



## Original article

## Income Inequality or Performance Gap? A Multilevel Study of School Violence in 52 Countries

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## A B S T R A C T

**Purpose:** The purpose of the study was to examine the association between income inequality and school violence and between the performance inequality and school violence in two international samples.

**Methods:** The study used data from Trends in International Mathematics and Science Study 2011 and from the Central Intelligence Agency of United States which combined information about academic performance and students' victimization (physical and social) for 269,456 fourth-grade students and 261,747 eighth-grade students, with gross domestic product and income inequality data in 52 countries. Ecological correlations tested associations between income inequality and victimization and between school performance inequality and victimization among countries. Multilevel ordinal regression and multilevel regression analyses tested the strength of these associations when controlling for socioeconomic and academic performance inequality at school level and family socioeconomic status and academic achievement at student level.

**Results:** Income inequality was associated with victimization rates in both fourth and eighth grade ( $r \approx .60$ ). Performance inequality shows stronger association with victimization among eighth graders ( $r \approx .46$ ) compared with fourth graders ( $r \approx .30$ ). Multilevel analyses indicate that both an increase in the income inequality in the country and school corresponds with more frequent physical and social victimization. On the other hand, an increase in the performance inequality at the system level shows no consistent association to victimization. However, school performance inequality seems related to an increase in both types of victimizations.

**Conclusions:** Our results contribute to the finding that income inequality is a determinant of school violence. This result holds regardless of the national performance inequality between students.

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IMPLICATIONS AND  
CONTRIBUTION

Research has reported through separate studies that both socioeconomic inequality and students' performance inequality may increase prevalence of school victimization. Using data from countries on five continents, we analyze the relation of both types of inequality and school violence. Results suggest that socioeconomic inequality has a greater impact on school victimization.

School violence and peer victimization is a public health and safety issue that is receiving an increasing amount of academic attention due to the pervasiveness that it may have and the high

private and social costs associated with it. Only considering school bullying, a specific type of peer victimization defined as a type of violence that is repetitive, intentional, and takes place between two parties that have a power differential that prevents the victim from defending him or herself using his or her own means [1]; the prevalence can reach >50% in some specific contexts [2].

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Furthermore, extensive literature shows that being frequently victimized by peers in school is linked to lower academic performance [3–5] and the development of multiple psychosocial problems in children and young people. For example, children near the age of 8 years who are victims of school bullying report having issues such as sleeping problems, bedwetting, and head and stomach aches, and young people around the age of 15 years who are victims of school bullying show a greater likelihood of having symptoms of depression, suicidal thoughts, feelings of insecurity, sadness, and exclusion from the school community [6–9].

There are also studies that show that victims of violence in school may have permanent costs, such as increases in (1) future use of psychopharmacological medication; (2) the likelihood of teen pregnancy; and (3) the likelihood of earning a lower salary as an adult [10–12].

Owing to the high costs associated with school peer victimization, it is important to examine its causes. Research focused on studying its determinants has found that student characteristics such as an unattractive physical appearance, students that have an inadequate connection with their parents, or those with low levels of trust in their teachers are more likely to be victimized [10,13,14].

However, research is less clear about the potential effect of socioeconomic status on violence in school. Although some studies show that students from a low socioeconomic status are more likely to be victims of school violence [15,16], others find that students from a high socioeconomic status could have a higher likelihood of victimization [17]. Despite the above, an increasing body of evidence suggests that there is a relationship between school violence and the socioeconomic inequality to which the students are exposed [18,19]. There are at least three studies that find that the socioeconomic inequality of the society which the children are exposed is related to the prevalence of bullying [18–20]. The theory is that there are dominant relationships between those who have more and those who have less in more unequal countries and that it is possible for children and adolescents who grow up in these social contexts to develop peer relationships that replicate the unequal relationships that they observe among adults through victimization [21].

There is no consensus in the literature on the effect that socioeconomic inequality may have on levels of school peer victimization. For example, Akiba et al. [22] analyzed determinants of school violence and concluded that it is not associated with the country's income inequality but that it is linked to inequalities in students' academic performance. Specifically, higher levels of school violence are found in educational systems where there is a larger performance gap between high and low academic outcomes. This would be explained by the fact that educational systems with a significant performance gap among high- and low-achieving students may have a higher percentage of young people who perceive themselves as academic failures compared with other students. This would be a source of frustration that could translate into higher levels of school peer victimization.

This article seeks to contribute to this debate, examining which type of inequality (socioeconomic or academic) has a stronger connection to school violence. Multilevel models are estimated separately to explain social and physical peer victimization based on socioeconomic inequality and academic performance at the school and national levels. The study was conducted separately for two groups of students: fourth-grade

preadolescents (age 9 years) and eighth-grade adolescents (age 13 years).

## Methods

Owing to the retrospective nature of this study, it was granted an exemption in writing by the University Diego Portales Ethics Committee.

### Sample

We use the 2011 Trends in International Mathematics and Science Study (TIMSS) assessment (<http://timssandpirls.bc.edu/>). The 2011 TIMSS gathers information on standardized test results in mathematics and science for 269,456 fourth graders and 261,747 eighth graders in 52 and 45 countries, respectively. Some countries participate in both grade levels, and others only take part in one. In addition to academic performance, this assessment provides context information gathered through questionnaires filled out by students, teachers, and principals from each of the schools evaluated. Students have an extra 30 minutes after taking the academic test for completing the anonymous questionnaires.

The TIMSS study uses a two-stage random sampling design. In the first stage, a sample of schools is selected proportional to size. In the second, one or more classes and all their students are chosen at random from the schools selected in the first stage. Only one class was selected for close to 80% of the schools. Given the sample precision standards set for the TIMSS study, any estimate at the student level must have a confidence interval of  $\pm 3.5\%$ . For most countries, this is achieved with a sample of approximately 150 schools and 4,000 students.

### Measurements and procedures

**Individual data.** The victimization data come from the following six questions posed to students regarding the frequency with which they feel that they have been the victims of different types of violence during the school year: (1) if they were called names or made fun of; (2) if they were ignored by other students during games or similar activities; (3) if lies were spread about them; (4) if something was stolen from them; (5) if they were hit or injured by other students; and (6) if they were forced to do things they did not want to do. The answer to each of the questions consists of an ordinal four-point scale (0 = at least once a week, 1 = once or twice a month, 2 = a few times a year, and 4 = never).

In addition, two variables were constructed that measure the frequency with which the student is a victim of physical or social violence. Physical victimization was measured using an ordinal variable created on the basis of three variables associated with such behavior (i.e., stealing, injury or being forced to do something). Each one of these variables was dichotomized and took a value of one when students said that they had been a victim of each type of victimization at least once or twice per month. It has been found that using this frequency is convenient and has a reasonably well-defined meaning in terms of the psychosocial consequences that victims present [23]. The physical victimization variable is the sum of these three dichotomous variables. The social victimization variable was defined in an equivalent manner but based on the three variables associated with verbal and relational victimization (called names, left out of games, lies spread about them).

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