Chapter 15
International Perspectives on Prevention and Intervention in School Shootings

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15.1 General Considerations and Problems

Especially since the beginning of the twenty-first century, school shootings have been an infrequent but increasing problem. School shootings have occurred in at least 23 different countries, distributed on all continents, making them a global phenomenon. The general increase in the number of offenses includes a rising number of extremely violent school shootings that leave large numbers dead and/or wounded (Bondü, 2012). The most severe offenses receive widespread media attention and have inflamed great public fear and uncertainty about the safety of our schools. Although school shootings are statistically rare events, they have a devastating impact on schools and communities. In response to intense public concern, there have been many proposals for preventive action. However, because of methodological problems and limitations, predicting and preventing school shootings is a difficult task (Bondü & Scheithauer, 2009, 2010; Borum, Cornell, Modzeleski, & Jimerson, 2010; Cornell, 2006).

A key conceptual problem lies in the lack of a consistent definition of the phenomenon. There is general agreement that school shootings can be defined as offenses by a present or former student who purposely chooses his or her school as the site to carry out an attempt to kill one or more persons. However, there is no consensus on details of the definition, which Harding, Fox, and Mehta (2002) referred to as a "case definition

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problem." The definition might include any attempt to kill someone, regardless of the outcome, or it may be limited to cases in which one or more persons are killed. There are also questions concerning whether prior planning is required and whether a firearm must be used. Because some students have used weapons other than firearms, alternatives to the term "school shooting" have been suggested, such as school rampage, lethal school violence, targeted violence in schools, or homicidal violence in schools. However, most of these terms face the converse problem of being too broad and not clearly differentiating school shootings from other lethal acts in school. These variations in definition not only affect the selection of cases for study, they lead to different calculations of their frequency and hinder comparisons between studies.

However, the chief difficulty in studying and preventing school shootings is their low frequency, that is, the low base rate. Although the United States averaged 21 student homicide fatalities per year over a 10-year period, with approximately 125,000 schools, the average school can expect such a student killing every 6,000 years (Borum et al., 2010). In Germany, which has around 43,500 schools, there have been 12 school shootings in the past 13 years; consequently, the average school can expect a similar student attack every 40,000 years. Thus, simply predicting that no student will carry out a violent attack will be correct more than 99.99% of the time. This leads to several methodological problems:

- Due to the low occurrence rate of school shootings, there are few offenses to study, and reliable data are hard to acquire (i.e., case files/court records, interview data). Easily accessible information in the news media is more often than not imprecise and stereotyped (Muschert & Larkin, 2007). Therefore, the quality of the data underlying research results is often not clear.
- Small sample sizes may generate statistically unreliable findings that capitalize on chance.
- Studies of school shootings have to date been conducted without comparison groups (see Harding et al., 2002, for more detail on the problem of defining suitable comparison groups), making it difficult to determine whether there are "risk factors" that are specific to these offenders. In those cases where comparative data are available (i.e., cases with suicidal ideation, violent media usage; see below for more details), they do not seem specific to school shooters and are sometimes quite common among adolescents.
- Research on school shootings is limited to retrospective analyses of offenses, further hampering the identification of *causal* risk factors. Longitudinal, prospective studies would require extremely large samples and raise ethical questions about the need for interventions with high-risk youth.
- Because not all relevant cases have yet been used for research on school shootings (e.g., because relevant data are hard to obtain) studies often rely on overlapping cases, making it difficult to replicate previous results in independent samples or generate new findings.
- Finally, cultural differences may make cross-national generalizations difficult. For example, a recent study of German school shootings suggests that there are important differences between US-American and German offenders (Bondü, 2012).

Prevention depends on the ability to identify high-risk youth, but efforts to pinpoint reliable risk factors have not been successful.

- First of all, the risk factors that seem to be most prevalent among the small population of students who commit school attacks have little specificity. Specificity refers to the percentage of nontarget cases that are correctly identified, i.e., what proportion of nonviolent students in the entire population are appropriately excluded from the intervention. This means that the risk factors are so common in the general population that they are not useful predictors. For example, three factors generally considered important risk factors for school shootings are violent media consumption, suicidal ideation, and experiences of bullying. However, in a representative sample of German children and adolescents, 51% of boys and 10% of girls played violent video games (Medienpädagogischer Forschungsverbund, 2010). More than one-third of a sample of German adolescents had thought about suicide or even talked about it with friends (Plener, Libal, Keller, Fegert, & Mühlenkamp, 2009). Finally, studies around the world find victimization rates for bullying in schools at around 10% or even higher (Iannotti, Nansel, & Haynie, 2007; Mishna, 2008; Scheithauer, Hayer, Petermann, & Jugert, 2006). These risk factors are so prevalent, even normative in some respects, that their presence cannot be considered a useful indicator of potential violence.
- Considering the high prevalence of single risk factors among adolescents, it is not surprising that even an accumulation of these factors is not sufficient to distinguish youth who have carried out school shootings from other youth in the general population. Attempts to use these nonspecific risk factors to construct a profile would result in a high rate of false positives, which means that numerous adolescents would be erroneously identified, and stigmatized, as "dangerous" (Mulvey & Cauffman, 2001).
- Beyond their weak specificity, the sensitivity of these risk factors is also limited. Sensitivity refers to the percentage of target cases that are correctly identified, i.e., what proportion of truly violent students in the entire population are selected for an intervention. A risk instrument could be highly sensitive but lack specificity: a simple hypothetical risk measure based on gender and age might identify all males over age 13 as violent. This measure would have high sensitivity because it would identify a high proportion of violent students, but it would have so little specificity that it has no practical utility. Many characteristics of school shooting offenders are not consistent across cases or have not been present in every case. Although school shootings are often treated as a homogenous phenomenon, several studies have shown that a school shooter profile does not exist. For example, among 41 US-American school shooters, Vossekuil, Fein, Reddy, Borum, and Modzeleski (2002) found offenders with high and low academic performance, with and without a circle of friends, and with and without prior aggressive or violent behavior. Results from a recent study on German offenders support these findings and provide empirical evidence for different types of offenders (Bondü, 2012). If there is no consistent profile of a typical school shooter, different combinations of risk factors and different developmental pathways can lead to a

shooting. In order for an offense to occur, a complex interaction of a large number of factors seems necessary.
– This finding points to what Harding et al. (2002) refer to as the "degrees of freedom problem": the large number of possible risk factors relative to the low frequency of the phenomenon itself. As a result, single factors have only small to moderate predictive value for violent behavior in general and minimal predictive power for rare events such as school shootings (Ferguson & Kilburn, 2010).

