The Causal Effects of Having Been Bullied
as an Adolescent on Later Life Outcomes

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Abstract

We use a large and rich cohort of recent English resident adolescents to analyse the long-term effects of having been bullied in junior high school. The data contains self-reports of five types of bullying and their intensity for the first hree waves of the data – up to the minimum school leaving age. We analyse a variety of outcomes, including educational achievements, obtained from matching administrative data, and earnings at age 25. We use a variety of estimation strategies - least squares, inverse probability weighting, and instrumental variables with and without exploiting factor analysis. Importantly, the data contains independent cross-reports of each bullying type from the main parent that are highly correlated with the self-reports, and which we exploit to resolve endogeneity arising from measurement error in the self-reports. Bullying affects a large minority of the cohort and our results suggest their experience of bullying has quantitatively important long run effects on them.

1. Introduction

Bullying is thought to be a widespread and serious experience that affects many and varied children. In our data, of a large cohort of English resident 14 year olds who have been followed to age 25, we find that 36% of young people in year 10 (age 15) reported they had been bullied in the previous 12 months in 2014.[1] Despite this high prevalence of bullying there is little existing research that deals with non-random selection into being a victim of bullying. To our knowledge only four quantitative studies deal with selection bias have been conducted: Brown and Taylor (2008), Ammermuller (2012), Ponzo (2013), and Eriksen et al. (2014) all confirm that bullying causes severe detrimental short and long-term consequences for individual's health, wellbeing and academic outcomes.

Our study contributes to this small literature by using exceptionally rich data available from the Longitudinal Study of Young People in England (LSYPE), which enables us to relate a youth's experience of being bullied at school to their subsequent outcomes measured at 25, when most of the cohort individuals would have completed their education and entered employment. Specifically, we distinguish between the following labour market and education outcomes: Advanced (A) level (school qualifications usually taken at age of 18)[2]; having a university degree; degree class; earnings; unemployment; and mental health - all measured at age of 25. Our work complements earlier correlational research using LSYPE by Vignoles and Meschi (2010) which focusses on short-term educational outcomes.

Our primary contribution is to address the endogeneity of the various forms of victimization self-reported in the data, which we do by exploiting the richness of the data and, importantly, by using the unusually detailed parental cross-reports in the data. Both youths and parents answered whether the individual was a victim of each of five forms of bullying in the last 12 months. Moreover, for each form, they are asked about the frequency of such victimization. Thus, the main objective of our

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[1] See the Longitudinal Study of Young People in England (LSYPE). Moreover, the 2017 edition of the Annual Bullying Survey, a large but on-line survey of young people in secondary schools and colleges all across the UK, has revealed even more alarming results: 54% of all respondents been bullied at some point in their lives. According to the same survey, more than one-third of all victims developed social anxiety, over one-third developed depression, and almost one-fourth of the victims had suicidal thoughts.

[2] A-levels are public examinations taken at age 18, usually studied over a two-year period and are used as the primary admission criterion by universities.

study is to investigate the causal effects of bullying in secondary school on academic achievements and labour market outcomes at age 18 or 25. We exploit the richness of our dataset and construct an index of bullying, including information about different types of bullying at various waves, and the frequency of bullying episodes. Further, we use instrumental variable estimation where the bullying intensity score is instrumented with the parental reporting of child bullying. We highlight the heterogeneity by gender in the effect of bullying on economic outcomes. Finally, we highlight that establishing a causal link between bullying and later economic outcomes is important for public policy. Internationally, there have been many school-based anti-bullying programs that bring about, on average, a reduction of 20% in bullying incidence (Ttofi and Farrington, 2011).[3] In the UK, the philosophy has generally been not to adopt or impose a specific program to stop bullying, but rather to make a range of options and resources available for schools to choose the most appropriate (Smith and Thompson, 2014). The 2014 Education Regulations has promoted equality at schools by implementation of an effective anti-bullying strategy.[4] This work provides estimates of the potential benefits to put alongside the costs of such policies.

