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Research on the Intergenerational Links in the Every Child Matters Outcomes.

Report to the Department of Children, Schools and Families

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This research was commissioned before the new UK Government took office on 11 May 2010. As a result the content may not reflect current Government policy and may make reference to the Department for Children, Schools and Families (DCSF) which has now been replaced by the Department for Education (DfE). The views expressed in this report are those of the authors' and do not necessarily reflect those of the Department for Education.

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Acknowledgments

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1 Introduction

The Every Child Matters (ECM) agenda was introduced in the UK, as a policy aiming to improve child outcomes along five broad areas. The categories are Be Healthy, Stay Safe, Enjoy and Achieve, Make a Positive Contribution and Achieve Economic Wellbeing[1]. The objective therefore, is to move beyond the traditional focus on child academic outcomes, to improve the wellbeing of children in the UK.

From a policy perspective, there is a need to understand the mechanism through which the wide range of child ECM outcomes form. This report evaluates the role of families in driving the ECM outcomes of their children. Specifically, we analyse the intergenerational transmission of ECM outcomes between parents and children.

We take the approach of analysing correlations across generations in a wide set of outcomes – the broadest set of variables studied to date. Existing studies of intergenerational correlations across generations tend to focus on outcomes such as earnings, and consequently very little is known about how healthiness, safety and enjoyment of school are correlated across generations. We contribute towards this literature by extending the scope of child outcomes.

We will not estimate causal relationships between the transmission of ECM outcomes across generations, but rather estimate status-quo correlations across generations. Put another way, we cannot interpret the coefficient as the effect between parental ECM outcomes and child outcomes, but an indication of the existing correlation. The reason is that it is very difficult to obtain exogenous variation in the parental ECM outcome when we consider such a broad range of outcomes. The correlations that we estimate are very meaningful however, and this is the first step to understanding how families pass on traits which are seen in current policy to define broadly educational achievement. We paint a clear picture of the degree to which ECM outcomes pass over across generations.

For two cohort studies - the 1958 National Child Development Study (NCDS) and the 1970 British Cohort Study (BCS) – we compile a three generational dataset, observing the correlations between parents of the cohort members, the participants themselves and the children of the cohort

[1] Table A1 details a more disaggregated list of ECM outcomes

members. We analyse the correlation between parents and children in over 60 different ECM outcomes, in both datasets. The strongest significant correlations that we find are between the cognitive achievement of the children and parents. This pattern tends to increase between early childhood and early adolescence and then stabilise. A one standard deviation increase in the reading (spelling) attainment of NCDS (BCS) parents at age 11 (10) is associated with 27.8% (22.3%) of a standard deviation increase in child attainment around the same age. We also find however that expectations and aspirations regarding educational achievement were strongly correlated between parents of cohort members and the cohort members themselves and although this correlation was lower in the BCS than the NCDS, in the former, parents leaving school at the legal age were still 20% more likely to wish their child to leave early also. The other area in which behaviour persists consistently across generations was in smoking and drinking habits. Cohort members whose parents smoked when the children were aged 16 were around 10% more likely to smoke at 16.

2 Literature Review

Be healthy

The range of outcomes included within the ECM Be Healthy outcome is wide, covering physical and mental health but also lifestyle choices[2]. Whilst traditional outcomes in the intergenerational literature focus on more easily measured outcomes, such as cognitive achievement, there is a growing literature in this area. Currie & Moretti (2003) estimate the intergenerational transmission between maternal education and a range of child health outcomes. In order to identify the causal impact from education, as opposed to a raw correlation, the authors exploit variation in the availability of colleges as an instrument for maternal education. There is a strong correlation between maternal education and child birth weight and gestation. They find that important mechanisms for this effect are through the correlation of maternal education with use of prenatal care, smoking behaviour, marriage and fertility.

[2] Note the full set of ECM outcomes in Table A1.

Relevant to the intergenerational transmission of mental health, Powdthavee & Vignoles (2008) examine a British longitudinal dataset, and find that the mental distress of parents is linked to their child's self-reported life-satisfaction in the following period of observation. Similarly, they find evidence of the intergenerational transmission in the opposite direction, as child life satisfaction drives their parent's future mental distress levels. This paper makes it clear that understanding of transmission between generations must look beyond the traditional measures of skills and ability and allow for a broader set of outcomes. Indeed, Osbourne-Groves (2005) evaluate the extent to which personality is a mechanism for the intergenerational transmission of earnings, using US National Longitudinal Survey. They find that personality is a big part of the picture, with around 11% of the parent to child transmission in earnings stemming from similar personality traits. In a similar vein, Blanden et al (2007) find that non-cognitive skills explain a large part of the intergenerational transmission of income, through the effect on educational attainment.

Stay safe

There is very little evidence on the intergenerational transmission of outcomes relevant to the ECM Stay Safe outcome, although a paper by Doumas, Margolin & John (2005) explore how exposure to aggression during childhood drives later aggressive behaviour. They distinguish between later violence in a marriage and child abuse and find robust intergenerational patterns of aggression for males, whereas for females no child abuse link was found to exist but the marital violence was passed on.

Enjoy and achieve

De Coulon *et al* (2008) use the BCS to evaluate how parental test score achievement translates into child test score outcomes. They exploit the long historical set of information contained in the cohort study to control for a wealth of covariates, in order to ensure that

their estimates are not driven by other observable traits of families. The results show a very strong relationship, as

> "parents whose basic skills situated them at the 25th percentile have children who perform 10.1 per cent better on cognitive tests than parents situated at the 10th percentile (the difference between the 25th and the 10th percentiles is within one standard deviation)." (page 12).

Brown *et al* (2009) relate the NCDS cohort members age 7 test score outcomes to those of their children, in the 1991 child supplement. They employ an instrumental variables (IV) methodology, using the age that the NCDS children were taught at school using systematic phonics as an IV. Their results suggest that a one standard deviation change in parental test score at age 7 raises the child score by a quarter of a standard deviation in reading and one tenth of a standard deviation for maths.

Studies of the intergenerational transmission in educational attainment seek to distinguish the causal effect of parental education on child education. Whilst there is a strong and significant correlation between parental and child education, the literature has focused on the fact that it may be picking up unobserved heterogeneity, such as genetics or motivation, rather than the experience of education itself. Black *et al* (2005) study a large longitudinal dataset of the population of Norway to investigate the role of parental education upon child education. To estimate the causal parameter, they employ an instrumental variables strategy, where they exploit a policy in Norway which extended the age of compulsory education, thereby shifting the education of parents in a way which they argue to be independent to the eventual education choice of the children. The policy was implemented in municipalities at different points in time, providing variation in the policy across time and region. Once they take account of unobserved heterogeneity, they find no causal effect of paternal education and an effect of maternal education only for sons. However, using a similar approach, Chevalier (2004) and Oreopoulos *et al* (2003) find that the effect of parental education remains significant in the instrumental variables estimates. Chevalier estimates that 1 extra year of parental education raises probability of staying on post compulsory age by 8 percentage points.

Plug (2003) uses a slightly different strategy, by evaluating a dataset with adoptees. If it is true that education is correlated across generations only through genetics, then there should be no correlation between the education of parents and adopted children. Plug finds that the correlation in the OLS regressions is no longer significant for mothers once the endogeneity was controlled for, however it remains significant for fathers.

The studies described are some of the examples of such papers which have used datasets containing some exogenous variation in parental education, to identify the causal, policy parameter. Still, there is a lack of consensus regarding the effect of parental education on child outcomes. As the current report aims to document the intergenerational correlation across many different outcomes, we do not tackle the issue of endogeneity and therefore in relation to educational outcomes, we refer to the literature for evidence.

One of the ECM Enjoy & Achieve outcomes is about being ready for school. Ermisch (2008) looks at the UK Millennium Cohort Study and finds that parental income is a very important driver of the cognitive attainment of children at age 3 in the MCS. He goes on to argue that this relationship is driven largely by their parents reading to them.

Make a positive contribution

At the time of writing, no intergenerational studies were found on the range of outcomes for Make a Positive Contribution.

Achieve economic wellbeing

The bulk of papers evaluating intergenerational transmission focus on the outcome of earnings. Evidence in the sociological literature dates back decades (see for example Kerckhoff *et al,* 1985). In the Economics literature, Ermisch & Francesconi (2002) estimate the elasticity in occupational status across generations to be 0.2 for men and 0.17 - 0.23 for women in the UK. Similarly, Becker & Tomes (1986) estimate the elasticity of 0.2 between

father and son earnings in the US. Chadwick & Solon (2002) move away from the father-son comparison and find strong intergenerational link in the household earnings of parents and daughters, through assortative mating, as the earnings of the husband are correlated with the earnings of the daughter's parents.

Finally, Blanden *et al* (2004, 2005, 2007) have explored how this pattern has changed across time. They find evidence of a decline in the intergenerational mobility of income in the UK, by comparing the 1970 BCS to the 1958 NCDS.

The wealth of evidence on the outcome of earnings again leads us to exclude it from our analysis, as the report's objective is to cover the widest range of ECM outcomes as possible, rather than to find individual identification strategies for each one.

3 Data

We use two UK cohort studies to evaluate the correlation in ECM outcomes across generations – the 1958 National Child Development Study (NCDS) and the 1970 British Cohort Study (BCS). All children born in a particular weak in 1958 and 1970 became a participant in the NCDS and the BCS respectively and additional waves of data track the cohort members up to the most recent wave at the time of writing, in 2004. Hence the data provides what approximates a life history of the participants.

There are a small number of ECM outcomes which have been recorded for the parents of the NCDS and the BCS, allowing us to generate estimates for the correlation across generations. We refer to this part of the analysis as a comparison across Generation 1 (G1 – the parents) and Generation 2 (G2 – the cohort members). However, the bulk of analysis will focus on a comparison of Generation 2 (G2) and Generation (G3 – the children of cohort members), by utilising a very rich set of socio- and emotional tests on the children of cohort members, in 1991 for the NCDS and 2004 for the BCS, allowing us to evaluate intergenerational correlations in a plethora of ECM outcomes between the cohort members as parents and their children. We focus mainly on this comparison purely because we will be able to define a much larger range of ECM outcomes for both generations. Throughout

the report, we will refer to the additional child samples as the Children of the National Child Development Study (CNCDS) and the Children of the British Cohort Study (CBCS). Additionally, in many cases fairly similar questions were posed in the NCDS and the BCS and consequently we take the study further to address how such correlations between parents and children have changed across time.

