

School Violence and Safety Policies and Practices in Urban and Rural Communities: Does Location Matter?

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Abstract

While there is a large body of literature on school violence and security policies in urban areas, school violence in rural areas has gained considerably less academic attention. Recent research in this area has indicated that rural schools and communities have experienced rates of violence that are similar to their urban counterparts. However, the generalizability of findings from these exploratory research projects is limited. The current study investigated the impact of school location on school violence incidents and compared correlates of school violence in rural schools to correlates of school violence in urban schools. Specifically, upon analyzing the 2010 School Survey on Crime and Safety (SSOCS) data, this study found that rural schools reported more incidents of school violence than urban schools, and different predictors affected school violence based on school location. In light of these findings, potential implications for location-specific school safety strategies are discussed within.

Keywords: School Violence, K-12, Rural Schools, Urban Schools, Comparative Research



There has been a lot of scholarly attention given to exploring predictors of school violence in urban areas (Barton-Bellessa et al., 2014). This is likely due to the reality that, historically, official crime rates have been higher in urban areas than in rural areas, suggesting the presence of more crime in urban locations than in rural locations (Wells & Weisheit, 2012). Thus, conventional wisdom would suggest a greater need to explore violent crimes in urban areas than in rural areas because there is more of it being committed there. That said, recent data have suggested that the gap in crime rates between urban and rural areas may be narrowing. According to the Office for Victims of Crime (2016), the rate of violent crimes in urban areas was 22.2 per 100,000 individuals in 2014. Comparatively, the violent crime rate in rural areas was 18.3 per 100,000 individuals for that same year. These data show that violent crimes are no longer a uniquely urban phenomenon. As such, researchers have suggested that more effort is needed to be made to explore violent crimes in rural areas (Donnermeyer, 2016; Rennison & DeKeseredy, 2017).

These general trends in violent crimes also extend to schools. However, while a few recent studies have found locational differences in school violence (Jennings et al., 2011; Lesneskie & Block, 2017), the direction of this relationship is still unclear, and effects of location on school violence seems to be mediated by cultural variables unique to school climate—which can be affected by school location (Gottfredson et al., 2005). To date, little scholarly attention has been given to comparing patterns of crime in rural and urban school settings (cf., Jennings et al., 2011; Lesneskie & Block, 2017; Flynn et al., 2018; Peguero et al., 2020). Research has also generally neglected to assess correlates of school crime that are unique to school location. This is an important, understudied area within criminology that needs further exploration as the effectiveness of school policies and practices for preventing crimes may differ by school location (Frederick & Jozefowicz, 2018). Accordingly, given the dearth of literature in this area, there were two primary goals to this exploratory study: (1) to examine locational differences in incidents of school violence, and (2) to explore the unique correlates of school violence in both urban and rural areas. To achieve these objectives the present study compared predictors of school violence between urban and rural schools using the restricted-use 2010 School Survey on Crime and Safety (SSOCS) data. Thus, the current study provides one of the first true examinations of predictors of school violence by school location using a national sample of U.S. schools and offers policy recommendations that educational administrators can use to help prevent school violence.

Literature review

School Violence

In simple terms, school violence refers to violent acts committed on school grounds or at school-sponsored events. There are several ways in which this concept has been operationally defined in the scholarly literature. Typically, school violence is captured using an index measure of the number of incidents of rape, sexual assaults, robberies, assaults, and/or threats of assault that occur at a school or during school-sponsored activities (see Jennings et al., 2011; Lesneskie & Block, 2017; Padgett et al., 2020). Schools that report more incidents of these types of crimes are considered to be more violent than those that report fewer incidents. In an effort to make schools safer, researchers have devoted considerable time toward assessing the antecedents of school violence. This research has documented a relationship between school size, racial and gender composition, and school violence (James et al., 2015; Jennings et al., 2011; Lesneskie & Block, 2017; Peguero et al., 2020; Robers et al., 2012). Generally, findings have revealed larger schools, and those with higher percentages of males and minority students experience more violent crimes than do smaller schools and schools with more female and white students (Jennings et al., 2011; Maskaly et al., 2011; Robers et al., 2012). Although limited, prior work has also suggested that school violence also may be affected by school location (i.e., between urban, rural, and suburban locations), but the strength and effects of school location on rates of school violence and correlates of school violence remains unclear (Jennings et al., 2011; Lesneskie & Block, 2017). The following provides a brief summary of the available scholarly research that has attempted to examine locational differences in school violence.

School Violence and School Location

A growing body of literature has begun to assess the impact of school location on school violence by comparing patterns of violence in urban schools to patterns of violence in rural schools. For example, Jennings et al. (2011) analyzed data from the 2006 School Survey on Crime and Safety (SSOCS) to explore the effectiveness of various security measures on violent crimes in schools. Their results revealed that the violent crime rate reported by administrators in rural schools was higher than the violent crime rate reported by administrators in city schools, when controlling for security measures and school characteristics. Conversely, using data from the 2008 SSOCS, Lesneskie and Block (2017) examined the effect of school location on rates of school violent crimes and found that rates of violent crimes were higher in urban schools than in rural schools when controlling for school climate, community and parental involvement, and security measures. However, using data from the 2003 National Crime Victimization Survey's School Crime Supplement, Wynne and Joo (2011) found no differences in victimization experiences between students attending urban schools and those attending rural schools.

