A Disaster Management Framework for Coping with Acts of Extreme Violence in School Settings: A Field Study

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Abstract – The present study is part of a 5-year research project on disaster management planning for coping with acts of extreme violence in schools. The project was funded by the SSH Research Council of Canada and carried out by an academic team from University of Quebec at Montreal (UQAM) in collaboration with researchers from six countries. In this article, the "Pressure and Release" and the "Triangle of Risk" models were used to identify (a) the root causes and the dynamic pressures that can increase the vulnerability of the educational system to hazards related to acts of extreme violence in schools, and the susceptibility to the impact of these hazards; (b) the main deficiencies in preparedness, and; (c) the challenges raised by the intervention process and the disaster recovery stage. The findings of this study have been integrated in a comprehensive framework that can be used to address the process of disaster risk management at each stage of the "risk cycle" (prevention, intervention and recovery).

Keywords – disaster risk management; man-made disaster; educational system; school violence; school shooting; contingency planning.

1. Introduction

We live in an era of space travel, DNA decryption, and spectacular advances in nanotechnologies. Yet, human beings still have little control over Planet Earth, and seem powerless when faced with natural or man-made disasters, such as the 9/11 terrorist attacks, the Indian Ocean tsunami of 2004, the Fukushima nuclear accident and the H1N1 pandemics. Moreover, disasters, which until recently were mainly the result of natural and technological hazards seem to be diversifying in their roots and patterns. The World Health Organization has reported that, between 1990 and 1999, “globally, approximately two billion people were affected by natural or technological disasters.” Nevertheless, after 2000, new types of disasters have emerged that seem to be related to social issues. For instance, the World Disaster Report dealt in 2000 with “chronic health crises” and then, in 2010, with the food crisis “that has caught the world by surprise.” (World Disaster report, 2011). Also, after 2000, some new social phenomena - such as ’work violence’ and ’school violence’ - have become subjects of concern for national governments. According to Akiba et al. (2002: 830), school violence has become “a global phenomenon that affects one of the core institutions of modern society to some degree in virtually all nation-states.” The school shootings are part of this new form of extreme violence in schools.

For the purpose of this study, a school shooting is defined as a multiple-victim act of extreme violence perpetrated on school’s premises, generally by a school-related perpetrator (student, former student, teacher, or outsider with ties to the school or its community) who carefully plans the act in advance. Therefore, schools should prepare contingency plans "to enable timely, effective and appropriate responses to such events and situations.”(United Nations, 2009:7).

2. Presentation of the research project, research goal and research strategy

The present study is part of a 5-year research project that was funded by the SSH Research Council of Canada in 2008. A project team was established to study the new form of extreme violence in schools and to understand why and how school shootings occur.

To conduct this project, the research team used two
methods, namely the 'Ethnographic Content Analysis' (ECA; Altheide, 1987) and the 'case study' method (Yin, 2012).

The investigation began in 2008 with a pilot project of six events (six pilot cases). An ECA was performed for each. The open-ended protocol that was designed and subsequently refined, the purposive sample of documents and the theoretical saturation that was reached in each of these six cases, as well as the main themes and sub-themes that emerged from the ECA, are reported in Dumitriu and Donia (2009). In the following years, the number of events that the research team has investigated rose to 111 (the results were reported in Dumitriu, 2013) and then to 160 (the present study). Data was collected from various databases, governmental reports of inquiries into these events, police reports, court records, school records, newspaper articles, scientific articles, books and book chapters that were written by authors who were directly involved in these events and archival documents.

Figure 1: The 160 school shooting events worldwide (1900-2013) and their distribution by region

In total, about 38,300 document pages and 2,000 web pages were investigated using paper-based and computer-based ECA, and 21 research assistants contributed to the gathering and sorting of data under the supervision of the project leader (triangulation through multiple evidence and multiple researchers). Because new school shootings events occurred each year while the project was underway, data about these events were collected continuously and then analyzed. The themes and sub-themes that emerged in the ECA process were grouped to form categories that have been integrated in theoretical models or research frameworks, which were used to conduct the second stage of the project. During the second stage, field data were collected through interviews and focus groups and then data were analyzed using the case study method. Two distinct types of frameworks were used. They were

a the 'crisis management' framework that enabled us to explore the themes that were organization-bounded, and;
b the 'disaster management' framework, that enabled us to study all of the stakeholders (school, police, medical teams, policy makers, etc.) and their interaction - before, during and after the events.

The results obtained by adopting the 'disaster management' approach and the case study method are reported in this article.

3. Research questions, research framework, method and sample

This article attempts to provide answers to the following research questions.

a What are the root causes of extreme violence in schools?
b What are the common characteristics and circumstances (if any) of the schools, communities, or countries in which school shootings occurred and how could these characteristics make schools and communities susceptible to the damaging effects of man-made hazards driven by violent behaviour?
c How must schools and communities prepare to deal with school shooting situations, and;
d what are the main challenges raised by the intervention process and the disaster recovery stage?

To find answers to these questions, The "Pressure and Release" model (Blaikie et al., 1994) and the "Triangle of Risk" model (Birkman, 2006) have been combined in an integrated framework (Figure 2) that has been used to

a design the multiple-case study,
b define the data collection protocol and prepare the interview guide, and

c compare, at the end, patterns from theory with those revealed by data analysis.

The research framework shows the chain of progression of vulnerability (Figure 2). Based on UNISDR terminology (UN, 2009), we define "vulnerability" as the characteristics and circumstances of the school and/or educational system that make it susceptible to the damaging effects of man-made hazards. The vulnerability to a specific hazard has its roots in 'pre-existing conditions' that can emerge within the organization or its external environment (stage 1). The framework in Figure 2 shows that the existence of various 'pressure points' may increase the vulnerability of an organization to hazards (stage 2). Finally, some 'unsafe conditions', such as unsafe location, unprotected buildings, lack of appropriate infrastructure, lack of preparedness actions, etc., may further increase the organization's vulnerability.

25 of the 160 school shootings in Figure 1 were selected for in-depth analysis by the case study method (Yin, 2003). Field data were collected in these schools' communities by semi-structured interviews and/or focus-groups
with relevant stakeholders:

1. senior officials of the Ministry of Education,
2. municipal officials of some of these communities,
3. health professionals at various hospitals,
4. members of the emergency medical teams or law enforcement agencies,
5. lawyers, prosecutors and court judges who presided over the cases,
6. psychologists who assessed the shooters before or after the shootings event,
7. relatives of some shooters, some of their former friends, and in some cases the shooters themselves,
8. in the case of ten schools that agreed to participate directly in this study, teachers and school administrators/employees, students, victims and their relatives.

