One Size Does Not Fit All: Traditional Lockdown Versus Multioption Responses to School Shootings

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To cite this article: Cheryl Lero Jonson, Melissa M. Moon & Joseph A. Hendry (2018): One Size Does Not Fit All: Traditional Lockdown Versus Multioption Responses to School Shootings, Journal of School Violence, DOI: 10.1080/15388220.2018.1553719

To link to this article: https://doi.org/10.1080/15388220.2018.1553719

Published online: 26 Dec 2018.

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One Size Does Not Fit All: Traditional Lockdown Versus Multi-option Responses to School Shootings

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ABSTRACT
Two paradigms inform responses to active shooting situations: a traditional lockdown approach where individuals find cover in a classroom and lock the door, and a multi-option approach where individuals evacuate the area, create barricades, and, in last resort situations, actively resist the gunman. While a majority of schools conduct active shooter drills, typically using a traditional lockdown approach, little is known about their effectiveness. Through simulations, this study sought to determine which of the two paradigms that inform active shooter drills is the most effective. Drills informed by the multi-option response paradigm were found to end more quickly and result in fewer people being shot.

ARTICLE HISTORY
Received 6 July 2018
Accepted 2 October 2018

KEYWORDS
Active shooter; traditional lockdown; multi-option response; school shooting

Columbine. Virginia Tech. Sandy Hook. Marjory Stoneman Douglas. Although scattered across the United States, these schools have one commonality: they experienced a school shooting. These four school shootings, where 98 people were killed, launched the topic of school safety to the forefront of the national dialogue (Ducharme & Meixler, 2018; Erikson, 2001; Hayes & Bohatch, 2018; Sandy Hook Advisory Commission, 2015; TriData, Division, System Planning Corporation, 2009).

After the shooting in Parkland, Florida, President Trump stated during a school safety meeting with state and local officials, “Active shooter drills is a very negative thing” (ABC News, 2018). However, in 2017, more than 70% of schools practiced drills specifically addressing active shooters (Campbell, 2018). While these numbers show that schools are increasingly training their students and teachers, little information is provided on what type of drill schools endorse. Currently, there are two competing paradigms informing active shooting drills. The first paradigm is commonly referred to as traditional lockdown. While exact protocols vary among schools, this paradigm typically includes locking the door and sitting quietly until the police arrive (Trump, 2011). The second paradigm, multi-option response, focuses on providing individuals with a variety of options that could be used in an active shooting incident. Multi-option responses utilize lockdown practices but also include a range of other options, from barricading, to evacuating, to actively resisting a gunman.

The shooting at Virginia Tech can provide anecdotal evidence on the effectiveness of these two paradigms. In this shooting, various responses were utilized by the students and faculty in the five classrooms, which resulted in vastly different numbers of injuries and fatalities (See Table 1). In classrooms where students barricaded the door or evacuated, the amount of people injured or killed was considerably lower than in rooms that employed more passive responses (e.g., weak or no barricade, did not evacuate, no active resistance). While this shooting suggests the advantage of using multi-option responses to increase survivability in a shooting, no empirical study has been conducted to validate this conclusion (Jonson, 2017). Therefore, this study seeks to be the first to test...
these two paradigms to determine which leads to a quicker time to resolution and greater survival in an active shooter situation. A discussion of both the traditional lockdown and multi-option paradigm follow.

**Traditional lockdown**

Originally designed as a response to drive-by shootings (Hendry, 2017), the basic notion of the traditional lockdown paradigm is to remove students, staff, and faculty from the threat of the active shooter by locating them in “locked classrooms or other secure areas” (Trump, 2011, p. 213). Once inside a classroom, individuals should respond by: 1. Turning off all lights. 2. Move as far away from the doors and windows as soon as possible. 3. Minimize physical exposure and, if appropriate, seek protective cover. 4. Remain calm and absolutely quiet. 5. Wait for an all clear from an established or credible source (Trump, 2011, p. 213).

