IMPACT OF SCHOOL CONTEXT ON VIOLENCE AT SCHOOLS
A MULTI-LEVEL ANALYSIS

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ABSTRACT

The research of violence at schools has focused predominantly on social characteristics of the individual students as potential causes for the occurrence of violence. In this paper we will extent this approach by means of including contextual variables on the level of the class, the school and the municipality where the school resides into a multi-level model. It will be demonstrated that the context variables shall be considered in a comprehensive explanation of violence at schools.

KEY WORDS

Violence at schools; Multi-level analysis; Context variables; Germany.

INTRODUCTION AND RESEARCH QUESTION

In many European countries as well as in other countries around the world, violence at school has received quit a lot of attention in the scientific communities as well as in the public discourses and crime prevention plans (Elliot et al. 1998; Debarbieux & Blaya, 2001; Smith, 2003). This interest in violence at schools is driven by the general wisdom whereupon juvenile crime and deviant behavior is accelerating or at least remains on inadequate high levels in modern societies. If schools as key socialization agencies are no longer perceived as shelters of good manners, human values and civic conflict solving strategies, but instead are prone to violence and deviant behavior one would fear that children and juveniles are raised in an environment characterized by deviant norms where they adapt to violent habits and patterns of deviant behavior that might consolidate and intensify over time which in turn would undermine the schools' mission with respect to the socialization and education of the young generation.

Thus, a scientific assessment of the extent and the causes of violence at schools needs to answer the questions, to what extent this fear is justifiable, to what exact extent violence is actually prevalent at the schools, and also how to prevent violence at schools and how to develop appropriate intervention strategies (Chandras, 1999). However, at the same time scientific studies are expected to reply to public exaggerations and overstatements. Despite the declining of violence at schools in several western industrialized countries (Fuchs et al., 2005 for Germany; Grier & Chaddock, 1999 for the US),[1] the media coverage oregarding violence at schools in general and of extremely violent incidence in particular (Furlong & Chung, 1995; Schubarth, 1999) suggests that violence is a dramatic problem in the respective educational systems. Thus, in addition to describing the prevalence of violence at schools and understanding its causes a scientific assessment also need to stimulate an analytic and fact-based discussion.

SOME BASIC FINDINGS ON VIOLENCE AT SCHOOLS

Even though, the various scientific enterprises and public discourses on this topic make use of similar terminology, it should be pointed out, that violence at schools is a heterogeneous phenomenon. The research topics cover a wide range of behaviors ranging from intentional physical attacks including the use of weapons, gang violence and sexual assaults to less serious behaviors like beating and slapping, to relatively harmless kicks and puffs. So far, there is no international standard classification for violent behaviors – mostly because the relative prevalence of various types of violence at schools differs across countries and continents. However, Olweus (1999) definition might serve as a preliminary standard: Violence is "aggressive behaviour where the actor or perpetrator uses his or her own body or an object (including a weapon) to inflict (relatively serious) injury or discomfort upon another individual" (Olweus, 1999, 12).

Nevertheless, this definition leaves a lot of room specific topics and respective definitions: Most studies focus on violence conducted inside the school limits; however, others include violent behaviors by students on their way to school or at other places outside the schools (Wetzels et al., 2000). In the existing literature we find analyses on heavily violent behaviors like the using knifes and weapons (Fuchs, 1995a; Marsh & Evans, 2007) and gangs violence (Fuchs 1995b; Eisner et al.. 2000), however, there is also a lot of attention for lower level violence like kicking others or hitting (Fuchs et al.,

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[1] However, it should also be said, that violence in developing countries is more prevalent and typically more severe (US Agency for international Development, 2004; Ohsako, 1997).

1996, 2001, 2005). In addition to physical violence against fellow students, various types of damage to property and vandalism at school as well as verbal aggression and other non-physical types of aggression are included in respective studies, like mobbing, coercion, and bullying (Olweus, 1999; Ng & Tsang, 2008). The focus of the existing literature is predominantly on lighter forms of justiciable behaviors as well as on behaviors below the threshold of the criminal law.

The literature available documents a wide range of consistent findings regarding the prevalence of violence at schools in Europe (Smith, 2003). Generally speaking the prevalence of violent behaviors is rather low, at least lower than expected based on the considerable attention this topic received in the media coverage. Also, findings suggest no sustainable increase of the violence over the past 10 years which is also in contrast to the general public's perception. Severe physical violence is seldom (Lamnek, 2000) and lighter forms of violence are a passage in the transition from childhood to adult (Meier & Tillmann, 2000) – only for a small proportion violence develops into an everyday pattern of conflict solving behavior (Eckart, 2000). Even though, violence at schools seems to be no excessive everyday problem, we should still be concerned with the present prevalence of violence at schools.

