The long-term consequences of early school absences for educational attainment and labour market outcomes

Jascha Dräger

School of Education, University of Strathclyde, UK
Email: j.drager@strath.ac.uk
ORCID: 0000-0002-3584-1139

Markus Klein

School of Education, University of Strathclyde, UK
Email: markus.klein@strath.ac.uk
ORCID: 0000-0003-1195-8938

Edward Sosu

School of Education, University of Strathclyde, UK
Email: edward.sosu@strath.ac.uk
ORCID: 0000-0002-7026-8470

Correspondence
Jascha Dräger
School of Education
University of Strathclyde
141 St James Rd
Glasgow G4 0LT
Email: j.drager@strath.ac.uk

Funding information
The project has been funded by the Nuffield Foundation [grant number FR-000023241], but the views expressed are those of the authors and not necessarily the Foundation. Visit www.nuffieldfoundation.org

Conflict of Interest
None.

The long-term consequences of early school absences for educational attainment and labour market outcomes

Abstract

Absences from school can have negative effects on a child's education, including the loss of teacher-led lessons, peer interactions, and, ultimately, academic achievement. However, little is known about the long-term consequences of school absences for overall educational attainment and labour market outcomes. In this paper, we used data from the 1970 British Cohort Study (BCS70) to study the long-term effects of school absences in late childhood on individuals' educational attainment, social class, unemployment, and earnings at age 42 while adjusting for a comprehensive set of risk factors of school absences. Our findings show that school absences are associated with lower educational attainment and a greater likelihood of non-employment at age 42. Individuals who missed five days of school at age 10 were 5.7% more likely to have obtained no qualifications and 4.2% more likely to be out of the labour force. However, we did not find a significant impact of school absences on individuals' earnings or time in unemployment after adjusting for risk factors of school absences. Our findings suggest that the negative effects of school absences persist beyond schooling into adulthood. Overall, this study highlights the importance of addressing school absenteeism to promote educational and career success over the life course.

Keywords: School absences, educational attainment, labour market, life course

Introduction

School absenteeism is a pervasive problem and has detrimental consequences for children's school achievement (e.g., Department for Education, 2016; Klein et al., 2022). This is because children miss out on teacher-led lessons, peer interactions, and the development of positive psychosocial (e.g., prosocial behaviour) or aspirational dispositions (e.g., educational aspirations and motivation) that may stimulate their learning and development (Kirksey, 2019; Morrissey et al., 2014). In the UK, students in state-funded primary, secondary, and special schools missed between 5% to 7% of school days on average in 2018–19 (Department for Education, 2020; Scottish Government, 2019; Welsh Government, 2022).

The Covid-19 pandemic has further exacerbated the issue of school absenteeism. Evidence from different educational contexts indicate that school attendance rates fell compared to before the Covid-19-related school closures when children returned to class (Fortin, 2022; Sibieta, 2020; Sosu & Klein, 2021). This is likely the result of the struggles that young people encountered during the period of home learning and for some, extended disengagement from school during the school closures (Julius & Sims, 2020). As a result, children's learning loss and lower achievement during the Covid-19 pandemic may not only be caused by school closures (Engzell et al., 2021; Maldonado & De Witte, 2022) but continues to be driven by lower attendance rates after schools reopened.

Not only are school attendance rates declining, but they are also socially stratified. Children from disadvantaged socioeconomic backgrounds are more likely to miss school than those from affluent backgrounds (Attwood & Croll, 2006; Klein et al., 2020). After the Covid-19-related school closures, this socioeconomic disparity in school attendance further widened (Sibieta & Robinson, 2020; Sosu & Klein, 2021). Because school absences are stratified by socioeconomic status, they contribute to socioeconomic achievement gaps (Gershenson et al., 2017; Morrissey et al., 2014) and likely other life course outcomes.

Since school absenteeism is growing and socially stratified, it is crucial to determine whether and to what extent children's long-term educational and labour market outcomes suffer

when they miss school. While we know much about the short-term impact of absences on educational outcomes such as achievement (e.g., Aucejo & Romano, 2016; Gottfried, 2010, 2011) or school dropout (e.g., Rumberger, 1995; Smerillo et al., 2018), only a limited number of studies have investigated whether these effects persist or accumulate beyond schooling. Most studies have tended to focus on more immediate post-school outcomes such as the likelihood of enrolling in college in the US (Liu et al. 2021), the number of years spent in postsecondary education in the US (Ansari et al. 2020), or occupational and employment outcomes up to age 23 in a UK context (Hibbett et al., 1990; Attwood and Croll, 2006, 2015; Department for Education, 2018). Only Cattan et al. (2022) evaluated the longer-term effects of primary school absences on final educational attainment, employment, and labour income up to age 40 using Swedish register and school administrative data for a cohort born between 1930-35. We add to this literature by considering a more recent cohort born in 1970.

Using data from the British Cohort Study 1970 (BCS70), our study addresses this research gap by examining the consequences of absenteeism in childhood on educational attainment, social class destination, unemployment, and earnings in mid-adulthood.

Consequences of school absenteeism

According to the faucet theory, students develop their skills through regular exposure to education, and once that exposure is stopped, they stop advancing their skills (Entwisle et al., 2001). As a result, students who attend school less frequently are at a disadvantage academically and may not progress as quickly as children who attend more frequently. In addition, students who are frequently absent from school may feel less connected to their classmates and struggle to participate in classroom activities and interactions with teachers and peers, which is detrimental to their academic development (Korpershoek et al., 2020).

In line with the faucet theory, there is compelling evidence from the United States that school absences are detrimental to students' academic achievement (e.g., Aucejo & Romano, 2016; Gottfried, 2010, 2011; Gottfried & Kirksey, 2017; Kirksey, 2019; Morrissey et al., 2014). Children with more frequent absences in early kindergarten, for example, have lower working memory and cognitive flexibility scores in early childhood (Ansari & Gottfried, 2021; Gottfried & Ansari, 2021), as well as lower literacy and grade point average scores at age 15 (Ansari & Gottfried, 2021; Ansari & Pianta, 2019; Gottfried & Ansari, 2021). Furthermore, school absenteeism has been linked to lower high school academic achievement and completion (Smerillo et al., 2018). For England, an increase of overall absence levels decreased achievement at the end of primary and compulsory secondary education (Department for Education, 2016). A recent Scottish study reported that school absences in secondary school have a negative impact on adolescents' achievement in high-stakes national exams at the end of compulsory and post-compulsory schooling (Klein et al., 2022).

In addition to its effect on academic performance, absenteeism may also have negative effects on longer-term outcomes, such as educational attainment and labour market returns. According to developmental and economic theories, a person's long-term capabilities and outcomes are contingent on the skills and dispositions he or she possesses from a younger age (Heckman, 2006; Shonkoff & Phillips, 2000). Absences from school can impede learning and the accumulation of the human capital necessary for success in postsecondary education and the labour market (Heckman et al., 2006). Absences can result in small immediate learning losses that accumulate to larger human capital losses and lower labour market returns. Specifically, they may affect individuals' life courses through their impact on lowering school qualifications, which decreases the likelihood of achieving favourable outcomes in higher education and the labour market in the short and long run (Bynner & Parsons, 2002; Caspi et

al., 1998; French et al., 2015; Hodge et al., 2021; Iannelli et al., 2016; Iannelli & Duta, 2018; Papay et al., 2022; Rose & Betts, 2004).

Moreover, school absences have been shown to exacerbate children's problem behaviours (Ansari & Pianta, 2019; Hallfors et al., 2002; Rocque et al., 2017), which, in turn, have detrimental consequences for life course outcomes (Baert & Verhofstadt, 2015; Healey et al., 2004; Le et al., 2005; MacDonald & Pudney, 2001; Parsons et al., 2022; Tanner et al., 1999; Terza, 2002). They further reduce children's social-behavioural skills (Gottfried, 2014; Santibañez & Guarino, 2021), dispositions that likely contribute to positive long-term educational and labour market outcomes (Daly et al., 2015; Deming, 2017; Heckman et al., 2006; Lleras, 2008). For instance, even after controlling for cognitive ability and academic achievement, Lleras (2008) discovered that students who were judged by their teachers to be more motivated and to get along well with other students in high school completed more education and had higher earnings.

Most research examining the longer-term effects of school absences focuses on outcomes immediately following secondary school. Regarding educational attainment, Liu et al. (2021) found that students in a large California school district were 2% less likely to go to college if they missed 10 classes in ninth grade. Ansari et al. (2020) looked at a group of students from ten different US locations and found that students who missed more school between kindergarten and eighth grade were less likely to go to college. For England, Attwood and Croll (2006, 2015) found that being absent from lower secondary school was linked to dropping out at age 16 and having a higher chance of being unemployed. According to a report by the Department of Education (2018) for England, more than 10% of absences in lower secondary school greatly increased the long-term risk of not being in education, employment, or training three years after finishing compulsory schooling. For Scotland, Furlong (2006) found that students with truancy-related absences were more likely to not be in school, work, or training three years after they graduated. Hibbett et al. (1990) looked at Great Britain and found that skipping school at age 16 was linked to lower-paying jobs, less stable career paths, and more unemployment at age 23. Only Cattan et al. (2022) used Swedish register and school administrative data to look at the long-term effects of primary school absences on employment and earnings up to the age of 40. They found that absences in early childhood reduced cohort member's final educational attainment and labour income but were not significantly related to employment.

The present study

This study aims to advance our understanding of school absenteeism and life course outcomes by examining the relationship between school absences and long-term educational and labour market outcomes using longitudinal data from the British Cohort Study 1970 (BCS70) on a cohort of children born in Britain during a single week in 1970 and followed into their 40s. Due to a lack of data linking children's school absences to their later life course trajectories, the literature on school absences and educational and labour market outcomes is scant. The BCS70 is ideally suited to examine this relationship, as it measures school absences at age 10 and provides detailed information on educational attainment and labour market returns (social class, earnings, unemployment risk) at various stages of the life course.

The study contributes to the literature in numerous ways. *First*, our study investigates the relationship between school absences and longer-term educational and labour market outcomes in mid-adulthood. Very few studies considered outcomes beyond secondary schooling, and those that did tend to focus on more immediate post-school outcomes such as the likelihood of enrolling in college (Liu et al. 2021) or the number of years spent in postsecondary education (Ansari et al. 2020).

Second, we examine a comprehensive set of labour market outcomes, including class destination, earnings, and the risk of unemployment at age 42, a stage of peak earnings and at which occupational careers have stabilised (Bukodi et al., 2016; Bukodi & Goldthorpe, 2011; Office for National Statistics, 2022). Prior research has been limited to occupational and employment outcomes up to age 23 and has focused primarily on truancy as a measure of absenteeism (Hibbett et al., 1990; Attwood and Croll, 2006, 2015). Cattan et al. (2022) examined the influence of early school absences on labour market outcomes up to age 40 in Sweden, but for a much older birth cohort (1930-1935).

Third, the analysis of the long-term effect of school absence on educational and labour market outcomes necessitates a robust strategy for isolating its causal effect from unobserved confounding. Students who miss school may come from lower socioeconomic backgrounds, have less cognitive ability, exhibit more problem behaviour, or have poorer health, which, if not addressed, could lead to biased estimates between absences and outcomes. The few existing studies did not sufficiently account for confounding risk antecedents (e.g., Department for Education, 2018; Attwood & Croll, 2006, 2015). Cattan et al. (2022) employed a sibling fixed effects design to exploit within-family variation in absences and account for all time-invariant family-level factors. Nonetheless, time-varying (family) characteristics may affect siblings differently and render associations between absences and outcomes spurious. In addition, sibling fixed effects estimates cannot be generalised beyond siblings and may underestimate average treatment effects in the full population (Björklund & Jäntti, 2012). To account for the endogeneity of school absences, the BCS70 permits us to adjust for all important risk factors of absences (Gubbels et al., 2019) that may also influence individuals' educational attainment and labour market outcomes, such as sociodemographic characteristics, child cognitive ability, behaviour, and health.