More recently, Flynn and colleagues (2018) used school location to assess patterns of school violence and delinquency across urban, suburban, and rural schools in the Commonwealth of Pennsylvania during the 2015-2016 academic year. The authors noted some differences in general patterns of delinquency. For example, the mean number of simple assault cases reported in rural schools was 27, compared to 33 reported in suburban schools and 45 reported in urban schools. Likewise, the mean number of fighting incidents reported was 84 in urban schools, 61 in suburban schools, and 34 in rural schools—indicating that more urbanized schools reported more violent incidents. However, the authors found schools in rural areas to report more incidents of bullying and more incidents involving a cutting instrument than suburban and urban schools, suggesting that the relationship between school location and school violence is complex, and may be dependent on outcome measures assessed.

Related, Cuellar (2018) used data from the 2007-2008 SSOCS to examine the utility of school safety strategies for preventing school-based violence. The author found no relationship between urbanicity and violent incidents reported by schools in multivariable modeling. He also found little evidence that physical prevention strategies, such as the use of cameras and metal detectors, or legal strategies, such as the use of school resource officers or security guards, had any effect on incidents of violence in a school in urban, suburban, rural, or city schools, controlling for other relevant predictors. Notably, Cuellar (2018) found that parental involvement and interactionist strategies, such as individual mentoring programs and student involvement in resolving problems, were inversely and independently related to incidents of school violence. Thus, schools that incorporated such mechanisms reported fewer incidents of school violence than those that had not.

The Current Study

Collectively, the scant literature in this area suggests that violent crimes in schools may be affected by school location, or factors indirectly related to school location, such as school climate. Urban and rural communities and schools have different geographic, demographic, economic, and social influences that impact social life and crime (Pleggenkuhle & Schafer, 2018). As a result, school safety policies or practices may work differently in different school locations. To date, however, little research has attempted to explore the correlates of school violence across school locations. Accordingly, to help fill these gaps in the literature, the current study examined the effects of location on incidents of school violence using a nationally representative sample of U.S. schools while also exploring the unique correlates of school violence across geographical location. The specific overarching research questions guiding this project were:

R1: Does school location differentially impact incidents of school violence?

R2: Are there predictors¹ of school violence that are unique to rural and urban schools?

Methods

Data

Data for this study come from the restricted-use 2010 School Survey of Crime and Safety (SSOCS), which was gathered from school principals and administrators of K-12 public schools in the United States by the U.S. Census Bureau between February 2010 and June 2010 (Neiman et al., 2012). In addition to detailed student demographic information (e.g., race, gender, and socioeconomic status), the survey included a variety of questions related to school programs and practices; school security; staff training; parent and community involvement in the school; the number of criminal incidents; and general school characteristics (Neiman et al., 2012). Employing a stratified sampling technique, the *U.S. Census Bureau* sent 3,476 questionnaire packets to public schools (i.e., elementary, middle, high, and combined schools). A total of 2,648 usable questionnaires were returned—representing an 81% response rate.

Measures

Table 1 below presents the operational definitions and coding scheme used for all variables included in this study.

Dependent variable. The dependent variable of interest for this study was school violence. Specifically, we examined non-lethal violent crimes committed at schools. Consistent with Neiman and colleagues (2012), this measure included both threats of attack and actual attacks, such as physical assaults, robberies, sexual batteries, and rape committed on school property in the previous year (Neiman et al., 2012).

Independent variables. There were three domains of independent variables included in analyses: school characteristics, school security measures, and school programs.

School characteristics. Five variables related to school characteristics were included in analyses. These measures were: school location (i.e., urban and rural), school grade (i.e., elementary, middle, high, and combined schools), number of black, non-Hispanic students

¹ Here, we use the word “predictor” in a linear manner, not in a causal manner.

Table 1

Variable Coding Schema

Variable	Description/Coding
Dependent Variable	
School Violent Crimes	Total number of violent incidents (rape, sexual batteries, robberies, attacks, and threats of attack)
Independent Variables	
<i>School Characteristics</i>	
School Location	Location of schools (City, Urban Fringe, Town, & Rural): 0 = urban (city, urban fringe, & town); 1 = rural
Grades	School Grades offered (Ref=High)
Elementary	1 = elementary; 0 = all other categories
Middle	1 = middle; 0 = all other categories
High	1 = high; 0 = all other categories
Combined	1 = combined; 0 = all other categories
Male Students	Percentage of male students
Black Students	Number of Black, non-Hispanic students in school
Free/Reduced Price Lunch	Percentage of students eligible for free/reduced-price lunch
<i>School Security Measures</i>	
Visitor Check-in	School requires visitor check-in: 1 = Yes; 0 = No
Locked Door	Access controlled locked/monitored doors: 1 = Yes; 0 = No
Random Metal Check	Have random metal detector checks on students: 1 = Yes; 0 = No
Security Guards	Number of full-time security guards
School Resource Officers	Number of full-time school resource officers
Guard with Firearm	Guards armed with firearms: 1 = Yes; 0 = No
Security Cameras	Camera(s) monitors school: 1 = Yes; 0 = No