It is important to note that there may be various levels of traditional lockdown. For example, a partial lockdown or “shelter-in-place” means that the doors leading outside of the school are locked and no one may exit/enter the building. This is often used when the threat is occurring outside the building such as when there is a search for a criminal on the run, an environmental hazard (e.g., gas leak), or dangerous weather. In contrast, a full lockdown involves an internal threat, such as an active shooter. Individuals in the hallway, cafeteria, or outside the school are to enter the nearest classroom and follow the protocol that was described above. After the Columbine shooting, traditional lockdown swept across nation as the most common practice used by schools in response to school shootings (Campbell, 2018).

**Multi-option response**

In response to the national attention focusing on school shootings, many federal and state agencies and private entities began to critically analyze these incidents. In part, these agencies sought to develop recommendations on how civilians should respond when confronted with an active shooter. Overwhelmingly, these organizations agreed in recommending multi-option responses as opposed to the historical single-option, traditional lockdown response. These recommendations were published in various reports authored by: the U.S. Department of Homeland Security (2008), International Association of Chiefs of Police and Bureau of Justice Assistance (2009), Ohio Attorney General School Safety Task Force (2013), U.S. Department of Education, Office of Elementary and Secondary Education, and the Ohio Attorney General School Safety Task Force (2013).
Education, and Office of Safe and Healthy Students (2013), New York City Police Department (2016), and the ALICE Training Institute (2018).

Although the documents were created by distinct agencies and use different terminology, the suggested recommendations include essentially the same three core concepts: (a) fleeing the scene, if possible; (b) if unable flee, barricading in a room with environmental objects (e.g., chairs, desks) to prevent the shooter from making entry; and (c) as a last resort, distracting and actively resisting by throwing objects and/or swarming the gunman. These three options are articulated by the U.S. Department of Homeland Security (2008) as “Evacuate, Hide Out and Take Action,” by the Federal Emergency Management Agency (FEMA, 2015) as “RUN. HIDE. FIGHT.” (FEMA, 2015), by the ALERRT Center (2004) as “Avoid, Deny, and Defend,” and by the ALICE Training Institute (2018) as “Evacuate,” “Lockdown,” and “Counter.”

ALICE

Since this study examines one specific multi-option program, ALICE, a more in-depth examination of the program is necessary. Created in 2001 by Greg and Lisa Crane, the acronym ALICE stands for alert, lockdown, inform, counter, and evacuate (ALICE Training Institute, 2018). The program was one of the first violent intruder responses that abandoned the single-option, traditional lockdown approach, by including various options that were later adopted by several federal agencies as previously discussed above. ALICE recognizes the fluidity of violent critical incidents (ALICE’s term that includes active shooting events) and suggests options be utilized based on the circumstances of the situation. Thus, one, two, or all five elements could be used depending upon the dynamics of the violent critical incident. The following is a description of the five components of ALICE.

Alert

Alert is the initial indication that there is a violent intruder on school grounds. Alerts can take many forms, including, but not limited to, seeing the assailant, observing someone exhibiting odd behavior, people running in a panic, hearing gunshots and/or screams, receiving a public address (PA) announcements and/or text message alerts, or someone stating there is a violent intruder on campus.

Lockdown

Lockdown entails making the violent intruder’s entry into a room or location more difficult by enhancing the single-option, traditional lockdown method. As in single-option, traditional lockdown approaches, ALICE recommends that individuals lock the door, but then goes beyond that by suggesting individuals barricade any entryways (e.g., doors, windows that are next to doors) with available environmental items in the room (e.g., tables, chairs, bookcases). Barricades do not only have take the form of stacking furniture in front of entryways, but can also include securing doors with available objects such as backpack straps, belts, and/or ties. Furthermore, doorstops or shoes can be wedged under a door to enhance a barricade. While in lockdown, individuals should prepare themselves to evacuate or counter, if needed.

Inform

Inform involves providing real-time information to individuals in the violent critical incident as well as to first responders. Vital information concerning the presence, location, and direction of the intruder must be provided in clear and plain language (e.g., no code words). This information can be transmitted via PA announcements, emails, text messages, phone calls, video surveillance, and/or
word of mouth. Providing real-time information assists law enforcement in their response as well as aiding faculty, staff, and students in determining if they are able to safely evacuate the area, need to barricade, or should begin to prepare to actively resist the intruder.

