The cumulative impact of socioeconomic disadvantage on educational attainment during austerity: a comparative cross-cohort approach

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Despite much empirical evidence highlighting the harmful effect of socioeconomic disadvantage on educational outcomes, there is a relative lack of understanding of how different risk factors impact upon attainment. Importantly, it has yet to be established what effect, if any, austerity cuts have had on the most disadvantaged students. Using rich data from two British cohort studies (Next Steps and MCS), this cross-cohort study explores how educational inequalities impact on attainment in distinct cohorts of students at identical age-points, whilst also examining the role of wider political and socioeconomic circumstances. The analysis reconfirms the detrimental effect of exposure to socioeconomic risk factors on attainment, highlighting the relative importance of some (e.g., social housing) over others, and emphasising the disproportionate association of exposure to multiple risks with poorer outcomes. For both cohorts, the attainment gap is already clear at age 11, and widens at every level of risk across secondary education. Despite the implementation of austerity, no evidence is found for worsening inequalities at an individual level. However, the persistent link between disadvantage and attainment means that, on a cohort level, increasing levels of disadvantage during austerity will inevitably lead to greater proportions of young people facing an attainment 'penalty'.

Keywords: socioeconomic disadvantage; educational attainment; austerity; cohort studies; attainment gap

1. Introduction

Cohort studies, following young people throughout their early lives, through their

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schooling and beyond, provide a useful lens through which to examine how social, economic and political factors shape their experiences and affect year-groups of students as they go through the education system. Linking data from these studies to administrative data, one can, furthermore, assess the impact that such factors have on their attainment.

This paper takes advantage of rich longitudinal data from two cohort studies – Next Steps (NS) (formerly the Longitudinal Study of Young People in England; LSYPE) of young people born in 1989/90, and the Millennium Cohort Study (MCS) of children born between 2000 and 2001 – to investigate the persistence of the socioeconomic 'attainment gap', whereby students from socioeconomic disadvantaged backgrounds consistently underperform academically, compared to their more affluent peers.

The novel contribution of the paper lies in the insights it brings by comparing the impact of equivalent measures of disadvantage on two cohorts of young people, born approximately eleven years apart. To date, there have been few studies exploring the socioeconomic attainment from a comparative cross-cohort perspective (but see Gregg & Macmillan, 2010). Employing a cross-cohort methodology allows us to look at how educational inequalities impact upon attainment in two distinct cohorts of young people at the same age-points, whilst it also allows us potentially to examine if period effects are at play. In this context, this refers to the wider political and socioeconomic circumstances affecting schools in the intervening period between the two cohorts' school careers, viz. the 2008 financial crisis and subsequent implementation of austerity policies.

2. Literature review

2.1. The attainment gap

Whilst governments of different ideological persuasions have invested vast sums of money to target those areas, schools, and groups deemed most in-need (Lupton & Obolenskaya, 2020), the Education Policy Institute estimates that, at the current rate of change, it would take more than 500 years to close the socioeconomic attainment gap (EPI, 2019). Figure 1 illustrates the persistence of the attainment gap over the past 20 years, with students eligible for free school meals consistently performing worst than their more affluent peers (Farquharson et al., 2022).

[Figure 1 here]

Why governments have been unable to significantly close the attainment gap has been the subject of much academic critique (Ball, 2021; Lupton & Hayes, 2021). Ball, for example, succinctly describes how policymakers have tended to "look in the wrong place" (2021, p. 162) by trying to tackle educational inequalities within the school, rather than seeing these as an extension of the social inequalities that pervade health, housing and employment. Whilst quality schooling is clearly important, success in education is also the product of "multiple 'social determinants' – family income and wealth' physical and mental health' housing and neighbourhood conditions and so on" (Lupton & Hayes, 2021, pp. 113-114).

However, instead of focusing attention on tackling deep-rooted structural inequalities in society, there has been a conscious shift in the policy discourse towards individual responsibility, which has emphasised social problems as the result of family inadequacies or community deficiencies (Ball, 2021). Policy strategies implemented

since 2010 – e.g., defunding multi-agency social policy initiatives, such as *SureStart*, raising the participation age for school-leavers, and a greater focus on 'troubled families' – are aligned with neoliberal rhetoric. The emphasis is on families and individuals overcoming adversities through self-improvement, raising aspirations and developing character and resilience. These are the tools that will allow individuals, through educational attainment, to become socially mobile and overcome the disadvantage of their early-life circumstances.

2.2. Disadvantage – an accumulation of adversities

However, despite this, empirical research (Gorard & Siddiqui, 2019; Pensiero & Schoon, 2019) has continued to highlight the persistent link between socioeconomic disadvantage (SED) and poor academic attainment. Furthermore, studies have emphasised the appearance of inequalities in outcomes amongst primary school children (Chowdry et al., 2011) and acknowledged the effect of disadvantage on children as young as two-years old (Murray & Murray, 2021).

Whilst the attainment gap continues to be monitored by policymakers and researchers, the key mechanisms underlying this relationship are yet to be fully elucidated. Theories of social reproduction (Bourdieu & Passeron, 1977; Bourdieu, 1986) highlight the process by which social class is reproduced through the intergenerational transmission of capital and particularly through the way educational fields are mediated (Kaye, 2018). This encompasses not only a lack of access to economic resources but also a paucity of social and cultural capital. Indeed, SED is better thought of as encompassing a whole suite of risk factors that are indicative of the specific disadvantages facing young people from the most impoverished backgrounds.

These young people will have access to fewer resources, which leads to specific difficulties in an educational context.

In this context, experience of SED has been viewed through the prism of social epidemiology research on adverse childhood experiences (ACE). McLaughlin (2016) has defined ACEs as "experiences which require significant adaptation by the developing child in terms of psychological, social and neurodevelopmental systems, and which are outside of the normal expected environment". These typically encompass such traumatic events as parental divorce, substance abuse or domestic violence (Lacey & Minnis, 2020). However, for several decades, sociological research has sought to examine the effects of urban poverty or SED on young people (Garmezy, 1991; Werner & Smith, 1982), recognising that such life circumstances represent a complex constellation of accumulated risk factors (Kaye, 2018).