Our findings suggest that it is important to revise the current anti-bullying strategies in UK secondary schools in order to alleviate the adverse long-term effects on economic outcomes. We found that bullied victims perform significantly worse than non-bullied adolescents in terms of their academic achievements and labour market outcomes. One standard deviation increase in school bullying score at ages 14-16 decreases the likelihood of achieving A-level by 4 percentage points.

The rest of the paper is organized as follows. Section 2 briefly reviews the literature and Section 3 describes the education system, data and construction of the bullying intensity measure. Section 4 discusses the methodology. Section 5 presents the main results and finally, and finally Section 6 offers concluding comments.

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[3] For instance, the Norwegian Olweus Bullying Prevention program (http://www.violencepreventionworks.org/public/olweus_history.page) aims to provide a different structure to school classrooms to discourage bullying and reward more helpful behavior.

[4] See, Department of Education (2017),"Preventing and tackling bullying", Advice for head teachers, staff and government bodies'

## 2.	Existing Literature

The existing literature supports the hypothesis that bullying impairs the subsequent academic achievement of victims (Glew et al., 2005, and Ma et al., 2001). Kumpulainen and Räsänen (2000) find that children involved in bullying had more psychiatric symptoms at the age of 15 years. Bullied children also show symptoms of depression and suicidal ideation (Kaltiala-Heino et al., 1999; Van der Wal et al., 2003). Drydakis (2013) studies the long-term correlates of bullying in school and finds that subsequent labour force participation, employment rate and hourly wages are all negatively affected.

Recent attempts to identify a casual effect of victimization include Brown and Taylor (2008), Ammermuller (2012), Ponzo (2013), Eriksen et al. (2014). Brown and Taylor (2008) investigate the link between bullying, educational attainments, and earnings on a sample of youths, born in a particular week of 1958 in the National Child Development Study (NCDS) in England. They find that being bullied at school increases the likelihood of failing secondary education exams by 1.7 percentages. Ammermueller (2012) uses a dataset from 11 European countries and similarly find that being bullied has a significantly negative impact on students' later economic performance. Their causal effect of being bullied is analyzed thorough investigating the role of possible confounding factors such as student appearance (being taller, looking attractive wearing glasses), non-cognitive skills and school effects, which are neglected e.g. in the analysis of Brown and Taylor (2008). Ponzo (2013) uses propensity score matching techniques to investigate the determinants and the effect of being victim of school bullying on educational achievement from Italian students enrolled at the fourth and eight grade levels. The adverse effect of bullying on educational achievement is larger at age 13 than age 9. Eriksen et al. (2014) establish a causal relationship between bullying in elementary school and future outcomes in Denmark using proportion of peers from troubled homes in one's classroom as an instrument for victim status. The authors exploit administrative data on parent's criminal history and find that bullied children have lower academic achievement in 9th grade, and the impact is larger when the episodes of bullying are severe.

3.   Educational context and data

Education system

Education in England is organized into 'Key Stages'. There is a common curriculum across almost all schools. At the end of Key Stage 4 (age 16-17) , which is the end of compulsory schooling, students take the General Certificate of Secondary Education exams (GCSEs). Students usually have GCSE exams in five to ten subjects, and need to pass five of them, including Mathematics and English, in order to move into further academic study in senior high school. After their GCSE exams, students may decide to pursue further studies from age 16–18, specializing in more challenging subjects in preparation for their General Certificate of Education (GCE) Advanced Level examinations (the so-called 'A-levels'). Usually, students select three or four subjects at A-level, depending on their academic preferences and intentions toward higher education.

Data

Our paper uses data from Next Steps (previously known as Longitudinal Study of Young People in England – LSYPE), which is a longitudinal study of English adolescents, covering a wide range of topics, including family relationships, attitudes toward school, family and labour market, and some more sensitive or challenging issues, such as risky health behaviours, and personal relationships. Young people included in the Next Steps were selected to be representative of the English population, and specific groups were oversampled (in particular, young people from a low socioeconomic background) (Department of Education, 2011). The survey started in 2004 when young people were at age of 14 (in school Year 9). In the first wave of the Next Steps, around 15,000 young people were interviewed across more than 700 high schools. The survey continuously followed these individuals for 7 years (age 14-21) and then re-interviewed them in wave 8 at age 25.

