Investigations of School Safety and the Perceived Risk of Violence in Schools

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APPROVAL OF THE DISSERTATION DEFENSE

This dissertation proposal ("Investigations of School Safety and the Perceived Risk of Violence in Schools") has been approved by the Graduate Faculty of the Curry School of Education in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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Dissertation Abstract

There is persistent, nationwide concern about the risk of violence in schools. More than a decade ago, authorities in law enforcement and education recommended the use of threat assessment as a violence prevention strategy, yet many schools have not adopted this approach and there is relatively little research to support school-based threat assessment. The three studies in this dissertation contribute to this knowledge gap by investigating how often students experience threats of violence at school, how frequently multiple casualty homicides occur at schools versus other locations, and, finally, how threat assessment practices are associated with school safety conditions and climate.

The first paper surveyed 3,756 high school students about their experiences of being threatened at school in the past 30 days. Approximately 12% of students reported being threatened, but only 9% of students who received a threat reported that it was carried out. Logistic regressions identified student and threat characteristics associated with threat reporting, seriousness, and outcome. These findings provide useful base rate information for threat assessment teams in suggesting that threats are relatively common but usually not reported and rarely carried out.

The second paper examined the prevalence and offense characteristics of multiple casualty homicides in schools as opposed to other locations using the FBI's National Incident Based Reporting System (NIBRS). NIBRS reported 18,873 homicide incidents from 2005 through 2010. Approximately 22% of homicide incidents in the NIBRS database involved two or more victims and were much more common in residences (47%) versus schools (0.8%). These findings suggest that the public perception that schools are a high-risk location for homicides is inaccurate. For example, homicides are 10 times more common in restaurants and 200 times

more common in residences than in schools. These findings have policy implications for the allocation of resources for public safety and security measures.

The purpose of the final paper of this dissertation was to investigate safety conditions and climate in schools using the Virginia Student Threat Assessment Guidelines. Previous studies on the Virginia Guidelines have not specifically investigated middle school grades, where rates of disciplinary infractions and school suspensions are highest. The study compared middle schools that use the Virginia Guidelines (Cornell & Sheras, 2006; N = 170) to schools that either do not use threat assessment (N = 120) or use an alternate model of threat assessment (i.e., school or district-developed; N = 48). School climate data was obtained from a statewide survey of students and teachers. Schools using the Virginia Guidelines reported lower short-term suspension rates than both groups of schools, and students perceived that there was fairer discipline and less peer aggression and bullying. . Teachers reported feeling safer at school. Additional analyses found that the number of years a school used the Virginia Guidelines was associated with lower long-term suspension rates, student reports of fairer discipline, and lower levels of student aggression.

Taken together, this three-paper dissertation found that although student threats are relatively common, schools are generally safe places for students, and the risk of homicidal violence is low. Although these results are correlational and cannot establish a causal effect, they suggest that the use of threat assessment in middle schools may help to promote school safety and positive climate.

Project Overview

After school shootings such as the one at Sandy Hook Elementary School, there have been renewed public policy debates over school safety and the perceived risk of violence in schools. Such debates have led to increased building security at schools. Moreover, there is a heated controversy about firearm use, with proponents of gun restriction and advocates of arming guards or teachers among the voices in the discussion (Armario, 2013; Healy, 2013). The three studies of this dissertation investigated the perceived risk of violence at schools, namely by investigating how often students experience threats of violence at school, how frequently multiple casualty homicides happen at schools versus other locations, and, finally, how threat assessment practices are associated with school safety conditions and climate.

Threat assessment approach. To address the need to evaluate student threats in schools, authorities in law enforcement and education recommended a threat assessment approach (Fein et al., 2002; O'Toole, 2000), a systematic investigative process designed to distinguish students who pose a risk of violence from those who make threats of violence (O'Toole, 2000). In response to this recommendation, the Virginia Student Threat Assessment Guidelines (Virginia Guidelines) was designed for schools (Cornell & Allen, 2011; Fein et al., 2002; O'Toole, 2000). The Virginia Guidelines trains school authorities to separate threats that are not serious, or *transient*, from those that are more serious, or *substantive*. Threat assessment teams then endeavor to resolve the conflict or problem underlying the threat and develop intervention plans for more serious cases. The goal of threat assessment is to respond appropriately to threats so that schools maintain safety while providing students with every reasonable opportunity to continue their education (Cornell & Sheras, 2006).

Understanding threats of violence. There is some foundational knowledge that would help threat assessment to be a successful approach. The first is a baseline understanding about student threats of violence, such as how frequently students experience threats and whether the threats are carried out. This knowledge helps school authorities understand that threats occur frequently, but that they are usually not carried out. Additionally, since threat assessment involves distinguishing substantive threats from transient threats, it is useful to understand whether student behaviors (like aggression) or threat characteristics (like a specific threat versus a non-specific threat) contribute to whether a threat is considered serious and whether it is reported as carried out. Last, school threat assessment teams rely on threats coming to their attention, and so an equally important issue is whether students report when they are threatened, and why they do not report threats.

Studies have found that students who experience threats may be aggressive and engage in other at-risk activities, such as alcohol or drug use (Brockenbrough, Cornell, & Loper, 2002; Zaykowski & Gunter, 2012). Previous research has also demonstrated a connection between threats of violence and general aggression; one study showed that children who threatened someone with violence were 6 to 8 times more likely than non-threateners to report subsequent violence (Singer & Flannery, 2000). However, no studies examined threat outcomes specifically, and what characteristics are associated with a threat being carried out.

There is evidence that threats often do not come to the attention of school authorities (Liau, Flannery, & Quinn-Leering, 2004), and that students may be unwilling to report threats when they occur (Brank, Woolard, Brown, Fondacaro, & Luescher et al., 2007). The reasons that students do not report threats remain to be investigated, although researchers have proposed that a fear of retaliation or the stigma of "snitching" may inhibit threat reporting (Brank et al., 2007).

Bullying research has found that aggressive attitudes were negatively associated with bullying reporting (Williams & Cornell, 2006), and that children who were more severely bullied were more likely to report their experiences (Unnever & Cornell, 2004). It would be useful to examine student reasons for not reporting a threat, as well the characteristics that may be associated with threat reporting, such as aggressive attitudes or the seriousness of the threat.

Understanding multiple casualty homicides. Given public concern for school safety and the perception that schools are dangerous places, it is important to have base rate knowledge about the prevalence of multiple casualty homicides in schools. Most research on multiple casualty homicides has been limited to using media reports as a data source, which is problematic because media data may be biased toward the most extreme and public cases (Petee & Padgett, 1999; Kelly, 2010). Other studies have used the FBI's Uniform Crime Reports, which do not include comprehensive information about the homicide offense, such as the specific number of victims or location type (Cooper & Smith, 2011; Duwe, 2004; Fox & Levin, 1998). This is problematic because it precludes knowledge about distinguishing features of multiple casualty homicides that might inform prevention efforts.

Due to these gaps in the literature, little is known about the prevalence of multiple casualty homicides in schools and, more specifically, whether schools are at greater risk for multiple casualty homicides than other locations in the community. Given recent shootings at schools and other locations, it would also be useful to investigate firearm homicides in particular.

Previous research on the prevalence of multiple casualty homicides has reported mixed results on the prevalence and characteristics of such events. Some studies suggest that they are not uncommon events, but that most occur at private locations and involve family members rather than strangers or acquaintances (Duwe, 2004; Fox & Levin, 1998). Other studies contend

that most occur at public locations like workplaces and involve acquaintance or stranger victims (Bowers, Holmes, & Rhom, 2010; Petee & Padgett, 1999). These contradictory results may be due to sampling differences, such as excluding multiple casualty homicides at residences (Petee & Padgett, 1999), and different data sources, like media reports versus the FBI's Uniform Crime Report (UCR; Duwe, 2004; Kelly, 2010). Such discrepancies in sampling and data sources suggest that research is needed to examine the incidence of multiple casualty homicides across locations using a relatively more comprehensive and reliable data source.

Another gap in the literature on multiple casualty homicides is the role of firearms. Little is known about the distinguishing characteristics of firearm homicides. One study suggested that shootings were associated with higher numbers of victims than homicides that did not involve firearms (Cacach & Grabosky, 1997). An additional study of shootings at public locations found that they most typically involved acquaintance or stranger victims (Kelly, 2010). Given discrepancies in sample selection and data sources, it would be useful to compare shootings to non-shootings using data from a more reliable source.

The association between student threat assessment and school safety. Although the central purpose of threat assessment is to prevent targeted acts of violence like school shootings, these phenomena are rare (Nekvasil, Cornell, & Huang, in press). In almost all cases, the threat assessment will be concerned with a student who has misbehaved or made a threat but is not a substantial risk for shootings. Therefore, an important aim of threat assessment is to resolve less-severe acts of violence, such as bullying or fighting.

Moreover, the threat assessment approach to school safety stands in contrast to zero tolerance policies, which are rigid and punitive responses to student misbehavior, typically out-of-school suspensions (American Psychological Association Zero Tolerance Task Force, 2008).

Instead, threat assessment promotes appropriate in-school disciplinary actions and interventions for student misbehavior. By doing so, the threat assessment approach to violence prevention also helps to foster a positive school climate in which students and teachers feel both safe and supported (Cornell & Heilbrun, in press).

Use of the Virginia Student Threat Assessment Guidelines has been associated with indicators of safety and positive climate at the high school level (Cornell et al., 2009; 2011; 2012). Specifically, use of the Virginia Guidelines is linked to suspension reductions in schools, fewer student aggressive behaviors, and improved school climate, as measured by support of students and structured disciplinary practices (Cornell et al., 2004; 2009; 2012). No studies have examined threat assessment in middle schools specifically, but middle schools have high rates of discipline problems, such as bullying, threats of violence, and school suspensions (Losen & Martinez, 2013; Cornell et al., 2004; Nansel et al., 2001).

Current Research

This three-paper dissertation investigated school safety and the perceived risk of violence in schools. Given the frequency of threats at schools yet relative rarity of fatal school violence, we asked three overarching questions in this dissertation: How common are student threats? How prevalent are school shootings? Are the Virginia Guidelines of Threat Assessment associated with school safety and positive climate in middle schools?

Paper One. This study addressed the need for research on the prevalence and characteristics of student threats in schools, including whether such threats were reported to someone and whether they were carried out. The paper, "Student Reports of Peer Threats of Violence: Prevalence and Outcomes," was published in the *Journal of School Violence* in September 2012 (Nekvasil & Cornell, 2012).

We asked the following questions in the study: 1) How frequently are threats reported at schools? 2) What characteristics are associated with reporting a threat versus not reporting a threat, serious threats versus non-serious threats, and threats that are carried out versus those that are not carried out?

Based on a survey of 3,756 students in five high schools, approximately 12% of students reported being threatened at school in the past 30 days, but only 23% of threatened students regarded the threat as serious and just 26% reported the threat to school authorities. Only 9% of students who received a threat reported that it was carried out. Finally, students were asked an open-ended question regarding why they did not report threats. Five qualitative reasons were identified after coding students' written responses. The most common reason for not reporting a threat was that the student felt that the threat was not serious.

Logistic regression analyses were used to identify the association between student characteristics (demographics, aggressive attitudes, alcohol intake and marijuana use, and specific versus non-specific threat to injure) and the following threat outcomes: 1) whether a threat was considered serious; 2) whether it was reported; and 3) whether it was carried out. The study concluded that threats are a common experience in high schools, but rarely considered serious by students. However, serious threats were associated with aggressive attitudes and other at-risk behaviors. Taken together, these findings are helpful to schools evaluating student threats.

Paper Two. This paper was concerned with the perception that schools are at risk for multiple casualty homicides, a term denoting an incident in which at least one person was killed and one or more others were killed or injured. Previous literature has used a variety of different terms and definitions of multiple casualty homicides (Petee & Padgett, 1999; Fox & Levin, 1998), and this paper used the broadest definition to obtain a large and inclusive sample. We also

tested the viability of several restrictive definitions (specifically 2 victims, 3 victims, 4 victims, and 5 or more victims). The study ultimately concluded that the more restrictive definition, such as the requirement that 4 or more persons were killed, was not justified based on the offense and offender variables available for this study.

A key question of the paper was whether schools are more likely than other places in the community to experience extreme violence. We also examine the role of firearms in such multiple victim cases. The paper, "Prevalence and Characteristics of Multiple Casualty Homicides," was presented at the APA National Convention in August 2013 and was accepted for publication in the *Psychology of Violence* in October 2014.

Despite widespread media attention following shootings at schools or other public locations, there is little research on the prevalence of these multiple casualty homicides to inform violence prevention efforts. In light of this gap in the literature, we asked three questions: (1) "How do multiple casualty homicides compare to single homicides in locations, such as schools, and other offense characteristics?" (2) "How do location and other offense characteristics change as the number of victims increases?" and (3) "How do shootings differ from other non-shooting homicides?"

Many previous studies have relied largely on news reports, which likely results in a sample biased toward the most extreme and thus newsworthy cases. Other research has used the FBI's Uniform Crime Report (UCR), which offers a large number of cases but includes relatively little information about each offense. The FBI's National Incident Based Reporting System (NIBRS), on the other hand, was formed to gather more detailed crime information. NIBRS is a voluntary system that has not been adopted nationwide, but currently includes 37 states representing 29% of the U.S. population. Nonetheless, it offers a comparatively large

sample of homicides in the United States. Thus it may be useful in determining whether multiple casualty homicides differ from single victim homicides, whether locations such as schools have distinctive kinds of homicide, and how firearms are associated with multiple casualty homicides. The second study used NIBRS to examine the prevalence and characteristics of multiple casualty homicides at schools and other public locations.

Based on a sample of 18,873 homicide incidents from 2005-2010, the second study found that multiple casualty homicides are relatively common in the United States. From 2005 to 2010, 15% of NIBRS homicide incidents had two victims, 4% had three victims, and 3% had four or more victims. The study found that multiple casualty homicides involving four or more victims most often occur at a residence (47%), and rarely occur in schools (0.8%). Additionally, the study found that firearms are strongly associated with increased numbers of victims, but firearm homicides were no more likely to occur at schools versus residences. These findings suggest that violence prevention at schools may be less about fortifying them, and more about using violence prevention practices that lower other less serious aggressive behaviors and enhance the school conditions for students and teachers alike.

Paper Three. There is a small body of literature on the use of threat assessment in schools. Previous studies have found that schools using the Virginia Student Threat Assessment Guidelines have lower suspension rates and other indicators of a more favorable school climate. However, no previous study has examined middle schools, which is an important developmental stage for students, who typically become more socially engaged at this time. Concurrently, levels of student misbehaviors like bullying and fighting are high (Berndt, 1982; Nansel et al., 2001). The third study of school safety and climate compared middle schools that use the Virginia Student Threat Assessment Guidelines (N = 170) to those that either have no formal threat

assessment program (N = 48) or use an alternate (school- or division-created) program (N = 120). The study was concerned with whether the results would be similar to a prior study conducted with Virginia high schools using similar methodology (Cornell et al., 2009). It was submitted for publication in the *Journal of Threat Assessment and Management* on March 1, 2015.

The sample was drawn from public middle schools in Virginia, which were required by the state to administer the Virginia Secondary School Climate Survey (VSSCS, 2013) to students and teachers. Schools provided school-level discipline data to the Virginia Department of Education (VDOE). The study's final sample consisted of 332 schools for which there were adequate records of their threat assessment procedures.

We asked two research questions in the study: (1) Is use of the Virginia Guidelines associated with more favorable school climate and safety conditions than schools that do not use the Virginia Guidelines?; and (2) Is longer use of the Virginia Guidelines associated with more favorable school climate and safety conditions?

To address the first question, we used multivariate analysis of covariance (MANCOVA) to compare school climate and safety conditions among three groups of schools: those that used the Virginia Guidelines, those that reported an alternate method of threat assessment, and those that did not have any threat assessment program. School climate and safety conditions were examined across multiple variables: short-term and long-term suspension rates, student perceptions that their schools were supportive of students, as well as strict but fair in their disciplinary practices (Konold et al., 2014). Moreover, we analyzed student and teacher perceptions of school safety. Three peer victimization scales provided a more comprehensive assessment of student perceptions of school safety (Cornell, Shukla, & Konold, in press):

bullying victimization, general victimization (verbal threats, fighting), and prevalence of teasing and bullying. Teacher perceptions were based on three observations about feeling safe at school. To address the second question, hierarchical linear regressions were used to examine the associations between how long a school has used the Virginia Guidelines and their reported school climate and safety conditions.

Finally, school-wide demographics of enrollment size, student socioeconomic status (SES), and racial demographics have been associated with a wide range of factors affecting school climate (Klein & Cornell, 2010; Leithwood & Jantzi, 2009; Stewart, 2003) Therefore, all analyses controlled for school enrollment size, the percentage of minority students, and the percentage of students qualified for free and reduced priced meals (FRPM).