To conclude, although some of the aforementioned factors may constitute risk factors for school shootings, they cannot be utilized as reliable predictors to identify persons with a high risk of committing a school shooting. This is especially true for so-called macro variables such as gender, which apply to large parts of the population and therefore are not practical (Lange and Greve 2002). Nonetheless, even these macro factors have been discussed as pivotal risk factors for school shootings (Klein 2002). In the face of the reviewed problems, Bondü (2012) recommends concentrating on particular warning signs in the form of observable behaviors that lead to a shooting. Table 15.1 gives an overview of various proposed strategies for the prevention of school shootings as well as emergency response interventions. What is considered effective and appropriate prevention and intervention differs not only between authors, but also by national and cultural background.

15.2 Universal or Primary Prevention

Universal prevention approaches seek to limit the influence of causal risk factors and strengthen protective factors in the general population before any negative development can be observed. In criminological contexts, such approaches are traditionally referred to as primary prevention. Universal or primary prevention strategies for school shootings are often based on working to prevent aggressive and violent behavior among children and adolescents in general.

15.2.1 Limiting Violent Media Consumption

Violent media consumption, especially violent video game consumption, is considered to be an important risk factor for school shootings (Bondü & Scheithauer, 2012; Verlinden, Hersen, & Thomas, 2000). Therefore, prohibiting or limiting access to extremely violent video games, particularly first-person-shooter games, has been discussed repeatedly in Europe as well as in the United States. For example, in 2005 the state of California passed a law to ban the sale of violent video games to minors, but in 2011 the US Supreme Court ruled that the law violated the First Amendment right to free speech (Brown vs. Entertainment Merchants Association; http://www.supremecourt.gov/opinions/10pdf/08-1448.pdf). There is

Table 15.1 Approaches to the prevention of school shootings (Adapted from Bondü & Scheithauer, 2009, p. 692)

	Universal/primary prevention	Indicated/secondary prevention	Emergency response
Social/political level	Tightening gun/weapon laws Reducing access to violent media, especially violent video games Fostering more appropriate media coverage	Installing hotlines to report risk factors and warning signs	Optimizing and accelerating police intervention
School level	Improving school climate Reducing pressure to perform Bullying prevention Zero tolerance Increasing numbers of school psychologists and other mental health service providers	Close monitoring of high-risk students Training school staff to recognize warning signs Computerized risk assessment Checklists/profiling Implementing threat assessment in schools	Door locks, cameras, and other security measures to block access to schools and classrooms Alarms to notify students and staff of an attack Safety drills and training for students and staff
Individual level	Fostering social and emotional competencies	Psychological treatment Conflict resolution and mediation programs Fostering integration/preventing social exclusion	Self-defense training for students and staff Arming school staff

still controversy regarding whether video games have a causal effect, and whether that effect is strong enough to produce acts of violence (Ferguson, 2011).

15.2.2 Bullying Prevention

Experiences of bullying and social isolation have been discussed as a pivotal trigger or important motive for school shootings (O'Toole, 2000; Vossekuil et al., 2002). Therefore, bullying prevention at schools is considered as one possibility to prevent the conditions that lead to school shootings (Cornell 2006; Dill, Redding, Smith, Surette, & Cornell, 2011; Expertenkreis Amok, 2009).

15.2.3 Improving School Climate

In a similar vein, many authors call for the improvement of the school climate as a general prevention strategy for school shootings (Dwyer, Osher, & Warger, 1998; Fein et al., 2002). To reach this goal, various measures were suggested, such as teaching in small groups and fostering cooperation, reducing academic pressure, and addressing prejudices and conflicts (Dwyer & Osher, 2000; Fein et al., 2002). Creating a supportive and trusting climate in schools seems particularly important. A supportive school climate may not only reduce conflicts among students and with teachers, but also encourage students to come forward when they have concerns about potential violence (see below; Eliot, Cornell, Gregory, & Fan, 2010).

15.2.4 Employing more School Psychologists

In order to reduce bullying at school, improve school climate, and prevent aggression and suicide among children and adolescents, some authors have suggested employing more school psychologists or other mental health professionals (Expertenkreis Amok, 2009). These professionals could also help to identify at-risk juveniles more reliably (see below, indicated prevention measures). However, this measure would only make sense if school psychologists had the necessary knowledge about risk factors and warning signs for school shootings and had been trained to work with children and adolescents who are at risk for violence. However, this approach would require reliable, empirical research results on warning signs, risk factors, and possible interventions—which are not currently available and/or need to be disseminated.

15.2.5 Fostering Social Competencies

Research on school shootings has suggested that perpetrators lack adequate coping and problem-solving skills to deal with stressful situations or events (Fein et al., 2002; Verlinden et al., 2000). Therefore, it may be useful to provide social skills training or some form of counseling to foster social competencies in children and youth.

15.2.6 Strengthening Gun Control Laws

In Europe, school shootings have prompted new restrictions in weapons laws. For example, Germany amended its weapons laws after the 2002 shooting in Erfurt and the 2009 shooting in Winnenden. Finland made changes following shootings in 2007 and 2008. In Germany, restrictions have been placed on access to certain kinds of firearms as well as some types of bladed weapons. In order to acquire a firearm in Germany, a citizen must obtain certification of personal adequacy and complete firearm safety training. Because some school shooters took weapons that were legally owned by family members, stronger requirements for the safe storage of firearms have been proposed. However, a substantial proportion of school attacks have involved bladed weapons and explosives.

