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Kill one or kill them all? Differences between single and multiple victim school attacks

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Abstract
Research indicates individual pathways towards school attacks and inconsistent offender profiles. Thus, several authors have classified offenders according to mental disorders, motives, or number/kinds of victims. We assumed differences between single and multiple victim offenders (intending to kill one or more than one victim). In qualitative and quantitative analyses of data from qualitative content analyses of case files on seven school attacks in Germany, we found differences between the offender groups in seriousness, patterns, characteristics, and classes of leaking (announcements of offences), offence-related behaviour, and offence characteristics. There were only minor differences in risk factors. Our research thus adds to the understanding of school attacks and leaking. Differences between offender groups require consideration in the planning of effective preventive approaches.

A range of offences has been subsumed under the label 'school shooting' or 'school attacks': offences against a single person or against large numbers of apparently arbitrarily chosen victims, homicides in school in general, or suicides at school. But even if based on a narrow definition, research on school shootings has failed to identify consistent risk factors for the offences or a homogeneous offender profile. To account for

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divergent findings, some researchers have proposed typologies of school offenders or outlined different pathways towards an offence. Mostly, however, empirical evidence for these models is sparse.

In our research concerning school attacks in Germany, two groups of offenders seemed to emerge: those who intended to kill only one preselected victim and those who aimed to kill more than one person or even as many people as possible. In the present study, we endeavoured to provide empirical evidence for this distinction and searched for differences in risk factors, leaking, offence-related behaviours, and offence characteristics. Thereby, we wanted to extend and deepen the knowledge and understanding of school attacks and leaking. 'Leaking' describes announcements of potential offences prior to their execution and can therefore be considered an important warning sign for school attacks. But, despite its potential use for preventive purposes, empirical research on the topic is sparse and leaking is not yet well understood. We were also interested in how our findings might advance efforts to prevent school attacks. Finally, we strove to extend research knowledge of school attacks by combining qualitative and quantitative methods and by using methods such as latent class analysis, which have not been used in this area of research before.

Definition of school attacks

School shootings or school attacks are generally defined as offences by present or former students who purposefully chose their school as the offence site and intended to kill one or more than one person related to that school. There are, however, large discrepancies in the details of this definition (Bondü et al., 2013). For some authors, only offences that claim a minimum number of dead victims (Meloy et al., 2001), that have student victims (Leary et al., 2003), that were committed by the use of firearms (Verlinden et al., 2000), or that were based on motives related to the school context (Bondü, 2012) qualify as school shootings. Other authors include offences against a single person, with wounded victims, with a mere intention to kill, with weapons other than firearms (Meloy et al., 2001), with offenders other than previous or current students, or even offences outside the school context (Bannenberg, 2010).

The term 'school shooting' has been criticized for referring only to shooting incidents. Some authors, therefore, have introduced alternative terms such as 'rampage' (Newman et al., 2004), 'severe targeted violence in school' (Fein et al., 2002), or 'school attacks' (Vossekuil et al., 2002). Given the large number of offences that correspond to the definition of a school shooting but are committed by weapons other than firearms, we use the term 'school attacks'. Considering the different terms and definitions of relevant incidents, research on school attacks often integrates diverse types of offences.

Lack of consistent risk factors and offender profiles

Even if based on narrow definitions of relevant cases, research on school attacks has failed to identify consistent risk factors or a homogeneous offender profile. But in media reports or in some scientific publications, offenders are still often portrayed as isolated

and humiliated by peers, neglected by parents, socially incompetent, depressed and narcissistic, and with a lasting interest in violence and weapons.

Research on school attacks, however, has produced inconsistent findings on a range of risk factors. In one of the most comprehensive studies to date, Vossekuil et al. (2002) found offenders with and without school failure or prior aggressive behaviour in 41 offenders. Similarly, the authors identified socially marginalized or isolated offenders and others who were well integrated into their peer group. Although several studies in past years yielded evidence of negative social experiences such as bullying, isolation, or social marginalization in many offenders (for example, Leary et al., 2003; Kidd and Meyer, 2002; McGee and DeBernardo, 1999; Newman et al., 2004; Verlinden et al., 2000), results from recent studies challenge the generalizability of these findings. They support the notion that not every offender was a victim of bullying or socially isolated and that some offenders were even well integrated into a circle of friends (Bondü, 2012; Langman, 2009a). Similarly, some researchers have described dysfunctional family structures (McGee and DeBernardo, 1999; O'Toole, 1999) whereas others have reported mixed findings (Newman et al., 2004) or few problems in the offender families (Leary et al., 2003; Moore et al., 2003). The proportion of offenders with diagnoses of mental disorders was small (Vossekuil et al., 2002). Nevertheless, depression, narcissism and other personality disorders, as well as psychotic and anxiety disorders (Bell, 2002; Bondü, 2012; Langman, 2009a; Moore et al., 2003; O'Toole, 1999) have been linked to the offences. Likewise, some doubt that violent media consumption has any influence on rare events such as school shootings (Ferguson, 2008), whereas others have described an interest in violent media in some (Vossekuil et al., 2002) or even most or all offenders (for example, Kidd and Meyer, 2002; McGee and DeBernardo, 1999; Verlinden et al., 2000). Finally, recent research has yielded evidence of cultural differences in school attacks (Bondü, 2012), adding further discrepancies to the field.

To sum up, there are large differences in potential risk factors for school attacks, suggesting distinct individual pathways towards an offence. Thus, the lack of a consistent offender profile is one of the rare consistent findings of research on school attacks (Bondü, 2012; Vossekuil et al., 2002). This complicates preventive efforts. Owing to the low frequency of school attacks (low base rate), it is hard to detect potential offenders. In addition, many potential risk factors have low predictive power because they were observed only in some offenders, are generally common in adolescents, or both (Bondü et al., 2013).

Offence and offender typologies

To explain the differences in risk factors for school attacks, several authors have suggested models of different pathways towards an offence or of different types of offenders. So far, most models base on theoretical assumptions rather than empirical findings.

Cornell and Sheras (2006) outlined three pathways to violent student behaviour. First, people on the antisocial pathway show behavioural and school problems and lack social skills and problem-solving abilities early on; some even show psychopathic traits. These offenders have a positive attitude towards aggression and use it as a coping and problem-solving strategy. Second, people on the conflict pathway react sensitively to conflicts,

criticism, rejection, bullying, or perceived injustice and respond with feelings of shame, humiliation, depression, and hopelessness. Through violence, they seek revenge for these negative feelings and experiences in social interactions. Third, people on the psychotic pathway have serious mental disorders (schizophrenic or bipolar), often accompanied by other problem behaviour (substance abuse, an obsession with violence). Paranoid thoughts or auditory hallucinations justify violence by suggesting a need to defend oneself.