Several studies indicate the impact of individual characteristics of the perpetrator on the prevalence of violence at schools. In fact, most of the research has assumed a rather etiologic stand since they focus on individual characteristics as key causes of violence at schools. Following is a list of selected sources that have been associated with the occurrence of violent behaviour:

- Almost every study has pointed out, that male Students are more violent compared to female students (Möller, 2001; Fuchs & Luedtke, 2003; Felix & McMahon, 2007; Luedtke, 2008). This is especially true for physical violence; in the case of verbal aggression the difference is smaller – nevertheless it is still visible.

- Parental violence has been identified to stimulate violence at school. This correlation has been demonstrated either for aggressive patterns among the parents (Benson & Fox, 2004) or – even more pronounced – for parental violence against their children (Lober & Stouthamer-Lober, 1998; Mansel, 2001; Straus, 2001).

- Children of families in severely underprivileged socio-economic conditions have been proven to be more violent than children of better-off families. This is especially true for parents who are out of work or draw local welfare support. However, given the literature at hand it is not clear whether this effect results directly from the socio-

economic disadvantage or whether the relative deprivation compared to better-off class mates stimulates violent behaviors by these children (e. g. Lipset, 1964; Hofstadter, 1964).

- Several of the highly violent students are members of a violent peer groups (Fuchs, 1995b; Eisner et al., 2000; Fuchs & Luedtke, 2008). This has raised the question to what extent the interaction with the gang might stimulate violent behaviors at school. However, it should be noted that the causal direction is not yet confirmed – it might also well be that violent students chose to enter a violent peer group because they themselves are prone to aggressive behaviors.

- The same lack of clarity applies to the often assumed influence of the consumption of violent media and PC games or online games (Fuchs, 2003). However, given the research designs at hand it is hard to prove that the consumption of violent media content actually evokes individual violent behavior. It might well be, that student who are violent because of other reasons are especially interested in violent PC games or aggressive online gaming because they are violent. This issue remains to be resolved in future research.

THE MICRO-SOCIAL CONTEXT OF VIOLENCE AT SCHOOLS

Even though the respective analyses on the explanatory factors mentioned above usually reveal considerable explanatory power, the current state of the research remains unsatisfactory because of theoretical and empirical shortcomings, which suggest an extension of the current approach (see also Laub & Lauritsen, 1998; Fagan & Wikinson, 1998):

From a theoretical point of view, it is obvious that the environment in a particular class, in the neighborhood where the students live and also the municipality where the school is located should have an impact on the prevalence of violence at schools. E. g., Benson and Fox (2004) argue based on a study among African-Americans that the higher rates of intimate violence of the parents could be accounted for by their greater likelihood of living in disadvantaged neighbourhoods. Accordingly, in our view violence at schools evolves in a micro-social setting. Violent perpetrators do not just act violently instead violence evolves in interaction with the social characteristics of the environment and also with other individuals. In fact, in a socially integrated setting a low intensity violent behavior or provocation by one student might well be absorbed by fellow students who are not familiar with violent conflict solving strategies. By contrast, the very same behavior might be answered by a violent response of similar intensity by another student which in turn will wind up the level of violence over time until excessive aggression occurs. Thus, we need to explore the micro-social context of the individual violent

perpetrators in order to assess potential boosting or alleviative factors. This view is supported by findings of the HBSC study which has demonstrated that violence and small crime is related to social disintegration in the neighborhood and the living quarters (Feltes, 2001; Hermann & Laue, 2003) and physical neglect and corruption in the surroundings ("broken window theorem"; Wilson & Kelling, 1982).

In our view, we have to differentiate various relevant levels of the micro-social context: the class, the school, the neighborhood where the school resides and the neighborhood where the students live as well as the municipality and the county as a whole. For the purpose of this analysis we will focus on the class, the schools, and the municipality where the school resides. Given the data at hand we are unable to assess the impact of all potential contextual factors. However, some relevant characteristics of the respective school context are available for the analysis:

Class

Given the gender-specific differences in the individual propensity to act violently, we speculate that classes with a high proportion of female students function as an absorbing context, reducing the likelihood of violent behaviors by individuals (both, by male and females students). By contrast, we predict that high levels of individual violence are more likely to occur when the proportion of male students is high since provocations and winding up each other will lead to manifest physical violence. With similar reasoning we assume that the proportion of students in a class who have experienced physical violence by their parents has a significant impact on individual violence. Based on social-learning theory it has been documented that students who are violently abused by their parents are more likely to act violently themselves – especially when other students initiate provocations of low level violence. Because they have learned that aggressive behavior is a legitimate conflict solving strategy they are more likely to react violently in response to fellow students showing provocative or activating behaviors. Since those students work as a catalyst we predict that students who attend classes with a high proportion of abused class mates show higher degrees of violence compared to students in classes with smaller numbers of victims of parental violence.

