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Millennium Cohort Study Exploration of Some Distinctive Results for Scotland

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**MILLENNIUM COHORT STUDY
EXPLORATION OF SOME DISTINCTIVE RESULTS
FOR SCOTLAND**

**Edited by Shirley Dex
Centre for Longitudinal Studies
Institute of Education, University of London**

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List of Contributors

Shirley Dex

Kirstine Hansen

Heather Joshi

Sos Ketende

Kelly Ward

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EXECUTIVE SUMMARY

1. The Millennium Cohort Study offers large-scale information about children born into the New Century and the families who are bringing them up, for the four countries of the United Kingdom. Its second survey, with which this report is concerned, conducted in 2003-5 when the children were age 3, is the first in a planned series of follow-ups, building on the first survey, carried out during 2001-2002. The first sweep, when the child was aged 9-10 months, laid the foundations for this major new research resource on nearly 19000 children. The second sweep of the Millennium Cohort Study (MCS2) collected information from 1,814 families in Scotland who were part of 15,590 families of children born across the UK in 2000-2.

2. During the preliminary analysis of the Millennium Cohort Study children and families, Scotland's families and children were identified as appearing to have, on average, some distinctive characteristics from other countries of the UK. This Report takes three of these seemingly distinctive differences and provides further multivariate analysis to examine whether the distinctive results are due to differences in the characteristics of MCS families in Scotland and the rest of the UK.

3. Three topics were selected for further analysis in this Report.

Children's cognitive scores

4. The Millennium Cohort Study administered two cognitive assessments, the BAS British Ability Scale for Vocabulary and the Bracken School Readiness Assessment, and one behaviour assessment to the children at age 3. Children in Scotland were found to have significantly higher average scores than those in other UK countries on the two cognitive assessments at age 3. In addition children were assessed by their mothers for the extent of their problem and difficult behaviour and on this score, children in Scotland also had lower average problem behaviour than children in the rest of the UK. The analyses of these 3 measures set out to examine whether it was the characteristics of the children or their families that explained the higher cognitive scores and fewer behavioural problems for children in Scotland.

5. The findings from the analysis showed that MCS children in Scotland have a small but significantly higher BAS vocabulary score than children in the rest of the UK at age 3 which cannot be explained by the gender of the child or the characteristics of MCS families. It must be due to other factors that differ between Scotland and the rest of the UK. These could be differences in early years education provision, in pre-school education, activities in the home or in grandparent influence. These are factors that cannot be assessed in this analysis.

6. The apparent advantages on the Bracken school readiness scale and on the problem behaviour score of children in Scotland over those in the rest of the UK was fully explained by the characteristics of MCS families, namely their parents' education, socio-economic status and family income.

7. The analysis also revealed that children in Scotland sometimes gained more ability or behaviour advantages than children in the rest of the UK, when they had parents with higher incomes or parents in high-level occupations. Why this should be the case is unclear. It is not likely to be due to the biases in the sample of Scotland's families who were lost to the survey at Sweep 2 since the main ways in which the MCS2 sample was biased have been taken into account in these analyses.

Family poverty

8. MCS families in Scotland were found to have surprisingly low rates of family poverty, 21%, at Sweep 2 of the Millennium Cohort Study when children were age 3 compared with 26% in the UK as whole. The analyses set out to examine whether the characteristics of the families explained the lower rate of family income poverty for children in Scotland.

9. The analyses showed that the advantage of MCS families in Scotland, of experiencing lower family income poverty than the rest of the UK, can be explained by Scotland's MCS mothers and their families having a combination of characteristics that are keeping them out of poverty to a greater extent than mothers in the rest of the UK. However, the analyses found there were a few ways in which the treatment of Scotland's MCS mothers differs from those in the rest of the UK, given their characteristics. Mothers' characteristics were different in Scotland from the rest of the UK due to differential response rates of MCS1 families in Scotland at the MCS2 interview, compared with the rest of the UK. These differences in responses have left the MCS2 sample of mothers in Scotland relatively more highly educated and more prosperous than those in the rest of the UK. The lower poverty rate in Scotland is therefore an artefact of the data.

Breastfeeding of babies

10. Babies in Scotland were not breastfed to the same extent as babies in other countries of the UK. This information was collected when the children were aged 9-10 months old mainly from their mothers (MCS Sweep 1). The analyses set out to examine whether it was the characteristics of the families that explained the lower rate of breastfeeding in Scotland.