The data asks both students and parents whether the child was a victim of bullying in the last 12 months. In particular, in the first three waves of the Next Steps (age 14-17), young people were asked whether they had experienced any of five forms of bullying in the last year including: name-calling; social exclusion by peers; being made to hand over money or possessions; threats of violence; and actual violence, which allows us to define different types of bullying Further, individuals

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report the intensity of every form of bullying, ranging from "every day" to "once a month" and to "less often than this". We combine all different measures of bullying along with frequencies of bullying at each wave using factor analysis. We find evidence of one common factor which we interpret as a measure of bullying intensity.[5] This score is standardized to have mean equal to zero and standard deviation of one, and therefore it allows us to interpret results in terms of standard deviations of the bullying score. We drop observations where we observe no information about victimization from either the student or the parents as well as observations with no information on the outcomes. The final sample consists of over 5,000 observations of students with non-missing observations on bullying status, educational and labour market outcomes, and other important independent variables.

We study the long-term impact of bullying on the following outcomes: the likelihood of receiving A-levels observed at age of 18; the A-level grade score; the likelihood of receiving a university degree. Further, we investigate the effect of bullying on some important adult life outcomes observed at age 25, such as: weekly earnings; risk of unemployment; and self-reported mental health.

Means of selected characteristics of youths and their parents by bullying status are shown in Table 1. These variables also enter into our conditioning set in the formal analysis below. Among the conditioning variables, we include two variables computed from a factor analysis recorded when the youth is 15-16 – locus of control and work ethic index; we expect these covariates to be strongly associated with bullying victimization. Interestingly, individuals who have never been bullied show higher level of work ethics. As expected, children with a disability are more likely to experience bullying.

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[5] The first factor explains 73% of the We tried with obliged rotation technique to allow the factors to be correlated. The rotation does not affect the estimates.

Table 1—Means and standard deviations by bullying status

Variable	Has been bullied at least once in wave 1-3			Never bullied		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
A-levels	3,099	0.44	0.49	2,373	0.49	0.50
A-level points	1,584	249.24	142.11	1,305	253.01	142.71
University degree	3,099	0.38	0.38	2,373	0.40	0.49
log weekly wages	3,099	5.71	0.25	2,373	5.70	0.23
Unemployment	3,099	0.095	0.29	2,373	0.07	0.26
Mental health	2,995	2.53	3.23	2,373	1.71	2.65
Work ethics index	3,099	0.05	0.93	2,373	0.15	0.89
Locus of control	3,099	0.29	0.84	2,373	0.36	0.80
Disability	3,099	0.13	0.34	2,373	0.09	0.30
male	3,099	0.45	0.50	2,373	0.45	0.50
Separated/divorced	3,099	0.16	0.36	2,373	0.13	0.34
IDACI	3,099	0.21	0.18	2,373	0.21	0.18
Parental qualification						
Degree	3,099	0.28	0.45	2,373	0.26	0.44
A levels	3,099	0.14	0.35	2,373	0.14	0.35
GCSE	3,099	0.26	0.44	2,373	0.27	0.44
No qualification	3,099	0.28	0.45	2,373	0.29	0.45
Asian	3,099	0.15	0.35	2,373	0.20	0.40
Black	3,099	0.04	0.20	2,373	0.06	0.24
Other ethnic group	3,099	0.06	0.24	2,373	0.08	0.27

4. Estimation methods

We exploit the richness of Next Steps and estimate two versions of our model, progressively expanding the set of independent variables to account for mediators and to establish the robustness of the estimated impacts. The first most parsimonious model includes a basic set of individual and family characteristics, including child's gender and ethnicity. Next, we also include personality traits (measured at wave 2), disability (recorded at wave 1) maternal education and marital status; and, additionally, the income deprivation affecting children index (IDACI) is which is a measure of socioeconomic status.

