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ISSN: 1556-4886 (Print) 1556-4991 (Online) Journal homepage: <http://www.tandfonline.com/loi/uvao20>

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To cite this article: Cheryl Lero Jonson (2017) Preventing School Shootings: The Effectiveness of Safety Measures, *Victims & Offenders*, 12:6, 956-973, DOI: [10.1080/15564886.2017.1307293](https://doi.org/10.1080/15564886.2017.1307293)

To link to this article: <https://doi.org/10.1080/15564886.2017.1307293>



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Preventing School Shootings: The Effectiveness of Safety Measures

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ABSTRACT

The tragedies at Columbine High School, Virginia Tech, and Sandy Hook Elementary School catapulted concern about school shootings into the national spotlight. Calls for something to be done to protect our students, faculty, and staff became a salient concern for school administrators, with many schools hiring armed security officers, restricting access to campus buildings, installing metal detectors, and training individuals how to respond when a shooter enters school grounds. However, many of these security measures were implemented with little to no consultation of the empirical literature. This failure to enact evidence-based responses has had fiscal and latent consequences that are only now being discovered. This essay seeks to fill that void by examining the empirical evidence surrounding common security measures enacted in response to well-publicized school shootings and calling for the use of an evidence-based approach to school safety.

KEYWORDS

Active shooter response; Columbine; lockdown; moral panic; school shootings; security; situational crime prevention

On April 20, 1999, two high school seniors, dressed in black trench coats and armed with handguns, a rifle, shotguns, knives, and multiple propane pipe bombs, entered Columbine High School and killed 12 students and one teacher while injuring many more (Erickson, 2001). Roughly eight years later to the day, on April 16, 2007, a senior at Virginia Polytechnic Institute and State University (Virginia Tech) carrying two handguns shot and killed two students in a dormitory before walking across campus to a classroom building and murdering 30 more students and five professors (TriData Division, System Planning Corporation, 2009). Five and a half years later, on the morning of December 14, 2012, a 20-year old man, encountering locked doors, shot out the plate glass window to the right of the front entrance and entered Sandy Hook Elementary School. Wearing a utility vest filled with ammunition and armed with a rifle and two handguns, the gunman killed 20 young children and six adults (Sandy Hook Advisory Commission, 2015).

Accounts like these have gripped American headlines for the past 17 years, and, while there were multiple school shootings between 1999 and 2012, the brutality and the significant loss of life distinguish the attacks that occurred at Columbine High School, Virginia Tech, and Sandy Hook Elementary School (Mitchell, 2013). These three mass shootings—which resulted in a combined loss of 71 innocent lives—riveted the country and forever changed the educational landscape in the United States (Bonanno & Levenson, 2014; Elsass, Schildkraut, & Stafford, 2014; Fox & DeLateur, 2014). With the

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incessant and widespread media attention of these events, schools no longer were viewed as safe places where the primary concerns were learning mathematical principles and the proper placement of a semicolon; instead, parents, teachers, and students alike were now faced with the harsh reality that a traumatic event could happen to them (Garofoli, 2007; Schildkraut, 2012; Schildkraut & Elsass, 2016). No school was deemed safe, with shootings occurring in high schools, university settings, and elementary schools.

As the media attention surrounding school shootings grew in scope and coverage, the resulting fear and panic spread like wildfire (Burns & Crawford, 1999; Fox & DeLateur, 2014; Madfis, 2016). In the month that followed the Sandy Hook shooting, Americans were glued to 24-hour television and internet news coverage, with over 90% of people reporting they were following the developing story somewhat closely or very closely (Fox & DeLateur, 2014; Saad, 2012). *The New York Times* alone published more than 130 newspaper articles about the shooting within that same 30 days (Elsass, Schildkraut, & Stafford, 2016; Schildkraut & Muschert, 2014). Much of that media coverage could be characterized as sensational, with journalists declaring that the tragedy at Sandy Hook—just as was done with the Columbine and Virginia Tech shootings—was indicative of a dramatic increase violence in schools in recent years (Altheide, 2009; Best, 2013; Birkland & Lawrence, 2009; Cornell, 2006; Fox & DeLateur, 2014; Frymer, 2009; Muschert, 2007).

With the continual barrage of survivor and victim accounts, in-depth news stories, video clips captured from the scene, magazine covers plastered with exclusive photos, and dramatic front page headlines, fear about sending children to school spikes after each one of these events (Madfis, 2016; McCarthy, 2014). The largest increase was recorded after the Columbine massacre, when 55% of parents reported that they feared for their eldest child's safety at school. In the years following Columbine, parental fear slowly dissipated to about 20% but then ballooned to 35% following the Virginia Tech shooting. Again as the months and years ticked by after Virginia Tech, fear dropped to 25%, intensifying to 33% in the wake of Sandy Hook (McCarthy, 2014).