School

A secondary school is characterized by many properties that have the potential to affect the prevalence of violence. In the context of the German educational system the fact that schools differ with respect to the tracked school system is the one most important feature. While lower track schools ("Hauptschule") attract students from lower socio-economic backgrounds and provide degrees leading to blue collar apprenticeships in the "Berufsschule",

intermediate track Schools ("Realschule") communicate more advanced subjects and topics which is even more pronounced for the higher track schools ("Gymnasium") providing the higher education entry qualification. Given the specific social classes attracted by the various school types, we predict higher track schools to be less prone to violence, thus, students attending higher track schools are assumed to act less violently.

Municipality

In addition, we also consider properties of the wider school context. In our view, students' behaviors are affected by the overall presence of crime and violence in the surrounding of the school. Since we do not have small area data available we included the crime rate of the municipality as a proxy for the violence in the schools surrounding. Also, we accounted for the size of the town as an indicator for the density of the social networks, for social control and also for the overall level of deviant behavior. Since the literature suggests a correlation of socio-economic prosperity and violence we also included the unemployment rate in the respective municipalities among juveniles up to age 20. Finally, the educational aid of the Youth Welfare Office provided to families having trouble with breeding their children is included in the analysis. We predict that larger efforts by local authorities helping families bringing up their children should decrease the overall number of family break-downs which in return should decrease the likelihood of violent children and juveniles at schools.

So far, we have argued that the explanatory power of most theoretical models for the analysis of the causes of violence at schools leaves room for improvement. Thus, in the light of recent research and theoretical reasoning it is necessary to include context effects in the explanation of violence at schools. In addition, from an empirical point of view, we need to consider the sampling design applied by most studies. Usually, due to cost constrains and lack of a reasonable sampling frame for simple random sampling, one-stage or two-stage cluster samples are drawn in order to sample large numbers of students at reasonable cost . Usually, schools are drawn at random from a list as primary sampling unit. Then, all students of the selected schools or a subsample of students (mostly one or multiple classes within each school) are asked to fill in a questionnaire including self-reports on violence and victimization. Thus, this type of data does not only provide ideal presuppositions for an assessment of explanatory factors related to the context in a multi-level analysis. It also requires analysts to consider design effects when estimating and testing for significance (we will discuss this issue in the methods section below).

METHOD

DESIGN OF THE STUDY

In this paper, we will report results based on a 3-wave representative trend study conducted in Bavaria (a state of Germany) in 1994, 1999, and 2004. Each year about 4,000 students have been included in the study resulting in a joint sample size of 12,300 secondary school students clustered into 537 classes and 235 participating schools. The combined response rate considering school specific non-response as well as individual non-response was about 80% across all three waves.

The study applied a disproportional stratified two-stage cluster sample design. Considering the average number of students per class in each school type, a disproportional stratified sample of schools was drawn in each of the four school tracks. Within each stratum we randomly assigned one grade to each institution aiming at a proportional representation of the respective grades in each stratum. Within each school we randomly selected on class from a given grade. This class was included in the study and all students from this class filled in a questionnaire.

The questionnaire consisted of some 50 question and a total of about 200 items. The core of the questionnaire remained unchanged since the first wave in 1904 including questions on self-reported violent activities as well as items on victimization. In addition to this constant core component of the questionnaire, subsets of questions have been replaced from wave to wave according to new research questions. The survey was conducted as a self-administered paper-and-pencil survey in a classroom setting. Each student received a 6 page questionnaire and a plain envelope. After completing the survey in class respondents were supposed to seal the questionnaire in the envelope. All envelopes from a class were put into a larger envelope in the presence of the students and sent off to the research team.

The key dependent variables were built using 23 items on self-reported violent activities. Four additive indices using multiple items on physical violence against fellow students, on damage to property and vandalism, on verbal aggression and on bullying, extortion and coercion have been generated. Each index was standardized to a scale ranging from 0 to 10 scale points where 0 scale points means no violence. For the purpose of this analysis we focus on physical violence against fellow students; the three other types of violence are not considered in this paper.

The explanatory variables were either taken from the questionnaire, generated based on the answers of all students within a class, or extracted

from official statistical data. For this analysis we will focus on the contextual information regarding the micro-context of the class and on the municipality. For each class we have aggregated the proportion of female students in that particular class and also the proportion of students who were bashed at least sometimes in their parents or who get slapped for poor school grades. On the municipality level in addition to size (number of inhabitants), we determined the proportion of unemployed up to age 20, two indicators regarding the activities of the local Youth Welfare Office (support for families having trouble with raising their children) and the overall crime rate in the respective municipalities.

