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# Locks, Lights, Out of Sight: Assessing Students' Perceptions of Emergency Preparedness across Multiple Lockdown Drills

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## ABSTRACT

Despite their proliferation in schools across the U.S., the impact of lockdown drills on students remains largely understudied. Despite their goal of preparing students – along with teachers and school staff – for situations like the 2018 shooting in Parkland, FL, questions have been raised in both the public and academic discourses about whether such practices achieve their desired end or instead produce fear and anxiety. To date, however, there is but one study that assesses the perceptions that students have about these drills. The present study seeks to fill such a gap by exploring how students in a large New York school district feel about their safety and preparedness in the wake of receiving instructional training and undergoing several lockdown drills.

## ARTICLE HISTORY

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## KEYWORDS

Emergency response plan; lockdown; drills; Standard Response Protocol; emergency preparedness

Lockdown drills have been commonplace in educational institutions across the United States since the April 20, 1999 shooting at Columbine High School, where two students took the lives of 12 of their classmates and a teacher. In the 2015–2016 school year, 95% of public schools across the country reported that they had conducted a lockdown drill (Musu-Gillette et al., 2018). Following the February 14, 2018 shooting at Marjory Stoneman Douglas High School in Parkland, FL, however, the topic of emergency preparedness training again was thrust into the national discourse when it was revealed that the teachers at the school had received little instruction on active shooter situations and students had received none, a fact that contributed, at least in part, to the 17 deaths that occurred that day (O'Matz, 2018).

Although schools continue to be among the safest places for children to be (Fox & Friedel, 2018) and mass shootings in these locations and more broadly are statistically rare events (Schildkraut, Formica, & Malatras, 2018), lockdown drills are designed to prepare students, faculty, and staff with how to respond to protect themselves from danger in and around school (e.g., police action in neighborhood, online threat, active shooter, dangerous animal; Gubiotti, 2015; National Association of School Psychologists [NASP], 2018). The manner in which these activities are conducted runs the gamut, from tabletop exercises to full-scale simulations involving law enforcement with simunition (non-lethal training ammunition; see, for example, Zraick, 2019). As a result, the potential for trauma associated with such drills remains a topic of conversation, with concerns over the possibility of anxiety, depression, academic performance issues, posttraumatic stress disorder (PTSD), and other social, emotional, and/or behavioral problems ever present (e.g., Blad & Will, 2019; Chatterjee, 2019; Rich & Cox, 2018; Rygg, 2015; Shockman, 2019).

Despite such concerns, however, little empirical research exists that examines the impact of lockdown drills on members of the education community. To date, only a few studies evaluate *any* facet of these drills (e.g., related perceptions of safety and/or preparedness, see Baer, Zarger,

Ruiz, Noble, & Weller, 2014; Perkins, 2018; Peterson, Sackrison, & Polland, 2015 or effectiveness of drills on response, see Jonson, Moon, & Hendry, 2018), with just one (Zhe & Nickerson, 2007) assessing the impact on students in a K-12 school environment, where such practices are most common. Using a sample of 74 students between the ages of 8 and 11 within a posttest only control group design, Zhe and Nickerson (2007) explored the effects of training and an accompanying lockdown drill. Their findings indicated that training the students on the drill protocol and then practicing it helped them to retain knowledge – at least in the short term – about how to respond in such an event (Zhe & Nickerson, 2007). Moreover, as compared to the control groups used, those students who participated in the training and drill did not significantly differ in their perceptions of school safety or anxiety, further highlighting that such exercises – when conducted effectively – can be a valuable learning and preparatory experience.

### **Standard Response Protocol Extended Edition**

The Standard Response Protocol Extended Edition (SRP-X; ILoveUGuys.org, 2015) is consistent with the U.S. National Incident Management Systems (NIMS) language from the Federal Emergency Management Agency (FEMA), which standardizes the vocabulary to be consistent with first responders (U.S. Department of Homeland Security, 2012). Moreover, in addition to lockdowns, SRP-X also provides operational guidance for lockouts (threats outside of the school), evacuations (e.g., fire drills), sheltering in place (typically used for weather-related emergencies and/or natural disasters), and holding in place (used to keep hallways clear), as recommended by federal (U.S. Department of Education, 2013) guidance for K-12 emergency preparedness. New York's Education Department specifically requires that public schools have protocols in place for these five situations (Bakst, 2015), meaning that the SRP-X mirrors state requirements. The SRP-X lockdown procedure includes locking classroom doors, turning off lights, having students and staff remain out of sight, and remaining quiet (ILoveUGuys.org, 2015). This type of lockdown drill is not the same as options-based drills that provide students and staff with a range of alternative strategies (e.g., run, hide, fight) when confronted with an active shooter or armed assailant (NASP, 2017), though the SRP-X program does provide additional guidance for self-evacuation techniques when locking down is not possible (e.g., when stranded in a hallway or common area).

