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Working Paper

Examining the role of bullying on schooling outcomes: Findings from the longitudinal cohort study on the Filipino child

PIDS Discussion Paper Series, No. 2024-42

Provided in Cooperation with:

Philippine Institute for Development Studies (PIDS), Philippines

Suggested Citation: Herrin, Alejandro N. et al. (2024) : Examining the role of bullying on schooling outcomes: Findings from the longitudinal cohort study on the Filipino child, PIDS Discussion Paper Series, No. 2024-42, Philippine Institute for Development Studies (PIDS), Quezon City, <https://doi.org/10.62986/dp2024.42>

This Version is available at:

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DISCUSSION PAPER SERIES NO. 2024-42

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Alejandro N. Herrin, Jan L.G. Alegado, Judith B. Borja, Nanette L. Mayol, Francisco M. Largo, Isabelita N. Bas, and Michael R.M. Abrigo



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This study is carried out with support from the Second Congressional Commission on Education (EDCOM II).



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(EDCOM II)

April 2025

Abstract

The 2018 PISA results revealed that the Philippines ranked close to the bottom in reading, mathematics, and science but ranked at the top in terms of bullying in school. Analyses of PISA 2018 data found that bullying has a negative effect on school performance. This study uses longitudinal data from the Longitudinal Cohort Study on the Filipino Child (LCSFC) to supplement existing PISA-based analyses on the role of bullying on schooling outcomes. For this study we examine schooling outcomes in terms of class days missed, average school grade, and being on track with schooling. Bullying variables include physical bullying by friends/classmates, adults, and parents, and emotional bullying by friends/classmates and by parents. Some forms of bullying do have significant association with schooling outcomes. Of particular interest specific to the type of data the LCSFC has collected, is the role of bullying outside of the school, namely by adults and parents. Of further interest is the possibility that emotional bullying from friends/classmates may build resiliency and motivation contributing to positive schooling outcomes, a finding requiring further exploration. Finally, while the focus was on bullying, the role of background factors (child, family, belongingness, and community) figured prominently as critical factors in schooling outcomes supporting stronger implementation of a broader set of policies. Many policies have already been enacted. Strategies for policy implementation are suggested. Areas for further research are noted.

Keywords: PISA, bullying, schooling outcomes, child, family and community factors, longitudinal data,

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1. Introduction

In 2018, the Philippines participated in the Programme for International Student Assessment (PISA) for the first time. Among the findings that stood out are that the Philippines ranked close to the bottom in reading, mathematics, and science among participating countries, but ranked at the top in terms of prevalence of bullying in school. PISA 2018 also collected information on life satisfaction and sense of belonging. Both bullying and weak sense of belonging were found to be negatively associated with schooling performance. The World Bank and Organisation for Economic Co-operation and Development (OECD) prepared separate reports highlighting Philippine results (World Bank 2020). A report for the Second Congressional Commission on Education (EDCOM2) prepared by a team from De La Salle University further examined the bullying phenomenon (Bernardo et al. 2024). An earlier study examined the correlates of schooling performance using PISA 2018 data (Orbeta et al. 2021).

This paper aims to supplement information from PISA 2018 using data from the Longitudinal Cohort Study on the Filipino Child (LCSFC). In particular, it will examine the relationships among bullying, schooling outcomes, and a common set of child, belongingness, family, and community background factors. The LCSFC is a prospective study of a nationally representative cohort of Filipinos who were 10 years old in 2016 and observed at almost yearly survey intervals until this same sample reaches age 24 in 2030. The main purpose of the LCSFC is to provide information that would “describe the situation of a cohort of children with respect to SDG indicators as they go through the SDG years” (OPS 2018).

2. Data Source

The Longitudinal Cohort Study on the Filipino Child (LCSFC) is a collaborative undertaking of government agencies, development partners and demographic researchers aimed to examine “how the lives of Filipinos are changed in the course of the implementation of the Sustainable Development Goals (SDG) agenda” (OPS, 2018). The research strategy is to prospectively observe a nationally representative sample of Filipinos from age 10 (n=5,000 at baseline) through 24 (n=2,000 estimated at endline given attrition) and collect data on significant life course milestones such as puberty, school completion, labor force entry/exit, sexual activity initiation and other reproductive health events, and marriage.

The core modules include:

- Socio-demographic and economic characteristics
- Education and work
- Health –morbidity, diet, physical activity, anthropometry
- Risk behaviors –smoking, drinking alcoholic drinks, internet/social media use
- Exposure to bullying and domestic/peer violence
- Environment –exposure to hazards, disaster exposure
- Participation in poverty alleviation programs

The currently available data for analysis are the results of six survey rounds (referred to as “Waves”) starting from 2016 (Wave 1) when the cohort or index children (IC) were 10 years

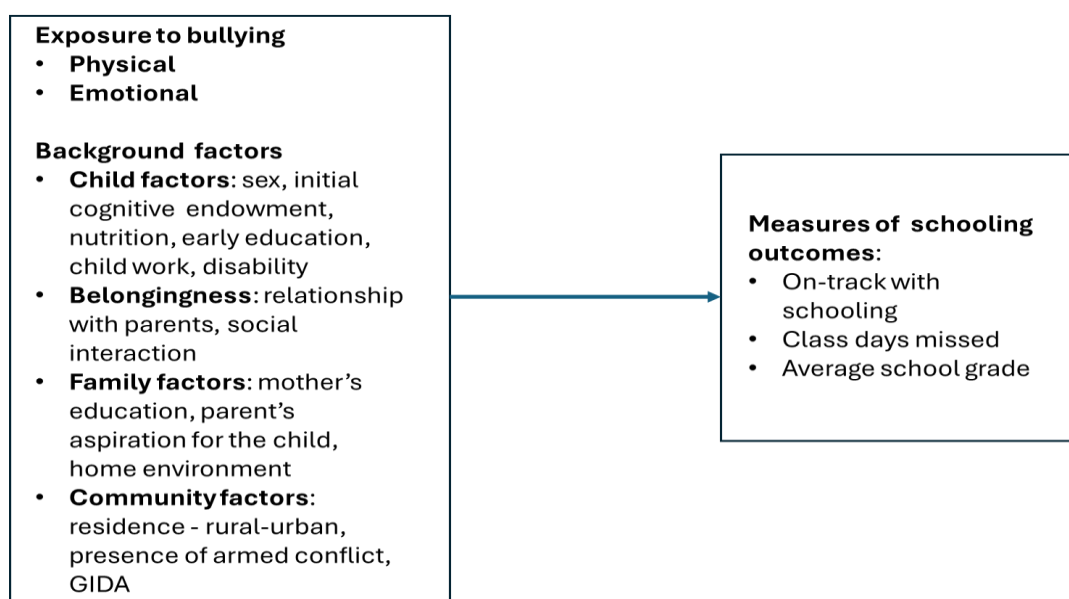
old (Grades 4-5) to 2022 (Wave 6) when the IC were 16 years old (Grades 10-11). *See Annex A: Definitions and Measures of LCSFC Variables* for the type and range of information obtained from the completed surveys. This study used a subset of this data.