We begin by estimating a linear-in means model of the effect of bullying and our baseline estimating equation is:

$$Y_{iht} = B_{iht-1}\alpha + \mathbf{X}'_{it-1}\boldsymbol{\gamma} + \epsilon_h + \omega_{ih} \tag{1}$$

where Y_{ih} represents a particular outcome at age 18 or 25 for individual i who attended high school h. The variable B_{ih} represents the bullying score calculated using factor analysis for student i attending high school h (combining information on bullying frequencies and types at waves 1-3, age 14-17), X_i is a vector of child and family characteristics (e.g. broken family, maternal education and marital status) and

ϵ_h is a school fixed effect. The inclusion of the school fixed effects ϵ_h allows us to control for unobserved time-invariant school characteristics, which may affect bullying and students' outcomes at the same time. In this specification the coefficient on the B_{ih} indicator, α, is our main parameter of interest. Remember that we measure bullying at ages 14-17; this implies that main parameter of interest is interpreted as the effect of victimization in secondary school on later economic outcomes, generally speaking.

The key problem in this analysis is that bullying is not randomly assigned, and as indicated in the descriptive section above, victims are typically negatively selected in terms of observable characteristics. An additional concern is that there may be some time-varying shocks that affect the school and students who attend it, and at the same time affect the likelihood of being bullied and individual outcomes and we exploit school fixed effects to handle this.

Although our conditioning set described above is very rich, we cannot rule out that these unobserved characteristics may lead to overstate the effect of bullying. In an attempt to solve these issues, we implement instrumental variable strategy.

Next Steps includes a very detailed set of questions about bullying asked to the main parent. These questions are asked at each wave from 1 to 3, and are very similar to the ones asked to the child. In other words, parents are asked to report whether their child has been the victim of any form of bullying (name calling, social exclusion, theft, threat with violence, actual violence) and, in case of a positive answer, they are asked to report the frequency of these episodes (from every day to less than once a month). We use this information in a similar way to what we have done to construct the individual bullying index, and we use factor analysis to construct a parent-reported bullying index.

We instrument the bullying score with the parent-reported bullying index. For this to constitute a valid instrument, it must affect students' bullying score (and the effect must go only in one direction) yet cannot directly affect individual long-term educational and labour market outcomes, but only through its indirect impact via individual reported bullying. Let MPB_{iht-1} be the main parents reporting students bullying intensity, defined at waves 1-3 (age 14-17). We can then model the first-stage equation as:

$$B_{iht} = MPB_{iht-1}\beta + \mathbf{X}'_{it-1}\boldsymbol{\pi} + \vartheta_{ih} \qquad (2)$$

where the exclusion restriction states that main parent reported bullying does not affect individual's long-term outcomes directly. We stress that it is the act of being bullied, which is likely to affect the individual long-term outcomes, and parental reporting should capture the most serious instances. Nonetheless, it is reasonable to assume that parents report bullying when they are aware of it, and this probably happens in the most serious instances (it is unlikely that a teenager child reports every single minor episode to his parents). Therefore, an important assumption here is that it is the act of being bullied, which is likely to affect the individual long-term outcomes, and parental reporting should mostly capture the most serious instances, but should not have an impact on the outcomes *per se*.

One possible concern in this analysis is that parents who report bullying may be systematically different from those who do not report it, and that they may put some strategies in place in order to support their child and help her/him navigate through these difficult experiences. If these characteristics or strategies also affect long-term outcomes, out estimates could be biased. However, this kind of parental behaviour is more likely to be found among parents who are more involved in their children's lives and possibly more able to support their children. We expect these parental characteristics to have a positive effect on children's long-term outcomes, and therefore this potential source of bias is likely to make our estimates more conservative.

Finally, in order to rule out this concern, we run a sensitivity test of our main results, by controlling for some indicators of parental involvement (e.g. parental involvement with the child's school life, whether the child takes extra classes in school subjects, whether the parents set a time for the child to come home at night before a school day, whether anyone at home helps the child with homework, etc.)

