

Millennium Cohort Study Briefing 13

Intergenerational inequality in early years assessments

Based on Chapter 9 of *Children of the 21st century (Volume 2): The first five years*

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About these briefings

This Briefing is one of 14 that distil the key findings of the first three surveys of the Millennium Cohort Study, as collected in *Children of the 21st century (Volume 2): The first five years*.

The study has been tracking the Millennium children through their early childhood and plans to follow them into adulthood. It covers such diverse topics as parenting; childcare; school choice; child behaviour and cognitive development; child and parental health; parents' employment and education; income; housing; and neighbourhood.

It is the first of the nationwide cohort studies to over-sample areas with high densities of ethnic minorities and large numbers of disadvantaged families.

For the first survey, in 2001–2, interviewers visited the families of nearly 19,000 children aged 9 months throughout the United Kingdom. It established the circumstances of pregnancy and birth, as well as the families' social background. The second survey recorded how nearly 16,000 cohort children were developing at age 3. The third survey, when they were age 5, involved almost 15,500 children and provided a uniquely

detailed account of their physical, cognitive and social development in the year they entered school.

The study is housed at the Centre for Longitudinal Studies at the Institute of Education, University of London. It was commissioned by the Economic and Social Research Council, whose funding has been supplemented by a consortium of government departments.

Children of the 21st century (Volume 2): The first five years, edited by Kirstine Hansen, Heather Joshi and Shirley Dex, The Policy Press, 2010, can be ordered via www.policypress.co.uk

Introduction

A key reason for launching the Millennium Cohort Study (MCS) was to gather up-to-date evidence on how family background can impact upon child outcomes. In this Briefing, MCS data are used to provide new evidence on the extent to which one measure of parental background, family income, is correlated with children's behaviour and cognitive ability (assessed here by vocabulary).

This analysis considers the magnitude of gaps in vocabulary score and behavioural outcomes by family-income group at ages 3 and 5. Previous research has established a connection between parental income and early child outcomes – in general, the wealthier the parents the better the child outcomes. This restricts the scope for intergenerational income mobility.

MCS findings are also compared with those of earlier birth cohort studies. Unlike their predecessors, the Millennium children experienced the beginnings of Sure Start and free nursery provision for the neediest three-year-olds. By exploring changes over cohorts born since the mid-1980s we can try to gauge the success of government policy since 1997.

Brief literature review

In an influential study, Feinstein (2003) analysed data from the British Cohort Study of children born in 1970 (BCS70). He found that gaps in child development by parental socio-economic status (SES) emerged as early as 22 months and appeared to widen by children's fifth birthday. Feinstein's index of early child development also appears to be important for determining labour-market performance at age 26. Feinstein identified children as high and low-achieving at 22 months and found that those in the highest-achieving group with parents in the most disadvantaged socio-economic group were overtaken, on average, at around age 6 by those from advantaged backgrounds who were initially in the low-achieving group.

In the US, Carneiro and Heckman (2005) have documented disparities in maths achievement and antisocial behaviour by income groups for 6 to 10-year-olds taking part in the National Longitudinal Survey of Youth. Heckman et al. (2006) showed that

cognitive and non-cognitive characteristics are related to subsequent employment, smoking, crime and early motherhood.

Data

Cognitive assessments

The Naming Vocabulary section of the British Ability Scales (BAS) was used to assess children's spoken vocabulary at age 3. This assessment consists of a booklet of coloured pictures of items that the child is asked to name.² At age 5, the vocabulary assessment was repeated and supplemented by BAS tests in picture similarities (to assess pictorial reasoning) and pattern construction (to measure spatial abilities). This Briefing looks only at vocabulary scores, as these allow us to compare performance at ages 3 and 5. However, the outcomes of such verbal assessments appear closely related to more general measures of cognitive ability.

Measures of behaviour

The cognitive assessments are supplemented with several behavioural assessments. At ages 3 and 5 the main respondent (usually the MCS child's mother) was asked to complete a self-reported module which included the 25 items of the Strengths and Difficulties Questionnaire. The mother was asked to say how true each item was, with the responses generating scores on five items: conduct problems or anti-social behaviour, pro-social behaviour, hyperactivity, emotional problems and problems with peers. A composite difficulties scale was generated by adding scores on all the subscales with the exception of the pro-social item.