As a result of the nonstop media coverage of these events and the accompanying perception that shootings at schools are increasing in both frequency and magnitude, students, staff, faculty, parents, and communities alike have become increasingly concerned about school safety (Fox & Savage, 2009; Madfis, 2016; Muschert & Peguero, 2010; Rocque, 2012). Demands for the creation of emergency response plans, mass notification systems, threat assessments, crisis teams, zero-tolerance policies, metal detectors, access control measures, armed police on campus, bullying prevention programs, armed teachers, and active shooter response plans have become commonplace (Addington, 2009; Borum, Cornell, Modzeleski, & Jimerson, 2010; Fox & Savage, 2009; Hankin, Hertz, & Simon, 2011; Rocque, 2012; Wang & Hutchins, 2010). Policymakers, legislators, and school administrators have sought to develop policies and implement various measures to prevent a shooting from occurring in their school. Each major event has resulted in calls to increase safety in their respective schools and to assure individuals that their school—and their children—will not be the victims of the next Columbine, Virginia Tech, or Sandy Hook.

In that context, the goal of the present article is to describe and assess the effectiveness of the various measures often implemented as a direct response to a well-publicized school shooting. Many of these policies and procedures are employed quickly and are based on the fear and misperception that school violence is spiraling

out of control (Burns & Crawford, 1999; Madfis, 2016; Muschert & Madfis, 2013; Muschert & Peguero, 2010). First, the prevalence of and the accompanying moral panic that surrounds these rare events is reviewed. Second, a description and evaluation of the effectiveness of common preventative techniques, such as armed police, access control measures, metal detectors, and active shooter responses for students, staff, and faculty, is provided. It is important to understand that preventative measures can and will fail at times. Locks can be broken, metal detectors can fail, and officers cannot be present everywhere at all times. Consequently, how students, staff, and faculty are trained to respond if they find themselves in an active killing situation has emerged as an important response to preparing for a school shooting. A description and evaluation of two competing models for responding to an active shooter is examined in the third section. The essay concludes with a call for a rational dialogue about school shootings in the United States and a movement towards evidence-based approaches to preventing and responding to these horrific events.

School shootings and the corresponding moral panic

While these tragic events are newsworthy, the media portrayal that school rampages are becoming epidemic and are an emergent social problem is flawed (Burns & Crawford, 1999; Elsass et al., 2016; Muschert, 2007). Crime in the United States, and particularly in schools, has been decreasing over time, including violent crimes occurring on school grounds (Burns & Crawford, 1999; Elsass et al., 2014, 2016; Fox & Burstein, 2010; Fox & DeLateur, 2014; Fox & Fridel, 2016; Wike & Fraser, 2009; Zhang, Musu-Gillette, & Oudekerk, 2016). Prior to Columbine, between the 1992 and 1997 academic years, the number of people killed between the ages of 5 and 18 years old at school ranged from a low of 28 in the 1994 and 1996 academic years to a high of 34 in the 1992 and 1997 academic years (Zhang et al., 2016). Over the course of the next 15 years, no academic year would exceed a toll of 33 deaths, with eight academic years having less than 20 total homicides (Zhang et al., 2016).

While the raw number of homicides occurring at school stayed relatively stable and indicated slight decreases over time, that fact alone does not settle definitively whether mass shootings have risen in recent years (Zhang et al., 2016). Estimating the number of mass shootings is a complicated matter because, as explained by Huff-Corzine et al. (2014), definitions used to classify a shooting as a mass shooting vary based on the number of victims and geographical location affected (see also Duwe, 2004). Definitions thus may range from at least two victims being killed (Messing & Heeren, 2004) to four or more individuals killed in a single incident in a single location (Fox & Fridel, 2016). Without a standard way to categorize these events, arriving at a firm or agreed-upon number of mass shootings is not possible.

Defining a mass shooting as “a multiple homicide incident in which four or more victims are murdered with firearms, within one event, and in one or more locations in close proximity,” Krouse and Richardson (2015, p. i) examined the prevalence of mass shootings between 1999 and 2013 in a report to the U.S. Congress. Including all shootings across the United States that fit that definition, they determined that the annual average of mass shootings between 1999 and 2013 was 21. Taken by itself, this figure masks the reality that most incidents fall into two main categories. Thus, of the 21 mass murders

committed annually with firearms, the vast majority could be categorized either as familicide, where the majority of the victims are members of the offender's family (8.47), or as other felony mass shootings, which involve murders that are attributed to criminal activity such as a robbery or assault (8.27). Less than a quarter of the annual mass shootings (4.4) have occurred in a public place such as a workplace or school.

Re-evaluating Duwe's (2007) research, which examined mass shootings from the 1970s, Krouse and Richardson (2015) were able to determine trends in mass public shootings over the last five decades. Beginning in the 1970s, there was on average 1.1 mass public shooting per year. This number increased to 2.7 in the 1980s, 4.0 in the 1990s, 4.1 in the 2000s, and 4.5 since 2010. Although the number of mass shootings more than tripled between the 1970s and 1990s, the number has grown less steeply in recent decades and does not reflect the often-cited reports that mass shootings are increasing by unprecedented proportions since the tragedy occurring at Columbine High School in 1999.