**Counter**

Counter is a last resort in a violent intruder situation. If individuals determine they are unable to escape the area or create an effective barricade between themselves and the assailant, then counter becomes the recommended option. Counter measures can be used to distract the intruder, reduce their ability to shoot accurately, and/or subdue the perpetrator. Moving, making noise, and throwing available objects provide not only distractions, but the ability to increase distance from the intruder and potentially escape the area. Counter measures are only recommended when a person is directly confronted by an intruder—only law enforcement should actively seek out the perpetrator.

**Evacuate**

Evacuate involves fleeing the situation and creating distance from the violent intruder. Individuals may leave the area through traditional means like doors, as well as windows if primary exits are blocked. It is recommended that individuals make themselves harder, more dynamic targets by taking nothing with them and running normally in a zigzag pattern, if possible (i.e., do not put hands up or behind head).

The focus of this study is to compare the following competing paradigms in responding to a violent intruder: traditional lockdown versus one specific multi-option response, ALICE. Specifically, the ALICE components of lockdown, counter, and evacuate are examined, as alert and inform are concerned with becoming aware of a situation and providing real-time information, rather than actual options (e.g., fleeing the shooter, barricading a room, or to actively resisting the shooter) presented in the multi-option paradigm. As more schools implement active shooter drills, it becomes vital to have an understanding of what types of drills best equip students with the skills to survive a school shooting (Campbell, 2018).

**Methods**

To determine which paradigm leads to a quicker resolution of the active shooting event and which of the two paradigms results in greater survivability, we collected data on active simulations that emulated a school shooting. In this study, real guns were substituted with Airsoft guns, which are replica firearms that shoot plastic pellets by way of compressed gas or electric and/or spring-driven pistons. Although a nonlethal situation, simulations with Airsoft guns look, feel, and sound real engendering fear and panic, as the gun emits loud sounds and produces projectiles that hurt/sting when they contact the skin. As explained below, the scenarios were designed by the ALICE Training Institute to approximate a real-life shooting in a school setting in an ethical manner.

**Participants**

The sample consisted of 326 individuals, who voluntarily enrolled in a two-day ALICE Instructor Certification Course. Between June 2016 and April 2017, all participants were trained by the same instructor from the National ALICE Training Team at 13 training sites across the United States. Basic background information on the participants were collected and are presented in Table 2. Roughly four fifths of the sample identified as male, with the remaining one fifth identifying as female. Ages ranged from 22 to 69 with a mean age of 43. Occupations were varied and included superintendents, principals, teachers, guidance counselors, law enforcement officers, former military,
security guards, library staff, hospital employees, state government employees, insurance company employees, and employees of private businesses. For purposes of this study, occupations were categorized into two groups: law enforcement (e.g., local, state, federal, or military) and non-law enforcement, which included education, business, and healthcare workers. Nearly half of the sample were working in some type of law enforcement capacity with the remaining in non-law enforcement occupations. The average number of years participants worked in their current occupation was 14 years across all groups.

**Procedures**

All of the traditional lockdown and multi-option simulations that were conducted are a component of the ALICE Instructor Certification Course, and we did not influence or modify their structure. Thus, for this study, we collected data on the outcomes of simulations that were already occurring as part of the course by providing IRB-approved surveys with informed consents. Upon arrival for the instructor course, participants signed waivers, voluntarily signed the informed consents, and were asked to participate in a pre-test survey that gathered basic demographic information. Participants were then trained in the traditional lockdown approach and took part in two simulations where they were instructed to utilize traditional lockdown procedures. For the first simulation, individuals were randomly assigned to classrooms, while for the second simulation, all participants were placed in a large open area, such as a library, cafeteria, or hallway. One person was selected by the instructor to play the role of the “active shooter” for all the simulations that took place over the two days. For consistency, strict guidelines for selecting a shooter were set: the person must be male, a current law enforcement official with 10 years of experience, no prior SWAT training, and free of injuries that could hinder sight/movement. If more than one person met the criteria, the instructor randomly chose the “shooter” from those meeting the requirements. At all but three sites, the shooter matched these criteria (the other three sites had “shooters” with SWAT experience, but met the remaining criteria). The decision to select a law enforcement official as the shooter was three-fold: (a) to have the shooter be comfortable with handling the Airsoft gun, (b) to control for shooting ability, while recognizing that most school shooters are not SWAT trained, and (c) to reduce the possibility of confirmation bias by having the shooter not be affiliated with or invested in the ALICE Training Institute. Additionally, all participants were provided with face guards and were instructed to wear multiple layers of clothing to protect themselves from the Airsoft pellets.