Based on case studies of 10 school attacks in the USA between 1997 and 2007, Langman (2009a, 2009b) also distinguishes three types of offenders. Psychopathic offenders are characterized by narcissism, a lack of empathy and conscience, and sadistic behaviour. They show paranoia, ruthlessness, and manipulative behaviour. Offenders' families seem intact, and usually show a long-term (legal) use of firearms, to which the offenders have access. Psychotic offenders (who represent about half of the investigated offenders) are characterized by schizophrenic disorders with typical symptoms such as hallucinations, paranoid and grandiose delusions, or alienation. They have dependent personality traits; they feel inferior, lonely, and depressed; and they are socially phobic and rejection sensitive. Finally, traumatized offenders have experienced emotional, physical, and/or sexual abuse. They come from dysfunctional, unstable families with parents who engage in drug abuse and criminal behaviour, including illegal possession and use of firearms. It was also possible to transfer this typology to a larger sample of 35 offences in educational settings such as schools and universities. Findings point to further differences in offender types in experiences of bullying or family and offence characteristics (Langman, 2013).

Instead of concentrating on offenders, some authors focus on offence characteristics as the basis for a typology of school attacks. Thus, differences in the course of school attacks are considered to originate from differences in motives and planning rather than from situational influences. Indeed, most offences are planned in detail a long time ahead (Vossekuil et al., 2002). Hence, differences in the course of the offence are assumed to allow for inferences as to the offender's motives and imply differences in planning or risk factors.

Klein (2002) differentiates four types of school attack based on the number and types of selected victims. Single homicides result in one dead, preselected victim. Multiple shootings are random shooting incidents, which result in no dead victims. Multiple homicides with adult victims result in at least one adult killed, and multiple homicides with children and sometimes adults killed result in predominantly child and adolescent victims killed.

Muschert (2007) suggests five types of school attack: rampage shootings, targeted shootings, mass murder, terrorist attacks, and government shootings. In the last three cases, the offender is not a member of the school. Offenders in rampage and targeted offences, however, are or have been a member of the school, including school staff. Rampage shootings result in multiple, partly preselected and partly arbitrary victims. The object of the offence is the school as an organization with a symbolic meaning. The offender is seeking revenge on society as a whole and striving to demonstrate power. Targeted shootings have one preselected victim. In these cases, the offender is seeking revenge for a subjective injustice supposedly perpetrated by the victim.

The present study

In our research on school attacks in Germany, two groups of offenders seemed to emerge from our data, which resembled the distinction between targeted and rampage shootings made by Muschert (2007). We defined single victim offenders (SV-offenders) as offenders who intend to kill only one preselected victim; multiple victim offenders (MV-offenders) strive to kill at least two or as many victims as possible (Bondü, 2012). By focusing on the offenders' intentions (deduced from their writings or expressions prior to the offences), our definition was independent of the exact number of victims in an offence. We investigated whether the distinction between SV- and MV-offenders was supported by differences in warning signs, risk factors, offence-related behaviour, and offence characteristics.

With regard to warning signs, we put special emphasis on leaking. 'Leaking' describes communications (direct leaking) or behaviour patterns and acts (indirect leaking) that are observable by others and might signal fantasies, thoughts, or ideas about, or even plans for, committing an offence (Bondü, 2012). In contrast to most risk factors, leaking has been observed in every school attack that has been closely analysed up to now (Band and Harpold, 1999; Newman et al., 2004; O'Toole, 1999). For German school offenders, leaking related thematically to the offence, was repeated over longer periods of time, was witnessed by several people, and in some cases contained detailed information (Bondü, 2012). Finally, compared with other risk factors, leaking seems less frequent. Thus, leaking can be a valuable means of identifying people in danger of committing an offence (Bondü et al., 2011, 2013; Meloy et al., 2012; Meloy and O'Toole, 2011). However, despite its potential use for preventive purposes, empirical knowledge about leaking is still limited. In the present study, we tested for differences between SV- and MV-offenders in the frequency, patterns, assessment of seriousness, characteristics, and classes of leaking. Owing to a lack of previous empirical findings, our study was mainly exploratory.

Methods

Sample

We defined school attacks as offences by current or former students of the school with potentially deadly weapons and the intention to kill a single person or groups of people associated with the school. Offences were planned; their sites were consciously chosen and related to the offences' motives (Bondü, 2012: 26). This definition comprised offences with weapons other than firearms and those against a single person, including students. It excluded violent acts at schools with no intention to kill, such as hostage-taking or sexual assault; lethal violence by non-attenders of the school; violent acts for political, religious, or romantic reasons; gang fights; spontaneous conflicts; suicides; and offences outside school property.

We analysed all offences that happened in Germany prior to or during our project period. Seven offences between 1999 and 2006 conformed to our definition of a school attack (see Table 1). All the offences were carried out by a single male offender between the ages of 15 and 22 years ($M = 17.3$; $SD = 2.6$). Four offenders ($M = 15.5$ years; range: 15–16 years; $SD = 0.58$) intended to kill one victim and were therefore defined as

Table 1. School attacks in Germany considered in the present study.

Date	Place	SV/MV	Offender's age (years)	Offence
09/11/1999	Meißen	SV	15	After several announcements, a student stabbed his teacher to death with two kitchen knives in front of his class. He then fled the scene and surrendered to the police.
16/03/2000	Brannenburg	SV	16	After being expelled for disruptive behaviour, a student returned to his boarding school with two of his father's guns next day. He shot one teacher to death and then tried to kill himself.
02/19/2002	Freising	MV	21	After losing his job, a former student killed two co-workers first. He then drove to his former school, shot the principal to death and seriously wounded a teacher. Finally, the offender shot himself.
26/04/2002	Erfurt	MV	19	Half a year after being expelled, a former student returned to his school and killed 12 teachers, 2 students, 1 administrative employee, and 1 police officer. Finally, the offender shot himself.
29/08/2002	Behrenhoff	SV	15	After a conflict with his teacher, a student came to school with two kitchen knives the next day. He tried to kill the teacher, but was stopped by other teachers.
02/07/2002	Coburg	SV	16	Following several announcements two days earlier, a student arrived at school with two of his father's guns. He tried to shoot his classroom teacher and wounded a second teacher before killing himself.
20/11/2006	Emsdetten	MV	18	Several months after finishing school a former student returned. He injured 36 people with firearms and smoke bombs, before finally shooting himself.

SV-offenders (Meißen, Brannenburg, Behrenhoff, Coburg). The other three offenders (M = 19.7 years; range: 18–22 years; SD = 2.08) intended to kill more than one person and were defined as MV-offenders (Freising, Erfurt, Emsdetten).

Procedure

We requested case files (covering between 600 and 10,000 pages) on the seven school attacks from law enforcement authorities. The files contained extensive witness reports, police investigative reports, reports on examinations of offenders' rooms and computers,

and, in most cases, psychiatric reports. We extracted relevant data from the case files utilizing a code sheet derived from the literature on school attacks and similar offences. The code sheet covered around 360 variables on offence-related behaviours, offence characteristics, warning signs (particularly leaking), and possible risk factors from several areas (social contacts, demographic data, appearance, school performance, aggressive or delinquent behaviour, media consumption, mental disorders, leisure activities, personality traits, negative experiences). Any relevant information from the case files was completely and literally transcribed to the code sheet according to one or more relevant questions, along with the source and date of information (for example: 'Did the offender collect information on school shootings, rampage, mass murder, workplace violence and the like?', 'Knowledge in handling weapons?', 'Has the offender been a victim of bullying?'). If there was no information clearly confirming or disconfirming a question, it remained unanswered and was treated as missing. Any information about the offender or the offence that seemed important but could not be fitted into one of the questions was transcribed to free spaces within the coding sheet.

