IEA COMPASS
BRIEFS IN EDUCATION

Researching education, improving learning

NUMBER 1 APRIL 2018

No one likes a bully

How systematic is international bullying and what relationship does it have with mathematics achievement in 4th grade?

SUMMARY

- Children are bullied in primary schools around the world.
- The amount of bullying varies widely but, on average, nearly half of all children report being bullied at least once a month
- Children who are bullied tend to do less well in mathematics.

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IMPLICATIONS

- The TIMSS 2015 results clearly show that bullying is not isolated to one country. Rather, bullying is an international phenomenon that spans cultures and economies.
- TIMSS 2015 provides evidence of a strong international association between bullying and mathematics achievement at the fourth grade. Bullying prevention policies should be considered to ensure a safe learning environment where all students can meet their potential. Scholars and policymakers should work together on this crucial topic to reduce bullying and improve achievement.
- This simple analysis of the international grade 4 TIMSS results shows that bullying begins at an early age, and achievement gaps between frequently and infrequently bullied students also emerge in the early years of education. Bullying policies also need to begin in the early years.
- TIMSS provides an important resource for policymakers to monitor both existing and new anti-bullying interventions, and it is a rich resource to learn from others and monitor what works.

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INTRODUCTION

Over the past two decades, there has been rapid growth in understanding of bullying in schools and its many negative effects. The reported incidence of bullying and other school violence has increased over time, and UNESCO recently estimated that 246 million children and adolescents experience violence in and around school every year (UNESCO 2017). Such findings have led the United Nations' envoy on violence against children to conclude that bullying in schools is a "serious concern" that threatens victims' fundamental rights to education (United Nations News Service 2015). Academic research has consistently confirmed that bullying is a global phenomenon affecting students at all levels of social status and academic abilities (see Akiba 2008; Jimerson et al. 2010; Rutkowski & Rutkowski 2016).

The International Association for the Evaluation of Educational Achievement's (IEA) flagship Trends in Mathematics and Science Study (TIMSS) is a valuable resource to inform better understanding of bullying trends in general, as well as revealing the relationship between bullying and academic achievement, both within and between countries. The TIMSS study is unique in that over the past 20 years it has administered a bullying scale to 4th and 8th grade students from around the world. The responses that students provided to the TIMSS 2015 student questionnaire provide a unique perspective on bullying around the world.

HOW TIMSS ASSESSES BULLYING

The TIMSS student questionnaire for grade four students features an eight-item scale that asks individual students about their bullying victimization experiences (Figure 1). Such contextual data permits researchers to analyze the percentage of students that report being a victim of bullying and connect this information with achievement results to examine the relationship between bullying and achievement in both mathematics and science.

Figure 1: Question G12 from the TIMSS 2015 student questionnaire, grade 4

G12

During this school year, how often have other students from your school done any of the following things to you (including through texting or the Internet)?

*Fill **one** circle for each line.*

	At least once a week	Once or twice a month	A few times a year	Never
a) Made fun of me or called me names	○	○	○	○
b) Left me out of their games or activities	○	○	○	○
c) Spread lies about me	○	○	○	○
d) Stole something from me	○	○	○	○
e) Hit or hurt me (*e.g., shoving, hitting, kicking*)	○	○	○	○
f) Made me do things I didn't want to do	○	○	○	○
g) Shared embarrassing information about me	○	○	○	○
h) Threatened me	○	○	○	○

Source: TIMSS & PIRLS International Study Center (2014).

BULLYING AROUND THE WORLD AND ITS RELATIONSHIP TO MATHEMATICS ACHIEVEMENT

Findings from TIMSS 2015 4th grade provide a unique opportunity to explore the extent of bullying experienced by students from around the world. In this 2015 survey, the majority of students internationally reported almost never being bullied (56%), while, in contrast, 16% of students reported being bullied about weekly, providing ample evidence that bullying is a systemic problem at the international level and that bullying is occurring during the early years of schooling (See Table 1). The results also show highly varied rates of bullying that depend on the educational system. For example, 76% of Korean students report never being bullied, while only 23% of South African students report similarly.