According to theories of cumulative disadvantage (Dannefer, 2003; Merton, 1973), multiple adversities experienced by young people tend to cluster, and those exposed early on to disadvantage experience a significant 'multiplier effect' throughout their lives (Olsson et al., 2003). Empirically, it has been shown that an accumulation of adversities has a 'graded relationship' with later adverse outcomes, with additional exposure increasing the link between disadvantage and poor life outcomes (Forsman & Jackisch, 2021).

Whilst individual indicators of SED, such as living in social housing, parental worklessness or family structure, might indicate short-term difficulties, evidence suggests that individual indicators of disadvantage cluster and are cyclical, indicating a 'stickiness' to disadvantage (Hobcraft, 2003).

2.3. Austerity and inequalities

Following the Great Recession in the wake of the 2008 financial crisis, there is international evidence to suggest that the effect of austerity cuts exacerbated inequality in young peoples' educational attainment (Mordechay, 2017; Shores & Steinberg, 2019), as well as in other outcomes, such as mental health (Thomson & Katikireddi, 2018), university enrolment (Ford et al., 2021) and school-to-work transitions (Schoon & Bynner, 2019).

Motti-Stefanidi and Asendorpf's (2017) study of socially disadvantaged Greek youth found a significant increase in conduct problems in school and truancy as well as a decrease in self-efficacy during the economic crisis. Moreover, Shores and Steinberg (2019) indicate, in the US at least, that "the Great Recession was associated with both aggregate declines in academic achievement and increases in achievement inequalities between poor and more economical advantaged school districts" (p. 2). Whilst their detailed analysis relies on aggregate-level, rather than individual-level data it is nonetheless reasonable to suspect that unemployment, family-level income loss and government-level spending cuts might disproportionately affect attainment amongst students from the most socioeconomically disadvantaged backgrounds. Mordechay (2017) highlights, for example, that parental job loss can limit the income necessary to purchase goods and services that can be educationally enriching and support a child's academic attainment (p. 51).

At the same time, however, prominent theorists (Becker, 1964; Elder, 1974) have highlighted that recessions have historically had the effect of promoting high-school completion and educational attainment amongst young people, for whom the prospect of finding employment in such adverse macroeconomic times appears much less plausible. Students experiencing socioeconomic adversity are likely the be at the

margins of where these decisions are made – those most attracted by the early entry into the labour market during good economic times, and those potentially seeking to further their educational qualifications as protection from recession.

Nonetheless, education spending in the UK fell by 14% in real terms between 2010 and 2018 (Belfield et al., 2018) and this is further likely to exacerbate the gap between those students from poorer backgrounds and their more affluent peers, who have greater recourse to extra-curricular activities, private tutoring, and other paid-for compensatory measures.

3. The current study

Despite the wealth of theoretical and empirical evidence on the harmful effect of SED on educational outcomes, there is a relative lack of understanding of how different risk factors are associated with attainment, what their independent and cumulative effects are, and how this has been affected by the 2008 financial crisis and subsequent contraction of real-terms educational spending.

The current study comprises a cross-cohort analysis examining the impact of exposure to multiple adverse conditions on educational attainment. It examines the relationship between disadvantage and educational outcomes across two cohorts using equivalent indicators of socioeconomic risk. Using longitudinal data, it examines the attainment gap at the end of primary school and its persistence through secondary education. Comparing two nationally-representative cohorts at different time-points, it can also provide some insight on the impact of austerity on young people's education.

These aims are formally addressed through the following research questions:

(1) What is the independent and cumulative impact of SED on educational attainment?

(2) To which extent is the relationship between SED and attainment at age 16 already apparent at age 11?
(3) How has this changed for cohorts taking GCSEs in 2017 compared to 2006?

In accordance with the empirical evidence, it might be expected that an accumulation of social risk factors would have an exponentially greater negative impact on educational attainment than any single indicator. Nonetheless, the current study does not make any assumption about the direction of this trend between the cohorts examined – i.e., whether the impact of austerity in the intervening period will have exacerbated the relationship, or if the socioeconomic attainment gap will have narrowed.

As noted above, the cuts in real terms to educational spending implemented by the Cameron government would be expected to affect all students going through the schools system in that period. However, it is reasonable to assume that those with recourse to extra-curricular activities, private tutoring, and other paid-for compensatory measures would fare better than those without the private means to afford them, leading to a widening of the socioeconomic attainment gap.

On the other hand, however, changes to the exam system, 'targeted' policy interventions or grade inflation (Sullivan et al., 2011) might have narrowed the gap from where it might be expected to be. Moreover, there is evidence that recession and negative macroeconomic shocks can reduce inequalities in educational outcomes by incentivising young people to stay in education, who might otherwise have sought to enter the labour market early in times of economic boom.

4. Data and methods

Data come from two nationally representative cohort studies: Next Steps (NS) and the Millennium Cohort Study (MCS). NS follows the lives of young people born in

England in 1989/90, with annual waves beginning in school year 9, when students were aged 13/14 (in 2004) until participants were aged 19/20 in 2010. The main objectives of NS were to gather evidence about young people's transitions from education to economic roles in early adulthood (DfE, 2011). The original sample was drawn from 33,000 Year 9 students in England in February 2004, derived using a two-stage PPS sampling procedure[2]. Of the 21,000 young people included in the final sample, a response rate at wave 1 of 74% was achieved (n = 15,770). Design and non-response weights are available for each wave of data and are applied as appropriate throughout the analysis.

