the number of potential fired cartridge cases and bullet impacts at the scene. Only 19.2% of the shooters fired more than 25 rounds, and none fired more than 200. More than half of the shooters used only handguns. The shooters were most likely to have brought only one firearm, but some brought two, and, rarely, three or more. Only six shooters brought firearms that they did not carry with them during their rampage episode. Nearly half (41%) reloaded, and of those, 75% used semiautomatic firearms. In light of these
numbers, investigators should consider that additional firearms may be present at the scene, on the shooter’s body, or in the shooter’s vehicle. No shooter obtained firearms or ammunition at the scene (i.e., by taking it from another person), but five shooters staged firearms or gear.

The possibility of a weapon other than a firearm being involved was minimal. While a number of shooters brought other types of weapons, few deployed them. One shooter set fire to another school prior to her rampage. Two students in one shooting episode (Columbine High School) deployed improvised explosive devices, none of which detonated. One shooter used his motor vehicle as a weapon. One shooter stabbed a student who tackled her.

Two-thirds of the shooters perpetrated their on-campus rampages in one general location within the school; only one-third moved about the school firing shots in different locations. Therefore, crime scenes are likely to be contained to a limited portion of the school rather than being spread throughout the school. Even when shooters were mobile, they often moved only through a small portion of the school. When Adam Lanza killed 26 people at Sandy Hook Elementary school, he did so only the main office, front hallway, and first two classrooms.

Limitations

Perhaps the most significant limitation to this research was reliance on news reports and other non-official sources for most of the data. Because no centralized, comprehensive database on school rampage shootings exists, data did not always come as cleanly or clearly as scientific researchers typically desire. Inferences had to be made
with respect to a number of variables: school security measures were often not mentioned in news reports; shooter motivations were often not known; and very little detail was available in many cases from which to discern the specifics of shooters’ crime scene behaviors beyond the general statistical tallies with respect to numbers of victims and the basic timeline of events. Times were rarely listed, so the duration of each event had to be ranged based contextual information about the event. The number of shots each shooter fired was rarely listed and, likewise, had to be ranged based contextual inferences. Where no news reports specifically mentioned a shooter’s mental health history, it was assumed that no diagnosed history existed. Where no prior threats were noted, it was assumed that none had been made. In short, the depth and breadth of the data, while still abundantly useful, left the lingering desire to have gone much further with this research.

**Further Research**

Further research is warranted, particularly with respect to the cases in which police intervention stopped the shooter. A comprehensive, qualitative study of all 21 episodes of police intervention would likely provide much greater depth and breadth to understanding police responses to school rampage shooting incidents. Likewise, a similar study of the episodes stopped by the intervention of unarmed citizens could provide valuable insight with respect to preparing faculty, staff, and students for the possibility of a school rampage shooting and to determine the probable efficacy of the various active shooter response programs currently being disseminated at schools around the country.

**Implications**

With approximately 130,600 schools in the United States (Dorn & Dorn, 2013),
any given school can expect to suffer a rampage shooting episode once every 56,000 years. Viewed through that lens, the level of policy discussion and public debate related to such episodes is hardly warranted. But fear is a strong driving force, and the potential for failure in the face of that fear should compel law enforcement managers and trainers to spend at least some measurable amount of time and resources on this issue.

It is incumbent upon law enforcement trainers and managers to understand the depth of breadth of the problem of school rampage shooters and to maintain an objective, evidence-based context for preparing for such events. Examples have been shown across the gamut of police responses: officers failing to act while gunfire was ongoing, officers rapidly intervening and stopping rampage shooters before casualties escalated, and officers over-reacting to school gunfire by implementing school-wide searches and deploying armored vehicles for a dramatic but quite isolated suicide attempt. It is precisely the goal of this research to narrow that gamut to appropriate, evidence-based responses in order not only to allow law enforcement officials to properly respond to school rampage shooting incidents, but also to help quell the unfounded public hysteria that often follows such episodes. To be sure, law enforcement preparation for, and response to, a school rampage shooting is a gamble, one that requires police managers and trainers to devote significant resources toward preparing for an event that is unlikely to happen but can end with catastrophic results if the first responders have are not trained and ready. Being in the position of making such decisions in realtime is unenviable as, with many aspects of law enforcement, it can place police managers in a damned-if-you-do-damned-if-you-don’t situation that may draw considerable public outcry and harsh
political backlash. Still, police simply cannot chose to do nothing. To that end, it has been
the goal of this research to help law enforcement trainers and managers better take the
gamble. To quote the lyrics from a famous song (Schlitz, 1978):

You got to know when to hold them,

Know when to fold them,

Know when to walk away,

And know when to run.