The composition of the sample in Appendix 1 was established following Yin’s recommendations regarding the use of multiple-case studies that are selected to predict similar results (direct replications) in various contexts. Each of these 25 events is considered to be a ‘typical’ school shooting situation, as the term is defined in this study. The cases in the sample differ in terms of

1. type of the school (primary/secondary school, college or university),
2. school’s size (number of enrolled students),
3. location (country and community - large/small city, village, township or unincorporated area),
4. school demographics,
5. time of the event,
6. shooter’s age and ties with the school.

17 of the 25 events in our sample, occurred in North America. This is consistent with the distribution by region of the 160 worldwide events in Figure 1. Moreover, the composition of the sample permitted comparisons of cases and enabled us to follow a pattern-matching logic.

4. Findings and discussion

4.1. Exposure to hazard and root causes

The results show that 68.7% of the 163 school shooters who perpetrated the 160 school shootings were students or former students. Some of them were graduate students enrolled in various master or doctoral programs (e.g., [2], [3], [8], [10], [12] in Appendix 1. Most of them were described
by their colleagues and teachers as “straight A students” or “high achievers”. In other cases (e.g., [1], [5], [19], and [23]) the shooter was a professor, a school employee or a school administrator. Some of the shooters were ‘outsiders’ with ties with the school community (e.g., [4], [7], [15], [20], and [21]). Finally, in some cases the shooter was an outsider with no tie with the school, its students or its teachers (e.g., [14]).

The results in Table 2 show that generally, the school shooter wanted to get revenge on the school and/or some individuals: (a) specific teachers/university professors, school’s administrators, and/or dissertation advisers who, he believed, ‘had wronged him’ (e.g., [3], [5], [6], [8], [10], [11], [19], and [23]); (b) specific students who had bullied him (e.g., [9], [13], [22] and [25]); (c) a specific ‘identity group’ that is defined by religion/specific skills/race or ethnicity/gender (e.g., [9] and [12]); and (d) ‘the school’ as a symbol of organizational injustice/ social injustice or as a cultural symbol (e.g., [9] and [12]). Our results show that the roles of mental health-related issues and bullying in school shootings seem to have been overstated by other researchers in the field. Only 11 of the 163 shooters suffered from a mental illness that had been diagnosed well before the event by health specialists. Also, it appears that bullying is rarely, by itself, the main cause of a school shooting. We found that only seven cases in our sample were related to severe bullying, in addition to other factors. Instead, perceived social and/or organizational injustice appears to be a more important cause of school shootings. Thus, in 15 of the 25 cases, the issue was mainly organizational and involved various aspects related to (a) organizational justice; (b) intergroup conflict in organizational settings; and (c) social justice-related issues, such as social equity and relative deprivation. With a few exceptions, these organizational aspects have not been addressed in previous research on school shootings. Finally, in three cases ([2], [14], and [24]), the shooter’s “motive” is rather unclear.

4.2. Pre-existing vulnerabilities

Two categories of pre-existing vulnerabilities of these schools have been identified (Dumitriu, 2013).

1. Structural vulnerabilities:

   - **School level/national level** - at least one of the following characteristics: (a) absence of clear principles of individual accountability for school administrators; (b) inflexible educational systems (do not allow students to change paths during their study period); (c) ambiguities and/or omissions in the following policies and procedures: hiring and firing policies; policies and procedures for the evaluation of faculty members, including tenure guidelines; the research policy, including guidelines regarding the use of grant funds; the student exclusion policy; the admission procedure, and; (f) rules and regulations dealing with disruptive and violent behavior of students and staff, academic mobbing, bullying, and discrimination.

2. Cultural vulnerabilities:

   - **Organizational level** - at least one of the following characteristics: (a) individualism/lack of “school connectedness” (Blum, 2005); (b) favoritism; (c) demanding academic environment/pressure to perform better; (d) rigidity and self-sufficiency; (e) lack of ethics-related values; (f) “laissez-faire” culture; (g) tolerance of violence; (h) dysfunctional group dynamics.

   - **National level** - countries with (a) low “Power Distance” (such as this term was defined by Hofstede, 2001); (b) high “Individualism” (Hofstede, 2001), and/or (c) strong “gun culture”

4.2.1. Structural vulnerabilities

Many of these schools have some common organizational characteristics.

   - **The Hiring/firing/evaluation and promotion policies**

   In many of the school shooting events that were investigated (e.g., [1], [5], [10], [19], [20], and [23]) the root cause was somehow related to some ambiguities and/or omissions in the hiring/firing/evaluation & promotion policies of the schools involved. These policies – that were rather vague and lacked rigor - have contributed to creating frustration among the members of the organization and thus, have induced in the organization a vulnerability to violence-related hazards. Consequently, some conflicting situations emerged:
## Table 2: School shooter’s motives

<table>
<thead>
<tr>
<th>Categories of shooters</th>
<th>Motive/root cause</th>
<th>Aggravating/precipitating factors</th>
</tr>
</thead>
</table>
| Students/former students (generally, white males between 11 and 21 years of age) | • has experienced longstanding bullying at school for: his appearance/overzealousness at school/some homophobia related issues  
• has been expelled/suspended (from a specific course or from school)  
• has been teased because of his difficulties in verbal communication (lack of proficiency in English/immigrant or other reasons)  
• has felt persecuted or harassed by specific teachers, and; was unhappy with the grades they had given him  
• has been faced with poor group dynamics in school and an organizational culture that seemed to favor one student group over the others | • "typical" middle to upper-middle class families. In some cases, parents have separated or divorced  
• in a few cases: a severe and abusive father/domestic violence/ neglected child (lack of attention from parents)  
• some used stimulants like Ritalin or Adderall - probably, to obtain better grades  
• some cases of autism disorders - "selective mutism" or "Asperger syndrome" - the patient is not supposed to be a danger to himself or to others |
| Graduate/postgraduate students (generally, white males between 36 and 43 years of age) | • conflict with his/her thesis adviser (alleged "intellectual exploitation")  
• teased by his peers for his difficulties in verbal communication (lack of proficiency in English) | • financial difficulties-large amount of debt and housing stress; in some cases, first generation immigrants  
• death of a relative/ or a good friend |
| University professors (white males and women; generally in their 40s or their early 50s) | • felt isolated/persecuted/perceived as a whistleblower  
• intellectual "exploitation"  
• "unfair" dismissal  
• has been denied tenure | • no other specific issues |
| School employees/former employees/school administrators (white males between 36 and 55 years of age) | • teased by his colleagues who spread rumors about him/her or about his/her family members  
• "unfair" decision made by the school in his regard (dismissal or others) | • no other specific issues |
| Outsiders with or without ties to the school (generally, white males between 30 and 55 years of age; but occasionally women) | • seeks revenge against the school population/school community that was perceived as: (a) a symbol that contradicted his or her religious beliefs or political views; (b) a symbol of social injustice; or (c) a symbol that reminds him/her of a tragic event in his or her life | • some health issues: (a) post-traumatic stress disorder; (b) obsessive-compulsion disorder, or; (c) schizophrenia  
• death of a parent, child or good friend |