The Millennium Cohort Study[3] (MCS) began in 2001 and follows 18,818 cohort members born between 2000 and 2001 across the UK. The national birth cohort study collects data in waves taking place at two-to-three-year intervals, when cohort members were aged 9 months, 3, 5, 7, 11, 14 and 17. The MCS was developed as a multidisciplinary survey to capture the influence of early family context on child development and outcomes throughout childhood, into adolescence and adulthood (CLS, 2020). The MCS sample was drawn from a population of children identified through the universal Child Benefits register. Children from deprived backgrounds were oversampled, as were children from areas of high ethnic minority concentration (*Ibid.*). Design weights are supplied by the data controller and are different depending on

[2] Further information can be found online at: https://doc.ukdataservice.ac.uk/doc/5545/mrdoc/pdf/lsype_user_guide_wave_1_to_wave_7.pdf

[3] The LSYPE2 cohort was not selected due to issues with missing prior attainment data at KS2. The MCS cohort is also slightly younger, allowing for potentially greater impact of policies following the change of government in 2010.

whether the analysis is conducted for a single country within the UK, or for the UK as a whole. Weights in later waves of the study are further adjusted for non-response. In wave 6, the study achieved a response rate of 60.9% of the original sample. Further details are available online (CLS, 2016; CLS, 2020).

The present study uses data from the first wave of NS (2004) and wave 6 of MCS (2015), when young people in each cohort are aged 13/14, approximately halfway through their secondary education and just prior to the start of their GCSE courses. For comparability between the two cohorts, only the MCS sample resident in England is included in the analysis (n = 11,695 at wave 1) and appropriate weights for this sub-sample are applied.

Data from the cohort studies is linked to national administrative data via the National Pupil Database (NPD), which includes educational attainment data and data from the Pupil-Level Annual School Census. Analysis of these data is restricted to cohort members for whom educational outcome data is available and who, in the case of the MCS, are resident in England and still part of the sample at wave 6. A key advantage of having data linked to education datasets lies in the reduction of recall bias and missing data, whilst administrative information can be matched to data from cohort studies on current circumstances throughout the sweeps. The size of the final analytical samples are: 12,308 for NS and 6,595 for MCS. Survey weights were included in the analyses to account for differential probability of selection in the design of the studies, and attrition bias due to non-response across the surveys (DfE, 2011; Ketende & Jones, 2011).

4.1. Educational outcomes

The main outcome variable for this study is the ‘capped GCSE points score’ (hereafter

'GCSE score'), a total score formed of the best eight GCSE grades a pupil achieves, including equivalent qualifications. This variable is derived from the NPD and matched to consenting cohort members participating in NS and MCS.

Significant changes to the way in which scores were assigned to GCSE grades between 2006 and 2017 makes direct comparison of raw scores difficult. In order to present comparable findings between the two cohorts, the scores in each cohort are converted to z-scores to provide an indication of the *relative* outcome for students within their school year group. The distribution of these scores for each cohort are illustrated in figure 2.

[Figure 2 here]

The histograms show similar but distinct patterns, with cohort members in NS clustering more densely around a midpoint and a slightly more left-skewed distribution indicating greater variation at the lower end of the of the achievement distribution, as compared to the younger MCS cohort.

Prior educational attainment data are also available via linkage with the NPD dataset. The timing of the introduction and abolition of standardised assessments means that the NS cohort has matched prior educational attainment data at KS2 (age 11) and KS3 (age 14), whilst the more recent MCS cohort has linked attainment data at KS1 (age 7) and KS2 (age 11) – standardised KS3 assessments having been discontinued in the intervening period. In order to maintain comparability, therefore, only KS2 data are included in the models below as prior attainment controls. This measure then becomes the main outcome variable for the subsequent models of educational attainment at age 11.

4.2. Measures of socioeconomic risk

Research on socioeconomic risk has typically focused on occupation- or education-based indicators and, in relation to children, it is common to identify those from a disadvantaged background as having parents working in low SES jobs or with low levels of education. Longitudinal studies in the UK and internationally have highlighted the continuity between low parental education and poor educational outcomes for children themselves (Dickson et al., 2016; Dubow et al., 2009).

Whilst definitions of occupation-based SES have changed as the structure of the labour force has developed, hierarchical conceptions of occupational status allow researchers to identify those working in the most routine jobs and/or requiring the fewest skills. Beyond this, research has shown that young people from workless families (Schoon, 2012) or from families considered to be part of the 'working poor' are also at risk of poor educational outcomes (Hick & Lanau, 2017).

SED is linked to difficulties associated with living in social housing (Hills, 2007) and, in addition to coming from low-income households, young people are more likely to have lower-educated parents and at greater risk of teenage parenthood. Moreover, living in social housing as a child is strongly predictive of being in socially-rented accommodation as an adult (Hobcraft, 2003).

Family circumstances have been shown to have a strong association with poor educational outcomes, with children of single parents (Harkness & Salgado, 2018) and those born of teenage mothers (Francesconi, 2008) faring worse compared to their peers at school.

In addition to these social indicators of risk, research has shown that material deprivation is a key risk factor for poor outcomes (West, 2007). Information on household income contained in the cohort studies allows us to assess the extent to which

the effect of living in a low-income household exerts an independent effect above and beyond other social indicators of disadvantage.

Six indicators of SED, collected when members of each cohort were aged 13/14, are included in this analysis and are operationalised as follows:

Low SES/from a workless family: Parental occupational status is based on the NS-SEC classification in both cohorts and refer either to mother's or father's SES (whichever is the higher). Data have been recoded to derive a binary variable whereby cohort members are coded '1' if their parents are employed in partly skilled/semi-routine or unskilled/routine occupations (NS-SEC classes 5-7) or are currently unemployed, and coded '0' if their parents are employed in professional, managerial, intermediate or skilled occupations (NS-SEC classes 1-4).

Low parental education**:** As above, parental educational level refers to the higher of mother or father's highest qualification. Low parental education is a binary variable coded '1' where parents' level of education is below GCSE level and '0' where it is at GCSE level or above.

Social housing**:** Data on housing tenure in both cohorts is recoded as a binary variable where '1' indicates that the cohort member is currently living in social housing, and '0' refers to all other housing circumstances.

Single-parent family is coded '1' where family structure is recorded as single-parent family and '0' for all other family structures.

Born to a teenage mother is derived by subtracting the age of the cohort member's mother at time of interview from the age of the cohort member herself. The binary variable is coded '1' if the cohort member's mother was under 20 at the time of their

birth and ‘0’ otherwise.