You never count your money

When you’re sitting at the table.

There’ll be time enough for counting

When the dealing’s done.
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### Appendix A: List of Shooters Included in Data Set

<table>
<thead>
<tr>
<th>LastName</th>
<th>FirstName</th>
<th>Year</th>
<th>VenueName</th>
<th>State</th>
<th>Country</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atchison</td>
<td>William</td>
<td>2017</td>
<td>Aztec High School</td>
<td>NM</td>
<td>USA</td>
<td>“A breakdown of everything we know in the Aztec deadly school shooting,” 2017; Associated Press, 2017b; Ellis, Levenson, &amp; Diaz, 2017; Kellogg, 2017; Levenson &amp; Diaz-Zuniga, 2017; McKee, 2017; Petersen &amp; Grover, 2017</td>
</tr>
<tr>
<td>Bishop</td>
<td>Amy</td>
<td>2010</td>
<td>University of Alabama</td>
<td>AL</td>
<td>USA</td>
<td>Johnson, 2015; Keefe, 2013; Lawson, 2014</td>
</tr>
<tr>
<td>Brown</td>
<td>Nathaniel</td>
<td>2010</td>
<td>Ohio State University</td>
<td>OH</td>
<td>USA</td>
<td>Decker &amp; Gray, 2010; Dodge, 2010; Leingang, 2010; Urbina, 2010; “Suspect kills self in Ohio State shooting,” 2010; Langman, 2009a, 2009b, 2015b</td>
</tr>
<tr>
<td>Bush</td>
<td>Elizabeth</td>
<td>2001</td>
<td>Bishop-Neumann Junior-Senior High School</td>
<td>PA</td>
<td>USA</td>
<td>Associated Press, 2001; Connie Chung interviews school shooter, 2017; School prayer follows school shooting, 2001</td>
</tr>
<tr>
<td>Butler</td>
<td>Robert</td>
<td>2011</td>
<td>Millard South High School</td>
<td>NE</td>
<td>USA</td>
<td>Abourezk, 2011; Langman, 2016; Liebowitz, 2007; Welch, 2011</td>
</tr>
<tr>
<td>Campbell</td>
<td>Mason</td>
<td>2014</td>
<td>Berrendo Middle School</td>
<td>NM</td>
<td>USA</td>
<td>Golowski, 2015; Nathanson, 2014; Thoren, 2015; Younger, 2015</td>
</tr>
<tr>
<td>Castillo</td>
<td>Alvaro</td>
<td>2006</td>
<td>Orange High School</td>
<td>NC</td>
<td>USA</td>
<td>Ferrell, 2006; Karas, 2009; Langman, 2012a</td>
</tr>
<tr>
<td>Cruz</td>
<td>Nikolas</td>
<td>2018</td>
<td>Marjory Stoneman Douglas High School</td>
<td>FL</td>
<td>USA</td>
<td>Dwyer &amp; Kennedy, 2018; Dwyer &amp; Neuman, 2018; Gonzales &amp; Dwyer, 2018; Nehamas, 2018; Nehamas &amp; Smiley, 2018; Rabin, Vassolo, &amp; Chang, 2018; Rodriguez, Madan, Harris, &amp; Vassolo, 2018; Rozsa, Balingt, Wan, &amp; Berman, 2018; “Shooting suspect Nikolas Cruz had swastikas on ammunition magazines,” 2018; Weaver, Flechas, &amp; Ovalle, 2018</td>
</tr>
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Appendix B: Code Book

1. **ID**: Unique identification number for each incident (may be duplicated if multiple offenders). This number provides a means of allowing the computer to distinguish between events in cases where more than one offender was involved.

2. **LastName**: Offender’s last name, included only for identification purposes.

3. **FirstName**: Offender’s first name, included only for identification purposes.

4. **MiddleName**: Offender’s middle name, included only for identification purposes.

5. **Gender**: Offender’s gender, included only for statistical purposes. The proportion of female rampage shooting offenders to male offenders is too low to allow for any meaningful differentiation between female offender behaviors versus male offender behaviors. This field was coded either as “Male” or “Female.”

