The adult consequences of being bullied in childhood

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ABSTRACT

Most studies examining the impact of bullying on wellbeing in adulthood rely on retrospective measures of bullying and concentrate primarily on psychological outcomes. Instead, we examine the effects of bullying at ages 7 and 11, collected prospectively by the child's mother, on subjective wellbeing, labour market prospects, and physical wellbeing over the life-course. We exploit 12 sweeps of interview data through to age 62 for a cohort born in a single week in Britain in 1958. Bullying negatively impacts subjective well-being between ages 16 and 62 and raises the probability of mortality before age 55. It also lowers the probability of having a job in adulthood. These effects are independent of other adverse childhood experiences.

1. Introduction

Being bullied in childhood is not uncommon. According to UNESCO (2019) more than 30% of the world's students have been victims of bullying and one in ten has been cyberbullied. In the United States in 2017 20% of students aged 12–18 reported being bullied (National Center for Education Statistics, 2019). The 2006 National Bullying Survey from the charity Bullying UK found 69% cent of children reported being bullied, 20% reported bullying others, and 85% had witnessed bullying (Vanderbilt and Augustyn, 2010). According to data from the Youth Risk Behaviour Survey (YRBS) conducted by the Centers for Disease Control and Prevention (CDC), 15% of American high school students reported being bullied at school in 2021.[1] In addition 16% of respondents reported being electronically bullied, including through texting, Instagram, Facebook, or other social media, during that year. In both the UK and the US both types of bullying fell during the COVID-19 pandemic as schools shifted to remote learning (Bacher-Hicks et al., 2022; CDC, 2023) but the gradual return to in-person instruction starting in fall 2020 caused an uptick.

It is perhaps unsurprising that the experience negatively impacts children in a variety of ways. It is associated with lower subjective wellbeing (Savahl et al., 2018; Heydenberk and Heydenberk, 2017) and an increased likelihood of stomach pains, sleep problems, headaches, bedwetting and poor appetite (Fekkes et al., 2006). Both bullying and cyber-bullying have been linked to poorer psychological and physical health, and poorer academic performance (Kowalski and Limber, 2012). Moore et al. (2017) note that bullying is associated with feeling tired, poor appetite, sleeping difficulties, dizziness, back pain and depression and suicidal ideation. Strong evidence, they argue, exists "*for a causal relationship between bullying victimization, mental health problems and substance use*".

There is also growing evidence linking being bullied in childhood to negative outcomes in adulthood including lower subjective wellbeing (Blanchflower and Bryson, 2023; Arseneault et al., 2010; Kelleher et al., 2008; Gladstone et al., 2006; Oshio et al., 2013; Smokowski and Kopasz, 2005), health, income, relationships with others (Wolke et al., 2013) and labour market prospects and wages (Drydakis, 2014). A meta-analysis of quasi-experimental studies on both short-run and long-run consequences of bullying suggests bullying victimization is causally linked to internalizing and externalizing symptoms and academic difficulties (Schoeler et al., 2018).

One potential reason for the persistence of bullying effects in

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[1] In the US bullying also fell and was higher in 2011 at 20% in the YRBS. Centers for Disease Control and Prevention (2023) have reported that in the United States among high school students who were bullied at school in the past year among girls fell from 22% in 2011 to 17% in 2021 and from 18% to 13% for boys (p52). Analogously, the proportion of girls who said they were electronically bullied the last year fell over these years from 22% for girls to 20% in 2021 and remained flat at 11% for boys.

adulthood is that, as Powdthavee (2014) hypothesized, psychological resilience in adulthood is determined in adolescence. Those who face adverse childhood experiences (ACEs) may be less resilient in future. Analyzing individual panel data from the British Household Panel Survey (BHPS) he concluded that "*people who during their early teenage years had spent a significant amount of time fighting other people, arguing with their parents, and whose parents had reported lower mental well-being were more likely than others to have worse mental well-being and lower life satisfaction as adults*" (p. 89).

So, bullying early in life may impact individuals' ability to cope with negative shocks subsequently in life. In his longitudinal study of nearly 3000 children Powdthavee (2012) found evidence to support this proposition since the negative effect of unemployment on mental health and life satisfaction was almost four times larger for workers who had been bullied a lot in their early life with zero adaptation to unemployment for these individuals over time.

The probability of being bullied as a child is not random and may be affected by other problems or disadvantages in childhood which themselves have long-term consequences in adulthood. For example, Oshio et al.'s (2013) study for Japan examined the impact of childhood interpersonal adversity on subjective well-being in adulthood. They concentrated on parental maltreatment (abuse and neglect) and bullying in school as childhood adversity variables and on perceived happiness and self-rated health as adulthood Social Wellbeing (SWB) measures. Using micro data from a survey in municipalities in and around the Tokyo metropolitan area they found 12% had been bullied by age 15. Their main result was that the experience of childhood adversity had a substantial negative impact on adulthood SWB. They also showed that social support and socio-economic status significantly mediated the impact of childhood adversity. However, physical abuse, parental neglect and bullying all increased unhappiness in adulthood, even controlling for social support variables and socio-economic status. In a similar vein, Armitage (2021) discusses the impact on child health of childhood bullying and notes that children who are perceived as being 'different' in any way are at greater risk of victimization.

It is therefore important to account for other childhood circumstances when seeking to isolate the independent effect of bullying on outcomes in adulthood. This can be difficult in cross-sectional studies which must rely on recall, often many years later, to identify precisely what their childhood experiences were and how they came about. It can be helpful, therefore, to exploit prospective data on what happened in one's childhood when examining bullying effects in adulthood. It is for this reason that we respond to Powdthavee's (2014: 97) suggestion that "*future research should reinvestigate the issue using different cohort data sets, such as the National Child Development Study (NCDS) and British Cohort Study (BCS), in order to try and distinguish lagged effects of childhood characteristics from short-run contemporaneous effects more effectively*" (2014: 97).

We are not the first to take up Powdthavee's call for additional analyses of birth cohort data to examine the effects of various childhood experiences on outcomes in adulthood. However, only a small number focus on the role of bullying.[2]

In an early study using the NCDS Brown and Taylor (2008) found that bullied children had lower incomes than their peers at ages 23 and 33, although not at age 42.[3] They found that school bullying has an adverse effect on human capital accumulation both at and beyond school and the impact of bullying on educational attainment at age 16

was similar in magnitude to class size effects. Furthermore, in contrast to class size effects, the adverse influence of bullying on educational attainment remained during adulthood. In addition, being bullied at school influenced wages received during adulthood.

Using NCDS data through to age 50 Brimblecombe et al. (2018: p. 138) find, "*substantial and durable individual and societal economic impacts at mid-life of being bullied in childhood. Four decades after the bullying occurred, both men and women who were bullied in childhood were less likely to be in employment and had accumulated less wealth in the form of home-ownership or savings than participants who were not bullied.*" Takizawa et al. (2014), also using NCDS data through to age 50, find similar results. They show that parental reports of the child being bullied at ages 7 and 11 negatively affect health in adulthood, raising the probability of depression, anxiety disorders, suicidality, as well as cognitive function, socio-economic status, relationships and well-being.