Across all 13 sites, in the first traditional lockdown simulation, participants entered their randomly assigned classroom and were informed of traditional lockdown procedures:

Close/shut the door, lower or close any blinds, get against the wall so that the intruder cannot see you (look for and go to a “Safe Corner”), turn out lights and computer monitors, keep quiet, and stay in safe areas until directed by your trainer to move or evacuate.

Participants were permitted to hide under or behind objects to conceal themselves. In the second traditional lockdown simulation, the same protocol was followed; however, respondents were located in a large open area.

| Table 2. Sample descriptives (N = 322). |
|-----------------|-----|-----|-----|
| Demographic     | n   | %   | M  | SD   |
| Age             | 312 | 42.9| 9.88|
| Sex             |     |     |     |
| Male            | 250 | 79.4|
| Female          | 65  | 20.6|
| Current occupation |  |     |     |
| Law enforcement | 150 | 47.6|
| Nonlaw enforcement | 165 | 52.4|
| Years in occupation | 302 | 14.6| 9.56|
For the traditional lockdown simulation in the classroom, the selected active shooter was then given two Airsoft guns and was instructed to

“aim chest and below (no headshots) when engaging any moving targets, aim below waist when engaging passive and static targets, shake, kick, and/or bang on the door for 10 seconds (to simulate forced entry) prior to entering each classroom, shoot as many people as you can as quickly as you can.”

The shooter was permitted to “go into any/all of the rooms” and to “shoot for five minutes or until all guns are empty.” Five minutes was provided as a cut-off as recent research has shown 70% of mass shootings end in five minutes or less (Blair & Schweit, 2014). Note that the 10 seconds prior to entry into the room was not calculated in the time to resolution for the traditional lockdown simulations. Time began once the shooter made entry into the room.

For the traditional lockdown simulation in the large open area, the active shooter was still armed with the same two Airsoft guns and given the same instructions, except they did not have to wait 10 seconds to enter the area. In each simulation, the ALICE instructor was responsible for recording how long it took for the simulations to end, maintaining safety for all participants, and signaling everyone when the simulations were complete. After each scenario, participants were given a post-test survey where they self-reported where they hid and the number of times they were shot as well as answered a variety of other questions.

Following the two traditional lockdown simulations, participants continued the two-day course. The ALICE Instructor Certification Course is designed to certify individuals to train others in the ALICE methodology. During the first day, participants are taught, through lectures and videos, the historical perspective of violent intruder procedures, review previous shootings (e.g., Columbine, Virginia Tech, Sandy Hook) and their outcomes, and are trained in the ALICE approach.

On the second day, after the educational component of the course was complete, two more simulations were conducted using the same areas as the simulations conducted on day one: one in a classroom setting and one in an open area (library, cafeteria, or hallway). During these simulations, participants were told they “may use any ALICE technique (evacuate, lockdown, and/or counter).” Thus, this second set of simulations were labeled as “multi-option,” since the participants could respond to the shooter by choosing one or more options depending on the fluidity of the situation. As in the day one simulations, the ALICE instructor was present during all simulations and was responsible for calling “safety” if the participants chose to tackle the shooter. Furthermore, the shooter from day one continued the role on day two. The shooter was instructed to “aim chest and below (no headshots), enter the classroom, shoot as many people as you can as quickly as you can.” Simulations were considered complete when one of the following occurred: all participants had escaped from the area, the participants had control of the shooter rendering him incapable of firing the Airsoft gun, the shooter could not breach a barricaded room, the shooter ran out of ammunition, or the five-minute time period expired. After each simulation, participants were again asked to self-report on a post-test survey the number of times they were shot and which options they utilized during the simulation.