6. **Ethnicity**: Offender’s race/ethnicity, included only for statistical purposes. Ethnicity was coded as “White,” “Black,” “Hispanic,” “Asian,” “Native American,” “Other” (including mixed race), or “Unknown.”

7. **Age**: Offender’s age (in whole years), included only for statistical purposes.

8. **Criterion**: This field identifies the criterion for inclusion and was coded as “MultVics” (two or more people shot), “RandomShots” (shots were fired randomly with probable intent to wound), or “AttemptMultVics” (attempted to shoot multiple
victims, regardless of number shot).  

9. **TimeOfDay**: Period of the day when the incident took place. This variable was coded as “Early Morning 0400-0800,” “Morning 0800-1200,” “Afternoon 1200-1600,” “Late Afternoon 1600-2000,” “Evening 2000-2400,” or “Night 2400-0400.” This variable was used to determine if there time-of-day factors could be used to influence the deployment of security resources at schools.

10. **Month**: Month during which incident occurred (two numerical digits). This variable is used for statistical purposes and to aid in understanding when law enforcement and security resources are most needed to respond to a rampage school shooting.

11. **Day**: Day of month on which incident began (two numerical digits). This variable is used for statistical purposes and to aid in understanding when law enforcement and security resources are most needed to respond to a rampage school shooting.

12. **Year**: Year during which incident occurred (four numerical digits). This variable is used for statistical purposes.

13. **DayOfWeek**: Day of the week on which incident began (automatically calculated by spreadsheet based on month, day, and year). The variable is coded as 1 = Saturday, 2 = Sunday, 3 = Monday, 4 = Tuesday, 5 = Wednesday, 6 = Thursday, and

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40 Acts of politically-motivated terrorism and acts of targeted domestic violence that did not involve additional randomly-selected victims were excluded from the data set. Acts apparently related to gang violence, drug activity, or criminal enterprise were excluded. Shootings that occurred entirely within campus dormitories or residential facilities were also excluded.
14. **VenueType**: Type of school at which incident primarily took place, coded as “College/University,” “High School,” “Middle School,” “Elementary School,” “Trade School,” or “Other School.”

15. **VenueName**: The name of the school where the incident primarily took place.

16. **City**: The city in which the school is located.

17. **State**: The state in which the school is located (two-character postal abbreviation).

18. **Country**: The country in which the school is located, coded as either “USA” or “CAN.”

19. **Description**: Text field with brief description of the shooting incident.

20. **RampageEnded**: What was the primary event that ended the shooting rampage? This variable was coded as “Suicide” when the offender committed or attempted suicide; “UnarmedCitizen” when the offender was subdued by or surrendered to an unarmed citizen, including faculty or staff; “ArmedCitizen” when the offender surrendered to an armed citizen; “Firearm” when the offender either experienced a firearm malfunction or ran out of ammunition, ending the shooting; “Fled” if the offender fled the scene or voluntarily stopped shooting; or “Police” if the rampage was stopped by police intervention.

21. **RestrictedAccess**: Was access to the venue restricted by means of some type of physical security? (Boolean)

22. **ArmedSecurity**: Was the venue protected by armed security personnel who
were present when the incident began? (Boolean)

23. **UnarmedSecurity**: Was the venue protected by unarmed security personnel who were present when the incident began? (Boolean)

24. **FirearmsRestricted**: Were firearms prohibited or restricted at the venue in the location where the incident primarily took place? (Boolean)

25. **Killed**: Number of victims killed (not included the offender).

26. **Wounded**: Number of victims wounded (not included the offender).

27. **AdultVictims**: Were adult victims shot by the offender? (Boolean)

28. **ChildVictims**: Were child victims shot by the offender? (Boolean)

29. **MaleVictims**: Were male victims shot by the offender? (Boolean)

30. **FemaleVictims**: Were female victims shot by the offender? (Boolean)

31. **ShotFamilyMembers**: Did the offender shoot family members prior to or in association with the shooting rampage? (Boolean)

32. **ShotCoworkers**: Did the offender shoot coworkers during the rampage? (Boolean)

33. **ShotStudents**: Did the offender shoot students? (Boolean)

34. **ShotFaculty**: Did the offender shoot faculty or staff members? (Boolean)

35. **ShotOtherKnown**: Did the offender shoot others known to him/her (not employees or students)? (Boolean)

36. **SparedVictims**: Did the offender intentionally spare any victims’ lives? (Boolean)