We contribute to the literature by examining the effects of being bullied in childhood on an array of subjective and physical wellbeing outcomes, as well as labour market performance, up to half a century later through age 62. The bullying data are collected prospectively from the mother when the child was aged 7 in 1965 and at age 11 in 1969. We pay particular attention to controlling for potential confounders, including how well the cohort member got on with parents in adulthood, family composition, conflict between parents, the parents' own labour market status, other aspects of the cohort member's health in childhood, as well as cognitive function (reading and math scores, and IQ), many of which have been omitted from previous studies.

The subjective wellbeing metrics (SWB) are collected from childhood through to age 62 and include two negative affect metrics at age 16; one negative affect outcome at age 23; one positive and one negative affect outcome at age 42; six aspects of negative affect at age 44; 17 positive and 15 negative affect outcomes at age 50; 3 positive and 2 negative affect outcomes at age 55; and one positive and four negative affect outcomes at age 62. Our labour market outcome is being in paid work at each survey interview from age 23 to 55. We also examine biomarkers reported at age 44 and how they, along with being bullied, impact early mortality as indicated by death between age 16 and age 50 or 55.

In Section Two we introduce our data from the NCDS and outline our estimation strategy before presenting results in Section Three and reflecting on the implications in Section Four.

2. Data and estimation

The National Child Development Study (NCDS) follows all those born in one week in March in England, Scotland, and Wales in 1958 (see http://www.cls.ucl.ac.uk/ncds). Participants have been and continue to be, followed throughout their lives.[4] The survey includes data from the cohort member (CM), the CM's teachers and the CM's parents and doctors. We make use of data from all the sweeps. In total there are 18,558 respondents including 619 stillbirths and neonatal deaths which we exclude from the analysis.

2.1. Estimation

In Section Three we estimate equations to establish the independent correlation between bullying at ages 7 and 11 and three sets of outcomes in adulthood, namely (i) subjective wellbeing (ii) labour market performance and (iii) physical wellbeing. These outcomes in adulthood are

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[2] For a review of research on bullying in childhood and consequences in adulthood, both in the UK and elsewhere, see Arseneault (2018).

[3] For other work on parent-child relationships and physical, mental, and social health parental outcomes, using the NCDS and other birth cohort data see Morgan et al., (2012), Stewart-Brown et al. (2005) and Stewart-Brown and Shaw (2004). For research using NCDS to examine associations between ACEs and mental health in adulthood see Gondek et al. (2021a).

[4] For information on the NCDS see Gondek et al. (2021b), Power and Elliott (2006) and numerous early papers on the Perinatal Mortality Study and the NCDS by its founder Professor Neville Butler, whose contributions were summarized in Ferri (1998). See in particular Butler (1962), Hirst et al. (1968), Butler and Alberman (1969), Peckham, West and Butler (1980), Neuspiel et al. (1989), Butler and Bonham (1963), Butler et al. (1973), and Feldstein and Butler (1965).

collected at various interview sweeps between the ages of 16 and 62. We provide detail regarding these dependent variables in Section Three and the Supplementary Appendix as part of the presentation of our results.

Because bullying is not randomly assigned to a cohort member (CM) we first estimate models capturing the frequency of being bullied, conditioning on variables measured at birth (such as birthweight and sex) and up to age 7 – including school test scores, family circumstances (such as moving residential address and household financial problems), and the child's physical and mental health. When estimating the frequency of being bullied at age 11 we also incorporate IQ score at age 11 and lagged bullying variables collected at age 7.

In isolating the independent association between being bullied in childhood and outcomes in adulthood we control for the potential confounders noted above, as well as some additional variables in some cases. For instance, the degree to which children aged 16 say they get on with their mother and father, their geographical location (region) and, in some wellbeing models, labour market status.

2.2. Data

We focus on the long-run associations between bullying and cohort members' wellbeing and their success in labour markets. We introduce the dependent variables when we present results in Section Three. Here we focus on our measures of bullying, the other adverse childhood experiences (ACEs) we use as controls, together with other control variables.

a) Bullying

The parent – usually the mother - was asked in 1965 and 1969 when the child was seven and eleven respectively, whether their child was bullied by other children at school.

Read this to the mother. Now I am going to mention some descriptions of behaviour shown by children. Could you tell me first whether these kinds of behaviour never happen with (child) or whether they happen sometimes or frequently **at the present time** (n135 in NCDS1 and n1449 in NCDS2) - he or she "**is bullied in school.**"

Twelve percent of respondents have no data as there was no parental interview or the answer was missing. Where valid responses were available parents said their child was bullied either sometimes or frequently in around one-third of cases at age 7 and one-quarter of cases at age 11.

	Age 7	Age 11
No, never	65% (n = 9359)	75% (n = 10,069)
Yes, sometimes	30% (n = 4248)	21% (n = 2824)
Yes, frequently	5% (n = 776)	4% (n = 542)
N	14,383	13,435

The table below shows the incidence of bullying both at 7 and 11. Mothers recorded their child as being bullied "frequently" on both occasions in 121 cases. A further 1025 reported being bullied "frequently" on one or other of the two occasions; 1105 reported being bullied "sometimes" on both occasions; and 452 that were bullied "frequently" on one occasion and "sometimes" on the other. 6429 were never bullied.

Responses to bullying questions at ages 7 and 11 were as follows.

Age 11:

	Frequently	Sometimes	Never	Don't know	Total
Age 7:					
Frequently	*121*	*248*	*270*	81	720
Sometimes	*203*	*1105*	*2218*	410	3936
Never	*152*	*1126*	*6429*	910	8617
Don't Know	31	146	489	184	850
Total	507	2625	9406	1585	14,123

Overall, there were 11,872 responses of never, sometimes or frequently, to both questions of which 1677 or 14.1% (121 + 248+203 + 1105) whose parents said their child had either been bullied frequently or sometimes in both NCDS1 at age 7 and NCDS2 at age 11.

b) BSAG score of psychological symptoms at age 7

We control for personality scores known as the Bristol Social-Adjustment Guide (BSAG) which was reported by teachers when the CM was aged 7. BSAG gives a quantitative assessment of the child's behaviour (Engel, 1959; Stott and Sykes, 1958). BSAG covers twelve syndromes: Unforthcomingness; Withdrawal; Depression; Anxiety about acceptance by adults; Hostility towards adults; 'Writing off' of adults and adult standards; Anxiety for acceptance by children; Hostility towards children; Restlessness; 'Inconsequential' behaviour; Miscellaneous symptoms; and Miscellaneous nervous symptoms" (Shepherd, 2013).