Whilst in both the BCS and the NCDS the sample of children of the cohort members chosen to particulate was a random group across the members themselves, there remains an issue of sample selection in that only the children whose mothers had given birth by 1991 (NCDS) or 2004 (BCS) could possibly participate in the evaluation. The cohort members were aged 33 or 34 at this time, hence we cut off the top end of the maternal age distribution and consequently it is likely that the participating children are disproportionately drawn from a sample of low socio-economic status mothers. This could induce a bias in our estimate of the intergenerational correlation in ECM outcomes and, as the missing counterfactual are those displaying more positive traits, the direction of the bias will underestimate the effect. The Appendix details exactly how each variable was defined, we discuss now the variables and their means. Table 1 reports the mean level of each variable, for both the NCDS and the BCS.

Be healthy

Physically Healthy

We analyse the correlation between the birth weight of parents and children. Whilst the measure of birth weight picks up endowments, or genetics, it is also closely correlated with family socio-economic status through nutrition. Column 1 of Table 1a shows birth weight to be increasing across time, but the mean birth weight in all four samples is between 3299-3469g. There are a wealth of measures for child illnesses in the cohort studies, and the ones for which we could easily make links across generations were measles, whooping cough, mumps, chicken pox and asthma. The statistics in columns 2-6 in Table 1a show that parents are much more likely to be ill with measles, whooping cough and mumps than their children, whereas have similar likelihood of contracting chicken pox. NCDS parents and children were as likely to suffer from asthma as each other, whereas BCS children

were more likely than their parents to. This links in with the fact that there has been a rise in asthma suffering in recent periods.

Whether parents vaccinate their children is an indicator of the healthiness of the children, but also of the health attitudes of parents. We measure immunisations against polio, diphtheria (NCDS only), BCG (BCS only), MMR (BCS only). From Table 1a columns 7-10, immunisations for polio are much higher in the BCS than the NCDS. BCG immunisations are higher in the BCS parent sample than the child sample, as it is observed at age 16, whereas the CBCS sample includes a range of child ages.

Mentally and Emotionally Healthy

The Rutter Score is a commonly used measure of non-cognitive skills, and addresses the ability of individuals to cope with life situations. We measure both the externalising score, which records the extent to which children react to situations by behaving externally (such as by having a tantrum), and an internal score, which is the extent to which children internalise their worries (for example may suffer from more headaches). See Rutter *et al* 1970 for detail of the Rutter Score.

Healthy Lifestyles

We measure the smoking habits of the first two generations in the cohort studies. We firstly examine correlations in the reports when cohort members are aged 16 that they smoke and that their parents smoke. From Table 1b columns 16 & 17, we see that in both the NCDS and the BCS, parents are more likely to be smoking than their children at this point in time. Additionally, by comparing across the cohorts, it is clear that smoking is more prevalent in later years, as both parents and children report a higher incidence of smoking in the BCS than in the NCDS.

Another aspect of a healthy lifestyle of a household is the alcoholic drinking habits. For the BCS cohort members, we record whether they drink alcohol at ages 16 and 30. We want to understand how this links with young drinking of their children. Children reports for age group of 13-16 indicate whether they already drink alcohol. The descriptive show that there is a very high rate of parental drinking at both age 16 (90.4%) and 30 (85%). Nearly 80% of children aged between 13-16 report that they drink alcohol. Given that the age range starts from a lower age for the children of the cohort members, the figures suggest that the incidence of young drinking is actually quite similar for those born in 1970 as for their children, but certainly not higher.

Choose Not to Take Illegal Drugs

We are able to record whether BCS parents and children report having tried solvents and cannabis, or both. Between 5-6% (10%) of the parents and children answer positively to the question of solvents (cannabis), clear from column 19 of Table 1b.

Stay safe

Safe from accidental injury and death

We construct measures of the frequency of serious accidents and serious burns, although a very small number of individuals report positively to this question. Unfortunately, there was not more information contained in the cohort studies for two generations on this outcome.

Safe from bullying and discrimination

For both the cohort members and their children we can observe if they have reported being bullied. Cohort members of both the NCDS and the BCS are more likely to suffer from bullying than their children, with the statistics in column 25.

Safe from crime and anti-social behaviour in and out of school

It was difficult to gain detailed information on this particular ECM categories, but we did construct some measures of happiness with the local area and the degree to which parents feel safe in a local area.

Have security, stability and are cared for

We record whether the NCDS cohort members and children have ever lived in local authority care, to pick up the security and stability of their home life. In columns 29 & 30 of Table 1c, 1.8% of NCDS children have lived in care at the age of 7, and 2.7% by the age of 11. Of their children, 1.6% had lived in care by 1991. We also construct a measure for living in an alcoholic household for NCDS

cohort members and the CNCDS sample. Unfortunately the measures differ across generations, making the comparison difficult. For the cohort members, we have a record for whether alcoholism was a family difficulty. However, for the cohort members as adults, we were able to add up their alcohol units and compare these to the government recommended allowance. This meant that only 1% of the G1 parents reported having alcoholic problems but 15% of G2 parents were classified as alcoholics.

The degree to which parents give their children attention was another measure used for this ECM outcome.

Finally, we record whether the children live in a broken home, or single parent household. This is strongly correlated with child achievement, but also with behavioural outcomes.

Enjoy and achieve

We are able to record a range of test score outcomes for the NCDS (BCS) cohort members at ages 7, 11 and 16 (5 and 10). Similarly, the CNCDS and the CBCS contain a section for cognitive testing, enabling a direct intergenerational comparison. See the Appendix for the exact tests included.

Ready for school

We measure the age that the NCDS and CNCDS samples started school.

Attend and enjoy school

Truancy is a measure of the extent to which children are engaged in school, and as measured in the BCS cohort for G2 and G3. It is important to understand whether this is persistent across generations. The parental mean is very close to zero, whereas that for their child is higher at 20%. We also measure directly the happiness of children at school in the NCDS. Table 1f, column 48 shows that 87.6% of cohort members reported being happy at school, whereas only 60.5% of their children did. One reason for this could be that the CNCDS are aged between 5-18, and may therefore report lower happiness during adolescence, so we cannot see this as a direct comparison.

Ermisch (2008) notes that parents reading to their children is very beneficial, and we are able to compare the incidence of this for both datasets. The statistics show that the incidence of reading to children has increased across the two samples.

Achieve stretching national educational standards at primary school

The cognitive measures are discussed in the appendix.

Achieve personal and social development and enjoy recreation

We are able to measure how well children get along with others, by creating an index from a set of measures asking how well liked the child is. This variable really indicates the success of the children in their personal and social development.

Achieve stretching national educational standards at secondary school

For the NCDS we take age 16 test score outcomes as the measure of secondary school success.

Make a positive contribution

Engage in decision making and support the community and environment

We measure the incidence of children volunteering, to measure the extent to which they are committed to the community. Also, we measure how socially active they are, to pick up the interactions they have in the local area.

Engage in law-abiding and positive behaviour in and out of school

A full range of criminal behaviour measures are available for the BCS cohort members. We observe if they have used physical force to get money (2.4% answered yes), have robbed someone (6.4% answered yes), have stolen from a shop (8.5% answered yes) and ever stolen a bike (4.2% answered yes). We estimate the correlation between the parents and children, taking the child measure of law-abiding behaviour from a question about the parents having been contacted by police due to

their child's behaviour, which is the indicator for G3. Only 2.4% of parents had been contacted, as shown in the table of descriptive statistics.

Develop positive relationships and choose not to bully and discriminate

We measure for the BCS and CBCS whether they children bully others, but also are able to understand the correlation between the BCS parents having discriminatory views and the children bullying. Full details of the definition for discriminatory views is in the appendix.

Achieve economic wellbeing

Engage in further education, employment or training on leaving school

We measure whether the G1 parents left school at the compulsory age and are able to compare this with their aspirations for their children to do the same. Table 1g shows that 62.1% of BCS fathers and 62.7% of BCS mothers had left school at the compulsory age, a very high percentage. We want to know how the experience of parents drives the expectations of the children themselves, with respect to their aspirations for educational achievement. We measure the BCS cohort members' desire to leave school early, where the number was closer to one third. In the NCDS data, only 19% of fathers and 70.5% of mothers left school at the compulsory age (although an extra 35% of fathers left one year after compulsory age), but the NCDS cohort members were very likely to expect to leave school at 16. For the BCS, we are able to take this comparison to the third generation also, as we estimate the correlation between the cohort member's early aspirations to stay on at school with their later aspirations that their children stay at school post the compulsory age. Note from the table of descriptive that the sample has changed from above, to those with children and we see that nearly 50% of these parents wanted to leave school at the compulsory age. Only 13% expected their child to leave school at 16. A very high number of parents – 77.5% - wanted their child to stay on to attend university.

Live in decent homes and sustainable communities

We constructed measures of the number of bedrooms in the children's houses and whether their parents owned the house.

4 Methodology

We take a two-step approach to estimating the correlations across generation in ECM outcomes.

Raw estimates

The first-step will estimate the coefficient from the following equation.

$$ECM_{child} = \alpha_1 + \beta_1 ECM_{parent} + u_{1,child} \quad (1)$$

We regress an ECM outcome of the parents (ECM_{parent}) on the same outcome defined for their child (ECM_{child}). α denotes the constant term and *u* the error term. β^1 is the first-step coefficient of interest, and represents the correlation across generations in the manifestation of a particular ECM outcome.

It is very important to note that this model will not estimate a causal parameter. In other words, β will not measure the extent to which child outcomes will change if a policy was to shift the ECM inputs of the parents. The reason is the parental ECM variable will reflect personal characteristics of the parents, which is termed *endogeneity* in the economics literature. Those particular characteristics, which have not been controlled for in the regression, may themselves drive both the parental and the child ECM outcomes. A useful example to set this idea is to consider the correlation between parental and child drinking habits during youth. Our regression using drinking as the ECM outcome for parents and children will neglect to control for parental unobservables, such as an innate un-healthiness, or lack of understanding of the consequences of drinking alcohol. Therefore, we may conclude that child drinking habits are formed based upon their parents, when it may be that there is a more deeply ingrained route cause of this behaviour which must be addressed in order to improve youth drinking habits. However, the correlations themselves are of great interest and can be used for programme targeting, to understand the persistence in behaviour across generations and to show the influence of the family in dimensions relating to the ECM objectives.