What is unique about the LCSFC data compared to PISA is its longitudinal nature. Longitudinal data can describe changes and sequential patterns in key variables and outcomes. Moreover, the LCSFC study captures the cohort's school enrollment patterns over time and thus includes both those in school and out of school at each wave, whereas the PISA data refers to students who are in school at the time of the assessment. Other differences between the PISA 2018 and the LCSFC data are in the concepts and measures used for major categories of variables. These differences are summarized in *Annex B: Concepts and Measures – PISA 2018 and LCSFC*.

3. Conceptual Framework and Measures of LCSFC Variables

The study aims to examine factors associated with bullying and schooling outcomes, considering a number of inter-related factors available from the LCSFC data. A simple framework showing the major categories of variables is depicted in Figure 1 below. In this framework, we examine the association among (a) three measures of schooling outcomes: on track with schooling; class days missed in the past month; and average school grade in last school year; (b) five measures of bullying: physically hurt by friends/classmates, by adults other than parents, and by parents; and emotionally hurt by friends/classmates and by parents; and (c) set of background factors that characterize the IC including measures of belongingness, their families, and communities of residence. A special focus is the association between bullying and schooling outcomes controlling for background factors. The list of variables used in the analysis together with their definitions and measures are shown in *Annex A. Annex C presents the descriptive statistics*. In the analysis, we use common statistical methods appropriate for longitudinal data. We use linear mixed effects models for the analysis for days missed and average grade, and discrete time duration survival analysis for on track with schooling.

Figure 1: Conceptual framework



3.1. Measures of schooling outcomes

The LCSFC collected schooling data on school grades (average grade in the last school year), number of days when classes were missed in the past month and repeat grades. These schooling outcomes were related to nutritional status (stunting and wasting), bullying, and disability using the baseline survey in 2016. The results are reported in the Wave 1 Report and specific policy briefs (USC-OPS 2018; Largo, et al. 2019a; Largo et al. 2019b; Largo et al. 2019c). These schooling outcomes are not standardized across students in different schools and grade levels. Nevertheless, we include class days missed in the past month and average school grade in the last school year as measures of schooling outcomes in our analysis.

While the PISA 2018 mainly measured schooling outcomes in terms of scores in standardized tests, it did mention one dimension of schooling outcome that is of interest in this present study, namely “students left behind.” The World Bank report on PISA 2018 results for the Philippines showed that about 17 percent of 15-year-old students were “behind track” (World Bank 2020, p. 13).

The LCSFC Study Team has earlier analyzed data from Waves 1 to 6 using the created “on track with schooling” variable (0=off-track, 1=on-track) for each wave (Borja 2024). This variable identifies the IC who were on- or off-track with schooling at each wave. Being on-track is defined as starting Grade 1 on or before age 7, not having missed or repeated a school year, and therefore enrolled at an age-appropriate grade level at time of survey. The data by sex are shown in Table 1. These are consistent with the PISA 2018 findings noted above. Once off-track at a particular wave, the IC are subsequently classified as off-track until high school completion. Thus, while enrolment rate remains high over time, the proportion of being on-track with schooling is declining. Enrollment rate is higher among female than male children, and on track with schooling is likewise higher among female than male children.

Table 1: Percent of children on track with schooling* and percent of children enrolled, by sex

	Wave 1 (2016, age 10.5 years)	Wave 2 (2018, age 11.8 years)	Wave 3 (2019, age 12.8 years)	Wave 4 (2020, age 13.7 years)	Wave 5 (2021, age 15.0 years)	Wave 6 (2022, age 16.4 years)
On track with schooling						
Male	88.9	86.8	85.0	82.4	77.7	75.2
Female	92.7	92.2	91.0	88.7	88.4	85.7
Both sexes	90.9	89.4	87.9	85.4	82.8	80.2
Enrolled						
Male	98.3	97.5	96.2	94.2	94.8	94.2
Female	98.6	99.2	98.3	96.9	98.0	98.0
Both sexes	98.4	98.4	97.2	95.5	96.3	96.0

*On track with schooling = in age-appropriate grade, no missed/repeated school year

Source: Borja, J. B. 2024. “Longitudinal Cohort Study on the Filipino Child: Overview, Key Findings, Research Papers. Presented at Bilang Bata: Every Child Counts, Marco Polo Ortigas, Pasig City, October 21, 2024

3.2. Measures of exposure to violence and bullying

This paper aims to provide additional information on bullying and school performance using LCSFC data. While both PISA 2018 and LCSFC obtained bullying data on common dimensions (physical and emotional), there are other dimensions not covered by one or the other (See Annex B). The LCSFC data were collected through a set of questions shown in Table 2¹. These data will be the focus of the analysis of this paper in relation to schooling outcomes.²

Table 2: Questions asked about exposure to violence and bullying

Physical bullying/violence

Variable	Questions: Waves 1-4, 6
Physically hurt by friends/classmates	In the past 6 months, has any of your friends/classmates physically hurt you?
Physically hurt by adults	In the past 6 months, has an adult physically hurt you?
Physically hurt with force by parents	In the past 6 months, has any of your parents physically hurt you in a forceful manner?
Witnessed physical violence at home	In the past 6, months, did you witness physical violence at home?

Emotional bullying

Variable	Questions: Waves 1-4, 6
Emotionally hurt by friends/classmates	In the past 6, months, has any of your friends/classmates said/done to hurt your feelings?
Emotionally hurt by parents	In the past 6, months, has any of your parents said/done to hurt your feelings?

The response required was either a yes or no with no other probing details asked given the nature of the questionnaire. The data represents as simple a concept as having experienced being physically or emotionally hurt and this aspect needs to be considered in interpreting the results. The questions were asked in the regional languages: Tagalog, Cebuano, Waray, Ilonggo.

¹ Wave 5 (2021) was conducted by phone given COVID-19 restrictions on in-person visits. Questions on experiences with violence and bullying were not asked to avoid triggering any traumatic recalls that interviewers may not be able to handle appropriately through a phone transaction.

²The LCSFC also collected data on cyberbullying in Waves 4 and 6. In Waves 2, 3, 4 and 6, the LCSFC also obtained data on the extent to which the children were themselves the bullies hurting both friends/classmates and family members. These have been reported in Borja, Mayol, Bas and Cinco (2025). Additionally, bullying experience among marginalized adolescents using data from a qualitative study series on a separate, non-probability sample is reported in USC-OPS (2019; 2024).

Table 3: Prevalence of physical and emotional bullying (sample with complete data)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 6	Sample size
Physical bullying/violence						
Physically hurt by friends/classmates	40%	33%	24%	19%	8%	2,555
Physically hurt by adults	25%	17%	13%	12%	7%	2,534
Physically hurt with force by parents	19%	15%	12%	8%	4%	2,521
Witnesses physical violence at home	33%	27%	25%	21%	18%	2,535
Emotional bullying						
Emotionally hurt by friends/classmates	46%	46%	42%	35%	27%	2,568
Emotionally hurt by parents	25%	23%	20%	18%	21%	2,524

In Table 3 we present data on the prevalence of bullying on the sample with complete data in all the waves to illustrate true trends over time. Similar rates were observed using cross-sectional data based on the sample present at each wave. Both sets of data show a declining prevalence of physical bullying. This decline may be related to increasing levels of maturity as the cohort got older and as they transitioned, in the Philippines case, from elementary (Grades 4-5 in Wave 1) to high school (Grades 8-9 in Wave 6). Over time, the cohort may have gained increasing tolerance for bullying or may have learned to cope better against bullying. This finding from the LCSFC is analogous to the findings in PISA 2018 where “the share of students who had been bullied at least a few times a month was smaller amongst upper secondary students than lower secondary students” (OECD 2019, Vol. III, p. 52).