DESIGN EFFECTS AND THE EFFECTIVE SAMPLE SIZE

Given the specifics of the sample design we computed the designs effects and the effective sample size (see table 1 for details). It is important to note that the design of the sample was quite cost efficient, however, the design effect was in the range of 2.77 to 3.69 depending on the variable assessed. Given the design effect the effective sample size is reduced heavily to a range of 3,329 to 4,431 cases. Even though the design effect heavily reduces the effective sample size (actually about 12,300 students took part in the study), one should note, that there was no central register of all students in the State of Bavaria. Thus, a simple random sample was not feasible. Accordingly, we chose the cluster design not only for economic reasons but also because no alternate sampling strategy was available.

The intra-class correlation (*roh*) is in the range of .08 to .12. While this intra-class correlation is a thread to the effective sample size at the same time it indicates that there should be considerable level-2 variance for the multi-level analysis. Interestingly, the design effect is relatively large for physical violence against fellow students (similar to the design effect of verbal aggression). The smaller design effects of vandalism and damage to property as well as for bullying, coercion and extortion indicate that physical violence differs to a greater extent across schools. By contrast, the degree of bullying, coercion and extortion as well as of vandalism und damage to property seems to be more ubiquitous, less dependent on the specifics of a particular school and thus representing a more homogenous and omnipresent phenomenon.

Table 1: Design effects and effective sample size for the measures of violence at school

Variable	$Var_{srs}[y]$	$Var_{clus}[y]$	$Var_{srs}[\bar{y}]$	$Var_{clus}[\bar{y}]$	DEFF	n_{eff}	roh
Violence against fellow students	1.965	.316	.000160	.000588	3.67	3,339	.12
Vandalism and damage to property	1.898	.230	.000154	.000428	2.77	4,431	.08
Bullying, coercion and extortion	1.392	.186	.000114	.000346	3.05	4,019	.09
Verbal aggression	4.153	.670	.000339	.001247	3.69	3,329	.12

Note: Variances computed based on raw scores (z-transformed scores used for regression analysis documented below). Var_{srs} = Estimate of the variance when the sample is regarded a simple random sample; Var_{clus} = Estimate of the variance when the sampling design (cluster sample) is taken into account. The correction for the sampling fraction has not been considered in the computation. Since the proportion of sampled students is rather small (below 1.0 %) we neglected this factor.

More generally speaking, researchers have to take into account the sampling design and the resulting design effects when analyzing their data sets. Since almost every sample of secondary school students is based on a cluster sample design, usually one faces design effects larger then 2.0 which indicates that the effective sample size (= size of a simple random sample with same precision) is considerable smaller than the actual number of cases in the data set. The design effects are crucial to consider when it comes to the computation of confidence intervals and to significance testing of differences among sub-groups within the sample. Usually, standard software uses variance estimation techniques feasible for simple random samples (each element of the population has the same known probability of selection). These techniques however heavily underestimate the variance which in turn results in standard errors, confidence intervals and p-values in significance testing that are too small. As a consequence researchers are likely to reject the null hypothesis when in fact they should accept it. Thus, special routines and software packages have to be used when analyzing cluster samples. The random intercept regression models and the associated statistical testing presented in this paper were computed using the routine `xtmixed` as implemented in STATA 10 Intercooled.

RESULTS

PREVALENCE AND CORRELATES OF VIOLENCE AT GERMAN SCHOOLS

In general, the distribution of the prevalence of violence at Bavarian schools suggests a moderate to low level of violence. On a scale from 0 to 10 on average we compute a value of .60 in 2004, down from .75 in 1994. In