Family income

The main family background measure is 'permanent' income (averaged over three surveys at 9 months, 3 and 5 years). This could be calculated because in each survey the main respondent was asked to place net family income in one of 18 or 19 bands, depending on whether the child lived in a one- or two-parent family. The family was then assigned the midpoint of the stated category. The mean average weekly income in December 2007 prices was £567, with a median of £474. This income measure was supplemented with one based on the status of parental occupations to show figures that are as comparable as possible with Feinstein (2003), who did not have data on parental income.

Sample selection

For the MCS-only analysis the sample was limited to those with scores at both 3 and 5 years. Only singletons³ and the first child listed for twins and triplets were included in the analysis.

Cross-cohort comparisons

One objective of the study summarised here was to map the evolution of the relationship between assessment scores, behaviour and parental income over time. MCS data were compared with information gathered on the children of members of the 1958 birth cohort who are being followed by the National Child Development Study (NCDS). Comparisons were also made with the children of people enrolled in BCS70. In 1991, data were collected on the co-resident children for one-third of NCDS members, then aged 33. Three thousand children aged 3 to 17 completed two Peabody assessments of Individual Attainment (in maths and reading) and Picture Vocabulary. Mothers also answered a questionnaire on children's behaviour and home environment.

In 2004 a similar exercise was conducted for children of half of the BCS70 cohort members. Age-appropriate assessments of word and number skills from the BAS were carried out to gauge children's cognitive skills and attainment. Mothers also reported on behaviour.

These two sets of children could therefore be compared with the MCS cohort, particularly as the offspring of the 1958 and 1970 cohorts can be matched with information on their parents' education, family income and other characteristics.⁴ The children's percentiles in the word assessments were used as the measure of cognitive ability for the NCDS/BCS70 offspring. These results were then compared with MCS children's performance in the age 5 vocabulary assessment. Non-cognitive comparisons could also be made because all three surveys have some identical questions on behaviour.

Helpfully, MCS members and BCS70 offspring who were selected for this comparison were born only about one year apart. Nevertheless, to ensure comparability the authors of the study summarised here selected the younger offspring of the NCDS/BCS70 cohort (5 to 7-year-olds in NCDS and

4 to 6-year-olds in BCS70). The comparable MCS sample was also limited to those with mothers aged 33–35 at the age 5 survey so that they could be matched with NCDS and BCS70 mothers.

Inequality of early child cognitive and behavioural outcomes

Figure 1 illustrates MCS children’s vocabulary-score gaps in five equal bands of family income at ages 3 and 5. The gaps at both ages in vocabulary performance are substantial. However, the penalty for coming from a low-income family seems greater than the advantage of belonging to a high-income family, when compared to the middle-income group.

Feinstein (2003) and Carneiro and Heckman (2005) showed that as children aged the impact of family background appeared to increase. From MCS there is limited evidence that the gap in attainment between children from the poorest (quintile 1) and richest (quintile 5) groups widens between ages 3 and 5 (Figure 1). The gaps across income bands remained steady with the exception of the very top group, who moved ahead by about 3 percentiles (position on a 100-rung ladder).

Feinstein, using the BCS70 cohort, found a marked (although not statistically significant) deterioration of performance in assessment scores among his most deprived group between ages 22 and 42 months, and a smaller decline between 42 and 60 months (closer to the age-groups observed here). There is no evidence of any decline at the bottom end among MCS children, which could be cautiously greeted as a sign of a small improvement.

An alternative way to quantify the assessment gaps observed is to think of them in terms of the amount of progress children might be expected to make in a month. On the vocabulary score, which can range from 10 to 170, children normally progress by 1.25 points per month, on average, over the 12 months around their third birthday and by around 0.83 points per month around their fifth birthday (see Hansen 2008). The gap between the richest and poorest groups of MCS children (top and bottom 20%), in terms of vocabulary scores, is about 12 points at age 3 and 5. This translates to a gap in vocabulary

development between the children of the richest and poorest bands of families of around 10 months at age 3 and 15 months at age 5.

Figure 2 provides information on the average percentile performance on the ‘total difficulties’ behaviour scale. Once again, the gaps are large, with those in the poorest income group at ages 3 and 5 scoring 25 percentile points higher than those in the richest quintile (a higher score here means worse behaviour).