Data & Methods

Data

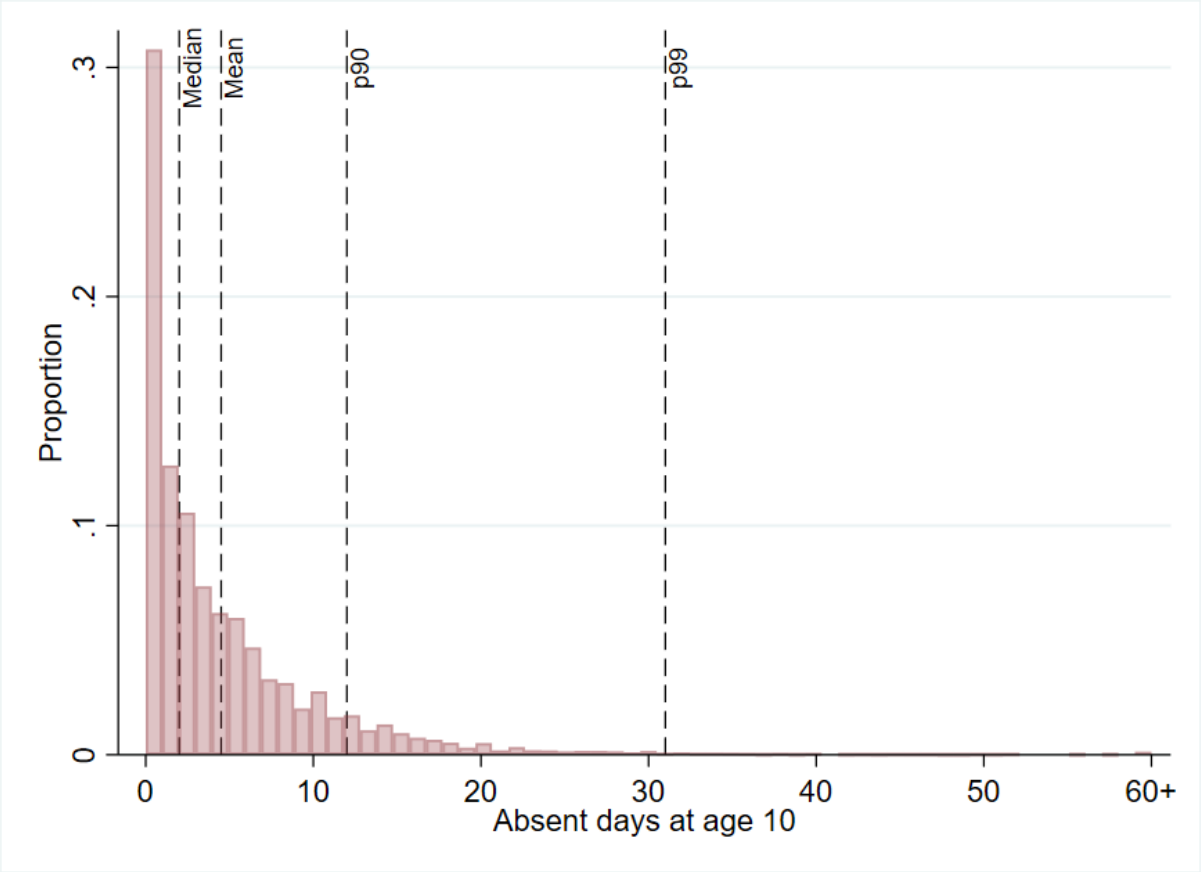
The target population of the BCS70 were all children born in England, Scotland, or Wales in the week from April 5-11, 1970 (Elliott & Shepherd, 2006). Data were collected at birth, age five, 10, 16, and in four-year intervals from 26 onwards. In the first sweep, the parents of 17,196 new-borns participated. Our analytical sample consists of all households who participated in the first (birth) and third sweep (age 10, when school absences have been measured), which leaves us with 13,776 cases. Cohort members' school absences and risk factors for absences in the BCS70 data are observed between birth and age 10 (sweep 1-3, Butler et al., 2016; Butler & Bynner, 2016; Chamberlain & Chamberlain, 2013). To deal with item non-response on all these variables, we used multiple imputation (for more information see section 'Missing Data'. Cohort members' educational attainment and labour market outcomes are measured with survey information from age 30 to 42 (sweep 6-9, University of London, 2016, 2019, 2020, 2022b) and the Activity Histories dataset (University of London, 2022a). Panel attrition until age 42 was addressed with inverse probability of attrition weighting (see section 'Missing Data').

Variables

School absences

School absences were measured in sweep 3, when children were 10 years old.[1] Teachers were asked about the total number of days the child missed schooling for any reason in the last term, including missed half days. Since teachers were mostly surveyed between March and July, absences mainly refer to the spring term. Reported absences are strongly skewed, with a mean of 4.5 days and a median of 2 days (see Figure 1). 99.9% of the pupils missed less than 62 days and 99% less than 31 days, with a few pupils missing almost the full 150 possible days.

Figure 1. Distribution of school absences in the last term when surveyed at age 10



Source: BCS70. *Note*: N=13,776, multiple imputed.

Outcomes

We considered four different outcomes: educational attainment, social class, unemployment, and earnings, all measured between ages 32 and 42. Table 1 shows the distribution of these variables.

We measured *educational attainment* as the highest academic or vocational qualification individuals obtained at age 42 (Dodgeon & Parsons, 2011). We distinguish between:

[1] There are also measures of absences at age 16. However, these have substantial problems. The teacher reported absences at age 16 are only available for one third of the pupils due to a teacher's strike when the survey took place. Pupil reported absences also only asked about absences other than due to illness.

1) *No qualification* (11.6% in our sample),
2) *Lower-level school qualification*[2] or vocational equivalent (bad O-levels, CSE grades 2-5, National Vocational Qualification (NVQ) level 1, 7.7%),
3) *Middle level school qualification* or vocational equivalent (good O-levels, 2+ AS levels or 1 A level, NVQ level 2, 24.8%),
4) *Higher level school qualification* or vocational equivalent (more than one A level, NVQ level 3, 14.9%),
5) *First degree* or vocational equivalent (diploma, degree or PCGE, NVQ level 4, 33.4%),
6) *Higher degree* or vocational equivalent (higher degree or NVQ level 5, 7.6%).

We measured cohort members' *social class destination* using the National Statistics Socioeconomic Classification (NS-SEC). The NS-SEC captures differences in employment relations that are associated with advantages and disadvantages in income security, short-term income stability, and longer-time income prospects (Goldthorpe & McKnight, 2006). We used the class in which individuals spent the most time in the decade preceding their 42nd birthday to enable a comprehensive identification of their dominant occupation using economic history data (Bukodi et al., 2016).We distinguished between:

1) *Salariat class*: Higher and lower managerial, administrative, and professional occupations (NS-SEC 1-2, 38.3%),
2) *Intermediate class*: Intermediate occupations, small employers, and own account workers (NS-SEC 3-4, 20.9%),
3) *Working class*: lower supervisory and technical, semi-routine or routine occupations (NS-SEC 5-7, 20.4%),
4) *Non-employed*: Inactive, unemployed, in education, or looking after home (14.5%).[3]

Using the economic history data, we measured the *number of months in unemployment* over the last 10 years (age 32-42). Months in unemployment are strongly skewed. 89% of individuals did not have any unemployment spells, and the average time that individuals spent in unemployment was 2.2 months. 4% of individuals were unemployed for at least one year, and 1% for more than 5 years.

We measured *earnings* as the gross weekly earnings reported at age 42. Earnings at age 42 are only observed for employed individuals (71% in our sample), excluding cohort members who are unemployed, inactive, or self-employed from the analysis. We bottom and top coded earnings at the 1st (£34.52) and 99th percentile (£3,356.16) to deal with implausible values and outliers. In the analysis, we take the natural logarithm of earnings to deal with their skewed distribution.

Table 1. Distribution of outcomes, unweighted

Variable	Proportion / Minimum / Mean / Maximum	Standard deviation
Educational attainment at age 42 (N=8,535)		
No qualification	11.55	-
Lower-level school qualification	7.66	-
Middle level school qualification	24.82	-
Higher level school qualification	14.90	-
First degree	33.44	-
Higher degree	7.63	-

[2] We follow the naming conventions in Plewis and Bartley (2014).

[3] Cohort members in each of the four groups spent on average more than 80% of these 120 months in the respective categories. We obtain similar results when analysing individuals' social class destination in the month (April 2012) when they turned 42.

Dominant social class (N=9,012)		
Salariat class	38.27	-
Intermediate class	20.94	-
Working class	20.41	-
Non-employed	14.48	-
Employment status at age 42 (N=8,505)		
Employed	71.15	-
Self-employed	14.31	-
Other	14.54	-
Gross weekly earnings in £ at age 42 (N=5,798)		
Minimum	34.52	-
Mean	604.89	519.07
Maximum	3,356.16	-
Months unemployed (N=9,082)		
Minimum	0.00	-
Mean	2.19	11.56
Maximum	120.00	-

Source: BCS70. *Note:* Samples based on the economic history data (dominant social class and months in unemployment) are larger than samples based on sweep 9 data (educational attainment and earnings) because the economic history data also include retrospective information if individuals participated in sweep 10 but not in sweep 9. The sample for the analysis of months in unemployment is slightly larger than the sample for the dominant social class because individuals who were employed, but whose occupation is unknown are excluded from the analysis of the dominant social class but included for the analysis of months in unemployment.

Risk factors of school absenteeism

Drawing on existing literature (e.g., Gubbels et al., 2019), we controlled for all significant risk factors of school absences that may also affect educational attainment and labour market outcomes, including household sociodemographic, child, parent, and school characteristics. We measured risk factors at the same time as school absences (sweep 3 - age 10) and used covariates at age 5 for measures where reverse causality is possible (e.g., behaviour difficulties, see Panayiotou et al., 2021). Table A1 in the online appendix shows the distribution of these variables.

Sociodemographic characteristics of the household included the highest parental education, highest occupational class, household income, accommodation tenure, rating of the neighbourhood, number of relocations, family composition, household size, number of children in the household, mother's age at birth, child gender and ethnicity.

Child characteristics included cognitive ability, behaviour difficulties, health, birthweight and whether the child was in special care the week after birth. Children's cognitive ability was measured using the English Picture Vocabulary Test (EPTV, Brimer & Dunn, 1962) to assess verbal vocabulary, the Copying Designs Test to assess visual motor-coordination (Rutter et al., 1970), and the Human Figure Drawing Test (Harris, 1963) to assess 'conceptual maturity'. Behavioural difficulties were measured using the Rutter Behavioural Scale and internalizing symptoms using the Malaise Inventory questionnaire, both completed by the mother (Rutter et al., 1970). Children's cognitive ability, behaviour difficulties, and internalizing symptoms are likely both early risk factors for school absences and influence school absences at a later stage. Children's health was operationalised with the total number of their health conditions, including eczema, hay fever, ear discharge, sore throats, snoring, bronchitis, pneumonia, meningitis, hearing difficulty, vision problem. Parent-related characteristics included the following measures: parental educational engagement (whether parents have met with the teacher, whether parents read to the child, frequency of joint family activities), mother's educational aspirations, parenting (mother's attitudes toward child

independence and authoritarian child-rearing), mother's mental health and prenatal risks (frequency of mother's smoking and drinking alcohol during pregnancy).

Finally, we conditioned on characteristics of schools that cohort members attended and their school practices: the school type whether the child is streamed and at which level and whether the child is taught in set groups in literacy and math and at which level.

Missing data

There are systematic differences in item non-response and attrition that must be addressed to prevent selection bias when analysing the BCS70 (Mostafa & Wiggins, 2015). We apply multiple imputation to address item non-response and inverse probability of attrition weighting to address attrition.

Multiple imputation

Information on school absences is missing for 14.8% of cohort members, and 13% of risk factor measures are missing on average. Except for the risk factor of students' set reading level at age 10 (27% missing), no other variable has more than 20% missing values (see Appendix Table A1). To correct for item nonresponse, we impute missing values on all variables using multiple imputation based on Categorization and Regression Trees (CART, Burgette & Reiter, 2010) but exclude individuals with imputed outcomes for the respective analyses because imputing outcomes may add noise to estimates (von Hippel, 2007). CART is a nonparametric recursive algorithm that creates groups with maximum intragroup homogeneity and minimum intergroup homogeneity using binary splits. The advantage of using CART for multiple imputation is that the algorithm finds the best predictors of missing data from all potential covariates, including non-linear patterns and interactions. We created 20 imputed datasets and calculated standard errors using Rubin's rules.

Inverse Probability of Attrition Weighting

To correct for selective participation in the later sweeps of BCS70 and missing data on the outcome variables, we weighted cases by the inverse of their probability of leaving the survey or having missing values on the outcome (Hernan & Robins, 2020). Because the number of missing values varies by outcome (varying between N=8,505 for employment status and N=9,082 for months in unemployment, see again Table 1), we estimated weights separately for each outcome.

$$Weight_{oi} = \frac{1}{\Pr(Nonmissing_o | Absence_i, Controls_i)}$$

Thus, the weight of person *i* for outcome *o* is the inverse of the probability, that a person with *i*'s values on absences and controls has complete information on outcome *o*. Using logistic regressions, we estimated the probability of having complete information on the outcome. By weighting the sample, a pseudo-population is created in which loss to follow-up is independent of school absences and all covariates, avoiding bias from systematic attrition based on observed variables. As a result, even though we use slightly different samples for each outcome of interest, the distribution of control variables and absences is consistent across all weighted analyses (see Online Appendix Table C1).

Analysis methods

For each of the four outcomes, we present bivariate associations with school absences at age 10 and associations adjusted for the theoretically guided school absence risk factors as well as factors that are likely to be associated with the outcomes. For the analyses of educational

attainment and dominant class destination, we used multinomial logistic regression. For the count data of months spent unemployed, we used a negative binomial regression to account for the distribution's skewness (following the approach used by Daly et al., 2015). All analyses are based on multiple imputed data and weighted using the attrition weights described above. To ease interpretation, we present the results of these regressions as average marginal effects (AME).

Earnings at age 42 are only observed for employed individuals, excluding cohort members who are unemployed, inactive, or self-employed from the analysis. This could result in biased estimates if employment-based censoring was associated with school absences and earnings (Elwert & Winship, 2014; Heckman, 1974). For example, this would be the case if school absences affected the probability of employment to the extent that only the most capable school absentees were observed with valid earnings data. Therefore, to obtain unbiased estimates of the effect on earnings, we must correct for 1) selective participation in the survey, and 2) selection into employment, among those individuals who participated in the survey. Again, we estimate the probability of participation in the age 42 survey and the probability of employment using logistic regressions including absences and control variables. Our correction weight is then the inverse of the product of the probability of employment and the probability of survey participation.

$$Correction\ weight_i = \frac{1}{\Pr(Participation|Absence_i, Controls_i) * \Pr(Empl|Absence_i, Controls_i, Participation_i = 1)}$$

For our outcome model on logarithmised earnings, we then estimated a linear regression applying this correction weight.

Under the assumptions of no unmeasured confounding and systematic attrition/censoring, positivity, and correct parametric specification of the weight models, the adjusted effect sizes in the weighted pseudo-populations yield consistent estimators for the average causal effect of school absences on educational and labour market outcomes. Even though it is impossible to test the assumption that there are no unmeasured confounders empirically, we believe that our assumption is reasonable given that our covariate set contains most relevant risk factors for school absences.

Results

Educational attainment

Figure 2 depicts unadjusted associations between school absences and educational attainment (blue triangles) and associations adjusted for risk factors (red dots) at age 42. Online Appendix B contains regression coefficients for all covariates.