a conflicts of interest and bias in decision making;  
b various 'pressure groups' and subtle academic mobbing, and;  
c open conflict between the members of the evaluation/promotion/firing committees and the teachers or employees concerned by the decisions made by these committees.

The school shooting that occurred at Concordia University (Montreal, 1992) provides an example of such a situation. After almost thirteen years of alleged "intellectual exploitation" (Arthurs, 1994:12, Independent Committee of Inquiry), Dr. Fabrikant, a tenure-track professor, complained about the administrators of the Engineering Department, who, he claimed, had co-authored many of his scientific articles, without actually contributing to them, and had repeatedly refused him tenure in order to continue to maintain control over his research activity and publications. When the internal inquiry ordered by Concordia’s Board of Governors dismissed his allegations, Dr. Fabrikant filed a lawsuit against Concordia administrators and made explicit threats to specific professors. In response, Concordia administrators began to search for a specific provision in the CUFA Agreement (Concordia University Faculty Association) that would have allowed them to fire him. However, Concordia University’s policy for firing a professor made no provision for those who exhibit threatening behavior. Meanwhile, Dr. Fabrikant applied for a gun permit, purchased guns, and then committed the shootings on August 24, 1992. The two independent external committees of inquiry into the shooting stated that in fact Dr. Fabrikant had been entitled to obtain tenure and identified many ambiguities in Concordia’s policies that allowed some professors to abuse their
administrative powers. In regards to the psychological impact of tenure denial on some people who desperately strive for social status and financial success, but who are, instead, suddenly confronted by financial stress and social marginalization, it should be emphasized that three more school shootings that were driven by tenure denial have occurred since the event at Concordia University ([19], [20], and [23] in Appendix 1).

- The Research Policy

The lack of clear guidelines regarding ethical behavior in research, including the use of research funds and the circumstances in which dissertation advisers co-author scientific articles with their doctoral students, has led, in some of the cases investigated, to internal conflicts when some members of the organization accused others of unethical behavior, claiming that they

a misused the research funds, and/or
b took credit for their work and research results.

In some cases (e.g., [5]), they were tenure-track professors. In some other cases (e.g., [3] and [8]), they were graduate students who claimed that their advisors were trying to artificially prolong their periods of graduate studies in order to take advantage of their research work. In the end, they shot their advisors and/or the members of the dissertation committee. For instance, Theodore Streleski, a Ph.D. student at Stanford University, was "fed up with his years of quiet desperation" (Waggoner, 1985). He was in his 16th year of his doctorate program and felt that his advisor "had belittled him" and "had unfairly delayed his graduate study" (Bartholomew, July 2003). He and his wife were struggling to survive financially because universities in North America forbid Ph.D. students to work during their Ph.D. program. They could have qualified for welfare, but Streleski was too proud to ask for social assistance. They finally separated in 1974 and his wife asked for a divorce in 1978. Two months later, he carried out the shooting at Stanford University, killing his advisor and himself. The school shooting perpetrated at San Diego State University by Frederick Martin Davidson in 1996, and that perpetrated by James Easton Kelly at the University of Arkansas in 2000 followed a similar pattern.

- The Student exclusion policy

In some cases (e.g., [11] and [17]) the shooter had been expelled from a course or from school and felt that the decision made by teachers or school administrators in his regard, had not been fair. Some of the students expelled from school began to work whereas others enrolled in other schools, but later returned to their school premises and perpetrated the shooting. Their targets were those who, they believed, contributed to their expulsion. For instance, Robert Steinhäuser - a student enrolled in his last year of studies at Johann Gutenberg Gymnasium in Germany - was expelled six months before graduation because he attempted to avoid a test by providing the school with a forged medical certificate. In the months following the expulsion, he tried unsuccessfully to enroll in other schools. On April 26, the day when his classmates were sitting the final exam, he headed to school and killed thirteen teachers, before committing suicide.

Our findings show that a student exclusion policy that is perceived as "unfair" or "discriminatory" by students could induce in the organization a vulnerability to violence-related hazards. These results are in line with those of Jost and Kay (2010: 1131) who suggest that people react unfavourably to inequity "only if it results from a decision that was made by another person" and when "they believe that a different decision could have reasonably been made." Researchers have identified a whole range of defensive attitudes that individuals develop to deal with the inequity experienced. These attitudes range from "defeatism, quietism and resignation" (Merton, 1938: 681) to anger (Greenberg, 1987) and a rebellious attitude.

- The Admission procedure

Some specific features of the admission procedures in schools and universities could make these organizations vulnerable to violence-related hazards. These features include, but are not limited to: (a) a very formal admission process leading to a rigid academic path that does not allow students to change paths during their study period; (b) a student recruitment strategy and an admission procedure that are designed to attract foreign students, but that do not consider the related aspects (social assistance, integration process, guiding centers, etc.); (c) an admission procedure focusing exclusively on the academic results of the candidates while totally ignoring their antecedents in terms of behavioral problems or mental illness and/or their special needs in terms of medical care and assistance. These issues have been raised in many situations such as [3], [10], [11], [12], [14], [16], and [17].

4.2.2. Cultural vulnerabilities

The organizational cultures of many of these schools have some common characteristics. The same is true for the national cultures of the countries in which these school shootings occurred.