Table 1: Student bullying reported by grade 4 students surveyed in TIMSS 2015

Country	Almost never				About monthly				About weekly				Average bullying scale score	
	Percent of students		Average achievement		Percent of students		Average achievement		Percent of students		Average achievement			
Korea, Republic of	76	(1.0)	608	(2.3)	20	(0.8)	609	(3.5)	4	(0.4)	604	(6.9)	11.0	(0.05)
Ireland	75	(1.1)	549	(4.6)	18	(0.8)	539	(7.0)	7	(0.6)	517	(7.5)	11.1	(0.07)
Kazakhstan	73	(1.2)	555	(2.2)	20	(1.0)	538	(3.7)	6	(0.4)	496	(5.9)	10.8	(0.06)
Croatia	73	(1.2)	507	(1.8)	19	(0.9)	493	(3.7)	8	(0.6)	485	(4.9)	10.8	(0.06)
Georgia	73	(1.1)	476	(3.3)	18	(0.7)	459	(4.7)	9	(0.7)	413	(7.8)	10.8	(0.05)
Serbia	73	(1.0)	522	(3.9)	19	(0.9)	523	(5.2)	8	(0.5)	488	(6.8)	10.9	(0.05)
Poland	73	(1.0)	540	(2.1)	19	(0.8)	531	(3.8)	8	(0.5)	502	(5.5)	10.7	(0.05)
Finland	71	(1.2)	540	(1.9)	22	(0.9)	531	(3.3)	7	(0.5)	504	(5.4)	10.5	(0.05)
Norway (grade 5)	70	(1.3)	554	(2.6)	23	(1.0)	543	(3.2)	7	(0.6)	521	(6.9)	10.5	(0.05)
Japan	68	(1.3)	598	(2.0)	23	(1.0)	588	(3.1)	8	(0.6)	566	(6.1)	10.6	(0.05)
France	65	(1.2)	492	(2.9)	26	(1.0)	486	(4.0)	8	(0.6)	467	(6.4)	10.4	(0.05)
Sweden	65	(1.3)	526	(2.8)	28	(1.1)	512	(3.6)	7	(0.5)	482	(6.4)	10.3	(0.05)
Northern Ireland	64	(1.5)	578	(3.0)	27	(1.1)	568	(4.4)	10	(0.7)	529	(7.2)	10.3	(0.06)
Chile	60	(1.3)	468	(2.6)	24	(0.9)	460	(3.6)	16	(0.8)	426	(4.2)	10.1	(0.06)
Czech Republic	60	(1.1)	535	(2.5)	28	(0.9)	526	(3.2)	12	(0.7)	501	(4.2)	10.2	(0.05)
Netherlands	59	(1.4)	533	(1.9)	31	(0.9)	531	(2.4)	10	(0.9)	512	(3.5)	10.0	(0.05)
Hungary	58	(1.3)	541	(3.1)	31	(1.1)	523	(3.4)	11	(0.7)	489	(8.7)	10.0	(0.05)
Chinese Taipei	58	(1.1)	602	(1.9)	29	(1.0)	593	(3.0)	13	(0.7)	583	(4.2)	10.1	(0.04)
Denmark	58	(1.2)	546	(3.0)	32	(0.9)	536	(3.4)	10	(0.7)	514	(4.4)	10.0	(0.05)
Slovenia	58	(1.0)	526	(2.1)	29	(0.9)	521	(2.6)	14	(0.8)	499	(3.4)	10.0	(0.05)
Turkey	57	(1.1)	500	(3.2)	28	(0.8)	481	(3.4)	14	(0.7)	428	(5.8)	10.1	(0.05)
Germany*	57	(1.3)	531	(2.2)	30	(0.9)	526	(2.5)	13	(0.7)	503	(4.2)	10.0	(0.05)
Slovak Republic	57	(1.1)	507	(3.0)	30	(0.8)	494	(3.1)	13	(0.7)	472	(5.6)	10.1	(0.06)
Portugal	57	(1.0)	547	(2.3)	29	(0.9)	542	(3.1)	15	(0.9)	521	(4.6)	10.0	(0.04)
Lithuania	56	(1.3)	547	(2.7)	31	(1.0)	530	(3.2)	13	(0.7)	502	(4.9)	9.9	(0.05)
United States	56	(0.8)	550	(2.5)	29	(0.5)	540	(2.5)	15	(0.5)	510	(3.5)	9.9	(0.04)
Cyprus	55	(1.2)	534	(3.0)	29	(1.0)	523	(3.1)	16	(0.8)	497	(3.9)	9.9	(0.06)
Hong Kong SAR	54	(1.4)	618	(3.1)	32	(1.1)	613	(3.4)	14	(0.9)	603	(4.6)	9.9	(0.05)
England	54	(1.3)	553	(3.4)	31	(1.1)	546	(3.4)	15	(0.8)	522	(5.2)	9.8	(0.05)
Bulgaria	54	(1.9)	539	(5.5)	30	(1.1)	519	(4.8)	16	(1.1)	494	(6.9)	9.9	(0.08)
Canada	53	(0.9)	520	(2.3)	30	(0.6)	513	(2.2)	17	(0.8)	486	(3.4)	9.7	(0.04)
Jordan	52	(1.8)	411	(4.1)	26	(1.1)	395	(4.1)	21	(1.4)	339	(5.0)	9.8	(0.09)
Russian Federation	51	(1.3)	571	(3.3)	33	(0.9)	564	(4.7)	16	(0.6)	544	(5.2)	9.8	(0.05)
Italy	50	(1.0)	512	(2.8)	35	(0.9)	507	(3.2)	15	(0.7)	494	(4.7)	9.6	(0.04)
Iran, Islamic Republic of	50	(1.6)	434	(4.4)	32	(0.9)	439	(4.2)	18	(1.1)	419	(7.0)	9.7	(0.07)
Spain	48	(1.0)	512	(2.8)	33	(0.6)	504	(3.0)	19	(0.8)	491	(3.7)	9.6	(0.05)
Kuwait	48	(1.2)	359	(3.4)	31	(0.8)	356	(6.5)	21	(0.9)	338	(8.3)	9.7	(0.06)
Saudi Arabia	47	(1.7)	405	(4.6)	27	(1.1)	386	(5.3)	26	(1.3)	356	(5.0)	9.5	(0.08)
Singapore	47	(0.9)	631	(3.8)	34	(0.6)	618	(4.0)	19	(0.7)	585	(5.3)	9.5	(0.03)
Belgium (Flemish)	47	(1.3)	547	(2.4)	36	(0.9)	550	(2.5)	17	(0.8)	532	(3.6)	9.6	(0.05)
Australia	45	(1.3)	529	(3.7)	36	(1.1)	518	(2.9)	20	(1.1)	490	(5.5)	9.4	(0.05)
Morocco	44	(1.5)	395	(4.0)	35	(1.1)	381	(4.1)	21	(1.0)	348	(5.7)	9.5	(0.06)
Indonesia	44	(1.4)	402	(4.1)	31	(1.0)	406	(4.1)	25	(1.0)	389	(5.0)	9.4	(0.07)
Qatar	43	(1.2)	457	(3.5)	28	(0.8)	449	(4.9)	28	(1.0)	408	(4.7)	9.3	(0.06)
United Arab Emirates	43	(1.0)	469	(3.0)	31	(0.5)	458	(3.1)	26	(0.8)	420	(3.4)	9.4	(0.05)
Oman	42	(1.6)	436	(3.1)	33	(1.0)	430	(3.3)	25	(1.0)	406	(3.7)	9.4	(0.06)
New Zealand	40	(1.0)	503	(3.1)	36	(0.7)	496	(2.7)	24	(0.7)	467	(3.5)	9.2	(0.04)
Bahrain	34	(0.7)	468	(1.8)	33	(0.6)	457	(2.5)	33	(0.7)	432	(2.4)	9.0	(0.03)
South Africa (grade 5)	23	(1.0)	419	(6.2)	34	(0.9)	391	(3.5)	44	(1.5)	347	(3.9)	8.5	(0.05)
International average	56	(0.2)	514	(0.5)	29	(0.1)	505	(0.5)	16	(0.1)	478	(0.8)		