Conditional estimates

In order to enrich the policy relevance of the estimated correlations, we implement step-two of the analysis, which is to control for the extent to which the correlation estimated in Section 4.1 is explained by the socio-economic background of the parents. Referring again to the example of youth alcohol drinking habits, we pose the question of whether the correlation across generations can be solely explained by the education of the parents. To estimate step-two, we define parents to have a high level of education if the father of the household stayed on at school post the compulsory level of education. We now estimate the following regression

$$ECM_{child} = \alpha_2 + \beta_2 ECM_{parent} + \partial SES_{parent} + u_{2,child} \quad (2)$$

The coefficients α and β plus the error term *u* now refer to the second-step estimators and *SES* denotes the socio-economic status of parents. We will gauge the role of SES by comparing the coefficient on ECM_{parent} in equation (1) and equation (2). We know from the omitted variable literature that the two coefficients are related to each other according to the following equation:

$$\beta_2 - \beta_1 = \hat{\partial} \frac{\text{cov}(SES, ECM_{parent})}{\text{cov}(ECM_{parent})} \quad (3)$$

where $\hat{\partial}$ denotes the estimated coefficient on SES_{parent}. Equation (3) tells us that the difference in the estimated coefficient across equation (1) and (2) stems from the correlation between parental SES and the ECM outcome for the parent. Therefore, if the original correlation was entirely driven by the parental SES, β_2 will be insignificantly different to zero. The relevance of this exercise is to see whether the policy relevant parameter is the ECM outcome itself, or the SES of parents.

Note that this method is similar to stratifying the sample by parental education and estimating a different coefficient for the intergenerational correlates of ECM outcomes. The reason we choose just to control for parental SES is that the sample size is small for many outcomes, therefore it is more prudent to maximise sample size and run one single regression.

5 Results

In this report, we estimate many different coefficients in order to cover the broadest spectrum of ECM outcomes and parental inputs. This creates two potential difficulties in reporting the results. Firstly, as the variables differ in their units of measurements, it becomes hard to compare the correlations across different ECM outcomes. In order to overcome this problem, we have coded the variables in such a way that the correlation can be compared for all of the regressions, even if the ECM outcome differs. The variable will either be a binary variable, taking the value of zero or one, or we have standardised the variable to have a mean equal to zero and a standard deviation equal to one. Therefore, the interpretation of the correlation between the ECM outcome of the parent and the child will be comparable for all outcomes. In the binary case, the coefficient describes how turning the parent's ECM value from zero to one will increase the proportion of children scoring one in their ECM outcome (for example, the increased proportion of children living in a broken home as adults, if their parents live in a broken home). If the ECM outcomes are standardised, the coefficient is interpreted as the correlation between parental and child traits in terms of a proportion of a standard deviation (for example, a coefficient of 0.1 on the ECM outcome of maths score tells us that a one standard deviation increase in parental achievement is associated with higher achievement of the children by 10% of a standard deviation.)

Secondly, there are a large number of coefficients, making it hard to draw clear conclusions regarding any correlations in ECM outcomes. We have produced a set of colour-coded summary Tables 2a-2e which show whether the intergenerational correlation is significant or not, and if it is the magnitude of the coefficient.

Be healthy

Table 2a shows the summarised results for the NCDS raw estimates of the correlation between Be Healthy outcomes of the parents and the children in column 1 and the estimates conditional on parental education in column 2. Columns 3 & 4 report for the BCS sample the raw and conditional correlations respectively. In the table, the Be Healthy outcome is disaggregated into each of the sub-categories for which we observe intergenerational data: physical health, mental and emotional health, healthy lifestyles and choosing not to take illegal drugs. Each of these is disaggregated into

the specific measures, according to the variables described in Section 3. We make clear whether the correlations describe the relation between Generation 1 (the parents of the cohort members: G1) and Generation 2 (the cohort members themselves: G2) or Generation 2 and Generation 3 (the children of the cohort members: G3) in column 3. As described in the Section 3, we are able to define a much broader set of intergenerational comparisons for the latter group, as is clear in the analysis. The colour coding is described in the key, where the colour red indicates no significant correlation in the regression of parental ECM traits on child ECM traits. All other colours indicate ECM intergenerational coefficients which are statistically significant. As we move up the traffic light colour coding, the coefficient is significant and becomes increasingly large in magnitude. The orange colour describes a significant, but quite small coefficient. Yellow is significant and still small, but the light green colour is relatively large. The dark green coefficient is both significant and very large in magnitude. Note that the full set of regression results are contained in Tables 2fi-2fv, which provide a much deeper analysis of the correlations.

In both the NCDS and the BCS, there is a significant correlation in the birth weight of parents and children, although the magnitude is larger in the latter data set, suggesting that the correlation has increased across cohorts. Looking at the regression results in Table 2fi for the NCDS and 2fiii for the BCS, we see that a one standard deviation change in parental birth weight is associated with a higher child birth weight by 7% and 15% of a standard deviation for the NCDS and BCS respectively. The conditional estimates are statistically not different to the raw estimates.

Intergenerationally, the NCDS datasets show no significant correlation in the incidence of measles and only a very weak correlation in the BCS. Whooping cough on the other hand has a larger and significant correlation in the NCDS, with an increase in the probability of contracting whooping cough of 5% if the parents also suffered, but in the later cohort of the BCS the correlation is insignificant. Mumps and chicken pox are significantly correlated across generations in both datasets, whilst asthma is very strongly correlated in intergenerationally between NCDS cohort members and their children, but not correlated at all in the BCS sample, evident from Tables 2fi & 2fiii. Once we condition upon parental education, these relationships stay the same in all cases, except in the NCDS correlation between mumps which becomes insignificant. Generally therefore, the correlation between illnesses is quite small and independent of family education levels.

With regard to immunisations, we see from Table 2a that there is a very weak intergenerational correlation in the incidence of polio, diphtheria and BCG, however in the BCS dataset we see a very

strong correlation in having the MMR vaccine. This is interesting, as the choice to take the vaccine in recent years has been tainted by evidence[3] that MMR is linked to autism. Anderberg, Chevalier & Wadsworth (2008) show that the decision to take the MMR vaccine is related to education. however, we see in the table that conditioning upon parental education does not change this intergenerational correlation, as the colour coding remains unchanged.

Moving onto the sub-category of mental and emotional health, it is evident from Table 2a that whilst there is a very weak correlation between early externalising and internalising behaviour in the NCDS, there is a much stronger relationship in the more recent BCS cohort. Indeed, by the age of 11, the correlation between parental and child externalising and internalising behaviour in the NCDS becomes significant but remains so for the BCS only with regard to externalising behaviour. Full results are reported in Table 2fii for the NCDs and 2fiv for the BCS. When recorded at the age of 16, we find no significant correlation for the externalising score, but a very strong correlation in the internalising score in the BCS cohort. Looking at Table 2fiv, at 16 a standard deviation increase in parental internalising score is associated with a child scoring 19% of a standard deviation higher, on average.

For the healthy lifestyle category, the intergenerational correlations between parental and child smoking, both observed when the cohort member is aged 16 is very strong in the NCDS and still significant but slightly weaker in the BCS. The BCS samples allowed us to compare drinking habits of BCS cohort members to those of their children. We compare two different measures of parental drinking, firstly whether the parents reported drinking at age 16 and secondly at age 30, when their children had been born. Looking at the results in Table 2a, child drinking habits are only correlated in the raw regressions with their parents drinking at age 30, around the time that the child reports their own drinking patterns. The full regression results in Table 2fii and 2fv show that parents who drink at age 30 are 20% more likely to have children who drink between ages 13-16. However, the magnitude of this estimate is reduced in the conditional estimates, suggesting that parental education is closely linked to alcohol patterns of both parents and children. In the conditional estimates, drinking habits of parents aged 16 are related to those of their children when they are aged 34. For drug taking behaviour, we find no significant correlation across generations in the BCS sample. Again, we note that the number of observations was low at around 200, and a very low number reported taking drugs, suggesting that the lack of significance could be due to sample size rather than the true correlation.

[3] which has been later rejected in many studies

Stay safe

Table 2b reports the summary of the estimated correlates between the stay safe outcomes, between parents and children in both the NCDS and the BCS. Instantly clear from the table is the large number of red cells, representing a lack or correlation. Further detail, again, is contained in the full regression results in 2gi-2giii. In the BCS, there is no significant correlation found between the frequency of either serious accidents or burns across generations. Regarding the incidence of being a victim of bullying, in the NCDS there is no significant correlation, however in the BCS there is a small correlation. There is no significant correlation between our proxy variables for being safe from crime and anti-social behaviour in and out of school, but again the NCDS and BCS are not particularly detailed in these variables, especially if we need to define the variables for two different generations. The exception is that in the BCS we find a significant correlation between the cohort members' parents being scared to go out as children, and a self-report of being afraid to walk alone at night as adults. It is impossible to say whether this is picking up a persistence in living in unsafe areas, or a persistence in fearfulness.

In the NCDS, we do find a significant conditional correlation between parents and children living in care by the age of 11, but not by the age of 7. There is a small sample of children having lived in care by age 7, which may explain the lack of significance. Living in an alcoholic household does not seem to be persistent across generations, in the NCDS. As noted above however, there is a very small incidence of the NCDS parents reporting having family difficulty due to alcoholism, therefore it is statistically hard to estimate robust correlates with such little variation. The full regression results, plus sample size are included in Table 2gi.

The variables within the stay safe category for which we do estimate significant correlation is the interest that parents show in their children. The BCS variables differ to the NCDS, in that the G2 question on parental interest in the NCDS came from the teacher questionnaire but in the BCS was derived from the interviewer. The BCS questions relating to G3 were much more informative than the NCDS questions. This may be the reason why there is a strong and significant correlation in the parental interest variable in the BCS, but not in the NCDS.

Finally, living in a broken home is robustly correlated across generations in both datasets. Children born to NCDS (BCS) cohort members who grow up with divorced parents are 11.5% (3.8%) more likely to go on to have children living in a single parent household.