addition the distribution in figure 1 indicates that the overwhelming majority of the students does not act violently at all or show rather small levels of violence, only. In 2004 about 69 % of all students were not involved in any violent activity (the respective values were 64 % in 1994 and 1999; p < .001). By contrast, the group of heavily violent students is considerable small. Only 1.7% of students are prone to high prevalence rates (more than 5 scale points on a scale from 0 to 10; 2.6 % in 1994 and 2.3 % in 1999). Thus, violence in Bavarian schools seems to be a phenomenon performed predominantly by a rather small but considerably active group of less than 2 % of the students.
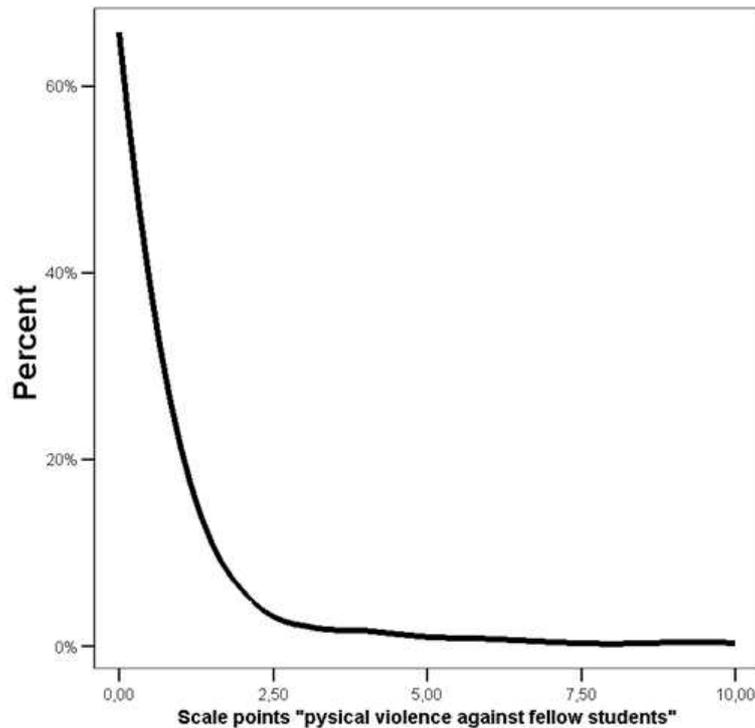

Figure 1: Distribution of the index "physical violence at school against fellow students" (mean index scores on a scale of 0 to 10, combined data 1994 through 2004)

However, it is also important to note, that 30% of the students (down 4 percentage points from 1994) show low to moderate level of violence at school (1 to 5 scale points). Given this reduction of the proportion of heavily violent students and also of the low to moderately violent students, the average of the violence scale dropped from .75 in 1994 to .60 in 2004 (p < .001).

As documented in the literature, we find significant differences of male and female students (p < .001) with the males being more than three times more violent than the female students (.99 and .27 respectively). Also, violence at schools seems to be a youth-specific phenomenon: Juvenile students age 14 through 17 are considerably more violent (.79; p < .001) than younger students (.59) and adult students (.57). Accordingly, violence at

schools has to be seen in the context of youth-specific deviant behavior in general; for the most part, violence at schools is a passage which does not open out into a permanent violent pattern in later stages of the live span. However, it should also be noted that violence does not disappear completely once the students turn 18.

Table 2: Prevalence of violence at schools (mean index scores on a scale of 0 to 10) in Bavarian secondary schools by predictor variables

Physical violence against fellow students	
By gender	
Male students	.99
Female students	.27
By age group	
9 through 13	.59
14 through 17	.79
18 and over	.57
By unemployment	
At least one parent unemployed	.89
No unemployment in family	.68
By type of school	
Lower track	.95
Lower intermediate track	.75
Higher intermediate Track	.72
Higher track	.31
Violence in the family ("bashed by parents")	
Never	.57
Seldom	.76
From time to time	1.29
Often	1.42
Very often	2.22

Note: $p < .001$ for all effects.

In addition to age and gender, the socio-demographic background of the students plays an important role: Students where at least one parent is unemployed show higher scale values compared to other students (.89 and .68 respectively; $p < .001$). Also, the proportion of heavily violent students is 4% in this group in 2004 – more than twice the value compared to the other group ($p < .05$). The type of school – which is highly socially selective in the German educational system – correlates also with the violence at school. In the lower track schools ("Hauptschule") the prevalence of violence is by far

more pronounced (.95) compared to the higher track schools ("Gymnasium"), where the prevalence is less than a third (.31; p < .001).

Also in accordance with the literature, we observe differences according to the prevalence of violence in the family. In the questionnaire we had multiple indicators for students experiencing violence in the family. In the table, the frequency of being bashed by parents is documents (other indicators show similar results). Our results demonstrate, that the frequency of being bashed by parents increases the prevalence of violence at schools (p < .001). While students who were never beaten yield an average scale value of .57, students who are bashed very often yield a value of 2.22.

In the next section we will assess the joint impact of these variables in a multivariate analysis. In addition, we will introduce supplemental contextual variables in order to assess the impact of the micro-social climate in class, in school and in the municipality where the school is located on the prevalence of school violence.

CONTEXT EFFECTS ON VIOLENCE AT SCHOOLS – A MULTI-LEVEL ANALYSIS

Based on the design effects estimated in the methods section we expected a considerable variance on the context level – that is between classes or schools or municipalities. The empty multi-level model reveals about 12% of the total variance located on level 2. While the residual level-1 variance is estimated at .886 the level-2 variance is estimated to be .117 (model 1 in table 3). Thus, we can conclude that the explanatory variables on level 2 may contribute to the explanation of violence at schools, since not all the variability of the violence can be attributed to the characteristics of the individual students.