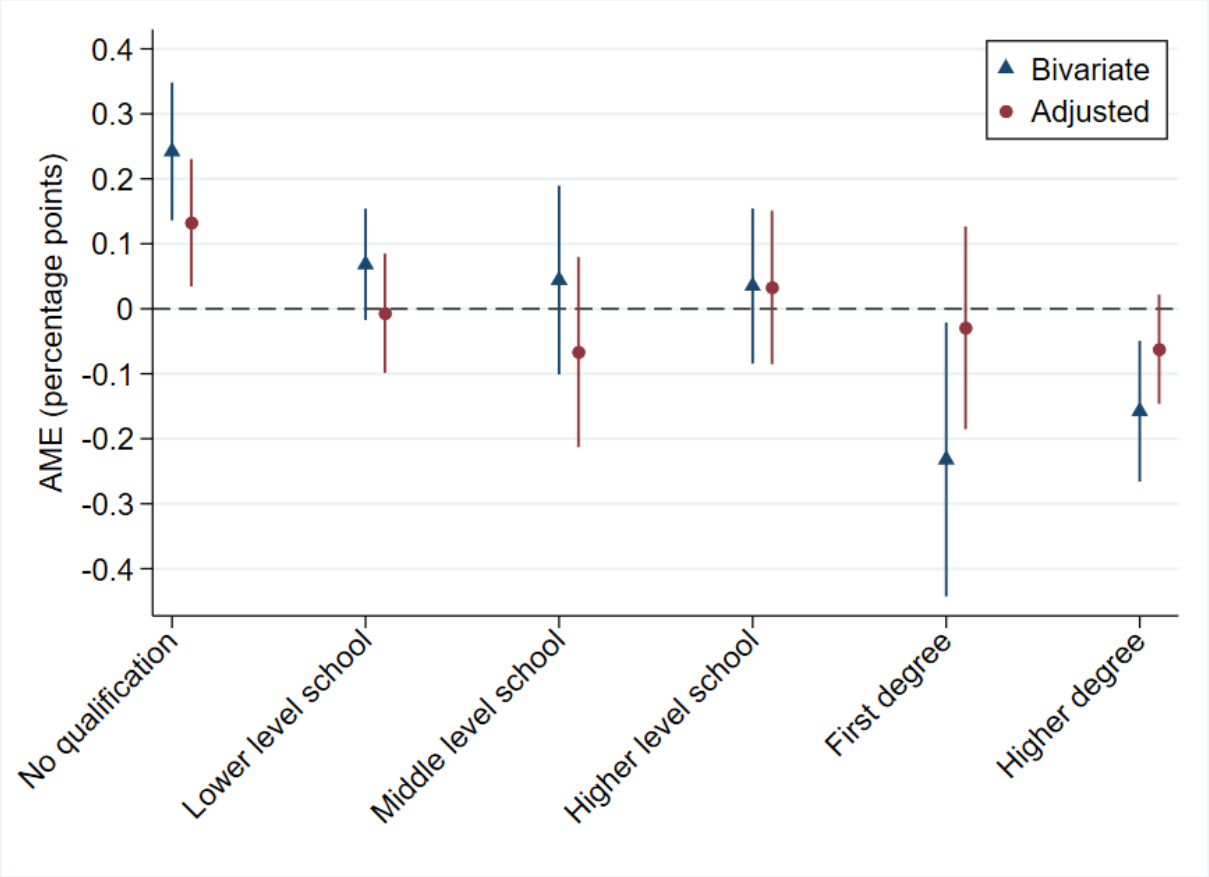
School absences are associated with a higher likelihood of not having a qualification and a lower likelihood of obtaining a first degree or a higher degree. Each additional day of absence is associated with a 0.24 percentage point increase in the likelihood of gaining no qualification (see the leftmost blue dot in Figure 2). Compared to those who did not miss a single day of school, individuals who missed five days of school (about the mean of absences of 4.5) have a 1.20 percentage point [5 * 0.24 percentage point] higher probability of not obtaining any qualification. Those who miss 5 days of school are also 1.16 percentage points less likely to obtain a first degree and 0.79 percentage points less likely to obtain a higher degree. However, these differences in obtaining a lower (AME=0.07, SE=0.04), middle

(AME=0.04, SE=0.07), or higher school qualification (AME=0.04, b=0.06) are small and statistically non-significant.

It is useful to set these difference in relation to the distribution of qualification in the sample (see Table 1) to compare effect sizes. In comparison to the distribution of qualifications, the 1.20 percentage point increase in the likelihood of not obtaining any qualification corresponds to a 10.4% increase [(11.55+1.20)/ 11.55]. Individuals who miss 5 days of school have a 3.5% lower likelihood of obtaining a first degree and a 10.4% lower likelihood of obtaining a higher degree.

When risk factors for school absences are controlled for, differences in not obtaining any qualification are cut in half but remain statistically significant. Individuals who have missed 5 days of school have a 0.66 percentage point (or 5.7% increase) higher probability of not receiving any qualification after controlling for risk factors. When risk factors are considered, the disadvantage in obtaining a higher degree is reduced to 0.31 percentage points (or 4.1% reduction) and is no longer statistically significant. Differences in obtaining a first degree vanish entirely.

Figure 2. Associations between school absences (days) and educational attainment at age 42



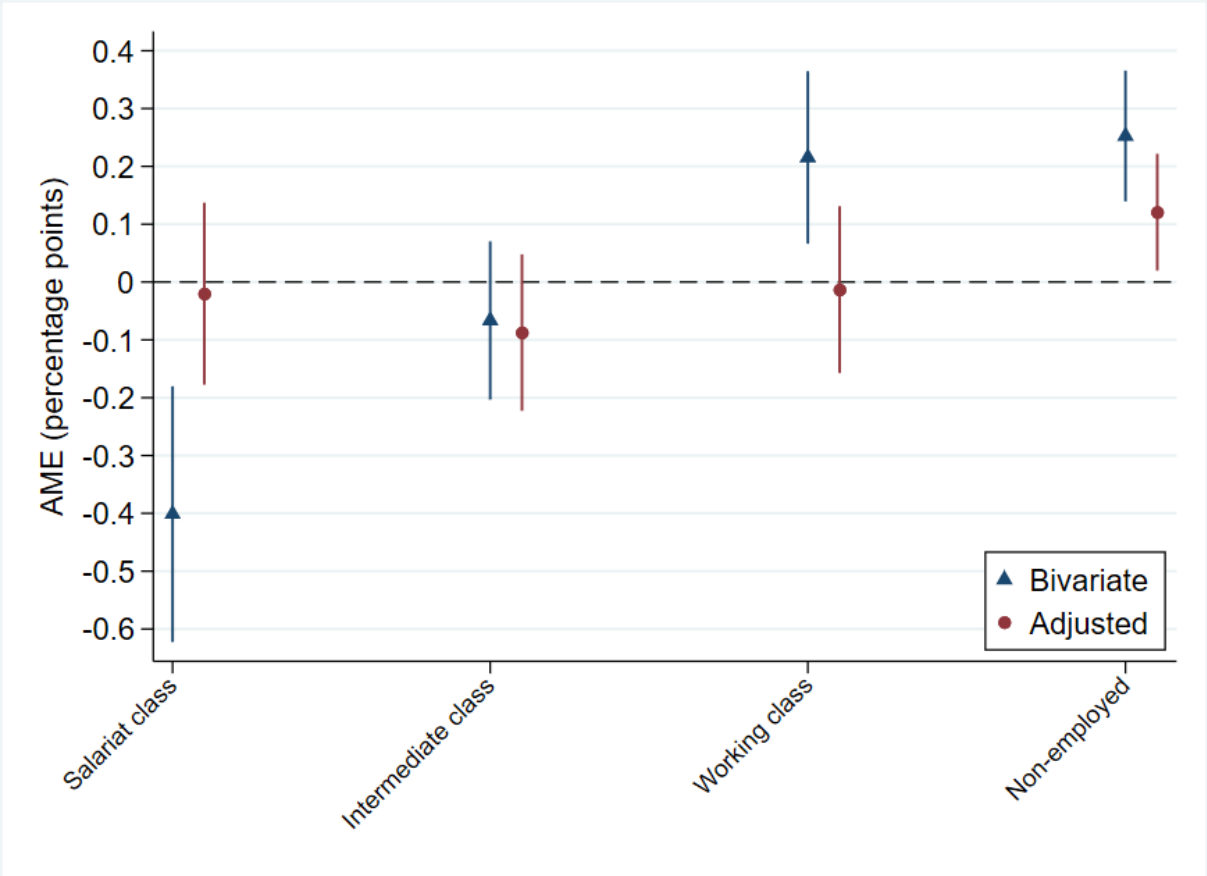
Source: BCS70. *Note*: N=8,535. Multiple imputed and weighted to correct for attrition. Vertical lines indicate 95% confidence intervals. AMEs for the association between school absences and educational attainment are calculated based on the regression coefficients of a multinomial logistic regression. The regression coefficients are available in the Online Appendix Tables B1 and B2.

When we look at educational attainment at ages 30, 34, and 38, we find very similar results (see Online Appendix Figure D1). Individuals with more absences are more likely not to have obtained any qualification and are less likely to have obtained a higher degree.

Social class destination

School absenteeism is associated with a lower likelihood of being in the highest occupational class and a higher likelihood of being in the lowest occupational class or non-employed (see blue triangles in Figure 3). Individuals who miss 5 days of school are 2.1 percentage points (or 5.5%) more likely to be in the Salariat class, 1.1 percentage points (or 5.3%) less likely to be in the Working class, and 1.3 percentage points (or 8.7%) more likely to be non-employed than those who do not miss a single day.

Figure 3. Associations between school absences (days) and social class destination



Source: BCS. *Note*: N=9,012. Multiple imputed and weighted to correct for attrition. Vertical lines indicate the 95% confidence interval. AMEs for the association between school absences and social class destination are calculated based on the regression coefficients of a multinomial logistic regression. The regression coefficients are available in Appendix Tables B3 and B4.

Again, differences diminish substantially when risk factors are considered (see red dots in Figure 3). Nonetheless, there remains a statistically significant and relevantly elevated likelihood of non-employment. Even after adjusting for a large number of risk factors, individuals who have missed five days of school are 0.6 percentage points (or 4.2%) more likely to be non-employed. The differences between the remaining occupational classes vanish.

When examining individuals' social class destination at ages 30, 34, 38, or 42 rather than the dominant social class from ages 32 to 42, we find similar results (see Online Appendix Figure D2). This indicates that the negative impact of school absences on non-employment emerges early in a person's career and then remains relatively stable.

Unemployment

School absenteeism is associated with increased unemployment duration. Individuals who missed five days of school were unemployed 8.1 days longer [.054 * 5 * 30 days] between the ages of 32 and 42 than those who did not miss school (p=0.048, see left part of Table 2). Adjusted for risk factors, this disadvantage resulting from school absence is reduced to 6.8 days and is no longer statistically significant.

Earnings

Absenteeism from school is associated with slightly reduced earnings. Individuals who missed five days of school at age 10 earned 2.0% [-0.004 * 5] less at age 42 than those who did not miss school (p=0.042, see right part of Table 2). However, after adjusting for risk factors of absenteeism, there are no significant differences in earnings. Similarly, we find no significant differences in earnings at ages 30, 34, or 38 after adjusting for school absence risk factors (see Online Appendix Table D1).

Table 2. Associations between school absences (days), months in unemployment, and weekly gross earnings (log)

	Months in unemployment		**Weekly gross earnings (log)**	
	AME	SE	b	SE
Bivariate	0.054*	0.028	-0.004*	0.002
Adjusted	0.045	0.030	0.000	0.002
N	9,082		5,798	

Source: BCS70. *Note:* Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.1. *Unemployment*: Multiple imputed and weighted to correct for attrition. All regression coefficients are available in the appendix Table B5. *Earnings*: Multiple imputed and weighted to correct for attrition and selection into employment. All regression coefficients are available in the appendix Table B6.

Discussion

The aim of our paper was to examine the long-term effects of school absences on educational attainment and labour market outcomes. Using BCS70 data, we examined the association between school absences at age 10 and individuals' highest educational qualification, social class destination, unemployment, and earnings at age 42, adjusting for a comprehensive set of school absence risk factors. We found small but significant negative effects of absences measured at late childhood on educational attainment and class destination in mid-adulthood. Predominantly, absences increased the likelihood of acquiring no qualifications and being non-employed. There was a negligible effect on the type of qualification attained and the class destination of employed individuals. Therefore, being absent from school at age 10 has negative long-term effects on not acquiring any academic or vocational credentials and accessing the labour market. Although we found negative consequences of school absences for time spent in unemployment, effect sizes were statistically non-significant at conventional 5%-criteria. We found no effect on earnings.

Our findings are consistent with previous research on the immediate short-term effects of school absences on the risk of being not in employment, education, or training after leaving school in the UK context (Attwood and Croll, 2006, 2015; Department for Education, 2018; Furlong, 2006; Hibbett et al., 1990), but we provide new evidence that these consequences extend to mid-adulthood. They also align with US studies indicating negative consequences of absences on educational and civic participation (Ansari et al., 2020; Liu et al., 2021). Our findings regarding the consequences of school absences on final educational attainment are also consistent with those of Cattan et al., (2022) for the Swedish context, which is the only

other study examining long-term effects of school absences on educational and labour market outcomes in mid-adulthood. Despite the fact that absences have the expected negative effect on all labour market outcomes in both studies, we found statistically significant effects on non-employment but not earnings, whereas Cattan et al. (2022) found the opposite pattern.

Overall, it is important to note that our findings of long-term effects of school absences are based on absences measured at one time point in late childhood. This suggests that the negative effect of early absences on education, training and the labour market was not fully redressed and carried forward into adulthood. Frequently absent students may therefore be unable to escape their initial disadvantages and catch up with their peers in terms of qualifications and class destinations over the life course. Our findings are consistent with developmental and economic theories (Heckman, 2006; Shonkoff & Phillips, 2000) suggesting that individuals' long-term capabilities and outcomes are dependent on the skills and dispositions they develop at a younger age.