School Programs

Parent Involvement	Parent participation Scale: Each item measured with Likert-scale ranging from 1 to 4. The total score on this scale ranges from 4 to 16 with higher scores indicating more involvement of parents in school events
Student Involvement	Student involvement in resolving student conduct problems: 1 = Yes; 0 = No
Individual Mentoring	Individual mentoring/tutoring of students by students or adults: 1 = Yes; 0 = No
Mentoring Student	Mentoring of students by teachers or counsellors: 1 = Yes; 0 = No
Teacher Training: Signs of Violence	Train teachers in early warning signs for violent behavior: 1 = Yes; 0 = No
Teacher Training: School Safety	Train teachers in school safety: 1 = Yes; 0 = No

enrolled in the school², percentage of male students, and percentage of students who were eligible to receive a free or reduced-price meal. The measure of school location used in the restricted-use 2010 SSOCS data included four response categories: city, urban fringe, town, and rural. According to Ratcliffe et al. (2016), “urban areas” include urbanized areas (i.e., 50,000 or more residents) and urban clusters (i.e., less than 50,000, but more than 2,500 residents), while “rural areas” refer to all territory and population not included under the definition of “urban area.” In the 2010 SSOCS, small towns were defined as areas that had less than 25,000 residents, but more than 2,500 residents (Neiman et al., 2012). Building on Ratcliffe et al.’s (2016) benchmark, city, urban fringe, and town were combined and considered “urban” (coded as 0), whereas the measure of “rural” was kept the same and coded as “1” in the current study. As seen in Table 1, school grades were transformed into a series of dummy variables with “high school” used as a referent category for multivariable analyses. All other school characteristics were continuous variables.

School security measures. The second domain, school security measures, included seven variables designed to assess security protocol at a school—mostly within the realm of what Cuellar (2018) would consider physical and legal safety measures. Five of these measures were related to a series of questions asking administrators: 1) if visitors at their school needed to

² Admittedly, this is a poor measure of racial diversity in a school. However, the authors did not have access to a more inclusive measure at the time of final analyses prior to publication. Future work should use a more inclusive measure to capture racial diversity in a school.

check-in to enter the school building, 2) whether their school operated locked/monitored doors to control visitors' access to the school building, 3) if their school had a random metal check policy to control weapon possession of students, 4) if security guards working at their school were armed with some type(s) of firearm, and 5) if their school had a security camera system installed to monitor the facility. Responses to these questions were dichotomized as "yes" (coded as "1") or "no" (coded as "0"). Two other continuous measures of school security were also included -- the number of security guards working at the school and the number of School Resource Officers (SROs) employed at the school, as prior research has suggested that type of security personnel may influence crime and delinquency within a school (Devlin & Gottfredson, 2018; Fisher & Devlin, 2020; Tanner-Smith et al., 2018).

School programs. The last domain assessed in this study included variables related to school programs involving parents, students, and teachers (Neiman et al., 2012). Specifically, these measures were constructed from questions asking administrators to report whether their school had five different types of school programs, including: 1) any kind of student involvement in resolving problems, 2) individual mentoring of students by students or adults, 3) a student mentoring program provided by teachers or counselors, 4) training sessions for teachers about early warning signs of violent behaviors, and 5) training sessions for teachers about school safety. Responses to these five questions were dichotomous (0 = no, 1 = yes).

Additionally, a continuous measure of parental involvement was also constructed and included in analyses. We argue that this measure serves as a proxy measure of collective efficacy within a school, as areas in which there is more collective efficacy would naturally have greater parental involvement in school activities because parents are interested in the well-being and development of children within the community. The parent involvement index consisted of four items designed to assess how involved parents in the school district were with school activities (i.e., parent participates in the open house, conference, and subject-area events, and parent volunteers at school). Each item was measured with a 4-point Likert-scale ranging from 1 (0 to 25 percent of participation) to 4 (76 to 100 percent of participation). Thus, the scale for this measure ranged from 4 to 16 with higher scores indicating more involvement of parents in school events.

Analytic Strategy

In the current study, a three-pronged approach was used for analyses. First, frequency and descriptive statistics were calculated and examined for all variables of interest. Second, bivariate analyses (i.e., t-tests and Chi-Square Tests) were constructed to assess differences in violent crimes, school characteristics, school security measures, and school programs between urban schools and rural schools. Third, multivariable modeling was used to examine the impact of school location and school characteristics on school violent crimes, and then to see if these

predictors varied by school location.

As the dependent variable was a frequency or count measure of school violence, there was a need to use a count-based modeling technique (Cuellar, 2018; Jennings et al., 2011; Lesneskie & Block, 2017; Long, 1997; O'Neill & McGloin, 2007). Consistent with other tests of crime (cf., Jennings et al., 2011; Long, 1997), the data for this study had over-dispersion issues, as noted by the dispersion statistic of Pearson Chi-Square equal to 1.852. Accordingly, this study employed a series of negative binomial regression models (Hilbe, 2011; Long, 1997). The first model examined the effect of school location on school violence while controlling for other variables indicated above. Then, two separate models were constructed to assess differences in the impact of the three domains of school predictors (i.e., school characteristics, school security measures, and school programs) on school violence in rural and urban locations.