5. Results

The baseline OLS results are reported in Tables 2 and 3, where the basic specification includes child gender and ethnicity along with the school fixed effects, while the full specification adds socioeconomic background characteristics such as adolescent's locus of control, measured at age 16, disability status, parental education and marital status, income deprivation index. The results suggest that being bullied at

school has a significant long-term negative impact on economics outcomes. In particular, one standard deviation increase in school bullying score at ages 14-16 decreases the likelihood of achieving A-level by 3.9 percentage points (the average of individuals taking A-level in the sample is 46%), and decreases probability of having A-level points by 9 points, or 6% of a standard deviation. Further, other things being equal, experiencing bullying at ages 14-17 also decreases individual's likelihood of university degree completion, measured at age 25, by about 2.1 percentage points (the average of individuals with a degree at age 25 is 38%).

We also consider the long-term effect of bullying on labour market outcomes. In line with Brown and Taylor (2008) we find that being bullied at school has a statistically significant negative influence on weekly wages. Indeed, a one standard deviation increase in the bullying index at ages 14-16 decreases the wages at age 25 by 2.1 percentage points and increases the probability of unemployment at that age by 1.7 percentage points.

Lastly, school bullying during adolescence correlates significantly with individuals' mental health. Other things being equal, an increase in the bullying index at ages 14-16 increases the General Health Score by about 0.37 points (12% of a standard deviation). Overall, adding comprehensive set of covariates slightly reduces the estimated magnitudes, but the estimates remain robust.

Tables 3 and 4 present results from the instrumental variables analysis. As in the OLS analysis we expand the conditional set. We find that presence of parent reporting bullying intensity significantly increases the magnitudes of reported effects. We believe that this is consistent with the idea that parent-reported bullying captures the most serious forms of bullying and that these are long-lasting episodes, which are likely to generate the most negative effects on adolescent's outcomes.

Table 2—Economics outcomes and school bullying, (OLS) basic specification

	(1) A-level	(2) A-level points	(3) University degree	(4) Log weekly wages	(5) Unemployed	(6) Mental health
Bullying score	-0.039	-9.105	-0.025	-0.021	0.017	0.370
	(0.007)***	(4.150)**	(0.007)***	(0.003)***	(0.004)***	(0.047)***
Male	-0.056	-15.925	-0.059	-0.091	-0.054	-0.440
	(0.014)***	(5.924)***	(0.015)***	(0.005)***	(0.008)***	(0.095)***
Asian	0.148	-0.030	0.186	-0.269	0.024	-0.062
	(0.026)***	(10.047)	(0.026)***	(0.009)***	(0.015)	(0.171)
Black	-0.051	-31.355	0.117	-0.271	0.007	-0.104
	(0.038)	(15.800)**	(0.039)***	(0.014)***	(0.023)	(0.250)
Other ethnic	0.034	-3.089	0.061	-0.292	-0.001	0.447
	(0.028)	(11.056)	(0.029)**	(0.010)***	(0.017)	(0.189)**
N	5,471	2,889	5,471	5,471	5,471	5,271

Notes: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 3—Economics outcomes and school bullying, (OLS) full specification

