The link between school climate and violence in school: A meta-analytic review

Citation for published version (APA):

Steffgen, G., Recchia, S., & Viechtbauer, W. (2013). The link between school climate and violence in school: A meta-analytic review. *Aggression and Violent Behavior*, 18(2), 300-309.
<https://doi.org/10.1016/j.avb.2012.12.001>

Document status and date:

Published: 01/01/2013

DOI:

[10.1016/j.avb.2012.12.001](https://doi.org/10.1016/j.avb.2012.12.001)

Document Version:

Publisher's PDF, also known as Version of record

Document license:

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The link between school climate and violence in school: A meta-analytic review

Georges Steffgen ^{a,*}, Sophie Recchia ^a, Wolfgang Viechtbauer ^b

^a University of Luxembourg, Luxembourg

^b University of Maastricht, The Netherlands

ARTICLE INFO

Article history:

Received 14 August 2012

Received in revised form 2 December 2012

Accepted 4 December 2012

Available online 12 December 2012

Keywords:

School climate

School violence

Meta-analysis

ABSTRACT

There has been significant interest in whether and how school climate and violent behavior are meaningfully related. The present meta-analysis reviewed studies reporting a relationship between school climate and school violence in order to summarize the total effect and the direction of these research findings. Database consultation and literature hand searching yielded 145 articles which were reviewed by two experts. Studies were included if they reported a statistical effect size of the relationship between school climate and school violence. Exclusion criteria were unclear operationalization of the principal variables, research findings from multiple publications, studies using multi-level analysis and qualitative studies. The meta-analysis included 36 independent studies ($N = 113,778$) with correlations ranging from $-.02$ to $-.53$. Using a random-effects model a moderate mean effect size of $r = -.26$, $CI [-30, -21]$ was found. Statistical findings indicated significant heterogeneity and a large range of variance between studies. Meta-regressions analyzed different potential moderators as relevant factors of heterogeneity, but none of these factors could be identified as a moderator. Due to the large variance between the studies, it remains difficult to draw final conclusions. Nevertheless, the moderate effect size underlines the role of environmental aspects for school violence intervention.

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Contents

1.	Introduction	300
2.	Method	301
2.1.	Literature search	301
2.2.	Data analysis	301
3.	Results	301
3.1.	Description of the studies	301
3.2.	Study characteristics	301
3.3.	Measures of school climate	302
3.4.	Measures of violence	302
3.5.	Calculating the effect size	302
3.6.	Overall effect	302
3.7.	Moderator analyses	304
4.	Discussion	307
4.1.	Limitations	308
4.2.	Perspectives	308
	References	308

1. Introduction

School violence remains a very important social issue world-wide (Debarbieux, 2006). A large number of students in schools are affected negatively by it, in the short term as well as in the long term (Gottfredson, 2001). In terms of conceptualization, violence at school is a very heterogeneous phenomenon (Debarbieux, 2006;

* Corresponding author at: Université du Luxembourg, Campus Walferdange, Research Unit INSIDE, Bâtiment XII; Bureau 1.05, Route de Diekirch, L-7201 Walferdange Luxembourg. Tel.: +352 46 66 44 6644; fax: +352 46 66 44 9535.

E-mail address: georges.steffgen@uni.lu (G. Steffgen).

Smith, 2005; Smith, Ananiadou, & Cowie, 2003). School violence includes a wide range of behaviors that threaten and harm others emotionally and physically: 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 punches (Fuchs, 2009). In general, violence (in schools) as a specific form of risk behavior can be defined as a purposeful damage in form of a physiological or psychological action that is directed against the self, other persons (student against student, student against teacher, teacher against teacher or teacher against student), or against objects (Steffgen, 2009). In contrast, bullying as a specific form of violence is marked as the systematic and repeated harassment of weaker people. It mostly emerges as a group phenomenon (Olweus, 2004; Smith, 2000). In summary, research studies on school violence differ strongly in the use of definitions and concepts.

During the last 20 years there has been extensive research on identifying risk factors for school violence (Benbenishty, Astor, Zeira, & Vinokur, 2002). The concept of school climate has received particular attention (Freiberg, 1999). Most importantly, the social climate in class and in school is assumed to have a significant effect on the prevalence of violence in schools (Janosz, Georges, & Parent, 1998; Janosz, Thiébaud, Bouthillier, & Brunet, 2005).