The study found that middle schools using the Virginia Guidelines recorded fewer short-term suspensions than both comparison groups. From the school climate survey, school discipline was perceived by students as fairer. Moreover, schools using the guidelines had fewer reports of student aggressive behaviors, and teachers reported that they felt safer. For the second research question, schools using the guidelines for longer reported fewer long-term suspensions, student reports of fairer discipline, and lower levels of student aggressive behaviors. The study was limited by a retrospective, quasi-experimental design.

Together, the three manuscripts that comprise this dissertation contribute to our understanding about school safety and the perceived risk of violence in schools. These findings provide knowledge about threats of violence and multiple casualty homicides in schools. We conclude that the schools are overwhelmingly safe places with low risk of fatal violence. The dissertation also provides evidence for the usefulness of the threat assessment approach to violence prevention in schools, suggesting that school threat assessment can have a broad,

positive influence on school safety, climate, and student behaviors. This dissertation research further suggests that future studies develop standards for threat assessment program fidelity and identify best practices associated with increased school safety and positive climate. There remains a need for randomized controlled trials on best practices in threat assessment, specifically how this approach to violence prevention is associated with changes in school climate. In summary, this three-paper dissertation contributes to the body of knowledge that is needed to improve the use of threat assessment in schools and to guide public safety policies and school discipline practices.

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Abstracts

Student Reports of Peer Threats of Violence: Prevalence and Outcomes

Authorities in education and law enforcement have recommended that schools use a threat assessment approach to prevent violence, but there is relatively little research on characteristics and outcomes of threats among students. The current study examined student reports of threat experiences in a sample of 3,756 high school students. Approximately 12% of students reported being threatened at school in the past 30 days, but only 23% of threatened students regarded the threat as serious and just 26% reported the threat to school authorities. Only 9% of students who received a threat reported that it was carried out. Five reasons why students did not report threats were identified. Logistic regression analyses identified student and threat characteristics associated with threat reporting and outcome. These findings provide new information about the prevalence and nature of student threats that can inform a threat assessment approach to school violence prevention.

Prevalence and Offense Characteristics of Multiple Casualty Homicides

Objective: In light of public concern about school shootings, this study examined the prevalence and offense characteristics of multiple casualty homicides across locations. ***Method:*** We used the FBI's National Incident Based Reporting System (NIBRS) to examine 18,873 homicide incidents involving 25,180 victims who were either killed or injured from 2005 through 2010. ***Results:*** Multiple casualty homicides were surprisingly common events, with approximately 22% of homicide incidents involving two or more victims. Multiple casualty homicides were much more common in residences (47%) versus schools (0.8%), but homicides in residences tended to have one victim (78%) rather than multiple victims (22%), whereas homicides in schools were about equally likely to have one victim (57%) or multiple victims (43%). Multiple homicides were

more likely to involve firearms than weapons such as knives or blunt objects. Finally, there were statistical differences in offense characteristics for homicides with one, two, and three victims. ***Conclusion:*** These findings suggest that the public perception that schools are a high-risk location for homicides is inaccurate. Although concern about school shootings is understandable, the larger problem of multiple casualty shootings is more common in other locations, which do not receive comparable media attention.

Student Threat Assessment Associated with School Safety in Middle Schools

Authorities in law enforcement and education have recommended the use of threat assessment to prevent violence, but few studies have examined its usefulness in middle schools. This retrospective, quasi-experimental study compared middle schools that use the Virginia Student Threat Assessment Guidelines (Cornell & Sheras, 2006; N = 166) to schools that either do not use threat assessment (N = 119) or use an alternative model of threat assessment (school- or district-developed; N = 47). Based on school records, schools using the Virginia Guidelines reported lower short-term suspension rates than both groups of schools. According to a statewide school climate survey, schools using the guidelines also had fairer discipline and lower levels of student aggressive behaviors, as reported by students. Finally, teachers reported feeling safer in schools using the Virginia Guidelines, as opposed to both groups of schools. Additional analyses of school records found that the number of years a school used the Virginia Guidelines was associated with lower long-term suspension rates, student reports of fairer discipline, and lower levels of student aggressive behaviors. All analyses controlled for school size, minority composition, and socioeconomic status of the student body. These findings suggest that use of a threat assessment approach to violence prevention is associated with lower levels of student aggression and a more positive school climate.

Manuscript One

Student Reports of Peer Threats of Violence: Prevalence and Outcomes

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Abstract

Authorities in education and law enforcement have recommended that schools use a threat assessment approach to prevent violence, but there is relatively little research on characteristics and outcomes of threats among students. The current study examined student reports of threat experiences in a sample of 3,756 high school students. Approximately 12% of students reported being threatened at school in the past 30 days, but only 23% of threatened students regarded the threat as serious and just 26% reported the threat to school authorities. Only 9% of students who received a threat reported that it was carried out. Five reasons why students did not report threats were identified. Logistic regression analyses identified student and threat characteristics associated with threat reporting and outcome. These findings provide new information about the prevalence and nature of student threats that can inform a threat assessment approach to school violence prevention.

KEYWORDS: student threats, threat assessment, peer aggression

Student Reports of Peer Threats of Violence: Prevalence and Outcomes

Student threats of violence are a widespread concern for United States schools. According to the National Center for Education Statistics (NCES), 47.8% of all public schools reported a student threat without a physical weapon and 9.3% reported a student threat with a physical weapon during the 2007-2008 school year (Neiman & DeVoe, 2009). The Youth Risk Behavior Surveillance Survey (YRBSS) found that approximately 11% of students reported being in a physical fight on school property in the previous 12 months, and nearly 6% reported that they had carried a weapon to school in the previous 30 days (Centers for Disease Control and Prevention [CDC], 2010). Additionally, approximately 8% of students reported that they had been threatened or injured with a weapon during the 12 months preceding the survey.

On the other hand, fatal acts of school violence are statistically rare; only one in one million students are victim to suicide or homicide on school premises per year (Vossekuil et al., 2002). When fatal attacks do occur at schools, however, the public demands both explanation and response to try to prevent such acts from happening.

To address the spectrum of school violence, authorities in education and law enforcement have recommended that each school have its own threat assessment team (O'Toole, 2000; Vossekuil et al., 2002). Threat assessment is a systematic, investigative approach to violence prevention that enables school personnel to identify and respond to student threats to commit violent acts (Cornell, 2003). Critical to the success of a threat assessment approach, however, is the willingness of students to report when they have been threatened (Vossekuil et al.). Although threat assessment appears to be a promising strategy for schools, we have little information beyond the prevalence of student threats to guide the work of threat assessment teams (Borum, Cornell, Modzeleski, & Jimerson, 2010). In order for threat assessment teams to be effective in

making judgments about student threats, they need baseline information about the frequency of student threats, how often they are reported to school authorities, and how often they are carried out. Especially critical from a prevention perspective is to understand why students often fail to report threats to school authorities. The purpose of this study was to investigate student threat experiences and identify factors associated with a student's perception of whether a threat is serious and whether it needs to be reported to others.

Threats and Violence

There may be important differences in student threat experiences associated with gender, age, and race. National prevalence rates from the 2009 YRBSS showed that boys (9.6%) reported more threats with weapons than girls (5.5%) and 9th grade students (8.7%) reported more threats than 12th grade students (5.2%). African American students (9.4%) reported more threats with weapons than White students (6.4%) (CDC, 2010). Absent from these reports of threat prevalence is any information regarding the seriousness of the threat and whether it was carried out, or whether it was reported to authorities.

There is only indirect information on threat outcomes, or how frequently threats are carried out. Singer and Flannery (2000) found that students who threatened others were at increased risk for engaging in some form of aggression, but did not ask whether they carried out their threats. Their survey of 9,487 students in Grades 3 to 12 found that students who reported frequently threatening others were 6 to 8 times more likely to report subsequent violence than nonthreateners, 14 to 23 times more likely to indicate that they had attacked someone with a knife, and 17 times more likely to report that they had shot at someone.

There are more studies of students who are recipients of threats. Specifically, threat experiences may be more frequent among students who endorse aggressive attitudes and engage

in risky behavior, such as substance use. Studies have shown that some adolescent victims of violence endorse aggressive attitudes and exhibit problem behaviors such as fighting and drug use (Brockenbrough, Cornell, & Loper, 2002; DuRant, Pendergrast, & Cadenhead, 1994; Haynie et al., 2001; Simon, Dent, & Sussman, 1997). One possible explanation is that aggressive youth may tend to associate with one another and/or engage in conflicts with one another. A study by Brockenbrough et al. (2002) grouped student victims into four subcategories: victims with aggressive attitudes, nonvictims with aggressive attitudes, victims without aggressive attitudes, and nonvictims without aggressive attitudes. The study found that victims with aggressive attitudes were the most likely group to report alcohol and drug use as well as fights at school. A study by Cook, Williams, Guerra, Kim, and Sadek (2010) reinforced these findings by demonstrating that externalizing behaviors such as aggression predicted bully-victim status.

Across a series of analyses, Zaykowski and Gunter (2012) showed that risky behaviors were the strongest predictor of victimization, even after controlling for measures of school climate. These authors surveyed 5,613 students in fifth, eighth, and eleventh grades to examine the relation between aggressive behavior and what the authors termed "deviant lifestyles" and victimization. Students who reported deviant behavior such as threatening or intentionally hitting another student were significantly more likely to report personal victimization, including being threatened with violence.

A critical issue in threat assessment is identifying characteristics that are associated with threat outcome. Law enforcement authorities (O'Toole, 2000; Vossekuil et al., 2002) have hypothesized that a more specific threat (e.g., "I am going to beat you up in the parking lot after school today") poses a more serious risk than a less specific threat (e.g., "I am going to get you"). The Virginia Student Threat Assessment Guidelines endorse the idea that specific threats

are more likely to be substantive, but there has been no specific test of this hypothesis (Cornell & Sheras, 2006). In summary, there is need for research on the frequency of students being threatened, risk factors for being threatened, and characteristics of threats that might indicate they were more likely to be carried out.

Threat Reporting

The Safe School Initiative (SSI) conducted by the U.S. Secret Service and Department of Education after the 1999 shooting at Columbine high school found that incidents of targeted violence were rarely unexpected. In their sample of school shooting cases, someone knew about the planned attack before it occurred in more than half of the incidents, although these individuals were predominantly peers (93%). The report emphasized the importance of encouraging students to report threats to an authority figure (Vossekuil et al., 2002).

School staff members are often unaware of student threats. A study by Liau, Flannery, and Quinn-Leering (2004) asked 3,201 students in Grades 3 to 6 how often in the past year they threatened to hurt another student. The students' teachers were then asked to identify students who threatened others. The study found that teachers correctly identified such students in only 23% of the cases (Liau et al., 2004).

It is important know why students do not report threats. One study found that many middle school students were unwilling to report a classmate who brought a weapon to school, and they concluded that students might be inhibited because of fear of retaliation or the social stigma of telling on someone (Brank et al., 2007). Another study found that girls reported more willingness to seek help than boys (Eliot, Cornell, Gregory, & Fan, 2010). Based on a sample of 7,318 ninth-grade students, the study also found that African American students were the least likely of all racial/ethnic groups willing to seek help. It would be useful to investigate whether

there are similar gender and race differences in student willingness to report being personally threatened and whether there are differences in the reasons students give for not reporting a threat.

Students with aggressive attitudes may also be less likely to seek help after a threat experience. In a sample of 542 middle school students, Williams and Cornell (2006) found that only 53% were willing to report being bullied. Moreover, students with aggressive attitudes and those who perceived that school authorities tolerated bullying were less likely to seek help. Although younger adolescents were more willing to seek help from teachers than older adolescents and girls were more willing to seek help than boys, demographic variables dropped to nonsignificance with the addition of aggressive attitudes and teacher tolerance of bullying (Williams & Cornell, 2006).

A limitation of many studies on help seeking is that students were asked about hypothetical reactions rather than their previous behavior. In contrast, Unnever and Cornell (2004) surveyed of 2,437 middle school students and found that 40% of the students who indicated that they had been bullied did not tell an adult. Moreover, the severity of bullying was positively associated with reporting the bullying. On the other hand, the study found that students were least likely to seek help after bullying when they perceived that teachers would not try to stop it. Girls were more likely to tell peers, but boys were more likely to tell an adult. Contrary to other studies, Unnever and Cornell found that African American students were just as likely to seek help as other racial groups.

The Current Study

This study investigated the nature and prevalence of threats in a secondary school sample. Students reported how frequently they were threatened and whether they regarded the threat as

serious. Students also reported whether the threat was carried out and whether they told others about the threat. Based on previous studies, it was hypothesized that younger students would be more likely to experience and report a threat than older students, and that boys would be more likely to experience a threat, but less likely to report it, than girls. Finally, we expected that students from racial or ethnic minority backgrounds would be more likely to experience a threat, but less likely to report it, than White students (Cornell & Williams, 2006; Eliot et al., 2010; Unnever & Cornell, 2004).

Of particular interest were comparisons between students who did or did not tell others about being threatened. It was hypothesized that students would be more likely to report a specific rather than a nonspecific threat. We also tested the hypothesis that risky problem behaviors, such as aggressive attitudes and substance use, would be associated with less frequent threat reporting, because these students might be less conventional and more independent of authority (Brockenbrough et al., 2002; Williams & Cornell, 2006; Zaykowsky & Gunter, 2011).

Previous studies have suggested that a student might not report a threat or ask for help for a variety of reasons, including fear of retaliation and belief that help will not work (Brank et al., 2007; Unnever & Cornell, 2004). In order to investigate this relatively unexplored topic, students answered an open-ended question about why they did not report their threat experiences and content categories were developed to classify their reasons.

We also investigated factors associated with threat victimization and outcome. Based on previous research (Brockenbrough et al., 2002; DuRant, Pendergrast, & Cadenhead, 1994; Simon et al.,1997), we expected that aggressive attitudes and drug and alcohol use would increase the likelihood of experiencing a threat. We also hypothesized that students from racial or ethnic minority backgrounds would be more likely to report that a threat was carried out than White

students. Finally, we reasoned that more specific threats were more likely to be reported as carried out.

Methods

Participants

The sample consisted of 3,756 high school students (53% girls) from five central Virginia high schools participating in a federally funded Safe Schools/Healthy Students program. There were 954 (25%) ninth graders, 974 (26%) tenth graders, 943 (25%) eleventh graders, and 885 (24%) twelfth graders. Their self-reported racial/ethnic breakdown was 2,298 (61%) White, 498 (13%) African American, 335 (9%) Hispanic, 152 (4%) Asian American, 149 (4%) multiracial, and 324 (9%) another ethnicity. Students ranged from 13 to 19 years of age with a median of 16 years. The sample represented 85% of the student enrollment.

The five schools were located in a small city and surrounding county including both rural and suburban populations. For the 2009-2010 school year, student enrollment ranged from 96 to 1,775 (M = 1,065; SD = 608). The percent of students eligible for free and reduced price meals (FRPM) ranged from 9.2% to 48.3% (M = 23.5%; SD = 14.9%).

Measures

Questions about threats were contained in the School Climate Bullying Survey, a self-report survey designed to assess bullying at school and related aspects of school climate (Cornell, 2012). The survey was augmented with five questions about student threats, which are reported in Table 1. The first question asked students, “Has another student threatened to harm you in the past 30 days?” with three response options (see Table 1). If the student responded that he or she had been threatened, he or she was asked what the other student threatened to do, with fixed response options (e.g., “injure me with a weapon such as a knife, club, or gun”). Students

were then asked whether they told anyone about the threat, If they did tell someone, they were asked whom they told—a friend, a teacher or another adult at school, or a parent. For chi square and logistic regression analyses, multi-response variables were dichotomized into threatened vs. nonthreatened and specific threats vs. nonspecific threats.

Threat outcome. The next fixed response question asked students what happened with the threat, with the possible threat outcomes of (a) *the threat is over and nothing happened*; (b) *the threat is not over and might be carried out*; and (c) *the threat was carried out and the person tried to hurt me or did hurt me (*see Table 1). The threat outcome variable was dichotomized into threat carried out vs. not carried out for logistic regression analyses.

Reasons for not reporting a threat. If the student answered that he or she did not tell anyone about the threat, the student was asked to write a response to the open-ended question, "Please explain why you have not told anyone that you were threatened." Initially, three categories were considered based on reasons found in the literature review: (a) the student thought that reporting the threat would be unhelpful or ineffective; (b) the student was concerned about a social stigma, such as being considered a "snitch"; and (c) the student feared retaliation if he or she reported the threat (Brank et al., 2007; Unnever & Cornell, 2004; see Table 2). After testing these categories on a sample of responses, two additional categories were identified: (d) the student did not consider the threat to be serious and (e) the student did not want or need help. A sixth "other" category was used for novel reasons that occurred rarely and were not covered in these five categories (e.g., "I just moved to this school and did not know anyone"). A seventh category was used for responses that seemed nonsensical or otherwise could not be coded (e.g., "I like bananas"). Such responses were relatively few (n = 24; 0.6% of the overall sample). After

practice, two researchers independently coded 120 responses and achieved 87% agreement with a Kappa of .85.