Low household income: Gross household weekly income, as reported in each of the surveys when cohort members were aged 13/14[4], is divided into quintiles with those in the lowest quintile coded ‘1’ and those in quintiles one to four coded as ‘0’.

4.3. Social Risk score

Measures and indices of SED have become the subject of much discussion as public policies have sought to monitor ‘gaps’ between those from poorer backgrounds and their better off peers, in terms of school attainment, university participation and successful labour market integration (DfE, 2015). Jerrim’s investigation (2020) into measuring disadvantage has sought to assess how well various proxies for family background perform in terms of correlating with long-run material disadvantage (i.e., family income). He concludes that indicators that rely on neighbourhood-based proxies are poor correlates of household-level disadvantage, susceptible as they are to the ‘ecological fallacy’. Gorard et al. (2019), similarly, conclude that individual-level indicators in general – and free-school meal (FSM) eligibility in particular – are the best indicators of economic circumstances (p. 118). Jerrim further notes, however, whilst FSM eligibility is the best available marker of childhood poverty, it is nonetheless focused upon the bottom end of the SES distribution and a fuller understanding of the socioeconomic gaps in education would be gained from using ‘hybrid’ measures which combine information from several indicators (2020, p. 22).

Whilst empirical evidence for the use of multiple indicators of disadvantage has emphasised that social risks do not occur in isolation and tend to cluster, how multiple

[4] Where the relevant wave data is missing, data on income from the following wave is used

indicators of childhood adversities might best be combined is the matter of ongoing debate (Lacey & Minnis, 2020). Previous research has employed a cumulative risk score approach, summing the number of risk factors to arrive at a total 'score'. Whilst this has the advantage of being able easily to identify those at the 'greatest risk', it has the drawback, statistically, that it assigns equal weight to each of the indicators. Yet other research (Strand, 2014) has used statistical techniques to produce a composite indicator of SES, by applying empirically-derived weighting to measures of parental occupation, education and income.

The present analysis adopts the prior approach, first employing an additive social risk score approach to examine cumulative exposure to multiple indicators of disadvantage, before including this as a reduced categorical variable to interrogate the hypothesised non-linear relationship of multiple disadvantage with attainment.

4.4. Control variables

The analysis controls for variables that are likely to impact upon outcomes but are largely exogenous to the process by which disadvantage affects attainment: gender, ethnicity and region of residence.

5. Analytical approach

Statistical analysis proceeded in two main stages. The first stage examines the relationship between disadvantage and attainment comparatively and the effect of cumulative disadvantage; whilst the second stage applies a time dimension by exploring these relationships with attainment at age 11. All statistical models were undertaken using *Stata 16* and the *svy-* prefix command with linearised variance estimation to account for the complex survey design and data structure of both NS and MCS (StataCorp., 2021).

In the first stage, OLS regression models were run on GCSE scores for each cohort and including each individual indicator of SED as binary covariates, with individual coefficients. This allows for a comparison of the different risk factors in shaping educational attainment at age 16 and provides for an indication of the relative and independent relationship between each indicator and GCSE attainment. The model is specified using the equation:

$$Y_i = \alpha + \beta 1_{teenmum} + \beta 2_{lowed} + \beta 3_{lowses} + \beta 4_{loneparent} + \beta 5_{sochousing} + \beta 6_{lowincome} + \beta' X_{i\ controls} + \varepsilon_i$$

(Eq. 1)

Where Y_i is the outcome GCSE score for student i, $\beta 1$ to $\beta 6$ are parameter estimates for each of the six indicators of SED, X_i is a vector of control variables, including demographic factors and prior attainment, and ε_i is an error term. Three linear regression models are estimated. First, the independent association between each of the indicators is estimated without controls (M1); M2 includes controls for demographic characteristics – sex, ethnicity and region of residence – and finally M3 controls both for demographic factors and prior attainment.

In order to assess the cumulative effect of exposure to multiple adversities, a composite, additive score is created and included in the previous models in place of the individual indicators (Eq. 2). Scores range from 0 (no risk factors) to 5 (exposure to five out of the six risk factors). The parameter of interest in these models (M4-6) is $\beta 7$, which provides an estimate of the effect on GCSE scores that is associated with exposure to an additional social risk factor (M4), controlling for demographic factors (M5) and both demographics and prior attainment scores (M6).

$$Y_i = \alpha + \beta 7_{socialrisk\_score} + \beta' X_{i\ controls} + \varepsilon_i$$

(Eq. 2)

As the relationship between disadvantage and attainment is hypothesised to be non-linear – i.e., indicators of disadvantage will cluster and greater exposure will lead to a disproportionately greater effect on attainment – social risk is also modelled as a categorical variable, with exposure to 1 risk, 2 risks and 3 or more risks compared to a reference group of students exposed to none of these risk factors (Eq. 3).

$$Y_i = \alpha + \beta 8_{socialrisk=1} + \beta 9_{socialrisk=2} + \beta 10_{socialrisk>=3} + \beta' X_{i\ controls} + \varepsilon_i$$

(Eq. 3)

In stage two, the relationship between social risk factors and attainment are re-examined with KS2 attainment replacing GCSE attainment score as the main outcome variable (Y_i). As with GCSE score, KS2 attainment is converted to z-scores with a mean of zero and a standard deviation (SD) of 1 to aid interpretation of the parameters. All model specifications (Eq. 1 to 3) are replicated to examine the relationship between social risk (individual risk factors, additive risk scores, and categorical levels of risk) and attainment at age 11. As the dataset contains no comparable measure of 'prior attainment' for both cohorts, these models control only for demographic characteristics.

6. Results

Table 1 presents the descriptive statistics for the social risk factors included in the models. Whilst the prevalence of some factors, such as low parental SES, have remained relatively constant between the two cohorts (around 1-in-3 families), it is

interesting to note that the proportion of parents with low levels of education has significantly reduced from around 20% to 15%. There has, by contrast, been an increase in the prevalence of young people living in social housing, in single-parent families and of those born to teenage mothers. Overall, the proportion of young people not exposed to any of the risk factors reduced slightly, from 46% in the older cohort to 43% amongst the more recent cohort. However, the trend is reversed for those exposed to three or more risks – under 20% of the earlier-born cohort experiencing this level of disadvantage, compared to 23% of the younger cohort.