Table 1: Student bullying reported by grade 4 students surveyed in TIMSS 2015 - continued

Country	Almost never				About monthly				About weekly				Average bullying scale score	
	Percent of students		Average achievement		Percent of students		Average achievement		Percent of students		Average achievement			
Benchmarking participants														
Norway (grade 4)	70	(1.2)	499	(2.3)	21	(0.9)	488	(3.6)	9	(0.6)	465	(7.1)	10.6	(0.05)
Florida, USA	56	(1.6)	558	(5.7)	28	(1.1)	544	(5.1)	16	(1.0)	517	(6.1)	10.0	(0.07)
Quebec, Canada	54	(1.6)	541	(4.3)	31	(1.1)	538	(4.3)	14	(1.2)	515	(6.5)	9.9	(0.07)
Ontario, Canada	52	(1.3)	521	(2.3)	31	(0.8)	513	(3.2)	17	(1.2)	490	(4.0)	9.7	(0.05)
Buenos Aires, Argentina	50	(1.2)	445	(3.1)	29	(0.8)	444	(4.1)	21	(0.7)	413	(3.9)	9.6	(0.05)
Dubai, UAE	46	(1.3)	523	(2.1)	32	(0.9)	514	(2.8)	22	(1.0)	484	(3.5)	9.5	(0.06)
Abu Dhabi, UAE	39	(2.0)	439	(7.1)	31	(1.0)	430	(6.2)	30	(1.6)	388	(6.7)	9.1	(0.10)