However, witnessing physical violence at home remains high in the last two observed waves, where violence need not necessarily involve the children. Compared to physical bullying, emotional bullying tends to be more prevalent and remains high across waves, whether this is from friends/classmates or from parents.

3.3. Measures of background/baseline factors

Background factors affecting schooling outcomes and exposure to violence and bullying include (see *Annex A*):

- Child factors - characteristics of the IC, which includes initial cognitive endowments (IQ score and early education); exposure to child work/labor and disability; depressive symptoms³; and with aspirations for college education and confidence that this can be achieved
- Belongingness – closeness of IC to parents, and social scale score⁴
- Family factors - characteristics of the household: education of parents, wealth, mother’s aspirations for college education for the IC, beneficiary of government programs (4Ps), belonging to indigenous peoples (IP) community
- Community factors – location of residence and social and geographic conditions (armed conflict and isolated areas)

³ DSM-Depressive symptom score based on the Achenbach System of Empirically Based Assessment (ASEBA) Tools (Child Behavior Checklist and Youth Self Report in Waves 4 and 5)

⁴ We explored different dimensions sense of belongingness that can be obtained from the LCSFC. In this study we used the relationship of the index child with parents (closeness with mother or father) and a social scale score based on the same ASEBA set of tools described above that measures membership in organizations, frequency of contact with close friends, and behavior with family/friends. These “belongingness” indicators are different from those obtained from PISA 2018, which included measures of satisfaction, meaning in life, and positive feeling.

4. Profile of children being bullied

Using logit models, we examined the association between the different types of bullying and a common set of background factors. We ran the models using longitudinal data and Table 4 presents the significant associations between bullying and background factors, on average, across the five time points (Waves 1-4 and 6). This analysis also aims to help identify confounding factors between bullying and schooling outcomes. The significant results are summarized in Table 4. The empty cells represent coefficients that are not significant.

- Child factors:
 - Male children are more likely to be physically bullied than female children, while female children are more likely to be emotionally bullied than males
 - Children in public schools tend to be more bullied than those in private schools for all types of bullying except for emotional bullying from parents
 - Children exhibiting depressive symptoms tend to be more bullied, though it is not clear whether the bullying is responsible for the depressive symptoms
 - Children with higher IQ scores tend to be less physically bullied but likely to be more emotionally hurt by friends and classmates
 - Children with high aspiration and confidence that they can achieve college education are less likely to be victims of physical bullying and emotional bullying from parents
 - Stunted children are more likely to be bullied physically but wasted children are less bullied physically by parents

Table 4: Summary: factors associated with the index child (IC) being bullied*

	IC physically hurt by friends classmates	IC physically hurt by adults	IC physically hurt with force by parents	IC emotionally hurt by friends classmates	IC emotionally hurt by parents
Child factors					
Male	Positive	Positive	Positive	Negative	
IQ scores (Ravens)		Negative	Negative	Positive	
With disability at W1					
Child work					
Attended nursery					
Depressive symptoms		Positive	Positive	Positive	Positive
IC believes can achieve college education	Negative	Negative	Negative		Negative
Stunted	Positive		Positive		
Wasted			Negative		
Enrolled in public school	Positive	Positive	Positive	Positive	
Belongingness					
Close to mother					
Close to father					Negative
Social scale			Negative	Positive	

Family factors					
Wealth quintile 1					
Wealth quintile 2					
Wealth quintile 3					
Wealth quintile 4					
Wealth quintile 5					
Mother is at least HS graduate			Negative		
Household is 4Ps beneficiary				Negative	
Mother believes IC can achieve college education	Negative				Negative
Witnessed violence at home	Positive	Positive	Positive	Positive	Positive
Mother reported as IP		Negative		Negative	Negative
Community factors					
Luzon					
Visayas		Positive	Positive	Negative	
Mindanao	Positive	Positive	Positive		Positive
Urban				Negative	
In armed conflict area at W1					
On GIDA at W1		Negative			Negative

*For complete statistical results, see Annex D.

- **Belongingness:**
 - Children who are close to their fathers are less likely to be emotionally hurt by them
 - Children with higher social scale score are less likely to be physically hurt by parents but more likely to be emotionally hurt by friends and classmates
- **Family factors:**
 - Witnessing violence at home consistently has a significant association with experiencing all types of bullying
 - Children are also less likely to be physically hurt by parents who have higher education and have high aspirations for their children to achieve college education
 - Bullying does not appear to be significantly associated with the family's wealth status
 - Being part of the IP community is protective against physical bullying from adults and emotional bullying
- **Community factors:** Higher incidence of bullying is associated with residing in Mindanao when compared to children from Luzon. Children in urban areas are more at risk of emotional bullying by friends. Residing in geographically isolated and disadvantage areas appears to be protective against physical bullying from adults and emotional bullying from parents.

In the next sections, we present a summary of results, first regarding bullying and schooling outcomes controlling for background factors, and then on background factors and schooling outcomes without bullying. We present a general map of results indicating the direction of significant associations. The statistical tables are shown in the annexes.

5. Association between bullying and schooling outcomes controlling for background factors

We examine the association between the five types of bullying and three types of schooling outcomes using statistical models appropriate to longitudinal data⁵. For bullying, two sets of analyses were made, namely: when all bullying types were included and when each bullying type was analyzed individually. The first approach is to allow other types of bullying as controls. The second approach is to recognize that each bullying type might have a unique association with schooling outcomes not influenced by or interacting with other bullying types that might be confounding factors. The results are mapped out in Table 5 (*see Annex E: Bullying and schooling outcomes controlling for background factors for the statistical tables*) which indicates the association between bullying and school outcomes, net of the effect of background factors on schooling.

Table 5: Overall summary: association between bullying and schooling outcomes, controlling for background factors

	All bullying types examined together			Each bullying type examined individually		
	Both sexes	Male	Female	Both sexes	Male	Female
On track with schooling*						
Physically hurt by friends/classmates						
Physically hurt by adults	Negative			Negative		
Physically hurt with force by parents	Negative			Negative	Negative	
Emotionally hurt by friends/classmates	Positive		Positive	Positive		Positive
Emotionally hurt by parents						
School days missed**						
Physically hurt by friends/classmates	Positive		Positive	Positive		Positive
Physically hurt by adults	Positive		Positive	Positive		Positive
Physically hurt with force by parents	Positive		Positive	Positive		Positive
Emotionally hurt by friends/classmates						Positive
Emotionally hurt by parents						
Average school grade**						
Physically hurt by friends/classmates	Negative		Negative	Negative		Negative
Physically hurt by adults						

⁵ For on-track with schooling, the method used in the analysis is the discrete time duration (survival) analysis. This allows us to see the trajectory of on-track with schooling across the waves and the shift in the trajectory resulting from bullying, all controlling for background factors. For both school days missed and average school grade, we used linear mixed effects model. This allows for both fixed effects and random effects. The random effects modeled here are the variation among students. Unlike in the PISA sampling design, the LCSFC did not have schools, for example, as sampling units, which could cause another source of variation.