However, prior to explaining these between-class differences, we add the individual characteristics of the students mentioned above in order to assess the impact of those variables on the violence conducted by the students (model 2 in table 3). The most effective factor in predicting the students' violence is their gender. Because male students are more violent compared to female students we compute a significant regression coefficient of -.46 (p < .001)[2] for female students. Also highly significant is the effect of the age group: Since juvenile students (age 14 through 17 = reference category) are especially prone to violence compared to younger students (age 9 through 13) and adult students (age 18 and over) yield both significant negative

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[2] All standard error and significance levels are computed correctly, i. e., taking into account the cluster structure of the sample when estimating the variances.

regression coefficients (-.10 and -.13 respectively, p < .001 for both coefficients).

In addition, the socio-economic situation of the students' parents also affects the degree of violence of their children. Students, whose parents are unemployed (father and/or mother) are significantly more violent compared to other students (.13; p < 0.01). Even though, unemployment is just a raw measure of the socio-economic situation in the family, the findings suggest the impact of relative deprivation. In addition, students with low subjective expectations regarding their own labor market success after school are more violent than other students (.06; p < .001; 1 = "very good expectation" to 5 = "very poor expectations").

Finally, it is important to recognize that students who are bashed by their parents when misbehaving or when they acquire poor school grades are more violent as compared to their fellow students who do not experience violent patterns in the family (bashing: .03; p < .01; slapping for poor school grades: .05; p < .001; 1 = "never" to 5 = "very often").

Even though, we could not control for all known individual factors affecting the prevalence of violence at schools, the findings prove many of the well known individual predictors contributing to the extent of the physical violence of children and juveniles at school. More advanced theoretical concepts, like social disintegration (e. g. Heitmeyer 1992) or relative deprivation (e. g. Lipset 1964; Hofstadter 1964) were not available for all three waves of our study, thus we had to restrict our analysis to variables that were part of the questionnaire in all three surveys since 1994.

In a next step we included class-specific context variables into the analysis (model 3 in table 3). When controlling for the type of school, we observe the expected effect of the tracked school system in Germany: Using the lower educational track as a reference category we compute significant effects for all other school types ranging from -.13 through -.30 for the students attending intermediate and higher track schools (p < .001 for all three coefficients).

As predicted, the proportion of female students in a class has a significant effect on the prevalence of violence for male and female students (.07; p < .001). In our view this finding indicates the importance of contextual characteristics. Even when controlling for type of school (school track) and also for the gender of the individual students we find a reasonable effect of the proportion of female class mates. Because a larger the fraction of less violent female students gives less room for provocations, winding up each other, and escalation processes. In sum, in addition to the gender effect on the individual level (female students are less violent) we also observe a compositional effect: The larger the proportion of female students in class,

the lower the level of violence of each individual student in class (including female and male students).

In addition to the proportion of female students, the percentage of students who have experienced violent patterns in their families has a small significant effect. While we could demonstrate significant effects for both indicators of violent socialization on the individual level, we find significant effects for the respective context characteristics only for the proportion of student who get slaps for poor school grades (.05; p < .05). The percentage of students who were bashed by their parents seems to have no significant effect (.03; not significant).

Table 3: Multilevel regression models for physical violence at schools against fellow students

	Model 1	Model 2	Model 3	Model 4
Individual level variables				
Sex (female)		-.46 ***	-.41 ***	-.41 ***
Age (9 thru 13)#		-.10 ***	-.12 ***	-.11 ***
Age (18 and older)#		-.13 ***	-.12 ***	-.13 ***
Parents unemployed		.13 **	.12 **	.12 **
Self-rated labor market expectations (1 = "very good"; 4 = "very poor")		.06 ***	.05 ***	.05 ***
"bashed by parents" (1 = "never" to 5 "very often")		.03 **	.02 **	.02 **
"slapping for poor school grades" (1 = "never" to 5 "very often")		.05 ***	.05 ***	.05 ***
Class level variables				
Proportion of female students			-.07 ***	-.07 ***
Proportion of student who were bashed by parents			.02	.03
Proportion of students who were slapped by parents for poor school grades			.05 *	.05 *
School level variables				
School type 2 (lower intermediate track)##			-.13 ***	-.14 **
School type 3 (higher intermediate track)##			-.19 ***	-.18 ***
School type 4 (higher track)##			-.30 ***	-.29 ***
Municipality level variables				
Size of town (number of inhabitants)				.06 *
Unemployment rate among people up to age 20				-.03 *
Education aid rate provided by the Youth Welfare Office (children remain inside the family)				-.05 +
Education aid rate provided by the Youth Welfare Office (children are taken out of the family)				-.02 *
Crime rate				.03 *
Model specifications				
Log likelihood	-17,035.29	-16,190.13	-16,132,60	-16,138.66
Variance on level 2	.117	.077	.051	.048
Residual variance on level 1	.886	.847	.847	.847

