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**Paper Title** Does Bullying at School Predict Student Academic Performance? Evidence From 65 Countries

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## **Does Bullying at School Predict Student Academic Performance?**

### **Evidence from 65 Countries**

**ABSTRACT.** This study, drawing on data from the latest cycles of the Trends in International Mathematics and Science Study (TIMSS) and the Progress in International Reading Literacy Study (PIRLS), examined whether or not bullying at school is related to (i) mathematics, science, and reading achievement among fourth-graders in TIMSS 2011 and PIRLS 2011 participating countries and (ii) mathematics and science achievement among eighth-graders in TIMSS 2011 participating countries. Ordinary least squares regression analyses revealed that bullying at school is negatively related to academic achievement among fourth- and eighth-graders in most of the TIMSS 2011 and PIRLS 2011 participating countries. Implications of the findings are briefly discussed for educational policy and practice.

*Keywords:* bullying at school, mathematics achievement, science achievement, reading achievement, TIMSS 2011, PIRLS 2011

### **Purpose of the Study**

There is growing evidence that bullying at school is alarmingly on the rise in many countries across the globe (see Craig et al., 2009; Martin, Mullis, Foy, & Stanco, 2012; Mishna, 2012; Mullis, Martin, Foy, & Drucker, 2012). For example, according to the fifth cycle of the Trends in International Mathematics and Science Study (TIMSS), 52% of the fourth grade students and 41% of the eighth grade students in over 60 countries were bullied at school either about monthly or about weekly (Martin et al., 2012). Moreover, the third cycle of the Progress in International Reading Literacy Study (PIRLS) also revealed that 53% of the fourth-graders in over 40 countries were bullied at school either about monthly or about weekly (Mullis et al., 2012).

Given the extent of bullying at school, it is crucial to examine the relationship of bullying at school to student academic performance. To date, however, only a small body of

research has explored the links between school bullying and student academic performance (e.g., Konishi et al., 2010). Specifically, there is a dearth of cross-national empirical evidence on the relationship between bullying at school and student academic achievement. Hence, the purpose of the present study was two-fold: first, to examine the relationship of bullying at school to mathematics, science, and reading achievement among fourth-graders in TIMSS 2011 and PIRLS 2011 participating countries; and second, to investigate the relationship of bullying at school to mathematics and science achievement among eighth-graders in TIMSS 2011 participating countries. The following two research questions addressed the purpose of the study:

1. Does bullying at school significantly predict mathematics, science, and reading achievement among fourth-graders in TIMSS 2011 and PIRLS 2011 participating countries?
2. Does bullying at school significantly predict mathematics and science achievement among eighth-graders in TIMSS 2011 participating countries?

### **Theoretical Framework**

A safe and orderly school environment is indispensable for student achievement and engagement (Konishi, Hymel, Zumbo, & Li, 2010; Mehta, Cornell, Fan, & Gregory, 2013). However, one of the major obstacles to school safety across countries is bullying at school (Craig et al., 2009; Elgar, Craig, Boyce, Morgan, & Vella-Zarb, 2009). Bullying refers to “a form of aggression that can be direct or indirect and includes physical, verbal, or psychological and relational acts, that is intentional and occurs in a relationship characterized by a power imbalance, and is repeated over time” (Mishna, 2012, p. 5).

A large body of research has documented the effects of bullying at school on student mental and physical health (e.g., Skrzypiec, Slee, Askell-Williams, & Lawson, 2012; Turner, Exum, Brame, & Holt, 2013). Such detrimental effects of bullying at school include, among