11. The analyses showed that the lower rate of breastfeeding among mothers in Scotland compared to the rest of the UK is not explained by the differences in characteristics between MCS mothers in Scotland and those in the rest of the UK, as far as we have been able to investigate. The lower rates of breastfeeding in Scotland are robust to the adjustment for a wide range of confounders. In fact, they were lower once these other factors are taken into account which suggests that there is a Scottish effect at work. This finding has implications for policy and research. Attendance at antenatal class appears to have a stronger positive effect on mothers taking up breastfeeding in Scotland than in the rest of the UK. This suggests that policy should seek ways of encouraging attendance at antenatal classes in order to boost breastfeeding rates in Scotland.

1. INTRODUCTION

1.1 During the preliminary analysis of the Millennium Cohort Study children and families, Scotland's families and children were identified as appearing to have, on average, some distinctive characteristics from other countries of the UK. This Report takes three of these seemingly distinctive differences and provides further multivariate analysis to examine whether the distinctive results are due to differences in the characteristics of MCS families in Scotland and the rest of the UK. Scores of children's cognitive and behaviour at age 3 are analysed as well as rates of family poverty at age 3 and mothers' breastfeeding after the birth of the cohort child. All references to Tables in this Executive Summary refer to the Annex Tables.

Introduction to the Millennium Cohort Study

1.2 The second sweep of the Millennium Cohort Study (MCS2) collected information from 1,814 families in Scotland who were part of 15,590 families of children born across the UK in 2000-2. The study's first sweep, carried out during 2001-2, when the children were aged 9-10 months old laid the foundations for this major new longitudinal research resource. It recorded the circumstances of pregnancy and birth, the all-important early months of life, and the social and economic backgrounds of the families into which the children were born.

1.3 The second survey data allow researchers for the first time to chart the changing circumstances of these children and their families and offer some direct measurements of the children's development at the age of three. Percentages reported here are re-weighted to provide representative estimates. There were differential rates of attrition by country from MCS1 to MCS2; a loss of 20% of Sweep 1 MCS families from the sample at MCS2, compared with a 15% loss from England, 17% from Wales and 22% from Northern Ireland. In addition, the loss of families from the Scotland sample was biased towards those without any educational qualifications although the rate of attrition in Scotland was higher than for England at all levels of education (Table A1.5). Fortunately MCS3 has picked up and interviewed 1444 families across the UK who were not interviewed at sweep 2.

1.4 The basic details of the sample sizes for analysis and an overview of the contents of the Millennium Cohort Study instruments are presented in Annex tables A1.1 to A1.5. The results of these analyses are all displayed in the Annex to this Report.

Weights

1.5 All of the statistics have been weighted by, in the case of Scotland, the country weight, and, in the case of the rest of the UK (England, Wales and Northern Ireland), by a specially constructed weight to reflect these 3 countries. The sample sizes given in each table are the unweighted sample sizes, unless otherwise specified. All analyses have been weighted and have had standard errors adjusted to take account of the cluster sampling design.

Topics analysed in this Report

1.6 Three topics were selected for further analysis.

(1) MCS2 children in Scotland were found to have significantly higher average scores than those in other UK countries on two cognitive assessments administered at age 3. Children in Scotland also had lower average problem behaviour scores than children in the rest of the UK. The results of the multivariate analyses of these scores are presented below (Section 2).

(2) MCS2 families in Scotland were found to have lower rates of family income poverty at Sweep 2 than families in the rest of the UK, when children were age 3. The results of the multivariate analyses of family poverty at MCS Sweep 2 are presented below in Section 3.

(3) Lastly, MCS1 babies in Scotland were not breastfed to the same extent as babies in other countries of the UK. This information was collected when the children were aged 9-10 months old mainly from their mothers (MCS Sweep 1). The results of analyses of whether MCS babies were breastfed are also presented below in Section 4.