- Organizational culture

In many of the 25 cases analyzed, some particular features of the organizational cultures induced a tense relationship between different subgroups in the organization. This, in turn, led to the isolation of some members, including those who perpetrated the shootings. At the time of the event, Stanford University (1978), Monash University (2002), Gutenberg-Gymnasium (2002), Dawson College (2006), and Virginia Tech (2007) had organizational cultures that possessed many characteristics of an "A11T/A11S" culture (Figure 3). Other organizational cultures (e.g., Dunblane Primary School; Columbine High School, and; Islas Malvinas School) were a combination of different features of an "A12" culture. For instance, Columbine
school seemed to favor a certain "elite" (students with exceptional athletic performance) – a fact that represented a major stressor for other students who did not possess such abilities, among them the shooters themselves. Students and parents complained that athletes teased others students and that they enjoyed many privileges at school, but school administrators did not consider these repeated complaints. Instead, some students formed their own organization (“Trench Coat Mafia”) that emerged as a balancing counter-force to the other groups in school (i.e., 'the athletes,' some religion-based / ethnicity-based groups, etc.). Then, some of its members decided to initiate a school shooting and targeted specific student groups in school, including 'the athletes'. Another feature of Columbine’s culture was its tolerance of verbal and physical violence, racist taunts, students’ odd appearance (students wearing odd clothes), and violent writings (Dumitriu, 2013).

- National culture

Most of the countries in which these 160 school shootings occurred have strict laws that regulate the confidentiality of personal information. This prevents, or at least limits, the disclosure of sensitive information, such as a person’s medical, academic, and criminal records.

Also, these countries share two cultural characteristics: ‘High individualism’ and ‘Low Power Distance’ (as these characteristics are defined in Hofstede’s model of national cultures). These issues are discussed in Dumitriu (2013).

An easy access to guns and/or a strong ‘gun culture’ are among other common characteristics of some of these countries (Figure 4).

### 4.3. Dynamic pressures and the progression of vulnerability

Three categories of dynamic pressures that appear to be related to this type of hazard were identified (Dumitriu, 2013):

- a ‘rapid growth strategy’ that was adopted by the school just prior to the shooting event (all schools in Appendix 1, except for [6], [13], [15], [22] and [25]);
- b a highly competitive environment in which the school operated and means that it has chosen to surpass its competitors (e.g., [3], [5], [12] and [17]); and;

<table>
<thead>
<tr>
<th>School’s culture and type of relationship</th>
<th>Teacher</th>
<th>Student</th>
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<tbody>
<tr>
<td><strong>A11T:</strong> An &quot;individualistic&quot; culture</td>
<td>The school leaders exert great pressure on the teachers to perform</td>
<td>The teachers exert great pressure on the students to perform academically</td>
</tr>
<tr>
<td>- A numbers-driven approach to assessing individual performance (students and staff)</td>
<td>- The relationship is strictly professional with no individual effort made to increase the number of students “connected” to the school</td>
<td></td>
</tr>
<tr>
<td>- Strong internal competition- poor cooperation among teachers</td>
<td>- A “students by numbers” attitude with no specific actions to integrate new students and/or foreign students; poor social support</td>
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<tr>
<td>- Self-interest is more important than common interest</td>
<td>- Few extracurricular activities</td>
<td></td>
</tr>
<tr>
<td>- Low level of interaction between the new members of the organization and the well-established ones</td>
<td></td>
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</tbody>
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<tr>
<th><strong>A12T:</strong> A &quot;laissez-faire&quot; culture – at least one of the following characteristics:</th>
<th><strong>A12S:</strong> An &quot;elitist&quot; culture</th>
<th><strong>A12S(1):</strong> An &quot;elitist&quot; culture</th>
<th><strong>A12S(2):</strong> A &quot;gang&quot; culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Poor control of the various activities in which teachers are involved and poor ethics –related values</td>
<td>- Some groups of students appear to be favored over the others</td>
<td></td>
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<tr>
<td>- Poor leadership; ‘conflict of interest’ is tolerated by the institution</td>
<td>or</td>
<td></td>
<td></td>
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<tr>
<td>- Professors/teachers are interested mainly in obtaining extra revenue by teaching at various campuses abroad or through industry-school links</td>
<td>- Violent writings, verbal/physical violence, racist attitudes, odd behavior, and odd appearance are tolerated</td>
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</table>

**Figure 3:** Types of organizational cultures of the schools in our sample (either A11T or A12T; A11S or A12S)
c specific budgetary constraints that the school confronted at the time of the event (e.g., [5], [6], [12] and [13]).

One school shooting that illustrates the role played by these three ‘dynamic pressures’ is the one that occurred at Monash University in 2002. Since 2000, ‘international education’ (‘Onshore’ and ‘Offshore’ international students) has become one of the main service industries in Australia, which has contributed largely to Australia’s GDP. With the rapid increase in the number of international ‘Onshore’ students and the decrease in government funding, universities had difficulties in providing the necessary social services that they needed. At that time, Monash University had initiated a ‘rapid growth strategy’ and was very concerned with finding ways to improve performance in three main areas:

a teaching;
b research, and
c international education (Table 3).

Many of the foreign students enrolled on its Australian campus struggled to cope with the high academic standards imposed by Monash, while facing social stresses related to their integration in a new economic, cultural and social context. One of their greatest difficulties was to become proficient in English. Although Monash University set up a Language and Learning Service, the number of international students was increasing at such a rapid pace that this center could no longer cope with the increasing demand for assistance (Rees, 2002). A Chinese graduate student, who was teased by his colleagues for his lack of proficiency in English and who was very frustrated because students and teachers did not understand his oral presentations, climbed onto his desk on the day that he was scheduled to give his oral presentation and opened fire at students and teachers, yelling, “You never understand me!” (Rees, 2002:1).

4.4 Unsafe conditions

Researchers have identified many contextual factors that are related to the onset and development of aggression.
and youth violence, such as neighborhood crime, neighborhood disorganization, gang membership, poverty, and antisocial parents and peers (Lipsey and Derzon, 1998). Our results show that none of the above mentioned factors applies to school shooting situations.

- The Family

The results show that family-related factors are not an important source of “unsafe conditions” in school shooting situations. Most of the school shooters of 24 years of age and younger were white males who grew-up in “typical” middle to upper-middle class families, with both parents working to keep the family financially secure. In many cases, both parents were well educated and had bright professional careers as business owners, company executives, professionals in various fields, educators, lawyers, etc. The “adult shooters” (25 years of age and older) were white males or white women, most of whom were married with children and had a normal family life.