Why is it, then, that the media portrayal of school shootings is so contrary to the empirical evidence? Why do school shootings often result in demands for sweeping and immediate changes to policies and increased safety protocols? Why has the public's concern about mass shootings increased in recent years despite relative stability in these types of events? One answer is absolutely the tragic nature of these offenses. These attacks harm our children, who are defined by their innocence and naivety of the realities of a harsh world (Altheide, 2002). They are just beginning their lives filled with hope and promise. Their deaths—particularly in a school setting which is marked with learning the alphabet, making art projects that hang on the refrigerator, conquering mathematical equations, and preparing for the challenge of college—seem especially unfair and horrific. However, school shootings are not a new phenomenon and have been occurring for decades before Columbine.

Another answer to the extreme media interest in school shootings may be found in Cohen's (1972) work on moral panics, which occur when "a condition, episode, person or group of persons emerges to become defined as a threat to societal values and interest" (Cohen, 2004, p. 4). Cohen continued to explain that once someone or something is defined as a threat, it becomes excessively portrayed by the media, often exaggerating the magnitude of that particular threat. Due to the incessant attention, public concern and fear grow and authority figures and policymakers respond to the public's outcry for action. The moral panic concludes when either the panic recedes as time passes and the current panic is replaced by a new threat or social changes are seen (see also Garland, 2008; Killingbeck, 2001).

There have been many instances of moral panics throughout American history. In 1919, the passage of the 18th Amendment prohibiting the manufacturing, transportation, and sale of alcohol exemplifies the fear that alcohol was leading to crime, corruption, and other social ills during that time period (Sanneh, 2015). The hysteria about drug use, particularly crack cocaine, in the 1970s and 1980s led to passage of harsh drug laws and subsequently contributed the mass incarceration movement (Garland, 2008). The terrorist attacks of September 11, 2001 triggered a moral panic, with many repercussions felt 15 years later. In the months following the attacks, news headlines and politicians continued to recount the events of that day and stressed the immediate danger facing the United States. This fear resulted in the public's willingness to approve a war, the creation of the Department of Homeland Security, amped up security measures at

airports, increased government spending on the military and subsequent cuts in spending on social aid, led to the passage of the U.S. Patriot Act, and planted the seeds of an anti-Islamic movement (Altheide, 2009; Muschert, 2007; Rothe & Muzzatti, 2004).

Just as each of these events triggered an increased discourse, concern, and demand for action to remedy what was constructed as the emerging threat of the time, the shooting on April 20, 1999 at Columbine High School sparked the moral panic surrounding mass school shootings (Killingbeck, 2001). Despite shootings occurring at Pearl High School (Pearl, Mississippi) and Heath High School (West Paducah, Kentucky) in 1997 and Thurston High School (Springfield, Oregon) in 1998, media attention surrounding Columbine was unique, shifting the focus from an isolated local event to a national threat affecting our children and educational system (Altheide, 2009; Birkland & Lawrence, 2009; Muschert, 2007). Unlike prior school shootings, Columbine was broadcast to millions, with scenes of terrified children fleeing from the scene, SWAT officers storming the school, and bloodied victims running away or dangling outside of windows (Addington, 2009). The carnage was catapulted to the national spotlight (Elsass et al., 2016) with CNN airing 6 hours of uninterrupted coverage that day (Muschert, 2002), network newscasts perpetually covering the story for the next 30 days (Robinson, 2011), and the top 50 major newspapers publishing over 10,000 articles in the following year (Newman, 2006).

While the early and mid-1990s was marked with fervent discussion of the rising of the new juvenile superpredator (Bennett, DiIulio, & Walters, 1996; DiIulio, 1995), White suburbanites felt protected and isolated from the threat of this new type of criminal (Heitzeg, 2009). Superpredators were defined as particularly violent and dangerous, urban, Black and Latino youth who were often associated with gangs and the crack cocaine epidemic found in the inner city (Templeton, 1998). That world did not collide with White middle-class to upper middle-class communities characterized by good schools, an abundance of extracurricular activities, and safe neighborhoods. After Columbine, however, that facade was shattered and the fear of the superpredator invaded White suburban neighborhoods (Frymer, 2009). The perception formed that nowhere was immune from the relentless violence that was sweeping the nation, with White middle-class youth now coming under attack (Frymer, 2009). With the merging of violence occurring in a wealthy White high school and the excessive media attention that followed, the moral panic surrounding school shootings was borne.

Something must be done: Situational approaches to preventing school shootings

Inspired by the moral panic and national outcry surrounding school shootings, appeals that something must be done to protect our children became widespread (Addington, 2009; Burns & Crawford, 1999; Madfis, 2016; Muschert & Peguero, 2010; Rocque, 2012). Many of the responses to these mass shootings called for increased security measures and surveillance to prevent guns and other weapons from entering the school, including armed police officers on campus, stricter access control measures, and metal detectors (Campus Safety Magazine, 2010; Fox & DeLateur, 2014; Muschert & Peguero, 2010; Newman, Fox, Roth, Mehta, & Harding, 2004; Rocque, 2012). In addition, the climate of the school also was called into question, with the media often portraying the killers as individuals who endured bullying and a hostile environment provoking them to lash out in a such a violent

manner (Elsass et al., 2016; Fox & DeLateur, 2014; see in this issue Mears, Moon, & Thielo, 2017). Corresponding calls to prevent bullying and make the school climate more inclusive and diverse were promoted. Furthermore, a lack of communication, both during the event (through mass notification systems alerting people of a shooting) and prior to the event (the failure of people reporting suspicious activity or threats one they had seen and heard), were blamed for the act being carried out in the first place and the corresponding high body counts that occurred as a result (Fox & Savage, 2009; Rocque, 2012). Consequently, security measures focused on early notifications and on easier and more streamlined reporting of suspicious activities were embraced as a means to prevent such a devastating event from occurring again.