Enjoy and achieve

Cognitive outcomes are more readily used in economic analysis of intergenerational transmission, partly because they are quite easy to define and to compare across generations. In Table 2c) there are significant and large correlations between achievement of parents and children, at different stages of development. This correlation seems to be independent to parental education. For example, from Table 2hi we see that conditioning on parental education, a 1 standard deviation change in parental maths (reading) achievement at age 7 is correlated with a 6% (14% or 15%) of a standard deviation change in that of the child (for reading recognition and reading comprehension, respectively). In the BCS, Table 2hv the correlation is 8% of a standard deviation for the early vocabulary outcome.

The age that the NCDS cohort members started school was closely correlated with that of their children. In the UK, all children start school in September, meaning that there is variation in the age in months that a child starts school. There is a growing literature on the effect of school starting age on child outcomes. On the one hand, starting school early increases the total time spent in the classroom of a child however, it may be possible that early stimulation from parents is more important for development. Recently Black *et al* (2008b) suggest that there is only a small effect on later IQ and teen pregnancy and no effect on educational achievement.

Surprisingly, we find no significant correlation in the reporting of reading to children across generations in the NCDS. Neither do we for being happy at school or for truancy in the BCS.

Again, cognitive outcomes at the end of primary school are strongly correlated across generations, even more so than the early test score outcomes. Table 2hii reports that a one standard deviation increase in the NCDS cohort member test score at age 11 is associated with 20% of a standard deviation change in their child outcomes. In the BCS, results from Table 2hv suggest the correlation between spelling at age 10 and child test score achievement is similar to the NCDS, but a little lower at 16% of a standard deviation for maths. Similarly, when we look at the secondary school outcomes in the NCDS, the correlations are of a similar magnitude. Achievement is very strongly correlated across generations.

Make a positive contribution

We were able to collect a range of variables across both generations for this particular ECM outcome. According to Table 2d, the activity index was strongly correlated in the BCS between parents and children, but not in the NCDS. Volunteering does not seem to have a link between generations in the BCS, but bullying does. Particularly, we find that when the BCS children bullied other children at 10 and 16, their children were also more likely to bully at these ages. This was partly explained by the parental education in the age 16 correlation, as the magnitude of the coefficient falls in the conditional regression, but as the cell is orange, it remains significant. Interestingly, BCS parents with discriminatory views have children more likely to bully other children. Full results are reported in Tables 2ji & 2jii.

Achieve economic wellbeing

As the CNCDS and CBCS were fairly young in the child interview of the NCDS and the BCS, it was hard to construct measures for economic outcomes. Note that achievement in secondary school, which we measured by age 16 test scores in section 5.3, is also relevant for this outcome and the results showed strong patterns of persistence in these scores. We were also able to construct different variables linking whether parents and children left school at the compulsory age, in a comparison between G1 and G2. Table 2e shows that these correlates are highly significant, in both datasets, as a very large number of cells are colour coded to be green – meaning that the correlates are significant and have a relatively high magnitude. Similarly, when we look at the correlation between the BCS cohort member's desire to leave school at 16 with their desire that their child leaves school at 16, or goes to university, there are strong correlations. So not only education, but aspirations for education are correlated across generations.

The literature review above provides evidence on the intergenerational transmission of income across generations. We construct two other measures for income to measure the extent to which living in decent homes and sustainable communities displays mobility between parents and children. The variables available were the number of rooms in a house and whether the parents owned the house – both of these variables are strongly correlated across generations. Regression results are included in Tables 2ki & 2kii.

6 Conclusion

In order for the ECM agenda to be effective, it is important to understand the role played by schools and families in generating child outcomes. This report tackles the latter issue, by estimating the intergenerational correlation of over 60 ECM outcomes using two rich data cohort data sets. It must be pointed out that we are looking at inter-generation relationships for particular cohorts (NCDS cohort members were born in 1958 and BCS members in 1970), and hence the results cannot be directly read as a comparison across time.

We find very strong persistence in the achievement of cognitive tests across generations. More than this though, there are very strong correlations between parents and children in their educational aspirations and expectations, specifically their desire to gain education over and above the legal requirement.

The evidence suggests some patterns of correlations in health outcomes, such as birth weight, an intergenerational correlation that increased across cohorts. Additionally, the incidence of whooping cough and the vaccination against MMR was correlated between parents and children of the BCS. Few other health outcomes were found to persist strongly across generations however. Smoking and drinking are always correlated closely across generations, however reported drug and criminal behaviour does not correlate (potentially due to the small sample sizes involved). There is a nonlinear relationship between non-cognitive achievement[4] across child age and across cohort studies. In the NCDS it is the later non-cognitive development that is correlated, at age 11. In the BCS, earlier child outcomes are also correlated and the internalising measure was also significantly persistent at age 16. Regarding antisocial behaviour, parents who bully tend to have children who bully. But similarly, parents with discriminatory views have children who bully.

When we conditioned upon the education of the household, there was very little change in the patterns noted above, suggesting that in general, the correlates are independent to the paternal education level.

[4] as measured by the Rutter internalising and externalising scores

The other ECM outcomes for which we observed data did not show any significant correlation between parents and children. It is important to understand what we can take from a lack of correlation. The ECM outcomes that are less commonly used in studies are often harder to define and to measure, therefore the lack of significant could indicate an imprecise measurement. This may be relevant for outcomes such as child abuse and safety in the home. Additionally, the sample size varies across questions and is sometimes very small. However, for variables more easy to measure precisely, such as parents reading to their children, the lack of correlation could well indicate that there is no strong intergenerational persistence in the behaviour. Regarding the variables noted above, for which we found significant correlations, further exploration of the causal relationships within families would be very informative about the mechanism of inter-generational transmission of ECM inputs from parents to their children.

To think of the policy implications of this report, consider that the ECM outcomes most transmitted across generations – cognitive achievement, educational aspirations, non-cognitive behaviour, smoking and drinking – measure social behaviour. As pointed out in the report, these are not causal relationships and it would be incorrect to think that improving these outcomes for children will necessarily pass onto the next generation. However, it does suggest that if policy can alter parents' attitudes towards education, good behaviour and decisions to smoke or drink, there may be an impact upon the choices of the next generation.

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Table 1a: Descriptive Statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Birth Weight (g)	Measles	Whooping Cough	Mumps	Chicken Pox	Asthma	Polio Immunisation	Diphtheria Immunisation	BCG Immunisation	MMR Immunisation
NCDS										
Child Mean	3469	0.237	0.066	0.213	0.602	0.170	0.543	0.695	.	.
Parent Mean	3319	0.891	0.165	0.429	0.641	0.176	0.832	0.811	.	.
BCS										
Child Mean	3361	0.047	0.014	0.010	0.654	0.309	0.898	.	0.099	0.824
Parent Mean	3299	0.492	0.072	0.455	0.624	0.125	0.958	.	0.932	0.953

Table 1b: Descriptive Statistics

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
	Internalising, age 5/7	Externalising, age 5/7	Internalising, age 10/11	Externalising, age 10/11	Father smoke age 16	Mother smoke age 16	Parent youth drinking (16) and child drinking (age13-16)	Parent adult drinking (30) and child drinking (age13-16)	Taken solvents	Taken cannabis	Taken any drugs
NCDS											
Child Mean	0.00	0.00	0.00	0.00	0.254	0.254					
Parent Mean	0.00	0.00	0.00	0.00	0.385	0.317					
BCS											
Child Mean	0.00	0.00	0.00	0.00	0.370	0. 370	0.777	0.789	0.052	0.100	0.144
Parent Mean	0.00	0.00	0.00	0.00	0.507	0.682	0.904	0.850	0.065	0.096	0.175

Table 1c: Descriptive Statistics

	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
	Smacked	Frequency serious accidents	Frequency serious burn	Bullied	Safe area	Scared of going out	Scared of going out 2	In care, 7	In care, 11	Live in alcoholic household
NCDS										
Child Mean	0.073			0.070	0.945			0.016	0.016	0.157
Parent Mean	0.282			0.346	2.665			0.018	0.027	0.011
BCS										
Child Mean	0.121	0	0.022	0.193	0.135	0.120	0.000			
Parent Mean	0.026	0	0.019	0.586	0.089	0.089	0.000			

Table 1d: Descriptive Statistics

	(32)	(33)	(34)	(35)	(36)
	Mother shows interest in child, 7	Father shows interest in child, 7	Mother shows interest in child, 11	Father shows interest in child, 11	Broken home
NCDS					
Child Mean	2.891	2.905	2.882	2.895	0.0705
Parent Mean	2.312	2.275	2.258	2.311	0.0300
BCS					
Child Mean	.	.	50.567	49.837	0.123
Parent Mean	.	.	3.381	3.425	0.136

Table 1e: Descriptive Statistics

	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)
	Pre-school Maths	Pre-school Reading/Vocab	Primary school general ability	Primary school maths	Primary school reading	Secondary School maths	Secondary school reading	Age started school	Truancy
NCDS									
Child Mean	23.680	24.720	.	48.871	53.052	1.216	1.189	2.557	.
Parent Mean	4.9510	23.334	48.864	15.613	15.582	11.692	11.661	5.417	.
BCS									
Child Mean	.	46.533	.	46.734	48.260	.	.	.	0.201
Parent Mean	.	51.38	.	47.028	47.097	.	.	.	0.003

Table 1f: Descriptive Statistics

	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)
	Parents read to child	Parents read to child	Child happy at school	Volunteering	Crime: physical force to get money	Crime: robbed	Crime: stole from shop	Crime: stole bike	Bullies age 5	Bullies age 10	Bullies age 16	Discriminatory views and bullying
NCDS												
Child Mean	1.589	1.589	0.605	.	.	.	.	.	.	.	.	.
Parent Mean	1.024	0.876	0.820	.	.	.	.	.	.	.	.	.
BCS												
Child Mean	.	.	.	0.508	0.040	0.024	0.024	0.024	0.116	0.116	0.116	0.109
Parent Mean	.	.	.	0.271	0.024	0.064	0.085	0.042	0.132	0.057	0.063	0.000