Approach to the analysis

1.7 We set out to identify whether there is a genuine difference attributable to being in Scotland per se and not to identifiable characteristics of MCS families being distinctive in Scotland from other UK countries. The Millennium Cohort Study is a sample of families living in Scotland and the rest of the UK and as such it is subject to bias. It is the assessment of this bias that is being evaluated. In order to do this we carried out multivariate analyses to control for the predictors noted as significant in the respective earlier studies of each of these three topics¹ (a) children's age 3 cognitive scores, (b) family income poverty and (c) breastfeeding. MCS data offers a large and rich array of controls and predictors of child's age 3 cognitive development, family poverty and whether the child was breastfed. The earlier User Guide to the UK Millennium Cohort study had explored a range of factors separately. The intention was to explore the same factors in combination in this Report. It will then be possible to identify whether these distinctive differences at the mean for children and families in Scotland are due to differences in MCS families' characteristics which vary between Scotland and the rest of the UK and explain all the difference. Alternatively, a 'Scotland effect' may remain after controlling for these other differences in MCS families' and children's characteristics. Factors that are not in the data set, or are difficult to measure, could explain these differences, for example, they may be related to policy differences between Scotland and the rest of the UK, or cultural differences.

¹ For example, gender, poverty and socio-economic factors, education of parents, family circumstances and marital breakdown, ethnicity and child health and development indicators. These predictors are described in detail under the relevant sub sections in the rest of this Report.

2. CHILDREN'S AGE 3 COGNITIVE AND BEHAVIOURAL SCORES.

2.1 In each of the analyses reported below we considered a range of factors which might potentially explain children's age 3 cognitive scores. These included the child's gender, which is well known to affect cognitive and behavioural scores at age 3. Other well-known indicators of children's early attainment and behaviour include poverty and socio-economic factors, education of parents, family circumstances and marital breakdown, ethnicity and child health and development indicators as reviewed in Rutter and Madge (1976) and Gunn-Brooks and Duncan (1997), and found or noted in Fergusson and Horwood (2003), Guo (1998), Owen and Shaw (2003), Gregg and Washbrook (2005) and Dubow and Ippolito (1994). Explanatory factors considered in combination in the analysis included, therefore, the highest educational qualification of either parent, the higher current or most recent socio-economic classification of either parent, the number of earners in the family, lone parent status and measures of development delays in fine or gross motor skills as recorded when the baby was 9-10 months old. In addition, we included mother's ethnicity in the analyses of the UK data because children's cognitive scores were found to differ for minority ethnic groups in the earlier analyses. Although mothers from minority ethnic groups were uncommon in Scotland (and insufficient in size to analyse in the Scotland data), they were important and over-represented groups in the England data and therefore in the UK data as a whole.

British Ability Scale -Vocabulary analyses

2.3 Children in Scotland were ahead, on average, of those in the rest of the UK on expressive language skills (BAS) by an amount that represents about three months of development at this age (Table A2.1). The higher BAS vocabulary scores for children in Scotland was not explained by the child's gender, family type, parental education, parental employment, parental occupation and annual family income, when considered separately. However, in the rest of the UK, children in families with two working parents had a higher BAS vocabulary score than children in families with one working parent, whereas in Scotland there was no difference according to whether there was one or two employed parents.

2.4 This range of independent factors in combination explained part of the difference between the scores of children in Scotland and those in the rest of the UK (Table A2.2). Children in Scotland, therefore, were approximately 1.5 months of vocabulary development ahead of those in the rest of the UK. This means that something other than gender, family type, parental education, parental employment, parental occupation and annual family income (and any combination of these factors) is responsible for children's advanced vocabulary development in Scotland compared to the rest of the UK. Children's vocabulary ability was also significantly higher in both Scotland and the rest of the UK:

- for girls;
- the higher their parents' education levels;
- the higher their parents' socio -economic status;
- having one or two earners in the family;
- living above poverty level income; and
- where they had no gross motor development delays at age 9-10 months.

Cognitive and Behavioural measures used of children in MCS2 at age 3.

2.5 Child outcomes at age 3 have been measured by two cognitive assessments and one behavioural assessment: the naming vocabulary subtest of the British Ability Scales (BAS) and the School Readiness Composite (SRC) of the Revised Bracken Basic Concept Scale. Both cognitive assessments were administered using CAPI by interviewers who were specially trained but who however were not professional psychologists. The Strengths and Difficulties Questionnaire (SDQ) was administered through a CAPI self completion instrument that the mother filled in about the child's behaviour.