Note: N₁ = 12,337; N₂ = 537; ICC = .12; Maddala-R^2 for model 4 = .14; 59% of level-2 variance explained by model 4; + p < .10; * p < .05; ** p < .01; *** p < .001. Random intercept regression models estimated using the routine xtmixed as embedded in STATA 10 Intercooled. Dependent variable standardized for the present analysis. # Reference category = age 13 through 17; ## reference category = lower track school.

All other coefficients on the individual level remain more or less unchanged when entering those context variables into the equation. This also holds true when further context variables on the level of the municipality are included. As expected the size of the municipality has a positive effect in the violence at schools: the larger the town the higher the overall prevalence of violence in a school (.06; p < .05). Also, the overall crime rate in the municipality where the school resides has a significant effect in the expected

direction (.03; p < .05). Even though, this effect is rather small it is interesting to note, that the violence at schools and the overall crime rate in its surroundings covariate. However, so far it is unclear whether the violence at schools is a direct consecution of the ongoing crime in the municipality of whether the overall crime level evokes social disorder in the schools environment which in turn motivates violence in the schools. Impartial of these presumptions it is important to highlight the fact that this effect is rather small compared to the effects on the individual level.

To our surprise we observe a negative effect of the overall unemployment rate of people up to age 20 (-.03; p < 0.5). Contrary to expectations the overall level of violence is higher when the unemployment rate is smaller. Given the individual effect – students whose parents are unemployed were more violent compared to students with working parent – we assumed, that high unemployment rates in the schools environment would also increase the overall prevalence of violence. However, there is no support for this hypothesis.

Finally, we assessed the impact of the local Youth Welfare Office's activities. Two indicators were used to measure the local government's activities in supporting families that struggle with the upbringing of their children: the number of education aid activities where the child is taken out of the family and the number of instances where the Youth Welfare Office supports families with the children remaining in the family household. The two indicators were weighted by the number of inhabitants in the respective municipality. Both variables yield small negative effects: the more activities deployed the lower the overall prevalence of violence at schools. However, for the number of actions take where the child remains in the family the effect does not fully meet the established significance level (-.05; p < .10). By contrast, the effect of the support activities where the child is taken out of the family is statistically significant (-.02; p < .05). Based on these findings, we can conclude, that a large number of actions taken by the Youth Welfare Office is not an indicator for high levels of existing problems in a municipality, but rather an indicator for the local authorities' efforts to fight disruptive socialization practices and social disintegration in general which in turn results in lower prevalence rates of violence at schools.[3]

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[3] The analysis reveals a significant negative correlation (-.08; p < .05) of the education aid rate by the local Youth Welfare Office in a municipality and the proportion of students in class who experience violence in the family.

SUMMARY AND DISCUSSION

In this study we aimed at identifying context effects in a survey among secondary school students on violence at school. The analysis was conducted based on a representative sample for the German state of Bavaria consisting of some 12,300 students. The survey was carried out as a 10-year longitudinal trend study (1994, 1999, and 2004). Overall, the prevalence of violence at Bavarian schools is rather low. Also, over time we observe a slight decrease of physical violence against fellow students.

In an analysis including individual level variables we identified gender, age, unemployment of parents and violence in the family as explanatory factors: We could prove that male students, juveniles age 14 through 17, children of unemployed parents and children who experience violence in the family yielded higher prevalence rates of violence at schools. Other individual characteristics not included in the analysis so far may contribute to the explanation as well, however, this was not the predominant goal of this study.

In particular, we aimed at identifying relevant context characteristics: Given the data at hand we could demonstrate that about 12 percent of the variance of our standard measure for physical violence is located at the context level, not at the individual level. Aside from the individual factors for violence at schools mentioned above we identified context variables that contributed significantly to the explanation of violence at schools. First we considered characteristics of the class: The proportion of female student attending a class significantly predicts the prevalence of violence at schools (the more female students the lower the prevalence rate for all students in class, including male students). In addition, the proportion of students who were slapped for poor school grades (as an indicator for violence in the family) also significantly affects individual violence at schools (the larger the proportion of those students in a class the higher the prevalence rate for other students in the same class as well). In addition to the size of the town where the school is located (students attending schools in larger municipalities are prone to more violence), we also found small significant effects of the education aid activities by the Youth Welfare Offices (more activities correlate with lower prevalence rates of individual school violence) and the local crime rate (higher crime rates go along with lower prevalence rates of individual school violence).

