



Humanwissenschaftliche Fakultät

Rebecca Bondü | Herbert Scheithauer

Leaking and death-threats by students

A study in German schools

Suggested citation referring to the original publication:
School Psychology International 35 (2014) 6, pp. 592–608
DOI <http://dx.doi.org/10.1177/0143034314552346>
ISSN (print) 0143-0343
ISSN (online) 1461-7374

Postprint archived at the Institutional Repository of the Potsdam University in:
Postprints der Universität Potsdam
Humanwissenschaftliche Reihe ; 388
ISSN 1866-8364
<http://nbn-resolving.de/urn:nbn:de:kobv:517-opus4-404121>

Leaking and death-threats by students: A study in German schools

School Psychology International

2014, Vol. 35(6) 592–608

© The Author(s) 2014

Reprints and permissions:

sagepub.co.uk/journalsPermissions.nav

DOI: 10.1177/0143034314552346

spi.sagepub.com



Rebecca Bondü

University of Potsdam, Germany

Herbert Scheithauer

Freie Universität Berlin, Germany

Abstract

Leaking comprises observable behavior or statements that signal intentions of committing a violent offense and is considered an important warning sign for school shootings. School staff who are confronted with leaking have to assess its seriousness and react appropriately – a difficult task, because knowledge about leaking is sparse. The present study, therefore, examined how frequently leaking occurs in schools and how teachers identify leaking and respond to it. To achieve this aim, we informed teachers from eight schools in Germany about the definition of leaking and other warning signs and risk factors for school shootings in a one-hour information session. Teachers were then asked to report cases of leaking over a six- to nine-month period and to answer a questionnaire on leaking and its treatment after the information session and six to nine months later. Our results suggest that leaking is a relevant problem in German schools. Teachers mostly rated the information session positively and benefited in several aspects (e.g. reported more perceived courses of action or improved knowledge about leaking), but also expressed a constant need for support. Our findings highlight teachers' needs for further support and training and may be used in the planning of prevention measures for school shootings.

Keywords

Death-threats, leaking, prevention, school shooting, violence in schools

Corresponding author:

Rebecca Bondü, Department of Psychology, University of Potsdam, Karl-Liebknecht-Str. 24–25, 14476 Potsdam, Germany.

Email: rebecca.bondue@uni-potsdam.de

School shootings are defined as offenses by current or former students who (intend to) kill single persons or groups of persons at their school, which was purposefully chosen as the site of offense (Fein, Vossekuil, Pollack, Borum, Modzeleski, & Reddy, 2002). Such offenses are rare. For example, school shootings only happen every 6,000 school years in the United States (Borum, Cornell, Modzeleski, & Jimerson, 2010) and less than every 40,000 school years in Germany (Bondü, Cornell, Leuschner, & Scheithauer, 2013). With at least 12 offenses, to date, Germany is the state with the second highest total number of school shootings after the United States. Because many of these shootings caused high numbers of dead and wounded victims, German researchers have increasingly recognized the need for preventive measures to avoid further offenses.

Most variables discussed as risk factors for school shootings (e.g. violent media consumption, suicidal ideation, victimization bullying) are prevalent among adolescents in general and are not present in all school shooters. Thus, these factors seem too unspecific to serve as reliable predictors of the offenses. This also holds true for past violent behavior, which is generally considered the most valuable predictor for future violent behavior (Borum, 1996): Some school shooters had shown violence and aggressive behavior prior to the offenses, but others had not (Bondü, 2012; Vossekuil, Fein, Reddy, Borum, & Modzeleski, 2002). That is, well-known risk factors from other areas of (youth) violence cannot simply be generalized to school shootings. Instead, there is a need for other, specific warning signs and predictors.

Leaking or *leakage* is considered one specific and important warning sign for school shootings and was introduced in publications by the Federal Bureau of Investigation (Band & Harpold, 1999; O'Toole, 1999). According to O'Toole (1999) "[l]eakage" occurs when a student intentionally or unintentionally reveals clues to feelings, thoughts, fantasies, attitudes, and intentions that may signal an impending violent act' (p. 16). It includes signs of inner conflict; boasts that may look empty, but express serious threat; or a repeated preoccupation with violence, hopelessness, or hatred (O'Toole, 1999, p. 16).

According to this definition, leaking encompasses threats, defined as expressions of the intention to harm directly towards the intended victim. Leaking, however, is a somewhat broader concept. For example, a preoccupation with similar offenses, suicide intentions, or the possession of weapons are considered potential forms of leaking, but do conform to the definition of a threat. In addition, leaking prior to school shootings almost never took the form of direct threats toward the intended victims. Fein et al. (2002) noticed that most school shooters 'did not threaten their targets directly, but did engage in pre-attack behaviors' (p. 5), concluding that a person may pose a threat without making one. Although the authors do not use the term leaking, they mention communications by the later offenders, which revealed their intentions and plans prior to the offenses. Among 87 leakings by seven school shooters in Germany, only 8% conformed to our definition of a threat (Bondü, 2012).