Thus, different theoretical approaches have been considered. The ecological development theory allows conceptualizing the impact of school climate on school violence (Bronfenbrenner, 1974). School violence is here defined as a behavioral expression located in the microsystem, but strongly influenced by the mesosystem (interpretation of school climate). A distinction is made between school violence as an act (behavior) versus school climate (cognitive and emotion interpretation) as the subjective and objective reality of the school subsystem. Bridging the two concepts together, the psychological process (psychosocial) of school climate interpretation plays an important role in school violence.

Continual attempts have been undertaken to identify key components of school climate. Therefore, existing school climate taxonomies offer different opportunities to categorize various dimensions (Moos, 1979). Some categorizations are defining climate variables as affective, if they are related to interpersonal and social relations (e.g., school belonging, student participation), as cognitive or affective, when psychological processes are involved (e.g., school attachment, school fear), and as organizational when referring to school specific variables (e.g., school security, school management) (Fraser, 1994).

There is a broad consensus among researchers that school climate is an important factor that warrants further investigation with regard to violence (Carra, 2009; Gottfredson, Gottfredson, Payne, & Gottfredson, 2005; Hernandez & Seem, 2004). However, the lack of clear definitions, taxonomies, and empirically-validated measures of school climate has resulted in a multitude of findings that are often difficult to interpret. The lack of quantitative reviews on the relationship between school climate and violence may, in part, be due to the conceptual uncertainty regarding the definition of school climate (Johnson, 2009).

Nevertheless, the purpose of the meta-analysis reported here is to investigate the relationship between school climate and school violence. Knowing the proliferation of concepts of school climate as well as of violence, there is still need for an integrative quantitative review that allows more clarity about the relationship between climate and violence. Thus, the primary aim of this study is to explore, by analyzing the statistical results of a collection of empirical research studies, if a relevant effect size could be detected between the relationship of school climate and school violence. Additionally, this meta-analysis' second target is to test if potential moderators may have an impact on the association of school climate and school violence.

2. Method

2.1. Literature search

A literature search was conducted to identify studies analyzing the impact of students' perceptions of school climate on violent behavior at school. The following search equation was chosen (aggress* or violent* or bully* and climate) in databases' specific fields (keywords, title or abstracts). Electronic databases were consulted (PsycInfo, Pubmed, EBSCO, Science Direct, ISI WEB of Knowledge, PROQUEST) for peer-reviewed journal articles written in English, French, or German. Periodical databases' alerts coded with the same search equation were consulted regularly. Studies were also sought from experts in the field, by a call made through the international observatory on school violence. This strategy identified 598 references.

Inclusion criteria specified studies that statistically analyzed the link between school climate and violence, and which used quantitative methods with objective, standardized, or validated self-report instruments. Exclusion criteria were studies using qualitative data, studies with unclear operationalization, research findings from multiple publications and studies using multi-level analysis. Hand search yielded 41 additional studies. The remaining 76 relevant studies were screened independently by two reviewers, with a satisfactory intercoder reliability of inclusion agreement (r Cohen's kappa ranged from .62** to .98**). Disagreements were resolved through discussion and consulting a third reviewer. For studies with insufficient statistical information, the authors were contacted with a response rate of 62%. Finally, 36 studies have been included in the present meta-analysis.

2.2. Data analysis

The data for the meta-analysis consist of 36 correlations measuring the direction and strength of the relationship between school climate and school violence. The goal of the meta-analysis was to examine the overall relationship between these two variables and to assess a number of potential moderators of this relationship. The analyses were conducted with the statistical package Comprehensive Meta-Analysis (Biostat, 2008), as well as with R (version 2.14.0), using the metafor package (version 1.6-0, Viechtbauer, 2010).

3. Results

3.1. Description of the studies

This meta-analysis included 36 studies reporting statistical effects of the relationship between school climate and school violence. These 36 empirical studies have been identified through literature search of published and non-published research. Taken together, studies came from different research fields (educational, psychosocial, and epidemiological domain); and studies' aims were divergent. Nevertheless, in the 36 studies, the environmental impact of school climate on school violence was analyzed. Table 1 provides an overview of the included studies' main purposes.