British Ability Scales (BAS)

2.6 The BAS Naming Vocabulary subtest is part of a cognitive assessment battery designed for children aged between 3 and 17 years (Elliott, 1983). The assessment is individually administered, and asks the child to name a series of pictures of everyday items. There are 36 items in total, however the number of items asked to each child is dependent on their performance. For example, one of the criteria for terminating the assessment is if five successive items are answered incorrectly. BAS assesses the expressive language ability of children. The analysis used normative BAS scores, derived from the standard BAS tables and defined with reference to the standardisation samples used in developing the assessments; these scores have also been adjusted according to the age of the cohort child and in these analyses converted into z scores. Increases in the scale signify increases in cognitive ability.

Bracken Basic School Readiness

2.7 The School Readiness Composite (SRC) comprises six subtests of the Revised Bracken Basic Concept Scale measuring children's knowledge of those 'readiness' concepts that parents and teachers traditionally teach children in preparation for formal education (Bracken, 1998). The assessment has been designed for children in the age range of 2 years 6 months through to 7 years and 11 months. The six subtests of the SRC comprise the assessment of children's basic concepts such as colours, letters, numbers/counting, sizes, comparisons and shapes. The assessment is individually administered. The analysis used SRC normative scores, which were derived from standard BAS and Bracken tables and defined with reference to the standardisation samples used in developing the assessments; these scores have also been adjusted according to the age of the cohort child and in these analyses converted into z scores. Increases in the scale signify increases in cognitive ability.

Strengths and Difficulties Scales

2.8 Behavioural adjustment of the children is measured with the Strength and Difficulties Questionnaire (SDQ). The SDQ is a behavioural screening questionnaire for 3 to 16 years olds (Goodman, 1997, 2001; Goodman, Meltzer, & Bailey, 1998). It consists of 25 items generating an overall scale, as well as scores for its five subscales measuring conduct problems, hyperactivity, emotional symptoms, peer problems and pro-social behaviour. The items were assessed via parental report, normally the mother, in the computer assisted self-completion module. For the following analysis an overall difficulties mean score for the whole sample was computed by summing replies to the first four of these subscales, scale range 1 to 20, indicating behaviour problems, i.e. conduct problems, hyperactivity, emotional symptoms, and peer problems. Increases in the scale represent increases in problem behaviour. Scores of between 14 and 16 are classified as borderline and scores of 17 and above are classified as abnormal. The estimated raw mean score was 9.3 (CI +/- 0.16). Ten per cent of boys had scores in the abnormal range, whereas for girls, the worst 10% was in the borderline region.

2.9 The analysis showed that children in Scotland who lived in families with one or two parents earning, or had no gross motor delays at 9-10 months, also gained greater BAS vocabulary ability advantage from these characteristics than the equivalent children in the rest of the UK.

Bracken Basic School readiness analyses

2.10 Children in Scotland did better, on average, in the Bracken school readiness assessment than children in the rest of the UK (Table A2.1). Girls also did better, on average, than boys. The lead in average scores in Scotland is equivalent to about two months' progress, while girls, on average, are three months ahead of boys. As with the BAS vocabulary score, it was not possible to account for this difference using a number of other factors separately; the differential in Bracken school readiness scores remained after trying to explain it by differences in the child's gender, family type, parental education, parental employment, parental occupation and annual family income with two minor exceptions. Children with parents with highest education at NVQ level 2, or parents in small employer or self employed occupations did have the same mean Bracken school readiness scores in Scotland as in the rest of the UK.

2.11 However, when considering these factors in combination, the advantage of children in Scotland in the Bracken school readiness assessment over those in the rest of the UK was fully explained (Table A2.3). The differences found in average scores between children in Scotland and the rest of the UK are due to the characteristics of MCS families rather than due to being a child in Scotland per se.

2.12 Factors that were found in this analysis to explain children's Bracken school readiness scores in both Scotland and the rest of the UK and were associated with them having higher scores were:

- Being a girl;
- Having a parent with higher educational qualifications;
- Family income above the poverty threshold;
- Having one parent, but not necessarily two parents, earning;
- Having a parent in the highest socio-economic status group; and
- Having no gross motor development delays at age 9-10 months.

2.13 School readiness scores of children in Scotland were higher than those for children in the rest of the UK when they had one or two of their parents employed and earning, and also when either parent was in a professional or managerial job.