- The Community

The results show that two types of communities appear to be more vulnerable to such hazards:

a the affluent neighborhoods with low criminality rates, in small suburban communities/small commuter towns/ unincorporated areas (usually, less than 30,000 people), which have experienced rapid growth and prosperity and have predominantly a white, educated population and;

b large metropolitan area/multi-ethnic cities. What these two types of communities have in common is a ‘low sense of community.’

Although some people in the small communities in which these school shootings occurred described their community as a ‘close-knit community,’ most of these communities were in a period of transition and rapid growth, with new people settling there each day. Moreover, many of these small communities are in fact ‘dormitory towns’ (also known as "bedroom communities") as their inhabitants work in other towns. For instance, about 90% of Newtown’s residents (white population of 95.1%) commute to work in other cities (such as New York and Stamford) or work from home (Economic Development Commission, Newtown/Connecticut, 2012). The estimated median household income is $111,506 and 53% of the population of age 25 years and more have a university degree.

- The School

The results of this study show that small isolated schools in virtually closed communities (e.g., [15]), as well as larger schools in rural communities and that have their own campus police (e.g., [17]) or universities and colleges that are located in the hearts of major cities (e.g., [12] and [14]), are all vulnerable to such events. However, small and medium-sized middle schools in small communities (rural/suburban/ small commuter towns) and large colleges and universities in large multi-ethnic cities seem to be more vulnerable (Figure 5).

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Table 3: Dynamic pressures at Monash University in 2002 (Source: Dumitriu et al., 2009)

<table>
<thead>
<tr>
<th>Rapid growth and diversification</th>
<th>Highly competitive environment and a numbers-driven approach to assessing and monitoring performance</th>
<th>Government policy in terms of education and tough budgetary constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The largest public university in Australia (55,000 students in 2002)</td>
<td>• A “research-focused tertiary institution”-founding member of the “Group of Eight”, (1999) known as the group of “Australia’s Leading Universities”</td>
<td>• Goal: internationalization of higher education, especially in the Asia Pacific region; “they even went to their respective countries to recruit them.” (i.e., the students; Rees, 2002).</td>
</tr>
<tr>
<td>• Service diversification: extensive number of courses offered in arts, commerce, engineering, education, law, medicine and science.</td>
<td>• Strategic plan 1998-2002: high academic standards</td>
<td>• Important contribution made by the Australian education service industry to Australian exports and to country’s GDP.</td>
</tr>
<tr>
<td>• International scope (2002): (a) ‘Offshore’ students: “Monash University Malaysia”, a joint venture with a local business conglomerate; “Monash South Africa”, a wholly-owned subsidiary; an European academic center in Italy; “Monash University Center” in London; Distance education in over 40 countries; pre-university programs in China, Singapore and Indonesia. (b) ‘Onshore’ students: 4,146 new international students enrolled in 2002 in its campuses in Australia, a 30% increase over 2001.</td>
<td>• A numbers-driven approach in setting its objectives (2002): to increase (a) the number of students by funding source; (b) its Median Tertiary Education Rank (TER scores); (c) the proportion of fields of study at Monash where the overall satisfaction of graduates equals or exceeds the national average; and (d) the percentage of its teaching and research staff members who have published in at least one of the best scientific journals (A1/B1/etc.).</td>
<td>• State governments’ funding policy: in 2001, the State governments contributed to university funding less than half of the amount received from universities, through payroll tax (Rees 2002). In response, some universities made cuts in their social costs and/or delayed social investments.</td>
</tr>
</tbody>
</table>
All areas in a school are equally vulnerable to such attacks. In some cases (e.g., [9] and [14]), the attack took place in open spaces (e.g., school cafeteria/main hall/auditorium/schoolyard) or in specific locations (e.g., the library or the gymnasium). In some other cases (e.g., [5], [11] and [17]), the shooter entered specific classrooms and/or offices, shooting as he passed. Finally, in a two of the 160 cases the perpetrator opened fire from the highest building of the school, shooting at pedestrians who were passing by in the street (case [2]).

4.5. Deficiencies in preparedness

In some cases, the lack of preparedness led to poor decisions and to delays in the intervention process (Table 4).

4.5.1. Contingency planning and security measures

Most of the primary and middle schools that were investigated had no CMP when the shootings occurred. Some colleges and universities (e.g., [9], [12], and [17]) had an ‘all-purpose’ CMP, but, generally,

a. it did not contain specific provisions for school shooting situations,

b. teachers and students were not instructed how to act in such a situation, and

c. no drills specific to such an incident had been conducted.

For instance, in 1999, when the school shooting occurred at Columbine Highschool, all schools in Jefferson County School District (JCSD) had to conduct fire drills on a regular basis (on a monthly basis in elementary schools, quarterly in middle schools, and bi-annually in high schools). The CMP of JCSD recommended some intervention measures for school violence, building explosion, hazardous materials spills/releases, bomb threats (including procedures for locker searches when necessary) (U.S. National Fire Data Center, April, 1999), etc. However, there were no training programs for teachers and administrators who, instead, were instructed to follow the procedures recommended in the CMP. At Columbine High School, no specific responsibilities for these actions had been assigned and no specific drills had been conducted. Seven years later, the lesson still had not been learned. At the time of the shooting, Dawson College (2006) had no CMP/CPT, and teachers and students interviewed on the day of the event insisted that they had never received instructions on how to act in such a situation.

Moreover, many schools did not have any of the basic security measures mentioned in Table 4. In some cases (e.g., [12], [13] and [25]), the shootings unfolded in a specific classroom before or during the class and the perpetrator was a student who was attending that class. Consequently, none of the above security measures could have prevented the tragic event from happening. In some other cases, in which the attack was perpetrated by an outsider in a primary or a middle school (e.g., [7] and [15]), a visitor sign-in policy along with a strict control of access to the building could have discouraged him from entering the school. Finally, in some other cases, the shooters were students or former students who entered specific classrooms, shooting as they passed (e.g., [11] and [17]). If the classroom had door locks operable from the inside, much of the carnage could have been prevented.