### **Current study**

The present study seeks to add to the important yet understudied area of student perceptions of preparedness and safety in relation to lockdown drills in several ways. First, building on the work by Zhe and Nickerson (2007), it aims to assess the perceptions of school safety and emergency preparedness among students. Second, it extends this line of inquiry by examining the change in attitudes across drill conditions (e.g., without training, with training in the SRP-X, and following best practice guidelines from NASP, 2018). Third, the study design incorporates a pretest component to provide a baseline understanding of such perceptions before the introduction of training and practice. Finally, it examines predictors of perceptions of safety and preparedness. Utilizing survey data collected in a large urban school district in Central New York at three different points over an academic year, both prior to and after multiple lockdown drills and emergency preparedness training, the present study seeks to answer the question: *What impact do training and lockdown drills have on students' feelings of safety and preparedness?*

## **Method**

### **Project overview**

The survey data for the present study was collected as part of a larger initiative to implement an emergency preparedness protocol in a large urban school district in Central New York. The district serves more than 21,000 students and employs more than 3,500 faculty and staff in 30 schools.<sup>1</sup> The

district's Department of Public Safety (DPS) partnered with the researchers following the Parkland shooting. In the initial planning stages, a survey of the school principals was conducted. While all schools were compliant in meeting the state standards for the number of required drills (eight evacuation and four lockdown drills) conducted each academic year,<sup>2</sup> the results of the surveys indicated that different protocols were being used in conjunction with these exercises, with approximately half indicating that they used SRP-X and half utilizing Run Hide Fight.<sup>3</sup> Thus, an overarching goal of the project was to standardize the protocol being used within and between schools to ensure uniformity in emergency responses district-wide.

**Table 1** provides a timeline and overview of the full project. As indicated, an initial baseline survey was distributed in September 2018 to better understand students' feelings of safety and preparedness at their schools. An unscheduled lockdown drill then was conducted in each building between October and early November with the assistance of DPS and school-based security officers. DPS notified schools approximately one week in advance of the week that the researchers would be coming to the schools, but the specific date and time were not provided in order to capture the most accurate responses to the drill calls. Though unscheduled, the drills were not unannounced in accordance with NASP recommendations (2017, 2018). During both lockdown drill phases, the call to initiate the exercise included the language "this is a drill" (which also was repeated) to ensure that building occupants were notified that it was not a real-world exercise.

**Table 1.** Project timeline.

Phase 1	Summer 2018	<b>Planning</b> <ul style="list-style-type: none"> <li>• Coordinate project with DPS</li> <li>• Survey principals on current practices</li> </ul>
Phase 2	September 2018	<b>Pretest Surveys</b> <ul style="list-style-type: none"> <li>• Administer school climate surveys to assess feelings of safety and preparedness</li> </ul>
Phase 3	October-November 2018	<b>Lockdown Drill # 1</b> <ul style="list-style-type: none"> <li>• Unscheduled drills in schools to assess lockdown effectiveness</li> <li>• Check for doors locked, lights off, room occupants out of sight/cannot be heard, and responses to door knocks</li> </ul>
Phase 4	November 2018	<b>Post-Drill Survey</b> <ul style="list-style-type: none"> <li>• Re-administer Phase 2 school climate survey</li> <li>• Compare results with pretest survey to assess changes in perceptions of safety and preparedness</li> </ul>
Phase 5	January-March 2019	<b>SRP-X Training</b> <ul style="list-style-type: none"> <li>• Train students, faculty, and staff in their respective buildings on new emergency response protocol</li> <li>• 70 sessions in 24 training days</li> </ul>
Phase 6	March 2019	<b>Lockdown Drill # 2</b> <ul style="list-style-type: none"> <li>• Unscheduled drills in schools using the same protocol as in Phase 3</li> <li>• Compare effectiveness of lockdowns before and after training</li> </ul>
Phase 7	April 2019	<b>Post-Training/Drill Survey</b> <ul style="list-style-type: none"> <li>• Re-administer Phase 2 school climate survey</li> <li>• Compare results with pretest and post-drill # 1 survey to assess changes in safety and preparedness perceptions as potentially impacted by training and continued drill exercises</li> </ul>

When each drill was initiated, the research team went room by room, checking to see if the doors were locked, lights were off, and if occupants could be seen or heard from the hallway. The researchers also knocked on each classroom and office door to see if anyone would respond prior to entering the room and advising them to remain in lockdown until administrators cleared the drill. Once all of the rooms had been checked, a debrief period was called for students and teachers to discuss the practice within their rooms and ask questions of the research team before the drill concluded. In addition to being consistent with the operational guidelines of SRP-X, the steps taken by the research team also are consistent with the NASP's (2018) guidance on mitigating trauma during school lockdowns. Depending on the size of the school, the drills took between 7 and 17 minutes, on average, to complete. This drill also served as a baseline to provide data on how effectively schools were securing in response to a potential threat inside the building prior to any training being conducted.