37. **Spree.MultipleLocations**: Did the offender engage in a spree killing defined
by multiple locations? (Boolean)

38. **Spree.BreakInTime**: Did the offender engage in a spree killing defined by a break in time between killings? (Boolean)

39. **KilledPriorToRampage**: Did the offender kill anyone prior to carrying out the rampage? (Boolean)

40. **CommittedSuicide**: Did the offender commit or attempt to commit suicide during or immediately following the rampage? (Boolean)

41. **KilledByPolice**: Was the offender killed by police during or immediately following the rampage? (Boolean)

42. **KilledBySecurity**: Was the offender killed by security personnel (non-LEO) during or immediately following the rampage? (Boolean)

43. **KilledByCivilian**: Was the offender killed by a civilian during or immediately following the rampage? (Boolean)

44. **ShotByPolice**: - Was the offender shot by police during or immediately following the rampage but not killed? (Boolean)

45. **ShotBySecurity**: - Was the offender shot by security personnel (non-LEO) during or immediately following the rampage but not killed? (Boolean)

46. **ShotByCivilian**: - Was the offender shot by a civilian during or immediately following the rampage but not killed? (Boolean)

47. **PoliceGunfire**: Did police fire at the offender? (Boolean)

48. **ConfrontedByPolice**: Was the offender confronted by police during or immediately following the rampage but not shot? (Boolean)
49. **ConfrontedByArmedSecurity**: Was the offender confronted by armed security personnel (non-LEO) during or immediately following the rampage but not shot? (Boolean)

50. **ConfrontedByUnarmedSecurity**: Was the offender confronted by unarmed security personnel (non-LEO) during or immediately following the rampage? (Boolean)

51. **ConfrontedByArmedCivilian**: Was the offender confronted by an armed civilian during or immediately following the rampage but not shot? (Boolean)

52. **ConfrontedByUnarmedCivilian**: Was the offender confronted by an unarmed civilian during or immediately following the rampage? (Boolean)

53. **PoliceArrived.NoConfrontation**: Did police arrive at the scene prior to termination of the rampage but not confront the offender? (Boolean)

54. **TakenIntoCustody**: Was the offender taken into police custody at the scene? (Boolean)

55. **Fled**: Did the offender flee and escape the scene? (Boolean)

56. **CommittedSuicide.OtherLocation**: Did the offender escape the scene and then commit suicide at another location? (Boolean)

57. **TacticalAttire**: Did the offender dress in tactical attire such as BDU pants, tactical vest, gun belt, etc.? (Boolean)

58. **VisibleWeapons**: Did the offender display or have visible weapons prior to shooting? (Boolean)

59. **VerbalAnnouncement**: Did the offender make a verbal announcement of his
presence and/or intent prior to shooting? (Boolean)

60. **ShotsFired.NotAtPerson**: Did the offender fire shots that were not aimed at a person (ceiling, wall, door, etc.)? (Boolean)

61. **AtScenePriorToAttack**: Was the offender at the venue in the normal course of business prior to beginning the rampage (e.g., went to class, attended meeting, studying in library, etc.)? (Boolean)

62. **StagedWeaponsOrGear**: Did the offender stage weapons, ammunition, or gear at the venue prior to carrying out the rampage? (Boolean)

63. **ForcedEntry**: Did the offender force entry into any area within the venue? (Boolean)

64. **BarricadedSniper**: Did the offender barricade himself/herself or otherwise conceal his/her location to snipe at victims from a distance? (Boolean)

65. **MobileShooter**: Was the offender mobile at any point during the rampage? (Boolean)

66. **TargetedVictims**: Did the offender select any of his/her victims based on targeted characteristics? (Boolean)

67. **RandomVictims**: Did the offender select any of his/her victims at random? (Boolean)

68. **FirearmsDescription**: Text description of the firearms used by the offender.

69. **FirearmsBroughtToScene**: Number of firearms the offender brought to the venue (including staged firearms).

70. **FirearmsCarried**: Number of firearms the offender carried on his/her person
(or kept within arms reach) during the rampage.

71. **FirearmsDischarged**: Number of firearms the offender actually fired during the rampage.