Bondü analysed five of the cases on her own and around two-thirds of the other two cases. Research assistants and trainees, trained by a set of guidelines and a smaller case file, analysed the remaining parts of these two files (see Bondü, 2012). The time required for analysis was between two and several weeks per case. All raters were psychologists or psychology students.

After gathering the raw data, we analysed offence and offender characteristics using qualitative content analysis as described by Mayring (2003). We created dichotomized variables stating whether a characteristic was present or not present in an offender or the offence (for example, teachers as victims?, consumption of violent video games?, offender described as introverted?). In this way, about 250 different offence and offender characteristics were analysed and quantified. We then searched for qualitative and quantitative differences between SV- and MV-offenders.

For dichotomous (yes/no, present/not present) data, we used Fisher's exact test to test for differences between offender groups or characteristics of leaking. With regard to risk factors and offence-related behaviour, whenever a characteristic was displayed by each member of one group, but by none of the other group (for example, all MV-offenders displayed evidence of the presence of an aspect and all SV-offenders displayed evidence of the absence of this aspect), Fisher's exact test equalled $p = .029$ (not considering Bonferroni correction). For continuous data, we used the Mann–Whitney U-test to test for differences between offender groups resulting from small sample sizes and t-tests to test for differences in numbers and duration of leaking between the two offender groups.

In addition, we extracted information about each behaviour applying to our definition of leaking, that is, any (potentially) observable communication, act, or behaviour pattern that might signal an idea or intention of committing an offence. This included behaviours that could be identified as leaking only post hoc (for example, farewell gestures such as parting from the mother in a unusual way) or that could have been observed or detected by others in a realistic period of time (such as postings on the internet). We included only behaviours that were not risk factors (for example, violent media consumption was not treated as leaking unless there was a special interest in offence-related media content that others knew about). Finally, we rated behaviours and communications as leaking only

when they were thematically related to an offence (for example, in contrast to threats to kill a teacher, threats to hurt a person not related to the school were not treated as leaking), even if the link could only be established post hoc. Every leaking in the presence of different people, at different points in time, or with distinguishable content was treated as a single leaking.

In this way, we identified 87 leakings among the seven offenders. Whenever possible, we determined the exact point in time of each leaking. We further analysed these 87 leakings using qualitative content analysis as proposed by Mayring (2003) and, with the help of ATLAS.ti, we were able to identify 36 different content characteristics, such as mentioning the planned time of an offence, showing off weapons, expressing conditions for an offence, or describing possible consequences of the offence. The presence of each characteristic was dichotomized (present/not present) for every single leaking and for each offender. We then compared SV- and MV-offenders with regard to duration, frequency, time patterns, the 36 content characteristics, and different classes of leaking.

Results

Offender characteristics

Offender characteristics include variables that refer to the offender's personality, interests, attitudes, general behaviour, and the like. In the following we will inspect results with regard to demographics, media consumption, mental disorders, social contacts, school, and general offender behaviour.

Demographic data. SV-offenders were somewhat, but not significantly, younger than MV-offenders ($Md_{SV} = 15.5$; $Md_{MV} = 19.0$; $U = 0.0$, $p = .057$, $Z = 2.16$, $r = .82$). At the time of the offence, all SV-offenders were present and all MV-offenders were former students of the school.

Media consumption. Five offenders displayed an intense interest in violent media (13 indicators) – two SV-offenders and all the MV-offenders. All consumed different violent media, especially video games, predominantly on their own. However, only the MV-offenders displayed an interest in similar offences, for example by watching films about school attacks or rampage or by collecting information about prior offences. Two MV-offenders also created violent films (Bondü and Scheithauer, 2012).

Mental disorders. Psychiatric reports were present in four case files. In these cases, we derived diagnoses of mental disorders directly from these reports. In addition, single symptoms of several mental disorders according to DSM-IV (the fourth edition of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders) or ICD-10 (the Tenth Revision of the International Classification of Diseases) were rated as having been present or absent in the offenders (69 indicators, including personality disorders, depression, and anxiety disorders). Six of the seven offenders displayed serious evidence of mental disorders (diagnosis taken from psychiatric reports and/or the number of symptoms required for a diagnosis according to DSM-IV or ICD-10 fulfilled

for at least one disorder: personality disorders, depression, schizophrenia, anxiety disorders). There were no striking differences between the two groups of offenders with regard to specific diagnoses or most symptoms. However, all MV-offenders displayed marked rumination, which could not be found among the SV-offenders. All MV-offenders also showed some evidence of high self-esteem, but in each case there was also evidence of low self-esteem. Thus, low self-esteem seems to have been masked among the MV-offenders. In contrast, three out of four SV-offenders showed clear evidence of low self-esteem, in two cases even diagnosed by psychological tests. Finally, two MV-offenders revealed holding a permanent grudge and being arrogant and overbearing, as well as rigid and compulsive behaviour, which were not identified among the other offenders.

Social contacts. There were no obvious differences between the two offender groups in friend relationships (12 indicators, including belonging to a circle of friends, having a best friend, and spending spare time with friends) or partner relationships (4 indicators, including being in romantic relationship at the time of the offence). All offenders but one had a close circle of friends and were in contact with their friends even in the period prior to the offences. However, two MV-offenders had never had a girlfriend and the remaining MV-offender's last relationship was years ago. In contrast, three of the much younger SV-offenders had already had a girlfriend. Four offenders had problems with peers other than their friends and had been rejected by them (10 indicators, including being bullied and feeling different). This applied to one SV-offender and all MV-offenders. There were no further differences in peer relationship characteristics. Similarly, there were no striking differences in parent or sibling relationships (29 indicators, including no interest in child and physical punishment), which were mostly described as positive. However, one SV-offender and all MV-offenders had more successful siblings and at least one family member with suicidal thoughts and delusions before and/or after the offence.

School. There was evidence of problems at school, and with teachers in particular, for all offenders. However, there were no differences between the two offender groups in problems with teachers and school (9 indicators, including no positive relationship with at least one teacher) or school performance (17 indicators, including low grades and suspension). On the other hand, all MV-offenders, but only one SV-offender, reported unrealistic career aspirations (career aspirations that required educational attainment they did not have or were unlikely to achieve, or had a criminal record that would not have been allowed in their job of choice).

Offender behaviour. There were no differences between the offender groups in terms of previous deviant and violent behaviour (14 indicators, including deviant behaviour in childhood; some offenders had shown deviant and violent behaviour prior to the offences, but others had not), a preoccupation with similar topics (4 indicators, including death), external appearance (7 indicators, for example changes in appearance), leisure activities (6 indicators, including shooting competitions), social and emotional competencies (13 indicators, including dysfunctional coping strategies), or personality traits (17 indicators, including introversion). Only one SV-offender, but all MV-offenders, displayed pronounced social and emotional problems and external problem attribution.

Offence characteristics and offence-related behaviours

Offence characteristics include variables that refer to triggers, motives, and details of the offence, as well as offenders' behaviour related to these offences. We inspect precipitating events, interest in weapons, pre-attack behaviours (ideas about and preparations for an offence), and the course of the offence (weapons used, duration, number of victims, end of offence).