Hayer, Rusch, Heubrock, and Scheithauer (2006) discriminated between direct leaking in verbal conversations, written or drawn statements, films, photographs,

or websites, and indirect leaking, such as interest in previous offenders, weapons, or violence, as well as suicidal tendencies. Bondü (2012) added that leaking needs to be (potentially) observable (to separate leaking from violent fantasies or private notations) and thematically related to the planned offense. For example, an interest in violent movies should not be judged as leaking, but only a pronounced, long-term interest in movies with a special focus on school shootings or rampage. Similarly, threats with beating up somebody would not qualify as leaking, but merely threats with murder or rampage. Detached expressions or behavior should not be interpreted as signals for an offense prematurely. Instead, repetition seems an important indicator for the seriousness of leaking (Bondü, 2012; Cornell & Sheras, 2006).

Taken together, leaking is defined as potentially observable thematically specific statements, behaviour patterns, or acts prior to an offense, by which a person might reveal fantasies, thoughts, ideas, intentions, or plans for an offense (Bondü, 2010, p. 47). Whether a behavior was leaking in the sense of a preceding signal for an offense can only be determined post hoc. If a person has come to attention due to leaking, further risk factors for school shootings need to be explored (Bondü et al., 2011) in a threat assessment procedure (Cornell & Sheras, 2006; Cornell, Sheras, Greogry & Fan, 2009; Fein et al., 2002; Leuschner et al., 2011) to confirm or invalidate an initial suspicion that a person might be planning an attack.

Although there has been some theoretical preoccupation with leaking (Hoffmann & Roshdi, 2013; Meloy, Hoffman, Guldimann, & James, 2012; Meloy & O'Toole, 2011), empirical research on its characteristics and potential assessment criteria is sparse. However, retrospective studies of school shootings have confirmed the presence of leaking prior to every offense (Bondü, 2010; Moore, Petrie, Braga, & McLaughlin, 2003; Newman, Fox, Harding, Mehta, & Roth, 2004; Vossekuil et al., 2002). Mostly, leaking occurred in verbal communications, was repeated over long periods of time (months and years; Bondü, 2012), and was observed by several persons (Verlinden, Hersen, & Thomas, 2000). Some offenders mentioned the intended victims and day of attack and showed their weapons to other students, whereas others did not mention any details. In sum, leaking is considered a valuable 'warning sign' for menacing offenses and may serve preventive purposes.

Little is known about the exact frequency of leaking and threats at schools, because official crime reports do not display such incidents specifically and because not every leaking is a criminal act or gets reported. However, this information is important to determine the rate of how often leaking results in an offense. Some US studies investigated the frequency of threats in schools. Cornell et al. (2004) report 188 threats in 37 US schools during one year. Ryan-Arredondo et al. (2001) found 202 threats among 160,000 students over a similar period of time. It remains unclear whether these findings can be transferred to other countries and to leaking, because there are no comparable studies on the frequency of leaking. Thus, we conducted a study on the frequency of leaking at around 900 schools in Berlin, Germany, by analysing schools' reports to the responsible school authority about

students' criminal or other conspicuous behaviors. We identified 429 leakings in the 11-year period between 1996/1997 and 2006/2007 (Bondü, Leuschner, Lippok, Scholl, & Scheithauer, in press). Thus, leaking and threats at schools seem not exceptional, but comparably infrequent. It remains unknown, however, how often leaking can be observed in a random sample of children and adolescents and how complete schools' reports about leaking are. Therefore, the exact frequency of leaking and threats with homicidal violence in German schools is still in question.

The lack of knowledge on this topic extends to the appropriate assessment and treatment of leaking as well. Beyond peers, it is primarily teachers and other school personnel who observe leaking, need to assess its seriousness, and react appropriately. This poses great demands on school staff, because at present, there are no reliable guidelines for identifying and assessing the seriousness of leaking and no instructions for appropriate reactions and interventions. Several German Federal States have administered emergency plans to schools (e.g. Senatsverwaltung für Bildung, Jugend und Sport Berlin, 2005) that contain guidelines for the appropriate handling of violent incidents at school, comprising school shootings and threats with murder or rampage. However, such guidelines are often not well remembered (Graham, Shirm, Liggin, Aitken, & Dick, 2006). Also, some plans provide only insufficient information about leaking or its proper assessment. Consequently, we do not know whether leaking as a concept is known by teachers and how they respond to it.

Accordingly, the aims of the present study were: 1. To test the effectiveness of a short-term intervention for teachers, which informs them about leaking and risk factors for school shootings and gives advice for the identification and response to leaking; 2. To explore teachers' knowledge about and reactions to leaking, their competencies for handling leaking, and their requirements for help; 3. To identify the frequency of leaking observed by teachers in Berlin, Germany; 4. To elaborate, which forms of leaking can be distinguished. We also examined whether individual differences between teachers on our outcome measures could be explained by age, years of experience as a teacher, gender, or previous encounters with leaking. Thus, our study aimed to extend the knowledge about leaking in general and about its frequency and handling in German schools in particular.

Method

Participants

We invited 56 schools to participate in the study in writing and via telephone in fall 2007 and winter 2007/2008. A non-representative sample of eight schools (one elementary, one special, two grammar, two secondary modern, and two professional schools) from districts with different socio-economic backgrounds participated. At each school, we organized a 60-minute information session. All teachers were invited to take part in this information session and to answer a first

questionnaire afterwards. In total, 239 teachers (16–45 per school) answered this questionnaire (pre-test, t1); six to nine months after the information session, all teachers from the participating schools were asked to answer a second questionnaire. In total, 166 teachers (14–37 per school) answered this questionnaire (post-test, t2). The second questionnaire was sent to schools by mail. In total, 81 teachers answered both questionnaires (pre–post-comparison, 3–16 teachers per school). This group had a mean age of 47 years ($SD = 8.04$, range: 33–65 years) and an average of 19 years of experience as a teacher ($SD = 9.65$, range: 2–36 years) and included 63% females.