3.2. Study characteristics

The present meta-analysis included 36 studies reporting an association between school climate and school violence. Concerning the characteristics of the studies included in the meta-analysis, the total population analyzed ($N=113,778$) has a mean age of 13.53 (1.44 SD) and a mean male percentage of 46.9%. Individual populations studied were elementary, middle, or high school students. Included studies had samples covering different numbers of schools varying from 1 to 528 schools. Data were collected at different times ranging from 1982 to 2008 in different countries across North America, Europe, and Asia.

Table 1
Overview of the included studies' main purpose.

Study	Study's purpose
Astor, Benbenishty, Vinokur, and Zeira (2006)	School context variables influence on students' fear of going to school
Bayraktar (2011)	Multifactor model of bullying among adolescents in North Cyprus and Turkey
Benbenishty et al. (2002)	Analyze of context and victimization impacts on nonattendance at school
Bosworth, Eseplage, and Simon (1999)	Association between misconduct and prosocial behaviors with involvement in bullying
Brookmeyer, Fanti, and Henrich (2006)	Effects of school connectedness as buffers of violent behaviors
Cernkovich and Giordano (1992)	Impact of school bonding on delinquent conduct
Crooks, Scott, Wolfe, Chiodo, and Killip (2007)	Influence of school level variables on delinquency
Cushing, Horner, and Barrier (2003)	Identifying variables that maintain inappropriate behaviors in schools
Dunn (2001)	Relations among achievement and school factors (violence, climate, anxiety)
Frey, Ruchkin, Martin, and Schwab-Stone (2009)	Protective role of school attachment and family involvement
Galand, Philippot, Petit, Born, and Buidin (2004)	Frequency and impact of different types of victimization in school
Goldstein, Young, and Boyd (2008)	Association of relational aggression and participation in a hostile school environment
Graham, Bellmore, and Mize (2006)	Relations between aggression and school difficulties
Henrich, Brookmeyer, and Shahar (2005)	Links between violence exposure, parent and school connectedness
Jenkins (1997)	Effects of school social bond on crime, misconduct and nonattendance in schools
Karwowski (2008)	Influence of perceived school climate on risk behaviors among adolescents
Kasen, Berenson, Cohen, and Johnson (2004)	Effect of school climate on concurrent behaviors related to bullying process
Klicpera, Gasteiger, and Schabmann (1995)	Contribution of school-specific factors to aggressive behavior
Kuperminc, Leadbeater, Emmons, and Blatt (1997)	Impact of school climate on student behavioral problems and emotional distress
Lee (2010)	Prediction model of bullying behaviors
Loukas, Suzuki, and Horton (2006)	Relations between connectedness, school climate, conduct problems and depressive symptoms
Miller (2006)	Perceptions of school climate and attitudes towards bullying among students and teachers
Mohr (1999)	Impact of peer victimization on adolescent's mental health
Nansel, Haynie, and Simons-Morton (2007)	Bullying behaviors and middle school adjustment
O'Brennan, Bradshaw, and Sawyer (2009)	Associations between bullying and aggressive behaviors and perceptions of school climate
Pfetsch (2010)	Impact of prosocial behaviors on violence in schools
Roland and Galloway (2002)	Relations between class factors (teachers' management, social structure) and bullying
Schechtman (2006)	Relationship between life skills, classroom climate and self-reported levels of victimization
Steffgen (2004)	Examination of school culture and violence
Stewart (2003)	Analyze of factors explaining school misbehavior
Sturzbecher, Landua, and Shahla (2001)	Examination of the disposition to aggression in a specific area of Germany
Sweaver et al. (2006)	Model of bullying and victimization in early adolescence
Tillmann, Holler-Nowitzki, Holtappels, Meier, and Popp (1997)	Impact of organizational school characteristics on violence behavior of students
Welsh (2001)	Indicators of school disorder
Willoughby et al. (2007)	Analyze of adolescent non-involvement in multiple risk behaviors
Wilson (2004)	Effects of connectedness and climate on measures of aggression and victimization

Detailed characteristics of the studies included in the meta-analysis are listed in Table 2.

3.3. Measures of school climate

Studies included in the meta-analysis made use of multiple different measures of school climate. Referring to existing classification (Moos, 1979), measures of the school climate have been grouped into three categories: (1) the relational dimension refers to interpersonal relations within the school (e.g., teacher-student relationships, cohesion); (2) the cognitive/affective dimension refers to perceptions or feelings toward the school (e.g., attachment, belongings); (3) the organizational dimension refers to a school's characteristics (e.g., security, rules).