Precipitating events. All offenders had had a range of negative experiences prior to their offence (bad grades, loss of a friend, loss of future perspectives). There were no striking differences between the two offender groups, although only one SV-offender but all MV-offenders had shown problems with teachers long term (for example, having problems with one or several teachers over longer periods of time or at different points in time during their school career or expressing a hatred of teachers in general).

Weapons. All the MV-offenders, but none of the SV-offenders, were described as fixated on weapons. Furthermore, all MV-offenders but only one SV-offender reportedly showed an intense interest in weapons, were described as weapons fanatics, had carried weapons to school or in leisure time, and had knowledge in handling weapons (13 indicators). Offenders with a particular interest in weapons were mainly interested in firearms, but two had also concerned themselves with explosives.

Pre-attack behaviours. Three SV-offenders had the idea for an offence two to six months prior to the offence; the fourth offender had done so for only one day. Every MV-offender had had such ideas for at least one and a half years. Similarly, SV-offenders spent months, days, or even only hours preparing the offence; MV-offenders spent much longer periods of time (1.5 and 2.5 years in two cases, in the other case the exact time is not known). Apparently, SV-offenders started preparing the offence only when they had finally decided to do it, whereas MV-offenders had already started preparations for the offence before making their final decision to carry it out.

  Finally, we rated the discovery risk of these preparations as high for three SV-offenders, as medium for one SV-offender and one MV-offender, and as low for the two remaining MV-offenders. Offenders with a high discovery risk had supplied detailed information about their plans for an offence and had shown their weapons to others on the verge of the offence. In addition, they had not made any arrangements in order not to be detected. The two offenders with a medium detection risk had made leakings with only few details or made arrangements not to be detected (for example, hiding weapons, locking his room, making excuses). The two offenders with a low detection risk had leaked only few details. Moreover, one offender lived alone, and the other one had hidden weapons and ammunition and had lied extensively.

Course of offence. Two offences by SV-offenders were conducted using knives. In the other five cases, firearms were the primary weapons. All SV-offenders had taken their weapons from home, either from their fathers' weapons cabinet (firearms) or from the family's kitchen (knives). The MV-offenders purchased their firearms (legally or

illegally) themselves. All MV-offenders also took knives to the site of the offence, and two of them took explosives.

Two SV-attacks resulted in one person being killed and none wounded; the other two attacks in no one being killed and one person wounded, in addition to the suicide of the offender. The first MV-attack resulted in three people being killed and two wounded, the second in 16 people being killed and 6 wounded, and the third in no one being killed and 36 people being wounded. SV-offenders and MV-offenders did not differ significantly in the number of dead victims, but they did differ significantly in the number of wounded victims ($Md_{SV} = 0$; $Md_{MV} = 6$; $U = 0.0$, $p = .057$, $Z = 2.20$; $r = .89$) and in total victims ($Md_{SV} = 0$; $Md_{MV} = 22$; $U = 0.0$, $p = .057$, $Z = 2.20$; $r = .89$). SV-offenders selectively attacked people they previously had had a conflict with. MV-offenders had named supposed victims prior to the offence, searched for certain people during the offence, and first attacked people or groups of people they had picked as primary victims prior to the offence. But they also targeted people who had not been involved in the initial conflict. This was also the case with one SV-offender. This increase in victims, however, was not planned.

Accordingly, the SV-offenders remained in one place during the offence, but MV-offenders roamed the school buildings. One offence even had two distinct sites: the former place of work and the former school. Consequently, the course of the offence lasted 2 to 3 minutes in SV attacks and around 10 minutes in MV-attacks. Five offenders (two SV-offenders and all MV-offenders) tried to kill themselves and four offenders (one SV-offender and all MV-offenders) actually killed themselves.

Table 2 gives an overview of the differences between the two groups of offenders.

Leaking

This section presents clearer inspections of the leaking characteristics shown by the two offender groups such as the number, temporal patterns, contents, and the classification of leaking.

Number of leakings. Every offender showed leaking. The number of leakings per offender ranged from 7 to 18, averaging 12.4 leakings per offender. SV-offenders showed less leaking than MV-offenders ($M_{MV} = 15.7$, range: 11–18; $M_{SV} = 10$; range: 7–13), but the difference was not significant.

Temporal pattern of leaking. MV-offenders also displayed leaking for longer periods of time than SV-offenders. All MV-offenders had done so for more than a year. Some leakings even dated back 2 to 5 years prior to the offence. MV-offenders showed most leakings more than 6 to 3 months prior to the offence. After that and probably after deciding to commit the offence, the number of leakings strongly decreased: only 7 out of 47 leakings by MV-offenders occurred during the three months prior to the offence. Furthermore, these seven leakings were mainly indirect leaking. Leaking by MV-offenders never occurred on the day before or the day of the offence. SV-offenders showed the opposite pattern. They showed leaking for only between half a year and one day. Only one SV-offender displayed an interest in weapons for more than six months prior to the

Table 2. Differences in risk factors and offence-related behaviours between multiple victim and single victim school offenders.

	MV (n = 3)	SV (n = 4)
Risk factors		
Age of offender in years[+]	M = 19.7	M = 15.5
Former student*	3	0
Rumination*	3	0
Constant grudge	2	0
Arrogance	2	0
Rigidity	2	0
Self-esteem	3 = high (masked)	3 = low
Rejection by peers	3	1
Problems with peers	3	1
More successful sibling	3	1
Parents suicidal/delusional after offence	3	1
Girlfriend prior to offence	2 = never	3 = yes
Unrealistic career aspirations	3	1
Fixation on weapons*	3	0
Social and emotional deficits	3	1
Accusation of others	3	1
Offence-related behaviour		
Consumption of attack-related media*	3	0
Research on prior offences	2	0
Strong interest in weapons	3	1
Described as weapons fanatic	3	1
Brought along weapons prior to offence	3	1
Knowledge in handling weapons	3	1
Ideas about an offence*	3 = years	4 = days/months
Preparations for an offence*	3 = long, intense	4 = short
Acquisition of weapons*	3 = own acquisition	4 = taken from home
Sequence of preparation/decision on offence*	3 = preparation first	4 = decision first
Duration of offence*	3 = c. 10 minutes	4 = seconds/minutes
Multiple crime scenes within the school*	3	0
Brought firearms and knives themselves*	3	0

[+]significant difference at $p = .059$ (U-test); *significant difference at $p = .029$ (χ^2-test).