Approximately one week after the lockdown drills concluded, a second survey (using the same instrument as the first) was distributed to students (November 2018). This allowed the researchers to assess what impact, if any, the drill had on students' perceptions of safety and preparedness within their buildings. Following the holiday break (January through March 2019), the research team conducted emergency response training using SRP-X. Seventy individual training sessions were held over 24 school days in the 30 buildings to jointly deliver the training to students, faculty, and staff. Upon completion of the emergency preparedness training, a second round of unscheduled lockdown drills were conducted using the same process as the first (schools notified a week in advance of the visit; researchers checking for locks, lights, out of sight, and responses to door knocks) to determine how the training had impacted the effectiveness of the practices. Finally, a third survey was deployed in April 2019 following the completion of the drills to assess not only the impact of the training but also of multiple lockdown drills on feelings of safety and preparedness. Given, however, that there was considerable disparity in emergency response preparedness prior to the initiation of this project, the present study was broadly guided by the following research question: *What impact do training and lockdown drills have on students' perceptions of preparedness and safety?*

## Participants

Upon receiving approval for the study from the principal investigator's university institutional review board, the district's superintendent mailed a letter to parents of all students enrolled in the district. In addition to outlining the scope of the full project, the letter also included details of how parents could opt out of their children completing the survey. Only one opt out was completed prior to the initiation of the project and that student's teacher was notified in advance of the date the survey was to be taken at each point.

Paper-and-pencil surveys then were distributed to students in grades six and higher, based on district preference and research indicating that validity and acceptability of self-reports (without cognitive pretests, adaptations, and assistance) increases for children over the age of 10 (Kassam-Adams, Kohser, McLaughlin, Winston, & Marsac, 2019). DPS provided the researchers with a list of teachers per school with their respective second period enrollment counts in order to allow for late arrivals to school to still be able to participate. Copies of the surveys, which also included a student assent form describing the survey and corresponding voluntariness, were placed in each teacher's mailbox approximately one week ahead of the intended completion date to allow for time to be retrieved by the educator. Teachers were asked to administer the surveys to students during the school day and return them to the main office. A total of 10,015 surveys were disseminated at each point. The distribution of responses by building level and time is presented in Table 2. Collectively, 10,926 surveys were received by the researchers, representing an average response rate of 36.4%.<sup>4</sup> Surveys were taken anonymously, thereby making it impossible for the researchers to match

**Table 2.** Distribution of student responses by building level and time.

BUILDING LEVEL	TIME 1 (PRETEST)	TIME 2 (POST-DRILL)	TIME 3 (POST-TRAINING)
Pre-K-to-8 (6–8 Only)	907	743	902
Middle School	1,313	810	770
High School	2,343	1,538	1,600
<b>TOTALS</b>	<b>4,563</b>	<b>3,091</b>	<b>3,272</b>
Response Rate	45.6%	30.9%	32.7%

respondents' answers across the three time points. Accordingly, for the purpose of analysis, each time's sample was treated as independent.

Table 3 provides the demographic breakdown of respondents at each time. Both overall and at Times 1 and 3, significantly more males took the survey than females ( $\chi^2 = 77.513$ ,  $p \leq .001$ ). Similarly, at all three survey points, respondents were more likely to identify as black or African American than any other racial group ( $\chi^2 = 45.396$ ,  $p \leq .001$ ). Respondents ranged in age from 10 to 21, with the mean age of respondents at Times 1 and 2 being 13.83 and 13.88 years, respectively. The mean age of respondents at the third survey point was 14.21 and statistically significantly different ( $F = 30.233$ ,  $p \leq .001$ ) from the other two time points according to the Scheffé post hoc analysis. The mean grade level of students at all three points was eighth (T1:  $\bar{X} = 8.64$ ; T2:  $\bar{X} = 8.55$ ; T3:  $\bar{X} = 8.55$ ) and did not differ significantly by time based on the post hoc analysis.<sup>5</sup>

**Table 3.** Distribution of demographic characteristics of student respondents.

	TIME 1 (PRETEST) N = 4,563	TIME 2 (POST-DRILL) N = 3,091	TIME 3 (POST-TRAINING) N = 3,272
<i>Sex</i>			
Male	2,539 (55.6%)	1,493 (48.3%)	1,501 (45.9%)
Female	1,932 (42.3%)	1,531 (49.5%)	966 (29.5%)
<i>Age</i>			
10	81 (1.8%)	14 (0.5%)	9 (0.3%)
11	754 (16.5%)	437 (14.1%)	327 (10.0%)
12	43 (0.9%)	547 (17.7%)	522 (16.0%)
13	583 (12.8%)	412 (13.3%)	480 (14.7%)
14	667 (14.6%)	466 (15.1%)	462 (14.1%)
15	518 (11.4%)	355 (11.5%)	454 (13.9%)
16	478 (10.5%)	314 (10.2%)	356 (10.9%)
17	482 (10.6%)	281 (9.1%)	310 (9.5%)
18+	176 (3.9%)	143 (4.6%)	248 (7.6%)
<i>Grade</i>			
6	869 (19.0%)	522 (16.9%)	618 (18.9%)
7	700 (15.3%)	560 (18.1%)	480 (14.7%)
8	551 (12.1%)	407 (13.2%)	498 (15.2%)
9	738 (16.2%)	501 (16.2%)	488 (14.9%)
10	509 (11.2%)	347 (11.2%)	430 (13.1%)
11	455 (10.0%)	306 (9.9%)	245 (7.5%)
12	522 (11.4%)	274 (8.9%)	335 (10.2%)
<i>Race/Ethnicity</i>			
White	636 (13.9%)	426 (13.9%)	474 (14.5%)
Black	1,533 (33.6%)	1,009 (32.6%)	1,171 (35.8%)
Hispanic	417 (9.1%)	267 (8.6%)	304 (9.3%)
Native American	115 (2.5%)	88 (2.8%)	74 (2.3%)
Asian	372 (8.2%)	264 (8.5%)	258 (7.9%)
Bi-/Multi-racial	746 (16.3%)	503 (16.3%)	376 (11.5%)
Other	480 (10.5%)	347 (11.2%)	346 (10.6%)