Following Brown and Taylor (2008, footnote 12) we use the combined total score for all these syndromes (variable = *n455*) in our empirical estimation.[5] The score takes values from 0 to 64 where higher scores indicate greater problem behaviours. It has both a mean and a standard deviation of 8.8. The distribution was 0 = 9.5%; 1 = 10.8%; 2 = 9.4%; 3 = 7.7%; 4 = 6%; 5–9 = 21.7%; 10–19 = 18.9%; 20–64 = 11.9%. Children that were bullied frequently had higher BSAG scores. The table below presents the mean BSAG score by the 'bullied at seven' variable (*n135*):

	BSAG Score	N	
Frequently	11.54	753	5.0%
Sometimes	9.66	4120	27.6%
Never	8.09	9068	60.8%
Not answered	9.79	985	6.6%
Total	8.81	14,926	

c) Cognitive ability

Children in the UK in the 1960s took an examination at age 11 (the 11-plus) to determine which type of high school they went to. This score is available as an IQ score of both verbal and non-verbal ability (n920) running from zero to 80 with a mean of 42.9. We also condition on the Southgate Reading Score at age 7 (running from zero to 30 with a mean of 23.2) and an arithmetic test at age 7 (running from zero to 10 with a mean of 5.1). In estimating cohort members' worry at age 16 we replace these with reading and math scores collected at age 16.

d) Quality of parental relationship with child at age 16

In 1974 when cohort members were aged 16 they were asked to respond to these statements.

i) I get on well with my mother (n2880)
ii) I get on well with my father (n2881)

In both cases the responses they could give were as follows – *very true; true; uncertain; untrue and very untrue.*

The distribution of these variables is presented below by gender

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[5] Heather Joshi and George Ploubidis have helpfully pointed out to us that the Total BSAG score which was designed to obtain a picture of the child's behaviour in the school setting has some limitations. They noted that the old coding did not extract anything positive about the CMs' behaviour so we are left with something that concentrates on 'bad behaviour' and psycho pathology. Care is needed when interpreting it directly (Dennison and Peters, 2022). When controlling for it we are isolating the effects of bullying later in life net of any effects that may have been mediated by the impact of bullying on BSAG.

Table 1

Frequency of being bullied at ages 7 (NCDS1) and 11 (NCDS2) OLS.

	Age 7	Age 11	Age 11
Birthweight (ounces) or estimate	−.0007	−.0009	−.0009
	(2.58)	(3.34)	(3.05)
Math test score at age 7	−.0125	−.0121	−.0067
	(4.91)	(4.87)	(2.62)
Reading test score at age 7	−.0021	−.0047	−.0030
	(2.27)	(5.10)	(2.84)
Financial problems age 7	.1373 (6.79)	.0407 (2.03)	−.0113
			(0.56)
BSAG total score all syndromes at 7	.0044 (6.52)	.0062 (9.39)	.0046 (6.96)
# family moves by age 7	.0275 (7.53)	.0105 (2.80)	.0021 (0.56)
Disabled at age 7	.0639 (2.28)	.0806 (3.00)	.0469 (1.76)
IQ score at 11			−.0009
			(2.10)
Bullied at 7 frequently			.2244
			(19.86)
Bullied at 7 sometimes			.5290
			(22.99)
Constant	1.5577	1.5335	2.8850
Adjusted R^2	.0278	.0416	.1108
N	12,622	10,659	9832

Notes: excluded bullied at 7 never and dk includes region < column 4 includes ncds2 and ncds1 regions and female. It is set to one if either somewhat or frequent in both mean = 0.141.

(column percentages). They are similar by gender but the proportion who say that it is very true they get on well with their mother is higher than saying the same in relation to their father.

	Mother		Father	
	Male CM	Female CM	Male CM	Female CM
Very true	32	34	27	26
True	38	35	35	35
Uncertain	6	7	9	10
Untrue	3	4	4	5
Very untrue	1	1	2	2
Not answered	20	19	23	22
N	7547	7107	7547	7107

d) Other background variables

The weight of new-born children in 1958 in the Perinatal Mortality Study (PMS) was measured in ounces, the mean being 129 ounces. Parents reported whether the family faced financial difficulties when the child was aged 7: 7 percent said they were. At the same time, they were asked how many times the family had moved home since the child's birth.[6] One-third had not moved but the mean was 1.2 moves and the maximum was 22 moves. When estimating feelings of worry at age 16 we also conditioned on the cohort member being in trouble with the police by age 16–7 percent said 'yes' – and whether the cohort member was 'squirmy' or 'fidgety' at age 16.

3. Results

3.1. Being bullied

Brown and Taylor (2008) ran a series of equations predicting frequency of being bullied at ages 7 and 11. We extend their work in

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[6] Previous research indicates the number of residential moves in childhood is linked to the on-set of poor mental health in adolescence (Winsper et al., 2016).

Table 2

Wellbeing at age 16.

a) Often worries about things at age 16 reported by parents and teachers OLS

	School	Parent
Reading score at 16 (n2928)	−.0038 (3.40)	.0031 (2.31)
Math score at 16 (n2930)	−.0060 (5.54)	−.0036 (2.81)
Bullied sometimes at age 7	.0047 (0.36)	.0723 (4.60)
Bullied frequently at age 7	.0838 (3.05)	.1967 (6.02)
Bullied sometimes at age 11	.0771 (5.03)	.1274 (7.01)
Bullied frequently at age 11	.1245 (3.77)	.2264 (5.80)
Constant	1.4422	1.3011
Adjusted R^2	.0274	.0309
N	10,025	8423

b) Rutter scores at age 16 reported by parents and teachers OLS

	School	Parent
Reading score at 16 (n2928)	−.1536 (18.92)	.0611 (8.15)
Math score at 16 (n2930)	−.1384 (17.61)	−.0604 (8.40)
Bullied sometimes at age 7	.0515 (9.54)	.5092 (5.80)
Bullied frequently at age 7	.4046 (2.01)	1.4349 (7.83)
Bullied sometimes at age 11	.3084 (2.77)	.6667 (6.55)
Bullied frequently at age 11	.6029 (2.46)	2.2988 (5.80)
Constant	9.2311	5.9765
Adjusted R^2	.0274	.0894
N	9547	8273
Mean	3.69	4.21

Notes. Includes region ncds3. School n2302 parent n2522 and female. The excluded categories are bullied never at 7 and 11 and bullied don't know included at both ages. Responses are 1 "does not apply" 2 "applies somewhat" 3 "certainly applies".

Table 1.[7] We code the dependent variable 1 = never, 2 = sometimes and 3 = frequently and for simplicity we run OLS equations: ordered logits produce very similar results. In column 1 we examine bullying at age 7 and in columns 2 and 3 at age 11. In column 1 we include controls for gender, math and reading scores at 7 plus birthweight in ounces reported at birth in the PMS. All three are significant and negative. Three variables also measured at age 7 are positive and statistically significant: if the child was disabled; if the family had financial problems in 1965; the number of family moves since the child's birth. The BSAG syndromes score is also significantly positive.

In the second column we repeat the exercise but this time for the frequency of being bullied at age 11. Although the size of coefficients differs a little the signs remain the same and they all remain statistically significant.

Column 3 also estimates the frequency of being bullied at age 11 but adds lagged bullied at 7 variables and the 11-plus IQ score, that both of the authors took, and one passed, and one didn't![8] The IQ test score is negative and statistically significant, as are the math and reading scores at age 7. The lagged dependent variable is positive and statistically significant, indicating persistence in being bullied. The addition of the lagged bullied at 7 and 11-plus and the reduced sample size this entails have little impact on the significance of other variables in the model.

3.2. Ill-being at age 16

In Table 2 we investigate whether bullying at ages 7 and 11 affects a child's wellbeing at age 16 as most CMs were about to leave school

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[7] We have a much larger sample size than Brown and Taylor (2008) who restricted the sample to respondents for whom there was bullying data at both ages.

[8] Brown and Taylor (2008) found being bullied at age 11 was positively associated with being male, disabled, being unattractive, upset by new environments, and the number of schools attended by age 7. They found no evidence of an impact of test scores although they used math and reading test scores from age 7 and did not include the 11-plus score.