4.5.2. Police intervention

In almost all of the events that we have studied, a local police team was first to arrive at the school. However, in many countries, local police do not have the authority to intervene in such a situation and are required to await the arrival of the SWAT team (in the US), state police team or other agencies. In all the 25 cases, these procedures led to important delays in the intervention process. For instance, first police officers from Polizeiinspektion Erfurt Mitte arrived at Gutenberg-Gymnasium at around 11:08 am, but at 11:11 police headquarters asked Thuringia Landeskriminalamt to send Spezialeinsatzzkmando (SEK) units to the school. As the SEK teams were late, at 11:15 the Thuringia police decided to enter the school. The first SEK team reached the school only at 11:35 (Figure 6).

In some cases (e.g., [14], [15] and [17]), the police were already at school as the shootings unfolded, but remained outside the school, awaiting for instructions for the SWAT team, securing the school area by establishing a “crime scene perimeter,” or setting up an incident command center. While observing these rules and regulations is necessary, the time that these actions take and the resources that they mobilize are often subject to criticism. In fact, in many cases, police entered the school after the shooter killed himself or had been immobilized by teachers and students (Figure 6).

In some other cases (e.g., [5], [7], [12] and [13]), the police arrived at the school after the shooting ended, but still took their time to put in place the above-mentioned protection measures before entering the school and before allowing medical teams to assist the wounded. In 1999, the Columbine Review Commission recommended that police take all necessary measures “to stop any ongoing attack in the school” instead of wasting time outside the school. Unfortunately, the procedures have not changed since then, and in many cases the police intervention is “a textbook example showing how quickly and efficiently killing can commence in the presence of a closely established police containment perimeter” (Armellino, 2007).

4.5.3. The Emergency Medical Teams intervention

The Emergency Medical Teams (EMT) are responsible for managing the triage and transportation process. However, in many countries, they are not allowed to intervene before the police declare that the crime scene is safe. They should

1. conduct an initial assessment of the incident (size and medical implications) and decide what additional resources are needed in terms of qualified human re-
Table 4: Deficiencies in preparedness

Prevention and Preparation

- Lack of a Contingency Management Plan (CMP)
- A CMP existed, but it had not been put to the test (emergency drills and exercises) and/or did not specify a meeting place where students and relatives could reunite immediately after such an event. Thus; when the shooting occurred, the students who escaped were left by themselves
- No Contingency Planning Team (CPT) established in advance or; large school/university and too many teams/too many members and no clear responsibilities assigned to them; inadequate knowledge of the required abilities, number, and affiliation of members in a CPT
- Lack of reporting mechanisms and conflict resolution and rumor control procedures that would have allowed parents, students and school staff to detect warning signs and anonymously report possible threats
- Poor security measures- lack of: door locks operable from the inside/ visitor sign-in policy/student badges/policy or means to control access to the building. No fence installed, campus not enclosed
- Files/records containing personal student data did not exist, were not up-to-date or were not readily available to the police.

Intervention

Police:

- Very bureaucratic structures and very rigid regulations, resulting, in some cases, in long delays and ineffective intervention
- Delays in the evacuation process – the police had no knowledge of the different areas of the school and the school did not provide the plan (blueprints) of the school
- Delays in the victim identification process: no accurate information was provided by the school management in a timely manner

Emergency Management Teams (EMT):

- Poor assessment of the incident (size and implications) and thus decisions were not necessarily the best with regards to: (a) resources needed (equipment and qualified human resources) and (b) trauma centers or hospitals to which victims were transported.
- Delays caused by the interaction with the police

Communication

- Poor communication among the various stakeholders; no campus spokesperson (designated and trained in advance)
- Poor communication with the media (inform the community about the incident and; rumor control)

The analysis revealed some difficulties that the EMT encountered in assessing the resources needed or in choosing the trauma centers for the wounded. For instance, during the tragic event at the Amish school, the first EMTs who arrived at the school were unable to assess the situation properly because the rules and regulation in place in Pennsylvania prevented them from approaching the victims before the crime scene had been declared safe by the police. They asked for “Basic Life Support” (BSL) services, which are ambulance services provided by trained respondents. However, these services do not include ‘drug therapy,’ which the Amish girls needed. Only later, when they realized that the situation was more critical than they had initially thought, they asked for “Advanced Life Support” (ALS) services. Also, the decisions made by the EMT about the hospitals to which the girls were sent may not have been the best choices that they could have made. Some of these trauma centers could not provide paediatric services and were not properly equipped for neurosurgery and other interventions that the Amish girls needed. Consequently, they were flown by helicopter to an out-of-county trauma center, from which some were later flown to Philadelphia Children’s Hospital.

School administrators have little control over the decisions made by the EMT. However, each school could prepare a list of the trauma centers in the area along with the main assets and capabilities of each, to help the EMT to
Figure 6: Difficulties and delays in the intervention process

make better decisions.

The selection of location in which to establish a triage/transportation center also emerged as a challenging issue. For instance, in the Columbine case, a first triage/treatment center was set up in Clement Park (north of the school building). However, with students fleeing the building through all of the 25 doors, it was soon realized that more triage/treatment centers were necessary. A second triage area was established at Yukon/Caley, but soon after it was recognized that that area was isolated, preventing the EMT from communicating with hospitals, police, and other agencies.

4.5.4. The communication process

The challenge posed by the communication process during and after the event is twofold. On the one hand, all the 'stakeholders' (various intervention teams, school management, teachers, students and parents) should be able to communicate effectively with one another. At the same time, each of the three key stakeholders - the police, school administrators, and EMT - should communicate with the media by means of a single/unique spokesperson and a rumor control process should be put in place.

Many difficulties in communication were encountered by the stakeholders.

1. Telephone lines: the telephone lines of the schools became overloaded. At Columbine, all 75 classrooms
were equipped with telephone lines. Other schools (e.g., Dunblane Primary School and Nickel Mines School) had only one main telephone line. Finally, the Amish school had no telephone line at all.

2. Dispatch Centers: an important increase in inbound calls was noted in the dispatch centers that requested additional dispatchers to respond to the 911 calls. Also, in some cases, the EMT and the police had separate dispatch centers, which caused a certain delay in communication.

3. Web sites: the schools’ web sites were affected by the sudden traffic overload that prevented all access to it. For example, Virginia Tech had a high-traffic website (150,000 hits per hour), but on the day of the event its traffic reached 148,000 hits per hour.

4. Radio communications: the radios used by various intervention teams that arrived at school operated on different bandwidths.