Aggressive attitudes. The survey included a 7-item Aggressive Attitudes scale, $\alpha = .88$, that measured student endorsement of aggression (e.g., "It feels good when I hit someone"). The items were rated on a Likert scale from *strongly disagree* to *strongly agree*. In a previous study, exploratory and confirmatory factor analyses demonstrated adequate fit for the Aggressive Attitudes scale and showed that it consistently correlated with bullying prevalence and gang violence at the school level (Bandyopadhyay, Cornell, & Konold, 2009).

Substance use. Students were also asked about use of marijuana and alcohol in the past 30 days using two questions from the Youth Risk Behavior Surveillance Survey (YRBSS; CDC, 2010): (a) During the past 30 days, on how many days did you have at least one drink of alcohol? (b) During the past 30 days, how many times did you use marijuana? Response options ranged from *0* days to *20-30 days* for alcohol intake and from *0 times* to *20+ times* for marijuana use.

Procedure

The school climate survey was administered anonymously to all students as part of the school's safety program in fall 2010; consequently, parents were informed about the survey by a letter from the school and offered the option to decline their child's participation. In each school, only a few parents declined. Other reasons for not taking the survey included being absent or suspended, or having cognitive or physical limitations that prevented a student from taking the survey. The overall student participation rate was 92%. This compares favorably to the student response rates for the YRBSS, which ranged from 61% to 94% (CDC, 2010).

Surveys were administered online in a classroom supervised by teachers or other school staff who used standard written instructions included with the measure. At the onset of the

survey, students were told that the purpose of the survey was to improve school climate and student relations and were assured that their answers were anonymous. The survey took approximately 20 minutes to complete. Both English and Spanish versions of the survey were available.

Validity screening. Validity screening items were used to identify students who might have answered carelessly or given intentionally dishonest answers. Previous research (Cornell, Klein, Konold, & Huang, 2011) has shown that this form of validity screening significantly reduced the frequency of extreme responses (e.g., reporting drug use 20 or more times in a month) and lowered schoolwide estimates of risk behavior rates. Screened surveys also produced measures of school climate that were more consistently correlated with external criteria. These findings suggested that screening improves the overall quality of survey data. Accordingly, the survey included three validity screening items: "I am telling the truth on this survey," "I am not paying attention to how I answer this survey," and "The answers I have given on this survey are true." In order to screen the items, the first two, rated on a Likert-type scale of *strongly disagree* to *strongly agree*, were dichotomized to *yes* or *no*. The final item was answered either *yes* or *no*. Students who indicated that they were not paying attention or answering truthfully were removed from the overall sample. After screening, 609 (14%) students were removed, with a final *N* of 3,756 students.

Descriptive statistics for the 609 invalid responders showed that 389 (62%) were male. There were 204 (33%) ninth graders, 119 (20%) tenth graders, 145 (24%) eleventh graders, and 141 (23%) twelfth graders. Their self-reported racial/ethnic breakdown was 220 (36%) White, 137 (22%) African American, 55 (9%) multiracial, 42 (7%) Asian American, 23 (4%) American Indian/Alaskan, and 132 (22%) another ethnicity. Chi square tests of association comparing

invalid and valid responders on each demographic variable revealed significant differences ($p <$ .001). Invalid responders were more likely to be boys (18% vs. 10%, $\chi 2[1, N = 4400] = 46.88$ $p <$ .001), students in lower grades (34% in ninth grade vs. 23% in twelfth grade, $\chi 2 = 21.85[3, N =$ 4400], $p < .001$), and students from racial or ethnic minority backgrounds (22% vs. 9%, $\chi 2[1, N$ $= 4400] = 151.26$, $p < .001$). Invalid responders were more likely to report that they had been seriously threatened (9% vs. 3%, $\chi 2[2, N = 4352] = 67.63$, $p < .001$) and that the threat had been carried out (26% vs. 9%, $\chi 2[2, N = 586] = 47.89$, $p < .001$). Invalid and valid responders did not differ in whether or not they told anyone about the threat.

Results

The first set of analyses provided a breakdown of threat cases. A majority of students ($n =$ 3,292, 88%) reported that they had not been threatened in the past 30 days. Among the 464 (12%) threatened, only 107 (3% of all participants, 23% of those threatened) reported that they regarded the threat as serious.

Among the subgroup of 464 threatened students, most of these students ($n = 364$, 80%) reported that "nothing happened," 47 (11%) reported that the threat might still be carried out, and only 42 (9%) reported that the threat was carried out.

Finally, among the 42 who reported that the threat was carried out, 29 (69%) indicated they did not tell anyone about the threat. The most common reason students gave for not reporting a threat that was carried out was fear of retaliation ($n = 11$), followed by not wanting or needing help ($n = 4$).

A chi-square test of association assessed whether demographic variables of gender, grade level, and minority status were significantly related to five threat variables: (a) experiencing a threat, (b) experiencing a serious threat, (c) threat outcome, (d) reporting a threat experience, and

(e) reasons for not reporting a threat. For the first two threat variables, the entire sample of 3,756 students was used. Only the sample of 464 students who reported being threatened was used for the final three threat measures.

As depicted in Table 3, boys were more likely than girls to: (a) report being threatened (15% vs. 10%) and (b) report experiencing a serious threat (4% vs. 2%). Girls were more likely than boys to tell someone about the threat (35% vs. 20%). There was no significant association between gender and (a) threat outcome or (b) reasons for not reporting a threat.

Students in higher grades were less likely to report being threatened than students in lower grades (e.g., 10% in twelfth grade vs. 14% in ninth grade). There were no statistically significant associations between grade level and serious threat experiences, threat outcome, threat reporting, and reasons for not reporting a threat.

Chi-square analyses showed that students from racial or ethnic minority backgrounds were more likely than White students to: (a) report being threatened (16% vs. 10%), (b) report being seriously threatened (4% vs. 2%), and (c) report that the threat was carried out (15% vs. 6%). There was no significant association between minority status and reasons for not reporting a threat. Because there were 12 chi-square analyses, a sequential Bonferonni adjustment (Holm, 1979) was conducted; this resulted in no difference in the pattern of statistically significant results ($p < .05$).

Regression Models

Hierarchical logistic regression was used to predict dichotomized variables for threat severity (serious threat vs. not serious threat), threat reporting (threat reported vs. non-reported), and threat outcome (threat carried out vs. not carried out). Because students were nested in five schools, schools were dummy coded and entered into the first block of each regression. In order

to control for demographics, age, gender, and minority status also were included in the first block of each regression. Initial statistical analyses showed that schools were not significantly associated with a student's threat experience in the first block of each regression; therefore, schools were dropped from the final regression analyses.

In the second and final block of each regression, we added the psychosocial variables of aggressive attitudes, alcohol drinking, and marijuana use. The variable of threat specificity was included in the regressions predicting threat reporting and threat outcome. Because a student's determination that a threat was serious might be influenced retrospectively by the threat outcome, threat specificity was not used as a predictor for threat seriousness. Results for the final block of each regression are summarized here and the full regression models are presented in Table 4.

For the first regression analyses, aggressive attitudes increased the odds of experiencing a serious threat (Odds Ratio (OR) = 1.15). Alcohol intake and marijuana use also increased the odds of experiencing a serious threat (OR = 1.32 and 1.32, respectively).

The second regression analyses examined predictors of whether a threat was reported. Students were less likely to tell someone about a threat if they were male (OR = 0.41) and more likely to tell if the threat was specific (OR = 1.71).

The final regression analyses investigated predictors of whether a threat was carried out. A threat was more likely to be carried out if there was a specific threat to injure the student (OR = 9.96) and if there was student endorsement of aggressive attitudes (OR = 1.16).

Discussion

Based on our results, threats are a relatively common experience among high school students, but they are usually not serious and not carried out. Our results suggest some caution in

interpreting the relatively high prevalence rates for threats reported in some national surveys (CDC, 2010; Neiman & DeVoe, 2009). In approximately three-fourths of the threat cases, the student felt that "the person did not really mean it." Furthermore, the most common reason given by students for not reporting a threat—60% of cases—was that they did not regard the threat as serious. Student assessments of threats might not be definitive, but these findings suggest that survey results could be inflated with threats that are relatively inconsequential.

These findings provide an important context for threat assessment teams or other authorities responding to a report of a student threat. Given the range of threat experiences among adolescent students, these findings support the admonition in the threat assessment literature that it is important not to over-react when a threat occurs, but to investigate each threat to assess its seriousness (Borum et al., 2010; Cornell, 2011). Although gender, minority status, and grade level were significantly associated with threat experiences in preliminary analyses, our results suggested that demographic variables might be mediated by aggressive attitudes, alcohol and marijuana use, and threat specificity, although this was not formally tested.

Consistent with previous research (Brockenbrough et al., 2002; DuRant, Pendergrast, & Cadenhead, 1994; Simon et al., 1997; Zaykowsky & Gunter, 2011), it might be that students who engage in risky behaviors such as aggression and drug use are at increased risk for being threatened by peers. One possible explanation is that aggression, victimization, and other at-risk behaviors cluster together within peer groups. The homophily hypothesis (Swearer, Espelage Vaillancourt, & Hymel, 2010) proposes that aggressive adolescents associate with likewise aggressive adolescents, and thus aggressive attitudes and behaviors are reinforced within the peer group. Thus students with aggressive and noncompliant attitudes may tend to engage in conflicts that generate threats of violence.

Although students who are recipients of threats are usually thought of as nonaggressive victims, bullying research has shown that many victims (approximately 20%) have aggressive attitudes and engage in bullying others, and thus are classified as *bully/victims* (Brockenbrough et al., 2002; Cook et al., 2010; Haynie et al., 2001). Our results supported this idea, although by no means does this indicate that all threat recipients fit this pattern. Future research on threat recipients consider subgrouping students into nonaggressive and aggressive victims to better understand threat experiences in context, with an emphasis on exploring how the peer group associations might lead to threat victimization in different ways.

Specific threats to injure were nearly ten times more likely to be carried out than nonspecific threats, which is consistent with expert opinions (O'Toole, 2000; Vossekuil et al., 2002), but to our knowledge has not been empirically tested. More specific threats may reveal a greater degree of thought and planning that reflects more serious intentions. Similarly, in the literature on suicide assessment, more specific threats are considered more dangerous (Bryan & Rudd, 2006). Future research is needed to examine threat content in more detail. It would be especially important to assess threats prospectively, so that student descriptions of threats are not influenced by threat outcomes.

Only about one-quarter (26.4%) of threats were reported—most often because the threat was not perceived as serious. This is not necessarily a problem, because if all threats were reported, schools might be inundated with threats to investigate. Students most likely exercise some judgment about the seriousness of threats, so a question that begs to be asked is whether their judgments are accurate. Our question about the seriousness of a threat was limited in scope and did not provide enough information to analyze the relative seriousness of different threats. Furthermore, our data were retrospective and may not tell us how students viewed threats at the

time they were received. Nevertheless, our results indicated that students were more likely to report threats they considered serious (49%) than not serious (19%) and that specific threats were more likely to be reported (33%) than nonspecific threats (22%). However, school authorities cannot rely on student judgments about the seriousness of a threat. For serious and carried-out threats, the most common reason for not reporting a threat was fear of retaliation, consistent with previous literature on help-seeking (Brank et al., 2007; Unnever & Cornell, 2004). Therefore, it may be important for school personnel to address student concerns about retaliation when threats are brought to their attention.

Limitations

Several limitations must be noted. A correlational study cannot provide strong evidence of causal relations. Moreover, this study was retrospective and based on student self-reports rather than direct observation. A prospective study is needed to eliminate the potential biases of retrospective reporting on threat experiences. However, prospective studies are complicated by the obligation of school authorities to investigate and take action on threats that appear to be serious.

This study was conducted in schools with an ongoing violence prevention program, which may have influenced how students responded to threats. Therefore, replication across a range of schools is needed. Additionally, it is possible that some of the students who were suspended or truant during survey administration might have been more likely to report threats.

Our results reinforced the importance of doing validity screening before analyzing self-report survey measures. Surveys identified as invalid through validity screening contained significantly higher levels of reported threats, reinforcing previous findings that invalid responders are more likely to give extreme responses to risky behavior items (Cornell et al.,

2011). Moreover, our findings suggest that younger, male students might be less likely to take surveys seriously, perhaps for developmental reasons, and students from racial or ethnic minority backgrounds might feel less engaged with their schools or less trusting of school authorities who administer the surveys (Eliot, Cornell, Gregory, & Fan, 2010). Nonsensical reasons were relatively few in number (n = 24, 9.3% of the threatened sample), but future studies might examine whether surveys with such answers should also be omitted through validity screening.

Conclusion

In conclusion, this study provides new information about the prevalence of student threats of violence, how they are related to risky behaviors, and how infrequently they are reported to school authorities. These results may assist schools, and threat assessment teams in particular, in evaluating and responding to student threats. Given that risky behaviors might cluster within peer groups, threat assessment teams might want to consider peer influences when evaluating threat experiences. Moreover, because a threat experience might represent only one event in an aggressive interaction, it follows that threat assessment teams should take care to understand the situational context and consider whether the student victim engaged in any aggressive or provocative behavior. These findings were consistent with a threat assessment approach (Borum et al., 2010; Cornell, 2011), which evaluates threats systematically and in context, so as to promote the safety and well being of every student.

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Table 1

Threat Survey Questions (N = 3,756)

Question	Response Options	N	%
(1) Has another student threatened to harm you in the past 30 days?	*I have not been threatened.*	3,292	88%
	I have been threatened, but the person did not really mean it.	357	9%
	I have been threatened and it was serious.	107	3%
(2) What did the other student threaten to do to you?	*Injure me without a weapon (e.g., hit me).*	117	26%
	Injure me with a weapon such as a club, knife or gun.	65	14%
	Nothing specific, just a threat to hurt or harm me.	272	60%
(3) Did you tell anyone about the threat?	*Yes*	119	26%
	No	333	74%
(4) What happened with the threat?	*The threat is over and nothing happened.*	364	80%
	The threat is not over and might be carried out.	47	11%
	The threat was carried out & the person tried to hurt me or did hurt me.	42	9%
(5) Please explain why you have not told anyone that you were threatened.	Open ended responses coded as:		
	(1) threat not that serious	136	60%
	(2) help not necessary	39	17%
	(3) fear of retaliation	29	13%
	(4) concern over snitching	15	7%
	(5) help would be ineffective	9	4%

Table 2

Responses to "Please explain why you have not told anyone that you were threatened."

Category	Explanation	Example
Concern over snitching	Student concerned that peers would regard him or her as a "snitch" or some other pejorative label	"I'm not a tattletale."
Threat not that serious	Student felt the threat was not serious or that it was a joke.	"It wasn't a big deal, geez."
Help not necessary	The student felt help from others was not necessary. Includes statements like "I didn't care."	"I can handle it on my own."
Fear of retaliation	The student feared retaliation from the student or students who made the threat.	"I'm afraid of what they will do if I tell."
Help would be ineffective	Student indicated that reporting the threat would not be helpful or effective.	"Teachers wouldn't do anything."
Other	The response was a reasonable reply but did not fit in any other category.	"I'm new here and don't know anyone well enough to tell."
Uncodeable	The response was nonsensical or could not be understood.	"My taco fell down a well."

Table 3

Crosstabulation of Student Demographics and Threat Experiences

		Gender				Race/Ethnicity				Grade Level					
		Male	Female	$\chi 2$	*p*	White	Minority	$\chi 2$	*p*	9th	10th	11th	12th	$\chi 2$	*p*
Threatened	*Yes*	266	198	25.0*	< .001	233	231	26.8*	< .001	132	134	112	86	9.59*	.022
	No	1480	1812			2065	1227			822	840	831	799		
Serious threat	*Yes*	63	44	6.8*	.009	44	63	18.7*	< .001	36	22	22	27	5.21	.157
	No	1683	1966			2254	1395			918	952	943	885		
Threat outcome	*Yes*	28	14	2.3	.130	13	29	7.7*	.005	14	12	8	8	1.17	.760
	No	198	166			195	169			98	107	92	67		
Reported threat	*Yes*	51	68	13.8*	< .001	60	59	.004	.951	32	31	31	25	1.47	.689
	No	208	125			169	164			96	101	76	60		

Table 4

Logistic Regressions on Student Threat Experiences

Predictors	Serious Threat				Threat Reporting				Threat Outcome			
Block 1	OR	95% CI	*SE*	*p*	OR	95% CI	*SE*	*p*	OR	95% CI	*SE*	*p*
Male	1.43	[0.95, 2.15]	0.21	*ns*	0.45*	[0.29, 0.71]	0.23	.001	1.49	[0.74, 3.03]	0.36	*ns*
Grade	0.94	[0.78, 1.13]	0.09	*ns*	1.15	[0.93, 1.42]	0.11	*ns*	0.91	[0.66, 1.26]	0.17	*ns*
Minority	2.19*	[1.43, 3.36]	0.22	<.001	1.13	[0.71, 1.78]	0.24	*ns*	2.70*	[1.27, 5.73]	0.39	.01
Block 2												
Male	0.77	[0.49, 1.22]	0.23	*ns*	0.41*	[0.25, 0.66]	0.25	<.001	0.53	[0.20, 1.42]	0.50	*ns*
Grade	0.90	[0.74, 1.09]	0.10	*ns*	1.16	[0.94, 1.44]	0.11	*ns*	0.84	[0.56, 1.24]	0.20	*ns*
Minority	1.07	[0.66, 1.72]	0.24	*ns*	1.11	[0.68, 1.79]	0.25	*ns*	1.47	[0.57, 3.77]	0.48	*ns*
Aggressive attitudes	1.15*	[1.11, 1.21]	0.02	<.001	1.00	[0.95, 1.06]	0.03	*ns*	1.16*	[1.06, 1.27]	0.05	.002
Alcohol intake	1.32*	[1.08, 1.62]	0.10	.007	1.00	[0.78, 1.28]	0.13	*ns*	1.29	[0.85, 1.95]	0.21	*ns*
Marijuana use	1.32*	[1.11, 1.57]	0.09	.002	1.02	[0.83, 1.26]	0.11	*ns*	1.25	[0.86, 1.81]	0.19	*ns*
Threat specificity	N/A				1.71*	[1.06, 2.76]	0.25	.029	9.96*	[3.49, 28.5]	0.54	< .001

Manuscript Two

Prevalence and Offense Characteristics of Multiple Casualty Homicides: Are Schools At Risk?