3.4. Measures of violence

Studies measured school violence with various instruments, and examined committed, experienced, and general perception of violence: (1) the violence committed dimension refers to engagement in various aggressive behaviors (e.g., physical aggression, verbal aggression, weapon use); (2) the violence experienced dimension refers to being victim of various aggressive behaviors (e.g., physical aggression, verbal aggression, weapon use); (3) the perception of violence in school dimension refers to the general feeling of on an insecure school (e.g. overall problem behaviors).

3.5. Calculating the effect size

The 36 studies provided correlations of the relationship between school climate and school violence with a high level of variability.

Fig. 1 below provides an overview of the distribution of the observed correlations in the form of a histogram. All of the correlations were below 0, indicating that an increasing positive school climate is related to a decrease in school violence (and vice-versa). However, the strength of the correlation varied considerably (range: $-.53$ to $-.02$).

3.6. Overall effect

To obtain an estimate of the average correlation, the observed correlations were first transformed via Fisher's r -to- z transformation (Fisher, 1921), and then meta-analyzed using a fixed- and a random-effects model (Konstantopoulos & Hedges, 2009; Raudenbush, 2009). The estimated average transformed correlation and the bounds of the corresponding 95% confidence interval (CI) were then back-transformed to correlation units for easier interpretation. The DerSimonian-Laird estimator was used to estimate the amount of heterogeneity in the random-effects model (DerSimonian & Laird, 1986). The correlations were tested for heterogeneity via the Q-test (Cochran, 1954). In addition, the amount of heterogeneity (in terms of τ^2 , the estimated standard deviation of the true (transformed) correlations), the I^2 statistic (Higgins, Thompson, Deeks, & Altman, 2003), and an approximate 95% credibility interval (indicating the range where 95% of the true correlations are expected to fall) were obtained (Riley, Higgins, & Deeks, 2011).

The correlations were clearly heterogeneous, as indicated by the test for heterogeneity ($Q=2271.24$, $df=35$, $p<.0001$) and by the I^2 statistic ($I^2=98.5\%$, indicating that almost all of the variability observed in the (transformed) correlations was due to heterogeneity in the true correlations and not simply due to sampling variability). Based on the fixed-effects model, the estimated average correlation was $-.22$ (95% CI: $-.21$ to $-.22$). On the other hand, the random-

Table 2
Studies' characteristics of the studies included in the meta-analysis.

Study	Age	Male percentage	School grade	Number of schools	Country	Survey year
Astor et al. (2006)	–	48	4–6	71	Israel	1998
Bayraktar (2011)	14.7	46.9	7–12	–	Turkey	–
Benbenishty et al. (2002)	–	44	7–9	102	Israel	1998
Bosworth et al. (1999)	12.4	46	6–8	1	USA	1995
Brookmeyer et al. (2006)	15.54	46	7–12	125	USA	1994
Cernkovich and Giordano (1992)	–	49	7–12	51	USA	1982
Crooks et al. (2007)	13.5	49	9	23	USA	2005
Cushing et al. (2003)	–	49	4–8	15	USA	2000
Dunn (2001)	–	43	6–8	1	USA	2000
Frey et al. (2009)	13.62	45	9	17	USA	2004
Galand et al. (2004)	–	51	7–12	45	Belgium	2000
Goldstein et al. (2008)	14.78	48	7–12	130	USA	2007
Graham et al. (2006)	11.5	46	6	11	USA	2005
Henrich et al. (2005)	–	48	7–12	132	USA	1995
Jenkins (1997)	–	50	7–8	1	USA	1990
Karwowski (2008)	15.21	54.5	–	1	Poland	–
Kasen et al. (2004)	14.9	49.6	5–12	–	USA	1985
Klicpera et al. (1995)	14	–	8	79	Austria	1993
Kuperminc et al. (1997)	12.8	49	6–7	1	USA	–
Lee (2010)	–	52.8	6–8	–	USA	2008
Loukas et al. (2006)	11.69	49	6–7	3	USA	–
Miller (2006)	–	52	7–8	3	USA	–
Mohr (1999)	13.28	61	5–9	2	Germany	1996
Nansel et al. (2007)	–	47	4–7	4	USA	1996
O'Brennan et al. (2009)	–	50	4–12	105	USA	2006
Pfetsch (2010)	11.96	48.8	2–12	13	Luxembourg	2007
Roland Galloway (2002)	11.4	48	4–6	22	Norway	1998
Schechtman (2006)	–	50	4–6	97	Israel	–
Steffgen (2004)	–	49.2	7–11	1	Luxembourg	2001
Stewart (2003)	–	–	10	528	USA	1990
Sturzbecher et al. (2001)	15	49	7–13	–	Germany	1999
Swearer et al. (2006)	13.06	44	6–9	3	USA	2000
Tillmann et al. (1997)	–	–9	6–10	24	Germany	1997
Welsh (2001)	12.12	48	6–8	11	USA	1994
Willoughby et al. (2007)	15.71	49	9–12	25	Canada	–
Wilson (2004)	–	–	6–12	19	USA	2001