Table 1g: Descriptive Statistics

	(58)	(59)	(60)	(61)	(62)	(63)	(64)
	G2 expect to leave school at 16: father	G2 expect to leave school at 16: mother	Aspirations for child to leave at compulsory age	Parent expectations of child going on to university	G1 expect to leave school at 16	Number of rooms in household	Parent owns house
NCDS							
Child Mean	0.683	0.683	.	.	2.450	8.102	0.714
Parent Mean	0.194	0.705	.	.	1.398	4.821	0.381
BCS							
Child Mean	0.336	0.336	0.132	0.775	.	4.367	0.653
Parent Mean	0.621	0.627	0.457	0.498	.	4.970	0.634

Table 2: Summary Tables of Results

Key:

No intergenerational information available
Insignificant correlation
Significant coefficient in range: 0-0.0499
Significant coefficient in range: 0.05-0.099
Significant coefficient in range: 0.1-0.1499
Significant coefficient in range: 0.15+

Table 2a: Be Healthy Intergenerational Correlations: Summary Table

		Generation	NCDS: Raw	NCDS: Conditional	BCS: Raw	BCS: Conditional
Physically Healthy	Birth weight	G2-G3				
	Measles	G2-G3				
	Whooping cough	G2-G3				
	Mumps	G2-G3				
	Chicken pox	G2-G3				
	Asthma	G2-G3				
	Polio immunisation	G2-G3				
	Diphtheria immunisation	G2-G3				
	BCG immunisation	G2-G3				
	MMR immunisation	G2-G3				
Mentally/Emotionally Healthy	Externalising behaviour, 7/5	G2-G3				
	Internalising behaviour, 7/5	G2-G3				
	Externalising behaviour, 11/10	G2-G3				
	Internalising behaviour, 11/10	G2-G3				
	Externalising behaviour, 16	G2-G3				
	Internalising behaviour, 16	G2-G3				
Healthy lifestyles	Father smoke	G1-G2				
	Mother smoke	G1-G2				
	Parent drinks at 16 to young child drinking	G2-G3				
	Parent drinks at 30 to young child drinking	G2-G3				
Choose not to take illegal drugs	Take cannabis/solvents	G2-G3				

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members.

Table 2b: Stay Safe Intergenerational Correlations: Summary Table

		Generation	NCDS: Raw	NCDS: Conditional	BCS: Raw	BCS: Conditional
Safe from maltreatment, neglect, violence and sexual exploitation						
Safe from accidental injury and death	Frequency of serious accidents, incidence of serious burn	G2-G3				
Safe from bullying and discrimination	Bullied	G2-G3				
Safe from crime and anti-social behaviour in and out of school	Mother happy with area and child's home Safe	G2-G3				
	Mother scared of going out, child victim of crime					
	Mother scared of going out, child scared					
Have security, stability and are cared for	In LA care age 7	G2-G3				
	In LA care age 11	G2-G3				
	Household alcoholism to CM drinks over limit	G2-G3				
	Parent's interest in child age 7	G2-G3				
	Parent's interest in child age 11	G2-G3				
	Broken Home	G1-G2				

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members.

Table 2c: Enjoy & Achieve Intergenerational Correlations: Summary Table

		Generation	NCDS: Raw	NCDS: Conditional	BCS: Raw	BCS: Conditional
Ready for school	Early maths achievement of parent and early achievement of children	G2-G3				
	Early reading achievement of parent and early achievement of children	G2-G3				
	Age started school	G2-G3				
Attend and enjoy school	Mother reads to child	G2-G3				
	Father reads to child	G2-G3				
	Happy at school	G2-G3				
	Truancy	G2-G3				
Achieve stretching national educational standards at primary school	Achievement at end of primary school	G2-G3				
Achieve personal and social development and enjoy recreation	Not liked by other children	G2-G3				
Achieve stretching national educational standards at secondary school	Adolescent achievement: child maths outcomes	G2-G3				
	Adolescent achievement: child reading outcomes	G2-G3				

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members.

Table 2d: Make a Positive Contribution Intergenerational Correlations: Summary Table

		Generation	NCDS: Raw	NCDS: Conditional	BCS: Raw	BCS: Conditional
Engage in decision making and support the community and environment	Activity Index	G2-G3				
	Volunteering	G2-G3				
Engage in law-abiding and positive behaviour in and out of school	Measures of theft and criminal behaviour	G2-G3				
Develop positive relationships and choose not to bully and discriminate	Bullying age 5	G2-G3				
	Bullying age 10	G2-G3				
	Bullying age 16	G2-G3				
	Parent discriminatory views to child bullying	G2-G3				

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members.

Table 2e: Achieve Economic Wellbeing Intergenerational Correlations: Summary Table

		Generation	NCDS: Raw	NCDS: Conditional	BCS: Raw	BCS: Conditional
Engage in further education, employment or training on leaving school	Father left school early, child wants to leave school early	G1-G2				
	Mother left school early, child wants to leave school early	G1-G2				
	Aspirations for child to leave at compulsory age	G2-G3				
	Parent expectations of child going on to university	G2-G3				
	Wanting to leave school at compulsory age	G2-G3				
Live in decent homes and sustainable communities	Number of rooms in house	G2-G3				
	Owner Occupied	G2-G3				

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members.

Table 2fi: Be Healthy Outcome I. National Child Development Study

	Birth Weight	Measles	Whooping Cough	Mumps	Chicken Pox	Asthma	Polio Immunisation	Diphtheria Immunisation
RAW								
Coefficient	0.0712***	-0.0414	0.0534***	0.0453**	0.0456**	0.255***	-0.000557	-0.0364*
	(0.00758)	(0.0299)	(0.0165)	(0.0186)	(0.0185)	(0.0697)	(0.0251)	(0.0212)
Child age		0.0475***	0.0125***	0.0371***	0.0303***	0.000525	-0.0393***	-0.0176***
		(0.00303)	(0.00162)	(0.00298)	(0.00293)	(0.00231)	(0.00312)	(0.00274)
N	17312	2520	2483	2483	2501	2932	2970	2970
CONDIT								
Coefficient	0.0742***	-0.0326	0.0458***	0.0252	0.0390**	0.254***	-0.00900	-0.0464**
	(0.00785)	(0.0310)	(0.0170)	(0.0195)	(0.0195)	(0.0712)	(0.0263)	(0.0218)
SESG1	-0.0411**							
	(0.0196)							
Child age		0.0448***	0.0116***	0.0385***	0.0300***	-0.00180	-0.0375***	-0.0155***
		(0.00314)	(0.00167)	(0.00319)	(0.00316)	(0.00251)	(0.00334)	(0.00292)
SESG2		-0.0230	-0.00417	-0.00656	0.0225	-0.0305**	0.0248	0.00946
		(0.0193)	(0.0108)	(0.0194)	(0.0186)	(0.0153)	(0.0198)	(0.0180)
N	16113	2295	2261	2255	2274	2656	2692	2692

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2fii: Be Healthy Outcome I. National Child Development Study

	Internalising, age 7	Externalising, age 7	Internalising, age 11	Externalising, age 11	Father smoke age 16	Mother smoke age 16
RAW						
Coefficient	0.0406	0.0298	0.0851***	0.108***	0.122***	0.131***
	(0.0319)	(0.0313)	(0.0301)	(0.0299)	(0.00535)	(0.00571)
N	983	1020	1101	1107	29373	29373
CONDIT						
Coefficient	0.0427	0.0263	0.0883***	0.0950***	0.123***	0.127***
	(0.0330)	(0.0322)	(0.0320)	(0.0321)	(0.00554)	(0.00592)
SESG1					-0.0121*	-0.0124*
					(0.00668)	(0.00668)
SESG2	0.0383	-0.143**	-0.0221	-0.0800		
	(0.0688)	(0.0668)	(0.0636)	(0.0635)		
N	924	959	986	992	27231	27231

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2fiii: Be Healthy Outcome I. British Cohort Study

	Birth Weight	Measles	Whooping cough	Mumps	Chicken Pox	Asthma	Polio Immunisation	BCG Immunisation	MMR Immunisation
RAW									
Coefficient	0.1520***	0.0214***	0.0101	0.0048**	0.0704***	0.0468	0.0060	-0.0134	0.1750***
	(0.0092)	(0.0055)	(0.0085)	(0.0019)	(0.0161)	(0.0668)	(0.0354)	(0.0247)	(0.0599)
Child age		0.0072***	0.0016***	0.0014***	0.0654***	-0.0261***	0.0098***	0.0172***	0.0303***
		(0.0006)	(0.0004)	(0.0003)	(0.0021)	(0.0062)	(0.00171)	(0.0014)	(0.0024)
N	11676	4168	4195	4220	4263	463	1888	1940	1421
CONDITIONAL									
Coefficient	0.1540***	0.0201***	0.0111	0.0049**	0.0730***	0.0397	0.0006	-0.0125	0.1840***
	(0.0100)	(0.0055)	(0.0087)	(0.0019)	(0.0162)	(0.0670)	(0.0347)	(0.0247)	(0.0602)
SES G2	0.0705***	-0.0092*	-0.0014	0.0007	0.0005	-0.0045	0.0057	0.0255**	0.0240
	(0.0206)	(0.0056)	(0.0035)	(0.0017)	(0.0158)	(0.0458)	(0.0138)	(0.0128)	(0.0189)
Child age		0.0070***	0.0015***	0.0015***	0.0655***	-0.0264***	0.0100***	0.0179***	0.0305***
		(0.0006)	(0.0004)	(0.0003)	(0.0022)	(0.0064)	(0.0017)	(0.0015)	(0.0024)
N	9741	4118	4141	4166	4209	455	1850	1905	1382

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2fiv: Be Healthy Outcome II. British Cohort Study

	Internalising age 5	Externalising age 5	Internalising age 10	Externalising age 10	Externalising age 16	Internalising age 16
RAW						
Coefficient	0.0513**	0.1170***	0.0021	0.105***	0.119	0.191**
	(0.0254)	(0.0253)	(0.0355)	(0.0357)	(0.0926)	(0.0936)
N	1542	1542	795	780	117	112
CONDIT						
Coefficient						
	0.0551**	0.1090***	0.0044	0.0990***	0.1780*	0.1440
	(0.0256)	(0.0255)	(0.0359)	(0.0361)	(0.0956)	(0.0946)
SES G2	-0.0613	-0.1410***	-0.0147	-0.0798	0.0823	0.2870
	(0.0517)	(0.0516)	(0.0788)	(0.0795)	(0.226)	(0.222)
N	1524	1524	779	763	109	114