Results

Univariate and Bivariate Analyses: Comparing Urban and Rural Schools

Table 2 displays results from our univariate and bivariate analyses. As seen in Table 2, the majority (74.6%) of schools in the sample were located in urban areas, while 25.4% were located in rural areas. Regarding school violent crimes, in the aggregate, the mean number of crimes reported was 21.91 with a standard deviation of 40.89. Upon separating the sample by location, there was a statistically significant difference found for the number of violent crimes reported by urban and rural schools. Administrators in urban schools reported a mean of 24.16 violent crimes with a standard deviation of 43.96, while administrators in rural schools reported a mean of 15.33 violent crimes with a standard deviation of 29.19. A standard deviation larger than the mean represents that the distribution of school violent crimes was skewed and widely dispersed from the mean in all three samples. Considering the skewed distribution of this variable, the median offers a better measure of central tendency. The median number of violent crimes was 10 in the sample as a whole, 12 in the urban sample, and 7 in the rural sample. The difference in reported violent incidents between urban and rural schools was found to be statistically significant ($t=5.9$, $p<0.001$), with results suggesting that the mean number of school violent crime incidents was higher in urban schools than in rural schools.

Several other important findings emerged from bivariate analyses. Notably, of the five variables in the domain of school characteristics, three were found to be statistically significantly associated with school location. For instance, type of school varied by location ($\chi^2=62.39$, $p<0.001$), with results indicating that there were more elementary schools, middle schools, and

Table 2

Descriptive Statistics for Total Variables and Comparison of Urban and Rural Schools Using Chi-Square (*n*, %) and *t* Tests (*M*, *SD*) (*N* = 2648)

Variable	Total N(%)	Total Mean±SD	Urban M±SD or N(%)	Rural M±SD or N(%)	<i>t</i> or χ^2
Dependent Variable					
School Violent Crimes	–	21.91±40.89 Mdn (10)	24.16(43.96) Mdn (12)	15.33(29.19) Mdn (7)	<i>t</i> = 5.9***
Independent Variable					
<i>School Characteristics</i>					
School Location					
Urban	1975(74.6)	–	–	–	–
Rural	673(25.4)	–	–	–	–
Grades					
Elementary	684(25.8)	–	517(26.2)	167(24.8)	$\chi^2=62.39***$
Middle	909(34.3)	–	689(34.9)	220(32.7)	
High	948(35.8)	–	724(36.7)	224(33.3)	
Combined	107(4.0)	–	45(2.3)	62(9.2)	
Male Students (%)	–	48.95±10.56	49.08±10.25	48.58±11.44	<i>t</i> = 1.003
Black Students (#)	–	128.5±222	150.28±241	64.91±132	<i>t</i> = 11.45***
Free/Reduced Price Lunch	–	46.69±26.96	47.62±28.06	43.93±23.26	<i>t</i> = 3.37**
<i>School Security Measures</i>					
Visitor Check-in					
Yes	2636(99.5)	–	1969(99.7)	667(99.1)	$\chi^2=3.84$
No	12(.5)	–	6(.3)	6(.9)	
Locked Door					
Yes	2410(91.0)	–	1797(91)	613(91.1)	$\chi^2=0.006$
No	238(9.0)	–	178(9.0)	60(8.9)	
Random Metal Check					
Yes	219(8.3)	–	191(9.7)	28(4.2)	$\chi^2=20.09***$
No	2429(91.7)	–	1784(90.3)	645(95.8)	
Security Guards	–	.52±2.48	.77±2.59	.30±1.82	<i>t</i> = 6.86***

School Resource Officers	–	.15±2.16	.24±2.22	.38±1.78	$t = 1.48$
Guard with Firearm					
Yes	1288(48.6)	–	1019(51.6)	269(40.0)	$\chi^2=27.15^{***}$
No	1360(51.4)	–	956(48.4)	404(60.0)	
Security Camera	–				
Yes	1932(73.0)	–	1445(73.2)	487(72.4)	$\chi^2=.164$
No	716(27.0)	–	530(26.8)	186(27.6)	
<i>School Programs</i>					
Parent Involvement	–	5.90± 2.98	5.95±2.98	5.77±2.97	$t = 1.299$
Student Involvement					
Yes	1375(51.9)	–	1075(54.4)	300(44.6)	$\chi^2=19.53^{***}$
No	1273(48.1)	–	900(45.6)	373(55.4)	
Individual Mentoring					
Yes	1685(63.6)	–	1325(67.1)	360(53.5)	$\chi^2=40.1^{***}$
No	963(36.4)	–	650(32.9)	313(46.5)	
Mentoring Student					
Yes	1176(44.4)	–	944(47.8)	232(34.5)	$\chi^2=36.1^{***}$
No	1472(55.6)	–	1031(52.2)	441(65.5)	
Teacher Training for Signs of Violence					
Yes	1285(48.5)	–	985(49.9)	300(44.6)	$\chi^2=5.64^*$
No	1363(51.5)	–	990(50.1)	373(55.4)	
Teacher Training for School Safety					
Yes	926(35.0)	–	748(37.9)	178(26.4)	$\chi^2=28.81^{***}$
No	722(65.0)	–	1227(62.1)	495(73.6)	

Note, Mdn=median; SoV¹=Signs of Violence, SS²=School Safety; *p < .05, ** p < .01, *** p < .001

high schools in urban settings than in rural settings. However, there were more “combined schools” in the rural sample than in the urban sample (9.2% v. 2.3%). Also, the number of black students ($t=11.45$, $p<0.001$), and the percentage of students who were eligible to receive free or reduced-price meals ($t=3.37$, $p<0.01$) varied by school location. Results showed that urban schools in our sample had more black students and greater percentages of students who were eligible to receive a free or reduced-price meal than did rural schools.