Note. Age is expressed in mean years; male percent in percentage; school grades comprised elementary, middle and high schools with grades ranging from 4 to 12; – indicated missing values.

effects model yielded an estimated average correlation of $-.26$ (95% CI: $-.21$ to $-.30$) and, given the large amount of heterogeneity ($\hat{\tau} = .15$), a very wide 95% credibility interval ($-.51$ to $.03$). Fig. 2 shows a forest plot of the 36 correlations (with 95% CIs for each study) and the estimated average correlation (with 95% CI) based on the random-effects model. The horizontal dashed line around the estimated average correlation indicates the 95% credibility interval.

Note that the fixed-effects model provides a conditional inference about the set of studies included in the meta-analysis (and, hence, an estimate of the average true correlation in those 36 studies), while the random-effects model provides an unconditional inference

about a hypothetical population of studies (and hence, an estimate of the average true correlation in the population of studies) from which the 36 studies are assumed to be randomly drawn (Hedges & Vevea, 1998).

Removal of each study, in turn, did not yield any appreciable differences in the conclusions. A wide variety of outlier and influential case diagnostics are shown in Fig. 3, including externally standardized residuals, DFFITS values, Cook's distances, covariance ratios, leave-one-out estimates of the amount of heterogeneity, leave-one-out heterogeneity test statistics, hat values, and weights (Viechtbauer & Cheung, 2010). There is no indication of any particular study being an outlier or exerting an undue influence on the results.

Fig. 4 shows a funnel plot (Light & Pillemer, 1984) of the transformed correlations. The white, light-gray, and dark-gray shaded areas indicate 90%, 95% and 99% pseudo confidence interval regions under the assumption that the true correlations are homogeneous (Peters, Sutton, Jones, Abrams, & Rushton, 2008). Due to the large amount of heterogeneity, the observed correlations often fall outside of these regions. There appears to be no indication that correlations on one side of the funnel plot have been systematically suppressed. The regression test for funnel plot asymmetry (Egger, Davey Smith, Schneider, & Minder, 1997) based on a random/mixed-effects model (Sterne & Egger, 2005) was not significant ($p = .32$). The rank correlation test (Begg & Mazumdar, 1994) also did not indicate any asymmetry in the funnel plot ($p = .95$). The trim-and-fill method (Duval & Tweedie, 2000a, 2000b) based on a random-effects model (Duval, 2005) suggested the possibility of five missing studies on the left side of the funnel. The estimate of the average correlation was $-.29$ (95% CI: $-.23$ to $-.34$) following the imputation of these potentially

Fig. 1. Histogram of observed correlations.

Fig. 2. Forest plot of the 36 correlations.

missing studies, a negligible difference in comparison with the results obtained earlier.

3.7. Moderator analyses

Moderator analyses were carried out using mixed-effects (meta-regression) models (Raudenbush, 2009) and using the mixed-effects model analogue of the DerSimonian–Laird estimator to estimate the amount of residual heterogeneity. Moderators were first tested individually (i.e., by means of univariate models) and then simultaneously (i.e., by means of a multiple meta-regression model) with backwards elimination to obtain a final model (with $p > .10$ for removal). A pseudo- R^2 statistic is given for each model, indicating the amount of heterogeneity that is accounted for by the moderator(s) included in the model. The Knapp and Hartung method, which provides accurate control of the Type I error rate, was used to adjust the test statistics of the moderator variables (Knapp & Hartung, 2003).