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2fv: Be Healthy Outcome III. British Cohort Study

	Father smoke age 16	Mother smoke age 16	Parent youth drinking (16) and child drinking (age13-16)	Parent adult drinking (30) and child drinking (age13-16)	Taken solvents	Taken cannabis	Taken any drugs
RAW							
Coefficient	0.0847***	0.0991***	0.1220	0.2130***	0.0131	-0.0030	0.0035
	(0.0098)	(0.0105)	(0.1260)	(0.0720)	(0.0655)	(0.0412)	(0.0576)
Child age					0.0026	0.0552***	0.0657***
					(0.0101)	(0.0121)	(0.0148)
N	9655	9228	157	341	231	229	229
CONDIT							
Coefficient	0.0991***	0.0847***	0.2190***	0.0496***	0.0133	-0.004	0.0023
	(0.0105)	(0.0099)	(0.0732)	(0.0137)	(0.0660)	(0.0405)	(0.0576)
SES G1	-0.0305***	-0.0359***					
	(0.0104)	(0.0102)					
SES G2			0.0115	-0.0534	-0.0035	0.0211	0.0063
			(0.0516)	(0.0491)	(0.0329)	(0.0358)	(0.0515)
N	9655	9228	157	341	231	229	229

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2gi: Stay Safe Outcomes I. National Child Development Study

	Safe home	Bullied	Safe home	In care age 7	In care age 11	Live in alcoholic household
RAW						
Coefficient	-0.0204	-0.00117	-0.000650	0.00939	0.0375***	-0.00154
	(0.0158)	(0.00941)	(0.00482)	(0.0143)	(0.0119)	(0.0295)
N	1107	3699	954	4287	4287	13834
CONDIT						
Coefficient	-0.0274*	-0.00331	0.000105	2.80e-05	0.0160	0.0183
	(0.0158)	(0.00953)	(0.00490)	(0.0133)	(0.0114)	(0.0358)
SESG2	0.0157	-0.0258***	0.0134	-0.00906**	-0.00890**	-0.0767***
	(0.0143)	(0.00862)	(0.0157)	(0.00366)	(0.00366)	(0.00750)
N	1056	3401	911	3925	3925	11088

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2gii: Stay Safe Outcomes II. National Child Development Study

	Mother shows interest in child, 7	Father shows interest in child, 7	Mother shows interest in child, 11	Father shows interest in child, 11	Broken home
RAW					
Coefficient	0.0111	-0.00178	0.0157	-0.0145	0.115***
	(0.0186)	(0.0187)	(0.0193)	(0.0177)	(0.0417)
N	658	444	515	618	12939
CONDIT					
Coefficient	-0.0402	-0.00545	-0.0706*	0.0176	0.0533*
	(0.0402)	(0.0429)	(0.0425)	(0.0398)	(0.0316)
SESG2	-0.0412	-0.00354	-0.0729	-0.0674	-0.0427***
	(0.0579)	(0.0690)	(0.0681)	(0.0609)	(0.0108)
N	627	428	490	588	11617

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2giii: Stay Safe Outcomes. British Cohort Study

	Frequency serious accidents	Frequency serious burn	Bullied	Lives in safe area	Scared of going out	Scared of going out 2	Broken home
RAW							
Coefficient	0.0010	0.00233	0.0295**	-0.0344*	-0.0260**	0.1100***	0.0380***
	(0.0152)	(0.0172)	(0.0148)	(0.0178)	(0.0117)	(0.0251)	(0.0119)
N	4340	4343	2876	8082	8082	1569	8906
CONDIT							
Coefficient	-0.00002	0.0021	0.0256*	-0.0312	-0.0216	0.1020***	0.0380***
	(0.0153)	(0.0172)	(0.0149)	(0.0205)	(0.0139)	(0.0257)	(0.0119)
SES G1							-0.0386***
							(0.0070)
SES G2	-0.1400***	0.0010	-0.0700***	-0.0257**	0.0507***	0.1130**	
	(0.0311)	(0.0046)	(0.0148)	(0.0112)	(0.0084)	(0.0527)	
N	4283	4286	2825	6269	6269	1540	8906

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2hi: Enjoy & Achieve Outcomes I. National Child Development Study

Age	7	7	7	7	7	7
Child outcome	Maths	Reading Recognition	Reading Comprehension	Maths	Reading Recognition	Reading Comprehension
Parental input	Maths	Maths	Maths	Reading	Reading	Reading
RAW						
Coefficient	0.0694***	0.0864***	0.0740***	0.103***	0.161***	0.164***
	(0.0142)	(0.0160)	(0.0192)	(0.0153)	(0.0169)	(0.0212)
Child age	0.465***	0.457***	0.405***	0.464***	0.456***	0.410***
	(0.0151)	(0.0172)	(0.0220)	(0.0150)	(0.0167)	(0.0214)
N	956	944	734	957	945	735
CONDIT						
Coefficient	0.0606***	0.0705***	0.0617***	0.0922***	0.143***	0.153***
	(0.0149)	(0.0167)	(0.0202)	(0.0162)	(0.0178)	(0.0221)
Child age	0.477***	0.472***	0.420***	0.474***	0.471***	0.424***
	(0.0156)	(0.0176)	(0.0228)	(0.0154)	(0.0171)	(0.0221)
SESG2	0.0966***	0.128***	0.130***	0.0767***	0.0975***	0.0921**
	(0.0289)	(0.0324)	(0.0397)	(0.0290)	(0.0319)	(0.0391)
N	892	880	683	892	880	683

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2hii: Enjoy & Achieve Outcomes II. National Child Development Study

Age	11	11	11	11	11
Child outcome	Maths	Reading Recognition	Reading Comprehension	Maths	Reading Recognition
Parental input	General Ability	General Ability	General Ability	Reading	Reading
RAW					
Coefficient	0.198***	0.235***	0.260***	0.202***	0.248***
	(0.0195)	(0.0222)	(0.0243)	(0.0214)	(0.0243)
Child age	0.213***	0.233***	0.251***	0.207***	0.226***
	(0.0168)	(0.0191)	(0.0211)	(0.0168)	(0.0191)
N	840	841	825	841	842
CONDIT					
Coefficient	0.190***	0.229***	0.257***	0.185***	0.230***
	(0.0212)	(0.0246)	(0.0271)	(0.0224)	(0.0260)
Child age	0.221***	0.233***	0.250***	0.213***	0.224***
	(0.0176)	(0.0205)	(0.0227)	(0.0176)	(0.0204)
SESG2	0.0528	0.0145	0.0294	0.0801**	0.0463
	(0.0407)	(0.0473)	(0.0522)	(0.0405)	(0.0469)
N	740	741	726	741	742

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2hiii: Enjoy & Achieve Outcomes III. National Child Development Study

Age	**11**	**11**	**11**	**11**
	Reading Comprehension	Maths	Reading Recognition	Reading Comprehension
Parental input	Reading	Maths	Maths	Maths
RAW				
Coefficient	0.278***	0.212***	0.233***	0.257***
	(0.0265)	(0.0208)	(0.0239)	(0.0262)
Child age	0.244***	0.210***	0.228***	0.246***
	(0.0211)	(0.0167)	(0.0193)	(0.0212)
N	826	841	842	826
CONDIT				
Coefficient	0.261***	0.203***	0.225***	0.250***
	(0.0285)	(0.0219)	(0.0257)	(0.0282)
Child age	0.240***	0.217***	0.227***	0.243***
	(0.0227)	(0.0175)	(0.0205)	(0.0228)
SESG2	0.0651	0.0722*	0.0446	0.0654
	(0.0516)	(0.0401)	(0.0470)	(0.0518)
N	727	741	742	727

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2hiv: Enjoy & Achieve Outcomes IV. National Child Development Study

Age	**16**	**16**	**16**	**16**	**16**	**16**	
	Maths	Reading Recognition	Reading Comprehension	Maths	Reading Recognition	Reading Comprehension	Age started school
Parental input	Reading	Reading	Reading	Maths	Maths	Maths	
RAW							
Coefficient	0.137***	0.187***	0.204***	0.138**	0.173***	0.189***	0.120***
	(0.0409)	(0.0413)	(0.0447)	(0.0594)	(0.0613)	(0.0663)	(0.0365)
Child age	0.147***	0.155***	0.168***	0.171***	0.183***	0.200***	
	(0.0399)	(0.0403)	(0.0437)	(0.0400)	(0.0413)	(0.0448)	
N	203	203	198	201	201	196	2395
CONDIT							
Coefficient	0.140***	0.197***	0.218***	0.199***	0.237***	0.259***	0.130***
	(0.0467)	(0.0446)	(0.0475)	(0.0734)	(0.0720)	(0.0768)	(0.0384)
Child age	0.149***	0.161***	0.172***	0.178***	0.196***	0.211***	
	(0.0456)	(0.0435)	(0.0468)	(0.0453)	(0.0444)	(0.0478)	
SESG2	0.0837	0.0646	0.0443	0.0480	0.0317	0.0135	0.0613
	(0.0957)	(0.0914)	(0.0980)	(0.0964)	(0.0944)	(0.102)	(0.0612)
N	167	167	164	165	165	162	2181

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2hv: Enjoy & Achieve Outcomes. British Cohort Study

	Vocabulary age 5	Truancy	Spelling age 10	Maths age 10	Child not liked by other children	Not liked, index
RAW						
Coefficient	0.0956**	0.3000	0.2230***	0.1720***	0.0641**	0.1620***
	(0.0436)	(0.354)	(0.0202)	(0.0256)	(0.0287)	(0.0343)
Child age			5.417***	-0.580**		0.1080***
			(0.2040)	(0.2490)		(0.0244)
N	523	706	1800	1793	3050	810
CONDIT						
Coefficient	0.0800*	0.2970	0.2180***	0.1600***	0.0633**	0.1620***
	(0.0439)	(0.354)	(0.0204)	(0.0257)	(0.0286)	(0.0352)
SES G2	0.229***	-0.0017	3.246***	6.140***	-0.0193	-0.0019
	(0.0877)	(0.0346)	(1.216)	(1.477)	(0.0133)	(0.0777)
Child age			5.495***	-0.475*		
			(0.206)	(0.251)		
N	522	689	1772	1765	3005	793