Most of the responses that emerged can be placed into a situational crime prevention framework, a perspective based on routine activities theory, rational choice theory, and crime pattern theory. According to Clarke (1983):

Situational crime prevention can be characterized as comprising measures (1) directed at highly specific forms of crime (2) that involve the management, design, or manipulation of the immediate environment in as systematic and permanent a way as possible (3) so as to reduce the opportunities for crime and increase the risks as perceived by a wide range of offenders. (p. 225)

Acknowledging that offenders make rational choices based on the opportunities available to them when deciding whether or not to commit criminal acts, early situational crime prevention approaches sought to alter and remove criminal opportunities as well as to increase the likelihood of apprehension when engaging in such behavior. In this regard, educational administrators have most often adopted three situational-prevention techniques to reduce school shootings. These include (a) the use of armed police officers within schools to strengthen formal surveillance; (b) locking and monitoring buildings as well as metal detectors to control access to facilities; and (c) active shooter responses for students, staff, and faculty as way of hardening the target (see Cornish & Clarke, 2003). Subsequently, the use of police officers and of forms of access control (including a special discussion of metal detectors) is presented. The following section then reviews different approaches to limiting the threat posed by an active shooter on school grounds.

Armed police officers and school resource officers: Policing our schools

Many of the responses to school shootings are based in situational crime prevention theory and thus would be expected to reduce such events in the future. In general, however, the evaluations of these measures show that they often have little to no effect on crime occurring at school and at times can increase fear and anxiety within the school setting (Addington, 2009; Birkland & Lawrence, 2009; Greene, 2005; Hankin et al., 2011; Hirschfield, 2008).

A common security measure implemented is the use of private security or school resource officers (SROs), who are often times armed. It seems logical that SROs will reduce incidents because an officer in the school can be a deterring presence or, if necessary, respond immediately to a crisis. Given this strategy's intuitive appeal, it is not surprising that the number of schools employing uniformed officers has skyrocketed in recent years, from only 13% in 1994 to over 51% 2014 (Addington, 2009; Centers for

Disease Control and Prevention, 2015). Further financial incentive has been provided by the Department of Justice, which offered over \$745 million dollars in grant money to train and hire SROs, leading many schools to adopt this as a primary response to mass school shootings (Addington, 2009; James & McCallion, 2013; Travis & Coon, 2005). Notably, because little empirical evidence was available, schools embarked on this initiative unaware of its effectiveness (Birkland & Lawrence, 2009; Greene, 2005). This failure to seek evidence-based approaches to school safety is particularly alarming because, compared to other security measures, armed officers are a substantial fiscal responsibility for the school district (Addington, 2009).

In fact, recent research reveals a complicated picture regarding the effectiveness of SROs (James & McCallion, 2013). Research has shown that schools with SROs are more likely to have their school grounds patrolled, have more formal responses to crime reports from students and teachers, have a developed emergency response plan, and conduct risk assessments (Travis & Coon, 2005). Further, in a survey of three large schools, McDevitt and Panniello (2005) found that when students had a positive view of the SRO, they were more likely to report a crime or threat and were more likely to feel safe at school. This finding suggests, however, that this benefit will be achieved only when the students respect and feel comfortable with their SRO. Simply placing officers in a school who adopt a traditional law and order role, for example, may prove counterproductive. Instead, SROs must create a positive environment and build relationships with the students in order to achieve crime reduction capabilities (McDevitt & Panniello, 2005). Indeed, in some schools, students, faculty, and staff have expressed that the presence of officers led to the perception that schools are unsafe places (Bachman, Randolph, & Brown, 2011; Travis & Coon, 2005). The respondents warned that the militarization of the school and the need to have armed officers present may result in students feeling more fearful rather than safe during the school day (Bachman et al., 2011).

The key policy issue, however, is whether SROs reduce school crime. To that point, few studies have examined the role of SROs in reducing crime in the school, with no study assessing the preventative capabilities of an SRO with mass school shootings (James & McCallion, 2013). Research testing the link between SROs and crime or victimization have yielded mixed results. Some studies have shown that SROs do not have a substantial effect on reporting being a victim (Tillyer, Fisher, & Wilcox, 2011) or on reports of serious violent, nonserious violent, or property crime (Na & Gottfredson, 2013; Swartz, Osborne, Dawson-Edwards, & Higgins, 2016). One study, however, found that having an SRO was associated with a decline in the number of reported serious violent crimes (Jennings, Khey, Maskaly, & Donner, 2011). One possibility for the diverse findings is that SROs play different roles in different schools. In some places, they are solely a disciplinarian, while in others they perform more service-oriented functions (Madfis, 2016). As was suggested by McDevitt and Panniello's (2005) research, the perception of the officer can lead to different outcomes concerning reporting crime and feelings of safety. Thus, with the current state of the research, the true effect of SROs remains inconclusive.