15.2.7 Zero Tolerance

The zero tolerance approach of seeking school safety through firm discipline has become widely used in US schools. The Gun-Free Schools Act of 1994 mandated that all public schools in the United States have a zero tolerance policy for firearms (http://www2.ed.gov/offices/OSDFS/gfsaguidance.html). It is common for schools to have additional zero tolerance policies that ban knives and other kinds of weapons such as nunchucks. Zero tolerance policies have even been applied to toy guns, including water pistols and the accessories to toy action figures. Still other zero tolerance polices ban verbal threats, bullying, or other undesirable behavior. A zero tolerance policy means that there is automatic punishment, usually a 1-year suspension or expulsion, for any violation. Although the federal law permits schools to make exceptions under appropriate conditions (e.g., a student unthinkingly brings a nonworking firearm to school for use as a prop in a school play), many school systems chose to apply them rigorously. Despite their widespread use, zero tolerance policies have been repeatedly criticized as excessively punitive and ineffective. The American Psychological Association task force concluded that there is no scientific evidence indicating that zero tolerance policies increase school safety

and considerable evidence that suspension is not an effective form of discipline, either in reforming the punished student or in deterring other students from misbehavior (Skiba et al., 2006).

15.2.8 Regulating Media Reports

One last approach aims at altering media reports on school shootings in order to limit their influence on youth who might be prompted to identify with perpetrators, imitate attacks, and commit copycat crimes (Dill et al., 2011). There is only anecdotal evidence that media coverage of school shootings has influenced later school attacks, but it is undeniable that high-profile school shootings have generated massive numbers of student threats (Kostinsky, Bixlwer, & Kettl, 2001). Therefore, there have been recommendations for voluntary efforts by the news media to report school shootings in a less inflammatory manner as well as to conduct public information campaigns that might discourage copycat behavior (Surette, 2010). Similar approaches have been shown to be useful in preventing the imitation of suicide (Chagnon, Houle, Marcoux, & Renaud, 2007). Accordingly, the news media might avoid reports that focus too heavily on the personal background and motives of the offender, and place more emphasis on the tragic consequences for victims and survivors. They should omit details that provide instructions for carrying out similar offenses or give the crime a dramatic, sensational quality. As the Internet has become a pivotal source of information on former offenses and offenders, it also seems important not to disseminate farewell letters or other media legacies.

Most of the primary prevention approaches (with the exception of zero tolerance policies) seem like desirable policies that would benefit the general school population. However, those approaches are not without problems. As already mentioned, one preliminary condition for successful primary or general prevention is sufficient empirical knowledge of single risk factors that increase the probability of the outcome long term. The identification of long-term risk factors that are amenable to diagnosis and treatment seems unlikely at present because the risk factors are not specific to school shootings and because it is unclear whether they are already effective in early childhood and youth and whether they can be diagnosed and treated at an early stage. Because school shootings have multiple causes, approaches focusing only on single risk factors fall short and touch only on parts of the problem. For example, even if violent video games were prohibited, youth would still be exposed to other forms of media violence, including media reports about former offenders. Similarly, while narcissistic and depressive traits are believed to constitute risk factors for school shootings, recent studies also point to the possible role of several other mental disorders (similar to results on adult offenders). Furthermore, not every risk factor is present in every offender. For example, there is evidence from recent studies that some school shooters were not victims of bullying or were not interested in violent media or even in prior shootings. Hence, there is insufficient evidence that preventive efforts targeted at any single risk factor will have an impact on school shootings. As a result, there are

differences of opinion between those who advocate primary prevention strategies (Cornell, 2006; Dwyer & Osher, 2000; Expertenkreis Amok, 2009) and others who doubt their effectiveness due to their poor sensitivity and low range (Bondü & Scheithauer, 2009; Kobe, 2009).

Although primary prevention may not be a useful strategy for tackling single risk factors, some of these factors might be reasonable targets of secondary prevention efforts. For example, Bondü and Scheithauer (2012) point out that extreme, time-consuming, and thematically linked violent media consumption may well constitute a risk factor for school shootings in some cases. Likewise, limiting access to firearms and other weapons could help to prevent school shootings by persons who have already revealed intent or interest in committing an offense. However, before any secondary or indicated prevention can be undertaken, it is essential to identify at-risk youth. It is to this that we now turn.

15.3 Indicated or Secondary Prevention

Indicated prevention efforts are appropriate when a student displays some indication of intention to commit a school shooting. In criminology, such prevention strategies are generally termed secondary prevention. There are two basic challenges for indicated prevention: (1) how to identify students in need of intervention; and (2) what intervention to implement.

15.3.1 Structured Risk Assessment

The conventional approach to identifying potentially violent individuals is to use a structured risk assessment instrument that combines a set of risk factors into a risk score. A variety of risk assessment instruments have been developed to predict violence in specific populations such as criminal offenders and persons with mental illness, and there has been substantial progress in improving the accuracy of structured risk assessment over the past three decades (Yang, Wong, & Coid, 2010). So it was natural to assume that similar instruments might be developed to identify students at risk of committing a school shooting. However, the low base rate problem and several other difficulties make this approach less useful for school shootings (Mulvey & Cauffman, 2001).

The problem of low specificity can be observed in many efforts to profile students likely to carry out a homicidal attack at school using checklists of risk factors and warning signs. Many of these risk factors are so general that numerous youth will be falsely identified as dangerous (“increase in risk-taking behavior,” “increase in use of drugs or alcohol,” “significant vandalism or property damage,” “loss of temper on a daily basis”; American Psychological Association, 1999). The FBI’s profiling experts found some common characteristics among students who committed school shoot-

ings—such as a history of being bullied and a fascination with violence-filled entertainment—but concluded that any profiles based on such characteristics would be misused and result in too many false identifications (O'Toole, 2000).

Another problem is that many risk measures have been based on research in broader populations of violent individuals, but have not been validated on youth who have attempted or carried out school attacks. For example, the Dallas Threat of Violence Risk Assessment (DTVRA) consists of 19 risk factors derived from a review of literature on risk factors for violence (Van Dyke & Schroeder 2006). Some of the more general risk factors include low academic achievement, lack of parental supervision, exposure to violence, and a record of disciplinary problems. Each item is rated as low, medium, or high and assigned a score of 1, 2, or 3, respectively. Although such a structured system can be appealing, the scoring system and cutoff points were "arbitrarily chosen by the committee without empirical validation" (Van Dyke & Schroeder, 2006, p. 608). The DTVRA has been widely used in the United States, but there is no research on its accuracy.