others, depression (e.g., Rethon, Head, Klineberg, & Stansfeld, 2011; Turner et al., 2013), anxiety (e.g., Yen, 2013), psychosomatic symptoms (e.g., Gini & Pozzoli, 2009), isolation and loneliness (e.g., Owusu, Hart, Oliver, & Kang, 2011), suicidal ideation and suicide attempt (e.g., Hepburn, 2012; Turner et al., 2013), and physical injury (e.g., Dukes, Stein, & Zane, 2010). A growing corpus of research has also demonstrated the effects of bullying at school on children's academic functioning (see Mishna, 2012, for a review). The academic consequences of bullying at school include, among others, school avoidance (e.g., Hutzell & Payne, 2012), early school dropout (e.g., Cornell, Gregory, Huang, & Fan, 2013), school disengagement (e.g., Juvonen, Wang, & Espinoza, 2011; Mehta et al., 2013), and low levels of school valuing and bonding (e.g., Farmer, Petrin, Brooks, Hamm, Lambert, & Gravelle, 2012). Given the adverse effects of bullying on students' mental, physical, social and academic functioning, it is of critical importance to examine the links between bullying at school to student academic performance.

## **Method**

### **Data**

Data for the study were drawn from the fifth cycle of the Trends in International Mathematics and Science Study (TIMSS 2011) and the third cycle of the Progress in International Reading Literacy Study (PIRLS 2011). TIMSS 2011 assessed the competencies of fourth- and eighth-graders in mathematics and science in 63 countries and 14 benchmarking entities. PIRLS 2011 assessed the competencies of fourth-graders in reading in 49 countries and nine benchmarking entities.

### **Measures**

**Mathematics, science, and reading achievement.** The TIMSS 2011 mathematics and science achievement scales for the fourth and eighth grades, and the PIRLS 2011 reading achievement scale for the fourth grade were the outcome measures in the present study (see

Martin & Mullis, 2012).

**Bullying at school.** In TIMSS 2011, both fourth- and eighth-graders were asked to report how often they experienced six bullying behaviors at school (“I was made fun of or called names.”; “I was left out of games or activities by other students.”; “Someone spread lies about me.”; “Something was stolen from me.”; “I was hit or hurt by other student(s).”; and “I was made to do things I didn’t want to do by other students.”). In PIRLS 2011, only fourth-graders were asked to report how often they experienced these six bullying behaviors at school. These six items were rated on 4-point Likert-type scale, ranging from 1 (*never*) to 4 (*at least once a week*). TIMSS and PIRLS used item response theory (IRT) scaling procedures for constructing indices based on these six items (see Martin & Mullis, 2012). The current study used the TIMSS and PIRLS indices of bullying at school (see Martin & Mullis, 2012).

In addition, variables such as gender, home language, and family socio-economic resources were entered into the regression equation as control variables.

### Results

To address the purpose of the study, separate ordinary least squares (OLS) regression analyses were conducted for each country (see Table 1). The IEA International Database Analyzer (Version 3.0) was used to perform OLS regression analyses. Internationally, on average, bullying at school was significantly negatively related to mathematics ( $\beta = -.13, p < .05$ ), science ( $\beta = -.13, p < .05$ ) and reading ( $\beta = -.17, p < .05$ ) achievement among fourth-graders. Similar results were evident for eighth-graders’ mathematics ( $\beta = -.10, p < .05$ ) and science ( $\beta = -.10, p < .05$ ) achievement as well. Thus, the results of the present study suggest that students who are frequently bullied at school are more likely to demonstrate poor academic performance cross-nationally.

### **Scholarly Significance of the Study**

The cross-national empirical evidence for the inverse relationship of bullying at school to student academic performance underscores the need for preventing and intervening in school bullying through effective anti-bullying programs. Because school bullying is a complex and pervasive phenomenon, bullying researchers underline the need to employ an ecological systems theoretical framework (Bronfenbrenner, 1979) to better understand and effectively address the phenomenon of school bullying (see Hong & Espelage, 2012; Mishna, 2012).