Several caveats must be taken into account when interpreting the results. *First*, causal interpretations of our estimates are based on the strong and unverifiable assumption that there are no (important) unmeasured confounding variables. However, we believe that we have addressed the majority of risk factors for school absenteeism that also predict educational and labour market outcomes, such as children's cognitive ability, behaviour problems, and health, that remained unaddressed in previous UK-based studies (e.g., Attwood and Croll, 2006, 2015).

Second, we only measured absences for a single school term at age 10 and did not capture absences throughout the entire school career. Early absences from school are not necessarily indicative of later absences. Secondary school absences may have a greater impact on achievement, as unauthorised absences are more prevalent in later years and more detrimental to achievement (Gershenson et al., 2017; Gottfried, 2009). It is further reasonable to assume that sustained exposure to school absences over time has a greater impact on outcomes (i.e., persistent absenteeism), which cannot be addressed with a snapshot measure of absenteeism. Consequently, our findings may be influenced by measurement error, resulting in an underestimation of the impact of school absences on educational attainment and labour market outcomes (i.e., attenuation bias).

Third, teachers provided information on absences at age 10 and may not have accurately reported children's number of absence days. This may be the result of recall bias or other context-based biases against the child. Typically, survey data on school absences do not accurately reflect administrative school data on absences (Keppens et al., 2019). However, administrative school records cannot be linked to the BCS70.

Despite these limitations, our findings of long-lasting consequences of being absent from school on individuals' life chances have significant implications for policy and practice. Given Covid-19-related decreases in school attendance particularly among vulnerable groups, there is an urgent need to design targeted interventions to reduce school absenteeism and break the cycle of intergenerational disadvantage (Department for Education, 2022). Interventions may also focus on mitigating the immediate negative impact of absences on learning and the social development of children. It is necessary to provide children with the means to make up schoolwork missed due to absences. The negative effects of these absences can be mitigated, for instance, by providing additional school support through tutoring during and after school, or by addressing disengagement through social activities and supportive peer and teacher interactions (Korpershoek et al., 2020). Finally, policy and practice should provide more targeted opportunities for lifelong learning so that chronically absent students can acquire the skills necessary for future success in education and the labour market later in life.

References

Ansari, A., & Gottfried, M. A. (2021). The Grade-Level and Cumulative Outcomes of Absenteeism. *Child Development*, *92*(4). https://doi.org/10.1111/cdev.13555

Ansari, A., Hofkens, T. L., & Pianta, R. C. (2020). Absenteeism in the First Decade of Education Forecasts Civic Engagement and Educational and Socioeconomic Prospects in Young Adulthood. *Journal of Youth and Adolescence*, *49*(9), 1835–1848. https://doi.org/10.1007/s10964-020-01272-4

Ansari, A., & Pianta, R. C. (2019). School absenteeism in the first decade of education and outcomes in adolescence. *Journal of School Psychology*, *76*, 48–61. https://doi.org/10.1016/j.jsp.2019.07.010

Attwood, G., & Croll, P. (2006). Truancy in secondary school pupils: Prevalence, trajectories and pupil perspectives. *Research Papers in Education*, *21*(4), 467–484. https://doi.org/10.1080/02671520600942446

Attwood, G., & Croll, P. (2015). Truancy and well-being among secondary school pupils in England. *Educational Studies*, *41*(1–2), 14–28. https://doi.org/10.1080/03055698.2014.955725

Aucejo, E. M., & Romano, T. F. (2016). Assessing the effect of school days and absences on test score performance. *Economics of Education Review*, *55*, 70–87. https://doi.org/10.1016/j.econedurev.2016.08.007

Baert, S., & Verhofstadt, E. (2015). Labour market discrimination against former juvenile delinquents: Evidence from a field experiment. *Applied Economics*, *47*(11), 1061–1072. https://doi.org/10.1080/00036846.2014.990620

Björklund, A., & Jäntti, M. (2012). How important is family background for labor-economic outcomes? *Labour Economics*, *19*(4), 465–474. https://doi.org/10.1016/j.labeco.2012.05.016

Brimer, M. A., & Dunn, L. M. (1962). *Manual for the English Picture Vocabulary Tests: Test 1 (age range 5: 0–8: 11), test 2 (age range 7: 0–11: 11)*. Educational Evaluation Entreprises.

Bukodi, E., & Goldthorpe, J. H. (2011). Class Origins, Education and Occupational Attainment in Britain. *European Societies*, *13*(3), 347–375. https://doi.org/10.1080/14616696.2011.568259

Bukodi, E., Goldthorpe, J. H., Halpin, B., & Waller, L. (2016). Is Education Now Class Destiny? Class Histories across Three British Birth Cohorts. *European Sociological Review*, *32*(6), 835–849. https://doi.org/10.1093/esr/jcw041

Burgette, L. F., & Reiter, J. P. (2010). Multiple Imputation for Missing Data via Sequential Regression Trees. *American Journal of Epidemiology*, *172*(9), 1070–1076. https://doi.org/10.1093/aje/kwq260

Butler, N., & Bynner, J. M. (2016). 1970 British Cohort Study: Ten-year follow-up, 1980 [data collection]. *University of London. Institute of Education. Centre for Longitudinal Studies. 6th Edition. UK Data Service. SN: 3723, DOI: 10.5255/UKDA-SN-3723-7*.

Butler, N., Dowling, S., & Osborn, A. (2016). 1970 British Cohort Study: Five-year Follow-up, 1975 [data collection]. *University of London. Institute of Education. Centre for Longitudinal Studies. 5th Edition. UK Data Service. SN: 2699, DOI: 10.5255/UKDA-SN-2699-4*.

Bynner, J., & Parsons, S. (2002). Social Exclusion and the Transition from School to Work: The Case of Young People Not in Education, Employment, or Training (NEET). *Journal of Vocational Behavior*, *60*(2), 289–309. https://doi.org/10.1006/jvbe.2001.1868

Caspi, A., Wright, B. R. E., Moffitt, T. E., & Silva, P. A. (1998). Early Failure in the Labor Market: Childhood and Adolescent Predictors of Unemployment in the Transition to Adulthood. *American Sociological Review*, *63*(3), 424–451. https://doi.org/10.2307/2657557

Cattan, S., Kamhöfer, D., Karlsson, M., & Nilsson, T. (2022). The Long-term Effects of Student Absence: Evidence from Sweden. *The Economic Journal*. https://doi.org/10.1093/ej/ueac078

Chamberlain, R., & Chamberlain, G. (2013). 1970 British Cohort Study: Birth and 22-month subsample, 1970–1972 [data collection]. *University of London. Institute of Education. Centre for Longitudinal Studies. 3rd Edition. UK Data Service. SN: 2666, DOI: 10.5255/UKDA-SN-2666-2*.

Daly, M., Delaney, L., Egan, M., & Baumeister, R. F. (2015). Childhood Self-Control and Unemployment Throughout the Life Span: Evidence From Two British Cohort Studies. *Psychological Science*, *26*(6), 709–723. https://doi.org/10.1177/0956797615569001

Deming, D. J. (2017). The Growing Importance of Social Skills in the Labor Market. *The Quarterly Journal of Economics*, *132*(4), 1593–1640. https://doi.org/10.1093/qje/qjx022

Department for Education. (2016). *The link between absence and attainment at KS2 and KS4*.

Department for Education. (2018). *Characteristics of young people who are long-term NEET*.

Department for Education. (2020). *Pupil absence in schools in England: 2018 to 2019*.

Department for Education. (2022). *Working together to improve school attendance—Guidance for maintained schools, academies, independent schools, and local authorities*.

Dodgeon, B., & Parsons, S. (2011). *Deriving Highest Qualification in NCDS and BCS70* (No. 2011/1; Data Note). Centre for Longitudinal Studies.

Elliott, J., & Shepherd, P. (2006). Cohort Profile: 1970 British Birth Cohort (BCS70). *International Journal of Epidemiology*, *35*(4), 836–843. https://doi.org/10.1093/ije/dyl174

Elwert, F., & Winship, C. (2014). Endogenous Selection Bias: The Problem of Conditioning on a Collider Variable. *Annual Review of Sociology*, *40*(1), 31–53. https://doi.org/10.1146/annurev-soc-071913-043455

Engzell, P., Frey, A., & Verhagen, M. D. (2021). Learning loss due to school closures during the COVID-19 pandemic. *Proceedings of the National Academy of Sciences*, *118*(17), e2022376118. https://doi.org/10.1073/pnas.2022376118

Entwisle, D. R., Alexander, K. L., & Olson, L. S. (2001). Keeping the Faucet Flowing: Summer Learning and the Home Environment. *American Educator*, *25*, 10–15.

Fortin, J. (2022). More Pandemic Fallout: The Chronically Absent Student. *New York Times*.

French, M. T., Homer, J. F., Popovici, I., & Robins, P. K. (2015). What You Do in High School Matters: High School GPA, Educational Attainment, and Labor Market Earnings as a Young Adult. *Eastern Economic Journal*, *41*(3), 370–386. https://doi.org/10.1057/eej.2014.22

Furlong, A. (2006). Not a very NEET solution: Representing problematic labour market transitions among early school-leavers. *Work, Employment and Society*, *20*(3), 553–569. https://doi.org/10.1177/0950017006067001

Gershenson, S., Jacknowitz, A., & Brannegan, A. (2017). Are Student Absences Worth the Worry in U.S. Primary Schools? *Education Finance and Policy*, *12*(2), 137–165. https://doi.org/10.1162/EDFP_a_00207

Goldthorpe, J. H., & McKnight, A. (2006). The Economic Basis of Social Class. In S. L. Morgan, D. B. Grusky, & G. S. Fields (Eds.), *Mobility and Inequality: Frontiers of Research in Sociology and Economics* (pp. 109–136). Stanford University Press.

Gottfried, M. A. (2009). Excused Versus Unexcused: How Student Absences in Elementary School Affect Academic Achievement. *Educational Evaluation and Policy Analysis*, *31*(4), 392–415. https://doi.org/10.3102/0162373709342467

Gottfried, M. A. (2010). Evaluating the Relationship Between Student Attendance and Achievement in Urban Elementary and Middle Schools: An Instrumental Variables Approach. *American Educational Research Journal*, *47*(2), 434–465. https://doi.org/10.3102/0002831209350494

Gottfried, M. A. (2011). The Detrimental Effects of Missing School: Evidence from Urban Siblings. *American Journal of Education*, *117*(2), 147–182. https://doi.org/10.1086/657886

Gottfried, M. A. (2014). Chronic Absenteeism and Its Effects on Students' Academic and Socioemotional Outcomes. *Journal of Education for Students Placed at Risk*, *19*(2), 53–75. https://doi.org/10.1080/10824669.2014.962696

Gottfried, M. A., & Ansari, A. (2021). Detailing New Dangers—Linking Kindergarten Chronic Absenteeism to Long-Term Declines in Executive Functioning. *The Elementary School Journal*, *121*(3), 484–503. https://doi.org/10.1086/712426

Gottfried, M. A., & Kirksey, J. J. (2017). "When" Students Miss School: The Role of Timing of Absenteeism on Students' Test Performance. *Educational Researcher*, *46*(3), 119–130. https://doi.org/10.3102/0013189X17703945

Hallfors, D., Vevea, J. L., Iritani, B., Cho, H., Khatapoush, S., & Saxe, L. (2002). Truancy, Grade Point Average, and Sexual Activity: A Meta-Analysis of Risk Indicators for Youth Substance Use. *Journal of School Health*, *72*(5), 205–211. https://doi.org/10.1111/j.1746-1561.2002.tb06548.x

Harris, D. B. (1963). *Children's drawings as measures of intellectual maturity: Revision of Goodenough draw-a-man test*. Harcourt, Brace and World.

Healey, A., Knapp, M., & Farrington, D. P. (2004). Adult labour market implications of antisocial behaviour in childhood and adolescence: Findings from a UK longitudinal study. *Applied Economics*, *36*(2), 93–105. https://doi.org/10.1080/0003684042000174001

Heckman, J. J. (1974). Shadow Prices, Market Wages, and Labor Supply. *Econometrica*, *42*(4), 679. https://doi.org/10.2307/1913937

Heckman, J. J. (2006). Skill Formation and the Economics of Investing in Disadvantaged Children. *Science*, *312*, 1900–1902. https://doi.org/10.1126/science.1128898

Heckman, J. J., Stixrud, J., & Urzua, S. (2006). The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior. *Journal of Labor Economics*, *24*, 411–482. https://doi.org/10.1086/504455

Hernan, M., & Robins, J. (2020). *Causal Inference: What if.* Chapman & Hall/CRC.

Hibbett, A., Fogelman, K., & Manor, O. (1990). Occupational Outcomes of Truancy. *British Journal of Educational Psychology*, *60*(1), 23–36. https://doi.org/10.1111/j.2044-8279.1990.tb00919.x

Hodge, L., Little, A., & Weldon, Matthew. (2021). *GCSE attainment and lifetime earnings* (p. 69). Department for Education.

Iannelli, C., & Duta, A. (2018). Inequalities in school leavers' labour market outcomes: Do school subject choices matter? *Oxford Review of Education*, *44*(1), 56–74. https://doi.org/10.1080/03054985.2018.1409970

Iannelli, C., Smyth, E., & Klein, M. (2016). Curriculum differentiation and social inequality in higher education entry in Scotland and Ireland. *British Educational Research Journal*, *42*(4), 561–581. https://doi.org/10.1002/berj.3217

Julius, J., & Sims, D. (2020). Schools' Responses to COVID-19: Support for Vulnerable Pupils and the Children of Keyworkers. *National Foundation for Educational Research*.