The impact of the crime rate in the municipality where the school resides is rather small however this factor raises the question, to what extent the violence in the school is affected by crime and violence outside the school grounds. It might well be, that crime in the schools' surrounding penetrates the schools and thus contributes to and increases the level of violence visible

at a particular school. If this were the case, the schools would somehow mirror the existing violence in society. One could the then argue, that schools by themselves are not responsible for the occurrence of violence, instead they need to strengthened in order to protect their students and their personnel against the intrusion of violence from its surroundings. At the same time one could assume that violence emerges in the schools and fans out from there to the local neighborhoods and living quarters. Given the small number of students in a particular school and considering the overall low intensity of the violence at schools, it is plausible to assume that violence at schools rather results from the ongoing crime and deviant behavior in the schools' environment. However, this causal path needs to be explored in greater detail, since the answer to this question has important implications for the prevention strategies chosen and for the intervention actions taken by governmental agencies and educational institutions.

It should also be noted that violent patterns in the family as a central socialization institution are far more important for the occurrence of violent students in secondary schools than the overall crime rate in a school's surroundings. As far as violence in the family is concerned there is no doubt that violence at schools results from the violence in the family – since it is unlikely that violent experiences in school motivate students to provoke violent behaviors of their parents. Thus, the schools reflect ongoing violent patterns and behaviors in the family. Given the finding at hand it is save to state: If we could effectively fight violence in the families we would also reduce the prevalence of violence at schools effectively.

The discussion of contextual effects should not hinder the further assessment of individual factors and causes of violence at schools. As demonstrated in this analysis, the bigger part of the variance is located at the individual level indicating that differences across student characteristics are more important in explaining violence at schools than the specifics of the respective context. Nevertheless, it should be noted that the observed violence is also related to properties of the class, the school and the neighborhood were the school is located.

Given our sample design we are unable to differentiate the context effects of classes, schools and municipalities in the analysis. Since on average we have one class per school and one school per municipality in our sample we do not have enough variance in order to assess the effects on the various levels of the context independently. Future research should aim to address this problem. However, since this would require an even more heavily clustered design the disadvantages in terms of the design effect have to be taken into account when planning for such a sample: Since a data set that allows for the separation of class-specific effects and effects of the school and the

municipality would require us to sample multiple classes in each school and multiple schools in each municipality. This in return would increase the design effect and reduce the effectiveness of the sample (the design effect would be even larger, since the classes within each school are more similar to each other compared to classes from different institutions).

So far we have assessed the impact of characteristics of the municipality where the schools reside. However, given the fact that a significant proportion of students does not live in the immediate neighborhood of the school (instead they commute using schools buses or public transportation), it would be advisable to include the living quarters and neighborhoods of the students as a relevant context into the analysis, too. Also, it should be noted that the municipality is a far too large of a context. Since students – especially the younger group age 10 through 13 – defines the social habitat rather small scale it would also be of great importance to measure social and economic characteristics on the level of neighborhoods and living quarters within the municipalities. Since official statistical data is seldom available for smaller entities within municipalities, we need to explore methods in order to measure the context characteristics based on teacher observations of student self-reports.

The existence of a significant proportion of variance at the context level (and the associated intra cluster correlation which is .12 in our case) is not only of interest from a theoretical point of view. This finding also suggests that the properties of the cluster samples usually drawn in studies on violence at schools need to be taken into account in the analysis. Even though those cluster samples are quite cost efficient, the design effect introduced by this type of sampling strategy needs to be considered. That does not necessarily require multi-level analyses, however, the cluster design of the sample should be taken into account when computing standard errors and confidence intervals. Otherwise, type-1 errors are more likely to occur than indicated by the computed p-values.

Once we consider the cluster structure of the sample for an adequate computation of standard errors, it is only a small step towards a multi-level analysis that takes into account contextual characteristics as predictors for violence at schools as well. The present study has aimed to demonstrate how the inclusion of contextual factors into the explanation of violence at schools might contribute to the theoretical advancement. When considering contextual information we will broaden our theoretical view, and we will be able to understand the emergence of violence at schools in a more comprehensive way. So far, theoretical reasoning has been very much focused on the individual students' characteristics, which in turn strengthened the search for individual causes for the development of violence. However, social

scientists are used to understand the development of violence based on the interplay of individual behaviors and contextual constraints. This is not imply to clear the individual perpetrators of their personal guilt however we need to extent our theoretical models towards a broader understanding of the emergence of violence at schools in context.

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