[Table 1 here]

In table 2 the bivariate correlations for the dichotomised social risk variables and main outcome measure are presented. There is significant inter-correlation between all the social risk factors and for both cohorts, supporting the hypothesis that such factors are likely to cluster, with young people likely to be exposed to several risks at once. Bivariate correlations with GCSE points scores indicate that the negative association between low parental SES and living in social housing are strongest for both cohorts. The correlation between low GCSE attainment and low parental education and living in a single-parent family appear to be weaker for the more recent cohort, compared to the older year group.

[Table 2 here]

6.1.Social risk factors and educational attainment at age 16

Table 3 presents the first stage of multivariate analysis. The OLS models regress

indicators of SED (M1-M3) and cumulative social risk score (M4-M6) onto GCSE scores for each of the two cohorts.

In the unadjusted model (M1), all six social risk factors are significantly and negatively correlated with GCSE points score for the NS cohort, whilst for MCS the effect of living in a single-parent family is not statistically significant. The largest coefficient in absolute magnitude for both cohorts refers to living in social housing, with young people experiencing this risk factor scoring between 0.39 (MCS) and 0.44 (NS) SD lower at GCSE than their peers[5]. Interestingly, for NS, being in the lowest income quintile displays the weakest coefficient, whilst for MCS, it is also weaker than most of the other factors included in the model. This indicates that the effect of income *per se* may not be as important as some other risk factors and may be mediated through more proximal indicators of young people's material circumstances (although, of course, some of the effects of income are being controlled for by the inclusion of social housing in the model).

Overall, these unadjusted models account for 19% of the variation in GCSE scores for NS, and for 14.9% of the variation for the MCS cohort. Including controls for demographic characteristics (M2) does not substantively alter the pattern of risk factors relative to the dependent variable, whilst the explanatory power of the model increases to 22.1% (NS) and 18.1% (MCS), respectively.

Model 3, which controls for prior attainment at age 11, as well as demographic characteristics, greatly increases the explanatory power of the model – up to 60% for

[5] For both cohorts, a 1 SD decrease in GCSE score is approximately equivalent to a two grade-point decrease in each of a student's eight best GCSEs – e.g., going from 8 'C' grades to 8 'E' grades in the pre-2017 letter-grading system.

NS and 57% for MCS. For NS, the effect of low income remains statistically insignificant. However, independent effects can still be observed for the other social risk factors, all of which are associated with a decrease in GCSE points score. For the more recent MCS cohort, however, the inclusion of prior attainment variables in the model attenuates the effect of low parental education and being born to a teenage mother, as well as being in the lowest income quintile on GCSE scores. The independent effect of low parental SES and social housing are, by contrast, relatively stronger in the adjusted model for MCS compared to NS.

Models 4 to 6 explore the cumulative effect of exposure to social risk factors by including a social risk score as a continuous variable. The unadjusted model (M4) for NS indicates a 0.29 SD decrease in GCSE score for each additional risk factors to which a young person is exposed. For MCS, the unadjusted model indicates a 0.25 SD decrease in GCSE score for an additional risk factor. The addition of demographic controls (M5) scarcely alters the estimates at all.

The cumulative effect of social risk score is evident even in the fully-adjusted model (M6), although it is greatly attenuated by the inclusion of prior attainment variables for both cohorts. It is interesting to note that the explanatory power of the models remains similar whether they include a cumulative social risk score (M6) or the individual risk factor variables (M3).

Comparing across the cohorts, the relationship between social risk scores and attainment is stronger for the NS cohort in both models that do not control for prior attainment. The inclusion of prior attainment scores in the model reduces the coefficients significantly in both cohorts, but in this case the stronger association of disadvantage with attainment is seen in the more recent MCS cohort.

[Table 3 here]

As the relationship between disadvantage and attainment is hypothesised to be non-linear, models 4 to 6 are re-run with social risk 'score' included as a categorical variable (table 4). This allows for comparison of those exposed to one, two, or three or more risk factors with a reference group composed of students experiencing none of these risks.

[Table 4 here]

Here, the non-linear nature of the relationship can be seen. Students experiencing increasingly greater numbers of risk factors, and those exposed to 'deep risk' (Duckworth & Schoon, 2012) are particularly vulnerable to poor educational outcomes. Indeed, in the unadjusted models (M4a), exposure to 3 or more risks is associated with significant reduction in GCSE scores (1.2 SD for NS; 0.9 SD for MCS) compared to peers not exposed to any of these risk factors.

Figure 3 illustrates for each of the cohorts the decrease in GCSE score associated with an additional risk factor, compared to a reference group of those experiencing no risk factors once demographic and prior attainment factors are controlled for (M6a in table 4). In both cohorts, there is a monotonically decreasing relationship between number of risks young people are exposed to and their educational attainment at GCSE. The relationship between cumulative risk and attainment is stronger for later born MCS cohort compared to NS and is particularly strong for young people exposed to 'deep risk'. Those in this highest-risk category are around half a SD

worse off in terms of their GCSE scores compared to their peers who do not experience any of these risk factors.

[Figure 3 here]

6.2.Social risk factors and educational attainment at age 11

Having identified clear socioeconomic attainment gaps in both cohorts for students exposed to specific risk factors (and particularly for those exposed to multiple risks) at age 16, we ask whether these inequalities are seen earlier in students' educational trajectory.

Table 5 replicates the analysis but uses standardised KS2 attainment scores as the dependent variable. Model 7 examines the independent relationship between individual social risk factors and attainment at age 11, whilst Model 8 adds controls for demographic factors. The dataset contains no comparable measure of 'prior attainment' for both cohorts so no comparable model with M3 above can be constructed. Models 9 and 10 again look at disadvantage from the perspective of an additive social risk score, with and without controls for demographics.