Further, as Madfis (2016) explained, it is important to note that two of the deadliest school shootings—Columbine and Virginia Tech—were not deterred by the presence of armed police. In 1999, Columbine High School had both an armed SRO and an unarmed school security guard. During the shooting, one of the killers exchanged multiple rounds of gunfire with the SRO then proceeded to murder students in the library (Erickson,

2001). The morning of the tragedy at Virginia Tech, five officers plus the police chief were present on campus (TriData Division, System Planning Corporation, 2009). The killer at Virginia Tech was familiar with the police, having had a previous encounter with them five months prior to the shooting. All three killers involved in these two cases were well-aware of the armed officers present on their respective campuses, yet in neither instance did that deter them from carrying out their crime. Although anecdotal, these cases cast doubt on the extent that SROs on campus can prevent a mass shooting or decrease the fatalities associated with such an event (Madfis, 2014).

Access control: Keeping the “bad guy” out

Although SROs are often the go-to response after mass shootings, it can take weeks, months, and possibly a year for the school board approve the hiring and associated salary of a full-time, permanent security officer. A more immediate and economical response is to tighten the access control of the school facility. Access control can include a variety of measures including locking the doors, screening visitors by having them sign in, requiring identification badges for students and/or staff, among other measures to monitor who is entering and leaving the school grounds (Addington, 2009; Centers for Disease Control and Prevention, 2015; Zhang et al., 2016). Due its relative ease to implement, this preventative measure is the most common response to school shootings (Fox & DeLateur, 2014; Lassiter & Perry, 2009; Zhang et al., 2016). For example, in a 2000 survey of all public middle and high schools, half of all schools reported they lock and monitor their doors, with 96% of the schools with access control measures stating they had done so in response to highly publicized school crimes (Snell, Bailey, Carona, & Mebane, 2002; see also Addington, 2009). By 2014, after the shootings of Virginia Tech and Sandy Hook shootings, the percentage of schools locking and monitoring doors grew substantially, with over 90% employing these measures (Centers for Disease Control, 2015).

In 2008, the National Clearinghouse for Educational Facilities provided guidelines for effective access control for schools. The single most important consideration was that the main building should have locked entry points, where entrance by students, staff, faculty, and visitors can only be gained through ID cards, coded entry panels, or approval by supervised staff. In addition to amplifying security measures at the main entry, it was also recommended that schools limit the number of side exterior doors, ensure that the majority of doors only have the ability to be opened from the inside, and have breakage resistant tempered glass in doors where glass is desired (National Clearinghouse for Educational Facilities, 2008). All of these strategies seek to monitor and allow only those who have a legitimate purpose to be in the building, while restricting the entry of those not associated with the functioning of the school.

Similar to the rapid implementation of SROs, schools immediately began to expand the use of access control measures in response to the fear of the next mass school shooting (Fox & DeLateur, 2014; Lassiter & Perry, 2009; Snell et al., 2002; Zhang et al., 2016). They did so with little regard to whether these measures were effective in reducing crime and potentially mass shootings (Addington, 2009). Two studies, however, are relevant to this issue. First, in a national study of 954 high schools, Jennings et al. (2011) sought to determine the effectiveness of a variety of school security measures, including access control measures and outsider identification measures, in reducing serious violent (rape,

strong armed and armed robbery, sexual battery, aggravated assault with a weapon, and threats of aggravated assault) and violent (incidents not involving a weapon) crime occurring at school. They discovered that few security measures had any preventative effect, and, in particular, access control measures and outsider identification measures had no significant effect on either violent or serious violent crimes. Second, examining data from the School Crime Supplement of the 2005 National Crime Victimization Survey, Bachman et al. (2011) examined the relationship between school security measures and fear among White and African American students. Locked doors did not have an effect regardless of race. Little evidence exists, therefore, that access control creates either actual or perceived safety in schools.

Notably, no study has examined the effect of implementing these measures in reducing a school shooting. Anecdotally, however, access control measures have not been effective in school shooting incidents (Fox & Burstein, 2010; Rocque, 2012). The stubborn reality is that the majority of school shooters are students, faculty, or staff of the school who have the proper identification to gain entry to the grounds (Rocque, 2012). For example, the Columbine and Virginia Tech shooters were students at the school, thus they had legitimate access to school grounds (Erickson, 2001; TriData Division, System Planning Corporation, 2009). Even in the rare case where an outsider comes to the school to cause harm, access control measures often fail. Although the doors at Sandy Hook Elementary were locked, the shooter was able to breach this access control measure by shooting out the window adjacent to the door and making entry into the building (Sandy Hook Advisory Commission, 2015).