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2ji: Make a Positive Contribution Outcomes. National Child Development Study

	Parents read to child	Child happy at school	Child not liked by other children	Child not liked, index	Child active index
RAW					
Coefficient	0.0132	-0.0133	-0.00808	-0.883**	0.0624
	(0.0368)	(0.0194)	(0.0472)	(0.297)	(0.0817)
N	801	4287	799	7	340
CONDIT					
Coefficient	-0.00480	-0.0117	-0.00646	0.00555	0.0150
	(0.0379)	(0.0343)	(0.0205)	(0.0481)	(0.0828)
SESG2	0.0224	0.0225	-0.0881***	0.0186	0.140*
	(0.0591)	(0.0591)	(0.0158)	(0.0216)	(0.0800)
N	760	760	3925	745	319

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2jii: Make a Positive Contribution Outcomes. British Cohort Study

	Social activity index	Volunteering	Crime: physical force to get money	Crime: robbed	Crime: stole from shop	Crime: stole bike	Bullies age 5	Bullies age 10	Bullies age 16	Discriminatory views and bullying
RAW										
Coefficient	0.1680**	-0.0230	0.0346	0.0061	-0.0138	0.0219	0.0315*	0.0716**	0.0901***	0.0187**
	(0.0679)	(0.0277)	(0.0395)	(0.0210)	(0.0121)	(0.0311)	(0.0189)	(0.0300)	(0.0345)	(0.00791)
N	213	1656	1056	1056	1055	1063	2900	3049	2223	1453
CONDIT										
Coefficient	0.1550**	-0.0221	0.0338	0.0058	-0.0140	0.0218	0.0311	0.0662**	0.0274***	0.0155**
	(0.0692)	(0.0282)	(0.0393)	(0.0209)	(0.0121)	(0.0311)	(0.0190)	(0.0292)	(0.0051)	(0.0078)
SES G2	0.0965	0.1020***	-0.0018	-0.0029	-0.0026	-0.0030	-0.0567***	-0.0443***	-0.0547***	-0.0648***
	(0.158-)	(0.0252)	(0.0098)	(0.0100)	(0.0100)	(0.0100)	(0.0116)	(0.0115)	(0.0112)	(0.0157)
N	207	1625	1049	1049	1048	1056	2861	3005	2825	1426

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2ki: Achieve Economic Wellbeing. National Child Development Study

	G2 expect to leave school at 16: father	G2 expect to leave school at 16: mother	G1 expect to leave school at 16	Number of rooms in household	Parent owns house
RAW					
Coefficient	-0.605***	0.665***	0.152***	0.0424**	0.145***
	(0.0159)	(0.0184)	(0.0178)	(0.0185)	(0.008)
N	12354	12354	1723	7786	13166
CONDIT					
Coefficient	-0.479***	0.672***	0.142***	0.0443**	0.122***
	(0.0167)	(0.0186)	(0.0196)	(0.0185)	(0.00814)
SESG1	0.514***	0			
	(0.0188)	(0)			
SESG2			0.0145	0.103**	0.0806***
			(0.0303)	(0.0449)	(0.00805)
N	11525	11525	1549	6889	11773

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Table 2kii: Achieve Economic Wellbeing. British Cohort Study

	G2 expect to leave school at 16: father	G2 expect to leave school at 16: mother	Aspirations for child to leave at compulsory age	Parent expectations of child going on to university	Number of bedrooms in household	Number of rooms in household	Parent owns house
RAW							
Coefficient	0.2640***	0.2740***	0.1300***	-0.1710***	0.0610***	0.0364***	0.199***
	(0.0137)	(0.0136)	(0.0246)	(0.0266)	(0.0094)	(0.0093)	(0.0093)
N	4109	4102	787	944	11362	11501	11488
CONDIT							
Coefficient	0.2890***	0.2803***	0.1300***	-0.1710***	0.0659***	0.1190***	0.1890***
	(0.0134)	(0.0132)	(0.0246)	(0.0266)	(0.0116)	(0.0103)	(0.0105)
SESG2	0.0428**	0.0382***	0.0122		-0.0514***	0.0653***	0.0312***
	(0.0191)	(0.0188)	(0.0288)		(0.0176)	(0.0206)	(0.00989)
N	4109	4102	787	944	9453	9563	9556

Note: conditional estimates control for a dummy variable equal to one if the parents stayed on post-compulsory education and zero otherwise. Datasets are the National Child Development Study (NCDS) and British Cohort Study (BCS). Generation 1 (G1) refers to the parents of the cohort members, Generation 2 (G2) to the cohort members and Generation 3 (G3) to the children of the cohort members. SESG1 denotes the socio-economic status (education) of G1 and SESG2 is defined similarly.

Appendix Table A1. Disaggregated ECM Outcomes

Be Healthy	**Stay Safe**	**Enjoy & Achieve**	**Make a Positive Contribution**	**Achieve Economic Wellbeing**
Physically Healthy	Safe from Maltreatment, Neglect, Violence and Sexual Exploitation	Ready for School	Engage in decision making and support the community and environment	Engage in further education, employment or training on leaving school
Mentally & Emotionally Healthy	Safe from Accidental Injury and Death	Attend and Enjoy School	Engage in law-abiding and positive behaviour in and out of school	Ready for Employment
Sexually Healthy	Safe from Bullying and Discrimination	Achieve Stretching National Educational Standards at Primary School	Develop positive relationships and choose not to bully and discriminate	Live in decent homes and sustainable communities
Healthy Lifestyles	Safe from Crime and Anti-social Behaviour in and out of School	Achieve Personal and Social Development and Enjoy Recreation	Develop selfconfidence and successfully deal with significant life changes and challenges	Access to transport and material goods
Choose not to Take Illegal Drugs	Have Security, Stability and are Cared For	Achieve Stretching National Educational Standards at Secondary School	Develop enterprising behaviour	Live in households free from low income

Appendix

Variable definitions

In many cases, we were able to define the variables identically in the NCDS and the BCS, however where differences exist, we make clear the exact definitions below. Finally, we make a distinction between the G1-G2 intergenerational correlations and G2-G3 correlations.

Be Healthy

Physically Healthy

Birth weight in grams: G2-G3. Recorded at birth for NCDS/BCS cohort members and recalled by parents in wave closest to birth for children of cohort members.

Child illness: Measles, Whooping Cough, Mumps, Chickenpox, and Asthma: G2-G3. Recorded at age 7 (10) for NCDS (BCS) cohort members and in 1991 (2004) for CNCDS (CBCS).

Immunisations against polio, diphtheria (NCDS only), BCG (BCS only), MMR (BCS only): G2-G3. Recorded at age 7 (10) for NCDS (BCS) cohort members and in 1991 (2004) for CNCDS (CBCS).

Mentally and Emotionally Healthy

Externalising Rutter score: G2-G3. An index created from the following variables: tantrums, restless, squirmy, disobedient, cannot settle (BCS only). See Rutter *et al* 1970 for detail of the Rutter Score.

Internalising Rutter score: G2-G3. An index created from the following variables: headache (BCS only), solitary (BCS only), miserable, fearful (BCS only) and worried.

Note: The Rutter score is a widely used measure of non-cognitive skills, recording the extent to which individuals cope with situations by either externalising (displaying outward behaviour) or internalising (displaying inward behaviour).

Note: Table 1b, columns 11-14 show the Rutter indices are created to have a mean of zero and a standard deviation of one. We ran a factor analysis on a pooled sample of mothers and children, to ensure that the factor loadings would be identical in the two groups. This means that any difference in the Rutter scores are due to behaviour only, rather than the estimation of the indices.

Note: all questions were posed to the mother.

Note: all variables were coded to equal 1 if untrue, 2 if sometimes true, 3 if frequently true.

Note: variables were restricted within studies to allow comparability across cohort members and their children.

Note: As CNCDS and CBCS were asked at different ages to compare with the cohort members, the children were grouped into age categories:

NCDS	BCS
5-8 inclusive compared with age 7	4-8 inclusive compared with age 5
9-13 inclusive compared with age 11	9-13 inclusive compared with age 10
14-16 inclusive compared with age 16	14-16 inclusive compared with age 16

Sexually Healthy

No intergenerational information available.

Healthy Lifestyles

Smoking habits: G1-G2. Parental and own smoking habits recorded when the cohort members are aged 16.

Drinking habits: G2-G3 (BCS only). We correlate parental drinking habits with child early drinking patterns. Recorded for cohort member at age 16 or 30, drinking defined as a dummy variable taking the value 1 if the parent drinks and 0 otherwise. Child reports drinking at age 13-16.

Choose Not to Take Illegal Drugs

Have tried solvents: G2-G3 (BCS only). Recorded at age 16 for BCS cohort member and in 2004 for CBCS. Answer positively to question 'Tried drug: solvents'.

Have tried cannabis: G2-G3 (BCS only). Recorded at age 16 for cohort member and in 2004 for the CBS. Answer positively to question 'Tried drug: cannabis.

Have tried any drugs: combination of two above questions.

Stay Safe

Safe from maltreatment, neglect, violence and sexual exploitation

Incidence of smacking: G2-G3. Reported at age 16 for the NCDS cohort members from the school questionnaire. The question asked if schools practiced corporal punishment. The BCS cohort members were themselves asked a different question, and was derived from a combination of the questions "Does your mother hit you?" and "Does your father hit you?". For the CNCDS and CBCS samples, in 1991 and 2004 respectively, parents reported which methods of discipline were used including frequency of smacking, which was coded into a binary yes/no variable. Unfortunately, with the NCDS and the BCS, it is not possible to uncover true maltreatment, neglect, violence or sexual exploitation for two reasons. Firstly, questions asking about smacking children are not detailed enough for researchers to reveal true abuse. Across years, the acceptability of smacking children has changed, such that a report of smacking children in past years may not represent abuse but form of discipline that was considered socially acceptable. Secondly, we define our variables from self-reported questionnaires and hence the variables are likely to under-report true abuse. For this reason, it is excluded from the analysis.

Safe from accidental injury and death

Frequency of serious accidents: G2-G3 (BCS only). Parent of cohort member at age 10, was asked "How many serious accidents has the cohort member been involved in".

Serious burns: G2-G3 (BCS only). Information was available on the type of accidents for the BCS cohort member and child, but the only comparable type of accident was if they were ever seriously burnt.