A final problem is that many risk assessment instruments are designed to identify individuals who will commit any act of violence at some point in the future, often over a period of years (Schmidt, Campbell, & Houlding, 2011). Schools face a much more immediate problem in determining whether a student is at risk for carrying out an attack. Situational and environmental risk factors are much more salient. Risk cannot be regarded as a static property of the individual student, but changes in response to environmental contingencies. For example, a student under adult supervision is in a lower risk state than when the same student is unsupervised. A student's risk of committing violence will increase if he or she is teased and harassed, or experiences some other provocative, distressing event. Therefore, the emergence of guided professional judgment has been an important development in risk assessment (Reddy et al. 2001). In this approach the professional makes use of structured risk assessment instruments as a source of information, but does not adhere strictly to actuarial decision-making and reserves the right to make professional judgments based on additional observations specific to the situation. An exemplary model of this approach is the Structured Assessment of Violence Risk in Youth (SAVRY; Borum, Bartel, & Forth, 2002). The SAVRY consists of 24 items empirically identified as predictors of adolescent violence and 6 protective factors. The manual discourages the use of a total score and recommends that professionals make a clinical judgment of risk as low, moderate, or high based on a review of all available information. Several studies have found good predictive validity for the SAVRY in samples of adolescent offenders (Schmidt et al., 2011). Although these findings are impressive, the predictions are for long-term outcomes (5–10 years in some studies), so that the SAVRY's ability to make short-term predictions is not yet established. Furthermore, the adolescents who have committed school shootings often have no history of prior offenses and may represent different populations than those typically studied with the SAVRY.

Some risk assessment instruments have also been computerized. A private consulting agency in the United States developed a software program called

MOSAIC for Threats by Students (MAST; De Becker n.d.). This program uses a series of multiple-choice questions to summarize what is known about the student and generate a report along with a rating on a 1–10 scale. The questions cover topics that the agency's experts believe to be important for identifying a violent student, but there appears to be no published research on the MAST. A similar computerized approach was developed by Hoffmann in Germany, based on analyses of German case files and relevant literature (see Hoffmann in this volume). On the basis of 32 questions (characteristic present, not present, no information available), the DyRiAS program (Dynamic Risk Analysis System) calculates the current risk of a violent attack at school on a seven-point scale. Computerized assessment is widely used in psychological testing as an efficient, reliable way to collect data, generate test scores, and summarize findings. However, critics point out that there is little research on the validity of computer-generated reports and caution that an automated report may convey unwarranted credibility because it seems more scientific (Butcher, Perry, & Atlis, 2000).

15.3.2 Threat Assessment at Schools

Research on the prevention of school violence must recognize, however, that prevention does not require prediction. There are many conditions that can be prevented even though individual prediction is not possible. For example, it is currently not possible to predict who will die of lung cancer, but rates have been dramatically reduced through public health campaigns to reduce smoking. Consequently, the rationale for indicated prevention should not be based on the accuracy of a predictive instrument for homicidal violence. Instead, students should be identified at least in part because their behavior raises concern on its own merit. Students who engage in aggressive or threatening behavior should be identified because their behavior is disruptive to others and may reflect a conflict or dispute that should be addressed. Others may engage in troubling behavior that suggests emotional disturbance, depression, or other adjustment problems that deserve attention. We hypothesize that effective intervention for these students will have widespread benefits that reduce less serious forms of aggression as well as homicidal violence.

In the United States, studies of school shootings by both the FBI (O'Toole, 2000) and the Secret Service (Fein et al., 2002) recommend a threat assessment approach (for Germany see Bondü, Cornell, & Scheithauer, 2011; Bondü & Scheithauer, 2009; Leuschner et al., 2011). Threat assessment is a form of risk management that is initiated in response to threatening statements or behavior and involves both assessment and subsequent intervention designed to reduce the risk of violence (Reddy et al., 2001). The assessment component is concerned with whether a student has expressed intent to harm someone. Threats can be addressed directly to the intended victim or communicated indirectly to third parties. They

may be explicit statements or more ambiguous. Threats can also be communicated by behavior such as possession of a weapon. The FBI also describes the broader phenomenon of "leakage" which refers to other ways in which students may intentionally or unintentionally reveal intention to carry out a violent act (O'Toole, 2000; also see Bondü, Leuschner, Lippok, Scholl, & Scheithauer, 2012). Students may leak their violent intentions through boasting comments, essays, letters, Internet postings, diary entries, or other forms of self-expression.

It is a guiding principle of threat assessment that there is no single profile or type of violent offender (Reddy et al., 2001). Students who commit school attacks may differ widely in their background and motivation. Threat assessment focuses on the context and seriousness of the student's behavior to determine what the student intended and whether he or she poses a threat. Any person can make a threat and many threats are little more than expressions of frustration, so that the critical issue for threat assessment is to determine whether the student's threat is serious and whether he or she is on a path of behavior leading to an attack. As a result, threat assessment is focused much more on whether the student is planning or preparing for an attack, and whether there are immediate environmental circumstances that would provoke or facilitate an attack.

15.3.3 Threat Assessment Research in the United States

Although threat assessment is a widely recommended practice, there is little empirical research on its effectiveness. The largest body of research has been conducted on the Virginia Student Threat Assessment Guidelines (see Newman et al. in this volume). The Virginia Guidelines were designed for school-based teams typically consisting of a school administrator, one or more mental health professionals such as school psychologists and counselors, and a school-based law enforcement officer known in the United States as a school resource officer. These teams are trained to evaluate a student threat using a seven-step decision tree. In order for the process to be flexible and efficient, the first three steps represent a triage process in which the team leader (or other team members) determines whether the case can be quickly and easily resolved as a transient threat or will require more extensive intervention as a substantive threat. Transient threats include jokes, figures of speech, or expressions of anger that do not reflect a sustained or genuine intent to harm the other person that would constitute a substantive threat. If the student responds positively to the initial intervention, the threat can be resolved and the process ends at step three. Most cases are not serious and are resolved as transient threats.