In addition, access control measures are often easily bypassed by those who are determined to carry out a shooting at school. For example, at Westside Middle School (Jonesboro, Arkansas), the 11- and 13-year old shooters, avoided all access control measures by pulling the fire alarm, running to a nearby wooded area, and shooting their classmates and teachers as they left the school. They killed four students, one teacher, and wounded 10 others (Fox & DeLateur, 2014).

Metal detectors: No guns allowed

Metal detectors serve a single purpose: to prevent the admittance of weapons, particularly guns, into the school (Hankin et al., 2011). Traditionally, metal detectors have been limited to urban, inner-city schools (Hirschfield, 2008; Vera Institute of Justice, 1999), but in light of the fear surrounding recent school shootings, they are now a visible school security measure in suburban area schools (Addington, 2009). Metal detectors, however, have not been implemented nearly as often as SROs and other access control measures, in large part because the costs can be highly prohibitive to the school (Hankin et al., 2011; Jennings et al., 2011; Snell et al., 2002; Zhang et al., 2016). According to Addington (2009), roughly 10% of schools had their students pass through a metal detector on a daily basis to prevent weapons from entering school buildings. To lower costs, some school systems have opted to utilize random metal detector checks. In the 2013–2014 academic year, 8.7% of high schools used this strategy to dissuade students from bringing firearms or other weapons into their buildings (Zhang et al., 2016).

So, the question becomes: Are metal detectors worth the high price tag to keep our schools safe? Although research on the topic is not extensive, some studies do show a beneficial effect of metal detectors (Birkland & Lawrence, 2009; Hankin et al., 2011). In a sample of New York City Public Schools, Ginsberg and Loffredo (1993) discovered a deterrent effect, with students reporting they were less likely to carry a weapon into school when a metal detector was present. In Chicago, metal detectors prevented 294 weapons, 15 of which were guns, from entering schools (Johnson, 2000). Further, metal detectors tend to be perceived as an effective school security measure. When asking school safety administrators if metal detectors were effective in reducing violent crime, Garcia (2003) found that 32% of the respondents found them to be somewhat or very effective and 55% found them to be at least somewhat effective (see also Hankin et al., 2011).

Although metal detectors appear to have some deterrent effect, there are two considerations that school officials must bear in mind when determining if this is the correct response to mass school shootings. First, the installation of metal detectors may have unanticipated effects such as increasing students' perceptions of fear and disorder within the school (Hankin et al., 2011; Mayer & Leone, 1999). In particular, the presence of metal detectors has contributed to the criminalization of the school system (Hirschfield, 2008; Kupchik, 2009). Commentators worry that metal detectors, armed SROs, and access control measures have transformed the school from a warm nurturing environment into a prisonlike setting focused on harsh discipline and increased security (Dohrn, 2002). In these types of environments, students' perceptions of trust and caring often decline, while perceptions that the school is unsafe increase substantially (Hankin et al., 2011; Hirschfield, 2008; Kupchik, 2010).

Second, metal detectors do not completely eliminate students from bringing weapons into a school or deter all students. Although Ginsberg and Loffredo (1993) found that metal detectors reduced the percentage of students who said they would carry a weapon to school by roughly half, 7.6% were not deterred and indicated they would bring a weapon despite the metal detectors (see also Hankin et al., 2011). Therefore, simply having a metal detector will not stop all guns from entering schools and potentially causing harm. Unfortunately, history provides a clear example of this reality. In 2005, a 16-year-old student shot and killed his grandfather, who was a police officer, and his grandfather's girlfriend. He then traveled to Red Lake Senior High School (Red Lake, Minnesota) where he killed an unarmed security guard, passed through a metal detector, and continued to murder a teacher and five students before committing suicide (Heffelfinger, 2006; Langman, 2013). The presence of a metal detector did not deter this individual from bringing a gun to school or prohibit his entry into the building. He was able to easily bypass this device and kill seven individuals inside the school, rendering the metal detector useless in preventing a gun from entering the school in this situation (Heffelfinger, 2006; Langman, 2013).

When all else fails: How to survive a school shooting

Armed police officers on campus, limiting who can gain access to school buildings, and the installation of metal detectors are typical responses to ease fears and increase security after a mass school shooting. They are all common sense measures with intuitive appeal and seem to be rational ways to create a safer school environment. Each one of these

security measures, however, can and has failed in the past. Schools must recognize that many of the hard security measures put into place will not completely eliminate the threat of a school shooter. In fact, total dependence on these measures places our children at a grave risk should an individual ever come to their school motivated to inflict harm (Vossekuil, Fein, Reddy, Borum, & Modzeleski, 2004). SROs cannot be all places at all times, access control measures are not impenetrable, and metal detectors are able to be bypassed (Langman, 2013). Therefore, it is imperative that students, faculty, and staff are trained on how to react to and survive when a mass shooting incident unfolds in their environment.