	A levels	A level points	University degree	Log income	Unemployment	Mental health
Bullying score	-0.0328***	-9.950**	-0.0205***	-0.0148***	0.0149***	0.349***
	(0.00699)	(4.091)	(0.00720)	(0.00213)	(0.00422)	(0.0469)
Work ethics	0.0577***	13.20***	0.0503***	0.00392	-0.0171***	-0.0774
(w. 2)	(0.00827)	(3.543)	(0.00852)	(0.00252)	(0.00500)	(0.0560)
Locus of	0.00545	-0.209	0.00536	0.0112***	-0.00882	-0.176***
Control (w.2)	(0.00913)	(3.733)	(0.00940)	(0.00278)	(0.00551)	(0.0620)
Disability	-0.0378*	6.623	-0.0439**	-0.0423***	0.0359***	0.321**
	(0.0205)	(8.652)	(0.0211)	(0.00622)	(0.0123)	(0.138)
Male	-0.0534***	-16.21***	-0.0549***	-0.0956***	-0.0549***	-0.447***
	(0.0141)	(5.889)	(0.0145)	(0.00428)	(0.00850)	(0.0951)
Parents	-0.0965***	-16.00*	-0.0549***	-0.158***	0.0267**	0.127
Separated or divorced	(0.0186)	(8.431)	(0.0191)	(0.00565)	(0.0112)	(0.126)
Main Parent education						
A levels	-0.112***	-24.37***	-0.0939***	-0.0196***	0.00723	-0.377***
	(0.0214)	(8.139)	(0.0220)	(0.00651)	(0.0129)	(0.144)
GCSE	-0.136***	-42.26***	-0.152***	-0.00508	0.0146	-0.189
	(0.0181)	(7.086)	(0.0187)	(0.00552)	(0.0110)	(0.122)
Lower	-0.212***	-48.62***	-0.190***	-0.166***	0.0464***	-0.102
qualification	(0.0195)	(8.411)	(0.0201)	(0.00593)	(0.0118)	(0.132)
Asian	0.164***	9.619	0.194***	-0.234***	0.0208	-0.0449
	(0.0259)	(10.37)	(0.0266)	(0.00787)	(0.0156)	(0.176)
Black	-0.0499	-26.75*	0.101***	-0.257***	0.00225	-0.180
	(0.0375)	(15.79)	(0.0386)	(0.0114)	(0.0226)	(0.253)
Other ethnic	0.0513*	0.0195	0.0672**	-0.265***	-0.00723	0.425**
group	(0.0277)	(11.04)	(0.0285)	(0.00843)	(0.0167)	(0.189)
IDACI score	-0.324***	-43.37*	-0.186***	-0.176***	0.155***	1.037***
	(0.0534)	(23.76)	(0.0550)	(0.0163)	(0.0322)	(0.362)
N	5471	2889	5471	5471	5471	5271

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4—Economics outcomes and school bullying, (IV) basic specification

	(1) A-level	(2) A-level points	(3) University degree	(4) Log weekly wages	(5) Unemployed	(6) Mental health
Bullying score	-0.103	-29.960	-0.083	-0.047	0.051	0.914
	(0.018)***	(15.006)**	(0.018)***	(0.006)***	(0.010)***	(0.118)***
Male	-0.053	-15.256	-0.064	-0.092	-0.047	-0.529
	(0.016)***	(6.617)**	(0.016)***	(0.006)***	(0.009)***	(0.105)***
Asian	0.145	7.398	0.216	-0.244	0.018	-0.050
	(0.031)***	(11.893)	(0.032)***	(0.011)***	(0.018)	(0.210)
Black	-0.007	-38.451	0.133	-0.261	-0.006	-0.149
	(0.044)	(18.062)**	(0.045)***	(0.016)***	(0.025)	(0.294)
Other ethnic	0.052	-4.046	0.056	-0.287	0.007	0.598
	(0.031)	(12.234)	(0.032)*	(0.011)***	(0.018)	(0.212)***
N	4,617	2,391	4,617	4,617	4,617	4,447