Results presented as raw counts with frequency percentages in parentheses. Frequency percentages are based on the total number of surveys collected at each time and may not round to 100.0% due to missing data.

## Measures and analysis

Within the survey instrument, respondents were asked a series of questions related to their feelings of safety in their school building. Specifically, they were asked to rate their agreement to the statements “I feel safe” (1) at my school; (2) in my classroom(s); (3) in the cafeteria; and (4) in the hallways. Responses were coded on a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5), such that higher mean scores indicated greater agreement to feeling safe at school. The questions were then summed into a scale for perceived school safety with a corresponding Cronbach’s alpha of .878.

Students also were asked to rate their agreement regarding their familiarity with SRP-X’s five emergency scenarios – lockout, lockdown, evacuate, shelter, and hold. Responses again were coded along a five-point Likert scale, with higher mean scores representing greater familiarity with how to respond to each instance. An additive scale also was created for further assessment of emergency protocol awareness ( $\alpha = .855$ ).

In order to analyze how perceptions of safety and preparedness varied based on the time at which the survey was taken (e.g., before or after drills and/or training), analysis of variance (ANOVA) was used on the individual questions listed above. Scheffé’s post hoc analysis also was employed to determine which groups, when applicable, significantly differed from one another. Additional analyses were estimated using multinomial logistic regression for the two dependent measures in the study to identify potential demographic correlates of such perceptions. This specific approach assesses each dependent measure by category: strongly disagree (reference group), disagree, neutral, agree, and strongly agree. This method is appropriate because the estimated effect of each independent measure differs across categories of the dependent variable (Hosmer, Lemeshow, & Sturdivant, 2013). In other words, multinomial regression provides the odds ratio of a certain change in perception for each level of agreement in the dependent variable.<sup>6</sup>

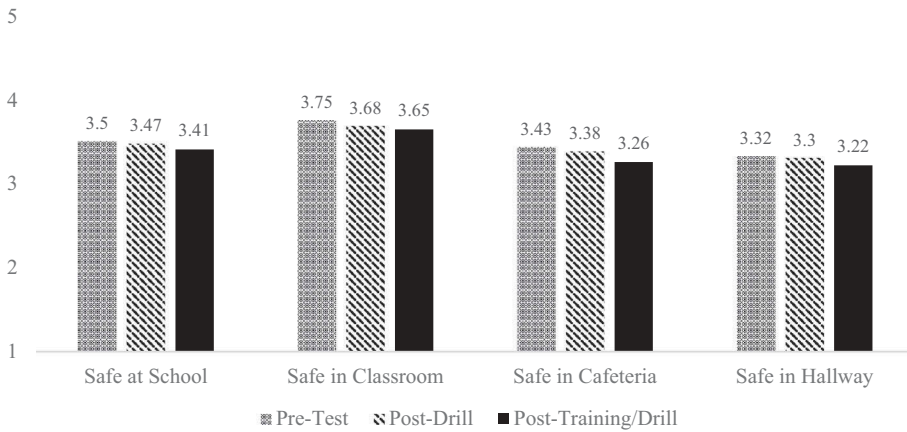
The scales for each dependent variable (school safety and emergency preparedness) were further collapsed according to the original response categories (five-point Likert scales) and number of questions before being entered into the multinomial logistic regression models. For school safety, for example, scaled responses between 1 and 4 were recoded to represent “Strongly Disagree” (1), 5–8 were recoded to “Disagree” (2), 9–12 were recoded to “Neutral” (3), 13–16 were recoded to “Agree” (4), and 17–20 were recoded to “Strongly Agree” (5). This process was repeated for the emergency preparedness measure relative to the number of questions (five) that comprised the original scale. These newly constructed scales then were entered into their respective models against respondent characteristics (sex, race, and school level) to assess differences in perceptions. Each of the independent variables were dichotomized with females, blacks, and Pre-K to 8 schools serving as the reference groups. Time also was included in the regression models as a control measure, with the Time 1 (pre-drills) survey respondents serving as the comparison group.