In the domain of school security measures, three variables were found to be statistically

significantly associated with school location. For instance, the number of security guards was higher in urban schools than in rural schools ($t=6.86, p<0.001$). Similarly, regarding our measure of random metal checks, 96% of rural schools did not have a random metal check policy compared to 90% of urban schools ($\chi^2=20.09, p<0.001$). Moreover, 52 % of urban schools had employed guards with firearms compared to just 40% of rural schools in our rural sample ($\chi^2=27.15, p<0.001$).

All variables except for parent involvement in the domain of school programs showed a statistically significant association with school location. The results reveal that, compared to rural schools, urban schools in our sample, generally, provided more school programs—including student involvement ($\chi^2=19.53, p<0.001$), individual mentoring by students ($\chi^2=40.1, p<0.001$), teacher mentoring ($\chi^2=36.1, p<0.001$), and teacher training for signs of violence ($\chi^2=5.64, p<0.05$) and school safety ($\chi^2= 28.81, p< 0.001$).

Negative Binomial Regression Model: Total Sample (N = 2648)

Table 3 displays the results of negative binomial regression testing the effects of school characteristics, security measures, and school programs on incidences of violent crimes at schools within the whole sample. The value of goodness of fit was 1.852, and the p -value of the omnibus test was less than .001, indicating that the model fit the data well (Oyedepo & Etu, 2016). Ten of the independent predictors were significant in the model. Most notably, results showed that after controlling for other variables in the model, rural schools had statistically significantly more incidents of violence reported than urban schools ($b = .137, SE = .049, p < .01$).

As seen in Table 3, all but one variable (i.e., the percentage of male students) in the school characteristics domain were statistically significant. Compared to high schools, elementary schools ($b = .270, SE = .073, p < .001$) and combined schools ($b = .301, SE = .113, p < .01$) reported more school violent incidents, but middle schools ($b = -.350, SE = .055, p < .001$) reported fewer violent incidents. Both the number of black students ($b = .001, SE = .000, p < .001$) and the percentage of students who were eligible to receive free or reduced-price meals ($b = .007, SE = .001, p < .001$) were statistically significant and positive.

Of the variables in the school security domain, only two measures showed statistically significant relationships with school violence. Specifically, having security guards at a school was statistically significantly and positively associated with the number of violent incidents reported by school officials ($b = .051, SE = .011, p < .001$). Further, results showed that whether or not security guards carried a firearm was more influential on the number of violent incidents

Table 3

Negative Binomial Regression Model: The Effects of School Characteristics, Security Measures, and School Programs on Incidence of School Violent Crimes (N = 2648)

Variables	<i>b</i>	<i>SE</i>	<i>p</i>	Exp (<i>b</i>)
School Location (ref=urban)				
Rural	.137**	.049	.005	1.147
Grades (ref=high)				
Elementary	.270***	.073	.000	1.310
Middle	-.350***	.055	.000	.705
Combined	.301**	.113	.007	1.352
Male Students	.002	.002	.452	1.002
Black Students	.001***	.000	.000	1.001
Free/Reduced-Price Lunch	.007***	.001	.000	1.007
School Security Measures				
Visitor check-in*	-.322	.307	.294	.725
Locked Door*	.113	.072	.118	1.119
Random Metal Check*	-.123	.077	.108	.884
Security Guards	.051***	.011	.000	1.052
School Resource Officers	-.012	.010	.246	.988
Guard with Firearms*	-.384***	.057	.000	.681
Security Camera*	-.071	.049	.000	.931
School Programs				
Parent Involvement	-.063***	.009	.000	.939
Student Involvement*	.041	.045	.368	1.041
Individual Mentoring*	-.048	.047	.305	.953
Mentoring Student*	-.194**	.057	.001	.824
Teacher Training: Signs of Violence*	-.042	.042	.319	.959
Teacher Training: School Safety*	.060	.057	.295	1.062
Model Diagnostic				
Goodness of Fit		1.852		
Likelihood Ratio Test (<i>df</i> = 20)		1165.025 (<i>p</i> = .000)		

Note: Dependent variable: Incidents of School Violence; **p* < .05, ** *p* < .01, *** *p* < .001; Reference category = No.

reported by school officials than was merely having security guards ($b = -.384, SE = .057, p < .001$).

In the domain of school programs, two variables were found to be statistically significantly associated with school violence. Parental involvement was negatively and statistically significantly related to school violence ($b = -.063, SE = .009, p < .001$). Violence was also statistically significantly lower in schools that had student mentoring programs by teachers or counsellors ($b = -.194, SE = .057, p < .01$). Interestingly, student involvement, individual mentoring, and teacher training were not statistically significantly associated with school violence.