72. **HandgunUsed**: Did the offender fire any handguns? (Boolean)

73. **RifleUsed**: Did the offender fire any rifles? (Boolean)

74. **AssaultRifleUsed**: Did the offender fire any centerfire semiautomatic rifles? (Boolean)

75. **ShotgunUsed**: Did the offender fire any shotguns? (Boolean)

76. **FirearmsBroughtNotUsed**: Did the offender bring any firearms to the scene that were not fired? (Boolean)

77. **SemiautomaticFirearmsUsed**: Did the offender fire any semiautomatic firearms? (Boolean)

78. **AutomaticFirearmsUsed**: Did the offender fire any automatic or select-fire firearms? (Boolean)

79. **Reloaded**: Did the offender reload any firearms during the rampage? (Boolean)

80. **AcquiredFirearmsAtScene**: Did the offender acquire any firearms not belonging to him/her during the rampage? (Boolean)

81. **AcquiredAmmunitionAtScene**: Did the offender acquire any ammunition not belonging to him/her during the rampage? (Boolean)

82. **TotalRoundsFired**: Total number of rounds fired by the offender at the scene of the rampage.
83. **DepletedAmmunition**: Did the offender run out of ammunition during the rampage? (Boolean)

84. **FirearmMalfunctioned**: Did the offender experience a firearms malfunction (failure to fire, failure to feed, failure to eject, etc.) during the rampage? (Boolean)

85. **Weapon.Explosives**: Did the offender deploy or attempt to deploy any explosives at the scene of the rampage? (Boolean)

86. **Weapon.Edged**: Did the offender use any edged weapon during the rampage? (Boolean)

87. **Weapon.Impact**: Did the offender use any impact weapon during the rampage? (Boolean)

88. **Weapon.ECD**: Did the offender use any electronic control device (Taser, stun gun, etc.) during the rampage? (Boolean)

89. **CoeffenderStatus**: Was the offender the only shooter, or did he/she have cooffenders? This variable was coded as “Alone,” “One Co-offender,” or “Multiple Cooffenders.”

90. **TotalMinutes**: The total time (in minutes) from beginning to end of the rampage.

91. **StudentStatus**: Offender’s student status, coded as “Current”, “Former,”, or “Not Applicable.”

92. **StudentType**: Offender’s student type, coded as “Undergraduate,” “Graduate,” “Professional,” “Doctoral,” “Other,” or “Not Applicable.”

93. **EmployeeStatus**: Offender’s employee status at venue, coded as “Current,”
“Former,” or “Not Applicable.”

94. **EducationLevel**: Offender’s highest education level, coded as “Less Than High School,” “High School,” “Some College,” “Undergraduate Degree,” “Graduate Degree,” “Professional/Doctoral Degree,” “Trade Certificate,” or “Other.” Use “other” if unknown.

95. **MilitaryService**: Offender’s military service status, coded as “Current,” “Former,” or “No Service.”

96. **HistoryMentalIllness**: Did the offender have a diagnosed history of mental illness? (Boolean)

97. **HistoryViolence**: Did the offender have a prior history of violence? (Boolean)

98. **PriorRiskAssessment**: Was the offender the subject of a prior risk assessment? (Boolean)

99. **PriorThreatAssessment**: Was the offender the subject of a prior threat assessment? (Boolean)

100. **PriorDirectThreats**: Did the offender make direct threats of the rampage prior to carrying it out? (Boolean)

101. **IntimatedPlanToOthers**: Did the offender communicate his/her plan to anyone else prior to carrying out the rampage? (Boolean)

102. **BehaviorChange**: Did others notice a change in behavior in the days prior to the shooting episode? (Boolean)
## Appendix C: Additional Statistical Tables

### Shootings by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Shootings</th>
<th>Killed</th>
<th>Wounded</th>
<th>U.S. Population (Million)</th>
<th>Shootings per 1M People</th>
<th>Killed per 1M People</th>
<th>Wounded per 1M People</th>
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| Total | 70 | 218 | 323 | 0.2420 | 0.7409 | 1.1412 |
| Min   | 0  | 0   | 0   | 0.0000 | 0.0000 | 0.0000 |
| Max   | 6  | 36  | 58  | 0.0188 | 0.1146 | 0.1378 |
| Mean  | 2.3 | 7.3 | 10.8 | 0.0081 | 0.0247 | 0.0380 |
| Median| 2.0 | 6.0 | 8.0 | 0.0077 | 0.0212 | 0.0257 |
| StdDev| 1.4 | 8.2 | 10.3 | 0.0 | 0.0 | 0.0 |
| R     | 0.390 | 0.312 | -0.062 | 0.139 | 0.282 | -0.179 |