The following moderators were tested: peer reviewed study (yes, no), mean age of the study sample (analyzed as a continuous moderator), percentage of males in the study sample (continuous moderator), school grade of the study sample (continuous moderator by the following classification elementary schools (1); elementary and middle schools (2), middle schools (3), elementary, middle and high schools (4), middle and high schools (5) and high schools (6), year in which the data were collected (continuous moderator), number of schools in the study (continuous moderator), continent on which the study was carried out (North America, Europe, and Asia), violence dimension (violence committed, violence experienced, and general perception of violence), climate dimension (relational, cognitive-affective,

and organizational), and publication year (continuous moderator). Categorical moderators were dummy-coded for the analysis.

Fig. 5 provides scatterplots for each of the six continuous moderators. The points are drawn proportional to the size of the studies (i.e., larger points indicate larger studies and, therefore, more precise estimates). The regression line (with pointwise 95% CIs) as estimated from the meta-regression model is added to each plot. Note that the number of schools was very large in one study in comparison to the rest of the investigations. Removal of that study from the analysis did not alter the conclusions for this moderator.

Table 3 provides the results for the (univariate) mixed-effects meta-regression models when analyzing the continuous moderators. Except for the variable publication year (which just barely misses the $\alpha = .05$ cutoff), there was no indication of a moderating effect for this set of variables.

Fig. 6 shows a cumulative forest plot, indicating the estimated average correlation based on a random-effects model as a function of the publication year of the study. The size of the estimated average correlation decreases slightly over time.

Table 4 provides the results for the (univariate) meta-regression models when analyzing the categorical moderators. None of the moderators reached significance at $\alpha = .05$. Also, none of the pairwise comparisons between the levels of a categorical moderator reached statistical significance.

Since the survey year and publication year variables were strongly correlated ($r = .70$), only publication year (which had no missing data) was entered into the multiple meta-regression model. Also, the mean age of the study sample was unknown for 17 of the 36 studies (47%), so that inclusion of this moderator would severely reduce

Fig. 3. Outlier and influential case diagnostics.

Fig. 4. Funnel plot of the transformed correlations.

the sample size for the multiple meta-regression model. Therefore, this variable was not entered into the model. A total of 27 studies had complete data on the remaining moderators entered into the model.

After backward elimination, the final model contained the moderators school grade and publication year. The results for this model are shown in Table 5. The omnibus test of the two moderators was significant ($F(2, 24) = 4.37, p < .05$). However, note that school grade is only significant at $\alpha = .10$. For this final model, $R^2 = .18$. Considerable residual heterogeneity remained even with the inclusion of these two moderators ($Q = 1224.26, df = 24, p < .0001, (\tau^2 = .14)$).

Based on the model, the estimated average correlation in 1992 (the earliest publication year) was $-.45$ (95% CI: $-.56$ to $-.32$) for the first school grade (the lowest school grade in the dataset). For 2011 (the latest publication year), the estimated average correlation was $-.26$ (95% CI: $-.37$ to $-.14$), holding school grade constant at 1. When setting school grade equal to 6 (the highest school grade in the dataset), then the estimated average correlation in 1992 and 2011 were $-.26$ (95% CI: $-.45$ to $-.05$) and $-.05$ (95% CI: $-.22$ to $.12$), respectively.

Fig. 5. Scatterplots for the continuous moderators.

Finally, as an alternative analysis strategy, the correlations were analyzed using a random-effects model based on the Hunter-Schmidt approach (Hunter & Schmidt, 2004). The main differences compared to the initial approach are: (1) raw (instead of transformed) correlations are analyzed; (2) the individual correlations are corrected for

Table 3
Results for the univariate meta-regression models (continuous moderators).

Moderator	k	Slope coefficient	Standard error	t-value	p-value	R ²
Mean age	19	.0079	.0255	.31	.76	0
Percent males	32	-.0058	.0077	-.75	.46	0
School grade	35	.0128	.0142	.90	.37	0
Survey year	28	.0061	.0043	1.41	.17	.28
Number of schools	32	.0000	.0003	.03	.98	0
Publication year	36	.0101	.0052	1.93	.06	.03

attenuation (measurement error) in the two variables (i.e., the measure of school climate and the measure of school violence); (3) the Hunter-Schmidt estimator for the amount of heterogeneity is used.

For 10 out of the 36 studies (28%), the reliability of the violence measurements was unavailable. Also, for 3 studies (8%), the reliability of the climate measurements was unavailable. The mean reliability based on the available data (.77 for both the violence and the climate measurements) was substituted for the missing information. Fig. 7 shows a scatterplot of the observed versus the disattenuated correlations in the 36 studies. The effect of the attenuation correction is to increase the size of the correlations.