Procedure

The intervention included an approximately 60-minute information session for teachers (the exact duration varied depending on the number of questions for example). We presented information on and descriptions of leaking, examples for leaking, as well as information about risk factors for school shootings in an oral presentation accompanied by slides (four presenters involved: two covering three schools, two covering one school). Teachers were provided with information on whom to contact in cases of emergency and advised to use the emergency plans (Senatsverwaltung für Bildung, Jugend und Sport Berlin, 2005), which had been distributed to every school in Berlin in 2005. Teachers were asked to report leaking-incidents at their schools during the following six to nine months (depending on when the information session took place) to the staff of the Berlin Leaking-Project. To this aim, teachers were provided with a standardized questionnaire including questions on details and treatment of the leaking-incident and the student's risk factors. We explained in detail, how to report leaking and to safeguard anonymity (e.g. by not naming students). Teachers were informed that the study and its contents had been approved by the Data Protection Commissioner of Berlin and the Ministry of Education, Science, and Research Berlin.

Teachers were instructed to name a 'leaking-appointee' at their school. The leaking-appointee was to serve as a central contact person for the members of the teaching staff who had witnessed leaking and as an assembly point for information on leaking from different sources. Following the information session, the leaking-appointee and the head of school were provided with hand-outs containing a summary of all information, leaflets with information about the Berlin Leaking-Project, and questionnaires to report leaking.

Teachers were asked to answer a self-constructed, standardized questionnaire (t1; 32 questions) comprising person-related data (age, sex, number of years as a teacher), feedback regarding the information session ('I have learned something new during the information session', 'I think the idea to name a leaking-appointee is...'), the frequency of leaking at the school, previous knowledge about leaking ('I have known the concept of leaking before') and about how to act in leaking situations ('The contents of the emergency plans are known to me', 'I [would] know what to do in such cases'), confidence in one's decisions and actions in real or

imagined confrontations with leaking ('When confronted with such situations in everyday life at school I feel overstrained', 'I feel confident in judging the seriousness of threats') and need for further support ('I wish for a closer cooperation with the police'), (potential) reactions to leaking ('I spoke about the incident with the student') as well as expectations and concerns ('I am concerned to report leaking, as my colleagues would not understand it and I would have to justify myself'). At the end of the reporting period of six to nine months, teachers were asked to answer the same questions again (t2; 28 questions; e.g. excluding items that referred to the information session at t1). Response options mostly ranged from 1 – not at all/very little/very bad to 5 – exactly/very much/very good) or were dichotomous (yes/no). Because we report results for single items, we did not compute internal consistencies.

Results

We report frequencies separately for the pre- and post-test including all teachers who answered the pre- and post-questionnaire respectively. Pre-post comparisons only include the 81 persons who answered the pre- and post-questionnaire. We used dependent *t*-tests to test differences in continuous data if the sample was larger than $N=30$, and the McNemar-Test for smaller samples (Eid, Gollwitzer, & Schmitt, 2009). For dichotomous data we used χ^2 -tests. We report Cohen's *d* and Odds Ratios (OR) as effect sizes. Due to multiple comparisons of the same sample and danger of Type 1 error inflation, we considered Bonferroni correction of the *p*-value. Whenever a result was not significant after Bonferroni correction, we point this out in the following description of our results.

The subsample of teachers who answered both questionnaires pre–post differed from teachers who merely answered the t1 questionnaire in gender distribution only. In the subsample, women were over-represented ($\chi^2=4.58$, $p=0.032$, OR = 1.83 [1.05; 3.19]). The subsample of teachers who answered both questionnaires pre–post differed from teachers who merely answered the t2 questionnaire (and who can be assumed to mostly not have attended the information session) in several aspects. Again, women were over-represented in the group of teachers who had answered both questionnaires ($\chi^2=4.48$, $p=0.034$, OR = 1.99 [1.05; 3.76]). These participants also reported a better knowledge about which incidents to report during the reporting period (only t2 questionnaire: $M=3.02$, $SD=1.38$; both questionnaires: $M=3.44$, $SD=1.17$; $t_{(161)}=2.06$, $p=0.041$, $d=0.33$ [0.14; 0.53]) and how to report them (only t2 questionnaire: $M=2.99$, $SD=1.37$; both questionnaires: $M=3.42$, $SD=1.01$; $t_{(162)}=2.31$, $p=0.023$, $d=0.36$ [0.18; 0.54]), as well as about how to respond in cases of leaking (only t2 questionnaire: $M=2.90$, $SD=1.36$; both questionnaires: $M=3.38$, $SD=1.04$; $t_{(161)}=2.53$, $p=0.012$, $d=0.40$ [0.21; 0.58]). They also reported to be more likely to inform the head of the school ($\chi^2=4.42$, $p=0.035$, OR = 2.15 [1.05; 4.42]) and the student's parents ($\chi^2=4.48$, $p=0.034$, OR = 2.33 [1.13; 4.81]) as well as to have less concerns about reporting the student to the project due to fear of stigmatizing the

student (only t2 questionnaire: $M=4.51$, $SD=0.76$; both questionnaires: $M=4.19$, $SD=0.97$; $t_{(156)}=2.31$, $p=0.022$, $d=0.37$ [0.24; 0.51]). Unexpectedly, participants who had only answered the second questionnaire reported to better know what leaking is than those who had answered both questionnaires (only t2 questionnaire: $M=1.32$, $SD=0.47$; both questionnaires: $M=1.16$, $SD=0.37$; $t_{(156)}=2.39$, $p=0.019$, $d=0.38$ [0.32; 0.45]). Note that due to multiple comparisons none of these differences would have reached significance when accounting for Bonferroni-correction.