School Location-Specific Negative Binomial Regression Model: Urban Schools (N = 1,975) and Rural School (N = 673)

To further test the effect of school location on the relationship between school violent crimes and safety policies and practices, two separate models for urban and rural schools were constructed. The values of goodness of fit were 1.785 in urban schools and 1.988 in rural schools, and both p -values for the omnibus tests were less than .001, suggesting good model fit of the data (Oyedepo & Etu, 2016).

As seen in Table 4, the two models showed different patterns in significant predictors. First, in the domain of school characteristics, four variables in the urban subsample were significant, whereas just two of these variables were statistically significant in the rural subsample. Specifically, in the urban subsample, elementary schools ($b = .327, SE = .085, p < .001$) reported more violent incidents than did high schools, but middle schools ($b = -.301, SE = .064, p < .001$) reported fewer violent incidents than did high schools. However, in the rural subsample, only middle schools ($b = -.435, SE = .108, p < .001$) reported fewer violent incidents than did high schools. The number of black students in both the urban subsample ($b = .001, SE = .000, p < .001$) and rural subsample ($b = .002, SE = .000, p < .001$) showed statistical significance. However, the percentage of students who were eligible to receive free or reduced-price meals showed statistical significance ($b = .009, SE = .001, p < .001$) only in the urban subsample.

Second, in the domain of school security variables, two measures in the urban subsample showed statistically significant relationships with school violence. Comparatively, only one measure in rural subsample was statistically significantly related to school violence. Specifically, in the urban subsample, the number of security guards working at a school was found to be statistically significantly related to the number of violent incidents reported by school officials (b

Table 4

Negative Binomial Regression Models: The Effects of School Characteristics, Security Measures, and School Programs on School Violent Crimes in Urban and Rural

Variables	Urban schools N=1975			Rural Schools N=673		
	b	SE	Exp (b)	b	SE	Exp (b)
School characteristics						
Grades (reference = school)						
Elementary	.327***	.085	1.387	.114	.146	1.121
Middle	-.301***	.064	.740	-.435***	.108	.647
Combined	.269	.166	1.309	.245	.163	1.278
Male students	-.001	.003	.999	.005	.004	1.005
Black students	.001***	.000	1.001	.002***	.000	1.002
Free/reduced-price lunch	.009***	.001	1.009	.003	.002	1.003
School Security Measures						
Visitor check*	-.031	.430	.970	-.833	.463	.435
Locked door*	.134	.084	1.143	-.116	.151	.891
Random metal check*	-.066	.083	.936	-.170	.215	.843
Security guards	.059***	.012	1.061	-.001	.030	.999
School resource officers	-.011	.011	.989	-.023	.025	.977
Guard with firearms*	-.442***	.064	.643	-.182	.127	.833
Security camera*	-.023	.057	.977	-.235*	.099	.790
School programs						
Parent involvement	-.062***	.010	.940	-.069***	.018	.933
Student involvement*	.049	.053	1.050	-.031	.091	.969
Individual mentoring *	.066	.056	1.006	-.133	.091	.875
Mentoring student*	-.196**	.063	.822	-.229	.142	.795
Teacher training:	-.018	.049	.982	-.146	.084	.864

signs of violence*						
Teacher training:	.050	.064	1.051	.133	.135	1.142
school safety*						

Model Diagnostic

Goodness of fit	1.785	1.988
Likelihood ratio test (<i>df</i> = 19)	899.918 (<i>p</i> = .000)	224.792 (<i>p</i> = .000)

Note, Dependent variable: Incidents of School Violence; **p* < .05, ** *p* < .01, *** *p* < .001;

*Reference category = No.

= .059, *SE* = .012, *p* < .001). Results indicate that as the number of security guards increased, so too did the number of violent incidents reported by school administrators. Also, the variable assessing whether security guards carried a firearm was statistically significantly and negatively associated with the number of violent incidents reported by school administrators (*b* = -.442, *SE* = .064, *p* < .001). Results revealed that an incident of school violence occurring in urban schools where security guards did not carry a firearm was higher than a violent incident occurring in urban schools where security guards carried a firearm. Interestingly, neither of these variables was significantly related to school violence in the rural subsample. In fact, the only statistically significant predictor of school violence in this domain in the rural subsample was related to a school having security cameras (*b* = -.235, *SE* = .099, *p* < .05). Findings suggest that an incident of school violence occurring in rural schools that did not utilize security cameras was higher than a violent incident occurring in rural schools that utilized security cameras.

Finally, in the domain of school programs, two variables in the urban subsample and one variable in the rural subsample revealed statistically significant relationships with school violence. In both subsamples, parental involvement was statistically significantly and negatively related to school violence (*b* = -.062 and -.069, *SE* = .010 and .018, *p* < .001 and .001, respectively). Additionally, in the urban subsample, school violence was also statistically significantly and negatively related to student mentoring program (*b* = -.196, *SE* = .063, *p* < .01). Findings suggest that school violence occurring in urban schools without student mentoring

Finally, in the domain of school programs, two variables in the urban subsample and one variable in the rural subsample revealed statistically significant relationships with school violence. In both subsamples, parental involvement was statistically significantly and negatively related to school violence (*b* = -.062 and -.069, *SE* = .010 and .018, *p* < .001 and .001, respectively). Additionally, in the urban subsample, school violence was also statistically significantly and negatively related to student mentoring program (*b* = -.196, *SE* = .063, *p* < .01). programs were higher than school violence occurring in urban schools with such a program. No other variables were statistically significant in either model.