When the initial intervention is not successful, or the team feels that there is still concern that the student has intent to harm someone, then the threat is considered substantive. A basic premise of the Virginia Guidelines is that teams should address the problem or conflict that stimulated the student to make a threat because a successful resolution of this problem or conflict would eliminate the student's motivation to carry out the threat. Therefore, the team engages in a progressively more extensive evaluation of the student and designs a safety plan to prevent violence. The evaluation may include

both a mental health assessment and a law enforcement investigation. A threat assessment may identify underlying problems with bullying or conflicts in friendships and romantic relationships. There may be disputes with teachers or concerns about academic failure as well as learning or attention problems. Other students may be undergoing stressful experiences leading to emotional distress, anger, and depression. Accordingly, a safety plan might include some form of mental health treatment, counseling to mediate a dispute or, in some cases, psychiatric treatment for a serious mental illness such as a psychotic disorder or severe depression. The plan also includes protective measures such as notifying potential victims and taking appropriate safety precautions.

Two field tests of the Virginia Guidelines (Cornell et al., 2004; Strong & Cornell, 2008) demonstrated that school-based teams were able to conduct threat assessments of several hundred students from grades K-12 and resolve threats without a violent outcome. In most cases, the students were able to return to school, or in some cases, transfer to a different school or educational program. Notably, few students were given long-term suspensions or placed in juvenile detention. This outcome contrasts strongly with the widespread use of zero tolerance discipline in American schools (American Psychological Association Zero Tolerance Task Force, 2008).

After the two field tests, there were three controlled studies of the Virginia Guidelines. The first (Cornell, Sheras, Gregory, & Fan, 2009) was a retrospective comparison of 95 high schools reporting use of the Virginia Guidelines, 131 schools reporting use of locally developed procedures, and 54 schools reporting no use of a threat assessment approach. Students at schools that used the Virginia Guidelines reported less bullying, greater willingness to seek help over bullying and threats of violence, and more positive perceptions of school staff members than students in either of the other two groups. There were one-third fewer long-term suspensions. These findings were maintained after controlling for school size, minority composition and socioeconomic status of the student body, neighborhood violent crime, and the extent of security measures in the schools.

A second, quasi-experimental study found a 52% reduction in long-term suspensions and a 79% reduction in bullying infractions in 23 high schools 1 year after implementing the Virginia Guidelines, but the 26 control-group schools showed little change (Cornell, Gregory, & Fan, 2011). The third study (Cornell, Allen, & Fan, 2012) was a randomized controlled trial that examined disciplinary outcomes for students who attended 40 schools randomly assigned to use the Virginia Guidelines or follow a business-as-usual disciplinary approach in a wait-list control group. Over the course of 1 year, students who made threats of violence in the threat assessment schools were four times more likely to receive counseling services and three times less likely to receive a long-term suspension in comparison to students who made threats in the control group schools.

15.3.4 Threat Assessment Research in Germany

In response to a series of school shootings in Germany, two projects developed a threat assessment program: the Berlin Leaking Project and the NETWASS (Network Against School Shootings) project (Leuschner et al., 2011). The projects were based on the analysis of German, and to some extent American research on school shoot-

ings and leaking. Bondü (2012) found that all German students who committed school shootings had engaged in repeated leaking behavior, and therefore considered it a critical warning sign. Leaking encompasses any observable communication, act, or behavior with a close thematic link to an offense that may convey an individual's violent thoughts or intentions. Leaking is a broader concept than threat because it includes a wider range of observable communications and behaviors (e.g., stories, diary entries, essays, poems, songs, drawings, interest in violent topics, suicidal ideation, changes in behavior). Leaking can also include information about planning or preparation such as asking a friend for help obtaining a weapon.

The Berlin Leaking Project (Bondü & Scheithauer, 2012; Leuschner et al., 2011) also trained teachers in eight Berlin schools to identify and report leaking to a central contact person or "leaking appointee" in each school. The study found that teachers had little knowledge about leaking and its treatment, felt the training was worthwhile, and were able to profit from it. However, they also expressed a desire for more involvement by police and school psychologists in dealing with leaking incidents. Over the course of 6–9 months, three incidents of leaking were reported. However, a follow-up questionnaire indicated that other observations of leaking had not been reported.

The NETWASS Project (Leuschner et al., 2011; see also Leuschner et al. in this volume) is a threat assessment approach derived in part from the Virginia Guidelines, but with adaptations based on the needs of German schools and the legal and administrative circumstances in the German federal states. Informed by results from the Berlin Leaking Project, NETWASS was designed to address threats and leaking by students as well as psychosocial risk factors. The core of this approach is to train teachers to be more aware of and attentive to indications of potential violence in their students and to foster a positive school climate in which students are willing to share sensitive information with teachers when a classmate threatens to commit a violent act.

In the NETWASS model, whenever teachers become aware of any information that raises concern, they report their concerns to a central "prevention appointee" in their school (usually the principal or a designated teacher). The prevention appointee then calls upon a threat assessment team consisting of the principal and other staff members who know the student, such as teachers or social workers. School psychologists may be members of the threat assessment team, but are often unable to participate in all cases because of their assignment to multiple schools. Law enforcement officers may be contacted as part of the process, but there is some reluctance to involve them in less serious cases because police officers in Germany are obliged to file charges as soon as they become aware of any statutory offense. Like the Virginia Guidelines, the NETWASS model is focused on identifying appropriate interventions for the student, such as mental health services.

The NETWASS model is currently being field-tested in approximately 100 German schools. Schools were randomly assigned to different types of training to determine the most effective and efficient means of preparing threat assessment teams. Outcome data will be collected directly after training and after a further 9 months. Compliance with the new model will be measured, incidents reported by school staff documented, and measures of school climate obtained from teachers and principals. In addition to evaluating the training program, the project objectives include assessing the frequency

of leaking in schools, the relationships between leaking, violent incidents, and subjective feelings of safety, and the potential for expanding this model to address other issues of concern such as bullying or political extremism.

Threats and leaking do not occur only during the school day, but also in leisure time. Consequently, there have been promising efforts to install hotlines to allow anonymous reporting of such incidents by anybody in contact with at-risk adolescents (Payne & Elliot, 2011).

15.4 Emergency Intervention

Because no prevention effort will ever be completely successful, it is important to have appropriate emergency response strategies. These generally aim at minimizing the harm caused by school shootings or avoiding them altogether, either by impeding their execution or by stopping the offender as quickly as possible. Generally, two broad strategies are considered. The first involves the installation of security systems, the second focuses on training students, school staff, and emergency services how to respond.