(Micklewright, 1989). We exploit data reported by the child's school (n2302) and their parent (n2522) in part a) of the table on whether the '*child often worries about many things*'. In both cases responses are coded "does not apply" (=1); "applies somewhat" (=2) and "certainly applies" (=3).

The models condition on reading and math scores at 16 and region or residence at age 16. Experience of being bullied at both ages 7 and 11 are included. The reference categories in both cases are not being bullied. Being bullied at 7 and 11 increases the propensity of the child's parent and teacher to say the child *often worries*. The effect is larger where the bullying has been frequent and is more recent. The size of the bullying coefficients is larger in the case of the teacher than it is with respect to the parent.

In part b) of Table 2 we then examine composite Rutter-scale scores derived from schools and parents (see Parsons et al., 2024). Each of the component parts for the measure obtained from the school respondent and the parents of the Rutter scale is scored from 1 to 3 as for the worried variables described above.[9] We sum them and set the minimum to zero. In both cases the two bullying variables at age 7 and age 11 are significantly positive.

3.3. Life satisfaction and ill-being

Table 3 examines mental health using Malaise scores at ages 23 (NCDS4) and 42 and a GHQ score at age 42 (NCDS6) which relate to ill-being. Here we find bullying at ages 7 and 11 worsen mental health by raising the malaise and GHQ scores.

In Table 4 we turn to examining the 11-step life satisfaction questions in NCDS6 at age 42, NCDS7 at age 46 and NCDS8 at age 50. The question in all three instances was as follows.

On a scale from 0 to 10, where '0' means that you are completely dissatisfied and '10' means that you are completely satisfied, what number corresponds with how satisfied or dissatisfied you are with the way life has turned out so far?

Mean life satisfaction was 7.29 at age 42, rising to 7.57 at age 46, only to fall back to 7.29 again at age 50. The correlation between life satisfaction at ages 42 and 46 was 0.457; the correlation between life satisfaction between age 42 and 50 was 0.439 and it was 0.531 between age 46 and 50.

Flouri (2004) has previously examined the link between CMs' life satisfaction at age 42 in the NCDS and their closeness to their parents in childhood. She found that closeness to mother at age 16 predicted life satisfaction at age 42 in both men and women. Flouri did not examine the importance of bullying. We therefore incorporate controls capturing how well a CM said she got on with her mother and father, asked at age 16, alongside the controls discussed above (region, math and reading scores, BSAG and sex) and we also add controls for labour force status, and birthweight. We confirm that closeness to mother and father, as reported by the respondent at age 16, continues to have impacts on life satisfaction decades later. Having controlled for these variables it is apparent in Table 4 that being bullied frequently at age 11 negatively impacted life satisfaction in one's 40s and 50s. Being bullied at age 7 is negative and statistically significant at age 50 and to some degree at age 46.

A referee suggested to us that we should examine the magnitude of the effects of bullying and a simple way to do this is to look at raw differences in life satisfaction in NCDS8 at age 50. Here we report life satisfaction means for those whose mothers said the respondent had been bullied at age 7 and age 11. The life satisfaction variable is coded from 0 to 10 (n = 9632) with an overall mean of 7.29. At age 7 the difference between never bullied and frequently bullied was 43 life satisfaction points (7.38–6.95) whereas at age 11 it is 6 percentage

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9 Details of the variables used are in the supplementary appendix.

Table 3

Malaise and GHQ score at ages 23 and 42, OLS.

	Malaise		GHQ-36
	Age 23	Age 42	Age 42
Female	1.3330 (20.58)	.8465 (9.64)	.0758 (3.92)
BSAG total score all syndromes at age 7	.0245 (6.56)	.0229 (4.69)	.0023 (2.21)
Bullied sometimes at age 7	**.2427 (3.71)**	**.3114 (3.67)**	**.0311 (1.69)**
Bullied frequently at age 7	**.5665 (4.18)**	**.6209 (3.51)**	**.0877 (2.28)**
Bullied sometimes at age 11	**.3668 (4.79)**	**.1785 (1.79)**	**.0353 (1.63)**
Bullied frequently at age 11	**.6436 (3.83)**	**.4485 (2.05)**	**.1171 (2.46)**
Gets on well with mother-true	.0786 (0.96)	.1898 (1.80)	.0739 (3.23)
Gets on well with mother-uncertain	.4366 (3.26)	.6040 (3.52)	.1077 (2.88)
Gets on well with mother-untrue	.6184 (3.55)	.5775 (2.58)	.0908 (1.87)
Gets on well with mother-very untrue	.9120 (2.69)	1.2267 (2.69)	.0026 (0.03)
Gets on well with father-true	.2241 (2.57)	.0732 (0.65)	.0093 (0.38)
Gets on well with father-uncertain	.6310 (5.39)	.6071 (4.03)	.1122 (3.43)
Gets on well with father-untrue	.8964 (5.79)	.6232 (3.11)	.0917 (2.10)
Gets on well with father-very untrue	1.1939 (5.20)	.6437 (2.24)	.0434 (0.69)
constant	2.2550	3.0415	1.4317
Adjusted R^2	.1428	.1285	.0407
N	9396	8423	8437
Mean	2.737	3.594	1.741

Equations include region and labor market controls at the relevant NCDS sweep math and reading scores and birthweight. Bullied variables at age 11 in NCDS2 reported by the mother and gets on well with variables reported by respondent in NCDS3 at age 16. Very true and not bullied excluded categories – each of the three variables include an N/A variable. T-statistics in parentheses.

points lower and it is 67 points (7.36–6.69) lower at age 11 which is 9 percentage points lower.

Age 7	
Frequently bullied	6.95
Sometimes bullied	7.21
Never bullied	7.38
Age 11	
Frequently bullied	6.69
Sometimes bullied	7.15
Never bullied	7.36

There is a considerable literature showing the harmful effects of unemployment on wellbeing (Graetz, 1993, Clark and Oswald, 1994, Winkelman and Winkleman, 1998, Wikleman, 2014, Blanchflower et al., 2014, Drydakis, 2015, Blanchflower and Bryson, 2021, Morrish and Medina-Lara, 2021). To assess the magnitude of the difference in life satisfaction between those who were bullied frequently and those who were never bullied it seems appropriate to scale them against the difference between the satisfaction of employees and the unemployed. At age 50 an employee has mean life satisfaction of 7.44 while an unemployed person had a mean satisfaction of 6.23 or 121 life satisfaction points lower. So, the 43-point difference, at age 7 and the 69 point difference at age 11 are clearly substantial compared to the drop from losing a job. It is also substantial compared to the declines in wellbeing as a result of divorce and poor health. The drop is also comparable to the drop in satisfaction between being married and divorced. At age 50 in NCDS8 life satisfaction of single people was 6.79, and divorced was 6.97, separated was 6.68 while being married was 7.67. In NCDS8 respondents were also asked to assess their health (n8hlth). Responses

Table 4
Life satisfaction (11-step) at ages 42, 46 and 50, OLS.