Discussion

The main objective of this research was to examine the relationship between school characteristics, security measures, school programs, and school violence—with a specific focus on assessing the impact of school location (i.e., urban or rural) on school violence. A second objective of this project was to determine the correlates of school violence that are unique to urban and rural schools. To achieve these goals, we used data from a nationally representative sample of U.S. schools. There are several findings from the current analyses that warrant further consideration.

First, one of the most important findings from the current study was that even though descriptive statistics showed that incidents of school violence were higher in urban schools than in rural schools, the incidents of violent crimes occurring in rural schools was actually higher than those in urban schools once adequate controls were entered into multivariable modeling (i.e., percent reduced lunches, security measures, etc). This finding contradicts results reported from another recent study in this area (Lesneskie & Block, 2017). However, this finding is similar to results reported by Jennings et al. (2011). In their study, Jennings and colleagues found that incidents of school violence occurring in rural schools was higher than a similar incident occurring in a city school or in an urban “fringe” school. Similarly, our results suggest that an incident of violence occurring in a rural school were also higher than a violent incident occurring in an urban school—controlling for relevant predictors. Thus, these findings reveal that aggregate differences in incidents of school violence between school locations (i.e., urban and rural) appear to be influenced by school characteristics, school security measures, and school programs, in addition to locational effects.

It is possible that the higher incidents of school violence noted in rural schools compared to urban schools could be partially explained by increasing social disorganization in rural communities (Pleggenkuhle & Schafer, 2018). For instance, Allen and Cancino (2012) reported that the resident population in many rural communities is no longer homogeneous due to increases in migration from adjacent urban/suburban areas in recent years. Further, many rural areas have suffered from poverty and unemployment issues similar to, and in some cases even worse, than in urban areas (Weingarden, 2017). In fact, Weingarden (2017) reported that unemployment rates (4.9) for non-metropolitan areas in the United States were higher than unemployment rates in smaller metropolitan areas (4.4) and larger metropolitan areas (3.7) in 2017. In this regard, as Sullivan, Kung, and Farrell (2004) argued, we can assume that rural communities and their schools have experienced similar patterns of social disorganization experienced by urban communities and schools in previous generations—thus, it is likely that there is less collective efficacy in these regions than in previous generations. This experience of social disorganization in rural communities could possibly affect the increase of odds in school

violence and crimes in these regions (Sullivan et al., 2004). However, our work did not include a direct measure of social disorganization, but rather an indirect measure of collective efficacy—parental involvement, which, as expected, was a negative predictor of school violence. Our results show that the odds of school violence occurring in a school—regardless of location—that did not have a parental involvement program were higher than the odds of a violent crime occurring in a school with such a program when controlling for other variables. This finding is similar to findings reported by Lesneskie and Block's (2017). While it is likely that parents living in regions with greater collective efficacy are more inclined to demand involvement in school activities, our findings suggest that school administrators in all locations should encourage parental participation in school events by developing a variety of parenting programs and building better relationships with parents. We suggest that future research should explore this finding more closely by examining the effects of direct measures of collective efficacy.

Second, similar to findings reported by Weisheit and Wells (2005) in their examination of homicide in urban and rural areas, our findings also indicated similarities and differences in predictors of school violence between urban and rural schools. As previously noted, school violence was statistically significantly related to eight variables in the urban school subsample, but only four variables in the rural school subsample. Though, it is important to note that the effects of all 12 significant relationships in both subsamples were relatively small (Cohen, 1992; Rosenthal, 1996). Nonetheless, three variables (i.e., being a middle school, the number of black students, and parental involvement) displayed statistically significant associations with school violence in both urban and rural schools. With that stated, some predictors of school violence were unique to school location. Five variables (i.e., elementary schools, the percentage of students who were eligible to receive the free or reduced-price meals, the number of security guards, guards with firearms, and mentoring students) in the urban subsample, and one variable (i.e., security cameras) in the rural subsample, independently showed statistically significant relationships with school violence. These findings support Frederick and Jozefowicz's (2018) argument that some school policies and practices for controlling school crimes in urban areas may have limited applicability to rural schools. In this sense, results from the current study suggest that school administrators and scholars may want to work on developing location-specific policies and programs instead of unconditionally adopting policies and practices from schools in different types of communities.

Regarding correlates of school violence, most of the findings from the current study revealed results similar to those reported in prior research. However, two variables (i.e., elementary schools and the number of security guards) exhibited statistically significant relationships with school violence in directions that were opposite of those expected (Cohen, 1992; Rosenthal, 1996). Notably, we found more incidents of school violence reported by administrators of elementary schools than reported by those in high schools. This is an interesting finding, especially because most previous research has found elementary schools to

exhibit fewer incidents of school violence than middle and high schools (Lesneskie & Block, 2017) and school violence to be the most prevalent in high schools (Bracy, 2011; Chen, 2008) or in combined middle/high schools (Adams & Mrug, 2019; Na & Gottfredson, 2013; Steinka-Fry et al., 2016). Our results show a need for future research to explore school violence in elementary schools more closely.