Notes: Standard deviations are reported in brackets. Percentages may not add to 100% because of rounding.
**Data are available for at least 70% but less than 85% of students.*
For a full explanation of the student bullying scale and scores, see Mullis et al. (2016), or http://timssandpirls.bc.edu/timss2015/international-results/timss-2015/mathematics/school-safety/student-bullying/

TIMSS also provides perspectives on achievement differences across bullying levels. At one extreme, Korean students appeared to be highly resilient, given that mathematics achievement differed by just four points between the least and most frequently bullied. At the other end of the spectrum, Irish and South African students demonstrated dramatic differences, where the mathematics achievement gap was 59 and 72 points, respectively, between the most and least frequently bullied. Internationally, with respect to mathematics achievement in TIMSS 2015, students who reported they were bullied about weekly achieved 36 points (or nearly one grade level) below those students that were almost never bullied.

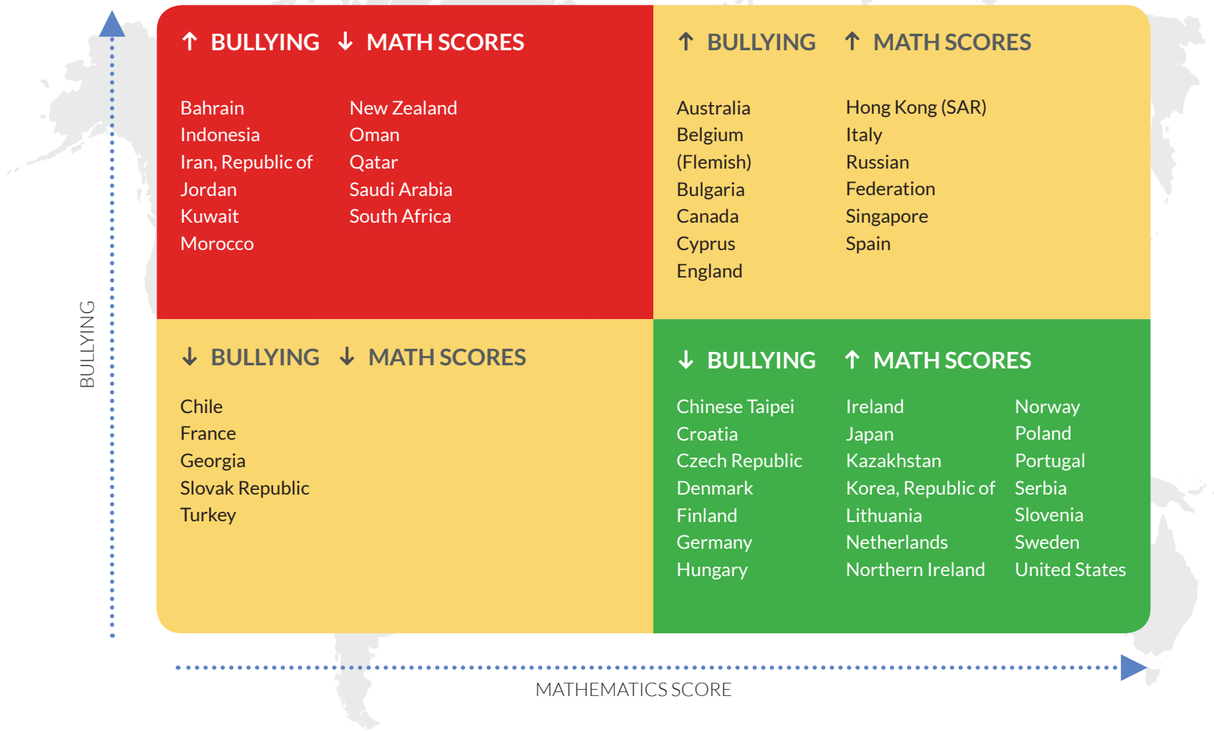
The results also illustrate a nuanced picture of the relationship between bullying and mathematics achievement. For example, Georgia – a relatively low performing country – reported that nearly three-quarters of their students almost never experienced bullying. Importantly, the difference between students who are almost never bullied and those that are bullied about weekly was 63 points for the TIMSS 2015 study. Similarly, students in high-performing Singapore reported a pervasive bullying problem, with about half of their students reporting being bullied at least monthly. The achievement differences in Singapore were similarly drastic – almost never bullied students achieved 46 points higher on average than their most frequently bullied peers. In spite of meaningful differences in average achievement and bullying experiences, these two diverse countries share similar relationships between bullying and mathematics, suggesting policymakers in both countries would be wise to consider measures to address bullying. There is clearly much to be learned from these sorts of patterns.