offence. Most leakings (24 out of 40) by SV-offenders occurred on the day before or the day of the offence (see Figure 1). These were mainly direct leakings, with many details in three cases. The average interval between leaking and offence was significantly longer for MV-offenders than for SV-offenders ($t_{(75)} = 9.11$; $p = .001$; $d = 2.07$, CI [1.85; 2.29]; SV-offender: $M = 2.85$, $SD = 2.13$, $N = 39$; MV-offender: $M = 7.34$, $SD = 2.20$, $N = 38$; with 1 = day of offence to 10 = more than 36 months prior to the offence).
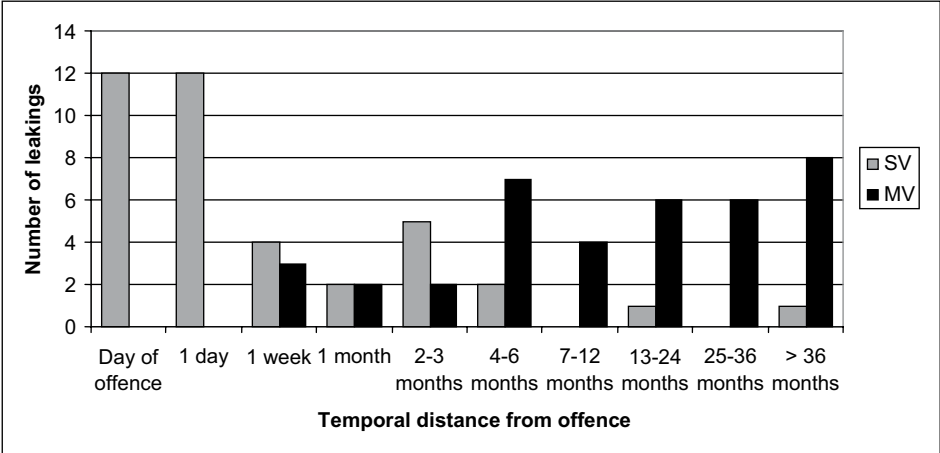
Figure 1. Interval between leakings and offences (*N* = 77; leakings for which the point in time could be determined).

Contents. We compared leakings by SV-offenders and MV-offenders with regard to the 36 content characteristics. Data were dichotomized for being present or not being present in each leaking. We used Fisher's exact test to test for differences in frequencies between the offender groups and report Odds Ratios (OR) as an effect size. If cell frequencies were zero, we computed OR by adding 0.5 to every cell. Because this procedure is not without problems, we report OR in square brackets in these cases. To account for Type I error inflation we adjusted alpha to $p = .001$. Given the small sample size, the low power, and the exploratory nature of our study, we also report differences in characteristics that would have been significant at the 5 percent level. Table 3 shows the results.

There were significant differences between SV-offenders and MV-offenders in four characteristics at the 0.1 percent alpha level. SV-offenders had named details such as the time of or the weapons for the offence significantly more often than the MV-offenders. MV-offenders showed significantly more unspecific and non-verbal behaviour-based leaking. There were further differences at the 5 percent alpha level: SV-offenders had mentioned target subjects as well as details about the planned course of the offence more often, referred to previous offences in their acts and communications more frequently (for example, talked about previous offences or revealed an intense preoccupation with previous offences), announced an act of violence more often (for example, talked about blowing up the school or cutting off somebody's finger), indicated the possession of or access to weapons or attempts to obtain weapons more frequently (by talking about their father's weapons), showed weapons to others on more occasions, and expressed thoughts about an offence's consequences more often (talked about getting into psychiatry or about plans for an escape). MV-offenders had more often invested much effort and time into leaking (for example, created a website about previous school attacks or programmed a map of his school for a first person shooter) and more often revealed an interest in violence (such as war, previous similar offences, producing videos with violent contents). The two groups did not differ in the total number of content characteristics.

Table 3. Differences in content characteristics of leaking between SV-offenders and MV-offenders.

	p^a	OR	CI / OR	More frequent in SV-offenders or MV-offenders?
Time of offence mentioned	.000	[32.70]	1.85; 578.70	SV
Weapons for offence mentioned	.001	10.83	2.27 / 51.72	SV
Unspecific leaking	.000	8.63	2.65 / 28.09	MV
Non-verbal leaking	.001	4.54	1.73 / 11.91	MV
Victims mentioned	.015	3.20	1.31 / 7.80	SV
Details of course of offence mentioned	.041	11.71	0.61 / 224.54	SV
References to other offences	.027	2.89	1.19 / 7.05	SV
Announcement of violence	.010	7.50	1.53 / 36.66	SV
Possession of weapons indicated	.029	3.25	1.21 / 8.74	SV
Showing weapons to others	.005	13.35	1.61 / 110.77	SV
Thoughts about consequences	.018	[14.72]	0.79 / 274.96	SV
Large amount of effort invested in leaking	.014	[15.00]	0.83 / 271.43	MV
Interest in violence prior to offence	.018	5.81	1.20 / 28.02	MV

^{a}Test statistic: Fisher's exact test.

Classes of leaking. Based on significant differences in content characteristics we conducted multiple latent class analyses to identify possible differences between SV- and MV-offenders' patterns of content characteristics. We selected details on the time of the offence, detailed thoughts about an offence, the repetition of leaking, non-verbal leaking, and indirect leaking (all dichotomized) as defining criteria. Dependent measures were accounted for by the complex-option of Mplus. We decided on a three-class solution. Analyses yielded no evidence for entirely different classes of leaking in the two offender groups (Bayesian information criterion [BIC] = 696.37). The three classes were shown by members of both offender groups (BIC = 651.60). However, the frequencies were significantly different (BIC = 662.57). Superficial direct leakings were almost always verbal and direct, but did not contain any references to the time of offence. They were repeated less frequently than the other two groups and conveyed intensive thoughts about an offence less frequently. This class comprised 48 percent of leakings and they were almost equally distributed between SV-offenders (23 percent) and MV-offenders (25 percent). Detailed direct leakings comprised repeated, verbal, direct leakings that revealed intensive thoughts about an offence and contained information about the time of the offence. This class accounted for 14 percent of leakings and was exclusively shown by SV-offenders. Finally, indirect leakings were displayed indirectly and non-verbally, were only partially repeated, and contained no or hardly any information about the time of the offence or intensive thoughts about it. Indirect leakings made up

38 percent of all leakings. They were predominantly shown by MV-offenders (29 percent; compared with 9 percent for SV-offenders).

Discussion

Based on our research into German school attacks, we assumed differences between single and multiple victim offenders in terms of risk factors, warning signs, offence-related behaviours, and offence characteristics. Our findings support this distinction. We found pronounced differences in leaking, offence-related behaviours, and offence characteristics, which seem to be associated with distinct triggers, motives, and aims of the offences. There were, however, only few and gradual differences between the two groups of offenders with regard to risk factors. If there were any differences, risk factors seemed more pronounced in MV-offenders.

Because there was little evidence for basal differences in risk factors in the two offender groups, it would appear that there are no fundamentally distinct developmental pathways towards a school attack for SV-offenders and MV-offenders. Thus, there seemed no need to construct separate developmental models with regard to the risk factors that seem to play a role in the development towards an offence (Bondü, 2012).

Nonetheless, differences in triggers, motives, and aims of the offences seem to be reflected in distinct pre-offence behaviours by SV-offenders and MV-offenders (such as planning and preparation, interest in prior offences, danger of early detection) and differences in offence characteristics (for example, multiple sites, kinds of weapons used). This has practical implications for prevention efforts and the design of interventions in school attacks.

Offence and offender characteristics

Compared with the number of indicators, there were only isolated quantitative or qualitative differences between SV-offenders and MV-offenders in the supposed risk factors for school attacks. This finding is particularly compelling if Bonferroni correction is taken into account. If there were any differences, they seemed gradual, with more pronounced stressors among MV-offenders. Their humiliations seemed stronger (constant grudge in combination with arrogance and high self-esteem) and failures seemingly affected more areas of their life (no partner, no driver's licence, unrealistic career aspirations, school failure). Most differences, however, were not pronounced. As was the case with rigidity, arrogance, or constant grudge, not all the characteristics that were observed only in MV-offenders were shared by all MV-offenders. In contrast, characteristics that were mainly shown by MV-offenders were also shown by SV-offenders. This holds true for the external attribution of blame, peer rejection, or a strong interest in weapons. One SV-offender in particular showed conformity with the MV-offenders in many aspects.