Physically hurt with force by parents						
Emotionally hurt by friends/classmates	Positive	Positive				
Emotionally hurt by parents						

* Using discrete time duration survival analysis

** Using linear mixed effects model

See Annex E:123 for statistical results

For on track with schooling, both physically hurt by adults and physically hurt by parents are negative for both sexes in both analyses. Additionally, physically hurt by parents is negative for male children when the bullying variable is examined individually. The role of physical bullying from friends/classmates is not significant.

Emotionally hurt by friends/classmates is positive for both sexes in both analyses, contrary to what is expected. This suggests further investigation of the underlying mechanism. One can tentatively hypothesize that rather than letting the emotional bullying affect the children, bullying may in fact serve as stronger motivation to prove themselves in school and excel in their studies.. That the role of physical bullying from friends/classmates was not significant might add to the hypothesis that being bullied by peers does not provide as much distraction to schooling and may even serve to build resiliency. Of greater concern is the significant adverse effects on schooling among children exposed to physical harm from adults and parents. The role of emotional bullying by parents was not significant.

For school days missed (number of school days absent in the past month), it is important to note that higher values for this variable indicate more adverse schooling outcomes (more absences) unlike in the case of the two other schooling outcomes. The results show that for school absences, all physical types of bullying were significantly positive for both sexes and for female children, in both types of analyses. For the emotional bullying, emotionally hurt by friends/classmates was significant and positive only for female children.

For average school grade (average grade the in the past school year, the results show physical bullying from friends/classmates are negative for both sexes and for female children in both set analysis. Emotional bullying from friend/classmates is positive for both sexes and for male children.

Taken altogether, it appears that physical bullying especially from adults and parents have the expected negative effects on schooling outcomes, especially among female children. On the other hand, emotional bullying by friends/classmates has positive effect on track schooling and average grades. The results are unexpected and may imply that this type of bullying, rather than adversely affecting children tend to build in them greater resiliency and stronger motivation to succeed in school. This obviously need further investigation.

6. Association between Background Factors and Schooling Outcomes Without Bullying

In this set of analysis, we examine the association between background factors and schooling outcomes excluding the bullying variables in the model. The aim is to highlight the unique role of background factors in influencing schooling outcomes, independent of the child's bullying exposure.

Child factors and belongingness

- Favorable cognitive endowment, early intervention and motivation, which are all positive (IQ scores, attended nursery, aspiration and confidence in completing higher education)
- Certain impediments that negatively influence schooling outcomes (disability, child work, depressive symptoms, stunting)
- Being in public school is associated with all poorer schooling outcomes
- Higher scores in social scale, which is used here as a proxy for “belongingness”, is associated with being on-track, having fewer absences and having higher grades. This also tells us of the importance and favorable effects on schooling of the components of “social scale” which includes membership in organizations, frequency of contact with friends, and positive behavior with family/friends

Table 6: Association between background factors and schooling outcomes without bullying

	On track with schooling			Class days missed			Average school grade		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Child factors									
Male	Negative			Positive			Negative		
IQ score (Ravens)	Positive	Positive	Positive	Negative	Negative	Negative	Positive	Positive	Positive
With disability at W1	Negative	Negative	Negative			Positive			
Child work status				Positive	Positive	Positive	Negative	Negative	
Attended nursery	Positive	Positive	Positive				Positive	Positive	
With depressive symptoms	Negative	Negative	0.000154	Positive	Positive		Negative	Negative	
IC believes can achieve college education	Positive	Positive	Positive	Negative	Negative	Negative	Positive		Positive
Stunted	Negative	Negative			Positive		Negative	Negative	
Wasted						Positive			
Attended public school	Negative	Negative	Negative	Positive	Positive	Positive	Negative		Negative
Belongingness									
Close to mother									
Close to father	Positive								
Social scale	Positive	Positive	Positive	Negative	Negative	Negative	Positive	Positive	Positive

	On track with schooling			Class days missed			Average school grade		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Family factors									
Wealth quintile 1									
Wealth quintile 2	Positive	Positive				Negative			
Wealth quintile 3	Positive	Positive	Positive	Negative		Negative			
Wealth quintile 4	Positive	Positive	Positive	Negative	Negative	Negative	Positive		
Wealth quintile 5	Positive	Positive	Positive	Negative	Negative	Negative	Positive	Positive	Positive
Mother is at least HS graduate	Positive	Positive		Negative	Negative	Negative	Positive		Positive
Household is 4Ps beneficiary	Positive	Positive		Negative	Negative	Negative	Negative		Negative
Mother believes IC can achieve college education	Positive	Positive	Positive	Negative	Negative	Negative		Positive	
Witnessed violence at home				Positive	Positive	Positive	Negative	Negative	Negative
Mother is reported as IP	Negative	Negative	Negative	Negative	Negative	Negative			
Community factors									
Luzon									
Visayas	Positive	Positive	Positive	Negative	Negative	Negative	Positive	Positive	Positive
Mindanao	Positive	Positive	Positive			Negative	Positive	Positive	Positive

Urban	Negative	Negative	Negative	Positive	Positive	Positive	Negative	Negative	Negative
In armed conflict area at W1	Negative	Negative	Negative		Positive				
In GIDA at W1				Negative		Negative			Positive
No of observations	14515	7254	7261	14508	7252	7256	12528	6229	6299

Family wealth/resources and community factors

- Favorable family resources indicated by household wealth, mother's education (which reflects in part an intellectual atmosphere in the family) and a more informed decision making regarding the child's upbringing and education), and mother's aspiration for higher learning for the child correspond to measures of academic success
- Impediments in the form of witnessing violence at home and being in conflict areas
- It is not clear why being in GIDA would be associated with less class days missed. It is possible that children in GIDA are residing with either relatives or friends or even private dorms located in non-GIDA areas close to the school where the children go to, especially female children. So, while the survey records the household as in GIDA, the school age children may be physically residing in nearby barangays or towns where schools are located

In the light of the above results, it is interesting to note that the results are similar to findings in PISA 2018 as summarized by the World Bank report (World Bank 2020). Particularly interesting is how the findings for the Philippines stand out relative to other participating countries.

- Girls' significant advantage over boys in measures of schooling outcomes. "The Philippines is one of only 14 PISA-participating countries and economies in which girls significantly outperformed boys in math", World Bank 2020, p.25
- Economic, social, and cultural status (ESCS) index⁶ - advantaged students significantly outperformed disadvantaged students. "In the Philippines, the association between performance—particularly for science and reading—and socioeconomic status was one of the strongest among all PISA-participating countries and economies" (World Bank 2020, p.27)
- Early childhood education and care: "Across all subjects, mean scores increase with the duration of early childhood education and care (ECEC), but only until three years in ECEC" (World Bank 2020, p.32)

7. Strategies for policy implementation

A set of policies already exists to address issues of bullying and improving schooling outcomes (EDCOM 2 Year 1 Report (2024); EDCOM 2 Year 2 Report (2025); World Bank (2020); OECD (2019). The challenge is implementation (Bernardo et al. (2024), Abrigo and Orbeta (2023), Paqueo, Orbeta and Aranas (2023). The following strategies may be considered.