## Results

### Perceptions of safety

The mean and SD of perceived safety in various areas of the school building by time are presented in Figure 1. The findings suggest that, at each survey point, respondents differed significantly in their feelings of safety within various areas of their schools. Looking at the Scheffé post hoc analyses, the findings indicate that, more specifically, respondents at the post-training survey (following the second lockdown drill) were significantly less likely to express feeling safe at their school and in classrooms, cafeterias, and the hallways than those students at the first survey point (the pretest). Additionally, the respondents at the third survey point also reported feeling significantly less safe in the cafeteria than those students who were surveyed following the initial lockdown drill (Time 2).





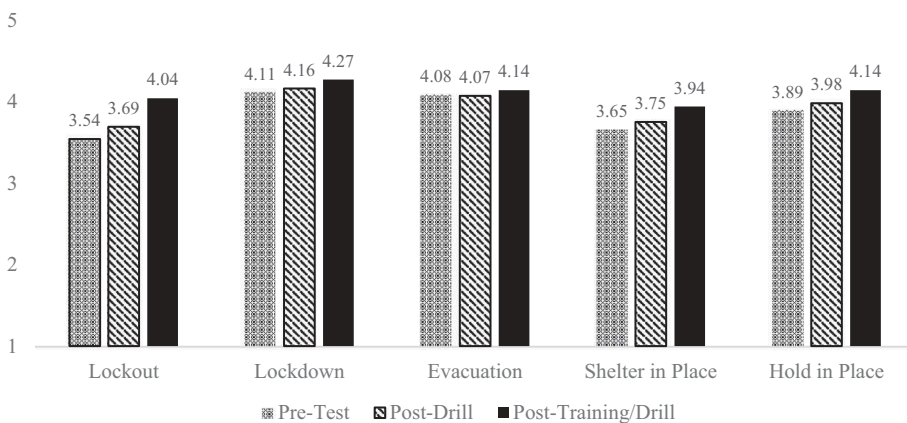
**Figure 1.** Student perceptions of school safety by time (N = 10,926). Response stems were "I feel safe ... ." rated on a five-point Likert Scale (1 = Strongly Disagree to 5 = Strongly Agree).

### *Perceptions of preparedness*

Respondents also were asked to rate their agreement, along a Likert scale, regarding their familiarity with SRP-X's five emergency scenarios. As indicated in [Figure 2](#), for each scenario – Lockout, Lockdown, Evacuate, Shelter, and Hold – the mean responses differed significantly based on when the survey was taken. More specifically, across all five categories, respondents expressed greater familiarity with knowing the protocols at the final survey time than at either the pretest (Time 1) or following the first drill but prior to training (Time 2). Significant differences also were identified between the first and second survey points for each scenario except evacuation.

### *Predictors of perceptions of safety and preparedness*

In first assessing perceptions of school safety ([Table 4](#)), the results indicate that, consistent with the ANOVAs, there are significant differences based on time. Specifically, students who completed the survey both after the first drill (Agree:  $b = -.418$ ,  $p \leq .05$ ; Strongly Agree:  $b = -.401$ ,  $p \leq .05$ ) and following the training and second drill (Agree:  $b = -.400$ ,  $p \leq .01$ ; Strongly Agree:  $b = -.439$ ,  $p \leq .01$ ), relative to those who completed the initial survey, were significantly less likely to express agreement



**Figure 2.** Student familiarity with SRP-X annexes by time (N = 10,926). Response stems were "I know what to do during a ... ." rated on a five-point Likert Scale (1 = Strongly Disagree to 5 = Strongly Agree).



**Table 4.** Multinomial logistic regression results for perceived school safety (N = 10,926).

	Disagree <i>b</i> (SE)	Neutral <i>b</i> (SE)	Agree <i>b</i> (SE)	Strongly Agree <i>b</i> (SE)
Sex (Male)	-.184 (.148)	-.187 (.129)	.004 (.128)	.274 (.132)*
White	.437 (.264)	.349 (.239)	.526 (.237)*	.297 (.242)
Hispanic	.037 (.270)	-.061 (.238)	.032 (.235)	-.092 (.242)
Asian	-.080 (.355)	.507 (.304)	.593 (.301)*	.248 (.309)
Native American	.259 (.451)	-.365 (.418)	.044 (.406)	-.052 (.416)
Biracial/Multiracial	-.415 (.209)*	-.346 (.177)	-.359 (.175)*	-.524 (.182)**
Other Race	-.290 (.222)	-.413 (.191)*	-.564 (.190)**	-.570 (.196)**
Middle School	-.566 (.231)*	-.953 (.208)***	-1.280 (.206)***	-1.164 (.210)***
High School	-.542 (.226)*	-.465 (.202)*	-.670 (.200)***	-.723 (.204)***
Posttest 1	-.418 (.177)*	-.400 (.155)**	-.528 (.153)***	-.458 (.157)***
Posttest 2	-.401 (.182)*	-.439 (.159)**	-.663 (.158)***	-.732 (.163)***
(Constant)	1.681 (.264)***	3.290 (.237)***	3.793 (.235)***	3.062 (.239)***
Log Likelihood = 274.764***				
Nagelkerke $R^2$ = .031				

Strongly disagree serves as the comparison category and is thereby omitted from the table.

\* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

compared to strong disagreement about feeling safe at their school. Compared to the Pre-K to 8 schools, students who attended traditional middle schools also were less likely to express agreement about feeling safe than strong disagreement (Agree:  $b = -1.280$ ,  $p \leq .001$ ; Strongly Agree:  $b = -1.164$ ,  $p \leq .001$ ), as were those who were enrolled in high school (Agree:  $b = -.670$ ,  $p \leq .001$ ; Strongly Agree:  $b = -.723$ ,  $p \leq .001$ ).

Looking specifically at demographics, significant differences are found based on the self-reported race of the respondents. As compared to black students, those identifying as biracial or multiracial ( $b = -.524$ ,  $p \leq .01$ ) and other race ( $b = -.570$ ,  $p \leq .01$ ) were significantly less likely to express strong agreement rather than strong disagreement that they felt safe at school. These same groups also were less likely than black students to agree rather than strongly disagree about feeling safe (Biracial/Multiracial:  $b = -.359$ ,  $p \leq .05$ ; Other Race:  $b = -.564$ ,  $p \leq .01$ ). Conversely, both white ( $b = .526$ ,  $p \leq .05$ ) and Asian ( $b = .593$ ,  $p \leq .05$ ) respondents were more likely than black students to agree rather than strongly disagree that they felt safe at school. With regard to sex, as compared to females, male students were significantly more likely to agree ( $b = .004$ ,  $p \leq .001$ ) or strongly agree ( $b = .274$ ,  $p \leq .05$ ) than to strongly disagree that they felt safe at school.

As illustrated in Table 5, several significant differences were found related to perceptions of emergency preparedness. First, as compared to students in Pre-K to 8 schools, respondents attending the district's middle schools were less likely to express agreement as compared to strongly disagreeing with knowing how to respond according to the SRP-X protocol (Agree:  $b = -1.055$ ,  $p \leq .01$ ; Strongly Agree:  $b = -.977$ ,  $p \leq .05$ ). This same trend held among high school respondents (Agree:  $b = -.962$ ,  $p \leq .01$ ; Strongly Agree:  $b = -1.450$ ,  $p \leq .001$ ). Finally, as with perceptions of school safety, male students were found to significantly differ in their perceptions of emergency preparedness as compared to their female counterparts. Specifically, males were more likely to strongly agree ( $b = .412$ ,  $p \leq .05$ ) than strongly disagree that they knew how to respond in an emergency at school.<sup>7</sup> These findings are discussed further in the next section.

## Discussion

For more than 20 years since the Columbine High School shooting, keeping students in educational institutions across the nation safe has been a top priority for parents, administrators, and other stakeholders. Among the many changes since April 20, 1999 has been the implementation of emergency preparedness training in the form of lockdown drills. Yet despite the reach of these programs, little empirical evidence (with Zhe & Nickerson, 2007 serving as a notable exception) is available to suggest what, if any, impact such exercises have on the individuals who participate. The

**Table 5.** Multinomial logistic regression results for perceived emergency preparedness (N = 10,926).

	Disagree <i>b</i> (SE)	Neutral <i>b</i> (SE)	Agree <i>b</i> (SE)	Strongly Agree <i>b</i> (SE)
Sex (Male)	-.459 (.244)	.030 (.211)	.143 (.207)	.412 (.207)*
White	.551 (.382)	.161 (.344)	.146 (.338)	-.074 (.338)
Hispanic	.151 (.424)	-.260 (.373)	-.046 (.363)	-.200 (.363)
Asian	.210 (.458)	.007 (.404)	.096 (.396)	-.279 (.397)
Native American	.052 (.863)	-.245 (.757)	.126 (.736)	.108 (.735)
Biracial/Multiracial	-.213 (.378)	-.065 (.319)	-.107 (.313)	.052 (.312)
Other Race	-.009 (.380)	-.247 (.329)	-.363 (.322)	-.543 (.322)
Middle School	-.789 (.434)	-.848 (.396)*	-1.055 (.390)**	-.977 (.389)*
High School	-.835 (.399)*	-.795 (.366)*	-.962 (.361)**	-1.450 (.361)***
Posttest 1	-.617 (.278)*	-.315 (.243)	-.297 (.239)	-.209 (.239)
Posttest 2	-1.010 (.327)**	-.457 (.271)	-.155 (.264)	.053 (.264)
(Constant)	2.122 (.454)***	3.583 (.415)***	4.596 (.409)***	4.730 (.409)
Log Likelihood = 399.428***				
Nagelkerke $R^2$ = .046				

Strongly disagree serves as the comparison category and is thereby omitted from the table.

\* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

present study sought to fill this gap by examining not only how students perceive their safety and emergency preparedness, but also how such attitudes are impacted by participation in a drill and training in the SRP-X protocol.

### **Perceptions of emergency preparedness**

As the results indicate, perceptions of emergency preparedness continued to improve over the course of the project. Specifically, as compared to the initial survey (when students had received no considerable instruction), respondents at the second survey – following the first lockdown drill but prior to formal training – reported significantly greater agreement that they knew how to respond to the five different emergencies within SRP-X. After receiving specific training on the protocol and participating in a second lockdown drill, respondents were significantly more likely to express feeling prepared for various emergencies as compared to the other two time points.

A primary goal of lockdown drills or similar practices (e.g., evacuation drills) is to develop muscle memory. In practicing the actions that one needs to take in an emergency situation, these skills become second nature, such that during a chaotic episode, one's body knows exactly how to respond. By continuing to participate in these lockdown drills, it may be helping to improve the general awareness of response strategies, thereby leading students to feel more confident in knowing what to do when faced with various emergency situations. The number of mandated emergency drills varies by state (The Council of State Governments, 2014), with 43 and the District of Columbia requiring school districts to have comprehensive safety and preparedness plans in place (Macdonald & Perez, 2019). Thus, it is imperative that schools regularly (though not excessively) conduct various types of emergency preparedness drills to increase students' confidence in and awareness of the adopted protocols.

### **Perceptions of safety**

Though feelings about emergency preparedness may have improved over the course of the project, perceptions of safety in the schools did not. Specifically, students taking the survey at the end of the project were significantly less likely to report feeling safe at school or in various parts of the building. There are two potential explanations for this. First, specifically related to the district where the research was conducted, these students both reside in and attend schools in areas that are prone to violence. Over the course of the project, three currently enrolled students from the district were killed (outside of the schools) and many were exposed to other episodes of neighborhood violence,

including gang shootings.<sup>8</sup> Thus, it is possible that their concerns about their potential for victimization in the community carried over into their perceptions of their safety at school. Further research, however, would be needed to determine if this was in fact the case.

A second potential explanation for the diminishing feelings of safety is that the continued drilling over the course of the school year served to highlight perceived vulnerabilities by the students, leading them to express feeling significantly less safe at school and within the buildings by the end of the project as compared with the start. Interestingly, in a supplementary survey question asked of the students, their belief that their teachers knew how to protect them decreased slightly after the first lockdown drill but improved significantly after the training (which students and their educators attended together) and second exercise. This may suggest that while they are more confident in their educator's ability to respond to an emergency, they still feel vulnerable to the possibility of one happening in the first place.

### ***Implications for practice***

Broadly speaking, the disparity in perceptions of students related to emergency preparedness and school safety can have potential implications for research in this area as it moves forward. Specifically, the findings of the present study highlight the fact that, in the context of emergency response, safety and preparedness are distinct concepts. This reasonably follows broader literature on fear of crime and perceived risk of victimization (see, generally, Ferraro, 1995; Ferraro & LaGrange, 1987). Considered to be conceptually distinct from one another, research has suggested that perceptions of risk victimization influence a person's fear of crime (Ferraro, 1995; Ferraro & LaGrange, 1987). It is possible then that a deeper relationship exists between the concepts of safety and preparedness as it relates to emergency response, and future research would benefit from teasing out such potential effects.

Another important finding of the present study is that there were significantly different perceptions related to both safety and preparedness for students attending traditional middle and high schools as compared to those enrolled in Pre-K to 8 schools. Notably, the middle and high school students reported feeling less safe and prepared as compared to those respondents at the combined centers. It is possible that the presence of younger children in the buildings could lead to handling of emergency situations differently, with administrators, teachers, and staff taking a more hands-on approach to responding as well as day-to-day security. For example, during drills, it was observed that teachers in the elementary schools were assisting the younger students in getting into their hiding spaces, whereas in the upper grades, such responsibility was placed on the students themselves. Another potential explanation is that a greater emphasis is placed in the middle and high school buildings on student autonomy and empowerment in responding to emergencies. Regarding this, future research should examine such considerations.

### ***Limitations and future research directions***

The present study is not without its limitations. First, as noted, the research was conducted in a large urban school district, despite that most mass shootings for which such exercises are used in preparation of tend to occur in suburban communities (Pane, 2018). Accordingly, future research should be conducted in school districts of varying sizes and in different types of localities as there may be differences in students' perceptions based on their perceived vulnerability stemming from their community structure. Doing so also would enable researchers to consider potential community effects, such as neighborhood violence, and their impact on school safety.

Moreover, future studies may wish to consider random assignment with experimental and control groups with smaller districts to further bolster the validity of the findings of the present study. While such was the original intent of the researchers, concerns existed over leaving any students untrained for an extended period of time, causing the design of the study to be altered to its present form at the request of the district. In addition, the response rate, although consistent with that found in survey

research more generally (Cook, Heath, & Thompson, 2000), could be improved with researchers administering the survey, following up with students who may have been absent, and giving multiple reminders and follow-ups to teachers about administering and returning the surveys. Ideally, though this study assessed group level changes, individual students would be tracked across time with an identifier to allow conduct within-individual analyses over time.