Cross-cohort changes in intergenerational mobility

In all three samples (MCS, and the offspring of NCDS and BCS70) there is a vocabulary-score gap of about 15 percentile points

between children in the highest and lowest family-income groups. The gaps in the behaviour index are not significantly different over this 15-year (1991–2006) period either.

These findings, coupled with evidence from other data sources, suggests that intergenerational mobility for MCS children is likely to be at a similar level to those born in 1970, rather than continuing to decline.

Dynamics of child achievement and behaviour

Feinstein’s BCS70 analysis found that those with lower SES who did well (top 25%) in assessment scores at 22 months were overtaken between ages 5 and 10 by those in the bottom quartile of achievement at

Figure 1
Vocabulary scores by parental income quintile in the MCS

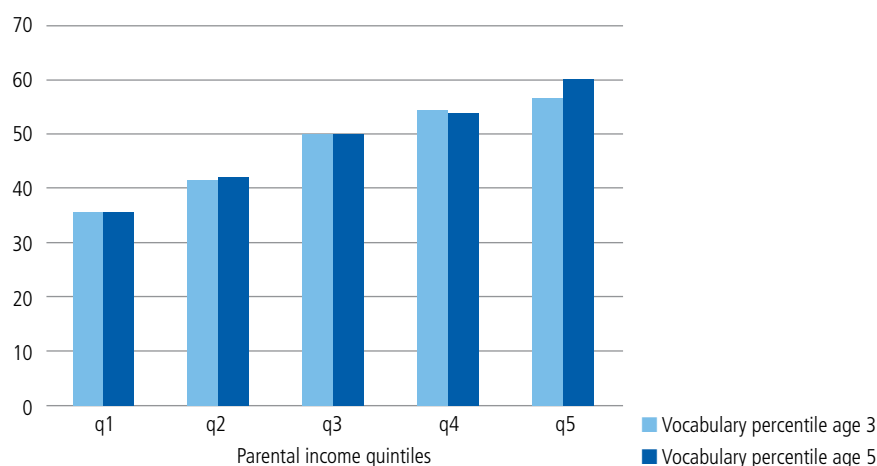
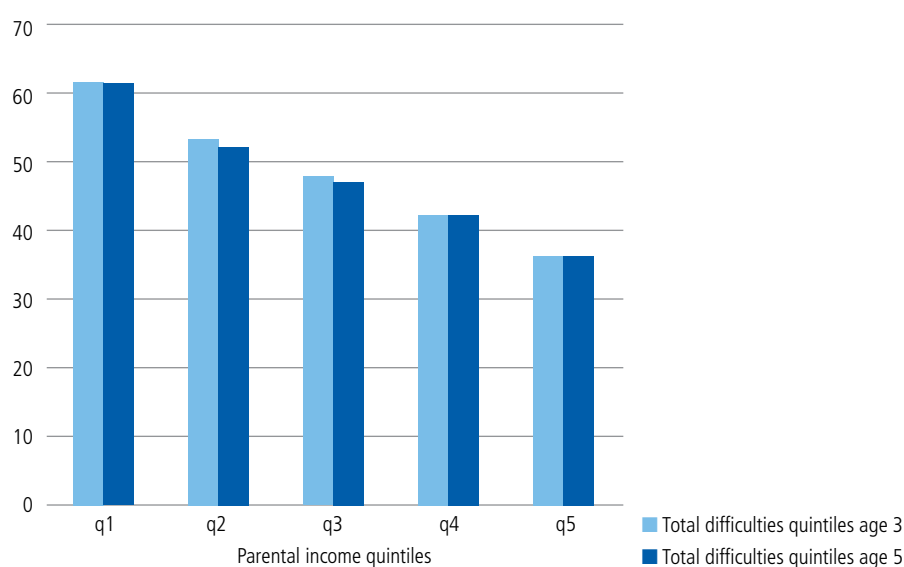


Figure 2
Behaviour scores by parental income quintile in the MCS



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22 months but in the highest SES group. This result has been taken to imply that the interaction of schooling with SES has more influence on outcomes than early ability. However, it should be noted that while the gap between high ability-low SES and high SES-low ability children narrowed between 42 and 60 months in the children of the BCS70 cohort (close to the age-range we can study in the MCS), the two trajectories are not projected to cross until the children are older.