The unadjusted model for NS shows that, whilst all risk factors are significantly and negatively correlated with KS2 attainment, the independent effect is relatively strongest for low parental education, low parental SES and living in social housing. For the MCS cohort, low parental education and SES also have the relatively greatest negative association with attainment at age 11. In addition, the relationship between low income and KS2 attainment is relatively stronger for the more recent MCS cohort, compared to the older NS year-group. Whilst for the older cohort, the independent effect of living in a one-parent family is small yet statistically significant, for the

younger MCS group, this factor is not statistically significant at all. The models adjusted for demographic factors do not substantially alter these findings, whilst their explanatory power is increased.

Including social risk score as a continuous variable, the models (M9 and M10) indicate that exposure to an additional risk factors is associated with around a 0.2 SD decrease in attainment at KS2. This is broadly similar for both cohorts of young people.

[Table 5 here]

Table 6 mirrors table 4 above, including social risk score as a categorical variable to examine the non-linear relationship between exposure to multiple and cumulative disadvantage and attainment. Again, there is a monotonically decreasing relationship between number of risks young people are exposed to and their educational attainment, with those exposed to 'deep risk' experiencing around 0.8 SD lower attainment scores than their more advantaged peers in both cohorts.

[Table 6 here]

Figure 4 summarises the relationship between the number of risk factors and attainment at KS2 and GCSE. For comparability, controls are included for gender, ethnicity and region of residence, whilst prior attainment – available only for the GCSE models – is not included. This illustrates the attainment gap, that already exists at age 11, widens at every level of risk across secondary education. Whilst the analysis suggests that there has been some improvement over the period between the two cohorts, an attainment gap for those at highest risk, which is already substantial at the end of primary school, is exacerbated throughout secondary education such that

students exposed to significant risk attain outcomes close to 1 SD below their more advantaged classmates.

[Figure 4 here]

7. Discussion and conclusions

The findings presented here have shown that certain, well-established factors relating to the social and economic circumstances in which young people grow up are strongly associated with comparatively worse educational outcomes, not just at the end of compulsory schooling, at age 16, but also long before this at the end of primary school.

This is congruent with a range of previous research that has looked at the role of disadvantage in young people's educational attainment (Ball, 2021; Gorard & Siddiqui, 2019; Lupton & Hayes, 2021; Pensiero & Schoon, 2019). Ball (2021), in particular, has highlighted that the persistence of socioeconomic attainment gaps represents a social policy issue, with governments overlooking the root cause of educational inequalities by focusing on school-based interventions and shrinking away from addressing the pervasive structural inequalities throughout society.

This research has, moreover, sought to uncover indicative evidence on what effect the implementation of austerity policies between 2010 and 2017 has had on this relationship for two cohorts of young people. Overall trends found in the analysis are broadly similar for both cohorts: the strong link between disadvantage and educational attainment (whilst it has narrowed slightly) remains, is apparent already by the end of primary school and persists and widens throughout secondary education.

Nonetheless, this should not be read as a success or a vindication of these policies. What this highlights is that the impact of SED remains irrespective of the

wider macroeconomic conditions and despite this being a stated aim of government policy for decades (Lupton & Obolenskaya, 2020). What the wider macroeconomic conditions and political choices do affect, however, is the prevalence of socioeconomic economic disadvantage. As shown in the descriptive analysis, individual indicators of disadvantage, such as those living in single-parent households and those in social housing, have seen notable increases between the two cohorts, whilst the proportion of young people exposed to 3 or more risk factors has risen from less than one-in-five to almost a quarter. What this might tentatively lead us to conclude is that, whilst there appears to be no *additional* impact resulting from the implementation of austerity at an individual level (i.e., the link between disadvantage and attainment remains regardless), there appears to be an increased negative impact at cohort level, whereby increased levels of disadvantage mean a greater proportion of young people facing an attainment 'penalty'.

Subsequent analysis emphasises that exposure to multiple risk factors has a disproportionately greater association with attainment, with young people exposed to 'deep risk' experiencing substantially worse outcomes than their more advantaged peers. This echoes the findings of Duckworth and Schoon (2012), who found that young people with three or more risks were almost six times as likely as those with no risks to be persistently NEET between 16 and 18. The association, therefore, between SED and educational outcomes is cumulative. These risk factors are the product of multiple 'social determinants', which tend to cluster together and exacerbate the gap between those from disadvantaged backgrounds and their more-advantaged peers (Olsson et al., 2003; Forsman & Jackisch, 2021). Furthermore, theories of cumulative disadvantage highlight that gaps between those exposed to disadvantage and more affluent individuals continue to widen throughout the life course (Dannefer, 2003), which

emphasises the need for interventions as early as possible in young people's lives, whilst later intervention needs to be targeted disproportionately at those from disadvantaged backgrounds (Finkelstein, 2019).

The implementation of austerity is likely to serve to undermine efforts towards reducing the socioeconomic attainment gap, restricting access to limited resources for those families most in-need. As Lupton and Thomson (2015) have described, severe cuts to non-protected areas of public spending, particularly in local government services as well as a range of cuts to welfare benefits, have restricted students from low-income families' access to improved life opportunities. Indeed, 'beating the odds' is terminology that is used frequently both in policy and academic discourse, which highlights the truism that the odds are indeed stacked against children from disadvantaged backgrounds. The consistency in the findings between these two cohorts of young people suggest that this seems unlikely imminently to change.

The appearance of educational inequalities early on in young people's trajectories also hints at where one might look to uncover the true effect of the austerity cuts in education. If there appears to be no 'additional' detrimental impact on one of the first cohorts of young people going through education in this period, it might be supposed that the effect is already being felt by yet-younger students only now beginning their school journeys.

Future research is needed to examine what impact funding cuts and policy decisions will have on the socioeconomic attainment gap of these cohorts, taking into account school- and area-level factors and focusing on a wider range of social, emotional and academic outcomes.