According to the ecological systems framework, “bullying problems do not reside solely with the child who bullies or who is victimised. Bullying unfolds in the social context of the peer group, the classroom, the school, the family, and the broader community and society” (Mishna, 2012, p. 25). School-based anti-bullying intervention programs are often ineffective in preventing bullying at school because such programs are not designed and implemented in line with the ecological systems framework (Hong & Espelage, 2012). Meta-analyses of the effectiveness of school-based anti-bullying intervention programs indicate that programs that incorporate an ecological systems perspective are more likely to be successful in preventing bullying at school (e.g., Ttofi & Farrington, 2009, 2011). Therefore, future school-based anti-bullying prevention and intervention programs should be embedded within an ecological systems framework with a view to eliminating or reducing bullying at school.

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Table 1. Regression analyses predicting mathematics, science, and reading achievement

	Grade 4						Grade 8					
	Mathematics		Science		Reading		Mathematics		Science			
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE		
Armenia	-.15*	.02	-.13*	.02	—	—	-.10*	.02	-.10*	.02		
Australia	-.12*	.02	-.12*	.02	-.14*	.02	-.11*	.02	-.06*	.02		
Austria	-.11*	.02	-.09*	.02	-.14*	.02	—	—	—	—		
Azerbaijan	-.20*	.02	-.21*	.02	-.20*	.03	—	—	—	—		
Bahrain	-.18*	.02	-.19*	.02	—	—	-.18*	.02	-.17*	.02		
Belgium (Flemish)	-.13*	.02	-.14*	.02	—	—	—	—	—	—		
Belgium (French)	—	—	—	—	-.10*	.02	—	—	—	—		
Botswana	-.14*	.02	-.15*	.02	-.14*	.02	-.21*	.02	-.23*	.02		
Bulgaria	—	—	—	—	-.15*	.02	—	—	—	—		
Canada (Alberta)	-.14*	.02	-.17*	.02	-.18*	.02	-.13*	.02	-.09*	.02		
Canada (Ontario)	-.10*	.02	-.09*	.02	-.21*	.02	-.08*	.02	-.08*	.02		
Canada (Quebec)	-.15*	.02	-.13*	.02	-.20*	.02	-.04*	.02	-.02	.02		
Chile	-.19*	.02	-.16*	.02	—	—	-.12*	.02	-.10*	.02		
Chinese Taipei	-.11*	.02	-.11*	.02	-.17*	.02	-.05*	.02	-.03	.02		
Columbia	—	—	—	—	-.16*	.03	—	—	—	—		
Croatia	-.15*	.02	-.16*	.02	-.17*	.02	—	—	—	—		
Czech Republic	-.15*	.02	-.15*	.03	-.16*	.02	—	—	—	—		
Denmark	-.12*	.02	-.12*	.02	-.11*	.02	—	—	—	—		
England	-.11*	.03	-.13*	.03	-.21*	.02	-.04	.03	-.04	.03		
Finland	-.09*	.02	-.09*	.02	-.13*	.02	-.07*	.02	-.03	.02		
France	—	—	—	—	-.14*	.02	—	—	—	—		
Georgia	-.19*	.03	-.21*	.03	-.24*	.03	-.13*	.02	-.14*	.02		
Germany	-.14*	.02	-.16*	.02	-.17*	.02	—	—	—	—		
Ghana	—	—	—	—	—	—	-.15*	.02	-.14*	.02		
Honduras	-.10*	.03	-.08*	.03	-.15*	.03	-.04	.02	-.02	.02		
Hong Kong	-.13*	.03	-.10*	.04	-.13*	.02	.01	.03	-.01	.03		
Hungary	-.09*	.03	-.08*	.03	-.13*	.03	-.06*	.02	-.03	.02		
Indonesia	—	—	—	—	-.05	.03	.03	.03	.01	.02		
Iran	-.01	.03	-.03	.03	-.02	.03	-.07*	.02	-.09*	.02		
Ireland	-.22*	.02	-.21*	.02	-.23*	.03	—	—	—	—		
Italy	-.10*	.02	-.09*	.02	-.14*	.02	-.10*	.02	-.07*	.02		
Japan	-.06*	.02	-.04	.02	—	—	.02	.02	.04	.02		
Jordan	—	—	—	—	—	—	-.23*	.02	-.26*	.02		
Kazakhstan	-.03	.03	-.01	.03	—	—	.00	.02	.04	.03		
Korea	-.07*	.02	-.04	.02	—	—	-.01	.02	.01	.02		
Kuwait	-.18*	.02	-.17*	.02	-.31*	.03	—	—	—	—		
Lebanon	—	—	—	—	—	—	-.22*	.03	-.29*	.03		