Figure 3 uses MCS data to replicate Feinstein's analysis for children growing up in the 2000s. Again, high vocabulary achievers at age 3 with low family incomes are losing ground between 3 and 5 while low achievers with high family incomes are improving more quickly than other children starting from a similar baseline.

Such results have to be interpreted carefully, as the differences observed by family background are not necessarily causal. It should also be noted that those performing well at age 3 tend to do relatively worse

at age 5. Figure 3 may be thought of – at least partially – as exhibiting 'regression to the mean'. However, the performance of those from advantaged groups with high vocabulary scores tends to fall by less than that of other children with high vocabulary scores at age 3.

Conclusions

This Briefing has shown that gaps in vocabulary scores and behaviour by family background are substantial for MCS children, with those from the most advantaged groups being over a year ahead in vocabulary at age 5, compared to those from disadvantaged backgrounds. It will be extremely interesting to observe the evolution of cognitive scores in the age 7 sweep, which will, of course, reflect the first few years of school.

The relationship between family income and early years outcomes can be thought of as an early manifestation of the inequalities that can lead to restricted social mobility in later life. However, comparing these MCS

Key statistics

15 months – the gap in vocabulary development between five-year-olds in the richest and poorest family groupings (top and bottom 20%).

22 months – the age at which previous cohort research in Britain has detected gaps in development between children in different socio-economic groups.

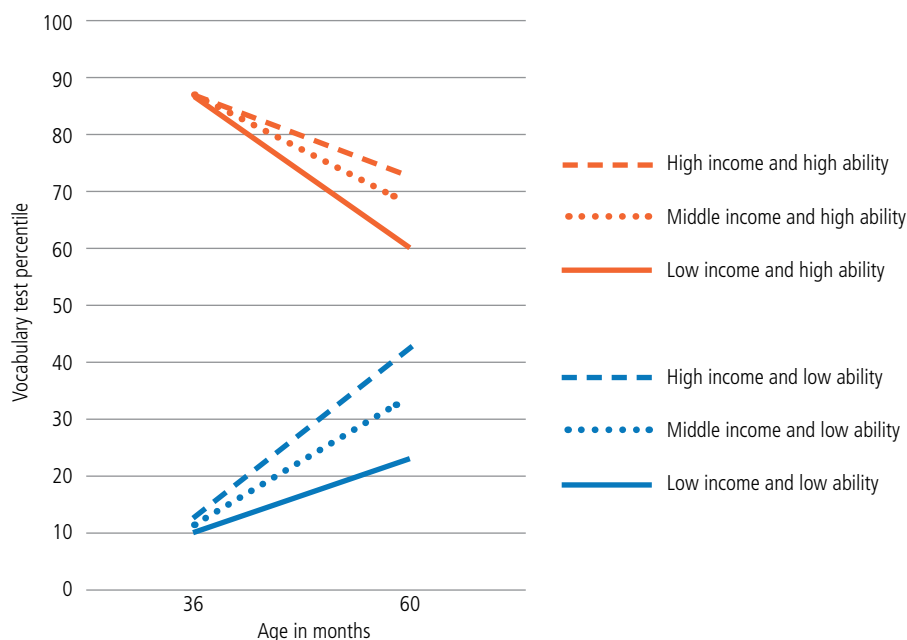
0 – cross cohort change in the income gap in child development around age 5, 1991–2006.

results with data for child cohorts born in the mid-1980s shows no substantive change, contrary to the common assertion of declining social mobility. This is an important contribution to the debate about intergenerational mobility. Drawing more definitive conclusions about mobility patterns for the Millennium cohort, as compared to older cohorts, will be an important research venture in the years ahead.

References

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Figure 3
Progression in MCS vocabulary scores by ability at age 3 and parental income



Notes: The income measure used is net parental income averaged across MCS1, 2 and 3. High income is defined as the top quintile by this measure. Low income is defined as the bottom quintile.

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- 2 There are 36 items in total but the assessment is terminated if five successive items are answered incorrectly. The assessment was not given to children who did not speak English. The scores are reported in terms of percentiles, i.e. the position of each child's answer relative to others, with the top mark ranked at 100. The assessment was identical at 3 and 5.
- 3 Children who are born as a result of single, rather than multiple, births.
- 4 It should be noted that the datasets on the offspring of cohort members were not designed to be representative of all children in the age group. The issue of representativeness therefore introduces a caveat on the results.