In contrast, there were manifold and clear differences between the two offender groups in offence-related behaviours and offence characteristics. MV-offenders displayed a longer, more intense preoccupation with the offence (rumination, longer duration of ideas for an offence, older offenders, former students) and related topics (consumption of violent, offence-related media content, fixation on weapons, research

into former offenders). They also spent more time planning a more deadly offence (acquiring weapons). Among MV-offenders, an original conflict has apparently been generalized to the entire school system or even society as a whole; the offence served as a means to take revenge for example for a lack of future prospects. Among SV-offenders, the conflict was restricted to a single person and revenge was constrained to the conflict partner; the offence appeared to serve as a means to solve a problem that – from the offender's perspective – could not be managed in any other way. Our findings thereby support the assumptions by Muschert (2007) regarding different motives for offences with a single targeted victim and those with more victims.

Given the high resemblances between the offender groups in terms of risk factors, there seemed no need for the description of separate pathways towards a school attack for SV-offenders and MV-offenders with regard to risk factors. Instead, each offender displayed an individual constellation of risk factors. Thus, the exact pathway towards an offence and the combination of risk factors is highly individual. Hence, our findings further support the notion that there is no consistent offender profile of school offenders.

Despite little evidence for differences in risk factors that are likely to exhibit an influence in the long term, our data provide evidence for clear differences between SV-offenders and MV-offenders with regard to motives and triggers for the offence, as well as warning signs, pre-attack behaviours, and offence characteristics. Thus, differences in motives and triggers seem to affect warning signs, offence characteristics, and offence-related behaviours. Considering these findings, it can be argued that there are few differences in the developmental pathways with regard to the potential risk factors, but large differences with regard to the warning signs. These differences in warning signs are of interest for the prevention of school attacks. Because leaking has been considered an important warning sign, differences between SV-offenders and MV-offenders in leaking require particular attention.

Leaking

There were clear and consistent differences between SV-offenders and MV-offenders in the temporal pattern, duration, frequency of content characteristics, and classes of leaking. These findings support the assumption that, despite the great lack of differences between the offender groups in risk factors, not only their offences but also the development towards these offences differ. Thus, differences in pre-offence behaviours indicate differences in offences. For example, different time patterns of leaking indicate different motives and triggers in SV and MV attacks. Seemingly, the triggers are acute, immediate, and based on concrete conflicts in SV attacks, but general and with long-term effects in MV attacks.

In addition, the motives for leaking might differ between SV-offenders and MV-offenders. Three SV-offenders made detailed statements about the planned offence; this was not the case for any MV-offender. SV-offenders displayed more evidence that they were planning an offence in statements and behaviours, for example by expressing thoughts about the consequences of an offence, showing their weapons to others and mentioning several details in one leaking (the planned time *and* the victim of an offence).

They also repeated leaking more frequently and in front of different people. Hence, the time, place, and intended victim of the attack were easy to determine. Thus, there were many opportunities to recognize the plans for an offence early on. In these cases, leaking might be interpreted as a cry for help and as a signal for a need to intervene.

Leaking by MV-offenders did not allow for inferences about the details of the planned offence. Furthermore, leaking appeared to be reduced prior to the offence. Whether this reduction happens consciously or unconsciously remains unknown, but the pattern is reminiscent of that observed prior to suicides (Roberts et al., 2008). Once they have decided on an offence, MV-offenders seemingly do not want to be deterred from it any more. As proposed by the Rubicon model, the decision might be protected by internal processes such as cognitive shielding after it has been made (for example, lacking a perception of alternative solutions; Gollwitzer and Sheeran, 2006). None the less, some characteristics of leaking by MV-offenders also pointed towards an offence and signalled seriousness. For example, they too showed weapons to friends and displayed an intense preoccupation with similar offences. MV-offenders showed leaking over very long periods of time, engaged in more different forms of leaking, spent more time on it (one case) and also used the internet as a platform for leaking (one case). There were many indirect leakings (for example, showing an interest in related topics such as weapons or similar offences, or changes in behaviour), which may be harder to detect but can more easily be observed by larger numbers of people.

Bondü (2012) confirmed the assumption that leaking by MV-offenders is harder to detect and that content characteristics require consideration to assess the seriousness of leaking by MV-offenders appropriately. According to assessment criteria for the seriousness of threats by O'Toole (1999; for example, richness of detail, plausibility, consistency), leaking by MV-offenders was consistently and significantly rated as less serious than that by three SV-offenders across seven raters. When raters were free to choose assessment criteria and also took into account content characteristics, the difference was no longer significant.

Finally, results from latent class analyses provide the first empirical evidence for a distinction between direct and indirect leaking. Our findings suggest an additional distinction between superficial and detailed direct leaking, depending on the richness in detail. Owing to the small sample size, however, the latent class model is unstable and requires replication in larger samples. Larger samples are also needed to control for dependent data in the comparison of the frequency of content characteristics between the two offender groups.

Implications for prevention and intervention

Prevention in SV-attacks should focus on complex details provided in leaking and on evidence of access to weapons. It is not sufficient to account for single details such as the time and the victim of the offence, because this information is also often part of leakings by non-offenders (Bondü and Scheithauer, 2010). Among SV-offenders, the cause for the offence is a single conflict with a single person that (subjectively) cannot be resolved any other way. Thus, the offence is a means to an end, not an end in itself. Accordingly, SV-offenders seem open to alternative solutions and interventions. In these cases,

interventions that occur at a late stage of the development towards an offence can also be effective. For example, in these cases it might be helpful to initiate and mediate a conversation between the student and the person he or she has a conflict with and to find solutions to the problem (is there really a problem or is it a misunderstanding; how can the student be helped with problems at school or with peers, or with mental health problems; what latitude does the teacher have; would a change of class or school help to solve the student's problem or intensify it?). In terms of a situational crime prevention strategy, this might help to reduce the rewards of an offence as well as further provocations (Clarke, 1995). Given the larger proportion of SV-offenders who took their weapons from home, stronger rules for and controls on private weapons storage might be useful in some SV offences (increasing the effort required to acquire weapons). However, some of the SV-offenders used knives for their offence and there is some evidence that offenders might fall back on more easily accessible weapons such as knives or axes if they fail to acquire firearms. Similarly, it might be helpful to make access to schools more difficult in SV-cases, although this approach will probably not prevent all offences and has some other disadvantages such as potentially increasing fear among school visitors.

In contrast, interventions with MV-offenders have to occur at an earlier stage in the developmental process towards an offence, that is, prior to the final decision to undertake the offence. Otherwise, the offence-related goals and the offence itself seem to gain in importance and the offence becomes an end in itself. In these cases, later interventions are likely not to have the intended effects. To prevent MV-attacks, therefore, leaking characteristics such as a long duration or frequent repetition and a strong interest in prior offences should be looked for. A stronger emphasis needs to be put on indirect leaking. Finally, problems leading to an offence were more pronounced among MV-offenders. Because MV-offenders prepared the offence long before its execution, early enquiries might be able to uncover preparations. Thus, although it might be more difficult to prevent MV- than SV-attacks, it does not seem to be impossible.