Lithuania	-.16*	.02	-.17*	.02	-.21*	.02	-.11*	.02	-.08*	.02
Macedonia	—	—	—	—	—	—	-.19*	.02	-.19*	.02
Malaysia	—	—	—	—	—	—	-.07*	.03	-.07*	.03
Malta	-.17*	.02	-.14*	.02	-.18*	.01	—	—	—	—
Morocco	-.15*	.03	-.14*	.03	-.14*	.03	-.05*	.01	-.06*	.02
Netherlands	-.10*	.02	-.09*	.02	-.11*	.02	—	—	—	—
New Zealand	-.15*	.02	-.14*	.02	-.22*	.02	-.08*	.02	-.05*	.02
Northern Ireland	-.15*	.03	-.14*	.03	-.17*	.02	—	—	—	—
Norway	-.14*	.03	-.09*	.02	-.12*	.02	-.08*	.03	-.09*	.03
Oman	-.10*	.02	-.11*	.01	-.12*	.02	-.20*	.01	-.22*	.02
Palestine	—	—	—	—	—	—	-.22*	.02	-.25*	.02
Poland	-.10*	.02	-.11*	.02	-.15*	.02	—	—	—	—
Portugal	-.10*	.03	-.10*	.03	-.13*	.02	—	—	—	—
Qatar	-.19*	.02	-.24*	.02	-.24*	.02	-.17*	.03	-.17*	.03
Romania	-.20*	.02	-.19*	.03	-.18*	.03	-.20*	.02	-.19*	.02
Russian Federation	-.10*	.02	-.08*	.02	-.12*	.02	-.05*	.02	-.01	.02
Saudi Arabia	-.14*	.02	-.19*	.02	-.18*	.03	-.08*	.02	-.10*	.02
Serbia	-.12*	.03	-.14*	.03	—	—	—	—	—	—
Singapore	-.17*	.02	-.15*	.01	-.18*	.01	-.11*	.02	-.09*	.02
Slovak Republic	-.14*	.02	-.12*	.02	-.16*	.02	—	—	—	—
Slovenia	-.16*	.02	-.13*	.02	-.17*	.02	.01	.02	.04	.02
South Africa	—	—	—	—	-.38*	.03	-.31*	.02	-.36*	.02
Spain	-.09*	.02	-.10*	.02	-.14*	.02	—	—	—	—
Sweden	-.11*	.02	-.13*	.02	-.15*	.02	-.07*	.02	-.05*	.02
Syria	—	—	—	—	—	—	-.12*	.02	-.14*	.02
Thailand	-.11*	.03	-.10*	.02	—	—	-.01	.02	-.01	.02
Trinidad and Tobago	—	—	—	—	-.15*	.02	—	—	—	—
Tunisia	-.17*	.03	-.19*	.02	—	—	-.02	.02	-.03	.02
Turkey	-.22*	.02	-.20*	.02	—	—	-.15*	.02	-.15*	.02
Ukraine	—	—	—	—	—	—	-.11*	.02	-.09*	.03
United Arab Emirates	-.17*	.02	-.18*	.01	-.18*	.02	-.18*	.01	-.19*	.01
United States	-.09*	.01	-.13*	.01	-.18*	.01	-.06*	.01	-.03	.01
Yemen	-.09*	.03	-.06	.04	—	—	—	—	—	—
International Average	-.13*	.00	-.13*	.00	-.17*	.00	-.10*	.00	-.10*	.00

*Note.* — indicates no data available.

\* $p < .05$ .