	Age 42	Age 46	Age 50
BSAG total score all syndromes at age 7	−.0096 (3.56)	−.0054 (2.31)	−.0095 (3.39)
Bullied sometimes at age 7	**−.0695 (1.48)**	**−.1129 (2.85)**	**−.1048 (2.18)**
Bullied frequently at age 7	**−.1355 (1.38)**	**−.0661 (0.80)**	**−.1824 (2.77)**
Bullied sometimes at age 11	**−.1340 (2.42)**	**−.0431 (0.92)**	**−.0546 (0.96)**
Bullied frequently at age 11	**−.3210 (2.65)**	**−.3491 (3.31)**	**−.4950 (3.92)**
Gets on well with mother-true	−.1978 (3.17)	−.1326 (2.55)	−.1193 (1.88)
Gets on well with mother-uncertain	−.4960 (5.94)	−.2994 (4.25)	−.4250 (4.98)
Gets on well with mother-untrue	−.3321 (2.98)	−.2899 (3.13)	−.3835 (3.34)
Gets on well with mother-very untrue	−.2840 (1.78)	.0004 (0.00)	−.2561 (1.61)
Gets on well with father-true	−.1154 (1.98)	−.0810 (1.66)	−.1522 (2.57)
Gets on well with father-uncertain	−.1885 (1.98)	−.1744 (2.20)	−.2959 (3.06)
Gets on well with father-untrue	−.4601 (3.71)	−.2598 (2.45)	−.5357 (4.16)
Gets on well with father-very untrue	−.4944 (1.95)	−.3978 (1.87)	−.1464 (0.57)
constant	7.4434	7.8094	7.3766
Adjusted R^2	.0558	.0709	.0777
N	8431	7188	7209
Mean	7.57	7.29	7.29

Equations include female region and labour market controls at the relevant NCDS sweep, math and reading scores and birthweight. Bullied variables at age 11 in NCDS2 reported by the mother and gets on well with variables reported by respondent in NCDS3 at age 16 also include dk at 7 and 11. Very true and not bullied excluded categories – each of the three variables include an N/A variable. T-statistics in parentheses.

were as follows 'excellent' = 7.98; 'very good' = 7.59; 'good' = 7.21; 'fair' = 6.38; 'poor' = 5.50. The difference of 69 life satisfaction points is a little less than the difference between saying excellent and good (77 life satisfaction points). The magnitude of the decline in satisfaction associated with bullying at school in childhood appears to be comparable to the decline in other major adverse life events.

3.4. Other aspects of wellbeing and illbeing in middle-age

In Table 5 we examine the correlation between being bullied in childhood and other aspects of cohort members' wellbeing at age 42. The questions, described in the supplementary appendix, capture six aspects of ill-being experienced "in the past month", namely being tired, having problems concentrating, being anxious, depressed and having sleeping problems. The questions ask for simple "Yes/No" answers. Being bullied frequently at age 7 is independently and positively associated with ill-being thirty-five years later across all five domains of ill-being, together with an overall score, the Clinical Interview Schedule, Revised (CIS-R), a validated scale with values between 0 and 33.[10][11] Being bullied at age 11 is statistically significant in some, but not all the models. These effects are apparent over and above controls such as the

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[10] For more information on the CIS-R see https://www.med.upenn.edu/cbti/assets/user-content/documents/Fatigue%20Assessment%20Scale%20(FAS).pdf.

[11] The dataset includes the summary scores for CIS-R modules: *totsum* which is the sum of Depressive ideas summary score; Depression summary score; Panic summary score; Phobias summary score; Anxiety summary score; Fatigue summary score; Irritability summary score; Sleep summary score; Concentration and forgetfulness summary score. See Gondek, Patalay and Lacey, (2021a).

BSAG score.

In Table 6 we undertake a similar exercise, but this time for 37 wellbeing and ill-being metrics collected when cohort members were aged 50 and 55. Each row of the table presents results from a separate regression and simply presents the coefficients and t-statistics for the frequency of being bullied at ages 7 and 11 with the estimation sample size in the final column. We report the results of using a nine item Malaise score in row 2 (mean = 1.49), and the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) variable in the third row which varies from 14 to 70 with a mean of 8.12). The items of the scale are all worded positively and cover both feeling and functioning aspects of mental wellbeing (Blanchflower, Oswald and Stewart-Brown, 2013).

The full details of the questions used, and their coding, is provided in the supplementary appendix. Almost without exception bullying is significantly positively correlated with ill-being at age 50/55 and significantly negatively correlated with wellbeing.[12] Usually the effects are more pronounced where the CM experienced bullying frequently in childhood.

In Table 7 we examine CM wellbeing and ill-being at age 62 during COVID. In addition to the 11-step life satisfaction "nowadays" we estimate models for four ill-being metrics, namely being nervous, down, experiencing little pleasure, and worry in the past two weeks. All four are coded on an ordered scale from not at all (=1) to nearly every day (=4). Full questions are presented in the Supplementary Appendix. Controlling for region, labour force status, gender, IQ at 11 and sweep we find bullying at 7 and 11 were positively correlated with ill-being and negatively correlated with wellbeing some 50 years later on all five variables.

3.5. Having a job

Table 8 estimates the probability of being in paid work (1,0 binary dependent variable) at the six survey interview points between ages 23 and 55. Having conditioned on sex, BSAG at 7, IQ at 11 – all of which operate as we might anticipate - there is a significant role for being bullied at age 11 which lowers the probability someone was working across the life-course. We did not find a role for bullying at 7 once bullying at 11 was controlled for and hence excluded it from the model.

3.6. Biomarkers and early mortality

Table 9 reports partial correlations between being bullied at age 7 and three physical wellbeing outcomes at age 44, namely pulse rates, C-reactive protein and fibrinogen.

C-reactive protein (CRP) is an acute phase response protein produced in the liver that indicates general systemic levels of inflammation. CRP is a general marker for inflammation and infection and has a number of functions related to immunity and host defense. CRP levels rise as part of the immune response to infection and tissue damage or injury and may be elevated due to the presence of chronic conditions, like diabetes, asthma, rheumatoid arthritis, and heart disease. CRP levels are also related to hormone levels in women and are elevated with the use of oral contraceptives or postmenopausal hormone replacement therapy. CRP can be used as a rough proxy for heart disease risk since it also rises in response to inflammation in coronary vessels (Koenig et al., 1999). Research has suggested that high levels of CRP - between 3 and 10 mg/dl - are related to the development of cardiovascular disease (Ridker et al., 2000) and cardiac events. A blood level above 10 mg/dl is considered a sign of acute illness. Elevated fibrinogen levels can also signal infection or inflammation.

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[12] The exceptions are 'out of my control' and 'do things I want'.

Table 5
Ill-being at age 42 in the Biomedical Survey, OLS.

	Tired	Problems Concentrating	Anxious	Depressed	Problems Sleeping	CIS-R
BSAG total score at 7	.0085 (4.91)	.0093 (4.69)	.0043 (2.43)	.0084 (4.77)	.0062 (3.55)	.0405 (6.49)
Bullied sometimes at age 7	**.0784 (2.40)**	**.0598 (1.58)**	**.0470 (1.41)**	**.0268 (0.81)**	**.0611 (1.86)**	**.4269 (3.60)**
Bullied frequently at age 7	**.2005 (2.96)**	**.1866 (2.48)**	**.1500 (2.18)**	**.2787 (4.10)**	**.1750 (2.58)**	**1.0039 (4.05)**
Bullied sometimes at age 11	**.0688 (1.78)**	**.0623 (1.39)**	**.0688 (1.74)**	**.0985 (2.53)**	**.0052 (0.13)**	**.1819 (1.29)**
Bullied frequently at age 11	**.1577 (1.87)**	**.1318 (1.40)**	**.1769 (2.07)**	**.1527 (1.80)**	**.0395 (0.46)**	**.5704 (1.85)**
constant	−.5606	−1.1778	−.6583	−.5768	−.4923	2.8483
Adjusted R^2	.0173	.0146	.0082	.0207	.0098	.100
N	8353	8279	8346	8279	8279	8285
Mean	.35	.17	.30	.39	.37	3.40

Biomedical surveys at age 44. Control also include DK bullying ages 7 and 11 and female. IQ at 11 is sum of reading and math scores. Also includes controls for socio-economic status at birth of mother's husband n490 Clinical Interview Schedule R is totsum.