The estimated average correlation based on the random-effects model using the disattenuated correlations was $-.32$ (95% CI: $-.37$ to $-.27$). The amount of heterogeneity remained very large ($Q = 2013.56$, $df = 35$, $p < .0001$; $I^2 = 98.1\%$; $\tau^2 = .17$), which is also reflected in the wide 95% credibility interval ($-.58$ to $.00$). Although the estimated average

Fig. 6. Cumulative forest plot as a function of publication year.

correlation was slightly larger due to the disattenuation, the results are qualitatively very similar to those obtained earlier.

In conclusion, there appears to be a small- to medium-sized negative correlation between school climate and school violence. The average correlation falls (approximately) somewhere between $-.20$ and $-.30$, depending on the model and analysis strategy. Outliers

or overly influential studies do not appear to be present. There is also no indication of funnel plot asymmetry (which suggests the absence of publication bias). The school grade of the sample and the publication year of the study may be potential moderators, with stronger (more negative) correlations being found in earlier school grades and in studies published earlier.

4. Discussion

This meta-analysis showed a moderate negative relationship between students' perception of school climate and violence. Attempts to identify factors explaining this relation were not successful. Students' characteristics (age, gender), as well as school' characteristics (school size, school grade) could not be identified as clear moderators. Moreover, subdividing studies' measures into categories did not provide more information of greater effect size between relational, cognitive, affective or organizational school climate, neither did differentiations between committed, experienced or general perception of violence. These results lead to the conclusion that even if there is large heterogeneity in the theoretical and methodological aspects of school climate and school violence, the overall effect of the 36 studies

Table 4
Results for the univariate meta-regression models (categorical moderators).

Moderator/level	K	Estimated correlation	95% CI
<i>Peer reviewed</i>			
• No	7	−.17	−.28 to −.07
• Yes	29	−.28	−.33 to −.23
		F(1, 34) = 3.36, p = .08, R ² = .02	
<i>Violence dimension</i>			
• Violence committed	23	−.23	−.29 to −.18
• Violence experienced	10	−.28	−.37 to −.20
• General perception	3	−.36	−.50 to −.21
		F(2, 33) = 1.47, p = .25, R ² = .09	
<i>Climate dimension</i>			
• Relational	10	−.27	−.35 to −.18
• Cognitive–affective	17	−.25	−.32 to −.18
• Organizational	9	−.26	−.35 to −.16
		F(2, 33) = 0.03, p = .97, R ² = .01	
<i>Continent</i>			
• North America	23	−.25	−.31 to −.19
• Europe	9	−.24	−.32 to −.14
• Asia	4	−.35	−.47 to −.21
		F(2, 33) = 1.07, p = .35, R ² = .14	

Table 5
Results for the multiple meta-regression model after backward elimination.

Moderator	Coefficient	Standard error	t-value	p-value
Intercept	-23.243	11.019	-2.11	.05
School grade	0.027	0.014	1.94	.07
Publication year	0.011	0.006	2.08	.05

Fig. 7. Observed versus disattenuated correlations.

included in the meta-analysis underlined the impact of environmental factors on violent behaviors in schools. With this in mind, an expansive research agenda to better understand the relationship is needed. In particular, more and potentially better definitions and theories about both constructs and their relationship are called for.

4.1. Limitations

Some limitations have to be taken into account. First, the strength of the relationship between school climate and violence is difficult to assess due to the multiple measures of school climate and violence used by the included studies. This can partially be attributed to: (1) the multidisciplinary nature of the studies, and (2) to the fact that this research domain is new (Johnson, 2009). Second, a large number of studies using hierarchical modeling (HLM) have been excluded because the present meta-analysis is based on the individual perception of school climate. HLM procedures provide aggregated analyses on different levels which enable researchers to take into account the shared climate perception of a school.

4.2. Perspectives

The goal of this meta-analysis was to provide evidence for the relationship between school climate and school violence. This review suggests that by modifying the environmental factor of the school, violence behaviors can be reduced. Thus, it is recommended that future prevention program should target both individual and environmental factors of school violence. Beyond the classical notion that violence perpetrators are the main factors responsible for school violence, the role of the school as an entity should be questioned. Schools' educational and social functions influence the people's development, and should, therefore, be a priority in violence prevention programs.

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