Feedback regarding the information session

Overall, teachers rated the information session positively: 75% ($N=177$) described its duration as *optimal*, 61% ($N=144$) rated the given examples for leaking as good or very good, and 66% ($N=156$) claimed to have learned at least something new (t1).

Prior knowledge

At t1, 56% of the 239 teachers reported to have known the concept 'leaking' before. At t2, 76% out of 166 teachers reported to exactly know what leaking is. Of the 81 teachers who had answered both questionnaires pre–post, 84% reported to *exactly* know what leaking is at t2 (no pre–post comparison; see Table 1 for an overview).

Table 1. Pre–post-comparison data for participants who answered both questionnaires.

Item/scale	t1 M (SD)	t2 M (SD)	t (χ^2)	p	d (OR)
Existence emergency plans			(11.04)	<0.001	(13.1)
Contents emergency plans	1.96 (1.19)	2.65 (1.14)	5.39	<0.001	0.59
Whom to contact	3.38 (1.30)	3.65 (1.06)	-1.72	0.090	-
Confidence assessment leaking	3.15 (0.81)	3.30 (0.91)	-1.38	0.170	-
Feeling overstrained	2.85 (0.88)	2.58 (0.87)	2.47	0.016	0.30
Wish for further help	4.24 (0.82)	4.10 (0.79)	1.39	0.167	-
Cooperation police	3.74 (0.79)	3.75 (0.93)	-0.12	0.910	-
Cooperation school psychology	4.06 (0.87)	4.03 (0.87)	0.34	0.735	-
Concern stigmatization students	4.23 (0.89)	4.18 (0.97)	0.32	0.700	-
Concern parents' reactions	4.39 (0.83)	4.32 (0.83)	0.31	0.591	-
Concern colleagues' reactions	4.76 (0.51)	4.54 (0.78)	2.03	0.046	0.33
Judgment procedure	2.26 (0.83)	2.82 (0.87)	-3.51	0.001	0.66
Approval leaking-appointee	2.45 (0.97)	3.57 (1.09)	-5.52	<0.001	1.08

At t1, 31% ($N=72$) of the teachers knew about the existence of the emergency plans. At t2, this proportion was 54%. Teachers who answered both questionnaires showed a significant increase in knowledge about the existence of the emergency plans ($\chi^2=14.26$, $p<0.001$, $OR=13.1$ [2.76; 62.20]; t1: 27%; t2: 54%).

Teachers also rated their knowledge of the contents of the emergency plans on a five-point scale. At t1, 54% and at t2, 25% of the teachers reported to know the contents not at all. There was a significant increase for teachers who had answered both questionnaires pre–post (t1: $M=1.96$, $SD=1.19$; t2: $M=2.65$, $SD=1.14$; $t_{(78)}=5.39$, $p<0.001$, $d=0.59$ [0.42; 0.78]).

At t1, 54% of the teachers reported to know quite well or exactly whom to contact in cases of leaking. Forty-three percent reported to know quite well or exactly how to react in this case. There were no significant differences pre–post. Only the subgroup of teachers who had noticed at least one leaking-incident during the reporting period reported a significant increase in knowledge about whom to contact in cases of leaking (McNemar-Test: $Mdn_{t1}=3$, $Mdn_{t2}=4$, $Z=-2.80$, $p<0.01$, $r=0.63$, $N=20$).

Confidence in decisions and actions

At t1, 36% ($N=84$) of the teachers reported feeling very or quite confident in assessing the seriousness of leaking, 44% ($N=72$) did so at t2. There were no significant differences pre–post.

At t1, 76% of the teachers reported to feel at least a little overstrained when confronted with leaking. Seventy-eight percent did so at t2. Teachers who answered both questionnaires pre–post felt significantly less overstrained at t2 (t1: $M=2.85$, $SD=0.88$; t2: $M=2.58$, $SD=0.87$; $t_{(78)}=2.47$, $p=0.016$, $d=0.30$ [0.18; 0.45]; not significant after Bonferroni-correction).

Teachers expressed a strong wish for help: At t1, 81% ($N=190$) and t2, 78% ($N=128$) claimed to quite or very much want further help. They also expressed a constant wish for closer cooperation with the police (quite or very much: t1: 59%, t2: 57%) and with school psychologists (quite or very much: t1: 73%, t2: 71%). Analyses revealed no significant pre–post differences.

Perceived courses of action

Teachers who had answered questionnaires pre–post reported an increase in the number of perceived or actually used options for reactions to leaking (e.g. inform parents, inform the police, consider approaches described in the emergency plans), some of which reached significance (talk about the incident with the whole class, inform the school authority). At t2, teachers who had answered both questionnaires pre–post indicated that in cases of leaking, they would or had contacted the police (t1: $M=0.14$, $SD=0.35$; t2: $M=0.31$, $SD=0.97$; $t_{(41)}=2.01$, $p=0.051$, $d=0.24$ [0.08; 0.39]) and would or had followed the proceedings suggested by the emergency plans more often (t1: $M=0.07$, $SD=0.26$; t2: $M=0.28$,

SD = 0.45; $t_{(42)} = 2.67$, $p = 0.011$, $d = 0.58$ [0.50; 0.66]) than at t1. However, due to small sample size, these data require replication.