Table 5—Economics outcomes and school bullying, (IV) full specification

	A levels	A level points	University degree	Log income	Unemployment	Mental health
Bullying score	-0.0947***	-36.66**	-0.0783***	-0.0361***	0.0469***	0.888***
	(0.0174)	(14.92)	(0.0180)	(0.00538)	(0.0100)	(0.118)
Work ethics	0.0606***	16.52***	0.0565***	0.00534*	-0.0160***	-0.0296
(w. 2)	(0.00906)	(3.960)	(0.00935)	(0.00280)	(0.00523)	(0.0624)
Locus of	0.00226	-2.057	-0.00415	0.00838***	-0.00414	-0.213***
Control (w.2)	(0.00997)	(4.126)	(0.0103)	(0.00308)	(0.00575)	(0.0689)
Disability	-0.0378*	7.989	-0.0357	-0.0404***	0.0350***	0.300**
	(0.0218)	(9.365)	(0.0225)	(0.00673)	(0.0126)	(0.150)
Male	-0.0480***	-14.33**	-0.0579***	-0.0956***	-0.0493***	-0.530***
	(0.0154)	(6.572)	(0.0159)	(0.00475)	(0.00886)	(0.106)
Parents	-0.100***	-18.47**	-0.0579***	-0.152***	0.0267**	0.0681
Separated or divorced	(0.0203)	(9.388)	(0.0210)	(0.00628)	(0.0117)	(0.140)
Main Parent						
education						
A levels	-0.117***	-24.69***	-0.107***	-0.0243***	0.00496	-0.331**
	(0.0224)	(8.658)	(0.0231)	(0.00692)	(0.0129)	(0.154)
GCSE	-0.141***	-41.55***	-0.153***	-0.00369	0.0151	-0.248*
	(0.0190)	(7.534)	(0.0196)	(0.00587)	(0.0110)	(0.131)
Lower	-0.222***	-47.38***	-0.205***	-0.162***	0.0441***	-0.0927
qualification	(0.0212)	(9.644)	(0.0219)	(0.00655)	(0.0122)	(0.146)
Asian	0.143***	11.50	0.211***	-0.226***	0.0203	-0.0166
	(0.0306)	(12.01)	(0.0315)	(0.00944)	(0.0176)	(0.212)
Black	-0.0155	-34.21*	0.109**	-0.252***	-0.00751	-0.213
	(0.0430)	(18.08)	(0.0444)	(0.0133)	(0.0248)	(0.296)
Other ethnic	0.0680**	-2.242	0.0636**	-0.264***	0.00201	0.574***
group	(0.0304)	(12.17)	(0.0314)	(0.00940)	(0.0175)	(0.212)
IDACI score	-0.366***	-55.18**	-0.212***	-0.187***	0.142***	0.847**
	(0.0606)	(27.61)	(0.0625)	(0.0187)	(0.0349)	(0.418)
N	4617	2391	4617	4617	4617	4447

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In Table 5 we present an analysis of heterogeneity of results by gender. Interestingly, the long run effect of bullying seem higher for girls than for boys

Table 6—Economics outcomes and school bullying, (OLS) full specification

	A-level	A-level points	University degree	Log weekly wages	Unemployed	Mental health
			MALES			
Bullying score	-0.036	-5.495	-0.026	-0.022	0.005	0.317
	(0.010)***	(5.858)	(0.010)**	(0.004)***	(0.005)	(0.064)***
Asian	0.090	5.907	0.166	-0.248	0.062	0.168
	(0.039)**	(17.887)	(0.040)***	(0.015)***	(0.020)***	(0.257)
Black	-0.122	-72.617	-0.007	-0.259	0.013	-0.099
	(0.061)**	(27.714)***	(0.062)	(0.023)***	(0.030)	(0.396)
Other ethnic	-0.017	-6.051	0.026	-0.298	0.059	0.519
	(0.046)	(21.061)	(0.047)	(0.017)***	(0.023)**	(0.301)*
N	2,483	1,258	2,483	2,483	2,483	2,384
			FEMALES			
Bullying score	-0.055	-25.715	-0.037	-0.024	0.034	0.400
	(0.012)***	(7.894)***	(0.012)***	(0.004)***	(0.007)***	(0.078)***
Asian	0.171	-8.794	0.174	-0.289	0.005	-0.258
	(0.037)***	(13.935)	(0.038)***	(0.013)***	(0.024)	(0.249)
Black	-0.022	-21.588	0.156	-0.291	0.007	0.074
	(0.053)	(20.768)	(0.054)***	(0.018)***	(0.034)	(0.355)
Other ethnic	0.078	-9.955	0.074	-0.296	-0.047	0.495
	(0.039)**	(14.466)	(0.040)*	(0.014)***	(0.025)*	(0.266)*
N	2,988	1,631	2,988	2,988	2,988	2,887

Notes: * *p*<0.1; ** *p*<0.05; *** *p*<0.01. Not reported here are full set of covariates as in the full specifications.

6. Conclusion

This paper investigates the determinants and potential causal effect of bullying in secondary school on later academic and labour market outcomes by exploiting a rich conditioning set of observables. Our empirical findings suggest that the school bullying has an adverse long-term effect on human capital accumulation and labour market outcomes. One standard deviation increase in school bullying score at ages 14-16 decreases the likelihood of achieving A-level by 4 percentage points and decreases probability of having A-level points by 9 points, other things being equal.

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