To prevent MV-attacks it seems important to provide potential offenders with future prospects long term. This might mean offering ways to finish school, find a job, or gain social contact. Especially among MV-offenders, it seems crucial to prevent further negative experiences such as the loss of a job, that is, to reduce provocation in terms of the situational crime prevention approach (Clarke, 1995). Because the MV-offenders in our study obtained weapons themselves, stronger controls on the weapons trade and acquisition might be more promising in these cases (increasing the effort required to acquire weapons). Given the stronger generalized hatred of teachers, the school system, or even society as a whole among MV-offenders, there seems to be a need for long-term mental health treatment as well as long-term monitoring of these potential offenders. The great danger posed to others by these people might even warrant in-patient psychological treatment for some time.

Generally, whenever a person has attracted attention owing to leaking, further warning signs and risk factors should be investigated in a threat assessment procedure (Fein et al., 2002). It is important to note that the presence of single risk factors is not sufficient indication of a probable cause. Instead, (1) there should be a combination of several risk factors, (2) risk factors should relate to the offence (not just an interest in violent media, but a particular interest in violent media with regard to schools or rampage; not just an

interest in weapons, but an interest in weapons related to killing people), and (3) risk factors need to be accompanied by warning signs such as leaking or preparations for an offence.

It is crucial to train school staff, school psychologists, law enforcement staff and other practitioners in the identification of these warning signs and risk factors and in conducting threat assessment procedures. In recent years, there have been some promising efforts to reach this goal (Cornell and Sheras, 2006; Leuschner et al., 2011). Practitioners should be made aware of differences in warning signs and pre-attack behaviours between SV-offenders and MV-offenders in order to respond appropriately during the threat management process.

Because leaking mostly occurred outside the school context and because MV-offenders were no longer visiting the school at the time of the offence, there is a need for publicly accessible possibilities to report leaking, especially to prevent MV-attacks. There have been some promising efforts to install public hotlines in collaboration with the police or child protection agencies, where leaking and other alarming behaviour can be reported by everybody (Leuschner and Scheithauer, 2012; Payne and Elliot, 2011).

Comparison with other typologies

Taken together, our findings provide evidence for a distinction between SV-offenders and MV-offenders, lending some face validity and practical value to the typology. The distinction between SV-offenders and MV-offenders is a fundamental one. As such, it does not represent an antithesis to other propositions for typologies of school offenders.

In particular, Langman (2009a, 2013) also provides empirical evidence for his typology of psychopathic, psychotic, and traumatized school offenders. Based on the description of the three offender types, we tried to allocate the seven school offenders from our sample to the three offender types. Of the three MV-offenders, one clearly matched the psychotic group (for example, the offender was diagnosed with schizophrenia and depression and displayed evidence of emotional depletion) and one the psychopathic group (the offender showed evidence of a narcissistic personality disorder, global hatred, and a strong concern for independence). The remaining MV-offender tended towards the psychopathic group, but could not be classified unambiguously (the offender showed some narcissistic traits, but their number would not have been sufficient to diagnose narcissistic personality disorder, and there was little or no evidence of paranoia or a lack of empathy). Among the four SV-offenders, one matched the psychopathic group and one the traumatized group. The two remaining SV-offenders, however, did not fit into any category. These differences in findings might be explained by differences in the proportions of MV-offenders in the present study and in the studies by Langman (2009a, 2009b). Langman's samples almost exclusively comprised offenders who would have been classified as MV-offenders in the present study. Because our MV-offender sample was small, systematic differences within the group might have been less obvious.

Difficulties in allocating the German offenders to one of the three suggested groups and differences between the offender typologies might also reflect cultural differences between German or European offenders and US school offenders. A recent study (Bondü, 2012) reveals differences between German and other school attacks around the world.

German school attacks had higher offender suicide rates, were more often perpetrated by former students and had more teachers as victims. Conflicts with and a general hatred of teachers were a central motive in German school attacks, whereas this motive has hardly been reported by US studies. German offenders often blamed their teachers for failure in school, for a loss of friends, or for failure in life in general. A perceived failure in life might explain why a comparably large proportion of former students came back to their schools in order to kill the people they held responsible for this failure and why a large proportion of the German offenders committed suicide. These cultural differences reflect a diversity in motives for and triggers of school attacks and might point to the need for different offender typologies in different parts of the world. Further findings from this study suggest that the distinction between offenders with above-average victim numbers as compared with other offenders might be more valid than the mere intention to kill one victim or more. Because these definitions were similar among the seven German offenders studied here, we were not able to test for these differences in the present study.

A focus on multiple victim school offenders in US studies might also account for the finding that many school offenders do not fit the profile of the typical offender as often portrayed in media reports (for example, experiences of bullying, narcissistic traits, an interest in firearms prior to the offences, the offender's suicide). Considering the findings of the present study, these characteristics seem more common among MV-offenders. Because it is these offences that attract most media attention, many of them are best known worldwide. Thus, they dominate the picture of a typical offence and possibly the script for a school attack. As our study results indicate, however, it is important not to consider school attacks as a homogeneous phenomenon.

Limitations and outlook

Our study has some limitations. First, it is based on data that were collected only in retrospect. Thus, our findings are correlational and do not provide any information about causal relationships between so-called risk factors and school attacks. Furthermore, leaking behaviours in particular may have been identified only with the help of hindsight.

Secondly, case files are not primarily designed for research purposes, but serve to document police investigations. Therefore, information that is of particular interest for research is not necessarily contained in every case file. In addition, case files differ in length, completeness, and quality. Thus, missing data are a general problem in case file analyses. However, to the best of our knowledge, case files provide the most extensive and reliable database for our area of research, particularly because most offenders cannot be interviewed or were not willing to be interviewed.

Thirdly, our sample size was small. Therefore it remains to be proved whether our findings can be transferred to other offender samples. Although our sample size is small, the number of potential risk factors is large. Thus, the possibility to detect differences between the two groups of offenders by chance was exceptionally high.

Fourthly, because coding took a lot of time and because of tight time restrictions in some cases, we were not able to have case files or parts of the case files coded separately by two people. Thus, we cannot provide information on inter-rater reliability. Therefore, as in most qualitative research, coder bias might pose a problem. We tried, however, to

meet this problem by using rater training and code books, close alignment to case file contents, and the use of quantitative methods if possible. In addition, coders were not aware of the SV and MV distinction, which emerged only late in our research and after several cases had already been coded. Thus, differences between the two offender groups should not be accounted for by raters' knowledge about the differentiation of the two groups.

To account for these difficulties, our study results require replication in international comparison studies with larger samples to confirm or disconfirm our findings and to test for the transferability of our offender typologies to different cultural contexts. Larger samples would also allow for the control of dependent data in the comparisons of leakings among different offenders, for example by using Generalized Estimating Equation Models (Hanley et al., 2002). Owing to a lack of comparison studies, we limited the present study to school attacks in a narrow sense. Future studies might test whether the distinction between SV-offenders and MV-offenders can be transferred to other (school-related) violent or lethal offences such as violence by non-attenders or employees of the school, terrorist acts or gang fights (Mohandie, 2000).