*Adopt a systems strengthening approach to scaling up policy implementation as distinct from merely increasing service inputs (Chee et al. 2013, WHO 2007)*⁷. The key elements of the system are governance, financing, human resources, delivery system, logistics and supply chain management, and information system including implementation research⁸. Strengthening each element and their interaction can be viewed from different levels. In the case of anti-bullying policy implementation, these levels would include DepEd as the national implementing agency,

⁶ The ESCS index is "derived from three variables related to family background, i.e.: parents' highest level of education, parents' occupational status and home possessions. Students are considered socioeconomically disadvantaged if they find themselves in the bottom quartile of the ESCS index and socioeconomically advantaged if they are within the top quartile" (World Bank 2020, p. 26).

⁷ The need for scaling up implementation is highlighted with DepEd report at the hearings in the House of Representatives that there are 10,000 public schools that so far have no localized anti-bullying policy as required by the Anti-Bullying Act. <https://edcom2.gov.ph/10018-deped-schools-without-anti-bullying-policy/>

⁸ See Peters et al. (2013) for description of implementation research.

school district in its areas of responsibility, and individual schools themselves. This is even more critical where implementation is multisectoral, multi-agency, and multi-level government as in the case of implementing the broader set of policies to address the background factors influencing schooling outcomes.

Place greater emphasis on prevention programs and intervention programs of anti-bullying policies provided for in RA 10627 and its IRR. These include:

- Prevention programs include school-wide initiatives, classroom-level initiative, and parents' prevention activities (DepEd Order No. 55, s. 2023, Rule 5, Section 6). Specially relevant are the **classroom level initiatives** that include “building a positive sense of self and interpersonal relationships through the development of self-awareness and self-management, interpersonal skills and empathy, and responsible decision-making and problem-solving” (Section 6[2]); and **parents prevention activities** that include “discussions on school policy, education sessions to parents”
- Intervention programs. These include “counseling, life skills training, education, other activities that will enhance the psychological, emotional and psycho-social well-being of both the victim and the bully” (Rule V, Section 7, par. 2)

In view of findings that show the importance of physical and emotional bullying by adults and parents, the “parents prevention activities” initiated at the school level might be expanded to include home and community level activities, with the parents involved in school activities as the first set of advocates.

Coordinate implementation of anti-bullying with mental health policies. This means coordinating activities provided for in the Anti-Bullying Act of 2013 (RA 10627) with the two mental health-related national policies - (Mental Health Act of 2019 (RA 11036,) and recently enacted (Basic Education Mental Health and Well-Being Promotion Act of 2024 (RA 12080) to address interrelated issues of bullying, mental health, and schooling outcomes. This may require a better understanding of the concept and measures of bullying to guide data collection, analysis, and intervention design. Longitudinal data such as the LCSFC provide opportunity for further analysis of the association between bullying and mental health and their links to schooling outcomes.

Inform further adjustments in the design and implementation of the broad set of existing policies based on better understanding of the interconnections among various background factors. These factors include early child development (nutrition, health, child work, disability, and mental health), and socio-economic disadvantage of families (family wealth, parental education, other vulnerable and marginal groups). Better understanding of their interconnection can be the basis for alternative designs and implementation modalities, including timelines, of a smaller but coherent subset of interventions that maximizes synergy among these factors towards greater outcomes.

8. Notes for further research

The contributions of this study using longitudinal data from the LCSFC include: the use of on-track with schooling as a measure of schooling outcome to shed light on a PISA finding reported in World Bank (2023). Although our study did not look at test scores like PISA, we examined class days missed and average school grade, which can be sensitive to current bullying but have cumulative effect with respect to being on track in schooling. The LCSFC also included bullying experienced outside of the school environment by adults and parents.

There is a need for better understanding of the concept and measures of bullying to guide data collection and analysis. Differences in concept and measures affect how to interpret statistical results. Differences include how the concept of bullying is described in the Anti-Bullying Act of 2013 versus common understanding based on the language used in different Philippine regions. An explicit standard set of characteristics should be used to measure the true prevalence of bullying (e.g., intentionality and repeatedness of the bullying act). Such standard could be how it is defined in the Anti-Bullying Act and concepts from international conventions on child protection and prevention of violence. It is, of course, not easy given the complexity of bullying (Baloloy et al. 2024).⁹

Other research areas include examining:

- Association between bullying and mental health based on LCSFC – what can the LCSFC data and analysis add to, or confirm results from, the international literature. Such research could help inform the implementation of laws addressing mental health (RA 12080 (Basic Education Mental Health and Well-Being Promotion Act of 2024).
- Dynamics of positive response to bullying: resiliency and motivation
- Interconnection among bullying and selected background factors while addressing issues of endogeneity and simultaneity, using methods appropriate for analyzing longitudinal data such as structural equation models and inverse probability weights

⁹ . A scoping review by the De La Salle team suggests that “bullying experiences among learners entails a significant number of psychosocial issues. ... The factors that influence the occurrence of bullying include existing psychosocial issues, adjustment problems, violence and bullying supportive attitudes and values, deviation from social norms, feelings of safety and attachment in schools, and learners’ quality of relationship with parents.” (Baloloy et al. 2024)

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Annex A: Definitions and measures: LCSFC variables

Variables	Definition/Measures
Child factors	
Male	Index Child (IC) Sex 1=Male 0=Female
IQ score (Ravens)	Raven's Standard Progressive Matrices Score [measured in Wave (W) 2]; Range: 0-57
With disability at W1	With disability (all forms) in W1; 0=No 1=Yes
Child work	Currently working/ever worked in W1; Ever worked the past year in W2,3,4,6; 0=No 1=Yes
Attended nursery	Attended nursery (asked in W3); 0=No 1=Yes
Depressive symptoms	DSM-defined depressive symptoms score (measured in W2,4,5); W2 value applied in W1, W4 for W3, W5 for W6; Range: 0-22*
Child believes can achieve college education	IC aspires for college-level education (graduate or not) and believes this can be achieved (all Waves); 0=No 1=Yes
Stunted	Stunted (height-for-age z-score <-2SD below mean 2007 WHO Reference Standards; (all waves) 0=No 1=Yes
Wasted	Severely Thin/Thin (body mass index-for-age z-score <-2SD below mean 2007 WHO Reference Standards; (all waves) 0=No 1=Yes
Enrolled in public school	IC enrolled in public school; (all waves) 0=No 1=Yes
Belongingness	
Close to mother	IC reported being close to mother; (all waves) 0=No 1=Yes
Close to father	IC reported being close to father; (all waves) 0=No 1=Yes
Social scale	Social scale score based on membership in organizations, number of/contact frequency with friends, behavior with friends/family); Range: 0.5-14.0*
Family factors	
Wealth index	Wealth index quintile; (all waves) Range: 1-5 (1=poorest, reference category)
Mother HS graduate	Mother at least high school graduate in W1; 0=No 1=Yes
Household is 4Ps beneficiary	Household 4Ps beneficiary in W1; 0=No 1=Yes
Mother believes child can achieve college education	IC's mother/caregiver aspires for college-level education (graduate or not) for IC and believes IC can achieve this (all Waves); 0=No 1=Yes
Witnessed violence	IC witnessed violence in household; (all waves) 0=No 1=Yes
Mother IP at baseline	IC's mother/caregiver reported being IP in W1; 0=No 1=Yes
Community factors	
Domain	Domain of residence at time of survey (all waves); 1=Luzon (reference category) 2=Visayas 3=Mindanao
Urban	Resides in urban barangay; (all waves) 0=No 1=Yes
Armed conflict areas at W1	Household in area with armed conflict in W1; 0=No 1=Yes
In GIDA at W1	Household in geographically isolated and disadvantaged area (GIDA) in W1; 0=No 1=Yes
Bullying	
Physically hurt by friends	Experienced being physically hurt by friends; (all waves) 0=No 1=Yes