The other unexpected relationship was related to the use of security guards. Findings suggest that the number of security guards employed at a school was positively associated with school violence. One possible explanation for this result is that employing more security guards results in an increased likelihood that violent acts will be discovered and a greater chance that an official report of violence will be made (Na & Gottfredson, 2013). Generally, some types of school violence, such as fights between students, are difficult to be detected by school officials—especially whenever these events occur in locker rooms or on practice fields. However, since security personnel often patrol these areas, it is logical to assume that they are more likely to witness these informal fights between students than are other administrators. Further, it is also reasonable to assume that security personnel may be more likely than other administrators to make an official report of the observed event (Na & Gottfredson, 2013). Thus, the presence of security guards at schools might transform unofficial and covert student delinquencies into official, overt crimes, and consequently, increase the number of reported incidents of school violence. Another plausible explanation for this finding is simply that schools with higher rates of school violence hire more security guards. Unfortunately, data limitations prevented us from exploring this finding further. As such, future work should attempt to examine this finding further.

Perhaps one of the most interesting findings from this study was related to a school's use of armed security guards. Recently, there has been much debate surrounding the utility of firearms for crime prevention in educational settings (Kuris et al., 2020). The most recent data suggests that a majority of the general public does not support arming teachers or school officials, even if they receive proper firearm training (Gallup, 2018). In the aggregate, our results found that having an armed security guard on campus was associated with a reduction in the odds of a violent incident occurring in that school. However, upon grouping our sample by school location, we found this result only to persist in the context of urban schools. That is, controlling for other relevant predictors, our results show that there were fewer incidents of violent crimes in urban schools with armed security guards than in urban schools without armed security guards. Interestingly, this variable had no effect on violent crimes in rural schools. Accordingly, in an effort to prevent violent crimes, this finding suggests that administrators in schools located in urban areas may want to consider arming their security staff—after providing them with appropriate training, of course. We encourage other researchers to explore this finding further, though, before any firm conclusions about this relationship can be drawn.

Another important finding to consider was related to the use of security cameras. Our findings showed that security cameras were associated with a reduction in violent school crimes, but only in rural schools. Previous research indicated that the visibility of security cameras significantly impacts rates of crime in that crime rates are related to not only a camera's capacities (i.e., monitoring range and distance) but also how visible the camera is to the public (McLean et al., 2013). Thus, security cameras are more effective at deterring crime in smaller buildings because they can effectively monitor a greater portion of territory and because people are more likely to notice them. When considering school size, rural schools are usually smaller than urban schools. In this regard, security cameras in rural schools may have better range, exposure, and visibility, which in turn can have a greater impact on incidents of school violence.

Limitations

There are several data limitations to this work that are worth noting. The 2010 SSOCS is a national survey gathered from K-12 public schools in the U.S. In this sense, concerns of generalizability are minimal (Bachman et al., 2017). However, the respondents of the survey were principals or administrators of sampled schools, not individual students enrolled in the schools (Neiman et al., 2012). As such, there is a chance for respondent bias in estimation of violent incidents at the schools (Lesneskie & Block, 2017). That is, compared to the average student, school principals and administrators are more likely to be concerned about their schools' reputation. Therefore, because school crimes can influence the prestige of a school, administrators may be more likely to underreport the true number of crimes. Related, not all crimes in a school come to the attention of administration, so it is possible that these estimates are skewed. Also, the dependent variable used in this study includes both threats of attack and actual attacks. The results showed 12 variables were significant, but the effects were relatively small. While our measure is consistent with prior research, it is possible that results were impacted by the nature and scope of our dependent measure. That is, combining violent incidents with threats of attack could skew some of the findings. In this regard, future research should consider the effect that predictors have on different types of violent acts.

More importantly, the data is a bit dated at this time and some key measures were unavailable to the research team. For instance, we were unable to control for school size in statistical models—although, it is reasonable to assume that rural schools, in the aggregate, tend to be smaller schools than urban and suburban schools. The number of students in each school and the region in which the school was located in were also not available to the research team at the time of analysis. Moreover, schools in the data set were defined as “rural” by the size of the community in which it was physically located, not the student population characteristics or size. In reality, a single school can be physically located in a rural community but can serve students from more than one community, even those located in urban and suburban areas. In this sense, future work should attempt to use more recent data, include better controls, and examine these

phenomena using various definitions of rurality to see if results are robust. Further, there is a concern for temporal ordering. The current project employed a cross-sectional research design. Thus, as noted above, our use of the term “predictor” in linear modeling is really more consistent with “correlation” as the causal ordering between the variables analyzed by the current study cannot be guaranteed—which is why caution is warranted when interpreting results and recommendations (Bachman et al., 2017). Future research should use longitudinal methods to better examine the effects of school location on school violence and the impacts of predictors of school violence between urban and rural schools. Lastly, future researchers should better attempt to explore predictors of school violence that are backed with criminological theory—we suggest starting with social disorganization theory and collective efficacy.

Conclusion

In sum, this exploratory study should be used as a steppingstone to support future studies of school violence in rural areas. Our results demonstrate the importance of developing location-specific policies and programs as they indicate that the correlates of school violence vary by location. To better ensure that rural areas are not neglected in future criminological research, more studies on school crimes occurring in rural areas need to be conducted.

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