Concerns

Teachers expressed little concern about the stigmatization of students by (anonymously) reporting leaking to the Berlin Leaking-Project at t1 (no or hardly any concern: 79%, $N = 184$) and t2 (83%, $N = 131$). They also expressed little concern about parents' reactions (no or hardly any concern: 85%, $N = 196$ at t1 and 86%, $N = 136$ at t2) or colleagues' reactions (no or hardly any concern: 93%, $N = 217$ at t1 and 89%, $N = 141$ at t2). Concerns about colleagues' reactions showed a slight, but significant decrease for teachers who answered both questionnaires pre-post (t1: $M = 4.76$, $SD = 0.51$; t2: $M = 4.54$, $SD = 0.78$; $t_{(78)} = 2.03$, $p < 0.046$, $d = 0.33$ [0.23; 0.44]; five-point-scale with 1 very to 5 not at all; not significant after Bonferroni-correction).

At t2, 52% of the teachers rated the reporting procedure as very or quite bad. At t2, 13% of the teachers evaluated the reporting procedure as very or quite bad. Around three-quarters now rated the procedure as partly good and partly bad. Among the teachers who had answered both questionnaires, there was a significant increase in the judgement of the procedure (t1: $M = 2.26$, $SD = 0.83$; t2: $M = 2.82$, $SD = 0.87$; $t_{(33)} = -3.51$, $p = 0.001$, $d = 0.66$ [0.47; 0.87]).

Leaking-appointee

At t1, 49% ($N = 112$) of the teachers judged naming a leaking-appointee as a very or quite bad idea. Only 11% ($N = 25$) thought this to be a quite or very good idea. This pattern had changed considerably at t2: 55% ($N = 87$) of the teachers now stated they would welcome a leaking-appointee at their school quite or very much, only 15% ($N = 24$) hardly or not at all. Within the group of teachers who answered both questionnaires pre-post, there was a strong and significant increase in the approval of a leaking-appointee (t1: $M = 2.45$, $SD = 0.97$; t2: $M = 3.57$, $SD = 1.09$; $t_{78} = -5.52$, $p < 0.001$, $d = 1.09$ [0.93; 1.25]; five-point-scale with 1 very bad to 5 very good).

Teachers' individual differences

Women reported significantly higher feelings of excessive demands (women: $M = 2.91$, $SD = 1.00$; men: $M = 2.53$, $SD = 0.81$; $t_{(228)} = 3.17$, $p = 0.002$, $d = 0.42$ [0.30; 0.54]), desire for further help in general (women: $M = 4.30$, $SD = 0.89$; men: $M = 4.06$, $SD = 0.87$; $t_{(226)} = 2.04$, $p = 0.042$, $d = 0.27$ [0.16; 0.39]), and further help from school psychologists in particular (women: $M = 4.24$, $SD = 0.89$; men: $M = 3.94$, $SD = 0.99$; $t_{(226)} = 2.36$, $p = 0.019$, $d = 0.32$ [0.20; 0.44]). Of the three differences only the first was significant after Bonferroni-correction.

Persons who had witnessed leaking prior to the information session, knew leaking more frequently ($\chi^2 = 4.31$, $p \leq 0.038$, OR = 1.8 [1.03; 3.13]) and knew better

what to do in cases of leaking at t1 (known before: $M=3.40$, $SD=1.01$; not known: $M=3.01$, $SD=1.23$; $t_{(231)}=2.42$, $p \leq 0.05$, $d=0.34$ [0.19; 0.47]). However, both these differences were not significant after Bonferroni-correction.

Older teachers (more than 1 SD older than the average) had observed less leaking than the others ($\chi^2=6.22$, $p \leq 0.05$). The youngest group (more than 1 SD younger than the average) knew significantly better, which leaking incidents to report ($F_{(2, 222)}=3.83$, $p \leq 0.05$). Again, however, both differences were not significant after Bonferroni-correction.

Frequency of leaking

During the reporting period, three leaking-incidents were reported to the research team, including two verbal statements and one painting. The painting showed a burning school building and a student driving away on a nail-trimmed motorcycle. One student verbalized the need for a terrorist attack at the school in front of a teacher and the third one was overheard by a teacher when saying that he was looking for a good place to lodge explosives when studying the ground plan of the school building. Thus, one of the three reported leakings can be considered a threat. All three students showed further risk factors.

Forty (31%) teachers from all schools recalled at least one leaking-incident (20 persons indicated they remembered one incident, 11 persons two incidents, eight persons three incidents, and one person four incidents) during the reporting period. Thus, the number of officially reported leaking-incidents apparently underestimates the real frequency.

Discussion

In the present study we collected data on the frequency, forms, and handling of leaking at German schools.

Knowledge about leaking and effects of the intervention

Teachers generally judged the information session positively. Most importantly, two thirds reported that they learned at least something new in the information session. Some teachers already knew the leaking concept, but the majority did not. Of the teachers who answered both questionnaires pre–post, three-quarters reported knowing exactly what leaking is at second measurement. Indeed, the three reported incidents conformed to our definition and were good examples of leaking.