The simulations in this study were designed to closely approximate a school shooting situation in an ethical manner. Thus, the data were analyzed by site, not at the individual level. The analyses included comparisons among the 13 training locations for: (a) the average length of time to resolution (e.g., shooter ran out of ammunition, shooter was rendered incapable of shooting by the participants, participants evacuated, five minute time limit was met) for traditional lockdown versus multi-option simulations, (b) the percent of participants shot in traditional lockdown versus multi-option simulations, and (c) linear regression analysis to determine if any factors influenced the percent of people shot in both the classroom and open-area multi-option simulations. In particular, we controlled for percent male, average age, percent of people employed as law enforcement, SWAT experience of the shooter, number of people in the simulation, and use of counter measures.
Results

Time to resolution

Table 3 shows the duration of time (in seconds) for both traditional lockdown and multi-option simulations in the classrooms and the open areas. Traditional lockdown simulations ranged in time from 22 to 290 seconds, while the multi-option simulations ranged from 4 to 70 seconds. When the traditional lockdown protocol was followed, the average time to resolution in the classroom setting was 195.77 seconds (3 minutes 15.77 seconds) versus 16.31 seconds when using multi-option responses. In the larger, more open areas, traditional lockdown simulations ended in an average of 168.31 seconds (2 minutes 48.31 seconds) versus an average of 8 seconds when multi-option responses were utilized. Every site experienced a reduction in time to resolution in both the classroom and open area simulations when participants utilized multi-option responses compared to traditional lockdown responses.

Paired sample t-tests were conducted to determine if the number of seconds to resolution was statistically different between traditional lockdown and multi-option simulations. In the classroom simulation, the overall mean difference of 179.46 seconds (2 minutes 59.46 seconds) was statistically significant \( (t = 7.97, df = 12, p = .00) \). For the open-area simulation, a mean difference of 160.31 seconds (2 minutes 40.31 seconds) was also statistically significant \( (t = 7.93, df = 12, p = .00) \). These data suggest that when participants used multi-option responses (e.g., evacuating the area, barricading the classroom, rendering the shooter incapable of shooting) as opposed to the traditional lockdown response, the duration of the simulation was significantly reduced in both classroom and open-area settings.

Percent shot

Table 4 lists the percent of persons at each site who reported they were shot during the simulation. Columns 3 and 5 indicate the mean number of persons shot in the traditional lockdown simulations in the classroom and the open area. Columns 4 and 6 list the mean number of persons shot in the multi-option simulations in the classroom and the open area.

When comparing the traditional lockdown to the multi-option simulations (PT1 versus PT3 and PT2 versus PT4), a reduction in the average percent of individuals shot occurred at every site. For the traditional lockdown classroom simulation, the mean number of individuals shot per site was 74% (range 36%–97%), whereas only 25% were shot (range 0%–48%) when multi-option techniques were used. In the open-area simulations, when the traditional lockdown protocol was used, an average of 68%...
(range 33%–89%) were shot, while only 11% (range 0%–31%) were shot when utilizing multi-option strategies.

Paired sample t-tests were conducted by each site (PT1 versus PT3 and PT2 versus PT4) and overall to determine if these differences reached statistical significance. Statistically significant results were found at 92% (12/13) of the sites for the classroom simulations and 100% (13/13) for the open-area simulations. Overall, differences in the percent of people shot between the traditional lockdown and multi-option simulations were statistically significant in both the classroom ($t(12) = 8.18, p < .001$) and open area ($t(12) = 12.94, p < .001$). These data reveal that when participants had the ability to choose from multiple options rather than hiding in a room, a smaller percentage were shot when compared to traditional lockdown techniques.

**Regression analysis**

The above paired sample t-tests indicated that the average percent of people shot was significantly lower in the multi-option than in traditional lockdown simulations. However, t-tests do not allow us to determine if there are variations on who gets shot in the multi-option scenarios. Thus, two OLS regression analyses were calculated to determine whether the average percent of people shot in the multi-option classroom and open area simulations were influenced by various factors. Regressions were only conducted on the multi-option simulations since participants had the choice to do something, whereas in the traditional lockdown simulation, all participants were instructed to respond the exact same way (shut the door and hide). The following six independent variables were analyzed: (a) sex (percent male); (b) average age; (c) occupation (percent law enforcement); (d) number of participants in each simulation; (e) designated shooter was SWAT trained (dummy coded 0 = no; 1 = yes); (f) percent that used the counter technique. Having used a counter technique was included to control for those who are closer in proximity to the shooter, potentially resulting in an increased likelihood of getting shot. Having prior SWAT experience was included to control for the three sites that had a shooter that varied on this trait from the criteria listed to play the role of the shooter.