Physically hurt by adults	Experienced being physically hurt by adults (not parents); (all waves) 0=No 1=Yes
Physically hurt by parents	Experienced being physically hurt with force by parents; (all waves) 0=No 1=Yes
Emotionally hurt by friends	Experienced feelings being hurt by friends; (all waves) 0=No 1=Yes
Emotionally hurt by parents	Experienced feelings being hurt by parents; (all waves) 0=No 1=Yes
Schooling outcomes	
On-track with schooling	Enrolled in age-appropriate grade level (in Grades 4 or 5 in W1 and/or started grade 1 before age 8 and have not missed/repeated a school year; (all waves) 0=No 1=Yes
Class days missed in the past month	Number of class days missed in past 30 days
Average grade last school year	Average grade past school year:1= <75, 2= 75-80, 3= 81-85, 4= 86-90, 5= 91 or higher

* Based on the Achenbach System of Empirically Based Assessment tools (W2: Child Behavior Checklist, W4&5: Youth Self Report)

Annex B: Concepts and measures: PISA and LCSFC

PISA 2018	LCSFC
Schooling outcomes	Schooling outcome
Measure: Scores in Reading, Math and Science	Measure: on-track/off track in schooling (composite of age started Grade 1, school enrolment, repeated grade level)
Background factors: <ul style="list-style-type: none"> • Male/female • Index of economic, social and cultural status (socio-economically advantaged/disadvantaged students) • School ownership (public, private, government dependent, private independent) • School community type (urban vs. rural) • Language: language other than the PISA test language • Early childhood education and care 	Background factors: Index child (fixed) <ul style="list-style-type: none"> • Male/female • Initial cognitive endowment: stunting, IQ scores, competency scores • Early child education (nursery) Household characteristics <ul style="list-style-type: none"> • Education of mother • Wealth index score • 4Ps • Marginalized category (IP, PWD, conflict area, GIDA, LGBTQ) Community characteristics <ul style="list-style-type: none"> • Island groups: Luzon, Visayas, Mindanao • Rural-urban residence School characteristics <ul style="list-style-type: none"> • Public/private • Class size
Bullying	Bullying
Measures: Students' exposure to bullying - students who reported that the following occurred at least a few times a month: <ul style="list-style-type: none"> • Frequently bullied • Any type of bullying • Other students left me out of things on purpose • Other students made fun of me • I was threatened by other students • Other students took away or destroyed things that belong to me • I got hit or pushed around by other students • Other students spread nasty rumors about me 	Measure: Experience with violence (Waves 1-4, 5) <ul style="list-style-type: none"> • Witnessed physical violence at home in past 6 months • Has an adult physically hurt you • Has any of your friends/classmates physically hurt your • Has any of your friends/classmates said/done to hurt your feelings • Has any of your parents physically hurt you • Has any of your parents said/done something to hurt your feelings • Have you physically hurt any of your friends/classmates (Waves 2-5) • Have you physically hurt any member of your family (Waves 2-5) Measure: Experiences with and involvement in bullying (Waves 4-6) <ul style="list-style-type: none"> • Ever been physically or emotionally bullied by anyone • Ever been involved in physically/emotionally bullying anyone

	<ul style="list-style-type: none"> Index child experience with and exposure to cyberbullying
<p>Background factors</p> <ul style="list-style-type: none"> Male/female Socio-economic status Immigrant/non-immigrant status Low/high achieving status 	<p>Background factors:</p> <p>Index child</p> <ul style="list-style-type: none"> Male/female Initial cognitive endowment: stunting, IQ scores, competency scores <p>Household characteristics</p> <ul style="list-style-type: none"> Education of mother Wealth index score 4Ps Marginalized category (IP, PWD, conflict area, GIDA, LGBTQ) <p>Community characteristics</p> <ul style="list-style-type: none"> Island groups: Luzon, Visayas, Mindanao Rural-urban residence <p>School characteristics</p> <ul style="list-style-type: none"> Public/private Class size
<p>Students' well-being: indicators of life satisfaction and emotional well-being: life satisfaction, meaning of life and positive feelings</p> <ul style="list-style-type: none"> Life satisfaction index (0=not at all satisfied to 10=completely satisfied) Meaning of life index based on responses regarding extent of agreement with the following statements: "(i) My life has clear meaning or purpose, (ii) I have discovered a satisfactory meaning in life, (iii) It is clear to me what gives meaning to my life. Positive feelings – response to question on how frequently students feel certain emotions: sometimes or always feeling happy, cheerful, joyful and lively; sometimes or always feeling scared, afraid, and sad. Value of school: Students were asked the extent to which they agree with the following statements: "(i) Trying hard at school will help me get a good job, (ii) Trying hard in school will help me get into a good college, (iii) Trying hard at school is important. These statements were combined to construct the value of school indicator. 	<p>Students' well-being and sense of belongingness:</p> <ul style="list-style-type: none"> Mental states (measures of depressive and anxiety symptoms, indicators of what make index child happy/sad Parenthesis Belongingness: care and support from parents, relationship with parents/family, closeness with friends, membership in organizations Parents' involvement in schooling activities, in school and at home Child labor – working or not Aspirations in life (education): (index child and mother/caregiver)

Annex C: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Schooling outcomes					
On track with schooling	21,768	0.871	0.335	0	1
Class days missed	21,175	1.714	2.570	0	30
Average grade last SY	20,034	3.186	0.951	1	5
Bullying					
Physically hurt by friends/classmates	21,392	0.251	0.434	0	1
Physically hurt by adults	21,328	0.151	0.358	0	1
Physically hurt with force by parents	21,336	0.124	0.329	0	1
Emotionally hurt by friends/classmates	21,414	0.395	0.489	0	1
Emotionally hurt by parents	21,339	0.215	0.411	0	1
Child factors					
Male	24,655	0.503	0.500	0	1
IQ scores (Ravens)	21,390	29.235	11.355	0	57
With disability at baseline	24,610	0.013	0.114	0	1
Child work	21,669	0.216	0.411	0	1
Attended nursery	23,095	0.850	0.357	0	1
Depressive symptoms	19,564	3.497	3.053	0	22
IC believes can achieve college	21,593	0.847	0.360	0	1
Stunted	21,433	0.287	0.452	0	1
Wasted	21,394	0.136	0.342	0	1
Enrolled in public school	21,197	0.920	0.272	0	1
Belongingness					
Close to mother	21,447	0.938	0.240	0	1
Close to father	21,305	0.871	0.335	0	1
Social scale	19,593	6.697	1.762	0.5	14
Family factors					
Wealth index	21,323	3.001	1.414	1	5
Mother is at least HS graduate	20,170	0.533	0.499	0	1
Household is 4Ps beneficiary	24,655	0.494	0.500	0	1
Mother believes IC can achieve college	21,782	0.832	0.374	0	1
Witnessed violence at home	21,347	0.251	0.433	0	1
Mother is IP					
Community factors	24,610	0.089	0.285	0	1
Luzon, Visayas, Mindanao	21,865	2.018	0.807	1	3