Keppens, G., Spruyt, B., & Dockx, J. (2019). Measuring School Absenteeism: Administrative Attendance Data Collected by Schools Differ From Self-Reports in Systematic Ways. *Frontiers in Psychology*, *10*(December), 1–10. https://doi.org/10.3389/fpsyg.2019.02623

Kirksey, J. J. (2019). Academic Harms of Missing High School and the Accuracy of Current Policy Thresholds: Analysis of Preregistered Administrative Data From a California School District. *AERA Open*, *5*(3), 233285841986769. https://doi.org/10.1177/2332858419867692

Klein, M., Sosu, E. M., & Dare, S. (2020). Mapping inequalities in school attendance: The relationship between dimensions of socioeconomic status and forms of school absence. *Children and Youth Services Review*, *118*, 105432. https://doi.org/10.1016/j.childyouth.2020.105432

Klein, M., Sosu, E. M., & Dare, S. (2022). School Absenteeism and Academic Achievement: Does the Reason for Absence Matter? *AERA Open*, *8*, 233285842110711. https://doi.org/10.1177/23328584211071115

Korpershoek, H., Canrinus, E. T., Fokkens-Bruinsma, M., & de Boer, H. (2020). The relationships between school belonging and students' motivational, social-emotional, behavioural, and academic outcomes in secondary education: A meta-analytic review. *Research Papers in Education*, *35*(6), 641–680. https://doi.org/10.1080/02671522.2019.1615116

Le, A. T., Miller, P. W., Heath, A. C., & Martin, N. (2005). Early childhood behaviours, schooling and labour market outcomes: Estimates from a sample of twins. *Economics of Education Review*, *24*, 1–17. https://doi.org/10.1016/j.econedurev.2004.04.004

Liu, J., Lee, M., & Gershenson, S. (2021). The short- and long-run impacts of secondary school absences. *Journal of Public Economics*, *199*, 104441. https://doi.org/10.1016/j.jpubeco.2021.104441

Lleras, C. (2008). Do skills and behaviors in high school matter? The contribution of noncognitive factors in explaining differences in educational attainment and earnings. *Social Science Research*, *37*(3), 888–902. https://doi.org/10.1016/j.ssresearch.2008.03.004

MacDonald, Z., & Pudney, S. (2001). Illicit drug use and labour market achievement: Evidence from the UK. *Applied Economics*, *33*(13), 1655–1668. https://doi.org/10.1080/00036840010014454

Maldonado, J. E., & De Witte, K. (2022). The effect of school closures on standardised student test outcomes. *British Educational Research Journal*, *48*(1), 49–94. https://doi.org/10.1002/berj.3754

Morrissey, T. W., Hutchison, L., & Winsler, A. (2014). Family income, school attendance, and academic achievement in elementary school. *Developmental Psychology*, *50*(3), 741–753. https://doi.org/10.1037/a0033848

Office for National Statistics. (2022). Low and high pay in the UK. *, Released 26 October 2022, ONS Website, Statistical Bulletin*.

Papay, J. P., Mantil, A., & Murnane, R. J. (2022). On the Threshold: Impacts of Barely Passing High-School Exit Exams on Post-Secondary Enrollment and Completion. *Educational Evaluation and Policy Analysis*, 01623737221090258. https://doi.org/10.3102/01623737221090258

Parsons, S., Bryson, A., & Sullivan, A. (2022). Teenage conduct problems: A lifetime of disadvantage in the labour market? *Oxford Economic Papers*, *00*, 1–21.

Plewis, I., & Bartley, M. (2014). Intra-generational social mobility and educational qualifications. *Research in Social Stratification and Mobility*, *36*, 1–11. https://doi.org/10.1016/j.rssm.2013.10.001

Rocque, M., Jennings, W. G., Piquero, A. R., Ozkan, T., & Farrington, D. P. (2017). The Importance of School Attendance: Findings From the Cambridge Study in Delinquent Development on the Life-Course Effects of Truancy. *Crime and Delinquency*, *63*(5), 592–612. https://doi.org/10.1177/0011128716660520

Rose, H., & Betts, J. R. (2004). The Effect of High School Courses on Earnings. *The Review of Economics and Statistics*, *86*(2), 497–513. https://doi.org/10.1162/003465304323031076

Rumberger, R. W. (1995). Dropping Out of Middle School: A Multilevel Analysis of Students and Schools. *American Educational Research Journal*, *32*(3), 583–625. https://doi.org/10.3102/00028312032003583

Rutter, M., Tizard, J., & Whitmore, K. (1970). *Education, health and behaviour: Psychological and medical study of childhood development*. Longman Group Limited.

Santibañez, L., & Guarino, C. M. (2021). The Effects of Absenteeism on Academic and Social-Emotional Outcomes: Lessons for COVID-19. *Educational Researcher*, *50*(6), 392–400. https://doi.org/10.3102/0013189X21994488

Scottish Government. (2019). *Attendance and absence 2018-19*.

Shonkoff, J. P., & Phillips, D. A. (2000). From neurons to neighborhoods: The science of early childhood development. *National Academies Press*.

Sibieta, L. (2020). *School attendance rates across the UK since full reopening: November 2020*.

Sibieta, L., & Robinson, D. (2020). School attendance and lost schooling across England since full reopening. *Education Policy Institute. Https://Epi. Org. Uk/Wp-Content/Uploads/2020/12/ANALYSIS_School-Attendance-and-Lost-Schooling-across-England. Pdf*.

Smerillo, N. E., Reynolds, A. J., Temple, J. A., & Ou, S.-R. (2018). Chronic absence, eighth-grade achievement, and high school attainment in the Chicago Longitudinal Study. *Journal of School Psychology*, *67*, 163–178. https://doi.org/10.1016/j.jsp.2017.11.001

Sosu, E., & Klein, M. (2021). *Socioeconomic disparities in school absenteeism after the first wave of COVID-19 school closures in Scotland*. https://doi.org/10.31235/osf.io/f4jsy

Tanner, J., Davies, S., & O'Grady, B. (1999). Whatever happened to yesterday's rebels? Longitudinal effects of youth delinquency on education and employment. *Social Problems*, *46*(2), 250–274. https://doi.org/10.2307/3097255

Terza, J. V. (2002). Alcohol abuse and employment: A second look. *Journal of Applied Econometrics*, *17*(4), 393–404. https://doi.org/10.1002/jae.671

University of London. (2016). 1970 British Cohort Study: Twenty-Nine-Year Follow-Up, 1999-2000. [Data collection]. *Institute of Education. Centre for Longitudinal Studies. 4th Edition. UK Data Service. SN: 5558, DOI: 10.5255/UKDA-SN-5558-3*.

University of London. (2019). 1970 British Cohort Study: Thirty-Eight-Year Follow-Up, 2008-2009. [Data collection]. *Institute of Education. Centre for Longitudinal Studies. 5th Edition. UK Data Service. SN: 6557, DOI: 10.5255/UKDA-SN-6557-4*.

University of London. (2020). 1970 British Cohort Study: Thirty-Four-Year Follow-Up, 2004-2005. [Data collection]. *Institute of Education. Centre for Longitudinal Studies. 5th Edition. UK Data Service. SN: 5585, DOI: 10.5255/UKDA-SN-5585-4*.

University of London. (2022a). 1970 British Cohort Study: Activity Histories, 1986-2016. [Data collection]. *Institute of Education. Centre for Longitudinal Studies. 4th Edition. UK Data Service. SN: 6943, DOI: 10.5255/UKDA-SN-6943-4*.

University of London. (2022b). 1970 British Cohort Study: Age 42, Sweep 9, 2012. [Data collection]. *Institute of Education. Centre for Longitudinal Studies. 3rd Edition. UK Data Service. SN: 7473, DOI: 10.5255/UKDA-SN-7473-3*.

von Hippel, P. T. (2007). Regression with Missing Ys: An Improved Strategy for Analyzing Multiply Imputed Data. *Sociological Methodology*, *37*(1), 83–117. https://doi.org/10.1111/j.1467-9531.2007.00180.x

Welsh Government. (2022). *Summary of absenteeism at school before and during the coronavirus (COVID-19) pandemic: September 2014 to August 2022*.

Appendix

A. Distribution of risk factors

Table A1. Distribution of risk factors

	Mean / Proportion	Standard deviation	Minimum	Maximum	Percent missing
Parental education age 10					8.725
No qualification	0.336				
O-Level or equivalent	0.393				
A-level or equivalent	0.095				
Sub-degree	0.054				
Degree	0.122				
Social class of parents age 10[A]					10.221
Unskilled	0.045				
Partly skilled	0.138				
Manual	0.420				
Non manual	0.106				
Managerial	0.235				
Professional	0.057				
Parental income in £ at age 10					14.830
250 +	0.058				
200 - 249	0.062				
150 - 199	0.164				
100 - 149	0.346				
50 - 99	0.300				
35 - 49	0.054				
under 35	0.017				
Housing tenure at age 10					7.731
Owned outright	0.111				
Being bought	0.502				
Rented, council	0.325				
Rented, private	0.032				
other	0.030				
Neighborhood rating at age 5					17.044
Poor	0.078				
Average	0.499				
Well To Do	0.233				
Rural	0.190				
Ethnicity					7.005
UK	0.959				
Other Eur..	0.009				
Indian	0.023				
Pakistani/Bangladeshi	0.006				
Other	0.002				
Child is male	0.516				0.000
Place of residence at age 10					0.356

England	0.844				
Wales	0.058				
Scotland	0.098				
Family structure at age 10					7.063
Two natural parents	0.834				
Stepfamily	0.070				
Single parent	0.083				
Other	0.013				
Household size (age 10)	4.656	1.229	2.000	18.000	7.586
Children in household (age 10)	2.568	1.087	1.000	13.000	7.535
Mother's age at birth	25.946	5.441	14.000	52.000	0.588
Number of addresses child had until age 10					10.976
Always the same	0.299				
2	0.378				
3	0.190				
4 or more	0.133				
Figure Drawing score (age 5)[B]	0.000	1.003	-3.155	3.805	16.195
EPVT score (age 5)[B]	0.011	0.996	-3.075	3.045	20.006
Copying Design score (age 5)[B]	0.001	0.998	-2.389	1.654	14.910
Rutter score (age 5)[B]	7.884	4.908	0	30	
Malaise Score (age 5)[B]	4.349	3.642	0.000	22.000	15.861
Medical conditions (age 5)[C]	1.022	1.254	0	10	
Birthweight	3305.357	527.454	567.000	6463.000	0.087
In special care after birth	0.127	0.333	0.000	1.000	0.000
Mother's alcohol consumption in early pregnancy					13.451
Twice per week or more	0.044				
Once a week	0.391				
Not at all	0.564				
Smoking during pregnancy					0.457
Non-Smoker	0.415				
Stopped before pregnancy	0.123				
Stopped during pregnancy	0.048				
1-4 cigarettes per day	0.069				
5-14 cigarettes per day	0.212				
15 or more cigarettes per day	0.132				
Sum scores of family activities at (age 10)[D]	10.319	2.247	0.000	14.000	9.596
Days reading to the child per week at age 5	4.289	2.589	0.000	7.000	17.930
Frequency of parent-teacher meetings at age 10					7.970
Once	0.490				
More than once	0.376				
never	0.134				
Mother's educational aspirations age 10					9.081
Cannot say	0.555				
Not continue education	0.047				

Continue education, university	0.160				
Continue education, other	0.238				
Mother's attitude to authoritarian child rearing (age 5)[B]	0.004	0.997	-2.814	3.021	15.077
Mother's attitude to child independence (age 5)[B]	1.008	0.997	-2.433	3.413	15.091
Sum of mother's mental health problems (age 10)[E]	17.979	2.788	1.480	23.000	14.242
School type at age 10[F]					18.322
Maintained	0.739				
Voluntary controlled	0.095				
Voluntary aided	0.130				
Independent	0.025				
Other	0.012				
Streaming at age 10					15.701
Not streamed	0.906				
low level	0.025				
middle level	0.038				
High level	0.031				
Reading set at age 10					27.214
No reading set	0.397				
low level	0.146				
middle level	0.255				
High level	0.203				
Math set at age10					19.084
No math set	0.357				
low level	0.157				
middle level	0.292				
High level	0.194				

A= Registrar General's measure of social class of the current or last job held by the fathers. In families with absent fathers, the social class of mothers was used. The Registrar General's measure was the official measure of social class until 2000.

B=Derived variables provided by BCS70:

Human Figure Drawing: Children were asked to draw a picture of man and a picture of a woman. The human figure drawing tests intends to measure intelligence in young children (Goodenough, 1926; Harris, 1963). Drawings were scored by whether certain features were present or not and weighted by the system proposed by (Koppitz, 1968). In our analysis, we use the score that has been standardised to mean of 0 and standard deviation of one.

English Picture Vocabulary Test (EPVT) is the English adaption of Peabody Picture Vocabulary Test (Brimer & Dunn, 1962). The EPVT raw score 1s the total number of correct Items occurring before the ceiling Item. In our analysis, we use the score that has been standardised to mean of 0 and standard deviation of one.

Copy Design Test: Children were asked to copy eight designs to assess their visual-motor coordination (Rutter et al., 1970). Each copy was scored as either poor or good copy. The total raw score is the count of good copies. In our analysis, we use the score that has been standardised to mean of 0 and standard deviation of one.

Rutter Score: Sum score from 27 behavioural items as suggested by Rutter et al. (1970).

Malaise Score: Sum score from 24 items as index of psychiatric problems in parents as suggest by Rutter et al. (1970).