Table 6
Wellbeing at ages 50 and 55 and impact of being bullied at ages 7 and 11 (NCDS8 and NCDS9).

	Age 7		Age 11		
	Sometimes	Frequently	Sometimes	Frequently	N
Life satisfaction[a]	−.0900 (1.93)	−.1721 (1.73)	−.0831 (1.50)	−.4311 (3.59)	7788
Malaise	.1350 (2.42)	.3460 (3.40)	.1350 (2.42)	.2619 (2.17)	7736
WEMWBS[a]	−.8590 (3.93)	−.4051 (0.88)	−.4825 (1.85)	−.7199 (1.27)	6998
Stressed out	.0911 (2.72)	.1767 (2.49)	.1213 (3.04)	.1933 (2.24)	7048
Worry about things	.0793 (2.54)	.2136 (3.22)	.1062 (2.85)	.0645 (0.69)	7066
Gets upset easily	.0889 (2.76)	.1392 (2.04)	.1510 (3.93)	.1823 (2.19)	7068
Frequent mood swings	.0367 (1.11)	.2039 (2.92)	.0064 (0.16)	.1412 (1.65)	7071
Often feels blue	.0675 (2.10)	.1517 (2.23)	.0837 (2.19)	.1480 (1.78)	7064
Feeling cheerful[a]	−.0775 (3.52)	.0027 (0.06)	−.0350 (1.33)	−.0773 (1.35)	7078
Bodily pain	.1180 (3.42)	.1143 (1.56)	.0268 (0.65)	.0647 (0.73)	7080
Feel full of life[a]	−.1364 (4.12)	−.0867 (1.24)	−.0088 (1.24)	.0303 (0.35)	7075
Very nervous person?	.0611 (2.15)	.0998 (1.65)	.1242 (3.67)	.2854 (3.86)	7077
Down in the dumps	.0953 (3.56)	.1470 (2.59)	.0652 (2.05)	.2501 (3.60)	7068
Calm and cheerful[a]	−.1203 (3.84)	−.1069 (1.61)	−.0497 (1.33)	−.0557 (0.69)	7068
A lot of energy[a]	−.1748 (5.12)	−.0857 (1.18)	−.0055 (0.13)	−.0230 (0.26)	7072
Downhearted and low	.1040 (3.42)	.1015 (1.57)	.0727 (2.00)	.1913 (2.42)	7078
Worn out	.1227 (3.81)	.0223 (0.33)	.0801 (2.09)	.1536 (1.84)	7070
Happy person[a]	−.1101 (3.48)	−.1316 (1.96)	−.0462 (1.23)	−.0605 (0.73)	7068
Feel tired	.1359 (4.24)	.0657 (0.97)	.1359 (4.24)	.0658 (1.57)	7070
Trouble sleeping	.0833 (2.25)	.1190 (1.52)	.0019 (0.04)	.1553 (1.62)	7090
Out of my control	.0384 (1.66)	.0375 (0.77)	.0093 (0.32)	.0546 (0.92)	7046
Left out of things	.0113 (0.53)	.0437 (0.97)	.0433 (1.70)	.1284 (2.31)	7047
Do things I want[a]	−.0343 (1.70)	−.0791 (1.84)	−.0427 (1.78)	−.0215 (0.41)	7044
Family responsibilities	.0519 (2.11)	.0834 (1.60)	−.0237 (0.81)	−.1237 (1.95)	7053
Can please myself[a]	−.0374 (1.76)	−.1107 (2.46)	−.0287 (1.13)	−.0237 (0.43)	7053
Look forward[a]	−.0446 (2.45)	.0032 (0.08)	−.0183 (0.85)	−.0203 (0.43)	7049
My life has meaning[a]	−.0618 (3.20)	−.1194 (2.91)	.0012 (0.05)	−.0618 (1.24)	7056
Enjoy things I do[a]	−.0523 (3.57)	−.0702 (2.26)	−.0134 (0.77)	−.0533 (1.41)	7060
Sense of happiness[a]	−.0331 (1.81)	−.0761 (1.96)	−.0409 (1.88)	−.1380 (2.92)	7049
Full of energy[a]	−.0910 (4.30)	−.0039 (0.09)	−.0123 (0.49)	−.1092 (2.00)	7051
Full of opportunities[a]	−.0611 (3.08)	−.0526 (1.25)	−.0176 (0.75)	.0289 (0.56)	7055
Future good for me[a]	−.0802 (4.05)	−.0861 (2.05)	−.0131 (0.56)	−.0147 (0.02)	7057
NCDS9					
Out of my control	.0483 (1.87)	.1031 (1.86)	.0365 (1.19)	−.0283 (0.12)	6696
Left out of things	.0227 (0.97)	−.0335 (0.68)	−.0797 (3.00)	−.1130 (1.82)	6695
Full of energy[a]	−.0977 (4.09)	.0564 (1.10)	.0117 (0.41)	.0799 (1.31)	6710
Full of opportunities[a]	−.0573 (2.45)	−.0531 (1.06)	−.0183 (0.66)	−.1474 (2.43)	6699
Future good for me[a]	−.0612 (2.77)	−.0387 (0.82)	−.0189 (0.71)	−.1371 (2.39)	6679

Notes: Controls gender, region at NCDS8, getting on with parents, bullying DK at ages 7 and 11.
T-statistics in parentheses.
[a] = positive affect (16).

Pulse rates were examined in Blanchflower and Bryson (2022b) whilst Blanchflower et al. (2011) examined CRP, pulse and fibrinogen.[13] Chen and Lacey (2018) used the NCDS to look at the impact of ACEs on C-reactive protein and fibrinogen at 42 using the NCDS. Their ACEs measure included care placement, physical neglect, parental separation, family history of offences, mental illness, domestic conflict, and alcohol misuse across childhood (0–16 years). They found that their ACE measure raised both CRP and fibrinogen but there was no significant effect with a full set of confounders including socio-economic status and health and psychological behaviours. They concluded "*our findings suggest that the occurrence of ACE appears to set children down a path of life course disadvantage, particularly with regards to educational attainment, socio-economic position and the uptake of risky health behaviours*" (p. 588).

[13] Blanchflower et al. (2011) estimated a series of CRP equations using data from the English Health Surveys of 1998, 1999, 2003, 2004 and 2006. They found that it rose with age and BMI, was lower for men and was higher for the unemployed than the employed. It was lower for blacks than whites and for single people compared to married and with the number of children. It was negatively correlated with income and the consumption of fruit and vegetables.

Table 7
Negative and positive affect at age 62.