Urban	21,713	0.477	0.499	0	1
Armed conflict area at W1	24,610	0.083	0.276	0	1
GIDA at W1	24,610	0.036	0.187	0	1

Annex D: Factors associated with the index child with being bullied by type of bullying*

	IC physically hurt by friends	IC physically hurt by adults	IC physically hurt with force by parents	IC emotionally hurt by friends	IC emotionally hurt by parents
Child factors					
Male	0.349***	0.546***	0.585***	-0.308***	-0.0262
IQ score (Ravens)	-0.000306	-0.0189***	-0.0225***	0.00909***	-0.00138
With disability at W1	0.0616	0.112	0.209	0.301	0.225
Child work	0.0941	0.110	-0.00451	0.0844	0.0844
Attended nursery	0.0414	0.0224	0.110	0.0657	0.0975
Depressive symptoms	0.014	0.0245**	0.0272**	0.0561***	0.0779***
IC believes can achieve college education	-0.312***	-0.241***	-0.356***	-0.0851	-0.222***
Stunted	0.206***	0.0935	0.195**	0.0735	0.0215
Wasted	-0.0301	-0.149	-0.178*	-0.106	-0.114
Enrolled in public school	0.710***	0.258*	0.553***	0.253**	-0.0222
Belongingness					
Close to mother	-0.171	-0.116	-0.239	-0.0891	-0.147
Close to father	0.107	0.0449	-0.00319	-0.0419	-0.185**
Social scale	0.000972	-0.00565	-0.0342*	0.0436***	0.0215
Family factors					
Wealth quintile 1	0	0	0	0	0
Wealth quintile 2	0.0399	-0.0399	0.120	0.0861	0.0139
Wealth quintile 3	0.112	0.0976	0.112	0.110	0.0352
Wealth quintile 4	-0.0211	-0.115	0.0276	0.0855	0.0411
Wealth quintile 5	0.00624	-0.0156	0.121	0.0547	0.0955
Mother at least HS graduate	-0.0472	-0.0734	-0.146*	-0.0108	-0.0784
Household is 4Ps beneficiary	-0.0387	0.0419	-0.083	-0.105*	-0.0604
Mother believes child can achieve college education	-0.143*	-0.0642	-0.125	-0.0657	-0.153*
Witnessed violence at home	1.170***	1.405***	1.402***	1.062***	1.361***
Mother reported as IP	-0.160	-0.454***	-0.204	-0.216*	-0.334**
Community factors					
Luzon	0	0	0	0	0

Visayas	0.0689	0.542***	0.604***	-0.130*	0.0818
Mindanao	0.146*	0.548***	0.799***	-0.114	0.459***
Urban	-0.0145	0.0679	0.0709	-0.113*	0.0817
In armed conflict area at W1	-0.00153	0.0941	-0.00537	-0.0354	-0.152
In GIDA at W1	-0.0476	-0.364**	-0.227	0.0822	-0.310*
_cons	-2.008***	-2.378***	-2.556***	-1.225***	-1.707***
No. of observations	14463	14429	14442	14474	14438

*logit coefficients =** p<0.05 ** p<0.01 *** p<0.001"

See also Table 4 in the paper.

Annex E: Bullying and schooling outcomes controlling for background factors

Annex E1: Association between bullying and on track with schooling controlling for background factors

	All bullying types examined together			Each bullying types examined individually		
	Both sexes	Male	Female	Both sexes	Male	Female
Physically hurt by friends/classmates	0.008	0.012	-0.001	0.005	0.007	0.000
	(0.188)	(0.181)	(0.930)	(0.351)	(0.403)	(0.952)
No. of observations				14457	7228	7229
Physically hurt by adults	-0.011*	-0.010	-0.012	-0.010*	-0.009	-0.011
	(0.097)	(0.310)	(0.164)	(0.089)	(0.291)	(0.171)
No. of observations				14423	7209	7214
Physically hurt with force by parents	-0.013**	-0.016	-0.006	-0.012*	-0.015*	-0.003
	(0.044)	(0.110)	(0.543)	(0.056)	(0.093)	(0.699)
No. of observations				14436	7213	7223
Emotionally hurt by friends/classmates	0.011**	0.008	0.014**	0.011**	0.009	0.012**
	(0.024)	(0.314)	(0.022)	(0.027)	(0.258)	(0.035)
No. of observations				14468	7230	7238
Emotionally hurt by parents	0.000	-0.001	0.005	0.002	-0.001	0.007
	(0.935)	(0.881)	(0.485)	(0.756)	(0.930)	(0.322)
No. of observations	14243	7122	7121	14432	7204	7228

Estimated using discrete time duration (survival) analysis

= "Marginal effects; p-values in parentheses"

= " (d) for discrete change of dummy variable from 0 to 1"

Results for background factors not shown. Complete set of results available.

Annex E.2: Association between bullying and class days missed controlling for background factors*

	All bullying types examined together			Each bullying types examined individually		
	Both sexes	Male	Female	Both sexes	Male	Female
Physically hurt by friends/classmates	0.233***	0.112	0.385***	0.257***	0.0947	0.454***
	(0.000)	(0.115)	(0.000)	(0.000)	(0.146)	(0.000)
No. of observations				14450	7226	7224
Physically hurt by adults	0.139*	0.103	0.195*	0.225***	0.122	0.369***
	(0.020)	(0.208)	(0.028)	(0.000)	(0.111)	(0.000)
No. of observations				14417	7208	7209
Physically hurt with force by parents	0.114	-0.000314	0.286**	0.180**	0.0190	0.417***
	(0.078)	(0.997)	(0.003)	(0.003)	(0.816)	(0.000)
No. of observations				14429	7211	7218
Emotionally hurt by friends/classmates	-0.0272	-0.0867	0.0306	0.0408	-0.0513	0.124*
	(0.534)	(0.195)	(0.590)	(0.323)	(0.411)	(0.023)
No. of observations				14462	7229	7233
Emotionally hurt by parents	-0.0746	-0.0614	-0.0897	-0.00588	-0.0530	0.0331
	(0.155)	(0.436)	(0.194)	(0.905)	(0.470)	(0.614)
No. of observations	14237	7121	7116	14425	7202	7223

"p-values in parentheses" = "*" p<0.05 ** p<0.01 *** p<0.001"

*Estimated using linear mixed effects model

Results for background factors not shown. Complete set of results available.

Includes p<.10

Annex E.3: Association between bullying and average class grade controlling for background factors*

	All types of bullying examined together			Each bullying type examined individually		
	Both sexes	Male	Female	Both sexes	Male	Female
Physically hurt by friends/classmates	-0.0455**	-0.0258	-0.0667**	-0.0366**	-0.0209	-0.0540**
	(0.002)	(0.179)	(0.002)	(0.006)	(0.233)	(0.008)
No. of observations				12484	6211	6273
Physically hurt by adults	-0.00686	-0.0162	0.00869	-0.0197	-0.0234	-0.0107
	(0.691)	(0.461)	(0.754)	(0.224)	(0.255)	(0.682)
No. of observations				12456	6190	6266
Physically hurt with force by parents	-0.0255	-0.0178	-0.0337	-0.0289	-0.0195	-0.0407
	(0.176)	(0.449)	(0.280)	(0.103)	(0.378)	(0.168)
No. of observations				12461	6195	6266
Emotionally hurt by friends/classmates	0.0281*	0.0209	0.0338	0.0185	0.0123	0.0250
	(0.028)	(0.249)	(0.059)	(0.123)	(0.469)	(0.141)
No. of observations				12484	6206	6278
Emotionally hurt by parents	0.0110	0.00720	0.0134	0.00617	0.00232	0.0102
	(0.464)	(0.735)	(0.531)	(0.665)	(0.907)	(0.617)
No. of observations	12300	6116	6184	12459	6189	6270

'P>|z| values in parentheses *P<0.05 **P<0.01 ***P<0.001 Include P<0.10.