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Abstract

Objective: In light of public concern about school shootings, this study examined the prevalence and offense characteristics of multiple casualty homicides across locations. ***Method:*** We used the FBI's National Incident Based Reporting System (NIBRS) to examine 18,873 homicide incidents involving 25,180 victims who were either killed or injured from 2005 through 2010. ***Results:*** Multiple casualty homicides were surprisingly common events, with approximately 22% of homicide incidents involving two or more victims. Multiple casualty homicides were much more common in residences (47%) versus schools (0.8%), but homicides in residences tended to have one victim (78%) rather than multiple victims (22%), whereas homicides in schools were about equally likely to have one victim (57%) or multiple victims (43%). Multiple homicides were more likely to involve firearms than weapons such as knives or blunt objects. Finally, there were statistical differences in offense characteristics for homicides with one, two, and three victims. ***Conclusion:*** These findings suggest that the public perception that schools are a high-risk location for homicides is inaccurate. Although concern about school shootings is understandable, the larger problem of multiple casualty shootings is more common in other locations which do not receive comparable media attention.

KEYWORDS: multiple casualty homicides, mass shootings, mass homicide, school shootings, targeted violence, gun violence

Prevalence and Offense Characteristics of Multiple Casualty Homicides: Are Schools At Higher Risk Than Other Locations?

School shootings have stimulated widespread debate about the need for increased school security and safety measures (DeAngelis, Brent, & Ianni, 2011; Healy, 2013; *The Times*, 2013). Within a few months of the shootings at Sandy Hook Elementary School in Connecticut, every state legislature in the United States introduced new school safety measures, and approximately 20 states passed laws to improve school security (Armario, 2013). Although the tragedy of a school shooting understandably raises great public concern that schools are dangerous places, decisions about school safety should be based on an objective assessment of the risk of violence in schools in comparison to other locations. The purpose of this study was to examine the prevalence of multiple casualty homicides in schools in comparison to other locations and to identify risk factors associated with such events. In this study a multiple casualty homicide was broadly defined as any violent crime with at least one homicide and more than one victim, but definitions involving two, three, or four, victims were also investigated.

The location of multiple casualty homicides is of special interest because of the policy debate over whether schools need more protection than other locations. Communities across the country have allocated millions of dollars to school building security measures because of the perceived risk of shootings. Many schools have invested heavily in security personnel and installed security measures such as metal detectors, electronic door locks, bullet-proof glass, intruder alarms, and security video cameras (Armario, 2013; Davidson, 2013; DeAngelis et al., 2011; *The Times*, 2013). Such measures are expensive investments at a time when public education has limited funding. However, few studies have examined where multiple casualty homicides most frequently occur and in particular, how frequently they occur in schools (Bowers

et al., 2010). Petee and Padgett's study (1997) found that multiple casualty homicides most typically occurred at restaurants (16%) retail stores (15%), or government offices/facilities (13%), but they purposely excluded homicides at residences. In contrast, Duwe (2004) found that most multiple casualty homicides occurred at private locations or residences (72%).

The overall number of homicides in schools also must be placed in a larger perspective. The Centers for Disease Control and Prevention (CDC) reported that 14 to 34 school-age children (ages 5-18) were victims of homicide at school (including travel to and from school) each year from 1992 to 2010 (Robers et al., 2013). In contrast, a far larger number of school-age children were murdered outside of school. For example, CDC identified 19 school-associated homicides during the 2009-2010 school year and 1,377 homicides outside of school. School-based homicides represent only one to two percent of homicides of school-age children. However, these data do not indicate how many of the homicides were shootings or how many were multiple casualty homicides, which are the cases that have aroused the greatest concern. More generally, there is substantial interest in the prevalence of multiple casualty shootings and whether they differ in important ways from single-victim shootings or other forms of homicide.

The role of firearms in school homicides is especially controversial. Gun safety advocates have characterized firearms as instrumental to the perpetration of school homicides, while gun ownership advocates have asserted that firearms are the only effective way to stop an attacker (National Rifle Association, 2012). Accordingly, proposals have ranged from restricting firearm purchases to training teachers to carry firearms (Armario, 2013; Healy, 2013). Although an analysis of gun safety strategies is beyond the scope of this study, understanding the relations between firearms and homicides can help clarify their relevance to discussions of school safety.

Finally, there is a general view among homicide researchers that multiple casualty

homicides should be distinguished from homicides with only a single victim (Bowers et al., 2010). The tragedy of multiple victims in schools has raised great public concern and it is important to consider how homicides differ as the number of victims increase. Multiple casualty homicides are most often distinguished from single homicides by the offender-victim relationship, which is typically classified as close relation, acquaintance, or stranger (Bowers et al., 2010; Duwe, 2004). However, previous studies are inconsistent in their findings. Duwe (2004) found that the most common offender-victim relationship in multiple casualty homicides was a close relation (i.e., a family member or intimate partner). This finding differs from some criminological literature (Bowers et al., 2010), which reported that multiple casualty homicide victims tend to be strangers or acquaintances. One possible explanation for this discrepancy is that multiple casualty homicides at public locations typically generate more media attention than such crimes at private locations, which likely involve close relations (Bowers et al., 2010).

The Current Study

Two methodological issues—sample selection and case definition—make it difficult to compare study findings. Some studies (Kelly, 2010; Petee & Padgett, 1997) have relied on media reports as a source of sample cases, which is problematic because news reports are likely to yield a sample biased toward the most extreme cases. Other studies have used the Federal Bureau of Investigation's (FBI) Supplementary Homicide Reports (SHR; Cooper & Smith, 2011; Duwe, 2004), which include a large number of cases, but do not provide information on the number of victims and location where the crime occurred. Several authors have identified the FBI's National Incident Based Reporting System (NIBRS) as especially useful in overcoming both the selection biases embedded in studies derived from media reports and the limited assessment of offense characteristics in SHR studies (Briere, 2014; Huff-Corzine et al., 2013; Maxfield, 1999).

The NIBRS was developed to gather more detailed crime information at the incident level than is obtained through the SHR and Uniform Crime Reports (FBI NIBRS User Manual, 2013; Maxfield, 1999). Like the Uniform Crime Reports, the NIBRS is coded by local and state law enforcement officers using data from official agency reports and investigations, but permits analysis of multiple-victim and multiple-offender incidents.

The definition of a multiple casualty homicide is also problematic. An underlying assumption is that multiple casualty homicides are qualitatively different from single homicides, but this has not been empirically verified (Duwe, 2009; Wright et al., 2008). Previous literature uses terms such as "mass homicide," "mass murder," or "mass shootings," to signify the killing of or attempt to kill many people at a specific location within a brief time span (Bowers, Holmes, & Rhom, 2010; Critical Incident Response Group [CIRG], 2013; Duwe, 2004; Petee & Padgett, 1997). These studies use various cut-offs of two (Wright, Pratt, & Delisi, 2008), three (CIRG, 2013; Petee & Padgett, 1997), or four (Duwe, 2004; Fox & Levin; 2003, Huff-Corzine et al., 2013) victims. A related problem is that many studies only count homicide victims, and omit cases in which only one or two persons are killed but others are wounded. Bowers et al., (2010) contended that it is not the specific number killed, but the attempt to kill multiple individuals, that is critical. No study has systematically compared homicide incidents in a large enough sample to compare different cut-offs and determine whether there is a distinctive change in offense characteristics, such as location, associated with the number of victims.

In order to obtain a sufficiently large sample of multiple casualty homicides and overcome some of the limitations of previous research, the present study examined 18,873 homicide cases recorded in NIBRS over a six-year period. We were primarily interested in comparing schools to other violent crime locations, but included other offense characteristics, including weapon,

offender-victim relationship, and the sex and age of offenders, in order to place findings about locations in an appropriate context. There were three research questions: (1) "How do multiple casualty homicides compare to single homicides in locations, such as schools, and other offense characteristics?" (2) "How do location and other offense characteristics change as the number of victims increases?" and (3) "How do shootings differ from other non-shooting homicides?"

Methods

Sample

The sample consisted of incident records from the NIBRS database for the years 2005 to 2010, the six most recent years with data available. The average number of homicide incidents per year from 2005 to 2010 was 3,145 for a total of 18,873. The NIBRS includes the number of victims for each offense, but only indicates whether the victim was killed for the first three cases. Of the 18,873 homicide incidents between 2005 and 2010, there were 14,475 cases (78%) involving a single victim and 4,398 (22%) involving multiple casualties. Among the homicides with more than one victim, the second victim was killed in 1,486 of the incidents (51% of two-victim incidents) and the third was also killed in 296 (40% of three-victim incidents).

Missing data. The main variables of interest (i.e., location of offense and number of victims), as well as the state of occurrence and incident year (n = 18,873) were complete for all cases. The weapons variable was missing for 1,366 (7.2%) cases while the offender-victim relationship variable was missing for 8,412 (45%) cases. Offender sex was missing for 3,962 (21%) cases and offender age for 4,872 (26%) cases. Missing offender data were due in part to cases in which the offender had not been identified.

In order to make use of the cases with missing data, multiple imputation was carried out using SAS PROC MI. Multiple imputation is robust to various types of missing data

mechanisms and is regarded as a principled method of handling missing data (Rubin, 1987; Schafer & Graham, 2002). While no established benchmarks have been set in the literature regarding what is an acceptable percentage of missing data to yield valid estimates (Dong & Peng, 2013), guidelines set by Allison (2012) and Bodner (2008) were followed in generating the imputed datasets. Traditionally, five to ten multiply-imputed datasets have been deemed acceptable (e.g., Roberts, 2007 used 10 multiply-imputed NIBRS datasets). As a conservative measure to ensure stable estimates, we used 30 multiply-imputed datasets in all inferential statistical analyses. Results from regression models using the datasets were combined using PROC MIANALYZE, which factored in the uncertainty due to the missing values.

Measures

The validity of NIBRS data for crime research has been examined by previous researchers who concluded that it is especially useful for research questions that go beyond the scope of the Uniform Crime Reports (UCR) or National Crime Victimization Survey (NCVS; Maxfield, 1999; Roberts, 2007). For example, the NIBRS has been used to examine domestic violence incidents and crimes against children (Finkelhor & Ormrod 2004; Snyder & McCurley, 2008). Although NIBRS is limited to known offense characteristics, it is most useful for crimes such as homicide that are less likely to go unreported than other violent crimes. The NCVS is derived from interviews with victims and includes crimes not reported to law enforcement, but does not include homicides or identify incidents with multiple victims.

Although NIBRS contains unparalleled information on a large amount of cases, it is a voluntary system that has not been implemented nationwide (Finkelhor & Ormrod, 2004). It includes crimes committed in 37 states, encompassing 29% of the U.S. population and 27% of the nation's reported crime. Two independent studies found that NIBRS incident data were

reasonably consistent with Uniform Crime Report homicide data (Addington, 2008; Rantala, 2000). A study of mass murders involving four or more victims found that NIBRS data provided estimates of offense characteristics consistent with the larger, but less detailed, data available in the Supplemental Homicide Reports (Huff-Corzine et al., 2013).

Location. Location type refers to where the homicide occurred. The original NIBRS coding had 44 categories, which were reduced prior to analyses to twelve more general categories (see Table 1). For example, the locations *drug store*, *department store*, and *specialty store* were combined into one *store* category. The *field/woods*, *lake/waterway*, and *park/playground* categories were combined into one *outdoors* category. In the NIBRS dataset, *school/college* was one category. Notably, only 13 of the 49 (27%) school/college homicides involved victims under 18 years of age and there were no victims below 12 years of age.

Weapons. The original weapons variable included 19 categories, ten of which were variations of firearms (e.g., handgun, rifle, shotgun) and therefore grouped into one category. Consistent with previous studies, the remaining categories were grouped into *close proximity weapons* (e.g., knife, hands, blunt object) or *other weapons*, such as an explosive device or poison (Duwe, 2004; Silverman & Mukherjee, 1987).

Offender-victim relationship. The original offender-victim relationship variable included 25 categories, which were reduced to three more general categories commonly used in previous studies: 1) close relation (family member or intimate partner); 2) acquaintance or otherwise known person (e.g., neighbor or employer); and 3) stranger (Bowers et al., 2010; Duwe, 2004). In multiple-victim cases, the first offender-victim relationship was used.

Offender demographics. NIBRS data provide demographic information for up to three offenders. We used the first offender in our analyses and included the offender's gender (male =

0 and female = 1) and years of age. Age was analyzed as a continuous variable, but four groups are presented for descriptive purposes in Table 1.

Analysis Plan

To address the first research question, we grouped incidents according to the number of victims and compared frequencies of the following: location, weapon, offender-victim relationship, and offender demographics (sex and age).

Because of the skewed distribution for study variables, a truncated Poisson-based regression was used to examine the second research question of whether there was an association between increasing numbers of victims and offense characteristics. Poisson regression approaches have demonstrated greater reliability and accuracy than ordinary least squares regression when analyzing skewed count data (Huang & Cornell, 2012).

To further investigate the second research question, a series of binary logistic regressions were used to systematically investigate how offense characteristics changed with each additional victim, by successively subdividing the sample with multiple victims. The first regression compared single-victim incidents versus all other incidents. The second regression compared incidents with two victims versus those with three or more victims. The third regression compared incidents with three victims versus those with four or more victims, and the fourth and final regression compared incidents with four victims versus those with five or more victims. There were too few incidents with six or more victims (n = 47) to merit further comparisons. The homicide offender's sex and age were used as predictors in the regression models.

To address our last research question, logistic regression analyses compared shootings to non-shootings. Weapons was used as the dependent variable, where all firearms = 1 and all other

weapons = 0. All of the regression models used in the analyses used a fixed effects approach (Huang, in press) to account for incidents nested within state and year of incident.

Results

Table 1 presents descriptive information. The most frequent location for homicides was a residence (52%), followed by highway/road/alley (24%), parking lot/garage/terminal (6%), and other location (6%). The remaining 8 categories, including restaurants/bars (3%) and schools (0.3%), comprised 12% of homicide incidents.

Regarding weapons used, 68% of homicide incidents involved a firearm, and only 26% of cases involved a close-proximity weapon. The remaining 6% involved other weapons, such as an explosive device. Offender-victim relationships were most commonly acquaintances (46%), followed by close relations (38%) and strangers (16%).

The number of victims ranged from 1 to 54 (mean = 1.33). Approximately 78.1% of the homicide incidents had one victim, 15.4% had two victims, 3.9% had 3 victims, 1.5% had four victims, and the remaining 1% had five or more victims. The number of offenders ranged from 1 to 17 per incident (mean = 1.44). Approximately 75% of the offenses had one offender, 14% had two offenders, 6% had three offenders, 3% had four offenders, 1% had five or more offenders, and the remaining 1% had six or more offenders.

Finally, 62% of offenses had one offender and one victim, 10% had two offenders and one victim, and 10% had one offender and two victims. Only 3.6% of offenses had three offenders and one victim, and 2.3% of offenses had one offender and three victims.

Offender characteristics. Offenders in the dataset were predominantly male (N = 13,397, 90%). Offender ages were the following:18 years (7%), 18-39 (69%), 40-65 (23%), and 66 or older (2%). Notably, 19 of the 49 (39%) school homicides involved adolescent offenders.

Truncated Poisson Regression Model

To examine the second research question, a truncated Poisson regression model was used to predict increases or decreases in the number of victims based on offense characteristics. The fixed effects regression model included the following variables: location type, weapon, offender-victim relationship, offender sex, age, and number of offenders per incident (see Table 2).

The full model results include an incidence rate ratio (IRR), which is the antilog of the regression coefficient (i.e., exp[b]) that indicates the factor change in counts for a one unit change in the variable. IRRs > 1 indicate that an independent variable is associated with an increase in the number of victims while IRRs < 1 indicate a decrease in the number of victims. For location, we used residence as the reference category because it was the most common location for a homicide. Notably, victim counts in schools were higher (IRR = 3.47) than victim counts in residences. Of note, there were only 49 (0.3%) incidents at schools in the dataset, but schools had the lowest percentage of single victims among all location categories: 78% of all incidents across all locations had one victim whereas only 54% of school homicides had one victim. Although homicides occurred infrequently at schools, when they occurred, they were more likely to involve multiple victims than homicides at other locations.