	Life satisfaction	Nervous	Down	Little pleasure	Worry
Bullied sometimes at age 7	−.0094 (0.26)	.0178 (1.35)	.0251 (2.10)	.0405 (3.20)	−.0030 (0.25)
Bullied frequently at age 7	−.1570 (1.94)	.1033 (3.49)	.1271 (4.74)	.1612 (5.69)	.0986 (3.61)
Bullied sometimes at age 11	−.1061 (2.50)	.0322 (2.08)	.0394 (2.80)	.0321 (2.16)	.0368 (2.57)
Bullied frequently at age 11	−.1626 (1.59)	.1055 (2.82)	.1758 (5.19)	.1179 (3.30)	.1195 (3.47)
constant	7.9259	1.2381	1.1294	1.2090	1.1199
Adjusted R^2	.0642	.0641	.0820	.0672	.0620
N	17,009	16,955	16,946	16,947	16,945

Notes: includes 2 sweep dummies, IQ score at 11, current region, female and labour force status. Also includes dk bullying at ages 7 and 11.
Merged waves 1–3 NCDS Covid Surveys, 2020; 2021 at age 62 and 63.

Table 8
Probability of paid work OLS.

	Age 23	Age 33	Age 42	Age 46	Age 50	Age 55
BSAG total score at 7	−.0041 (8.09)	−.0026 (5.04)	−.0031 (6.46)	−.0028 (5.82)	−.0037 (7.35)	−.0028 (4.76)
IQ Score at 11	.0061 (11.88)	.0043 (8.26)	.0023 (9.13)	.0035 (7.10)	.0046 (8.76)	.0028 (4.60)
Bullied sometimes age 11	−.0193 (1.86)	−.0390 (3.74)	−.0183 (1.92)	−.0159 (1.63)	−.0125 (1.19)	−.0186 (1.54)
Bullied frequently age 11	−.0393 (1.75)	−.0478 (2.14)	.0110 (0.54)	−.0229 (1.06)	−.0692 (3.05)	−.0634 (2.44)
constant	.6312	.7983	.8296	.8331	.7607	.7389
Adjusted R^2	.1006	.0929	.0435	.0366	.0393	.0303
N	10960	9971	9992	8390	8571	7738

Equations also include region dummies from each sweep, female and a dummy for 'Don't know it bullied at age 11'.

Table 9
Pulse rates and C-reactive protein levels at age 44.

	Pulse rates		Log C-reactive protein	
Female	2.1880	2.1551	.0959	.0945
	(9.26)	(9.17)	(3.29)	(3.23)
Bullied sometimes at age 7	**.4278**	**.3970**	**.0622**	**.0650**
	(1.60)	**(1.47)**	**(1.88)**	**(1.96)**
Bullied frequently at age 7	**1.2791**	**1.2878**	**.1670**	**.1579**
	(2.30)	**(2.29)**	**(2.41)**	**(2.27)**
BSAG total score at age 7	.0563	.0503	.0110	.0107
	(3.91)	(3.45)	(6.18)	(6.00)
Physical abuse by parents		1.6341		.2269
		(3.23)		(3.64)
Constant	69.9815	69.9458	−.1266	−.1358
Adjusted R^2	.0113	.0122	.0073	.0093
N	8280	8108	6867	6775
Mean	71.67		.032	
Fibrinogen				
Female	.1622	.1618		
	(10.64)	(10.58)		
BSAG score at age 7	.0047	.0046		
	(4.98)	(4.85)		
Bullied sometimes at age 11	**.0446**	**.0494**		
	(2.25)	**(2.48)**		
Bullied frequently at age 11	**.0559**	**.0570**		
	(2.30)	**(1.26)**		
Physical abuse by parents		.1124		
		(3.52)		
constant	2.8281	2.8196		
Adjusted R^2	.0190	.0217		
N	6859	6456		
Mean	2.96			

Also includes bullied dk.
Bullying at age 11 insignificant in pulse and C-reactive protein equations and at 7 in fibrinogen.

However, they did not examine bullying.

In the cases of pulse rates and C-reactive protein the bullying at 11 variables were not significant and we excluded them while in the fibrinogen equations the age 7 bullying variables were insignificant, so we excluded them.

Three pulse rate readings are taken at age 42 in the Biomedical Survey, and we average them in Table 9. We find that being bullied frequently at age 7 is associated with higher pulse rates, C-reactive protein and fibrinogen levels thirty-five years later. For pulse rates and log C-reactive protein we find that the bullying at 7 variables are significant but in the case of fibrinogen the age 11 variables are more significant. We also find that a variable, reported at age 44, that the CM was physically abused by their parent as a child enters significantly positive, with little or no impact on the bullying variables.[14]

There is a literature indicating that ACEs are linked to premature death (see Brown et al. (2009) and Yu et al. (2022) for the United States and Østergaard et al. (2019) for Denmark). These results were confirmed by Kelly-Irving et al. (2013) for cancer with the NCDS: ACEs substantially raised the probability of mortality before age 50.[15] One potential mechanism is the on-set of poor mental health, something examined in NCDS by Ploubidis et al. (2021). They concluded "*we observed associations between early-life mental health with biomarkers in midlife as well as premature mortality … Experiencing the onset of mental health symptoms in the transition from childhood to adolescence was found to be detrimental with respect to both biomarkers and premature mortality*" (pp. 43–44).

Jokela, Ferrie and Kivimäki (2009) also used data from the NCDS to examine the role of childhood problem behaviours assessed by teachers at ages 7 and 11 years and early mortality. They found a positive association between BSAG in childhood and increased long-term mortality risk at age 46. These studies did not examine bullying. However, work by Geoffrey Arsenault et al. (2023) has examined the NCDS data and found that fifty-five participants (48 males) had died by suicide between the age 18 and 52 years. They found that "bullying victimization was associated with suicide mortality".

In Table 10 we extend this earlier work by estimating the probability

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[14] The question asked was as follows. "*Thinking about your childhood, up to the age of 16 …. For each, please say whether the statement applies to you …. I was physically abused by a parent - punched, kicked or hit or beaten with an object, or needed medical treatment Yes/no?*" (mean = .060).

[15] The authors found that the odds of having a cancer before 50 among women increased twofold for those who had 2+ ACEs versus those with no ACEs, after adjusting for adult factors and early life confounders. ACE was measured using reports of 1) child in care, 2) physical neglect, 3) child's or family's contact with the prison service, 4) parental separation due to divorce, death or other, 5) family experience of mental illness and 6) family experience of substance abuse.

of death by ages 50 and 55 respectively for whatever reason. The (0,1) outcome variable we examine is set to zero if there is a response to the relevant survey and is set to 1 if the survey participant had died since the age of 16. The number of deaths and productive cases are as follows.

	Dead	Productive
Age 0	673	17,415
Age 7	821	15,425
Age 11	840	15,337
Age 16	873	14,654
Age 23	960	12,537
Age 33	1049	11,469
Age 42	1199	11,419
Age 44	1286	9377
Age 46	1323	9534
Age 50	1459	9790
Age 55	1659	9137

By 2012 1659 of the original cohort had died and 786 since 1974 at age 16. We focus here on survival since age 16 in NCDS3. At that point there were a total of 873 deaths, so we focus on deaths since that point in adulthood through age 55. At NCDS8 we have 586 (1459–873) dead and at NCDS9 786 (1659–586) dead and 9137 productive.