Our findings indicate that teachers have some, but not sufficient knowledge about leaking. Thus, teachers need to be informed about leaking, its identification, and potential forms of reactions large scale. Apparently, the concept of leaking may be conveyed to teachers with little effort. Merely handing out guidelines such as emergency plans, however, is not sufficient to reach this goal. In line with previous research (Graham et al., 2006), the teachers in our study often were not even

aware of the existence of these plans and hardly knew their contents. That is, teachers need to be made aware of such guidelines, be thoroughly introduced to them, and be trained to use them. This reasoning is further supported by the fact that even after our information session and despite a significant increase in the knowledge about the contents of the emergency plans pre-post, the absolute knowledge about these contents was still rather low ($M=2.65$ on a five-point scale ranging from 1–5). Comprehensible examples are required to achieve the intended effects. Finally, research has shown that individual school-internal processes should be considered and leveraged in these training sessions (Leuschner et al., 2011).

Teachers' information about leaking and potential responses is also necessary, because a lack of knowledge causes feelings of insecurity. However, teachers evidently even profit from short interventions. We found an increase in the knowledge about leaking, some of the possible responses to leaking, and the emergency plans. The information session apparently encouraged some teachers (especially those who noticed leaking and had to react to it during the reporting period) to seek out further information themselves. We were also able to reduce feelings of excessive demands in teachers who had answered both questionnaires. Furthermore, after initial scepticism, teachers approved of a leaking-appointee at second measurement and expressed hardly any concerns about the study's proceedings.

These findings are also supported by the differences we observed between those participants who had answered both questionnaires pre-post and those who had only answered the second questionnaire and, therefore, mostly probably not attended the information session. These findings indicated a better knowledge about what to do in cases of leaking, how to report leaking, what to report, a stronger sharing of information about leaking with the head of school and the students' parents, as well as less concerns regarding a cooperation with our project. Unexpectedly, however, teachers who only answered the second questionnaire, estimated their exact knowledge about the definition of leaking higher than the participants who had answered both questionnaires. This may indicate that teachers who had attended the information session and had been informed about direct and indirect forms of leaking as well as its differences to threats are more aware about the diversity of leaking than teachers who did not attend the information session.

We did not, however, observe changes on all outcome measures and our data suggested still existing drawbacks after the intervention: Many teachers still reported to not feel at ease with assessing the seriousness of leaking and to not know how to react properly. They also expressed a constant need for support and cooperation with the police and school psychologists. This suggests that teachers should not be left alone with the difficult task of assessing and reacting to leaking. Instead, decisions should always be made in interdisciplinary threat assessment teams which should be installed in all schools (Bondü, 2012; Leuschner et al., 2011). Therefore, school psychologists and police officers should be trained in the identification of and the assessment of the seriousness of leaking as well and should be integrated into the school threat assessment team. Furthermore,

cooperations with other institutions should be established and emergency plans should be introduced in more detail to all involved parties (Bondü, Cornell, Leuschner, & Scheithauer, 2013; Brock et al., 2009; Brock & Jimerson, 2012; Cornell & Sheras, 2006; Hoffmann & Roshdi, 2013; Leuschner et al., 2011).

Finally, there were hardly any differences in our findings depending on teachers' age, gender, years of experience as a teacher, or prior experiences with leaking after Bonferroni-correction. Thus, our findings seemingly are not based on individual differences between teachers, but on a general lack of information on leaking.

Frequency of leaking

The three reported leaking incidents indicate that leaking may be observed and is a relevant phenomenon in German schools. Our findings also suggest leaking to be infrequent. However, because teachers reported to have witnessed considerably more leaking incidents than were reported, our findings apparently underestimate the frequency of leaking.

Although we do know how many teachers reported to have witnessed at least one leaking incident during the reporting period, we cannot quantify the exact discrepancy between the remembered and the reported number of leakings for several reasons: First, teachers may have recalled leaking incidents that had already happened prior to the reporting period. Second, more than one teacher may have remembered one of the reported leakings. Third, two or more teachers may have witnessed the same non-reported leaking.

The discrepancy between the numbers of reported and remembered leakings during the reporting period raises the question why teachers did not report all incidents. There are several explanations for this finding. First, although teachers expressed little concerns about stigmatizing students or others' reactions at t1, they rated the reporting procedure negatively at t1 and only somewhat better at t2. Thus, teachers may have been concerned about the anonymity of the reporting procedure nonetheless. The finding may also signal that the reporting procedure was perceived as too complicated or that the reporting sheet was too detailed. Second, many schools and teachers declined from participating in our study due to time restrictions. Thus, a lack of time might also explain the lack of reports. Third, because not all teachers who answered the second questionnaire visited the information session, some of them may not have been familiar with the reporting procedure. Fourth, we may not have succeeded in convincing teachers of the importance to report every leaking. In this case, a more thorough training session, the presentation of further examples for leaking, or a clearer outline of our study's intentions might have been useful. Finally, most leakings occur within the peer group (Bondü, 2012). Thus, teachers may not be aware of all leakings unless they are reported to them by other students.