Technical security systems include cameras, metal detectors to detect weapons, as well as locking entrances and controlling them with security monitors or electronic locks. Many of these security measures have been adopted by American schools. Others employ special security staff. Indeed, some shootings seem to have been prevented by the early intervention of security staff (e.g., an incident in New York on November 12, 2004, when a suspended student tried to stab the principal; http://www.schoolsecurity.org/trends/school_violence04-05.html). However, in other cases, persons trying to intervene in the offense. In other cases, intervening persons have been among the (first) victims. were not members of the security staff, but teachers and students from the school (e.g., Erfurt, Germany, in 2002). But, as is the case with most other prevention strategies, there is little research on their effectiveness. However, there are reasons to doubt the value of some security measures. For example, video cameras and metal detectors will not stop a person who is determined to attack or willing to die. Some studies suggest that these technical security measures have a negative effect on school climate by triggering feelings of fear and reducing feelings of safety within the school (Juvonen, 2002; Skiba et al., 2006).

Because cameras, metal detectors, locked entrances, and security staff cannot detect every armed student or prevent all shootings, it may be necessary for schools to have secondary security measures to respond to an actual attack. Therefore, some require measures to block or at least control access to schools and classes. This goal is achieved by building walls around schools, installing gates that may be opened only with keycards, or installing classroom doors that can be locked from inside. Some schools have special codes or signals to let school staff members know if there is an intruder in the building. Teachers may also have cell phones, warning buttons, or some other means of communicating with the school office if an incident occurs in their classroom. Finally, schools may hold regular drills in which students

take cover in the event of an attack or practice exiting the building in an organized, rapid manner, similar to a fire drill. These security measures might be helpful in some cases, but there is no expectation that they can prevent all forms of attack.

There have also been efforts to prepare school staff and students for attacks by providing them with emergency response guidelines and training. Several countries have adopted emergency guidelines for schools, for example, advising students and school staff to lock and barricade doors, stay away from doors and windows, call for help, and wait for the arrival and clearance of the police before opening doors again. Research at US and German schools has shown, however, that school staff may not recall or even know about emergency guidelines (Bondü & Scheithauer, 2012; Graham, Shirm, Liggin, Aitken, & Dick, 2006). These studies indicate the need for better training of school staff. In a similar vein, many schools have established crisis response teams, for example, to guide interactions with the task forces, relatives, or the media and maintain contact with psychologists or social workers who can give assistance to victims and witnesses shortly after the incident (Borum et al., 2010).

Because school shooters carry out different kinds of attacks that can be thwarted in different ways, emergency plans must be flexible. In Germany, for example, rules for police responses to school shootings have changed in recent years. Currently, police officers are instructed to enter schools immediately rather than waiting for specially armed forces to arrive, and are instructed to stop the perpetrator by all means necessary, including the use of deadly force.

15.5 Discussion

What conclusions can be drawn from the discussion of prevention efforts? What prevention strategies can be recommended to schools? The most important criterion for all recommended prevention strategies is that they must be based on scientific research and evaluation. Other considerations, such as social and political desirability or practicability, are relevant for implementation and program marketing, but do not assure efficacy.

Predicting and preventing a low base rate phenomenon such as a school shooting is a complex task. Three problems hamper the scientific evaluation of prevention strategies: 1. the lack of a consistent definition of the phenomenon; 2. the low base rate of school shootings; and 3. the relative nonspecificity of warning signs and risk factors. Further research is needed here.

It is an open question whether universal prevention approaches can prevent events as rare and multiply-determined as school shootings. Nevertheless, it is certainly beneficial to improve school climate by reducing conflicts among students and with teachers and to encourage students to come forward when they have concerns about potential violence. Providing social skills training or some form of counseling also may be useful to foster social competencies in children and adolescents. Most of the universal prevention approaches seem desirable policies that

would benefit the general school population even if there are questions about their sensitivity to school shooting cases.

There has been little research on the effectiveness of technical security systems, and some concern that they might have an adverse impact on school climate (Juvonen, 2002; Skiba et al., 2006). Nevertheless, it is important to have appropriate emergency response strategies. Emergency guidelines can prepare school staff and students by providing clear organizational structure and guidance. However, because school shooters commit attacks in different ways, emergency guidelines need to be flexible.

The most promising options for preventing school shootings are strategies of indicated prevention, which are appropriate when a student displays some indication of intention to commit an offense. It is important to differentiate between risk assessment approaches and threat assessment. Many risk assessment measures are based on research in broader populations of violent individuals and have not been validated on school shooters. Structured risk assessment approaches are designed primarily to identify individuals who will commit any act of violence at some time in the future, but it has not been demonstrated that they would predict such a low base rate phenomenon as a school shooting. Regarding computerized risk assessment, it is important to emphasize that there is no published research documenting the accuracy of any risk measure to predict whether a student will engage in a school attack (Butcher et al., 2000). Additionally, there is concern that an automated report may convey unwarranted credibility because it seems more scientific.

In conclusion, threat assessment methods that identify students on the basis of threatening statements or behavior seem to be the most promising and efficient prevention strategy. Although threat assessment is a widely recommended practice, it faces similar problems as other prevention strategies. More research is needed to identify risk factors and determine the most effective interventions. Finally, the low base rate of school shootings makes it difficult to establish whether any strategy is effective at preventing school attacks. Therefore practitioners should consider programs that demonstrate other beneficial outcomes, such as a positive impact on school climate or student welfare. Both the Virginia Student Threat Assessment Guidelines (Cornell, 2006) and the NETWASS Crisis Prevention Model (Leuschner et al., 2011) are designed to have broader effects on school functioning as well as prevent severe acts of violence.

References

American Psychological Association. (1999). *Warning signs of youth violence*. Retrieved January 22, 2011, from http://www.apa.org/helpcenter/warning-signs.aspx.

American Psychological Association Zero Tolerance Task Force. (2008). Are zero tolerance policies effective in the schools? An evidentiary review and recommendations. *American Psychologist, 63*, 852–862. doi:10.1037/0003-066X.63.9.852.