Despite these limitations and the exploratory nature of our study, our findings provide new insights into school attacks and the possible distinction between single and multiple victim school offenders. We closely analysed leaking as a potentially valuable means for prevention purposes and are therefore also able to provide new insights into this phenomenon. Thus, the present study offers a good starting point for further research. It also highlights possibilities for profiting from the use of quantitative methods. Although school attacks are a comparatively recent and low-frequency phenomenon, the offences as well as their perpetrators are far from forming a homogeneous group. This knowledge should be kept in mind when describing the phenomenon of school attacks and their offenders, as well as in the design of prevention and intervention measures for school attacks.

Funding

References

Band SR and Hapold JA (1999) School violence. Lessons learned. *FBI Law Enforcement Bulletin* 68: 9–16.

Bannenberg B (2010) *Amok. Ursachen erkennen – Warnsignale verstehen – Katastrophen verhindern*. [Amok. Recognizing causes – understanding warning signs – preventing disaster]. Gütersloh: Gütersloher Verlagshaus.

Bell CL (2002) The contribution of narcissism and peer rejection to the psychological internalization process of the classroom avenger. Dissertation Abstracts International: Section B: The Sciences and Engineering.

Bondü R (2012) *School Shootings in Deutschland. Internationaler Vergleich, Warnsignale, Risikofaktoren, Entwicklungsverläufe* [School shootings in Germany. International comparison, warning signs, risk factors, developmental pathways]. Dissertation, Freie Universität

Berlin. URL (accessed 18 February 2014): http://www.diss.fu-berlin.de/diss/receive/FUDISS_thesis_000000037683.

Bondü R and Scheithauer H (2010) *Eine Generation von Trittbrettfahrern? Zu Häufigkeit und Merkmalen von Morddrohungen an Berliner Schulen*. [A generation of copycats? On frequency and characteristics of death-threats in Berlin schools]. Paper presented at the 47th Kongress der Deutschen Gesellschaft für Psychologie, 26–30 September 2010, Bremen.

Bondü R and Scheithauer H (2012) Media consumption in German school shooters. In: Muschert G and Sumiala J (eds) *School Shootings: Mediatized Violence in a Global Age*. Bingley: Emerald, 69–90.

Bondü R, Cornell DW and Scheithauer H (2011) Student homicidal violence in schools: An international problem. *New Directions for Youth Development* 129: 13–30.

Bondü R, Scheithauer H, Leuschner V and Cornell DG (2013) International perspectives on prevention and intervention in school shootings. In: Böckler N, Seeger T, Sitzer P and Heitmeyer W (eds) *School Shootings: International Research, Case Studies, and Concepts for Prevention*. New York: Springer, 343–362.

Clarke RV (1995) Situational crime prevention. *Crime and Justice* 19: 91–150.

Cornell DG and Sheras P (2006) *Guidelines for responding to student threats of violence*. Boston: Sopris West.

Fein RA, Vossekuil B, Pollack WS, Borum R, Modzeleski W and Reddy M (2002) *Threat Assessment in Schools. A Guide to Managing Threatening Situations and to Creating Safe School Climates*. Washington DC: United States Secret Service and United States Department of Education.

Ferguson CJ (2008) The school shooting/violent video game link: Causal relationship or moral panic? *Journal of Investigative Psychology and Offender Profiling* 5: 25–37.

Gollwitzer P and Sheeran P (2006) Implementation intentions and goal achievement: A meta-analysis of effects and processes. *Advances in Experimental and Social Psychology* 38: 69–119.

Hanley JA, Negassa A, Edwardes MD deB and Forrester JE (2002) Statistical analysis of correlated data using generalized estimating equations: An orientation. *American Journal of Epidemiology* 157: 364–375.

Kidd ST and Meyer CL (2002) Similarities of school shootings in rural and small town communities. *Journal of Rural Community Psychology* E5(1). URL (accessed 18 February 2014): http://www.marshall.edu/jrcp/sp2002/similarities_of_school_shootings.htm

Klein JS (2002) *High-profile School Shootings: How Violence Is Hidden in Masculinity Expectations*. Ann Arbor: ProQuest.

Langman P (2009a) *Why Kids Kill: Inside the Minds of School Shooters*. New York: Palgrave Macmillan.

Langman P (2009b) Rampage school shooters: A typology. *Aggression and Violent Behavior* 14: 79–86.

Langman P (2013) Thirty-five rampage school shooters: Trends, patterns, and typology. In: Böckler N, Seeger T, Sitzer P and Heitmeyer W (eds) *School Shootings: International Research, Case Studies, and Concepts for Prevention*. New York: Springer, 131–158.

Leary LM, Kowalski RM, Smith L and Philips S (2003) Teasing, rejection, and violence: Case studies of the school shootings. *Aggressive Behavior* 29: 202–214.

Leuschner V and Scheithauer H (2012) Wissenschaftlich begründete Prävention schwerer, zielgerichteter Schulgewalt. *Forensische Psychiatrie, Psychologie, Kriminologie* 6: 128–135.

Leuschner V, Bondü R, Schroer-Hippel M, Panno J, Neumetzler K, Fisch S, Scholl J and Scheithauer H (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.

McGee JP and DeBernardo CR (1999) The classroom avenger. *The Forensic Examiner* 8: 1–16.

Mayring P (2003) *Qualitative Inhaltsanalyse: Grundlagen und Techniken* [Qualitative content analysis: Basics and techniques]. Weinheim: Beltz.

Meloy JR and O'Toole ME (2011) The concept of leakage in threat assessment. *Behavioral Sciences and the Law* 29: 13–27.

Meloy JR, Hempel AG, Mohandie K, Shiva AA and Gray BT (2001) Offender and offense characteristics of a non-random sample of adolescent mass murderers. *Journal of the American Association of Child and Adolescent Psychiatry* 40: 719–728.

Meloy JR, Hoffmann J, Guldimann A and James D (2012) The role of warning behaviors in threat assessment: An exploration and suggested typology. *Behavioral Sciences and the Law* 30: 256–279.

Mohandie K (2000) *School Violence Threat Management*. San Diego: Specialized Training Services.

Moore MH, Petrie CV, Braga AA and McLaughlin BL (eds) (2003) *Deadly Lessons. Understanding Lethal School Violence*. Washington DC: National Academic Press.

Muschert GW (2007) Research in school shootings. *Sociology Compass* 1: 60–80.

Newman K, Fox C, Harding DJ, Mehta J and Roth W (2004) *Rampage: The Social Roots of School Shootings*. New York: Perseus Books.

O'Toole ME (1999) *The School Shooter: A Threat Assessment Perspective*. Federal Bureau of Investigation. URL (accessed 18 February 2014): http://www.accem.org/pdf/school.pdf.

Payne SR and Elliot DS (2011) Safe2Tell®: An anonymous, 24/7 reporting system for preventing school violence. *New Directions for Youth Development* 129: 103–111.

Roberts AR, Monferrari I and Yeager KR (2008) Avoiding malpractice lawsuits by following risk assessment and suicide prevention guidelines. *Brief Treatment and Crisis Intervention* 8: 5–14.

Verlinden S, Hersen M and Thomas J (2000) Risk factors in school shootings. *Clinical Psychology Review* 20: 3–56.

Vossekuil B, Fein RA, Reddy M, Borum R and 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 DC: US Secret Service and US Department of Education.