As suggested by previous research (Bondü et al., in press), leaking in schools is more often noticed than officially reported. For example, none of the three

reported leaking-incidents was reported to the police. That is, although teachers feel overstrained and although they wish for closer cooperation with other professions, the assessment of and the response to leaking often remains within the school system. This might signal a fear of causeless stigmatizing of a student or distrust in the further proceedings by the police. Therefore, it seems pivotal to train teachers to be able to make reliable judgements of leaking. Our study was a first step towards this goal. In a second step, tighter networks between schools, the local police, and school psychologists should be initiated (Leuschner et al., 2011). Our results suggest that schools need help to take this step.

In line with previous research (Bondü et al., in press), the number of leakings in schools seems manageable, even if not only the reported, but also the remembered leakings are taken into account. This should enable schools to react to every leaking individually and to investigate further risk factors for school shootings or evidence for other forms of negative development (e.g. school failure, mental problems, problems within the family) in a threat assessment procedure. This procedure, however, requires further training of the school staff.

Forms of leaking

In line with previous findings (Bondü, 2012), only one of the three reported leaking-incidents conformed to our definition of a threat. This lends support to the notion that leaking and threats cannot be considered to be equal. However, leaking in form of threats is probably easier to detect and assessed as more seriously by teachers than other forms of leaking. If other forms of leaking are harder to detect, this might also explain the small number of reported leakings.

Outlook and limitations

Our study provided new insights into leaking as well as its identification and treatment in schools. To the best of our knowledge, there is no comparable study on leaking at present. Furthermore, by explicitly focussing on leaking instead of threats, our study differs from previous research in the United States and covers a broader range of potentially relevant behaviors and statements. Finally, our study is a further step to extend the research on school shootings and their risk factors and warning signs to other countries than the United States. Future international comparison studies may investigate whether our findings can be transferred to other countries or whether differences in school systems lead to diverging results.

Our study also has some limitations, which need to be discussed and should be addressed by future studies. For example, the present study comprises a non-representative sample of schools. Due to the high drop-out rate from t1 to t2, there was only a sample of 81 participating teachers for pre–post comparisons. Future studies should strive to keep their attrition rate small, for example by visiting schools a second time instead of sending the t2-questionnaire by mail.

However, despite the high attrition rate, the pre–post-comparison group differed from teachers who merely answered the t1-questionnaire in gender only. In addition, our small sample may have actually prevented the identification of further effects due to low statistical power. Thus, our findings require replication in larger samples.

Because we did not employ a control group, we cannot reason without doubt that the observed pre–post-changes in teachers who answered both questionnaires were only due to our intervention. There may have been other influencing factors which we did not control for. Thus, future studies should employ a control group. These studies might also consider controlling for further factors that might influence the identification of and responding to leaking such as prior experiences with violence at the school or the general level of anxiety among teachers.

Finally, we asked for previous knowledge about leaking retrospectively after the information session, instead of assessing this knowledge prior to the information session. We chose this approach for several reasons: (1) We wanted to evaluate the contents, duration, and comprehensibility of the information session which was only possible after the session; (2) we were not sure whether leaking as a scientific term would be known to all teachers although they well might have encountered the phenomenon. Furthermore, it seemed important to clarify that leaking comprises more behaviors than threats. Asking about leaking and its treatment before giving a proper definition of the term, therefore, might have contorted the data; (3) finally, we did not want to overstrain the teachers by issuing three questionnaires especially as schools had already expressed concerns about the time required for the information session. Thus, our baseline data may have been influenced by the contents of the information session. This information, however, supposedly worked to blur pre–post-differences rather than the opposite. Consequently, our testing seemed rather conservative. Similarly, we asked for the teachers' subjective knowledge, instead of testing their actual knowledge. Consequently, social desirability may have influenced our data. Again, however, this should have influenced teachers' answers at both points of measurement.

Despite these limitations, our study provides an important basis for further research. Our findings indicate that leaking is a relevant problem in German schools and that teachers can learn how to identify and respond to leaking. Hence, scientifically based information sessions as reported in our study should be developed further and be evaluated in large samples. Thus, our results add to the improvement of the future identification of and responding to leaking in schools as an important warning sign for school shootings.

Acknowledgements

This research was supported by the Senatsverwaltung für Bildung, Wissenschaft und Forschung, Berlin, Germany. It is part of the Berlin Leaking-Project, funded by the Stiftung Deutsche Klassenlotterie, Berlin, Germany.