Data citation:

University College London, UCL Institute of Education, Centre for Longitudinal Studies. (2021). *Next Steps: Sweeps 1-8, 2004-2016*. [data collection]. *15th Edition.* UK Data Service. SN: 5545, http://doi.org/10.5255/UKDA-SN-5545-7

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Tables

Table 1: Descriptive statistics for indicators of social risk and cumulative social risk score

	NS		MCS	
	N	%	N	%
Low parental SES / workless parents	3,660	32.1	1,842	31.0
Low parental education	2,463	20.4	928	15.0
Born to a teenage mother	629	5.3	403	6.9
Lives in a single-parent family	2,822	22.8	1,779	28.7
Lives in social housing	2,454	19.9	1,580	26.1
Lowest income quintile	1,449	16.1	1,288	20.8
Social risk score:				
0 risks	7,241	46.0	3,314	43.3
1 risk	3,341	21.2	1,525	19.9
2 risks	2,065	13.1	1,028	13.4
3 or more risks	3,092	19.7	1,787	23.4

* Weighted counts and percentages

Table 2: Correlation matrix for indicators of social risk and main outcome

Coefficients for NS are below the diagonal; those for MCS are above the diagonal

	1.	*2.*	*3.*	*4.*	*5.*	*6.*	*7.*
1. Low parental SES/workless		.386*	.176*	.376*	.424*	.509*	-.317*
2. Low parental education	.390*		.099*	.245*	.287*	.465*	-.243*
3. Teenage mother	.144*	.090*		.099*	.201*	.140*	-.140*
4. Single-parent family	.316*	.230*	.059*		.306*	.312*	-.196*
5. Social housing	.424*	.321*	.185*	.313*		.443*	-.300*
6. Low income	.398*	.305*	.087*	.452*	.337*		-.264*
7. GCSE points score (standardized)	-.360*	-.302*	-.161*	-.237*	-.345*	-.242*	

* $p < 0.001$

Table 3: OLS regression models on GCSE points score

	NS						MCS					
	M1	M2	M3	M4	M5	M6	M1	M2	M3	M4	M5	M6
	b (SE)	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*
Low parental SES/workless	-.406***	-.396***	-.158***				-.346***	-.342***	-.150***			
	(.029)	(.028)	(.021)				(.040)	(.040)	(.028)			
Low parental education	-.355***	-.398***	-.111***				-.254***	-.252***	-.041			
	(.031)	(.031)	(.024)				(.054)	(.049)	(.041)			
Teenage mother	-.419***	-.370***	-.170***				-.240***	-.232***	-.089*			
	(.057)	(.058)	(.046)				(.070)	(.067)	(.043)			
Single-parent family	-.147***	-.140***	-.187***				-.069	-.046	-.057*			
	(.034)	(.033)	(.026)				(.038)	(.037)	(.026)			
Social housing	-.467***	-.479***	-.229***				-.365***	-.403***	-.264***			
	(.036)	(.036)	(.027)				(.051)	(.049)	(.035)			
Low income	-.092*	-.101**	-.005				-.168***	-.202***	-.060			
	(.037)	(.037)	(.029)				(.046)	(.047)	(.035)			
Social risk score				-.316***	-.320***	-.144***				-.245***	-.250***	-.121***
				(.009)	(.009)	(.007)				(.011)	(.011)	(.008)
Controls for:												
demographics	x	✓	✓	x	✓	✓	x	✓	✓	x	✓	✓
prior attainment (KS2 only)	x	x	✓	x	x	✓	x	x	✓	x	x	✓
N (unweighted)	9,698	9,594	8,857	12,300	12,130	11,147	6,008	5,847	5,570	6,595	6,374	6,076
R-sq.	.203	.231	.595	.187	.217	.583	.149	.181	.571	.141	.170	.566

Survey weights applied; Demographic controls include those for gender, ethnicity and region of residence, prior attainment controls include z-scores for KS2 attainment.

Statistically significant at *** p < .001; ** p < .01; * p < .05 level

Table 4: OLS regression models on GCSE points score (social risk as a categorical variable)

	NS			MCS		
	M4a *b (SE)*	M5a *b (SE)*	M6a *b (SE)*	M4a *b (SE)*	M5a *b (SE)*	M6a *b (SE)*
Social risks (ref=0)						
1 risk	-.461*** (.026)	-.468*** (.027)	-.199*** (.018)	-.392*** (.039)	-.392*** (.040)	-.183*** (.029)
2 risks	-.730*** (.034)	-.746*** (.034)	-.307*** (.025)	-.483*** (.044)	-.504*** (.045)	-.259*** (.033)
3 or more risks	-1.186*** (.036)	-1.208*** (.035)	-.549*** (.027)	-.943*** (.043)	-.961*** (.043)	-.467*** (.033)
Controls for:						
demographics	x	✓	✓	x	✓	✓
prior attainment	x	x	✓	x	x	✓
N (unweighted)	12,300	12,130	11,147	6,575	6,356	6,058
R-sq.	.186	.216	.583	.132	.162	.564

Statistically significant at *** p < .001; ** p < .01; * p < .05 level

Table 5: OLS regression models on KS2 score

	NS				MCS			
	M7 *b* (SE)	M8 *b (SE)*	M9 *b (SE)*	M10 *b (SE)*	M7 *b (SE)*	M8 *b (SE)*	M9 *b (SE)*	M10 *b (SE)*
Low parental SES/workless	-.316*** (.028)	-.316*** (.028)			-.322*** (.041)	-.308*** (.041)		
Low parental education	-.407*** (.030)	-.409*** (.029)			-.283*** (.058)	-.310*** (.058)		
Teenage mother	-.246*** (.049)	-.244*** (.051)			-.186* (.077)	-.212** (.075)		
Single-parent family	.059* (.029)	.062* (.030)			.003 (.035)	.018 (.037)		
Social housing	-.319*** (.031)	-.325*** (.031)			-.184*** (.048)	-.228*** (.046)		
Low income	-.096** (.033)	-.094* (.032)			-.234*** (.050)	-.207*** (.052)		
Social risk score			-.233*** (.009)	-.232*** (.008)			-.204*** (.012)	-.202*** (.012)
Controls for:								
demographics	x	✓	x	✓	x	✓	x	✓
N (unweighted)	10,055	9,921	14,252	13,931	5,807	5,645	6,383	6,164
R-sq.	.132	.142	.115	.124	.111	.129	.099	.115