The OLS regressions for the average percent shot in both the classroom and open area were not statistically significant, and no variable in either model was significant. Therefore, the differences in the percent of men, women, law enforcement, non-law enforcement, average age, number of participants, whether the shooter had SWAT experience, and the percent who used counter techniques at each location did not impact the number of people shot in the room. Instead, the use of the different tactics (multi-option versus traditional lockdown), as opposed to demographics and/or characteristics of the situation, produced the differences seen in the percent shot across the simulations.

<table>
<thead>
<tr>
<th>Site</th>
<th>n (Classroom/Open area)</th>
<th>Traditional classroom shot PT 1</th>
<th>Multi-option classroom shot PT 3</th>
<th>Traditional open area shot PT 2</th>
<th>Multi-option open area shot PT 4</th>
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<tbody>
<tr>
<td>1</td>
<td>26/26</td>
<td>65.38</td>
<td>26.92*</td>
<td>61.54</td>
<td>7.69*</td>
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<td>2</td>
<td>23/22</td>
<td>82.61</td>
<td>34.78*</td>
<td>68.18</td>
<td>13.64*</td>
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<tr>
<td>3</td>
<td>35/34</td>
<td>97.14</td>
<td>14.29*</td>
<td>91.18</td>
<td>8.82*</td>
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<tr>
<td>4</td>
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<td>75.76</td>
<td>39.39*</td>
<td>57.58</td>
<td>6.06*</td>
</tr>
<tr>
<td>5</td>
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<td>25.00*</td>
<td>53.13</td>
<td>9.38*</td>
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<td>37.50</td>
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<td>81.25</td>
<td>31.25*</td>
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<tr>
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<td>84.21</td>
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<td>23.08*</td>
<td>84.62</td>
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<td>0.00*</td>
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<td>20.00*</td>
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<td>73.76</td>
<td>25.13*</td>
<td>68.44</td>
<td>10.73**</td>
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</table>

*Note. Assessed with a paired sample t-test for each site and total across all 13 sites. *p < .05; **p < .001.
Discussion

With active shooter drills becoming the norm in America's schools, determining which type of drill most effectively equips students, staff, and faculty with potentially lifesaving skills is crucial (Campbell, 2018). Despite the gravity of this topic, little research has been conducted on civilian responses to active shooters, with, to our knowledge, no known study placing individuals in live action simulations (Dorn, 2018). Consequently, this is the first study to compare the two competing paradigms informing active shooter drills (traditional lockdown versus multi-option responses) to determine which could potentially end the event more quickly and result in fewer injuries and casualties.

Our results indicate that one multi-option program—ALICE—is a more effective civilian response to active shooter incidents compared to the traditional lockdown response. Concerning time to resolution, the amount of time until the simulation ended was greatly reduced when multi-option techniques were used. The average time to resolution dropped just shy of three minutes in the classroom and over two and a half minutes in the open area simulations when moving from using traditional lockdown techniques to ALICE techniques. This is important, because time is of the essence in school shootings. The longer the time that these incidents are able to continue, the more fatalities and injuries there usually are. For example, the majority of school shootings that have gripped national headlines due to their high fatalities have all lasted multiple minutes: Columbine, approximately 50 minutes; Virginia Tech–Norris Hall, roughly 10 minutes; Sandy Hook, about 5 minutes; Marjory Stoneman Douglas, around 7 minutes.

While we acknowledge that at some sites the time to resolution was mere seconds, an examination of school shootings have shown when multi-option responses were used, some incidents can be resolved in a matter of seconds. At both Noblesville West Middle School and Mattoon High School, teachers immediately recognized a threat in the classroom and cafeteria, respectively, tackling the shooter and ending the rampage within seconds. Thus, even if our simulations have resulted in slightly faster times to resolution since the shooter was expected, the vast differences between the traditional lockdown and multi-option simulations cannot be overlooked and do not seem too far removed from reality.