Authoritarian child rearing: Factor derived from a principal component analysis of the following 13 items:

1. Such activities as painting and playing should take second place to teaching reading and arithmetic in Infant schools.
2. Increases in vandalism and delinquency are largely due to the fact that children nowadays lack strict discipline.
3. Children should not be allowed to talk at the meal table.
4. Children under five should always accept what their parents say as being true.
5. One of the things parents must do is sort out their children's quarrels for them and decide who is right and wrong.
6. Unquestioning obedience is not a good thing in a young child.
7. A mother who always gives in to her young child's demands for attention will spoil him.
8. If pre-school children would pay more attention to what they are told instead of just having their own ideas they would learn more quickly.
9. A child should not be allowed to talk back to his parents.
10. There are many things a 5 year old child must do with no explanation from his parents.
11. It is not surprising if educational standards are falling when children have so much freedom in school nowadays.
12. You cannot expect a child under five to understand how another person feels.
13. A well brought up child is one who does not have to be told twice to do something.

Child independence: Factor derived from a principal component analysis of the following 6 items:

1. Strictly disciplined children rarely grow up to be the best adults.
2. If a child la often allowed to have his own way while he 1s young he will be uncontrollable later.
3. Parents should treat young children as equals.
4. Teaching 5 year old children obedience and respect for the authority is not as important as all that.
5. A young child must be allowed to be himself even if this means going against his parents' wishes.
6. A mother should accept that her children are sometimes too busy to do as she asks.

C=Count of health conditions (Eczema, hayfever, ear discharge, sore throats, snoring, Bronchitis, Pneumonia, Meningitis, hearing difficulty, vision problem).

D=Sum score of family activities (Going for walks, hanging out, have meals together, holidays together, shopping, chat for at least 5 minutes, go to restaurants together).

E=Sum score of maternal mental health (tired, miserable, headaches, worried about things, difficult falling asleep, wake unnecessarily early, worry about own health, get into violent rage, annoyed by people, twitching, scared for no good reason, scared to be alone, easily upset, frightened of going out alone, keyed up, indigestion, upset stomach, poor appetite, everything gets on nerves, heart races, pain in the eyes, rheumatism).

F=*Maintained schools:* Fully funded and maintained by the local education authority. They are not influenced by business or religious groups and follow the national curriculum.
Independent schools: Run by not-for-profit academy trusts, are independent from the local authority - they have more freedom to change how they run things and can follow a different curriculum.
Voluntary schools are funded by the local authority but have more freedom to change the way they do things - sometimes they are supported by representatives from religious groups. They follow the national curriculum, but they can choose what they teach in religious studies. *Voluntary aided schools* contribute

to building costs (or often own land and building) and are therefore more autonomous than *voluntary controlled schools*.

B. Full regression tables

Educational attainment

Table B1. Multinomial logistic regression of educational attainment on absences (Odds Ratios, standard errors in parenthesis)

	No qualification	Lower level school	Middle level school	Higher level school	First degree
Absences	1.043***	1.032**	1.025**	1.025**	1.015
	(0.010)	(0.010)	(0.009)	(0.010)	(0.009)
N	8,535				

Source: BCS70. *Note:* Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.1. Multiple imputed and weighted to correct for attrition. Reference outcome: Higher degree.

Table B2. Multinomial logistic regression of educational attainment on absences and risk factors (Odds Ratios, standard errors in parenthesis)

	No qualification	Lower level school	Middle level school	Higher level school	First degree
Absences	1.022**	1.011	1.008	1.013	1.009
	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)
Parental education					
No qualification	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
O-Level or equivalent	0.714	0.782	0.949	0.947	0.960
	(0.123)	(0.138)	(0.149)	(0.157)	(0.148)
A-level or equivalent	0.630	0.670	0.793	0.889	0.845
	(0.164)	(0.177)	(0.172)	(0.201)	(0.171)
Sub-degree	0.420**	0.424*	0.567*	0.597*	0.710
	(0.121)	(0.145)	(0.131)	(0.146)	(0.150)
Degree	0.287***	0.262***	0.354***	0.346***	0.614*
	(0.082)	(0.086)	(0.078)	(0.080)	(0.121)
Social class					
Unskilled	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Partly skilled	0.455	0.510	0.596	0.581	0.674
	(0.220)	(0.253)	(0.281)	(0.284)	(0.325)
Manual	0.514	0.518	0.626	0.601	0.747
	(0.240)	(0.245)	(0.287)	(0.279)	(0.347)
Non manual	0.463	0.420	0.536	0.453	0.735
	(0.225)	(0.210)	(0.252)	(0.217)	(0.349)
Managerial and Technical	0.413	0.356*	0.576	0.559	0.757
	(0.200)	(0.179)	(0.264)	(0.264)	(0.351)
Professional	0.403	0.332	0.341*	0.441	0.714
	(0.225)	(0.205)	(0.175)	(0.228)	(0.351)
Parental income in £					
250 +	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
200 - 249	0.421*	0.854	0.886	0.837	1.017

	(0.147)	(0.338)	(0.226)	(0.215)	(0.203)
150 - 199	0.625	0.786	0.876	0.847	0.974
	(0.164)	(0.284)	(0.196)	(0.191)	(0.175)
100 - 149	0.619	1.098	0.917	0.847	1.076
	(0.163)	(0.370)	(0.206)	(0.188)	(0.193)
50 - 99	0.589	0.881	0.794	0.710	0.944
	(0.162)	(0.318)	(0.192)	(0.177)	(0.192)
35 - 49	0.688	1.117	1.066	1.162	0.934
	(0.319)	(0.602)	(0.475)	(0.528)	(0.385)
under 35	0.547	0.304	0.626	0.445	0.741
	(0.330)	(0.234)	(0.349)	(0.267)	(0.381)
Housing tenure					
Owned outright	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Being bought	1.277	1.762**	1.273	1.128	1.304
	(0.251)	(0.377)	(0.195)	(0.184)	(0.185)
Rented, Council	2.088**	2.659***	1.805**	1.650*	1.450
	(0.501)	(0.679)	(0.372)	(0.357)	(0.294)
Rented, private	1.186	1.698	1.287	0.876	0.809
	(0.414)	(0.649)	(0.387)	(0.286)	(0.241)
Other	1.607	2.296	1.712	1.277	1.553
	(0.636)	(0.974)	(0.591)	(0.472)	(0.514)
Neighbor-hood rating					
Poor	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Average	0.791	0.766	1.012	0.913	1.002
	(0.228)	(0.235)	(0.284)	(0.259)	(0.269)
Well To Do	0.569	0.684	0.886	0.824	1.034
	(0.183)	(0.237)	(0.261)	(0.252)	(0.296)
Rural	0.825	0.906	1.133	1.103	1.258
	(0.270)	(0.304)	(0.344)	(0.338)	(0.373)
Ethnicity					
UK	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Other European	0.535	0.371	1.011	0.588	0.788
	(0.341)	(0.274)	(0.525)	(0.357)	(0.412)
Indian	1.196	0.655	1.172	1.690	2.745
	(0.714)	(0.420)	(0.667)	(0.982)	(1.488)
Pakistani/ Bangladeshi	0.088**	0.292	0.135**	0.353	0.420
	(0.081)	(0.219)	(0.098)	(0.240)	(0.232)
Other	0.000**	0.000**	1.852	0.491	1.016
	(0.000)	(0.000)	(1.954)	(0.652)	(1.128)
Child is male	1.236	1.215	1.116	1.322**	1.074
	(0.144)	(0.152)	(0.115)	(0.143)	(0.103)
Place of residence					
England	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Wales	0.530**	0.318***	0.553**	0.425***	0.564***
	(0.113)	(0.084)	(0.101)	(0.088)	(0.097)
Scotland	0.366***	0.355***	0.401***	0.494***	0.657*
	(0.079)	(0.083)	(0.075)	(0.096)	(0.110)
Household	1.268	1.382*	1.254	1.186	1.149

size					
	(0.155)	(0.179)	(0.146)	(0.145)	(0.128)
Number of children in household	0.872	0.793	0.818	0.831	0.885
	(0.114)	(0.110)	(0.101)	(0.107)	(0.105)
Family structure					
Two natural parents	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Step family	2.090*	1.788	1.669	1.412	1.300
	(0.603)	(0.543)	(0.453)	(0.399)	(0.341)
Single parent	1.092	1.168	0.958	0.902	1.082
	(0.321)	(0.367)	(0.264)	(0.257)	(0.282)
Other	2.156	1.375	1.085	1.517	1.421
	(1.494)	(1.089)	(0.726)	(1.035)	(0.907)
Mother's age at birth	0.981	0.983	0.979*	0.976*	0.982
	(0.012)	(0.012)	(0.010)	(0.011)	(0.010)
Birthweight	1.000	1.000	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
In special care after birth	1.029	1.089	1.039	0.800	1.015
	(0.182)	(0.206)	(0.161)	(0.134)	(0.147)
Number of health conditions	1.079	1.035	1.039	1.045	1.058
	(0.055)	(0.058)	(0.048)	(0.052)	(0.044)
Figure Drawing score	0.876	0.864*	0.907	0.975	0.976
	(0.061)	(0.062)	(0.055)	(0.060)	(0.055)
EPVT score	0.818*	0.833*	0.827**	0.926	1.006
	(0.064)	(0.069)	(0.055)	(0.066)	(0.063)
Copying Design score	0.686***	0.736***	0.794***	0.833**	0.881*
	(0.050)	(0.060)	(0.052)	(0.056)	(0.053)
Malaise Score	1.015	1.018	1.009	1.014	1.021
	(0.023)	(0.025)	(0.021)	(0.021)	(0.020)
Rutter Score	1.006	1.013	1.007	1.001	1.007
	(0.016)	(0.018)	(0.014)	(0.015)	(0.014)
Frequency of parent-teacher meetings					
Once	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
More than once	1.111	1.130	1.036	1.094	1.081
	(0.136)	(0.153)	(0.110)	(0.122)	(0.107)
None	1.265	1.245	1.025	1.015	0.964
	(0.240)	(0.249)	(0.175)	(0.186)	(0.158)
Days reading to the child per week	0.944*	0.959	0.959	0.962	0.969
	(0.025)	(0.028)	(0.023)	(0.025)	(0.022)
Family activities	0.981	0.989	1.013	1.008	1.016

Score					
	(0.029)	(0.029)	(0.026)	(0.027)	(0.025)
Mother's educational aspirations					
Cannot say	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Not continue education	1.159	0.881	0.647	0.801	0.552
	(0.449)	(0.354)	(0.247)	(0.318)	(0.217)
Continue education, university	0.386***	0.436***	0.326***	0.473***	0.690**
	(0.070)	(0.087)	(0.047)	(0.069)	(0.083)
Continue education, other	0.634**	0.615**	0.618***	0.760*	0.863
	(0.095)	(0.101)	(0.081)	(0.105)	(0.106)
Authoritarian child rearing	0.790**	0.778**	0.835**	0.826**	0.894
	(0.058)	(0.061)	(0.054)	(0.056)	(0.055)
Attitude to child independence	1.038	0.987	1.046	1.057	1.036
	(0.065)	(0.066)	(0.056)	(0.063)	(0.054)
Mother's mental health	0.999	0.975	0.977	0.995	1.001
	(0.029)	(0.030)	(0.026)	(0.027)	(0.025)
Smoking during pregnancy					
Non-Smoker	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Stopped before pregnancy	1.765**	1.240	1.474*	1.437*	1.296
	(0.314)	(0.244)	(0.230)	(0.235)	(0.186)
Stopped during pregnancy	1.784*	1.075	1.770*	1.497	1.419
	(0.497)	(0.345)	(0.431)	(0.386)	(0.329)
1-4 cigarettes per day	1.632*	1.409	1.183	1.201	1.071
	(0.349)	(0.326)	(0.222)	(0.239)	(0.184)
5-14 cigarettes per day	1.944***	1.533*	1.615**	1.514**	1.342*
	(0.327)	(0.274)	(0.243)	(0.240)	(0.192)
15 or more cigarettes per day	2.642***	2.391***	2.308***	2.385***	1.733**
	(0.594)	(0.558)	(0.478)	(0.514)	(0.352)
Mother's alcohol consumption during pregnancy					
More than twice per week	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Once a week	1.014	0.911	0.958	1.226	1.099

or less					
	(0.290)	(0.278)	(0.243)	(0.343)	(0.248)
Not at all	1.067	0.937	1.024	1.246	1.059
	(0.301)	(0.282)	(0.253)	(0.342)	(0.237)
School type					
Maintained	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Voluntary controlled	0.992	1.198	1.069	1.135	0.905
	(0.216)	(0.261)	(0.204)	(0.225)	(0.167)
Voluntary aided	0.654*	0.740	0.733*	0.750	0.844
	(0.118)	(0.153)	(0.113)	(0.125)	(0.124)
Independent	0.725	0.539	0.555	0.448*	0.973
	(0.310)	(0.282)	(0.172)	(0.157)	(0.215)
Other	0.870	1.143	0.882	1.045	0.833
	(0.475)	(0.659)	(0.404)	(0.473)	(0.330)
Streaming					
Not streamed	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
Low level	2.121	1.843	1.864	1.521	1.951
	(1.527)	(1.351)	(1.266)	(1.087)	(1.378)
Middle level	0.842	0.901	0.751	0.679	1.001
	(0.283)	(0.320)	(0.240)	(0.224)	(0.293)
High level	1.009	0.917	1.000	1.060	1.195
	(0.333)	(0.348)	(0.262)	(0.292)	(0.262)
Reading set					
No reading set	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
low level	0.804	0.880	0.932	0.770	0.900
	(0.323)	(0.362)	(0.305)	(0.275)	(0.288)
middle level	0.582*	0.731	0.804	0.817	0.950
	(0.140)	(0.198)	(0.161)	(0.180)	(0.176)
High level	0.590**	0.589**	0.668**	0.761	0.845
	(0.110)	(0.110)	(0.096)	(0.108)	(0.104)
Math set					
No math set	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
low level	3.192**	3.318**	2.775**	2.162*	1.830
	(1.206)	(1.341)	(0.917)	(0.757)	(0.588)
middle level	2.062**	2.081**	1.782**	1.539*	1.379
	(0.455)	(0.496)	(0.324)	(0.312)	(0.236)
Number of addresses					
Always the same	*Reference*	*Reference*	*Reference*	*Reference*	*Reference*
2	0.953	0.760	0.812	0.906	0.899
	(0.139)	(0.118)	(0.102)	(0.122)	(0.107)
3	0.913	0.796	0.844	0.969	0.892
	(0.165)	(0.149)	(0.131)	(0.157)	(0.129)
4 or more	1.313	0.821	1.071	1.074	1.089
	(0.282)	(0.191)	(0.202)	(0.214)	(0.194)
N	8,535				

Source: BCS70. *Note:* Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.1. Multiple imputed and weighted to correct for attrition. Reference outcome: Higher degree.