Estimated using linear mixed effects model

Results for background factors not shown. Complete set of results available.

Annex F: Background factors and schooling outcomes without bullying

Annex F1: Background factors and on track with schooling without bullying

	Both sexes	Male	Female
Child factors			
Male	-0.0493***		
IQ score (Ravens)	0.00378***	0.00493***	0.00275***
With disability at W1	-0.136***	-0.137***	-0.113***
Child work status	-0.00246	-0.00963	0.0121
Attended nursery	0.0451***	0.0358***	0.0497***
With depressive symptoms	-0.00185*	-0.00429***	0.000154
IC believes can achieve college education	0.0320***	0.0404***	0.0245***
Stunted	-0.0212***	-0.0405***	-0.00102
Wasted	-0.00907	-0.00528	-0.0122
Attended public school	-0.119***	-0.162***	-0.0792***
Belongingness			
Close to mother	0.00416	0.0132	-0.00267
Close to father	0.0137*	0.01000	0.0138
Social scale	0.00815***	0.00596**	0.00993***
Family factors			
Wealth quintile 1	0	0	0
Wealth quintile 2	0.0215**	0.0251*	0.0153
Wealth quintile 3	0.0238***	0.0273*	0.0200*
Wealth quintile 4	0.0423***	0.0466***	0.0338***
Wealth quintile 5	0.0535***	0.0719***	0.0323**
Mother is at least HS graduate	0.0281***	0.0455***	0.0114
Household is 4Ps beneficiary	0.0115*	0.0207**	0.00408
Mother believes child can achieve college education	0.0325***	0.0327***	0.0307***
Witnessed violence at home	-0.00445	-0.00742	-0.000835
Mother is reported as IP	-0.0697***	-0.101***	-0.0389***
Community factors			
Luzon	0	0	0
Visayas	0.0328***	0.0322***	0.0329***
Mindanao	0.0228***	0.0218*	0.0214**
Urban	-0.0517***	-0.0642***	-0.0392***
In armed conflict area at W1	-0.0575***	-0.0844***	-0.0331***
In GIDA at W1	-0.0147	-0.0271	-0.00159
No. of observations	14515	7254	7261

Estimated using discrete time duration survival analysis ="* p<0.05 ** p<0.01 *** p<0.001"

= "Marginal effects; p-values in parentheses"

= " (d) for discrete change of dummy variable from 0 to 1"

Annex F2: Background factors and school days missed

	Both sexes	Male	Female
Child factors			
Male	0.426***		
IQ score (Ravens)	-0.0231***	-0.0242***	-0.0220***
With disability at W1	0.405	0.18	0.608*
Child work status	0.302***	0.307***	0.285***
Attended nursery	0.00831	-0.0797	0.102
With depressive symptoms	0.0202**	0.0369***	0.00517
IC believes can achieve college education	-0.454***	-0.384***	-0.543***
Stunted	0.059	0.171*	-0.0523
Wasted	0.114	0.0318	0.223*
Attended public school	0.511***	0.545***	0.460***
Belongingness			
Close to mother	-0.0601	-0.069	-0.0743
	-0.548	-0.632	-0.593
Close to father	-0.00755	0.0882	-0.0948
	-0.911	-0.396	-0.277
Social scale	-0.0492***	-0.0633***	-0.0369*
	0.000	0.000	-0.017
Family factors			
Wealth quintile 1	0	0	0
Wealth quintile 2	-0.0983	-0.0136	-0.177*
Wealth quintile 3	-0.142*	-0.0868	-0.192*
Wealth quintile 4	-0.300***	-0.311**	-0.290**
Wealth quintile 5	-0.373***	-0.306*	-0.454***
Mother is at least HS graduate	-0.251***	-0.333***	-0.172*
	0.000	0.000	-0.02
Household is 4Ps beneficiary	-0.230***	-0.275**	-0.184*
	0.000	-0.001	-0.011
Mother believes child can achieve college education	-0.507***	-0.473***	-0.525***
Witnessed violence at home	0.163***	0.140*	0.196**
Mother is reported as IP	-0.305**	-0.320*	-0.298*
Community factors			
Luzon	0	0	0
Visayas	-0.294***	-0.270**	-0.336***
Mindanao	-0.0809	0.0349	-0.203*
Urban	0.351***	0.303***	0.384***
In armed conflict area at W1	0.135	0.305*	-0.0175
In GIDA at W1	-0.299*	-0.188	-0.399*
_cons	3.143***	3.500***	3.272***
No. of observations	14508	7252	7256

Estimated using linear mixed effects model
p-values in parentheses ="* p<0.05 ** p<0.01 *** p<0.001"

Annex F3: Background factors and average school grade

	Both sexes	Male	Female
Child factors			
Male	-0.481***		
IQ score (Ravens)	0.0279***	0.0281***	0.0275***
With disability at W1	-0.0676	0.0957	-0.225
Child work status	-0.0336*	-0.0400*	-0.0234
Attended nursery	0.107***	0.159***	0.0618
With depressive symptoms	-0.00488*	-0.00802**	-0.00257
IC believes can achieve college education	0.0561**	0.0424	0.0726**
Stunted	-0.0518**	-0.0681**	-0.0387
Wasted	0.00771	0.0193	-0.00862
Attended public school	-0.0704**	-0.0515	-0.0817*
Belongingness			
Close to mother	0.00150	0.0367	-0.0411
Close to father	0.0343	0.0307	0.0396
Social scale	0.0184***	0.0134**	0.0222***
Family factors			
Wealth quintile 1	0	0	0
Wealth quintile 2	0.00432	-0.0296	0.0344
Wealth quintile 3	0.0288	0.0110	0.0424
Wealth quintile 4	0.0475*	0.0472	0.0438
Wealth quintile 5	0.117***	0.101**	0.130***
Mother is at least HS graduate	0.135***	0.0422	0.228***
Household is 4Ps beneficiary	-0.0659**	-0.0419	-0.0799*
Mother believes child can achieve college education	0.0213	0.0484*	-0.0123
Witnessed violence at home	-0.0486***	-0.0511**	-0.0447*
Mother is reported as IP	-0.00369	0.0785	-0.0759
Community factors			
Luzon	0	0	0
Visayas	0.184***	0.170***	0.198***
Mindanao	0.266***	0.275***	0.249***
Urban	-0.282***	-0.238***	-0.324***
In armed conflict area at W1	-0.0598	-0.0944	-0.0122
In GIDA at W1	0.0874	0.000498	0.168*
_cons	2.348***	1.841***	2.393***
	(0.000)	(0.000)	(0.000)
No. of observations	12528	6229	6299

Estimated using linear mixed effects model

p-values in parentheses = "*" p<0.05 ** p<0.01 *** p<0.001"