The TIMSS results can be analyzed to identify the relationship between bullying and achievement (Figure 2). Examining country groupings in terms of bullying levels and achievement, Korea again stands out as a high-achieving country with low levels of bullying, as does Japan. Discernible regional patterns are also apparent, as the Scandinavian countries all reported higher than average achievement and lower than average levels of bullying. An in-depth policy analysis of countries with these characteristics is merited as a first step toward identifying strategies to mitigate bullying.

The analysis also identified countries that could be considered at risk. In particular, some countries reported high math scores in spite of high rates of bullying. Although these countries might be regarded as resilient, it is reasonable to hypothesize that sustained high levels of bullying could eventually depress achievement, putting this group of countries at risk. An alternative explanation could be that the learning cultures in some high-achieving countries foster bullying behaviours. Either way, this situation is worthy of further exploration, particularly as it pertains to interventions or policies that might shift countries toward high achievement and low bullying levels. Also notable is that most of the countries that reported both lower than average achievement and higher than average rates of bullying were part of the Middle East and North African region (MENA). Again, such a strong regional pattern is worth further exploration in an effort to create a safe learning environment and, potentially, raise achievement.

From this relatively simple analysis of the international grade 4 TIMSS results, we conclude that bullying begins at an early age. Further, achievement gaps between frequently and infrequently bullied students also emerge in the early years of education. This important finding confirms that bullying policies also need to begin in the early years.

Figure 2 : The relationship between national mathematics achievement and the percentage of students who reported being bullied at least monthly in TIMSS 2015



Note: The international average of TIMSS 4th grade mathematics (500 score points) was used to divide low and high mathematics scores. To separate low- and high-system-level bullying, the international average of students who reported being bullied at least monthly (45%) was used.

CONCLUSIONS

Educational policymakers should address the issue of bullying by carefully examining their own contexts and using interventions that are proven to work best in a given setting. To that end, it is important to recognize that TIMSS findings are just one piece of evidence in the international bullying literature and further research, especially at the system level, is clearly needed to identify potential interventions and policies that foster a safe, secure learning environment for the youngest students. Nevertheless, analysis of a large-scale assessment such as TIMSS, with many countries and representative samples, demonstrates that bullying victimization is happening across a wide range of heterogeneous countries, regardless of geography, dominant race/ethnicity, language, culture, and economic development. Further, irrespective of rank, in the majority of countries there were lower levels of achievement where bullying was prevalent. Finally, the longitudinal design of TIMSS, which assesses 4th and 8th grade students every four years, offers policymakers an opportunity to use TIMSS results to investigate bullying trends over time, within and between countries.

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More about TIMSS

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SELECTED NATIONAL ANTI-BULLYING POLICIES AND INITIATIVES

Australia
https://www.education.gov.au/state-and-territory-anti-bullying-policies

Ireland
http://www.citizensinformation.ie/en/education/primary_and_post_primary_education/attendance_and_discipline_in_schools/bullying_in_schools_in_ireland.html

Singapore
https://www.gov.sg/news/content/channel-newsasia---education-ministry-does-not-tolerate-bullying-in-any-form-ng-chee-meng

United States
www.stopbullying.gov

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IEA COMPASS

ABOUT THE IEA
The International Association for the Evaluation of Educational Achievement, known as the IEA, is an independent, international consortium of national research institutions and governmental agencies, with headquarters in Amsterdam. Its primary purpose is to conduct large-scale comparative studies of educational achievement with the the aim of gaining more in-depth understanding of the effects of policies and practices within and across systems of education.

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Please cite this publication as:
Rutkowski, D., & Rutkowski, L. (2018, April). *How systemic is international bullying and what relationship does it have with mathematics achievement in 4th grade?* (IEA Compass: Briefs in Education No. 1). Amsterdam, The Netherlands: IEA.