Social Class Destination

Table B3. Multinomial logistic regression of social class on absences (Odds ratios, standard errors in parenthesis)

	Salariat class	Intermediate class	Working class
Absences	0.972***	0.980***	0.990*
	(0.006)	(0.005)	(0.004)
N	9,012		

Source: BCS70. *Note:* Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.1. Multiple imputed and weighted to correct for attrition. Reference outcome: Non-employed.

Table B4. Multinomial logistic regression of social class on absences and risk factors (Odds ratios, standard errors in parenthesis)

	Salariat class	Intermediate class	Working class
Absences	0.990	0.987*	0.990
	(0.005)	(0.005)	(0.005)
Parental education			
No qualification	*Reference*	*Reference*	*Reference*
O-Level or equivalent	1.113	1.084	0.936
	(0.108)	(0.107)	(0.088)
A-level or equivalent	1.037	0.881	0.805
	(0.158)	(0.142)	(0.128)
Sub-degree	0.906	0.781	0.545**
	(0.165)	(0.154)	(0.113)
Degree	0.976	0.566**	0.470***
	(0.170)	(0.109)	(0.096)
Social class			
Unskilled	*Reference*	*Reference*	*Reference*
Partly skilled	1.591*	1.100	1.048
	(0.361)	(0.232)	(0.194)
Manual	1.534*	1.102	1.007
	(0.333)	(0.220)	(0.176)
Non manual	1.703*	1.138	0.685
	(0.392)	(0.256)	(0.143)
Managerial and Technical	1.840**	1.112	0.927
	(0.428)	(0.249)	(0.186)
Professional	2.883***	1.550	1.077
	(0.873)	(0.492)	(0.342)
Parental income in £			
250 +	*Reference*	*Reference*	*Reference*
200 - 249	0.976	1.009	0.920
	(0.232)	(0.264)	(0.257)
150 - 199	0.914	0.916	1.060
	(0.193)	(0.215)	(0.267)
100 - 149	0.832	0.817	1.048
	(0.169)	(0.185)	(0.258)
50 - 99	0.717	0.642	0.930
	(0.154)	(0.153)	(0.240)

35 - 49	0.541*	0.597	0.906
	(0.152)	(0.173)	(0.281)
under 35	0.480*	0.543	0.473
	(0.177)	(0.215)	(0.186)
Housing tenure			
Owned outright	*Reference*	*Reference*	*Reference*
Being bought	1.167	1.084	1.203
	(0.148)	(0.147)	(0.161)
Rented, Council	0.736*	0.860	1.041
	(0.103)	(0.127)	(0.152)
Rented, private	0.751	1.191	1.148
	(0.179)	(0.291)	(0.278)
Other	0.994	1.069	1.223
	(0.246)	(0.274)	(0.308)
Neighborhood rating			
Poor	*Reference*	*Reference*	*Reference*
Average	1.257	1.421*	1.146
	(0.199)	(0.233)	(0.168)
Well To Do	1.551*	1.516*	1.135
	(0.277)	(0.285)	(0.203)
Rural	1.265	1.544*	1.304
	(0.219)	(0.284)	(0.221)
Ethnicity			
UK	*Reference*	*Reference*	*Reference*
Other European	1.594	1.065	0.660
	(0.599)	(0.445)	(0.285)
Indian	1.884*	1.886*	0.718
	(0.526)	(0.531)	(0.215)
Pakistani/Bangladeshi	2.117	2.053	0.518
	(0.997)	(1.058)	(0.333)
Other	1.17e+06**	8.91e+05**	3.49e+05**
	(5.07e+06)	(3.89e+06)	(1.54e+06)
Child is male	4.604***	3.137***	4.198***
	(0.377)	(0.269)	(0.350)
Place of residence			
England	*Reference*	*Reference*	*Reference*
Wales	1.024	0.855	0.822
	(0.157)	(0.140)	(0.129)
Scotland	1.529**	1.465*	1.344*
	(0.222)	(0.222)	(0.198)
Household size	0.963	1.171	1.077
	(0.076)	(0.095)	(0.080)
Number of children in household	0.964	0.793**	0.887
	(0.081)	(0.069)	(0.072)
Family structure			
Two natural parents	*Reference*	*Reference*	*Reference*
Step family	0.987	0.880	0.939
	(0.146)	(0.138)	(0.136)
Single parent	1.296	1.163	1.148
	(0.225)	(0.219)	(0.194)

Other	0.459*	0.542	0.668
	(0.150)	(0.190)	(0.216)
Mother's age at birth	0.992	0.982*	0.988
	(0.008)	(0.008)	(0.008)
Birthweight	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)
In special care after birth	1.026	1.050	0.934
	(0.119)	(0.127)	(0.109)
Number of health conditions	1.011	0.998	0.970
	(0.034)	(0.037)	(0.033)
Figure Drawing score	1.117*	1.123*	1.075
	(0.052)	(0.057)	(0.052)
EPVT score	1.177***	1.100	1.042
	(0.055)	(0.053)	(0.049)
Copying Design score	1.217***	1.167**	1.012
	(0.059)	(0.057)	(0.047)
Malaise Score	1.004	1.000	1.002
	(0.014)	(0.014)	(0.013)
Rutter Score	0.976*	0.988	0.987
	(0.010)	(0.010)	(0.010)
Frequency of parent-teacher meetings			
Once	*Reference*	*Reference*	*Reference*
More than once	0.901	0.889	0.897
	(0.074)	(0.077)	(0.075)
None	0.799	0.871	0.877
	(0.093)	(0.104)	(0.099)
Days reading to the child per week	1.012	1.021	0.985
	(0.017)	(0.019)	(0.016)
Family activities Score	1.035	1.037	1.030
	(0.020)	(0.020)	(0.020)
Mother's educational aspirations			
Cannot say	*Reference*	*Reference*	*Reference*
Not continue education	0.479***	0.619*	0.844
	(0.097)	(0.116)	(0.134)
Continue education, university	1.539***	0.966	0.904
	(0.186)	(0.131)	(0.121)
Continue education, other	1.095	0.984	0.935
	(0.105)	(0.097)	(0.093)
Authoritarian child rearing	1.053	0.981	1.018
	(0.045)	(0.044)	(0.044)
Attitude to child independence	0.981	1.000	0.980
	(0.040)	(0.044)	(0.041)

Mother's mental health	1.025	1.024	1.019
	(0.018)	(0.019)	(0.017)
Smoking during pregnancy			
Non-Smoker	*Reference*	*Reference*	*Reference*
Stopped before pregnancy	0.649***	0.735*	0.956
	(0.076)	(0.093)	(0.114)
Stopped during pregnancy	0.753	0.830	0.881
	(0.128)	(0.151)	(0.154)
1-4 cigarettes per day	0.685*	0.846	0.955
	(0.102)	(0.132)	(0.144)
5-14 cigarettes per day	0.789*	0.910	0.960
	(0.081)	(0.097)	(0.098)
15 or more cigarettes per day	0.580***	0.832	0.833
	(0.070)	(0.103)	(0.098)
Mother's alcohol consumption during pregnancy			
More than twice per week	*Reference*	*Reference*	*Reference*
Once a week or less	0.929	0.855	0.914
	(0.190)	(0.184)	(0.181)
Not at all	0.838	0.741	0.767
	(0.169)	(0.156)	(0.150)
School type			
Maintained	*Reference*	*Reference*	*Reference*
Voluntary controlled	1.039	1.112	1.275
	(0.143)	(0.167)	(0.177)
Voluntary aided	1.265	1.205	1.182
	(0.164)	(0.160)	(0.155)
Independent	1.200	0.906	0.570
	(0.329)	(0.283)	(0.206)
Other	0.981	0.664	1.167
	(0.347)	(0.282)	(0.452)
Streaming			
Not streamed	*Reference*	*Reference*	*Reference*
Low level	0.622	0.913	0.800
	(0.183)	(0.243)	(0.202)
Middle level	0.984	0.957	0.728
	(0.200)	(0.194)	(0.153)
High level	1.164	1.080	1.292
	(0.282)	(0.291)	(0.339)
Reading set			
No reading set	*Reference*	*Reference*	*Reference*
low level	1.356	1.251	1.011
	(0.336)	(0.305)	(0.233)
middle level	1.411*	1.243	0.938
	(0.242)	(0.237)	(0.179)

High level	1.305*	1.004	0.802
	(0.163)	(0.137)	(0.106)
Math set			
No math set	*Reference*	*Reference*	*Reference*
low level	0.332***	0.594*	0.964
	(0.074)	(0.132)	(0.204)
middle level	0.660**	0.897	1.129
	(0.104)	(0.154)	(0.190)
Number of addresses			
Always the same	*Reference*	*Reference*	*Reference*
2	0.922	0.965	0.915
	(0.089)	(0.102)	(0.090)
3	1.088	1.040	1.052
	(0.131)	(0.134)	(0.129)
4 or more	0.822	0.696*	0.786
	(0.111)	(0.099)	(0.107)
N	9,012		

Source: BCS70. *Note:* Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.1. Multiple imputed and weighted to correct for attrition. Reference outcome: Non-employed.

Unemployment

Table B5. Negative binomial regression of months in unemployment on absences and risk factors (Odds Ratios, standard errors in parenthesis)

	Bivariate		Adjusted	
Absences	1.023*	(0.011)	1.018	(0.011)
Parental Education				
No qualification			*Reference*	
O-Level or equivalent			1.086	(0.160)
A-level or equivalent			0.853	(0.213)
Sub-degree			1.130	(0.347)
Degree			1.208	(0.328)
Social Class				
Unskilled			*Reference*	
Partly skilled			1.318	(0.404)
Manual			0.996	(0.296)
Non manual			1.310	(0.457)
Managerial			1.171	(0.379)
Professional			0.879	(0.396)
Parental income				
250 +			*Reference*	
200 - 249			1.753	(0.712)
150 - 199			1.626	(0.526)
100 - 149			1.679	(0.556)
50 - 99			2.286*	(0.781)
35 - 49			2.111	(0.849)
under 35			2.038	(1.102)
Housing tenure				
Owned outright			*Reference*	
Being bought			0.793	(0.164)
Rented, council			1.213	(0.286)
Rented, private			0.468	(0.188)
other			0.574	(0.266)
Neighborhood rating				
Poor			*Reference*	
Average			0.643*	(0.134)
Well To Do			0.489*	(0.140)
Rural			0.482**	(0.122)
Ethnicity				
UK			*Reference*	
Other European			0.847	(0.532)
Indian			1.479	(0.573)
Pakistani/ Bangladeshi			0.121**	(0.095)
Other			0.922	(1.030)
Child is male			2.092***	(0.239)
Place of residence				
England			*Reference*	

Wales	0.973	(0.234)
Scotland	0.739	(0.177)
Household size	0.974	(0.106)
Children in household	1.114	(0.133)
Family structure		
Two natural parents	*Reference*	
Stepfamily	0.881	(0.211)
Single parent	1.081	(0.262)
Other	2.541	(1.231)
Mother's age at birth	1.019	(0.011)
Birthweight	1.000	(0.000)
In special care after birth	0.915	(0.143)
Number of health conditions	1.093	(0.055)
Figure Drawing score	0.995	(0.066)
EPVT score	0.955	(0.069)
Copying Design score	0.813**	(0.062)
Malaise Score	0.994	(0.021)
Rutter Score	1.040**	(0.014)
Frequency of parent-teacher meetings		
Once	*Reference*	
More than once	1.101	(0.141)
Never	1.164	(0.216)
Days reading to the child	0.989	(0.024)
Family activities score	0.992	(0.029)
Mother's educational aspirations		
Cannot say	*Reference*	
Not continue education	0.914	(0.258)
Continue education, university	1.063	(0.190)
Continue education, other	0.672*	(0.111)
Authoritarian child rearing	1.013	(0.069)
Attitude towards child independence	0.996	(0.063)
Mother's mental health	1.002	(0.025)
Smoking during pregnancy		
Non-Smoker	*Reference*	
Stopped before pregnancy	1.169	(0.212)

Stopped during pregnancy			1.319	(0.315)
1-4 cigarettes per day			0.961	(0.232)
5-14 cigarettes per day			1.137	(0.179)
15 or more cigarettes per day			1.127	(0.201)
Alcohol consumption during pregnancy				
More than twice per week			*Reference*	
Once a week or less			1.113	(0.316)
Not at all			1.148	(0.329)
School type				
Maintained			*Reference*	
Voluntary controlled			1.125	(0.227)
Voluntary aided			0.954	(0.198)
Independent			1.240	(0.395)
Other			1.514	(0.744)
Streaming				
Not streamed			*Reference*	
Low level			1.691	(0.594)
Middle level			1.070	(0.322)
High level			0.873	(0.291)
Reading set				
No reading set			*Reference*	
Low level			0.960	(0.337)
Middle level			0.919	(0.241)
High level			0.789	(0.136)
Math set				
No math set			*Reference*	
Low level			1.063	(0.362)
Middle level			1.082	(0.257)
Number of addresses child had				
Always the same			*Reference*	
2			1.138	(0.173)
3			1.273	(0.226)
4 or more			1.304	(0.249)
Constant	40.964***	(1.490)	36.953***	(1.396)
N	9,082		9,082	

Source: BCS70. *Note:* Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.1. Multiple imputed and weighted to correct for attrition.