Not only did the ALICE simulations end quicker, but fewer people also self-reported being shot with the Airsoft gun in the ALICE simulations compared to the traditional lockdown simulations. In the classroom simulations, the average number of participants shot decreased roughly 50 percentage points when moving from traditional lockdown to multi-option responses. When the setting of the simulations moved to large open areas (e.g., library, cafeteria, hallway), the use of ALICE options resulted a 58 percentage point drop of those shot when compared to utilizing the traditional lockdown response. This suggests when individuals make themselves hard, dynamic targets by evacuating, barricading, and/or actively resisting they are less likely to be shot than when they are passive, static targets. In essence, doing something active is better than hiding in a dark room. We liken this approach, of doing something, to fire safety. Teachers, staff, and students are trained to leave the building and get away from the danger posed by the fire as evidenced by mandatory fire drills. If escape is not possible, they are provided with another option—get low to the ground and place wet items under the door to block smoke and form a barricade between themselves and the fire. If students find themselves on fire, students are trained to employ a different tactic—stop, drop, and roll. We would never provide fire training that only taught stop, drop, and roll. Rather, we recognize the fluidity of fires and fire training provides people with the knowledge of how to react to their particular situation.

Anecdotal evidence provides clear examples that when students and teachers are provided with options, their likelihood of surviving increases. Many of these shootings have not made national headlines as few deaths and injuries resulted from these incidents. For example, at Rancho Tehama Elementary School (0 killed) students and teachers barricaded and the shooter left after being unable
to gain entry. At West Liberty-Salem High School (0 killed), staff tackled the gunman as students and teachers barricaded and/or evacuated the school. At Dixon High School (0 killed), students barricaded and evacuated as the school resource officer engaged with the shooter. The outcomes of these shootings stand in stark contrast to Columbine, Sandy Hook, and Marjory Stoneman Douglas, where students relied on traditional lockdown techniques.

Limitations

Although the results show a clear distinction between the two paradigms, there are some limitations to the research that must be addressed. First, as mentioned in the methods section, the study employed a quasi-experimental design. Although ethical reasons prohibit ever conducting a true experiment, simulations have long been used to study critical issues in criminal justice (e.g., police use of force; Ho, 1994). Second, a convenience sample was used. Participants who were already enrolled in the two-day ALICE Instructor Certification Course were asked to participate in the study. The presence or absence of selection bias can only be confirmed with future research studies; however, our findings showed no demographics influenced our results, and individuals were instructed to use specific techniques in each simulation, which may reduce the effect of selection bias.

A second potential limitation may be a testing effect. However, strict instructions were provided in each of the scenarios. The traditional lockdown simulations allowed individuals only to hide and remain quiet, while the multi-option simulations allowed for individuals to flee, barricade, and/or actively resist the shooter. Simply being exposed to a “shooting” does not change the fact that under the traditional lockdown paradigm, individuals are passive, static targets compared to the multi-option simulations, where they are hard, dynamic targets. Also, in the traditional lockdown scenarios, individuals had 10 seconds before the shooter entered the room to prepare/hide, while in the multi-option simulations the shooter could enter the classroom of his choosing immediately. Furthermore, if there was a testing effect, it would be likely that the shooter would have become more comfortable and accurate between the traditional lockdown versus multi-option simulations, thus reducing the differences seen between the two simulations.

Due to the simulations being conducted during an ALICE Instructor Certification Course, measures were taken to mitigate the effect of confirmation bias, many of which are discussed in the paragraph above. First, the individuals in each simulation and the shooter were given strict and specific instructions on what responses were allowed in the traditional lockdown and multi-option simulations. Second, in the traditional lockdown simulations, people were given more time to prepare (10 seconds) than the ALICE simulations. Third, the shooter was not affiliated with the ALICE Training Institute to avoid any subconscious or conscious desire to “shoot” fewer people in the ALICE simulations. Fourth, individuals self-reported if and where they were shot on the post-test in each simulation, thus giving the ALICE trainer no influence over these data.

A final limitation is that this is one study—the first to empirically test these two paradigms, making the results suggestive, rather than definitive. Policies and practices must be informed by more than one study. Replication of this study with larger sample sizes, additional simulations, and varying populations (e.g., juveniles) is strongly encouraged.