Safe from bullying and discrimination

Ever bullied: G2-G3. Recorded at age 11 (10) for NCDS (BCS) and in 1991 (2004) for CNCDS (CBCS). Parents of cohort members and the cohort members themselves rate the degree of bullying between 1 to 3, which we recode to take the value of 1 if the child is bullied and 0 otherwise.

Safe from crime and anti-social behaviour in and out of school

Child lives in a safe area: G2-G3 (NCDS only). Mother of cohort member age 11 reported whether happy with play areas nearby. The answer rates the happiness between 1 (very satisfied) and 5 (very unsatisfied).

Parent scared of going out (G2) linked to being a victim of crime (G3): G2-G3 (BCS only). Mother of BCS aged 5 asked if they were scared of going out in the local area. This was then coded as a binary yes/no variable, where 9% reported being scared. It is a proxy variable for the safety of the local area the child lives in, although it may also reflect traits specific to the parents, such as anxiety. This is linked to the extent to which the BCS cohort is a victim of crime in 2004, again intending to proxy for the safety of the child's area. This G3 CBCS variable indicating being a victim of crime is the sum of six potential crimes that could be committed against the cohort member.

Parent scared of going out (G2) linked to a measure of the parent of cohort members being afraid of walking alone at night (G3): G2-G3 (BCS only).

Parent scared of going out (G2) II. Same maternal variable, but now using binary response for if the cohort member is afraid to walk alone at night in 2004. This reflects safety of the local environment for G2 and G3. The mean value for this is zero – cohort members are generally not scared to walk around at night. Both of these reflect the safety of child environments, therefore indicate a G2-G3 correlation.

<u>Have security, stability and are cared for</u>

Child has lived in local authority care: G2-G3 (NCDS only). Reported at age 7 & 11 for the NCDS and recorded in 1991 for CNCDS.

Lives in an alcoholic household: G2-G3 (NCDS only). Record for G2 whether the family reports alcoholism being a family difficulty when then child is aged 7 in the NCDS. Only 1% of parents responded positively to this question in the NCDS. Record for G3 whether the cohort member drinks over the government recommended level of alcohol per day in 1991. These two variables lead to an indicator for a child living in an alcoholic household, although they are not identical across generations.

Interest parents show in child: G2-G3.

NCDS: G2 recorded from teachers of cohort members asked when cohort members aged 7 and 11 how much interest the parent show in their child. The variable takes the value of 1 if little interest is shown and 3 if much interest is shown. G3 recorded from maternal questionnaire answer to the question "how often do you talk to your child when busy?" Again, we code the variable to take the value of 3 for a positive answer.

BCS: G2 recorded from rating from interviewer of the father/mother's interest in the cohort member which ranges between 18-60, when the child was age 10. G3: the cohort member describes their relationship with the child: generated from set of 12 questions each with a 5 point scale. They were modified such that higher values indicated a better relationship, then summed together.

These questions are:

- parent and child share affectionate, warm relationship
- child will seek comfort from parent
- child is uncomfortable with physical affection or touch from parent
- child beams with pride when parent praises them
- child spontaneously shares information about themselves
- child easily becomes angry at parent
- parent finds it easy to be in tune with child's feelings
- child remains angry or resistant after being disciplined
- dealing with child drains parent's energy
- child's feelings towards parent can be unpredictable or change suddenly
- child's feelings towards parent can be unpredictable or change suddenly
- child is sneaky or manipulative with parent

Both variables for G2 and G3 were standardised for analysis to have a mean of zero and a standard deviation of one to enable comparison.

Living in a broken home: G1-G2. Recorded at age 11 (10) for NCDS (BCS) whether the cohort members live with their natural father and in 1991 (2004) for the CNCDS (CBCS) whether the cohort member has ever been divorced. This is described as a link between G1-G2, in which case it would represent the intergenerational correlation in having a broken home, or alternatively could be seen from the perspective of G2-G3 as the incidence of a child living in a broken home.

Enjoy and Achieve

Ready for school

Pre- School Attainment: G2-G3. The NCDS took a maths and reading test at age 7 and the BCS took a vocabulary test at age 5. We compared these tests to those of their children in 1991 for the NCDS and 2004 for the BCS. As the CNCDS and CBCS were at different ages, we selected only those aged 8 and under in the CNCDS and aged between 3 and 6 in the CBCS, to allow comparability. All test scores were standardised to have a mean of zero and a standard deviation of one, in order to construct a meaningful measure of attainment..

Age started school: G2-G3 (NCDS only). Recorded at age 7 for the NCDS and in 1991 for the CNCDS. For the children, the starting age included pre-school, which is why the number is much lower than for the cohort members themselves.

Attend and enjoy school

Truancy: G2-G3 (BCS only). Parents rate the truancy level of their child, which was converted to a binary variable. We select children aged 10+ from the CBCS.

Parents read to children: G2-G3 (NCDS only). Parents of cohort members rate how often they read to their child at age 7, out of three. Cohort members rate how often they read to their child, out of five, which we aggregate into a score of three.

Happy at school: G2-G3. The parent of the cohort member reports the happiness of their child at school at age 7. The cohort member answers whether their child is happy at school in 1991.

Achieve stretching national educational standards at primary school

Primary School attainment: G2-G3. The NCDS took general ability, maths and reading tests at age 11 and the BCS took spelling, reading and maths tests at age 10. We compared these tests to those of their children in 1991 for the NCDS and 2004 for the BCS. As the CNCDS and CBCS were of different ages, we selected only those aged between 9 and 12 in the CNCDS and aged between 6 and 16 in the CBCS, to allow comparability. All test scores were standardised to have a mean of zero and a standard deviation of one, in order to construct a meaningful measure of attainment.

Achieve personal and social development and enjoy recreation

Not liked by other children: G2-G3. An index created from the following variables:

G2 not liked scale generated from:

- Solitary –Parent reports if cohort member solitary
- Bullied –Self report if bullied
- Self report “others fall out with you”
- Self report “feel sad because no-one to play with”
- Self report “do you have to find new friends”
- Self report “do others think you tell lies”

G3 not liked scale generated from:

- Parent reports if child solitary
- Parent reports if child bullied
- Parent reports if child not liked
- Parent reports if child has more friends significantly older
- Parent reports if child has more friends significantly younger

- Parent reports if child has good friend

The index was normalised to have mean of zero and a standard deviation of one.

Achieve stretching national educational standards at secondary school

Secondary school attainment: G2-G3 (NCDS only). The NCDS took maths and reading tests at age 16. We compared these tests to those of their children in 1991 for the NCDS. As the CNCDS were of different ages, we selected only those aged between 14 and 18 in the CNCDS, to allow comparability. All test scores were standardised to have a mean of zero and a standard deviation of one, in order to construct a meaningful measure of attainment.

Make a Positive Contribution

Engage in decision making and support the community and environment

Volunteering: G2-G3 (BCS only). Cohort member asked about extent of voluntary work at age 16, and answers ranged between 1 and 3. This is converted into a binary variable indicating whether they ever volunteer. The same applies to the child of the cohort member, in 2004.

Social activity index: G2-G3. An index for the cohort members at age 16 and their child was constructed based upon their answer to the following set of questions.

- Party-Does the individual go to parties, friend's houses after school
- Sport-Does the individual play sport regularly
- Volunteer-Does the individual volunteer for community events
- Youth club – Does the individual attend a youth club

The variables were on a scale 1-3, with 3 being most active. These were summed together and standardised to have a mean of zero and a standard deviation of one.

Engage in law-abiding and positive behaviour in and out of school

Criminal behaviour: G2-G3 (BCS only). A range of self-reported questions by the BCS cohort member about crimes committed. These were turned into binary variables indicating a positive answer. The list of criminal activities are:

- Have used physical force to get money
- Whether robbed someone
- Stolen from a shop

- Stolen a bike

The cohort members when aged 34 were also asked if they have ever been contacted by police due to their child's behaviour, which is the indicator for G3.

Develop positive relationships and choose not to bully and discriminate

Bullying: G2-G3 (BCS only). At age 5, 10 and 16 the parents of the BCS cohort member reported whether they bully others and the cohort member were asked in 2004 the same question of their child. The variable takes the value one if the child bullied others and zero otherwise.

Holding discriminatory views and child bullying: G2-G3 (BCS only). The BCS cohort member was asked how much they agreed with certain statements out of 3. These statements uncovered discriminatory behaviour. These were coded such that 3 was the most discriminatory and the five scores were summed together and then standardised. The questions used were:

- Homosexuals should be prosecuted
- Handicap teens not enjoy same as others
- Black people just as good as white
- Black people should not marry white people
- Women can do the same jobs as men

This variable is not a clear measure of intergenerational persistence in bullying, but rather measures whether parental attitudes are correlated with the bullying behaviour of children.

Develop self-confidence and successfully deal with significant life changes and challenges

No intergenerational information available.

Develop Enterprising Behaviour

No intergenerational information available.

Achieve Economic Wellbeing

Engage in further education, employment or training on leaving school

Parents left school at compulsory age correlated with child's desire to do the same: G1-G2. When the cohort was 16, they were asked if their mum/dad left school as soon as it was possible.

They were also asked if they wanted to leave school at 16. Both were coded as binary variables.

Aspirations for child to leave at compulsory age: G2-G3 (BCS only) The above question posed to the cohort member was compared with the expectations of the cohort member at age 34 regarding their own child's expected leaving age. They were asked what they wanted their child to do upon reaching age 16. We coded the answers to equal one if they wanted the child to continue into full-time education and zero otherwise.

Parent expectations of child going on to university: G2-G3 (BCS only). Again the explanatory variable of whether the cohort member desired to leave school at age 16 was compared to a question they answered at 34, of whether they expected their child to go to university.

Ready for employment

No intergenerational information available.

Live in decent homes and sustainable communities

Number of rooms/bedrooms in the house: G2-G3. At age 11 (10) the NCDS (BCS) parents were asked how many bedrooms were in the household. In 1991 (2004) they answered the same question about their house.

Parents own house: G2-G3. At age 11 (10) the NCDS (BCS) parents were asked whether they own the house they live in. In 1991 (2004) they answered the same question about their house.

Access to transport and material goods

No intergenerational information available.

Live in households free from low income

No intergenerational information available.