The following locations were also associated with higher victim counts when compared to residences: gas stations/convenience stores (18% higher), restaurants/bars (60% higher), and stores (57% higher). On the other hand, the following locations were associated with lower victim counts, as compared to residences: highways/roads/alleys (12% lower) and hotels/motels (29% lower). Number of victims also tended to be lower outdoors (42% lower) and at other locations (33% lower) than at residences.

We used close-proximity weapon (i.e., knife or blunt object) as the reference category for weapons, because we were interested in how firearm use was associated with higher victim counts. Compared to close-proximity weapons, the use of firearms was associated with a higher number of victims (98% higher) as was the use of other weapons (78% higher). Strangers, compared to close relations (i.e., the reference category), had victim counts that were higher by 28%. The number of victims per incident was lower by 33% for female offenders compared to male offenders. Finally, victim count was higher by 20% as the number of offenders per incident increased, controlling for all other variables included in the model.

Logistic Regression Models

To further examine our second research question, we used five orthogonal, fixed effects logistic regression models. Each was used to predict two dichotomous groups based on the number of victims and included the following variables: location type, weapon, offender-victim relationship, offender sex, age, and number of offenders per incident (see Table 3).

The first regression model comparing single homicides to multiple casualty homicides was significant (Nagelkerke $R^2 = .13$, $p < .001$). Homicides in schools (OR = 2.62) were more likely to have two or more victims, compared to homicides in residences (the reference category), which were more likely to have one victim. Although residences were the most common location for homicides (a total of 9,847 incidents), 22% of incidents involved two or more victims. In contrast, homicides in schools were rare (a total of 49 incidents or .0025% of the 18,873 homicides in the NIBRS), but 43% of these incidents had more than one victim.

Again, comparing the ratios of multiple to single casualty homicides, multiple casualty homicides were less likely among homicide incidents to occur at highway/road/alley locations (OR = 0.88), outside (OR = 0.49), or at other locations (OR = 0.63), and more likely to take

place at a gas station/convenience store (OR = 1.43), restaurant/bar (OR = 1.72), or store (OR = 1.99), as compared to homicide incidents at residences.

In multiple casualty homicides, offenders were more likely to use a firearm (OR = 2.13) or other weapon (OR = 1.77) than a knife or other close-proximity weapon. Victims were more likely to be strangers than close relations (OR = 1.35). Multiple casualty homicides were also more likely if the incident involved an offender who was younger (OR = 0.996) or male (OR = 1.56). Multiple casualty homicides were more likely to involve multiple offenders (OR = 1.35).

The second regression analysis contrasted homicides with two victims versus three or more victims (Nagelkerke $R^2 = .06$, $p < .001$). The proportion of incidents with three or more victims was higher at a restaurant/bar than at a residence (OR = 1.84). Offenders were more likely to use a firearm (OR = 1.54) or other weapon (OR = 1.82), rather than a knife or other close-proximity weapon. Cases with three or more victims were less likely to have offenders who were younger (OR = 0.99) and female (OR = 0.62), but more likely to involve multiple offenders (OR = 1.20). Schools were not significantly associated with three or more victims.

The third regression analysis compared homicides with three victims versus four or more victims (Nagelkerke $R^2 = .11$, $p < .001$). Incidents with four or more victims were more likely to involve firearms (OR = 1.67) or other weapons (OR = 2.18), younger offenders (OR = 0.98), and multiple offenders (OR = 1.12). The remaining model that examined five or more victims had no predictor variables that were statistically significant (Nagelkerke $R^2 = .14$, $p > .05$).

Shootings versus non-shootings. To address our final research question, a logistic regression model compared shootings to non-shootings as the outcome variable and included all previously used independent variables (see Table 4).

The overall model comparing shootings to non-shootings was significant (Nagelkerke R^2 = .15, $p < .001$). Shootings were no more likely than non-shootings to occur at schools, compared to residences ($p > .05$). They were more likely than non-shootings to occur at a gas station/convenience store (OR = 2.41), highway/road/alley (OR = 1.81), parking lot/garage/terminal (OR = 1.88), restaurant/bar (OR = 1.41), or store (OR = 2.27), compared to a residence. Shootings were less likely than non-shootings to occur outdoors (OR = 0.73) compared to a residence. They were more likely than non-shootings to involve victims who were acquaintances (OR = 1.11) or strangers (OR = 1.31), as compared to close relations. For offender demographics, shootings were more likely than non-shootings to have male offenders (OR = 1.96) who were older (OR = 1.0004). Finally, shootings were more likely than non-shootings to have higher offender counts (OR = 1.13) and victim counts (OR = 1.47) per incident.

Discussion

There is understandable public concern over tragic events such as a mass shooting at a school because they seem so unjustified and unexpected. Massive news media attention to the shooting at Sandy Hook Elementary school in particular generated nationwide calls for increased school security (Armario, 2013). In response to the same shooting, a position statement on the urgent need to prevent school and community violence was endorsed by nearly 200 professional organizations, including 31 Divisions of the American Psychological Association (Interdisciplinary Group on Preventing School and Community Violence, 2013). However, the need for school security is based on a perception that schools are risky places that need more protection from violent attacks than other locations. Findings from the present study provide a broader perspective on schools as locations vulnerable to homicidal violence.

Based on the NIBRS database containing more than 18,873 homicide incidents, more than half (53%) of homicide incidents occur in residences, including nearly half (47%) of multiple casualty homicides. In contrast, only 0.3 percent of homicides and 0.8 percent of multiple casualty homicides in this sample occurred in schools. These results support a previous study using CDC mortality data (Modzeleski, 2008) that concluded that school-associated student homicides represent approximately 1% of homicides that occur among school-age youths. From this perspective, schools are one of the safest places in the United States, and should not be regarded as high-risk for homicidal attacks (Borum, Cornell, Modzeleski, & Jimerson, 2010). These findings raise questions about the massive allocation of public funding and human resources to school security (DeAngelis et al., 2011).

From the standpoint of protecting young people from homicidal violence, it would seem to be most effective to increase security where there is greatest risk. When police officers are pulled from community patrols to stand guard at the entrance of elementary schools, there is legitimate concern that public safety has not been enhanced. Such security decisions imply that "school violence" is a form of violence that requires special attention. To use a striking counter-example, consider the finding that multiple casualty homicides are more frequent in restaurants than schools; "restaurant violence" has not been identified as a public safety concern and there have been no public calls to increase restaurant security or arm waitpersons (Cornell, 2013).

Glassner (2010) conducted a sociological analysis of the culture of fear phenomenon in the United States, identifying many circumstances in which the American public developed an exaggerated fear based on media attention to poignant events that were contrary to statistical trends and scientific evidence. The cases he identified ranged from fears of various infectious diseases such as the Ebola virus to crack babies, super-predator teens, and satanic cult abductions

of children. He made an appeal to repudiate media misrepresentations, educate the public, and reallocate public funds to more realistic needs and threats.

One unexpected finding is that a homicide incident in a school was almost evenly likely to have one victim (46%) versus more than one victim (54%), whereas a homicide incident in all other locations typically had one victim (78%). Moreover, approximately 39% of school homicides involved adolescent offenders. These findings may reflect the copycat appeal of a mass shooting in a school. Copycat motivation has been identified in several case studies of school shootings and has been observed in other high profile crimes, and may be especially appealing to adolescents (Dill et al., 2011). The sensational nature of a high profile crime and its capacity to have such forceful impact on the public may make it attractive to some troubled individuals who are already contemplating a violent act (Surette, 2010).

As the number of victims increased, the role of firearms increased substantially, suggesting that firearms are an especially important risk factor for multiple casualty homicides. Firearms were the primary weapons for multiple casualty homicides with two victims (77%), three victims (81%), four victims (85%), five victims (82%), and six or more victims (94%). These findings are consistent with the study by Huff-Corzine and colleagues (2014), who found overall similarity between NIBRS and Supplementary Homicide Report databases, but limited their cases to murders involving four or more fatalities.

The current study also found that fatal shootings at schools were not more likely to occur than homicides with other kinds of weapons. Shootings may be more likely to generate media attention and are more likely to result in multiple fatalities than attacks with other kinds of weapons, but fatal attacks without firearms should not be discounted from school safety considerations. This is noteworthy in light of the comparatively high prevalence of fatal attacks

in German schools that involved edged weapons rather than firearms (Bondü, 2010) and a highly publicized knife attack in a Pittsburgh school (Silver, 2014). However, shootings were approximately twice as likely as non-shootings to be associated with a number of public locations, including parking lots, stores, or gas stations/convenience stores. Notably, shootings were associated with more victims, even when compared to a group that included arson and explosive devices. These findings further reinforce the need to develop strategies to reduce firearm-related deaths (American Psychological Association, 2013).

Limitations

This was a correlational study that cannot establish a causal relationship or determine the direction of effects. There is no claim, for example, that firearms cause multiple casualty homicides, although the association between the use of firearms and the number of victims suggests that firearms facilitate an increased number of casualties compared to other weapons.

The NIBRS database is derived from law enforcement records, which have several well-known limitations. Only cases known to law enforcement are included, and data on offenders are available only in cases when the offender has been identified. Despite these limitations, the use of a larger and more comprehensive dataset can lower selection biases that may skew results.

The substantial amount of missing information in the NIBRS may have limited our results, although we employed multiple-imputation to account for the missing data, as have other NIBRS studies (e.g., Roberts, 2007). To strengthen future research, law enforcement agencies should endeavor to code more complete information for homicide incident and offender variables. Furthermore, NIBRS currently includes only about one-third of the U.S. population and nation's reported crime, and cannot be regarded as a representative sample of either states or law enforcement agencies (Addington, 2008). An analysis of nonresponse bias found that NIBRS

"may have a greater capacity to illuminate the crime problem than previously believed" but is less suitable for estimating changes in annual crime rates, which were not examined in our study (Addington, 2008, p. 46). Briere (2014) identified the lack of nationwide participation as the major shortcoming of the NIBRS and advocated the need to facilitate data entry and provide law enforcement with greater incentive to adopt the program by making results more accessible.

Research Implications

One of the important unresolved questions in the field concerns the number of victims necessary to define a mass homicide. The present study systematically examined cut-offs of two, three, four, and five or more victims. Based on an analysis of available offense characteristics, there were some significant differences at two, three, and four victims. It seems likely that no specific cutoff for number of victims is sufficient to identify a meaningfully distinct form of homicidal violence and that other distinguishing features must be considered. The most important features for defining a mass homicide, or types of mass homicides, may involve the offense motive, which is not currently captured in NIBRS, SHR, and other crime databases.

A related research problem concerns the limited number of multiple homicide cases available for study. A higher cut-off for number of homicide victims may increase the distinctiveness of a mass shooting, but it reduces the number of cases obtainable for study and has resulted in a research literature populated primarily by case studies and small samples. Our approach was to include injured victims rather than limit the definition to homicide victims (Bowers et al., 2010), and thus we used the term "multiple casualty homicide" rather than "multiple homicide" or "mass homicide." One result of this expanded definition is that there are many more cases available for study. In the present NIBRS database encompassing approximately 29% of the U.S. population, there was an average of 3,145 homicide incidents per

year. Of these incidents, an average of 688 (22%) involved two or more victims. By extrapolation, there would be approximately 2,372 multiple homicide casualty incidents nationwide. Even using a more restrictive criterion of three or more victims, there was an average of 203 incidents per year in the NIBRS database, generating an estimated national prevalence of 698 per year. We recommend that researchers use an expanded definition to obtain the largest possible number of cases, and then investigate whether the number of homicides versus injuries makes any meaningful difference in their analyses.

Clinical and Policy Implications

The specter of "school violence" has become a recognized phenomenon that has dramatically shaped school safety policies and in turn affected clinical practice. Although it is widely recognized in the mental health field that individual predictions of violence are often inaccurate and should be placed in a highly qualified and carefully framed context of risk reduction and management (Heilbrun, 1997; Monahan & Skeem, 2014), school authorities who suspect a student might commit a school shooting often make referrals to mental health professionals to determine categorically whether the student is dangerous or can safely return to school (Cornell & Heilbrun, in press). The low base rate for school homicides underscores the futility of predicting a school shooting (Mulvey & Cauffman, 2001). Additional concerns have been raised about the hazards of using psychological profiles which will over-identify nonviolent students who may share non-specific characteristics with homicidal students, such as anger and feelings of alienation (Mulvey & Cauffman, 2001; O'Toole, 2000). Clinicians must clarify the nature and limitations of their clinical assessments of students and should consider reframing the evaluation from a threat assessment perspective (Borum et al., 2010).

In their report on gun violence, the American Psychological Association (2013) recognized behavioral threat assessment as an effective and cost-efficient prevention strategy. Threat assessment is a form of violence prevention that emphasizes investigation and intervention to reduce the risk of violence following an identified threat of violence. For decades, the FBI and Secret Service have used threat assessment to protect public officials (Fein & Vossekuil, 1998). Threat assessment provides people with opportunities to report threats of violence and helps authorities respond appropriately to such threats (O'Toole, 2000; Vossekuil et al., 2002). This approach has become a recommended practice for higher education institutions (ASMI-Innovative Technologies Institute, 2010), workplaces (ASIS International and Society for Human Resource Management, 2011), and military settings (Department of Defense, 2010). In studies of school shooters (O'Toole, 2000; Vossekuil, Fein, Reddy, Borum, & Modzeleski, 2002), offenders almost always communicated their thoughts or plans of violence to peers, and engaged in extensive preparation for an attack that was observed by others. Given these findings, the FBI and Secret Service recommended that schools adopt threat assessment programs. Threat assessment guidelines have become widely used in K-12 schools, and the Virginia Student Threat Assessment Guidelines (Cornell, Allen, & Fan, 2012) is the first threat assessment program to be recognized as an evidence-based practice by the National Registry of Evidence-Based Programs and Practices (NREPP; 2013). Threat assessment does not presume or predict that individuals are dangerous, but focuses on resolving any identified problem that stimulated threatening behavior. It embodies principles of prevention consistent with a public health approach and can be applied across settings (American Psychological Association, 2013).

More generally, our findings regarding the offender-victim relationship and crime location suggest that most incidents involved a conflict or grievance prior to homicidal violence.

Previous literature has found prior conflicts or grievances to be a risk factor for fatal violence in residences, workplaces, and schools (Lankford, 2012; Rugala & Isaacs, 2003). One prevention approach might be greater use of conflict resolution across community contexts for those experiencing relational difficulties. Two meta-analytic studies showed the effectiveness of conflict resolution programs in schools in managing interpersonal conflict (Burrell, Zirbel, & Allen, 2003) and reducing antisocial activities like aggression (Garrard & Lipsey, 2007).

The high prevalence of multiple casualty homicides at residences suggests that one focus of violence prevention may be to support family members at risk for homicidal violence. Previous research on intimate partner homicide has found that pre-existing domestic violence, estrangement in the relationship, suicidal intentions, and prior threats with a weapon are risk factors for homicide within families (Bailey et al., 1997; Campbell et al., 2003; Sillito & Salari, 2011). Given the frequent intersection of law and mental health in domestic violence cases, programs that involve collaboration between police officers and mental health professionals, such as crisis intervention teams (CITs), have shown promise in de-escalating high-risk situations (American Psychological Association, 2013).

In light of the strong association between firearms and multiple casualties, another important strategy may be to focus on the prevention of firearm-related fatalities. In their article on gun violence in the United States, Webster and Vernick (2013) recommended prohibiting firearm sales to high-risk individuals, such as those with a restraining order for violent behaviors, persons convicted of stalking, and/or seriously mentally ill individuals who have exhibited threatening, suicidal, or other violent behaviors. The diversity of circumstances and locations in which multiple casualty homicides occur makes it unlikely that any single prevention strategy will be sufficient, but our findings suggest promising pathways that merit consideration.