Earnings

Table B5. Linear regression of log gross weekly earnings on absences and risk factors (Standard errors in parenthesis)

	Bivariate		Adjusted	
Absences	-0.004*	(0.002)	0.000	(0.002)
Parental Education				
No qualification			*Reference*	
O-Level or equivalent			0.039	(0.025)
A-level or equivalent			0.051	(0.036)
Sub-degree			0.040	(0.050)
Degree			0.186***	(0.046)
Social Class				
Unskilled			*Reference*	
Partly skilled			0.005	(0.052)
Manual			0.050	(0.048)
Non manual			0.126*	(0.055)
Managerial			0.085	(0.054)
Professional			0.097	(0.071)
Parental income				
250 +			*Reference*	
200 - 249			-0.097	(0.058)
150 - 199			-0.147**	(0.051)
100 - 149			-0.156**	(0.050)
50 - 99			-0.167**	(0.053)
35 - 49			-0.186*	(0.072)
under 35			-0.133	(0.092)
Housing tenure				
Owned outright			*Reference*	
Being bought			0.002	(0.033)
Rented, council			-0.067	(0.036)
Rented, private			-0.086	(0.061)
other			-0.122	(0.066)
Neighborhood rating				
Poor			*Reference*	
Average			0.073	(0.045)
Well To Do			0.094	(0.049)
Rural			0.069	(0.048)
Ethnicity				
UK			*Reference*	
Other European			-0.039	(0.102)
Indian			0.351***	(0.067)
Pakistani/ Bangladeshi			0.447**	(0.159)
Other			0.113	(0.142)
Child is male			0.721***	(0.019)
Place of residence				
England			*Reference*	

Wales	-0.086	(0.044)
Scotland	0.123***	(0.031)
Household size	-0.020	(0.019)
Children in household	0.018	(0.020)
Family structure		
Two natural parents	*Reference*	
Stepfamily	-0.007	(0.041)
Single parent	0.014	(0.046)
Other	-0.128	(0.097)
Mother's age at birth	-0.002	(0.002)
Birthweight	0.000	(0.000)
In special care after birth	0.039	(0.028)
Number of health conditions	0.006	(0.008)
Figure Drawing score	0.009	(0.011)
EPVT score	0.039***	(0.012)
Copying Design score	0.038**	(0.012)
Malaise Score	-0.005	(0.004)
Rutter Score	0.001	(0.002)
Frequency of parent-teacher meetings		
Once	*Reference*	
More than once	-0.034	(0.020)
Never	-0.029	(0.029)
Days reading to the child	0.003	(0.004)
Family activities score	0.004	(0.005)
Mother's educational aspirations		
Cannot say	*Reference*	
Not continue education	-0.075	(0.050)
Continue education, university	0.156***	(0.031)
Continue education, other	0.035	(0.024)
Authoritarian child rearing	0.028**	(0.011)
Attitude towards child independence	0.005	(0.010)
Mother's mental health	0.003	(0.005)
Smoking during pregnancy		
Non-Smoker	*Reference*	
Stopped before pregnancy	-0.084**	(0.029)

Stopped during pregnancy			-0.098*	(0.046)
1-4 cigarettes per day			-0.050	(0.035)
5-14 cigarettes per day			0.006	(0.026)
15 or more cigarettes per day			-0.047	(0.030)
Alcohol consumption during pregnancy				
More than twice per week			*Reference*	
Once a week or less			0.006	(0.053)
Not at all			-0.007	(0.052)
School type				
Maintained			*Reference*	
Voluntary controlled			-0.031	(0.034)
Voluntary aided			0.028	(0.031)
Independent			0.153*	(0.073)
Other			0.032	(0.095)
Streaming				
Not streamed			*Reference*	
Low level			0.011	(0.059)
Middle level			-0.034	(0.057)
High level			-0.016	(0.049)
Reading set				
No reading set			*Reference*	
Low level			0.041	(0.056)
Middle level			0.078	(0.040)
High level			0.098***	(0.029)
Math set				
No math set			*Reference*	
Low level			-0.199***	(0.051)
Middle level			-0.131***	(0.036)
Number of addresses child had				
Always the same			*Reference*	
2			0.021	(0.023)
3			0.020	(0.030)
4 or more			0.007	(0.033)
Constant	6.121***	(0.014)	5.631***	(0.180)
N	5,798		5,798	

Source: BCS70. *Note:* Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.1. Multiple imputed and weighted to correct for attrition and selection into employment.

C. Inverse probability of attrition weights

Table C1. Distribution of inverse probability of attrition weights and absences

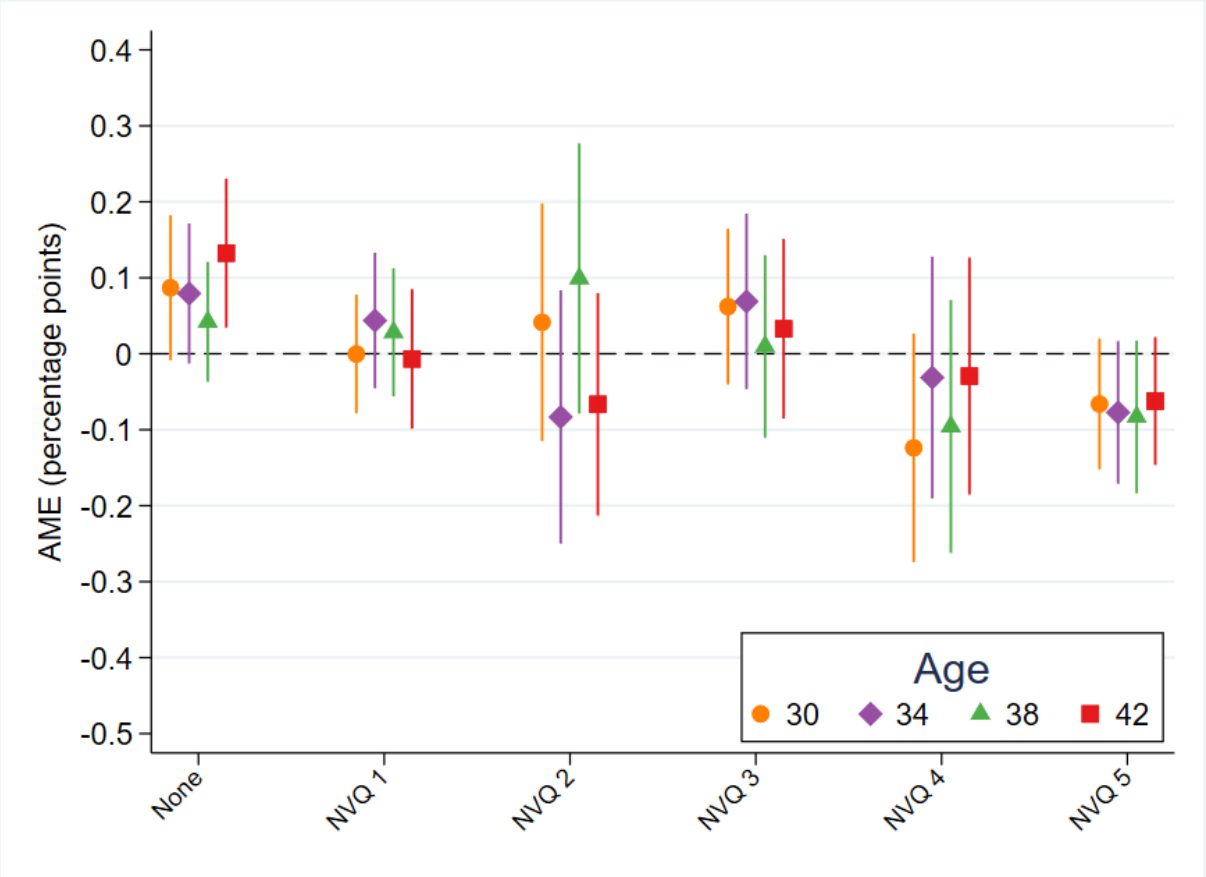
Outcome	N	Mean weight	Minimum weight	Maximum weight	Mean absences (unweighted)	Mean absences (weighted)
All	13,776	-	-	-	4.505	-
Educational Attainment	8,535	1.611	1.168	5.108	4.267	4.503
Occupational class	9,012	1.526	1.153	3.798	4.266	4.503
Month in unemployment	9,082	1.514	1.152	3.863	4.290	4.495
Employment status	8,505	1.616	1.169	5.090	4.292	4.496
Earnings	5,798	2.364	1.449	9.544	4.123	4.468

Source: BCS70.

D. Effect of earlier measures on outcomes

Educational attainment

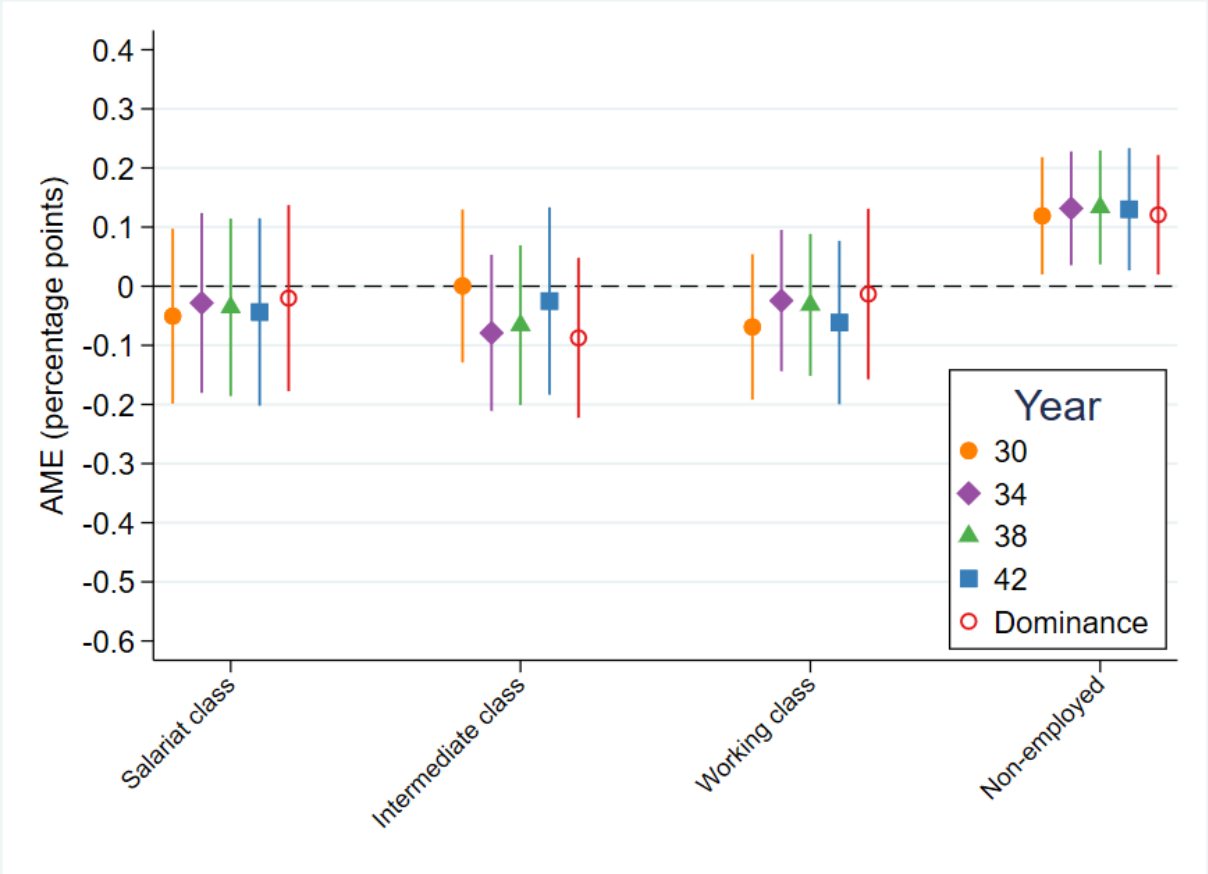
Figure D1. Associations between absences and educational attainment by age



Source: BCS70; *Note:* Adjusted for risk factors, multiple imputed and weighted to correct for attrition. N_{30}=9,758, N_{34}=8,432, N_{38}=7,751, N_{42}=8,535.

Social class

Figure D2. Associations between absences and social class destination by age



Source: BCS70; *Note:* Adjusted for risk factors, multiple imputed and weighted to correct for attrition. N_{30}=10,382, N_{34}= 10,106, N_{38}= 9,449, N_{42}= 8,653, $N_{Dominance}$= 9,012.

Earnings

Table D1. Associations between absences and weekly gross earnings (log) by age

Age	b	SE	N
30	0.002	0.002	6681
34	0.001	0.002	5581
38	0.001	0.002	4376
42	0.000	0.002	5798

Source: BCS70. *Note:* Significance levels: *** p<0.001, ** p<0.01, * p<0.05, + p<0.1. Adjusted for risk factors, multiple imputed and weighted to correct for attrition and selection into employment.

References

Brimer, M. A., & Dunn, L. M. (1962). *Manual for the English Picture Vocabulary Tests: Test 1 (age range 5: 0–8: 11), test 2 (age range 7: 0–11: 11)*. Educational Evaluation Entreprises.

Goodenough, F. (1926). *Measurement of Intelligence by Drawings*. Harcourt, Brace and World.

Harris, D. B. (1963). *Children's drawings as measures of intellectual maturity: Revision of Goodenough draw-a-man test*. Harcourt, Brace and World.

Koppitz, E. (1968). *Psychological Evaluation of Children's Human Figure Drawings*. Grure and Stratton.

Rutter, M., Tizard, J., & Whitmore, K. (1970). *Education, health and behaviour: Psychological and medical study of childhood development*. Longman Group Limited.