Finally, researchers should assess not only the impact of training and drills on students but also the protocol(s) used and the manner of delivery of the practices. Given the variability in options available, it is imperative to adequately assess all to fully determine which has the greatest opportunity to prepare students for emergencies without unnecessarily inducing fear and apprehension. While all of the schools in the district were compliant in conducting the number of state mandated emergency preparedness drills, information obtained from the principals at the start of the project indicated a difference in the specific programs employed between the schools (Run Hide Fight vs. SRP-X). This may have attributed to the differences between schools and level of institution (middle, high, and Pre-K to 8) in perceptions of safety and emergency preparedness that existed at the baseline survey point (Time 1), though additional research would be needed to determine what, if any, impact the protocols being used had on such attitudes.

## Conclusion

Still, despite these limitations, the present study makes an important contribution to the literature on school safety broadly and lockdown drills executed according to the SRP-X, in particular. As school shootings continue to occur, it is imperative to ensure that students, along with the faculty, staff, and administration, receive evidence-based training on how to respond if ever faced with such a situation. The lockdown approach tested in this study prepares students and staff to secure themselves out of sight behind locked doors but did not assess the self-evacuation option, consistent with running, or fighting as active shooter or armed assailant options-based drills do (NASP, 2017). Therefore, it is critical to note that these findings apply only to lockdown drills and those that comply with the SRP-X protocol and best practices (see NASP, 2018). Continued assessment of awareness and perceptions of safety and preparedness – necessary to increase participant buy-in, along with evaluating the effectiveness of the drills themselves, is vital to ensuring that, should the worst day happen, everyone will be ready to respond.

## Notes

1. The breakdown of the schools in the district is 15 elementary (grades Pre-K to 5), 5 Pre-K to 8, 5 middle (grades 6 through 8), and 5 high (grades 9 through 12). All schools participated in the project at the directive of the superintendent. An additional 800 contract employees also serve the district.
2. New York State Education Law, Title 1, Article 17 § 807.
3. Given that the state requirements for the five situations schools must be prepared to respond to, as noted at the onset of this paper, mirror SRP-X, it is possible (though unable to be confirmed through the survey responses) that the principals selected this out of the response choices provided as it was most akin to what they were already doing.
4. The reported response rate can be attributed to several factors, including (though not necessarily limited to) teachers not administering or returning the surveys, students not giving assent to the surveys, and student absenteeism.
5. Information obtained from the New York State Department of Education (NYSED; <https://data.nysed.gov/>) on the demographic composition of the district pertaining to sex and race/ethnicity was compared against the study's sample to determine representativeness. For the majority of race/ethnicity categories (white, black, Hispanic, Native American, and biracial/multiracial), any difference between the sample and population was not significant. For Asian, as well as sex, the differences were significant. Specifically, compared to the district as a whole, males and females each were underrepresented in the sample, while Asians were slightly overrepresented. Information on the distributions of age and grade level was not available from NYSED.

6. Although multinomial logistic regression is the most appropriate analytic technique, it does possess certain limitations. First, comparisons are made between each category of the dependent variable, which limits the inferences that can be made across categories of the dependent variable to only comparisons to the reference category (strongly disagree). Additionally, this categorization of the logistic regression analysis results in a loss of power in the regression estimates.
7. At the recommendation of the reviewers, additional analyses (not presented due to space limitations) were performed on revised dependent measures. Specifically, the neutral responses were dropped from the analyses and the models were re-estimated using binary logistic regression to examine predictors of agreement (collapsing responses of Agree and Strongly agree, coded as 1) as compared to disagreement (collapsing responses of Disagree and Strongly Disagree, coded as 0 and serving as the reference group) related to perceptions of school safety and emergency preparedness. While most of the significant predictors remained consistent, several notable changes were uncovered. With regard to perceptions of school safety, all predictors remained significant (and in the same direction) with the exception of biracial/multiracial, which was no longer significant in the revised model. For perceptions of emergency preparedness, both white and other race became significant predictors, with individuals identifying as either race being less likely to express agreement than disagreement with familiarity of SRP's five annexes. The significance of time also changed slightly: Time 2 (post-drill but pre-training) was no longer a significant predictor; Time 3 (post-training and second drill) was significant but the direction changed. Specifically, respondents completing the survey at Time 3 were more likely to express agreement about their familiarity with the emergency protocol than disagreement than those who completed the initial survey (Time 1).
8. In addition to the three students who were killed that were enrolled in the district during the course of the project, one additional student who had ties to the district but had transferred to another district in a neighboring county also was killed. Of the enrolled students who were killed, two – one middle school and one high school – were killed after the initial survey (Time 1) but before the first lockdown drill. The third student was killed in mid-December, after the second survey was disseminated and collected but prior to the remaining phases (training, second drill, and final survey) of the project.

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