Statistically significant at *** p < .001; ** p < .01; * p < .05 level

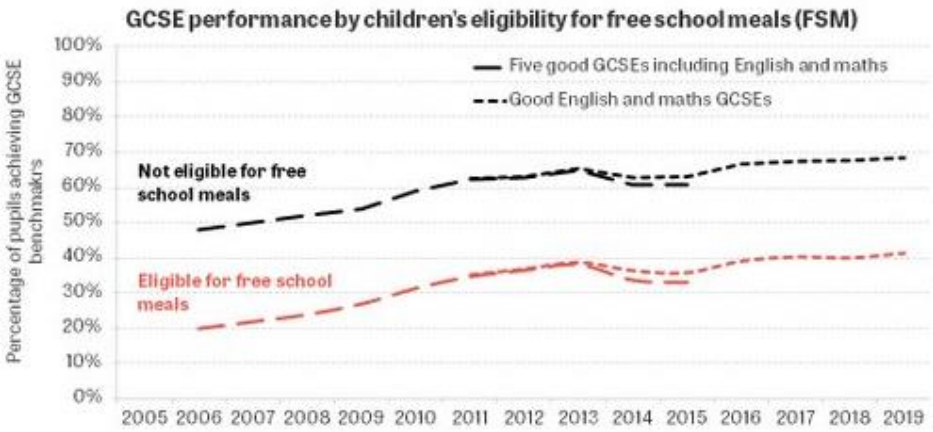
Table 6: OLS regression models on KS2 score

	NS		MCS	
	M9a *b (SE)*	M10a *b (SE)*	M9a *b (SE)*	M10a *b (SE)*
Social risks (ref=0)				
1 risk	-.379*** (.024)	-.369*** (.025)	-.346*** (.040)	-.336*** (.039)
2 risks	-.607*** (.030)	-.594*** (.030)	-.435*** (.046)	-.419*** (.047)
3 or more risks	-.879*** (.034)	-.875*** (.034)	-.796*** (.046)	-.776*** (.047)
Controls for: demographics	x	✓	x	✓
N (unweighted)	14,252	13,931	6,362	6,145
R-sq.	.121	.128	.095	.110

Statistically significant at *** p < .001; ** p < .01; * p < .05 level

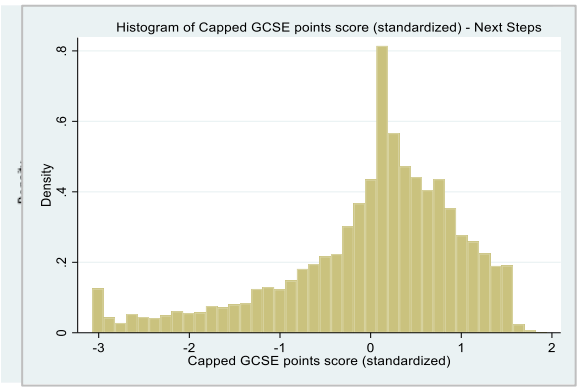
Figures

Figure 1: GCSE performance by children's eligibility for free school meals



Source: Figure 28, Farquharson et al., (2022)

Figure 2: Distribution of educational outcomes (GCSE scores) for NS and MCS



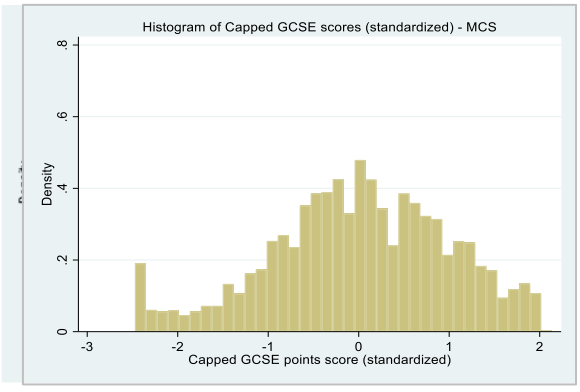


Figure 3: Relationship between number of risk factors and GCSE points score, compared to reference group (risk factors = 0), controlling for gender, ethnicity, region and prior attainment

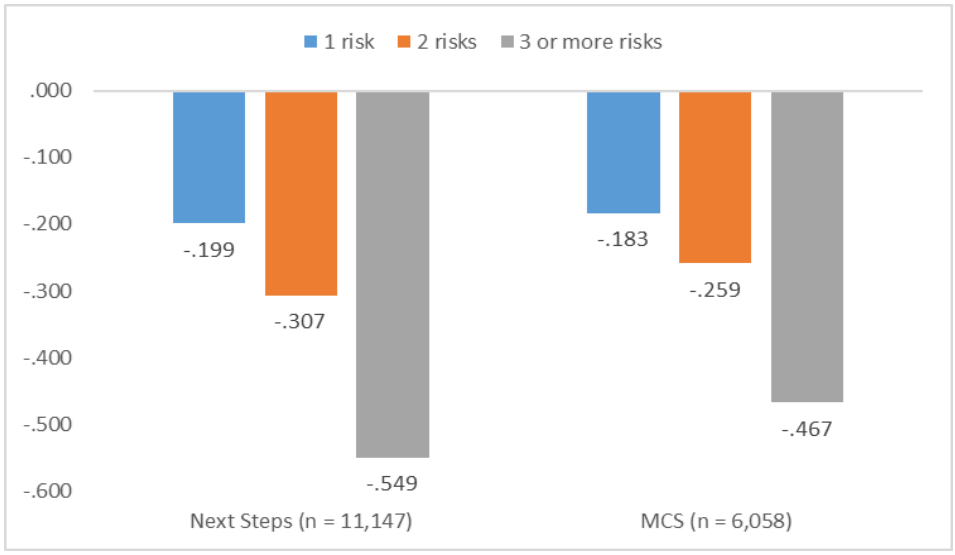


Figure 4: Relationship between number of risk factors and KS2/GCSE points score, compared to ref. group (risk factors = 0), controlling for gender, ethnicity and region