Two schools of thought surround the question of how individuals should respond if they find themselves in the midst of a school shooting. One approach is referred to as traditional lockdown (Trump, 2011). This approach typically involves instructing individuals to lock interior doors, turn off lights, stay low to the ground, move to a corner of a room away from the door and windows, and remain silent until the police arrive on scene (Trump, 2011; see also Jonson, Moon, & Hendry, 2017). The second school of thought, multi-option responses, builds on traditional lockdown by providing more options to individuals when encountering a school shooter (Jonson et al., 2017). Proponents of multi-option responses argue that the traditional lockdown response to shooters does not adequately prepare individuals for the complexities of a school shooting (A.L.i.C.E. Training Institute, 2014; International Association of Chiefs of Police & Bureau of Justice Assistance, 2009; Ohio Attorney General School Safety Task Force, 2013; U.S. Department of Homeland Security, 2008).

School shootings do not always occur in places or during times where traditional lockdown protocols can be easily enacted. For example, the Columbine shooting occurred when many students were in the cafeteria and the library. It is difficult to rely solely on traditional lockdown procedures in these types of open spaces because there are multiple entry points and large windows that can be easily shot out (Erickson, 2001). At Red Lake Senior High School, the classrooms went into a traditional lockdown when the shooter made it past the metal detectors and into the school. But, unfortunately, there was a glass sidelight next to the door that the shooter shot out, breaching the traditional lockdown and making entry into the classroom, killing six people inside (Heffelfinger, 2006). In addition, there will always be a first room attacked by the shooter, rendering traditional lockdown an impossible response to the situation. Informed with the lessons learned from prior school shootings, multi-option responses seek to provide more than one procedure besides the traditional locking the door and remaining quiet response to increase the survivability of individuals that are tragically involved in active shooting events.

While a number of agencies have created their own version of a multi-option response program with their own unique terminology (e.g., Run, Hide, Fight; Avoid, Deny, Defend; Alert, Lockdown, Inform, Counter, Evacuate), they all include three core concepts: (a) leaving the scene of the shooting, (b) locking down and barricading, and (c) actively resisting the shooter (see also ALEERT Center, 2004; A.L.i.C.E. Training Institute, 2014; Jonson et al., 2017; U.S. Department of Homeland Security, 2008). First, each program recommends that if it can be done safely, individuals should leave the scene of the shooting. Just as people are instructed to leave a building if there is a fire, individuals in active shooting incidents are given the option to run from the danger. Multi-option response proponents argue that fleeing the scene and not encountering the active gunman

is a best case scenario if that option is available to an individual (ALEERT Center, 2004; A.L.i.C.E. Training Institute, 2014; Jonson et al., 2017; U.S. Department of Homeland Security, 2008).

If evacuating the building is not a viable option due to the shooter being close by or physical obstructions to fleeing, multi-option response proponents recommend locking down and barricading the room. Unlike the traditional lockdown approach that recommends individuals rely solely on locking the door, multi-option responses add the act of barricading the room. Barricades can be formed with objects found in the immediate environment such as tables, desks, shelves, and chairs. The goal is to make the room a hard target and to prevent access into the room by the shooter. It is important to note that the barricades do not have to hold for an extended period of time, such as hours or days, because most mass shootings (69%) end in less than 5 minutes (Blair & Schweit, 2014). Rather, the barricade is intended to have the school shooter move past the room, thereby saving the lives of those inside (ALEERT Center, 2004; A.L.i.C.E. Training Institute, 2014; Jonson et al., 2017; U.S. Department of Homeland Security, 2008).

Finally, and most controversially, multi-option response programs instruct individuals to actively resist a shooter if no other option is available and they come face-to-face with a gunman. This prevention strategy might include throwing readily available objects (e.g., books, chairs) at the shooter to distract the perpetrator and disrupt his or her aim. Or it might include swarming the gunman or otherwise fighting back to subdue the shooter and render him or her incapable of continuing the ongoing rampage (ALEERT Center, 2004; A.L.i.C.E. Training Institute, 2014; Jonson et al., 2017; U.S. Department of Homeland Security, 2008). This option is a worst-case scenario response that may be employed when either fleeing the scene or barricading inside a room are not viable possibilities. However, active resistance is a crucial piece missing in traditional lockdown approaches. In every shooting, there will be one room or one set of victims in which the shooting begins. Individuals in this situation often do not have the ability to flee the gunman or to lockdown and barricade a room since the shooter has already made entry. This option provides these individuals with a response that can increase their likelihood of surviving an encounter with a gunman.

Although many schools have enacted a variation of one of these programs, the research examining the effectiveness of both traditional lockdown and multi-option responses is severely lacking (Zhang et al., 2016). However, some information about the effectiveness of each approach can be gleaned by examining prior school shootings (Erickson, 2001; Jonson et al., 2017; Sandy Hook Advisory Commission, 2015; TriData Division, System Planning Corporation, 2009). At both Columbine and Sandy Hook, the majority of fatalities occurred with students taking a passive response either by being huddled in corners or by hiding under tables when the shooter entered the room (Erickson, 2001; Sandy Hook Advisory Commission, 2015). Very few students evacuated even though the option to flee was readily available, and no one fought back against the assailants.