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Table 1. *Descriptive Statistics of Homicide Incidents*

Number of Victims	**1**		**2**		**3**		**4**		**5**		**6+**	
	N	Column %	N	Column %	N	Column %	N	Column %	N	Column %	N	Column %
Incident N	14,745	100	2,912	100	735	100	281	100	110	100	90	100
N of offenders per homicide incident	14,212	100	2,715	100	1,059	100	471	100	209	100	207	100
Primary Incident Location												
Residence	7,809	52.9	1,465	50.3	346	47.0	128	45.6	55	50.0	44	48.9
Parking lot/garage/terminal	905	6.1	206	7.1	57	7.8	25	8.9	7	6.4	9	10.0
Highway/road/alley	3,418	23.2	732	25.1	191	26.0	75	26.7	26	23.6	13	14.4
Outside	551	3.7	58	2.0	13	1.8	4	1.4	2	1.8	1	1.1
School	28	0.2	15	0.5	2	0.3	3	1.1	0	0	1	1.1
Store	95	0.6	44	1.5	10	1.4	4	1.4	2	1.8	4	4.4
Gas station/convenience store	224	1.5	75	2.6	25	3.4	5	1.8	3	2.7	1	1.1
Government/office building/place of business	227	1.5	38	1.3	12	1.6	7	2.5	1	0.9	3	3.3
Restaurant/ bar	339	2.3	108	3.7	45	6.1	22	7.8	9	8.2	10	11.1
Hotel/motel	170	1.2	33	1.1	6	0.8	2	0.7	0	0	0	0
Religious	19	0.1	4	0.1	0	0	0	0	0	0	1	1.1
Other	960	6.5	134	4.6	28	3.8	6	2.1	5	4.5	3	3.3
Location column total	14,745	100	2,912	100	735	100	281	100	110	100	90	100
Primary Weapon of Use												
Knife, Blunt object, or personal (e.g., hands)	3995	29.5	493	17.6	97	13.6	26	9.5	12	11.3	0	0
Firearm	8688	64.2	2161	77.2	578	81.0	232	84.7	87	82.1	82	94.3
Other weapon	845	6.2	144	5.1	39	5.4	16	5.8	7	6.6	5	5.7
Weapon column total	13,528	100	2,798	100	714	100	274	100	106	100	87	100
Primary Offender-Victim Relationship												
Close relation	3,357	40.7	483	30.5	94	24.0	29	20.6	18	30.0	8	16.7
Acquaintance/known	3,745	45.5	748	47.3	170	43.5	59	41.8	21	35.0	15	31.3
Stranger	1,136	13.8	352	22.2	127	32.5	53	37.6	21	35.0	25	52.0
Relationship column total	8,238	100	1,583	100	391	100	141	100	60	100	48	100
Offender sex												
Male	10,097	88.5	2,283	93.3	611	95.9	237	97.9	92	95.8	77	95.1
Female	1,311	11.5	164	6.7	26	4.1	5	2.1	4	4.2	4	4.9
Gender column total	11,408	100	2,447	100	637	100	242	100	96	100	81	100
Offender age group												
Under 18 years of age	642	6.0	187	8.3	45	7.5	26	11.4	7	8.0	8	10.8
18-39 years of age	7,298	67.8	1,591	70.8	453	75.9	171	74.7	70	79.5	60	81.1
40-65 years of age	2,588	24.0	440	19.6	94	15.8	32	13.9	11	12.5	6	8.1
66+ years of age	238	2.2	29	1.3	5	0.8	0	0	0	0	0	0
Age column total	10,766	100	2,247	100	597	100	229	100	88	100	74	100

Note: Homicide incidents include at least one homicide. Subsequent victims suffered either injury or fatality.

Table 2.
Poisson Regression Results on Multiple Casualty Homicides (n = 18,873)

	Model		
Predictors	***b***	***SE***	***IRR***
Location[1]			
Gas station/convenience store	0.16 *	0.08	1.18
Government/office	0.14	0.09	1.15
Highway/Road/Alley	-0.12 ***	0.03	0.88
Hotel/Motel	-0.34 *	0.14	0.71
Other	-0.39 ***	0.06	0.67
Outdoors	-0.55 ***	0.09	0.58
Parking lot/garage/terminal	-0.07	0.05	0.94
Religious establishment	0.33	0.27	1.39
Restaurant/bar	0.47 ***	0.05	1.60
School	1.24 ***	0.11	3.47
Store	0.45 ***	0.09	1.57
Weapon[2]			
Firearm	0.68 ***	0.04	1.98
Other	0.58 ***	0.07	1.78
Relationship[3]			
Acquaintance/Otherwise known	0.01	0.04	1.01
Stranger	0.24 ***	0.05	1.28
Female offender	-0.40 ***	0.06	0.67
Offender age	-0.01 ***	0.00	0.99
Number of offenders	0.18 ***	0.01	1.20

Notes. Model results using 30 multiply-imputed datasets. [1]Reference group = residence.
[2]Reference group = Knife/personal weapon. [3]Reference group = Close relation. IRR = incident rate ratio.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3.

Logistic Regression Results on the Number of Multiple Casualty Homicides

	1 vs. 2+ victims				2 vs. 3+ victims				3 vs. 4+ victims				4 vs. 5+ victims			
Predictors	***OR***		***95% CI***	***SE***	***OR***		***95% CI***	***SE***	***OR***		***95% CI***	***SE***	***OR***	***95% CI***	***SE***
Location[1]															
Gas station/ convenience store	1.43	**	(1.12 - 1.83)	0.18	1.07		(0.69 - 1.64)	0.23	0.45		(0.19 - 1.04)	0.19	1.25	(0.30 - 5.11)	0.90
Government/ office	0.98		(0.72 - 1.32)	0.15	1.49		(0.87 - 2.57)	0.41	1.49		(0.62 - 3.61)	0.67	0.57	(0.14 - 2.27)	0.40
Highway/Road/ Alley	0.88	**	(0.80 - 0.97)	0.04	0.92		(0.76 - 1.10)	0.08	0.77		(0.56 - 1.05)	0.12	0.64	(0.38 - 1.09)	0.17
Hotel/Motel	0.77		(0.53 - 1.11)	0.15	0.57		(0.25 - 1.25)	0.23	0.41		(0.08 - 2.15)	0.34	N/A	N/A	N/A
Other	0.63	***	(0.53 - 0.75)	0.06	0.73		(0.50 - 1.06)	0.14	0.61		(0.30 - 1.22)	0.22	1.69	(0.51 - 5.52)	1.02
Outdoors	0.49	***	(0.38 - 0.63)	0.06	0.81		(0.47 - 1.38)	0.22	0.80		(0.30 - 2.15)	0.40	0.60	(0.11 - 3.28)	0.52
Parking lot/ garage/terminal	0.93		(0.80 - 1.09)	0.07	0.94		(0.72 - 1.24)	0.13	0.82		(0.52 - 1.31)	0.19	0.67	(0.32 - 1.41)	0.25
Religious establishment	0.97		(0.34 - 2.74)	0.51	0.47		(0.05 - 4.74)	0.55	N/A		N/A	N/A	N/A	N/A	N/A
Restaurant/bar	1.72	***	(1.42 - 2.09)	0.17	1.84	***	(1.35 - 2.52)	0.29	1.22		(0.75 - 1.99)	0.30	0.94	(0.45 - 1.97)	0.35
School	2.52	**	(1.38 - 4.61)	0.78	0.83		(0.31 - 2.23)	0.42	4.31		(0.46 - 40.46)	4.93	0.40	(0.04 - 4.44)	0.49
Store	1.99	***	(1.42 - 2.79)	0.34	0.93		(0.54 - 1.62)	0.26	1.46		(0.56 - 3.81)	0.71	1.18	(0.28 - 4.92)	0.86
Weapon[2]															
Firearm	2.13	***	(1.92 - 2.36)	0.11	1.54	***	(1.24 - 1.93)	0.18	1.67	*	(1.09 - 2.54)	0.36	1.41	(0.62 - 3.23)	0.59
Other	1.77	***	(1.47 - 2.12)	0.16	1.82	**	(1.26 - 2.64)	0.34	2.18	*	(1.13 - 4.19)	0.73	1.59	(0.52 - 4.89)	0.91
Relationship[3]															
Acquaintance/ Otherwise known	1.05		(0.95 - 1.17)	0.06	0.93		(0.76 - 1.15)	0.10	0.82		(0.55 - 1.23)	0.17	0.84	(0.44 - 1.62)	0.28
Stranger	1.35	***	(1.19 - 1.54)	0.09	1.23		(0.95 - 1.58)	0.16	0.95		(0.62 - 1.47)	0.21	1.04	(0.51 - 2.12)	0.38
Female offender	0.64	***	(0.55 - 0.75)	0.05	0.62	*	(0.44 - 0.89)	0.11	0.77		(0.38 - 1.57)	0.28	1.67	(0.50 - 5.55)	1.02
Offender age[4]	1.00	*	(0.99 - 1.00)	0.00	0.99	*	(0.98 – 1.00)	0.00	0.98	*	(0.97 – 1.00)	0.01	1.00	(0.98 - 1.03)	0.01
N of offenders	1.35	***	(1.30 - 1.40)	0.02	1.20	***	(1.13 - 1.26)	0.03	1.12	**	(1.03 - 1.22)	0.05	1.06	(0.94 - 1.19)	0.06
n			18,873				4,128				1216			481	
Nagelkerke R^2			.13***				.06***				.11***			.14	

Notes. Model results using 30 multiply-imputed datasets. [1]Reference group = residence. [2]Reference group = Knife/personal weapon. [3]Reference group = Close relation. N/A = not available. Although the odds ratio may indicate 1.00, the upper bound of the confidence interval is 0.9995. ORs that include 1.00 within the 95% confidence interval are not statistically significant. Results are statistically significant as a result of the large sample size used in the analyses.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.
Logistic Regression Results Comparing Shootings to Non-shootings (n = 18,873)

Predictors	*OR*	*95% CI*	*SE*
Location[1]			
Gas station/convenience store	2.41 ***	(1.75 - 3.31)	0.39
Government/office	0.98	(0.75 - 1.27)	0.13
Highway/Road/Alley	1.81 ***	(1.65 - 1.99)	0.09
Hotel/Motel	0.85	(0.63 - 1.14)	0.13
Other	1.09	(0.94 - 1.27)	0.08
Outdoors	0.73 ***	(0.61 - 0.88)	0.07
Parking lot/garage/terminal	1.88 ***	(1.61 - 2.19)	0.15
Religious establishment	1.51	(0.55 - 4.16)	0.78
Restaurant/bar	1.41 **	(1.13 - 1.75)	0.16
School	0.61	(0.33 - 1.12)	0.19
Store	2.27 ***	(1.46 - 3.53)	0.51
Relationship[2]			
Acquaintance/Otherwise known	1.11 *	(1.01 - 1.22)	0.05
Stranger	1.31 ***	(1.15 - 1.49)	0.09
Female offender	0.51 ***	(0.45 - 0.57)	0.03
Offender age[3]	1.00 *	(1.00 - 1.01)	0.00
Number of offenders	1.13 ***	(1.08 - 1.18)	0.02
Number of victims	1.47 ***	(1.39 - 1.56)	0.05

Notes. Model results using 30 multiply-imputed datasets. [1]Reference group = residence.
[2]Reference group = Close relation. Nagelkerke R^2 = .15. [3]While the odds ratio indicates 1.00, the lower bound of the confidence interval is 1.006. ORs that include 1.00 within the 95% confidence interval are not statistically significant. Results are statistically significant as a result of the large sample size used in the analyses.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Manuscript Three

Student threat assessment associated with safety in middle schools

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Abstract

Authorities in law enforcement and education have recommended the use of threat assessment to prevent violence, but few studies have examined its usefulness in middle schools. This retrospective, quasi-experimental study compared middle schools that use the Virginia Student Threat Assessment Guidelines (Cornell & Sheras, 2006; N = 166) to schools that either do not use threat assessment (N = 119) or use an alternative model of threat assessment (school- or district-developed; N = 47). Based on school records, schools using the Virginia Guidelines reported lower short-term suspension rates than both groups of schools. According to a statewide school climate survey, schools using the guidelines also had fairer discipline and lower levels of student aggressive behaviors, as reported by students. Finally, teachers reported feeling safer in schools using the Virginia Guidelines, as opposed to both groups of schools. Additional analyses of school records found that the number of years a school used the Virginia Guidelines was associated with lower long-term suspension rates, student reports of fairer discipline, and lower levels of student aggressive behaviors. All analyses controlled for school size, minority composition, and socioeconomic status of the student body. These findings suggest that use of a threat assessment approach to violence prevention is associated with lower levels of student aggression and a more positive school climate.

Keywords: threat assessment, school violence, school climate, general victimization

Student threat assessment associated with safety in middle schools

After a series of shootings culminating in the tragic incident at Columbine High School, authorities in education and law enforcement recommended the use of threat assessment in schools (Fein et al., 2002; O'Toole, 2000). In their 2013 report on gun violence, the American Psychological Association (2013) recognized behavioral threat assessment as an effective violence prevention strategy. This article reports on the use of student threat assessment in a sample of middle schools.

Threat assessment is a systematic approach to violence prevention in which threats are evaluated on a case-by-case basis to identify individuals who pose a serious threat of violence (Fein et al., 2002; O'Toole, 2000). A joint report of the U.S. Department of Education and Secret Service, as well as a separate study of school shootings by the Federal Bureau of Investigation, concluded that a threat assessment approach ought to be part of a concerted effort by school authorities to promote a positive school climate where students feel safe and supported and discipline is consistent and fair (Fein et al., 2002; O'Toole, 2000).

Although the central purpose of threat assessment is to prevent targeted acts of violence like school shootings, these phenomena are rare (Nekvasil, Cornell, & Huang, in press); in a study of multiple casualty homicides, only 0.8% occurred at schools, versus 47% at residences. At the same time, student threats of violence are relatively common at schools, but most often they are expressions of anger or challenges to fight, rather than indications of an imminent shooting. A national survey of school principals found that threats were officially recorded in 46% all U.S. public schools e during the 2009-2010 school year (Nieman, 2011). However, many threats go unreported to school authorities. A survey of high school students found that approximately 12% of students reported being threatened at school in a one-month period

(Nekvasil & Cornell, 2012). Yet only 26% of these students reported the threat to someone, most often because they did not regard it as serious (Nekvasil & Cornell, 2012).

Although threats are rarely carried out (Cornell et al., 2004; Nekvasil & Cornell, 2012), a one study found that threats are strongly associated with general aggression in school, such as fighting (Singer & Flannery, 2000), suggesting that school authorities cannot ignore threats when they occur. Aggressive behaviors such as fighting and bullying are common problems in schools, yet lethal attacks or more serious violence such as rape or aggravated assault are rare (Robers, Kemp, Truman, & Snyder, 2013). In light of the low base rate for lethal or serious violence in schools and the much higher rate of fighting and bullying, a school threat assessment will most likely be concerned with a broad range of aggressive behaviors, rather than merely shootings. Thus, an important aim of threat assessment is to resolve less severe acts of violence—like bullying and peer conflicts—before they become more serious violence.

To less serious yet more common violence, threat assessment in schools encourages a problem-solving approach that helps to create a positive school climate where students and teachers feel safe and supported (Cornell & Heilbrun, 2015). A positive school climate, in turn, may help to prevent shootings by creating an environment with less stress and discord (Fein et al., 2002; Daniels et al., 2010). Such a climate may also encourage students to report when they are threatened, a pre-requisite for a threat assessment to be initiated. A study of averted school shootings (Daniels et al., 2010) found that a critical factor was a positive school climate, in which students reported concerns to school authorities that triggered an investigation.

Another reason for using threat assessment is that it provides schools with an alternative to zero tolerance disciplinary practices, which endorse rigid and punitive responses to student misbehavior, typically out-of-school suspensions (American Psychological Association Zero

Tolerance Task Force, 2008). School suspension has been associated with a number of negative student outcomes, including disengagement from school (Arcia, 2006), further misbehavior and academic failure (Hemphill,Toubmourou, Herrenkohl, et al., 2006), and, finally, school dropouts (Fabelo, Thompson, Plotkin, et al., 2011). Given these deleterious results, several national reports have called for schools to move away from zero tolerance policies (Morgan et al., 2014; U.S. Department of Education, 2014).

Middle Schools and Threat Assessment

There is a special need to study middle schools because they face disciplinary challenges related to developmental changes in their students. As students become adolescents, they typically become more socially engaged, and levels of student misbehaviors like bullying and fighting are high (Berndt, 1982; Nansel et al., 2001). Compared to other grade levels, middle school grades experience elevated rates of threats of violence (Cornell et al., 2004) and bullying (Nansel et al., 2001).

Furthermore, many middle schools employ zero tolerance disciplinary practices to address student misbehavior. A nationwide study of middle schools found a disproportionately high use of out-of-school suspensions compared to both elementary and high school grades (Losen & Skiba, 2010). Another investigation found that out-of-school suspensions more than quadrupled from 2.4% of students in elementary school to 11% in middle school (Losen & Martinez, 2013).

Virginia Student Threat Assessment Guidelines

The Virginia Student Threat Assessment Guidelines (Virginia Guidelines) was developed for schools based on the recommendations of the FBI and Secret Service (Cornell & Allen, 2011; Fein et al., 2002; O'Toole, 2000). The Virginia Guidelines discourage overly punitive responses

to student misbehavior by encouraging administrative responses that are appropriate and measured, focused on correcting the student's misbehavior while keeping him or her engaged in school. The threat assessment guidelines include explicit training on the importance of moving away from zero tolerance approaches and school suspensions to respond to student threats and misbehaviors. Rather, threats are treated as an indication that a student is frustrated by a problem he or she cannot resolve. Thus the multidisciplinary team's effort to help the student resolve the problem is seen as both a violence prevention measure and a teaching opportunity, and disciplinary consequences are calibrated to the seriousness of the student's misbehavior. Furthermore, suspension from school is recommended only in the most serious cases when there are immediate safety concerns. Importantly, in almost all cases the student is able to return to school under certain conditions specified in a safety plan (Cornell et al., 2012).