5. Media: in some cases, the school addressed students during the event through “many voices,” as no specific spokesperson had been designated in advance. In other cases, there was little interaction and cooperation among the various spokespersons representing the three main stakeholders (school/police/EMT) and consequently, many contradictory statements were made.

6. ICT devices: When the shootings occurred at Virginia Tech, the university had a modern ICT (Information and Communication Technology) system including a unified, multimedia messaging system that was not fully operational at that time. These ICT technologies help to notify students and declare a lockdown on campus as soon as such an incident occurs. However, since the first assessment of the situation made by Virginia Tech at that time was incorrect (it was thought to be an act of domestic violence, which posed no threat to students), the university did not immediately use the system to notify its student population of the event and to initiate the lockdown procedure (see Figure 6).

4.6. The recovery process

During the recovery stage, these schools had to deal with various challenges:

1. Conflict management: managing the social tensions between the school and the parents. Examples for challenges and measures adopted:

   - Virginia Tech: the victims’ families were not satisfied with the inquiry conducted by the Virginia Tech Review Panel and asked Governor Kaine to reopen the case.
   - Islas Malvinas School: during the recovery period, three successive management teams resigned due to the hostile atmosphere encountered among parents, students, and school staff.

2. Symbolic management: restoring the morale of students and teachers, dealing with students and teachers who wanted to move to other schools. Examples for challenges and measures adopted:

   - Gutenberg-Gymnasium: 30% of teachers were shot and others decided to leave the school; the recruitment process during the recovery period was unsuccessful.
   - Virginia Tech retained the services of an image management company at a cost of approximately $600,000.

3. Asset management: rebuilding/reconverting the building in which the school shooting occurred, installing new security devices. Examples for challenges and measures adopted:

   - Cost of demolishing/building a new school: Nickel Mines school, Dunblane school
   - Replacement costs at Sandy Hook Elementary School: $60 million.
   - Columbine High School and Virginia Tech reconverted the buildings in which the shootings occurred. The costs incurred by Virginia Tech: 6.3M$ (from which (a) renovations, cleanup, and relocations - $1 M; (b) door upgrades/locks replacement of handles - $2 M; (c) a new unified alert system - about $1 M.

4. Change management: lessons learned and organizational changes, a new school safety policy/ new research hiring and firing policies, etc. Examples for challenges and measures adopted:

   - Concordia University: new policies addressing (a) conflicts of interest, (b) intellectual misconduct in academic research, (c) financial misconduct and misuse of research funds, and (d) criteria for determining authorship.
   - Concordia University: new policies addressing (a) conflicts of interest, (b) intellectual misconduct in academic research, (c) financial misconduct and misuse of research funds, and (d) criteria for determining authorship.
   - Columbine High School: new “Code of Student Conduct” adopted by the school district: (a) 450 grounds for suspension or exclusion; (b) all stakeholders must share and disseminate information from student records, including “disciplinary information”; (c) control of the written content of students’ published papers; (d) student dress code; (e) secret societies/gang activity.

5. Psychological consequences: counselling services and costs. Examples for challenges and measures adopted:

   - Gutenberg-Gymnasium: one year after the shooting, 100 students were still receiving psychological counselling.
   - Dawson College: 7% of the school community reported post-traumatic stress between 2006 and
Figure 7: Integrative Risk Management (IRM) for dealing with school shooting situations

2009 (Louis-H. Lafontaine Hospital).
- Virginia Tech: 712 students and staff members were assessed/treated by Virginia Tech medical personnel in the five to six months following the shootings; addition of four full-time mental health professionals at Cook centre; assistance for victims - $2.65 million
- Dunblane Primary School- costs of social services of £928,177
- Sandy Hook Elementary school: $4 million for support to families.

6. Legal consequences: attorneys costs and settlement with victims’ families. Examples for challenges and measures adopted:

- Virginia Tech: (a) $11.1 million in financial compensation for victims’ families and injured survivors, of which Virginia Tech’s part is $3.3 million; (b) $1.7 million for lifetime health insurance costs for those who were seriously injured; and; (c) the university was fined $55,000 by the U.S. Department of Education.

5. Conclusion, limitations and future research

5.1. Added value to integrative risk management

The findings of this study support the United Nations’ model of disaster risk reduction and have been integrated in a comprehensive framework (Figure 7) that can help policymakers and educational institutions to enhance institutional resilience by

1. dealing proactively and effectively with the new emerging risks that are related to school violence, and
2. improving the process of disaster risk management at each stage of the “risk cycle”, i.e., prevention, intervention and recovery.

5.2. Limitations of the study and future research

The research process undertaken in this study complies with all of the requirements of the case study method formulated by Yin (2012). Moreover, as we have studied 25 organizations in the same manner and used the same framework, we have, in fact, designed an embedded, multiple-case study. Consequently, the "ensuing
data can provide greater confidence in the findings" (Yin, 2012:7). Nevertheless, the challenge of generalizing from case studies is significant. As Yin (2012:9) explained, the "statistical generalizations" differ from the "analytic generalizations" and "for case study research, the latter is the appropriate type". Moreover, "the sought-after generalization is not that of a conclusion but, rather, more like a working hypothesis." Because "confidence in such hypotheses can then build as new case studies [...] continue to produce findings related to the same theoretical propositions" (Yin, 2012:10), in the future we will extend the number of events to be investigated with the case study method, by considering the 135 events remaining in our database.

Also, we would like to emphasize that our findings are based on data from schools in which incidents of extreme violence occurred. Accordingly, caution should be exercised in generalizing results to all schools and contexts.

References


Waggoner, D. (1985) : A Remorseless Murderer Goes Free After Seven Years, Refusing to Promise That He Won’t Kill Again, People, 23(13), 60-65.