Bondü, R. (2012). *School shootings in Deutschland: Internationaler Vergleich, Warnsignale, Risikofaktoren, Entwicklungsmodelle [School shootings in Germany. International compari-*

son, warning signs, risk factors, and developmental models]. Retrieved September 27, 2012, from http://www.diss.fu-berlin.de/diss/receive/FUDISS_thesis_000000037683.

Bondü, R., Cornell, D. W., & Scheithauer, H. (2011). Student homicidal violence in schools: An international problem. *New Directions for Youth Development, 129*, 13–30. doi:10.1002/yd.384.

Bondü, R., Leuschner, V., Lippok, A., Scholl, J., & Scheithauer, H. (2012). Leaking-Phänomene und Ankündigungen von Gewalt—ihr Nutzen für die Prävention von schwerer, zielgerichteter Gewalt an Schulen. Befunde aus dem Berliner Leaking-Projekt und dem Projekt NETWASS [Leaking and announcements of violene – their use for prevention of severe targeted violence in schools. Results from the Berlin Leaking-Project and the project NETWASS]. In J. Hoffmann & K. Roshdi (Eds.), *Schwere Schulgewalt, Jugend- und Erwachsenenamok—Täterpsychologie—Psychiatrische Aspekte—Risikoanalyse—Bedrohungsmanagement*. Stuttgart: Schattauer (in press).

Bondü, R., & Scheithauer, H. (2009). Aktuelle Ansätze zur Prävention von School Shootings in Deutschland. *Praxis der Kinderpsychologie und Kinderpsychiatrie, 58*, 685–701.

Bondü, R., & Scheithauer, H. (2010). Explaining and preventing school shootings: Chances and difficulties of control. In W. Heitmeyer, H. G. Haupt, S. Malthaner, & A. Kirschner (Eds.), *Control of violence: Historical and international perspectives on violence in modern societies* (pp. 295–314). New York: Springer.

Bondü, R., & Scheithauer, H. (2012). Violent media consumption in German school shooters. In G. Muschert & J. Sumiala (Eds.), *Mediatized violence in a global age*. Chicago: Emerald (in press).

Borum, R., Bartel, P., & Forth, A. (2002). *Manual for the Structured Assessment of Violence Risk in Youth (SAVRY)*. Lutz, FL: Psychological Assessment Resources.

Borum, R., Cornell, D., Modzeleski, W., & Jimerson, S. R. (2010). What can be done about school shootings? A review of the evidence. *Educational Researcher, 39*, 27–37. doi:10.3102/0013189X09357620.

Butcher, J. N., Perry, J. N., & Atlis, M. M. (2000). Validity and utility of computer-based test interpretation. *Psychological Assessment, 12*, 6–18.

Chagnon, F., Houle, J., Marcoux, I., & Renaud, J. (2007). Control-group study of an intervention training program for youth suicide prevention. *Suicide and Life-Threatening Behavior, 37*, 135–144.

Cornell, D., & Sheras, P. (2006). Guidelines for responding to student threats of violence. Longmont, CO: Sopris West.

Cornell, D., Allen, K., & Fan, X. (2012). A randomized controlled study of the Virginia Student Threat Assessment Guidelines in grades K-12. *School Psychology Review, 41*, 100–115.

Cornell, D., Sheras, P., Gregory, A., & Fan, X. (2009). A retrospective study of school safety conditions in high schools using the Virginia Threat Assessment Guidelines versus alternative approaches. *School Psychology Quarterly, 24*, 119–129.

Cornell, D., et al. (2004). Guidelines for student threat assessment: Field-test findings. *School Psychology Review, 33*, 527–546.

Cornell, D., Gregory, A., & Fan, X. (2011). Reductions in long-term suspensions following adoption of the Virginia Student Threat Assessment Guidelines. *Bulletin of the National Association of Secondary School Principals, 20*, 1–20. doi:10.1177/0192636511415255.

De Becker, G. (n.d.). *Gavin de Becker explains MOSAIC*. Retrieved November 11, 2011, from https://www.mosaicmethod.com/.

Dill, K., Redding, R., Smith, P., Surette, R., & Cornell, D. (2011). Recurrent issues in efforts to prevent homicidal youth violence in schools: Expert opinions. *New Directions for Youth Development, 129*, 113–128. doi:10.1002/yd.391.

Dwyer, K., & Osher, D. (2000). *Safeguarding our children: An action guide*. Washington, DC: US Departments of Education and Justice, American Institutes for Research.

Dwyer, K., Osher, D., & Warger, C. (1998). *Early warning, timely response: A guide to safe schools*. Washington, DC: U.S. Department of Education.

Eliot, M., Cornell, D., Gregory, A., & Fan, X. (2010). Supportive school climate and student willingness to seek help for bullying and threats of violence. *Journal of School Psychology, 48*, 533–553.

Expertenkreis Amok. (2009). *Gemeinsam Handeln: Risiken erkennen und minimieren: Prävention: Intervention: Opferhilfe: Medien: Konsequenzen aus dem Amoklauf in Winnenden und Wendlingen am 11. März 2009*. Stuttgart: Author.

Fein, R. A., Vossekuil, B., Pollack, W. S., Borum, R., Modzeleski, W., & Reddy, M. (2002). *Threat assessment in schools: A guide to managing threatening situations and creating safe school climates*. Washington, DC: U.S. Department of Education, Office of Elementary and Secondary Education, Safe and Drug-Free Schools Program/U.S. Secret Service, National Threat Assessment Center.

Ferguson, C. J. (2011). Video games and youth violence: A prospective analysis in adolescents. *Journal of Youth and Adolescence, 40*, 377–391. doi:10.1007/s10964-010-9610-x.

Ferguson, C. J., & Kilburn, J. (2010). Much ado about nothing: The misestimation and overinterpretation of violent video game effects in Eastern and Western nations: Comment on Anderson et al. (2010). *Psychological Bulletin, 136*, 174–178. doi:10.1037/a0018566.

Graham, J., Shirm, S., Liggin, R., Aitken, M. E., & Dick, R. (2006). Mass-casualty events at schools: A national preparedness survey. *Pediatrics, 117*, e8–e15. doi:10.1542/peds.2005-0927.

Harding, D. J., Fox, C., & Mehta, J. D. (2002). Studying rare events through qualitative case studies: Lessons from a study of rampage school shootings. *Sociological Methods Research, 31*, 174–217. doi:10.1177/0049124102031002003.