A study of 351 school staff following training in the Virginia Guidelines found that they were less likely to endorse a zero tolerance approach and more open to using threat assessment principles to address student conflicts and other problematic behaviors (Allen, Cornell, & Lorek, 2008). These results were consistent across principals, mental health providers, and law enforcement officers.

The Virginia Guidelines uses a decision tree to evaluate threats of violence. The threat is first evaluated as *transient* or *substantive* (Cornell & Sheras, 2006). If school personnel conclude that the threat was not serious, or *transient*, they resolve the threat. Generally, transient threats are figures of speech, hyperbole, or expressions of anger that do not reflect a sustained intent to harm someone. Disciplinary actions may include a reprimand, brief counseling, or minor disciplinary action for the student.

Substantive threats are those that indicate that an individual or individuals intend to carry out a threat to harm someone. For such threats, which are often student fights, the threat assessment team determines the appropriate protective actions to take, including notifying the victim and victim's parents, notifying the student's parents, and strongly cautioning the student of potential consequences should he or she attempt to carry out the threat. Serious substantive threats may be resolved with separating the student from potential victims. The threat assessment team may also recommend counseling or some other mental health intervention. For very serious substantive threats (such as threats to kill, rape, or seriously harm another), the team not only notifies appropriate parties, but also initiates a safety evaluation that involves both a law enforcement investigation and mental health assessment of the student.

The final step involves a written safety plan based on the findings from the safety evaluation. The aim of the safety plan is two-fold: 1) to take steps on behalf of the safety of potential victims; and 2) to determine the most appropriate educational provisions for the student. When the student is allowed to return to school, the safety plan includes specific instructions for the student's behavior and procedures to monitor him or her upon return (Cornell & Allen, 2011). A detailed description of the threat assessment procedure is found in the Virginia Guidelines manual (Cornell & Sheras, 2006).

School Climate and Safety Conditions

Three studies found that schools using the Virginia Guidelines had lower long-term suspension (11-364 days) rates than control group schools (Cornell, Sheras, & Fan, 2009; Cornell et al., 2012). The first study (Cornell et al., 2009) compared suspension rates in 95 high schools using Virginia Guidelines to 131 high schools with informal threat assessment procedures and 54 high schools with no threat assessment program. The study demonstrated that

high schools using the Virginia Guidelines had lower long-term suspension rates than both groups of schools. The current study extends this retrospective examination of Virginia high schools to middle schools (Cornell et al., 2009).

A randomized control trial compared K-12 students who made a threat of violence in schools using the Virginia Guidelines with a control group of K-12 students in schools not using the Virginia Guidelines (Cornell et al., 2012). After one school year, students in the intervention group received significantly fewer long-term suspensions (25%) than students in the control group (49%; Cornell et al., 2012).

Schools using the Virginia Guidelines may have less peer aggression, as measured by three scales used in previous studies: prevalence of teasing and bullying, bullying victimization, and general victimization such as student fighting or threats. Compared to schools with no threat assessment program, students in schools using the Virginia Guidelines reported less aggression (Cornell et al., 2009). The retrospective study (Cornell et al., 2009) also found that students reported lower levels of teasing and bullying in school. This is important because pervasive student aggression undermines school safety and has been linked to student dropout rates in high school (Cornell et al., 2013).

Several studies indicate that the Virginia Guidelines promotes two features of school climate: school-wide support of students—specifically student willingness to seek help from authorities—and the use of discipline that is strict but fair, which is described as having high disciplinary structure (Konold et al., 2014; Cornell et al., 2012; Cornell et al., 2009; Cornell, Sheras, Kaplan, et al., 2004). Importantly, adolescents may be reluctant to seek help from adults at school following a threat of violence if they perceive that school authorities cannot or will not do anything to help (Nekvasil & Cornell, 2012). Thus it would be useful to examine the relation

between middle schools using Virginia Guidelines and student perceptions of school support and disciplinary practices.

One less often examined aspect of school climate is teachers' experience of school safety. Previous research has shown that teachers are affected by student aggression toward them: professional burnout has been linked to teachers perceiving that students are hostile toward them (Brouwers & Tomic, 1998). Student aggression may involve verbal threats, intimidation, or physical attacks, and result in teachers feeling unsafe at school.

School-wide demographics of enrollment size, student socioeconomic status (SES), and racial composition have been associated with a wide range of factors affecting school climate. Some research suggests that aggressive behaviors such as bullying, threats, and fighting occur more frequently at larger schools (Stewart, 2003), although there are mixed results on whether large schools are inherently less safe because of their size (Klein & Cornell, 2011). Schools with lower student SES have been linked with higher rates of fighting and bullying victimization (Leithwood & Jantzi, 2009). Furthermore, previous research has found disproportionate suspension rates for minority students (Gregory et al., 2011). On the other hand, one study found that minority students in multiethnic schools perceive that they are safer than minority students in less diverse schools (Juvonen, Nishina, & Graham, 2006). Thus these potentially confounding factors are important to consider in analyses of school climate and safety conditions.

The Current Study

The purpose of the present study was to investigate school climate and safety conditions of schools using the Virginia Guidelines in comparison to two other groups of schools: schools that developed their own models (or obtained training from another source), and schools that did not have a threat assessment program.

Our primary research question was, "Is use of the Virginia Guidelines associated with more favorable school climate and safety conditions than schools that do not use the Virginia Guidelines?" To address our first question, the study used data from a statewide school climate survey of grades 7-8 conducted in 2013. School climate and safety conditions were examined across multiple variables. The study analyzed short-term and long-term suspension rates across the three groups of schools. School climate was then examined by measuring student perceptions that their schools were supportive of students, as well as strict but fair in their disciplinary practices (Konold et al., 2014). We analyzed teacher perceptions that schools were safe and student reports of bullying victimization, general victimization, and prevalence of teasing and bullying. It was hypothesized that use of the Virginia Guidelines would be associated with more positive school climate and safety conditions, as compared to both groups of schools (Cornell, Sheras, Kaplan, McConville, & Douglass, 2004; Cornell, Sheras, Gregory, & Fan, 2009; Cornell et al., 2012).

One limitation of this study is that school climate data were available for only one year and so it was not possible to identify changes in school conditions before and after implementation of the Virginia Guidelines. Therefore, we measured how long schools used the Virginia Guidelines and examined a second question: "Is longer use of the Virginia Guidelines associated with more favorable school climate and safety conditions in schools?" It was hypothesized that longer use of the guidelines would improve student and teacher trust in school authorities, strengthen disciplinary structure, and increase student willingness to seek help for threats of violence. We hypothesized that schools that have used the Virginia Guidelines for a longer duration would report more positive school climate and safety conditions.

Methods

Participants

Schools. The Virginia Secondary School Climate Survey (VSSCS, 2013) was administered in 423 schools with 7th-8th grade students, which included some alternative schools and schools with K-12 grades. The study used two sources to create a sample of middle schools: University of Virginia (UVA) training records were used to identify schools that used the Virginia Guidelines. To determine schools that either had no formal threat assessment program or used a program other than the Virginia Guidelines, the study used records from an annual safety audit survey conducted by the Virginia Department of Criminal Justice Services. The safety audit survey asked whether a school used "a formal threat assessment process to respond to student threats of violence" (response options yes or no) and "what kind of formal threat assessment model" the school used. Principals responded whether they used a school-created model, division-created model, or other model.

The study's final sample consisted of 332 schools. There were 166 schools in the Virginia Guidelines group, 119 that reported using another threat assessment program, and 47 schools that had no formal threat assessment program. A total of 91 schools had missing or ambiguous records: either they did not report their procedures, reported that they used the Virginia Guidelines when they had not been formally trained on them, or did not report that they used the Virginia Guidelines when UVA records indicated that they had been trained.[1]

[1] Follow-up contacts with some of these schools indicated that some school administrators were not aware that they were using the Virginia Guidelines because it has been adopted before they came to the school. Because we lacked information on implementation fidelity, it seemed preferable to drop schools with missing or ambiguous information.)

Total school enrollment for the study sample (N = 332) ranged from 109 to 4,033 students (M = 749, SD = 435). The proportion of students in each school who qualified for free or reduced price meals (FRPM) ranged from 2 to 99 percent (M = 44, SD = 20.5). The percentage of minority students in each school ranged from 0 to 99 percent (M = 40.1, SD = 27.2). The sample was distributed across urban, suburban, and rural regions.

For the 91 schools dropped from the sample, total school enrollment ranged from 61 to 1603 (M = 607, SD = 312). The proportion of students in each school who qualified for free or reduced price meals (FRPM) ranged from 6 to 96 percent (M = 49.4, SD = 20.8). The percentage of minority students in each school ranged from 0 to 99 percent (M = 33.8, SD = 29).

Students. Each school was given two options for administering the Virginia Secondary School Climate Survey: 1) invite every student in the 7th and 8th grade to take the survey (whole grade option) or 2) randomly select 25 7th grade students and 25 8th grade students from school rosters to take the survey (random sample option). If a school chose the random sample option, they were provided a random number list with instructions for selecting students. The target sample number of 25 is comparable to previous national education studies (Chromy, 1998; Ingels, 1990).

All students were eligible to participate unless they had limited English proficiency or intellectual disability. Parents of each student received a letter informing them of the survey. Reasons a student may not have taken the survey included parents declining their child's participation, school absence on the day of administration, cognitive or physical limitations precluding survey completion, or another reason such as technical difficulties at the school. Student participation was the total number of students who participated across all schools divided by the total number invited to participate. The student participation rate was 86%.

Of the 29,203 students who participated in the survey, approximately 52% were female. Their self-reported racial/ethnic breakdown was 51% White, 20% Black, 16% multiracial, 3% Asian, 2% American Indian/Alaskan, and 8% another race/ethnicity. Finally, 13% of students reported that they were Hispanic or Latino in a separate question.

Teachers. All 7th and 8th grade teachers were requested to participate in the survey. A total of 6,298 teachers completed the survey, with an 84% participation rate. Approximately 75% reported that they were female. Most teachers (53%) had greater than 10 years of experience. Approximately 24% reported 6-10 years of experience, 13% reported 3-5 years, and 10% reported less than 3 years of experience. Other demographic variables were not requested in order to protect teacher identity.

Procedure

School climate surveys were administered anonymously online in spring 2013. All participants were given standard instructions before taking the survey. Students completed surveys during school hours and were supervised by teachers or other school staff members. Teachers completed surveys independently. School principals completed the state's safety audit survey after the end of the school year.

Validity screening. Previous research suggests that screening survey responses for students who responded carelessly or dishonestly improves the quality of survey data (Cornell, Lovegrove & Baly, 2014). Specifically, validity screening has been shown to reduce extreme responses to questions, lower rates of risky behaviors, and yield school climate results more consistent with independent criteria (Cornell, Klein, Konold, & Huang, 2012; Cornell et al., 2014).

Two validity screening items were included in the student survey: 1) "I am telling the truth on this survey" and 2) "How many of the questions on this survey did you answer truthfully?" For the first question, students responded 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Agree*, or 4 = *Strongly Agree*. Students who answered 1 = *Strongly Disagree* or 2 = *Disagree* were removed from the sample. The second question response options included 1 = *All of them*, 2 = *All but 1 or 2 of them*, 3 = *Most of them*, 4 = *Some of them,* and 5 = *Only a few or none of them*. Students who answered either 4 = *Some of them* or 5 = *Only a few or none of them* were removed from the sample. After screening, 2,871 (9% of the sample) were identified as invalid responders and removed from the sample. Additional information on validity screening in this sample is reported elsewhere (Cornell et al., 2013).

Measures

Suspension rates. Schools provided school-level discipline data to the Virginia Department of Education (VDOE). Principals were required to report the number of short-term (1-10 days) and long-term (11 to 364 days) out-of-school suspensions for their schools. All schools used standard definitions of disciplinary infractions.

Suspension counts were unduplicated, meaning that each student was counted only once in the records regardless of the number of times they were suspended. This practice is consistent with previous literature using suspension rates (Gregory et al., 2011; Hemphill et al., 2006; Suh et al., 2007; Wallace et al., 2008) and maintains independence of the observations. Suspension rates were determined by dividing unduplicated suspensions by the school's total enrollment.

School climate measures. School climate was measured on two domains of student support and disciplinary structure. These two scales measured student perceptions that teachers and adults support and listen to their students (support) and that their school's disciplinary

practices are strict but fair (disciplinary structure; Cornell et al., 2009; Cornell et al., 2012; Konold et al., 2014).

The Student Support scale consisted of eight items that measure student perceptions that adults at school are supportive of them (e.g., "There are adults at this school I could talk with if I had a personal problem"). Each student answered 1 = *Strongly disagree*, 2 = *Disagree*, 3 = *Agree*, or 4 = *Strongly agree*. Multilevel exploratory and confirmatory factor analyses supported the use of eight items to assess overall school support (Konold et al., 2014). Cronbach's alpha for the scale was .93 in the present study.

The Disciplinary Structure scale consisted of seven items that measure student perceptions that their school is strict but fair (e.g., "The punishment for breaking school rules is the same for all student"). Each student answered 1 = *Strongly disagree*, 2 = *Disagree*, 3 = *Agree*, or 4 = *Strongly agree*. Multilevel exploratory and confirmatory factor analyses demonstrated adequate model fit for the scale (RMSEA = .08, CFI = .93, TLI = .89, SRMR = .04; Konold et al., 2014). In the present study, Cronbach's alpha was .77.

Teacher perceptions of school safety. Teacher perceptions of safety consisted of three items: (1) I feel physically safe at this school, (2) I feel that there is adequate safety and security at this school, and (3) I worry about someone committing a shooting at this school. Teachers responded 1= *Strongly disagree*, 2 = *Disagree*, 3 = *Somewhat disagree*, 4 = *Somewhat agree*, 5 = *Agree*, or 6 = *Strongly agree*. Because there were only three questions and each was of substantive interest, they were not combined into a scale.

Peer victimization. In order to obtain a comprehensive assessment of safety conditions from student perspectives, the survey included three measures of peer victimization (Cornell, Shukla, & Konold, in press). One scale asked students about their experiences of being bullied

using a standard definition of bullying, a second scale asked about general victimization, such as fighting, and a third scale asked about perceptions of bullying and teasing observed among other students.

Bullying victimization. The Bullying Victimization scale consisted of five items that measured personal experiences of being bullied. First, students were provided with the following definition of bullying:

> "Bullying is the repeated use of one's strength or popularity to injure, threaten, or embarrass another person on purpose. Bullying can be physical, verbal, or social. It is not bullying when two students who are about the same in strength or popularity have a fight or argument."

Students then responded 0 = *never,* 1 = *once or twice,* 2 = *about once per week,* or 3 = *more than once per week* to (1) whether they had been bullied at school in the past year, and then whether they had been (2) physically, (3) verbally, (4) socially, and (5) cyber bullied at school in the past year.

Previous research on this measure has demonstrated consistency with teacher and peer nominations of bully victims, as well as stability over middle school grades (Baly, Cornell, & Lovegrove, 2014). Bullying victimization using this measure was linked to negative school outcomes, such as lower grade point average, and mental health problems like feelings of sadness or thoughts of suicide (Baly et al., 2014). Cronbach's alpha was .87.

General Victimization. The General Victimization scale consisted of five items that measured student experiences of verbal or physical aggression by peers (e.g., "A student threatened to hurt me" and "A student physically attacked, pushed, or hit me"). Students responded 0 = *No*, 1 = *Once*, or 2 = *More than Once*, and higher scores on the scale indicate

greater victimization. The scale has been used in other studies of peer victimization in schools (Cornell, Gregory, Huang, & Fan, 2013; Klein & Cornell, 2010). Prior literature on this scale of general victimization has shown a link between higher rates of aggression and poorer school climate (Cornell, Shukla, & Konold, under review). For the present study, Cronbach's alpha was .76.

Prevalence of Teasing and Bullying (PTB). Students answered five questions about the extent of teasing and bullying in their school (e.g., "Bullying is a problem at this school" and "Students here often get teased about their clothing or physical appearance"). Each student responded 1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, or 4 = *strongly agree*.

Previous exploratory and factor analyses indicated adequate model fit and supported the five-item PTB scale at the school level (Konold et al., 2014). Two studies supported the criterion validity of the PTB scale by showing that higher scores predicted lower student engagement (Mehta, Cornell, Fan, & Gregory, 2013), and lower school-wide passing rates on state-mandated testing (Lacey & Cornell, 2013). Cronbach's alpha was .87.

Analysis Plan

The study used data available for one year only, limiting the study to a cross-sectional design. Ten dependent measures of school climate and safety conditions were examined across three groups of schools. School-level measures derived from the school climate survey were determined by summing items and determining the average for all students (or all teachers) within the same school.