Citation


Appendix
Table 5: Sample of cases

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country &amp; date of event</th>
<th>School &amp; school enrolment (at the time of the event)</th>
<th>Community &amp; population at the time of the event</th>
<th>Perpetrator, age and ties with the school</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>USA (South Pasadena, California); May 6, 1940</td>
<td>South Pasadena Junior High School (900)</td>
<td>small town; 14,536</td>
<td>Verlin Spencer, 38; teacher and school principal</td>
</tr>
<tr>
<td>2.</td>
<td>USA (Austin, Texas); Aug. 1, 1966</td>
<td>University of Texas (30,000)</td>
<td>town; 204,000</td>
<td>Charles Whitman, 25; graduate student</td>
</tr>
<tr>
<td>3.</td>
<td>USA (Stanford, California); Aug 18, 1978</td>
<td>Stanford University (12,866)</td>
<td>NIA (13,000; students not included)</td>
<td>Theodore Streleski, 42; Ph.D. student</td>
</tr>
<tr>
<td>4.</td>
<td>Canada (Montreal, QC), Dec. 6, 1989</td>
<td>École Polytechnique (6,000)</td>
<td>metropolitan area; 1.76 M</td>
<td>Marc Lépine, 25; outsider</td>
</tr>
<tr>
<td>5.</td>
<td>Canada (Montreal, QC), Aug 24, 1992</td>
<td>Concordia University (40,000)</td>
<td>metropolitan area; 1.78 M</td>
<td>Valery Fabrikant, 52; tenure-track professor</td>
</tr>
<tr>
<td>6.</td>
<td>USA (Grayson, Kentucky); Jan. 18, 1993</td>
<td>The East Carter High School (817)</td>
<td>small town; 3,800</td>
<td>Gary Scott Pennington, 17; student</td>
</tr>
<tr>
<td>7.</td>
<td>Scotland (Dunblane); March 13, 1996</td>
<td>Dunblane Primary School (640)</td>
<td>commuter town; 7,900</td>
<td>Thomas Hamilton, 43; outsider with ties to Dunblane school</td>
</tr>
<tr>
<td>8.</td>
<td>USA (San Diego, California); Aug. 15, 1996</td>
<td>San Diego State University (26,800)</td>
<td></td>
<td>Frederick Martin Davidson, 36; graduate engineering student</td>
</tr>
<tr>
<td>9.</td>
<td>USA (Colorado; Columbine Valley); April 20, 1999</td>
<td>Columbine High School (2,000)</td>
<td>NIA near Littleton; 40,340</td>
<td>Eric Harris, 18; and Dylan Klebold (18); students</td>
</tr>
<tr>
<td>10.</td>
<td>USA (Seattle, California June 28, 2000</td>
<td>University of Washington in Seattle (DNA)</td>
<td></td>
<td>Dr. Jian Chen, 42; a Chinese Resident physician</td>
</tr>
<tr>
<td>11.</td>
<td>Germany (Erfurt); April 26, 2002</td>
<td>Gutenberg Gymnasium (700)</td>
<td>town; 207,000</td>
<td>Robert Steinhaüser, 19; former student</td>
</tr>
<tr>
<td>12.</td>
<td>Australia (Melbourne); Oct. 21, 2002</td>
<td>Monash University (55,000)</td>
<td>metropolitan area; 4.1M</td>
<td>Huan Yun Xiang, 36; a Chinese graduate student; Australia resident</td>
</tr>
<tr>
<td>13.</td>
<td>Argentina (Carmen de Patagones); Sept. 28, 2004</td>
<td>Islas Malvinas School (400)</td>
<td>small town; 30,000</td>
<td>Rafael (family name not disclosed), 15; student</td>
</tr>
<tr>
<td>14.</td>
<td>Canada (Montreal, QC); Sept. 13, 2006</td>
<td>Dawson College (10,000)</td>
<td>metropolitan area; 1.8 M</td>
<td>Kimveer Gill, 25; outsider</td>
</tr>
<tr>
<td>15.</td>
<td>USA (Nickel Mines, PA); Oct. 2, 2006</td>
<td>West Nickel Mines School (27)</td>
<td>rural community; 4,000</td>
<td>Charles Roberts, 32; outsider with ties with the Amish</td>
</tr>
<tr>
<td>16.</td>
<td>Germany (Emsdetten); Nov. 20, 2006</td>
<td>Geschwister Scholl (700)</td>
<td>small town; 36,000</td>
<td>Sebastian Bosse, 18; former student</td>
</tr>
<tr>
<td>17.</td>
<td>USA (Blacksburg, VA); April 16, 2007</td>
<td>Virginia Tech University (26,000)</td>
<td>suburban community; 48,000</td>
<td>Cho Seung-Hui, 23; student</td>
</tr>
<tr>
<td>18.</td>
<td>Finland (Kauhajoki); Sept. 23, 2008</td>
<td>Kauhajoki School of Hospitality (150)</td>
<td>town; about 14,000</td>
<td>Matti Juhani Saari, 22; student</td>
</tr>
<tr>
<td>19.</td>
<td>USA (Huntsville, Alabama); Feb. 13: 2010</td>
<td>University of Alabama in Huntsville (31,347)</td>
<td>town; 180,105</td>
<td>Amy Bishop, Anderson, 44; professor - tenure track faculty position</td>
</tr>
<tr>
<td>20.</td>
<td>USA (Panama City, Florida); Dec. 14, 2010</td>
<td>DNA t</td>
<td>own; 36,484</td>
<td>Clay Duke, 55; outsider with ties to the school</td>
</tr>
<tr>
<td>21.</td>
<td>China (City of Weifang); April 30, 2010</td>
<td>Shangzhuang Primary School (390)</td>
<td>town; 100,000</td>
<td>Wang Yonglai, 45; outsider with ties to the school (local farmer)</td>
</tr>
<tr>
<td>22.</td>
<td>Brazil (Rio de Janeiro); April 7, 2011</td>
<td>Tasso da Silva Municipal School (NA)</td>
<td>metropolitan area; 6.6M</td>
<td>Wellington Menezes de Oliveira, 23; former student</td>
</tr>
<tr>
<td>23.</td>
<td>USA (Jacksonville, Florida); March 7, 2012</td>
<td>Jacksonville Episcopal School (849)</td>
<td>town; 821,784</td>
<td>Shane Schumert, 28; teacher (tenure-track position)</td>
</tr>
<tr>
<td>24.</td>
<td>USA (Newtown, Connecticut); Dec. 14, 2012</td>
<td>Sandy Hook Elementary School (456)</td>
<td>commuter town; 27,000</td>
<td>Adam Lanza, 20; former student; home schooled</td>
</tr>
<tr>
<td>25.</td>
<td>USA (Kern County; California); Jan 10, 2013</td>
<td>Taft Union High School (900)</td>
<td>small town; 9,400</td>
<td>16 years old student (a juvenile - can’t be named)</td>
</tr>
</tbody>
</table>