However, the Virginia Tech shooting offers a unique perspective because the shooter attempted to enter five classrooms during his rampage, with the various rooms responding in a different manner (TriData Division, System Planning Corporation, 2009). And, although not a traditional research study, Virginia Tech can be viewed as a sort of “natural experiment” comparing the effectiveness of the more passive traditional lockdown approach compared to the more active multi-option response approach to school shootings (Jonson et al., 2017).

In the two classrooms that took a more passive approach—not utilizing barricade, evacuation, or active resistance measures—the number of lives lost and injured was tragically high (36 individuals present with 22 killed and eight injured). By contrast, the three rooms at Virginia Tech in which the various options advocated in multi-option response programs were enacted experienced fewer fatalities and injuries (44 present with seven killed and nine wounded). In each of the three rooms, a barricade was created when those inside used their feet, hands, or bodies. In one room, students laid on the floor and used their feet to hold the door shut. The shooter never made entry, and no one was killed or injured in that classroom. In a second room, after taking a passive response during the shooter's first entry into their classroom, a young man and young woman barricaded the door with their bodies and hands, keeping the shooter from re-entering their room. Of the 13 students in that classroom, five were killed and six were injured the first time the shooter made entry in the room, whereas no one was harmed thereafter. In the third room, a professor placed his body in front of the door as he directed his students to evacuate the room by jumping out of the second-story window. There were two people killed in that classroom, the professor who was shot through the door and a student who was making her way to the window to jump (TriData Division, System Planning Corporation, 2009).

Thus, the Virginia Tech shooting shows that when individuals take a more active multi-option response approach to shootings, they appear to have a higher likelihood of surviving such an incident. And, if placed into a situational crime prevention approach, the reasons why become clear. Unlike traditional lockdown approaches, multi-option responses with barricading, evacuating, and active resisting make potential victims harder targets for offenders to victimize (Cornish & Clarke, 2003). Potential victims become hard, dynamic targets for the shooter, rather than passive, static targets (A.L.i.C.E. Training Institute, 2014). In essence, individuals are making it more difficult for the shooter to have the opportunity to kill them. Multi-option response approaches increase the effort needed for offenders to achieve their goal, rather than having potential victims huddle together in a corner behind a locked door, giving the offender little to no active resistance as advocated in traditional lockdown approaches.

Conclusion: Taking school safety seriously

Although rare occurrences, school shootings are a reality in today's world. They are tragic events that attack the most innocent of victims in a place where safety should be guaranteed. The public's outcry and their corresponding calls that something must be done in the aftermath of one of these incidents are quite understandable (Addington, 2009; Burns & Crawford, 1999; Madfis, 2016; Muschert & Peguero, 2010; Rocque, 2012). However, it is imperative that school administrators do not respond to such calls in a rash, emotionally laden manner and instead make informed, rational decisions fully understanding of the consequences of their decisions.

As was reviewed, many of the security measures that were immediately enacted after well-publicized school shootings were done so without any consultation of the empirical evidence (Addington, 2009; Birkland & Lawrence, 2009). And, even 17 years after the first major school shooting to make national headlines, the research examining the effectiveness of these measures is still lacking. School security is an expensive endeavor. For example, the hiring of

SROs and the installation of metal detectors can be cost-prohibitive and force schools to make cuts in other areas more central to the educational mission of the school system, such as the hiring of more teachers, purchasing various forms of technology, and enhancing extracurricular activities (Hankin et al., 2011). Without knowledge of their true effects, it is fiscally, if not educationally, irresponsible for schools to invest in these security measures at the detriment of addressing the learning needs of their students.

Demand for evidence-based practices and policies can be seen in a variety of fields ranging from medicine to policing to corrections (MacKenzie, 2000; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996; Sherman, 1998). In all these fields, the importance of making informed decisions based in the empirical evidence is stressed (Cullen, Myer, & Latessa, 2009). Concerning school security, having school administrators engage in this type of decision making would be beneficial. Schools would be better able to allocate their limited budgets by investing only in measures that do, in fact, keep their students, staff, and faculty safe. Additionally, any iatrogenic effects that could arise from the security measure could be identified and addressed, as in the case of SROs and metal detectors (Bachman et al., 2011; Hankin et al., 2011; Hirschfield, 2008; Kupchik, 2010; Travis & Coon, 2005).

Fortunately, school shootings are not increasing at epidemic proportions as often portrayed in the media (Burns & Crawford, 1999; Elsass et al., 2016; Muschert, 2007). This fact, of course, does not mean that schools should not institute measures shown to deter these incidents from occurring or, in particular, not use programs to train school personnel and students on how to survive such an event. But administrators do need to avoid rash decisions that result in the implementation of ineffective and potentially counterproductive measures just to do something in the wake of a shooting. Taking school security safely seriously requires school officials rely on an evidence-based approach to develop policies and procedures that will not only keep our schools safe but also maintain an environment conducive to learning. The lives of our students, staff, and faculty merit this investment.

Acknowledgments

The author thanks Joe Hendry for his expertise and guidance on this article.

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