To address the first research question, multivariate analysis of covariance (MANCOVA) was used to compare school climate and safety conditions among three groups of schools: those that used the Virginia Guidelines, those that reported an alternate method of threat assessment,

and those that did not have any threat assessment program. Least Significant Difference (LSD) was used to adjust for multiple comparisons (Williams & Abdi, 2010; Hayter, 1986). The study controlled for percentage of students eligible for free or reduced price meals (FRPM), proportion of minority students, and school enrollment.

To address the second question, hierarchical linear regressions were used to examine the associations between how long a school had used the Virginia Guidelines and their school climate and safety conditions.

Results

Table 1 includes demographic characteristics and dependent measures for the three groups of schools. The MANCOVA test for overall group differences was significant (Wilks's Lambda = 0.84; $F(20, 574) = 2.65$, $p < .001$). Partial h^2 was used as a measure of effect size, which was 0.08 and considered a small effect size (Cohen, 1988).

Seven of the ten outcome variables were statistically significant (Table 1). Post-hoc pairwise comparisons demonstrated that schools using the Virginia Guidelines had lower short-term suspension rates and lower levels of teasing and bullying, bullying victimization and general victimization, compared to both groups of schools. Teachers in schools using the Virginia Guidelines reported feeling safer at school for all three variables. Effect sizes using partial h^2 ranged from 0.03 to 0.05, which are considered small effects.

The second question examined the length of time that schools have used the Virginia Guidelines. School demographic variables were entered at step 1 and length of time using the Virginia Guidelines at step 2. Only step 2 of the regressions is summarized here (see Table 2).

Short and long-term suspension rates. At Step 2, length of time using Virginia Guidelines was not significant for short-term suspension rates. The total variance accounted for

by the model was $R^2 = 0.50$, $p < .001$. In contrast, length of time was a significant predictor for long-term suspension rates ($\beta = -0.37$, $p < .01$). The total variance accounted for by the model was $R^2 = 0.22$, $p < .001$. The increase in R^2 was = 0.12, $p < .001$.

Structure scale. At step 2, length of time was significantly associated with student reports of school structure ($\beta = 0.16$, $p < .05$). The total variance accounted for by the model was $R^2 = 0.22$, $p < .001$; the increase in R^2 was 0.02, $p < .05$.

Support scale. At step 2, FRPM significantly contributed to the model. Length of time did not predict student-reported support.

Teacher perceptions of safety. At step 2, only one safety item ("I feel physically safe at this school") was significantly associated with length of time ($\beta = 0.18$, $p < .01$). The total variance attributable to the model was $R^2 = 0.28$, $p < .001$. The variance accounted for by Virginia Guidelines duration was $R^2 = 0.03$, $p < .05$.

Bullying victimization scale. At step 2, length of time was inversely associated with bullying victimization ($\beta = -0.17$, $p < .05$). The total variance accounted for by the model was $R^2 = 0.04$, $p < .05$; the portion of variance attributable to Virginia Guidelines duration was $R^2 = 0.03$, $p < .05$.

General victimization scale. At step 2, length of time was inversely associated with general victimization ($\beta = -0.18$, $p < .05$). The total variance accounted for by the model was $R^2 = 0.18$, $p < .001$; the portion of the variance accounted for by Virginia Guidelines duration was $R^2 = 0.03$, $p < .05$.

Prevalence of teasing and bullying scale. At step 2, length of time was inversely associated with student-reported PTB ($\beta = -0.17$, $p < .05$). The total variance accounted for by

the model was $R^2 = 0.21$, $p < .001$; the portion of the variance accounted for by Virginia Guidelines duration was $R^2 = 0.02$, $p < .05$.

Discussion

The present study demonstrated that middle schools using the Virginia Guidelines reported more favorable school safety conditions and climate compared to two comparison groups, schools that used an alternate threat assessment program and those that reported having no program. Although a retrospective study of school conditions, there were positive findings across three sources of information, including school suspension records, student reports, and teacher reports.

Middle schools using the Virginia Guidelines had significantly fewer short-term suspensions (a rate of 8 per 100 students) than both comparison groups. The latter two groups had rates that were 50% higher, each averaging approximately 12 short-term suspensions per 100 students. These findings are consistent with several studies, including a retrospective investigation, longitudinal study, and randomized controlled trial. Whereas the previous studies examined high schools (Cornell et al., 2009, 2011) or a group of K-12 schools (Cornell et al., 2012), this was the first study concerned specifically with middle school grades, where discipline infractions and school suspensions are high (Nansel et al., 2001).

These findings are noteworthy in light of the deleterious impact that zero tolerance policies and out-of-school suspensions have on student academic performance and success (APA Zero Tolerance Task Force, 2008; Raffaele Mendez, 2003; *Seal v. Morgan*, 2000). Moreover, there is evidence that suspension of students does not improve student behavior or increase school safety, and the U.S. Department of Education (2014) has called upon schools to review their discipline practices and reduce their use of school suspension. The Virginia Guidelines

stress threat assessment as an alternative to zero tolerance policies and school authorities are trained to minimize the use of school suspensions. They are discouraged from using a single sanction for all student misbehaviors and from treating all infractions the same regardless of severity. Suspensions are advised primarily when there is an imminent threat of harm to others (Cornell & Sheras, 2006).

Two aspects of school climate that were not associated with the Virginia Guidelines were student perception that discipline is strict but fair, and that schools are supportive of their students. This conflicts with a previous finding that threat assessment was associated with school support (Cornell et al., 2009). One explanation may be that students do not readily perceive fairer discipline or school support in fewer suspensions and decreased aggressive behaviors, which are more direct targets of the Virginia Guidelines.

Notably, our three distinct measures of student aggressive behaviors—bullying victimization, general victimization, and prevalence of teasing and bullying—were lower in schools in which the Virginia Guidelines was used, as compared to both groups of schools. This is supported by a previous quasi-experimental study that found a 79% reduction in bullying infractions the year after high schools began to use the Virginia Guidelines (Cornell et al., 2011). The present study's findings about student aggression are also consistent with the Virginia Guidelines and threat assessment approach generally, which endeavor to train teams to address grievances and conflicts before they escalate into more serious violence (Cornell & Sheras, 2006; Randazzo, Borum, Vossekuil, et al., 2006).

Teachers reported feeling safer from violence in schools that used the Virginia Guidelines. Previous research on guidelines training has shown immediate changes in school team member beliefs about school violence, threat assessment, and zero tolerance policies (Allen

et al., 2008). Specifically, staff members who received training were less worried about school shootings and felt prepared to use the Virginia Guidelines as a violence prevention measure. These staff members were primarily administrators and mental health professionals, and did not include a group of teachers. To date, however, there has been no examination of teacher perceptions of safety in relation to the Virginia Guidelines. One possible explanation for this finding is that teams gain increased confidence from their training that can affect school climate and be communicated to teachers. Future studies should examine what teachers knew about threat assessment in their schools and what factors they identify as making them feel safer.

Finally, these results generalized across schools with diverse demographics, suggesting that the findings were not an artifact of schools with less poverty, differing racial composition, or smaller enrollments. Furthermore, previous research suggests that use of threat assessment may be associated with decreased racial disparities in disciplinary practices, although an investigation of racial differences was beyond the scope of the present study (Cornell et al., 2011; Wallace et al., 2008). Future research investigating the association between disparities among demographics and threat assessment practices would be useful.

Taken together, our results suggest that disciplinary methods in schools that use the Virginia Guidelines are less punitive, as evidenced by lower suspension rates. Students reported less aggression on three measures of bullying and peer conflict. Moreover, teachers reported feeling safer at school across three variables measuring feelings of safety. These findings are consistent with the goals of the Virginia Guidelines to improve school safety and climate by responding to student aggressive behaviors with appropriate, in-school disciplinary actions rather than school exclusion. Such disciplinary measures, in turn, help to ensure safety and correct misbehaviors while keeping students in school to learn.

Length of Time Using the Virginia Guidelines

The present study did not have longitudinal data that could be used to make a stronger test of the association between using the Virginia Guidelines and positive school climate and safety outcomes. Therefore, association between length of time and use of the Virginia Guidelines was examined. Analyses demonstrated that longer use of the Virginia Guidelines was associated with more favorable school climate and safety conditions. Schools that used the Virginia Guidelines for two years or less (n = 22) averaged 10 suspensions per 1,000 students, whereas schools that used the guidelines for ten or more years (n = 65) averaged 2 long-term suspensions per 1,000 students. These results may be due to a combination of change in policy and improvement in student behaviors so that long-term suspensions are no longer as frequent. Such hypotheses should be investigated in future studies.

The current study showed that middle schools that used the Virginia Guidelines longer also reported more positive student perceptions of school climate, as measured by its disciplinary practices. As with suspension rates, full program effects may not be immediate. Improved student and teacher perceptions would need to follow implementation of the Virginia Guidelines and threat assessment team actions. Over time, threat assessment cases would accumulate and there would be more opportunities for intervention. For example, assessing and intervening for bullying would take time to have school-wide effects.

Finally, the length of time that schools used the Virginia Guidelines was positively associated with school safety, as measured by both positive teacher observations of safety and lower levels of student teasing and aggression. This finding provides evidence that it takes time for a threat assessment program to have full impact in a school. One mechanism that may explain the changes in school conditions is the school's response to the student making a violent threat.

Over time, school personnel perceive that they are safer, while students who misbehave are both corrected and supported at school.

Limitations and Future Research

The study was cross-sectional and correlational, and thus cannot provide evidence of causal relations between use of the Virginia Guidelines and school climate and safety variables. A longitudinal, prospective study with a randomized, experimental design could control for baseline levels of the study's outcome measures and would be useful to determine causal links between the Virginia Guidelines and school climate outcomes. Furthermore, the study relies on student and teacher perceptions that may introduce additional error and limit what can be concluded from our findings. Students and/or teachers may perceive their schools to be safe or unsafe, or to have more or less positive climate, based on their internal biases or limited observations that do not reflect school-wide safety conditions and climate. However, the study used aggregate data across three sources of information (i.e., students, teachers, and suspension records), minimizing error due to self-report. Furthermore, there is no reason to suggest that such self-report error would result in favorable results for schools using the Virginia Guidelines.

Uncontrolled self-selection factors may have contributed to study findings. For example, a school that used the Virginia Guidelines may have already had safe conditions and a positive school climate. It is important to note, however, that the decision to incorporate the Virginia Guidelines was not made by individual schools but rather school divisions, lessening the likelihood of school-level selection bias. The problem of self-selection is mitigated in part by the finding that schools using the guidelines longer showed more positive school safety conditions and climate.

There were no available measures of implementation fidelity in order to assess whether effects were larger in schools with better implementation, as the randomized controlled trial found (Cornell et al., 2012). Findings may have been diminished by the inclusion of schools with poor implementation of the Virginia Guidelines (Cornell et al., 2012). It would be useful for future research to examine implementation fidelity of the Virginia Guidelines and other programs and how it is associated with school climate and safety outcomes.

There remains a need to define, differentiate, and examine alternative threat assessment models. In the present study, it was not possible to define specific alternative threat assessment practices, and most schools reported developing their own model. Thus there was no group of schools identified that used specific programs, such as the Salem Keizer (Van Dreal, 2011) or Dallas (Van Dyke & Schroeder, 2006) models. In order to assess schools that use other programs, it would be useful to develop a taxonomy or set of standards for classifying different models of threat assessment.

Further research is needed to identify best practices across programs. Particularly, it would be useful to identify practices among threat assessment models that are linked to positive school climate and safety outcomes. Mechanisms within threat assessment models may include specific responses to student violence (e.g., the use of in-school discipline versus suspensions in responding to threats). Such research would enable threat assessment researchers to design the most useful programs for schools.

It was expected that results on length of time using the guidelines would be similar to those from the first research question. But there were discrepancies between the results for the two research questions regarding suspensions and school disciplinary structure. Specifically, short-term suspensions were lower in schools using the Virginia Guidelines, as compared to the

other two groups of schools, whereas long-term suspensions were lower in schools that had used the guidelines for a longer duration. Long-term suspension rates are much lower than short-term rates (short-term suspension rates were per 100 students and long-term suspension rates were per 1,000 students). Due to their low base rate, reductions in long-term suspensions might develop more slowly.

Moreover, although school disciplinary structure was no different in schools using the guidelines, as opposed to the other groups of schools, schools that had used the Virginia Guidelines for longer had higher structure compared to schools that had used the guidelines for a shorter duration. These differences suggest that some changes may be slower to develop than others. It would be useful to assess schools for differences in implementation fidelity, as well as changes in fidelity over time, especially with staff turnover.

The available research on threat assessment has focused primarily on school level effects. More study is needed on individual student effects, including controlled studies on students who threaten with violence, their targeted victims, and school responses to such threats. Specifically, it would be useful to know long-term academic and disciplinary outcomes of students who make threats or who have been threatened with violence.

In summary, future research on threat assessment would benefit from developing standards for threat assessment programs in schools and identifying best practices that are associated with most positive outcomes at both the school and individual levels. These results would inform current knowledge about the aspects of the threat assessment approach that are most useful for school personnel. They would also assist researchers and administrators in implementing the best approach to violence prevention—one that not only provides students with safety, but also encourages a positive climate that promotes educational success.

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Table 1

Group Comparisons on School Climate and Safety Condition Measures

	(1) Virginia Model n = 166		(2) No Model n = 47		(3) Other Model n= 119		Group comparison effect size and statistical test result	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	1 vs. 2	1 vs. 3
School enrollment	887	499	608	293	610	309	n/a	n/a
Percent Minority Student	42.5	25.3	37.2	26.7	49.5	18.1	n/a	n/a
Percent free/reduced priced meals	38.7	21.5	47.8	17.9	38.0	29.9	n/a	n/a
Short-term suspension rate*	0.08	0.07	0.12	0.09	0.12	0.09	-0.03*	-0.02*
Long-term suspension rate	0.004	0.01	0.003	0.001	0.004	0.001	0.00	0.00
Bullying victimization*	7.12	0.53	7.51	0.58	7.36	0.67	-.033*	-.19*
General victimization*	7.61	0.56	7.87	0.51	7.81	0.49	-.021*	-0.14*
Prevalence of teasing and bullying*	12.4	1.27	12.9	0.99	12.8	1.04	-0.47*	-0.32*
Teacher perception of safety[1] (1)*	5.02	0.43	4.90	0.05	4.20	0.03	0.06	0.20*
Teacher perception of safety (2)*	4.31	0.59	3.89	0.58	3.91	0.79	0.32*	0.30*
Teacher perception of safety (3)*	2.47	0.50	2.71	0.57	2.73	0.65	-0.19*	-0.20*
School structure	19.0	1.34	18.6	0.18	18.7	0.11	0.38	0.25
School support	24.0	1.34	23.9	0.19	23.8	0.12	0.11	0.18

Notes. * $p < .05$

[1]Teacher perception of safety items were the following: (1) I feel physically safe at this school, (2) I feel that there is adequate safety and security at this school, and (3) I worry about someone committing a shooting at this school.

Table 2

Multiple Regressions on School Safety and Climate Measures

	Short-term Suspensions			Long-term Suspensions			School Support			School Structure		
	β	R^2	Δ R^2	β	R^2	Δ R^2	β	R^2	Δ R^2	β	R^2	Δ R^2
Step 1		0.50*	0.50*		0.09*	0.09*		0.12*	0.12*		0.19*	0.19*
School Enrollment	0.07			0.17			-0.04			0.12		
% Minority	0.26*			0.14			0.04			-0.34*		
% FRPM	0.58*			0.22*			-0.37*			-0.17		
Step 2		0.50	0.50		0.22*	0.12*		0.12	0.002		0.22*	0.02*
School Enrollment	0.06			0.15			-0.04			0.12		
% Minority	0.27*			0.16			0.05			-0.34*		
% FRPM	0.54*			0.08			-0.36*			-0.11		
Virginia Guidelines duration	-1.84			-0.37*			0.04			0.16*		

Table 2 cont'd

Multiple Regressions on School Safety and Climate Measures

	PTB			Teacher Perc. of Safety[1]			Bullying Victimization			General victimization		
	β	R^2	Δ R^2	β	R^2	Δ R^2	β	R^2	Δ R^2	β	R^2	Δ R^2
Step 1		0.19*	0.19*		0.25*	0.25*		0.01	0.01		0.15*	0.15*
School Enrollment	0.21*			-0.06			-0.06			0.01		
% Minority	0.08			-0.09			-0.02			0.20*		
% FRPM	0.43*			-0.48*			0.08			0.28*		
Step 2		0.21*	0.02*		0.28*	0.03*		0.04*	0.03*		0.18*	0.03*
School Enrollment	0.20*			-0.06			-0.06			0.002		
% Minority	0.09			-0.10			-0.02			0.21*		
% FRPM	0.37*			-0.42*			0.02			0.21*		
Virginia Guidelines duration	-0.17*			0.18*			-0.17*			-0.18*		

Notes. * $p < .05$

[1]Only one perception of safety, "I feel physically safe at this school," was significant. The other two items had the following values at step 2: "I feel that there is adequate safety and security at this school" ($R^2 = 0.18$; Δ $R^2 = 0.02$), and "I worry about someone committing a shooting at this school" ($R^2 = 0.12$; Δ $R^2 = 0$), all *p*s > .05.