The criticism that this study was conducted using adults deserves some elaboration. Some may argue that because adults are more physically, psychologically, and emotionally developed, they will respond to a drill and/or an actual active shooter incident differently than a child or adolescent (Hamblin, 2018). However, children and adolescents are trained at a very early age tactics and skills to survive many other emergency and risky situations they may find themselves encountering (e.g., fire, stranger danger; Moran, Warden, Macleod, Mayes, & Gillies, 1999). Furthermore, if drills are done correctly, in an age-appropriate manner, an increase in the confidence about handling a crisis situation can be achieved (Sacks, 2018).
Policy implications

Based on both the findings of our simulation study and a critical analysis of prior school shootings, we propose that drills informed by the multi-option paradigm appear to more effectively prepare civilians to respond and potentially survive a school shooting compared to drills based on the traditional lockdown paradigm. In an active shooting event, preventing causalities and quickly ending the incident is of the utmost of importance. According to a recent FBI study, “in 63 incidents where the duration of the incident could be ascertained, 44 (69.8%) of 63 incidents ended in 5 minutes or less, with 23 ending in 2 minutes or less” (Blair & Martaindale, 2013, p. 8). In addition, police response times also vary significantly, with a median police response time of three minutes to active shooting events (Blair & Schweit, 2014). However, schools located in rural areas may see a police response time of up to an hour. Thus, any effective active shooter drill must provide individuals with the skills needed to survive and potentially end these incidents while waiting for the police to respond to the scene. Our results indicate that the multi-option ALICE response led to significantly fewer individuals reported being shot and quicker time to resolution in all simulations than the traditional lockdown response.

The major implication of this study is for schools to develop or examine their current active shooter plans to include options in addition to traditional lockdown. While lockdown is a component of multi-option programs, relying solely on traditional lockdown in dynamic active shooter situations is ill advised. School shootings are dynamic events. Lockdown with barricade is a viable option when teachers and students have the ability to get behind a locked door. However, what happens when a shooting occurs in an open area like a cafeteria, library, or hallway? What if there is no door or the door does not lock? What if the gunman is in the room? Relying on one option in a fluid situation does not provide students, staff, and faculty with the knowledge and skills needed to respond in a rapidly changing environment. Consequently, training students, faculty, and staff on traditional lockdown only is no longer a viable stand-alone option as a response to an active shooter. This applies for the other options as well; individuals should not be trained to only evacuate or to only actively resist the gunman. Rather, active shooter drills should provide training on multiple responses that equip individuals with a vast repertoire of skills that could be drawn upon during an active shooting event. Thus, schools should have serious conversations regarding their current plans and consider adding additional options that are not only recommended by government and private entities and reinforced with anecdotal evidence, but empirically supported by this study (ALICE Training Institute, 2018; International Association of Chiefs of Police & Bureau of Justice Assistance, 2009; New York City Police Department, 2016; Ohio Attorney General School Safety Task Force, 2013; U.S. Department of Education, Office of Elementary and Secondary Education, & Office of Safe and Healthy Students, 2013; U.S. Department of Homeland Security, 2008).

School shootings are rare, but the harm is extreme. The aftermath for individuals and communities impacted by these tragedies is devastating and lifelong. While research on and the development of techniques to prevent shootings is vital, schools must also be prepared in the case that prevention measures fail. With the majority of schools implementing active shooter drills, it is imperative that schools conduct drills that been empirically shown to be effective (Campbell, 2018; Jonson, 2017). While more systematic studies are needed, right now, the best available evidence suggests that multi-option strategies have the potential to save lives and should be adopted over tradition lockdown drills.

Acknowledgments

The authors wish to thank the ALICE Training Institute for their assistance in the data collection of this study during the two-day ALICE Instructor Certification Course and acknowledge that $715 in funding for the project was provided by a Northern Kentucky University College of Arts and Sciences Professional Development Award. Furthermore, the authors would like to thank John Paul Wright for his guidance on this article and an employee of the ALICE Training Institute for ensuring treatment fidelity.
Competing interests

Two authors are certified ALICE instructors and one is employed as a National Trainer for the ALICE Training Institute. In addition, all authors are trained in Run. Hide. Fight. The authors have also participated in traditional lockdown drills.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

Funding for the project was provided by a Northern Kentucky University College of Arts and Sciences Professional Development Award.

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