Iannotti, R. J., Nansel, T. R., & Haynie, D. L. (2007). Adolescent bullying involvement and perceived family, peer and school relations: Commonalities and differences across race/ethnicity. *Journal of Adolescent Health, 41*, 283–293. doi:10.1016/j.jadohealth.2007.04.009.

Juvonen, J. (2002). *School violence: Prevalence, fears, and prevention* (RAND Issue Paper). Retrieved April, 19, 2009, from http://www.rand.org/pubs/issue_papers/IP219/index2.html.

Klein, J. S. (2002). *High-profile school shootings: How violence is hidden in masculinity expectations*. Ann Arbor: ProQuest.

Kobe, S. (2009). Statistik seltener Ereignisse: Über die Effizienz von Präventivmaßnahmen zur Verringerung des Restrisikos von "school shooting"-Attentaten nach Winnenden aus mathematischer Sicht. [Statistics of seldom incidents: On the efficacy of prevention measures for the risk-reduction of school shootings from a mathematical perspective]. *Forum Kriminalprävention, 7*, 7–9.

Kostinsky, S., Bixlwer, E., & Kettl, P. (2001). Threats of school violence in Pennsylvania after media coverage of the Columbine High School massacre. *Archives of Pediatric & Adolescent Medicine, 155*, 994–1001.

Lange, T., & Greve, W. (2002). Amoklauf in der Schule—Allgemeine Überlegungen aus speziellem Anlass [Rampage at school—general thoughts for a special reason]. *Soziale Probleme, 13*, 80–101.

Leuschner, V., Bondü, R., Schroer-Hippel, M., Panno, J., Neumetzler, K., Fisch, S., et al. (2011). Prevention of homicidal violence in schools in Germany: The Berlin Leaking Project and the Networks Against School Shootings Project (NETWASS). *New Directions for Youth Development, 129*, 61–78. doi:10.1002/yd.

Medienpädagogischer Forschungsverbund Südwest (Eds.). (2010). *JIM 2010: Jugend, Information (Multi-)Media: Basisstudie zum Medienumgang 12-bis 19-Jähriger in Deutschland* [Youth, information (multi-)media: Basic study on media use of 12- to 19-year-olds in Germany]. Stuttgart: Author.

Mishna, F. (2008). An overview of the evidence of bullying prevention and intervention programs. *Brief treatment and crisis intervention, 8*, 327–341. doi:http://dx.doi.org/10.1093/brief-treatment/mhn020.

Mulvey, E. P., & Cauffman, E. (2001). The inherent limits of predicting school violence. *American Psychologist, 56*, 797–802.

Muschert, G. W., & Larkin, R. W. (2007). The Columbine High School shootings. In F. Bailey & S. Chermak (Eds.), *Crimes and trials of the century* (pp. 253–266). Westport: Praeger.

O'Toole, M. E. (2000). *The school shooter: A threat assessment perspective*. Quantico, VA: National Center for the Analysis of Violent Crime, Federal Bureau of Investigation.

Payne, S. R. T., & Elliot, D. S. (2011). Safe2Tell®: An anonymous, 24/7 reporting system for preventing school violence. *New Directions for Youth Development, 129*, 103–111. doi:10.1002/yd.390.

Plener, P. L., Libal, G., Keller, F., Fegert, J. M., & Mühlenkamp, J. J. (2009). An international comparison of adolescent non-suicidal self-injury (NSSI) and suicide attempts: Germany and the USA. *Psychological Medicine, 27*, 1–10. doi:10.1017/S0033291708005114.

Reddy, M., Borum, R., Berglund, J., Vossekuil, B., Fein, R., & Modzeleski, W. (2001). Evaluating risk for targeted violence in schools: Comparing risk assessment, threat assessment, and other approaches. *Psychology in the Schools, 38*, 157–172. doi:10.1002/pits.1007.

Scheithauer, H., Hayer, T., Petermann, F., & Jugert, G. (2006). Physical, verbal and relational forms of bullying among students from Germany: Age trends, gender differences, and correlates. *Aggressive Behavior, 32*, 261–275. doi:10.1002/ab.20128.

Schmidt, F., Campbell, M. A., & Houlding, C. (2011). Comparative analyses of the YLS/CMI, SAVRY, and PCL:YV in adolescent offenders: A 10-year follow-up into adulthood. *Youth Violence and Juvenile Justice, 9*, 23–42. doi:10.1177/1541204010371793.

Skiba, R., Reynolds, C. R., Graham, S., Sheras, P., Conoley, J. C., & Garcia-Vazquez, E. (2006). *Are zero tolerance policies effective in the schools? An evidentiary review and recommendations: A report by the American Psychological Association Zero Tolerance Task Force*. Retrieved April, 16, 2009 from http://www.senate.state.tx.us/75r/Senate/commit/c530/handouts06/092006.c530.LevinM.1.pdf.

Surette, R. (2010). *Media, crime, and criminal justice*. Belmont, CA: Thomson.

Strong, K., & Cornell, D. (2008). Student threat assessment in Memphis city schools: A descriptive report. *Behavioral Disorders, 34*, 42–54.

Van Dyke, R., & Schroeder, J. (2006). Implementation of the Dallas Threat of Violence Risk Assessment. In S. R. Jimerson & M. J. Furlong (Eds.), *The handbook of school violence and school safety* (pp. 603–616). Mahwah, NJ: Lawerence Erlbaum.

Verlinden, S., Hersen, M., & Thomas, J. (2000). Risk factors in school shootings. *Clinical Psychology Review, 20*, 3–56. doi:http://dx.doi.org/10.1016/S0272-7358(99)00055-0.

Vossekuil, B., Fein, R. A., Reddy, M., Borum, R., & Modzeleski, W. (2002). *The final report and findings of the Safe School Initiative: Implications for the prevention of school attacks in the United States*. Washington: U.S. Secret Service and U.S.Department of Education.

Yang, M., Wong, S. C. P., & Coid, J. (2010). The efficacy of violence prediction: A meta-analytic comparison of nine risk assessment tools. *Psychological Bulletin, 136*, 740–767. doi:10.1037/a0020473.