References

- Band, S. R., & Harpold, J. A. (1999). School violence. Lessons learned. *FBI Law Enforcement Bulletin*, 68, 9–16.
- Bondü, R. (2012). *School shootings in Deutschland. Internationaler vergleich, warnsignale, risikofaktoren, entwicklungsverläufe [School shootings in Germany. International comparison, warning signs, risk factors, courses of development]*. Berlin: Freie Universität Berlin. Retrieved from: [http://www.diss.fu-berlin.de/diss/servlets/MCRFileNodeServlet/FUDISS_derivate_000000011902/Bondue_Dissertation_SchoolShootings_vollstaendig_fin.pdf?jsessionid=B1FDE7E62594A335D9875D1DBBEEB701?hosts=.](http://www.diss.fu-berlin.de/diss/servlets/MCRFileNodeServlet/FUDISS_derivate_000000011902/Bondue_Dissertation_SchoolShootings_vollstaendig_fin.pdf?jsessionid=B1FDE7E62594A335D9875D1DBBEEB701?hosts=)
- Bondü, R., Cornell, D. G., Leuschner, V., & Scheithauer, H. (2013). International perspectives on prevention and intervention in school shootings. In N. Böckler, T. Seeger, P. Sitzer, & W. Heitmeyer (Eds.), *School shootings. International research, case studies, and concepts for prevention* (pp. 343–362). New York, NY: Springer.
- Bondü, R., Cornell, D. G., & 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. (in press). Leakingphänomene und ankündigungen von gewalt – nutzen für die prävention von schwerer, zielgerichteter gewalt an schulen. Befunde aus dem Berliner Leaking-Projekt und dem Projekt NETWASS. [Leaking-phenomena and announcements of violence – use for the 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.
- Borum, R. (1996). Improving the clinical practice of violence risk assessment. Technologies, guidelines, and training. *American Psychologist*, 51, 945–956. doi: 10.1037/0003-066X.51.9.945.
- 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.
- Brock, S. E., & Jimerson, S. R. (2012). *Best practices in school crisis prevention and intervention*, 2nd ed Bethesda, MD: National Association of School Psychologists.
- Brock, S. E., Nickerson, A. B., Reeves, M. A., Jimerson, S. R., Lieberman, R. A., & Feinberg, T. A. (2009). *School crisis prevention and intervention. The PREPaRE Model*. Bethesda, MD: National Association of School Psychologists.
- Cornell, D. G., & Sheras, P. (2006). *Guidelines for responding to student threats of violence*. Boston, MA: Sopris West.
- Cornell, D. G., Sheras, P. L., 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. doi: 10.1037/a0016182.
- Cornell, D. G., Sheras, P. L., Kaplan, S., McConville, D., Posey, J., & Levy-Elkon, A., et al. (2004). Guidelines for student threat assessment: Field-test findings. *School Psychology Review* 33, 527–546.
- Eid, M., Gollwitzer, M., & Schmitt, M. (2009). *Statistik und forschungsmethoden [Statistics and research methods]*. Weinheim: Beltz.
- 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 to creating*

- safe school climates*. Washington DC: United States Secret Service and United States Department of Education. Retrieved March 7? 2012 from http://www.secretservice.gov/ntac/ssi_guide.pdf.
- Graham, J., Shirm, S., Liggin, R., Aitken, M. E., & Dick, R. (2006). Mass-casualty events at schools: A national preparedness survey. *Pediatrics, 117*, 8–15. doi: 10.1542/peds.2005-0927.
- Hayer, T., Rusch, S., Heubrock, D., & Scheithauer, H. (2006). schulbezogene prävention von waffengewalt: das project, 'waffenfreies Bremen – ein zeichen gegen gewalt' [School-related prevention of violence with weapons: The project 'Bremen free of weapons – a mark against violence']. *Empirische Pädagogik, 20*, 135–152.
- Hoffmann, J., & Roshdi, C. (2013). School shootings in Germany: Research, prevention through risk assessment and threat management. In N. Böckler, T. Seeger, P. Sitzer, & W. Heitmeyer (Eds.), *School shootings. International research, case studies, and concepts for prevention* (pp. 363–378). New York, NY: Springer.
- Leuschner, V., Bondü, R., Schroer-Hippel, M., Panno, J., Neumetzler, K., Fisch, S., Scholl, J., ... Scheithauer, H. (2011). Prevention of homicidal student violence 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.387.
- Meloy, J. R., Hoffmann, J., Guldemann, A., & James, D. (2012). The role of warning behaviors in threat assessment: An exploration and suggested typology. *Behavioral Sciences and the Law, 30*, 256–279. doi: 10.1002/bsl.999.
- Meloy, J. R., & O'Toole, M. E. (2011). The concept of leakage in threat assessment. *Behavioral Sciences and the Law, 29*, 513–527. doi: 10.1002/bsl.986.
- Moore, M. H., Petrie, C. V., Braga, A. A., & McLaughlin, B. L. (Eds.) (2003). *Deadly lessons. Understanding lethal school violence*. Washington, DC: National Academic Press.
- Newman, K. S., Fox, C., Harding, D. J., Mehta, J., & Roth, W. (2004). *Rampage: The social roots of school shootings*. New York, NY: Basic Books.
- O'Toole, M. E. (1999). *The school shooter: A threat assessment perspective*. Federal Bureau of Investigation. Retrieved April 11, 2010, from <http://www.acem.org/pdf/school.pdf>.
- Ryan-Arredondo, K., Renouf, K. L., Egyed, C., Doxey, M., Dobbins, M., Sanchez, S., ... Rakowitz, B. (2001). Threats of violence in schools: The Dallas independent school district's response. *Psychology in the Schools, 38*, 185–196. doi: 10.1002/pits.1009.
- Senatsverwaltung für Bildung, Jugend und Sport Berlin (Hrsg.). (2005). *Notfallpläne für die Berliner Schulen. Hinsehen und Handeln. [Emergency plans for Berlin schools]*. Berlin: Senatsverwaltung für Bildung, Jugend und Sport.
- Verlinden, S., Hersen, M., & Thomas, J. (2000). Risk factors in school shootings. *Clinical Psychology Review, 20*, 3–56. doi: 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, DC: US Secret Service and US Department of Education.

Author biographies

Rebecca Bondü is a research assistant at the University of Potsdam and does research on risk factors for externalizing and internalizing problem behavior.

Herbert Scheithauer is Professor for Developmental and Clinical Psychology at Freie Universität Berlin and Head of the Division “Developmental Science and Applied Developmental Psychology”.