In Table 10 columns 1–3 refer to death at age 50 and the sample size is around 15000 in the first column. We include bullying variables at age 11 as those at age 7 were insignificant. Column 1 includes the two bullying variables which are both significantly positive.[16] Column 2 adds the three biomarker variables which are all significantly positive and remain so when the "physical abuse by parents' variable – itself positive and significant - is added in column 3. Bullying at age 11 remains statistically significant. The story is similar in the final three columns relating to death at age 55. Although the bulling variables become non-significant in columns 2 and 3 this may be due to a mediating effect working through the physical health variables. The parental physical abuse variable is significantly positive.

Table 10 has implications for the remainder of our results because they imply that bullying 'effects' on cohort members' wellbeing may have led to early death, such that the bullying effects we recover from survivors underestimate the size of any bullying effects, representing lower bound estimates.

4. Limitations

Whilst prospective data on bullying linked to outcomes in adulthood means we might be in a stronger position to establish potential causal linkages between bullying and those outcomes as compared with cross-sectional data which collect childhood bullying data retrospectively, there are nevertheless some limitations to our study. First, as we have indicated, bullying is not randomly assigned across CMs and, as such, any partial association between bullying in childhood and health, wellbeing and labour market outcomes in adulthood may be subject to omitted variables biases where those omitted variables affect both bullying and the outcomes of interest. We have sought to address this issue by conditioning on a variety of variables, notably other ACEs, which are not ordinarily observed in many data sets which might drive the 'effects' that we might otherwise attribute to bullying.

Second, we are reliant on mothers' reports on their child being a victim of bullying. It is valuable that our data contain reports at two ages (7 and 11) and that they capture the frequency with which bullying is thought to occur. Nevertheless, parents' perceptions of bullying are likely to be subject to some measurement error. If that error is in some way systematically associated to outcomes in adulthood, this may lead to biased estimates of role played by bullying.

Third, we have chosen to examine a wide range of outcomes in adulthood over the life-course in the hope that this indicates the degree to which bullying may have persistent and pervasive 'effects' on outcomes in adulthood. As a consequence, we have not had the space in this paper to examine the pathways by which bullying may influence outcomes in adulthood, something which could be accomplished with these data.

5. Conclusion and discussion

Significant numbers of adults are today paying the health consequences of being bullied when they were children. It is an issue affecting adults from around the world (Blanchflower and Bryson, 2022a). Our findings underscore the comments made recently by Arseneault (2017) who concluded:

"*There is little doubt today that being bullied in childhood is an adverse experience that casts a shadow on children's and adolescents' mental health and wellbeing. After several decades of general skepticism about the true impact of bullying victimization, accumulating evidence now demonstrates a detrimental effect on youth's mental health and reveals other poor outcomes including low self-esteem, self-harm and academic failure. Recently, emerging findings have pointed toward a possible long-lasting effect of bullying beyond the childhood and adolescent periods. The impact of bullying on the young victims may therefore persist once the bullying has long stopped.*"

Being bullied in school, we find, has persistent and harmful effects through life and the magnitude of any impacts appear substantial. After analysis of longitudinal cohort data on all those born in a single week in March 1958 and followed for over sixty years, we can conclude that being bullied as a child has major negative impacts across the life course. Bullying impacts both negative and positive affect. Being bullied at 7 or 11 lowers wellbeing as an adult and increases subjective ill-being. Bullying also adversely impacts employment probabilities. These results hold conditioning on a wide range of other potentially important correlated factors such as how well one got on with one's parents, and a number of adverse childhood experiences (ACEs) such as poverty, humiliation by parents, physical and sexual abuse, as well as cognitive skills. The mechanism may well be that this inflames the blood and hence increases pulse rates, C-reactive protein and fibrinogen levels.

The effects we recover are likely an *underestimate* since bullying also positively impacts the probability of early mortality by age 55. If we were to adjust for this survivor bias in our own estimates, we would expect to see bullying having greater negative coefficients on subjective and physical wellbeing as well as greater negative coefficients on being in paid work.

We find that being bullied has a strong, independent effect on lowering subjective wellbeing and raising subjective ill-being when respondents are in their 40s, 50s and 60s. It also increases inflammation and pulse rates when cohort members are in their 40s and leads to a greater likelihood of early death before one's mid-50s. Being bullied also lowers the probability of being in a job throughout cohort members' working lives from ages 23–55. We conclude that being bullied in childhood creates a *lifetime of misery*.

Whilst this paper focuses on the incidence and implications of being bullied in the UK the problem of bullying is recognized elsewhere around the world and has prompted imaginative responses to tackle it. There is growing evidence that policy interventions can reduce bullying. For example, Rees et al. (2022) examine the Youth Risk Behaviour Surveys of 2009–2017 for the United States and show that state level anti-bullying laws (ABL) reduce bullying victimization, depression, and suicidal ideation, with the largest estimated effects being for female teenagers and teenagers who identify as lesbian, gay, bisexual, or questioning. In addition, ABLs are associated with a 13 to 16 percent reduction in the suicide rate of female 14- through 18-year-olds.

For China, Cunha, (2023) examined a four-month parent-directed

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[16] Hawkes and Plewis (2006) found that non-response, rather than mortality was also higher for those with lower birthweight and reading test scores.

Table 10

Mortality – OLS – based on deaths since ncds3.

	Age 50			Age 55		
Female	−.0169 (5.75)	−.0075 (3.42)	−.0076 (3.43)	−.0199 (5.87)	−.0109 (3.49)	−.0110 (3.50)
Bullied sometimes at 11	**.0092 (2.37)**	**.0060 (2.07)**	**.0059 (2.04)**	**.0145 (3.23)**	**−.0064 (1.57)**	**.0064 (1.55)**
Bullied frequently at 11	**.0127 (0.63)**	**.0104 (1.89)**	**.0004 (0.07)**	**.0260 (3.23)**	**.0005 (0.05)**	**−.0002 (0.02)**
Pulse rate		.0003 (2.81)	.0003 (2.72)		.0006 (4.04)	.0006 (3.96)
C-reactive protein		.0008 (2.72)	.0008 (2.75)		.0009 (2.09)	.0009 (2.12)
Fibrinogen		.0033 1.62	.0032 (1.55)		.0064 (2.22)	.0072 (1.98)
Physical abuse by parents			.0127 (2.72)			.0143 (1.98)
Constant	.0292	−.0218	−.0217	.0508	−.0420	−.0421
Adjusted R^2	.0029	.0053	.0063	.0035	.0062	.0068
N	13,668	7135	7045	15,304	7135	7045

T-statistics in parentheses. Includes bullied at 11 dk.

intervention designed to foster empathy in middle schoolers through parental education. They found the interventions, which involved educating and coaching parents, reduced bullying at low cost. Recent systematic and meta-analytical reviews of international evidence by Gaffney and co-authors (Gafney et al., 2019a; 2021, Gaffney et al., 2019c; Gaffney et al., 2019b) suggest that policymakers could learn lessons from programmes operating in various countries across Europe and elsewhere. The question is whether such programmes can be scaled up in such a way as to deal with the enormity of the problem identified in this study.

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CRediT authorship contribution statement

David G. Blanchflower: Writing – original draft, Investigation, Formal analysis, Data curation, Conceptualization. **Alex Bryson:** Writing – review & editing, Project administration, Methodology, Investigation.

Data availability

The data that has been used is confidential.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2024.116690.

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