Total difficulties analyses

2.14 Children in Scotland had lower mean scores on this total difficulties behavioural scale, signalling fewer problems on average than children in the rest of the UK, and than children in England and Wales but not children in Northern Ireland (Table A2.1). It was not possible to explain this difference by examining a range of factors separately; that is the difference was not due to the child's gender, family type, annual family income and most levels of parental education, parental employment, parental occupation, when considered separately.

2.15 However, the behaviour advantage of children in Scotland over those in the rest of the UK on the total behavioural difficulties scale was fully explained by this range of factors in combination (Table A2.4). The difference between children in Scotland and those in the rest of the UK was due to the combination of the gender of the child and the characteristics of

MCS families (their family type, annual family income, levels of parental education, parental employment, parental occupation) rather than due to being a child in Scotland per se.

2.16 Factors that were found in this analysis to be significantly associated with children's problem behaviour scores in both Scotland and the rest of the UK and were associated with them having fewer problems were:

- Being a girl;
- Having a parent with higher educational qualifications;
- Family income above the poverty threshold;
- Having one parent or two parents earning;
- Having a parent in the highest socio-economic status group;
- Having no fine motor development delays at age 9-10 months.

2.17 However, in many of these relationships problem behaviour was lower for children in Scotland than for children in the rest of the UK, for a given characteristic.

Conclusions

2.18 In conclusion, MCS children in Scotland have a small but significantly higher BAS vocabulary score than children in the rest of the UK at age 3. This cannot be explained by the gender of the child or the characteristics of MCS families. It must be due to other factors that differ between Scotland and the rest of the UK. These could be differences in early years education provision, in pre-school education, activities in the home or in grandparent influence. These are factors that cannot be assessed in this analysis.

2.19 The apparent advantages on the Bracken school readiness scale and on the problem behaviour scores of children in Scotland over those in the rest of the UK were both fully explained by the characteristics of MCS families, namely their parents' education, socio-economic status and family income.

2.20 The analysis also revealed that children in Scotland sometimes gained more ability or behaviour advantages than children in the rest of the UK, when they had parents with higher incomes or parents in high-level occupations. Why this should be the case is unclear. It is not likely to be due to the biased attrition in the MCS 2 sample since the main ways in which the MCS2 sample was biased have been taken into account in these analyses.

3. FAMILY POVERTY AT AGE 3

3.1 The proportion of UK cohort families in income poverty at MCS2 averaged 26%. The proportion of families in Scotland falling below this threshold in sweep 2 was lower at 21%, a slight decrease on the figure at MCS sweep1 at 23%. Some of this difference in poverty rate at MCS2 is due to the disproportionate loss of low income families from the MCS2 sample of families in Scotland.

3.2 Changes took place in families' financial circumstances between MCS sweeps 1 and 2. The flows between living in and out of poverty showed distinctive and significant differences in Scotland from the rest of the UK. MCS families in Scotland were both significantly less likely to move into poverty over this period, and more likely to move out of it, than MCS families in the rest of the UK. Whereas 12% of families who were not in poverty in Scotland at MCS1 ended up in poverty at MCS2, the equivalent figure for the rest of the UK was 15%². Also, 44% of families who were in poverty in Scotland at MCS1 moved out of this state by MCS2, compared with 36% of families in the rest of the UK³. The relative sizes of these flows are significantly different by country and this meant that Scotland maintained its lower rate of family poverty at MCS2 compared to the rest of the UK.

3.3 We considered two measures of poverty, family income poverty and whether the family was in receipt of any means tested benefits. By using two measures of poverty, it is notable immediately that Scotland only has a lower level of 'poverty' than the rest of the UK when using the family income measure of poverty (Table A3.1). Scotland did not appear to be at an advantage on the receipt of 'means-tested benefits as the measure of poverty.'⁴ (Only the results from the family income measure are presented in the Annex tables.)⁵ A range of independent explanatory factors were considered in seeking to explain whether families lived in poverty at MCS 2. These included mothers' highest educational qualifications, whether she was employed during pregnancy, mother's age at birth, number of siblings at MCS2, type of area lived in, and a combined marital status and household employment status variable at MCS2. In addition, measures of mother's ethnicity were included when analysing data for the rest of the UK separately. Although mothers from minority ethnic groups were uncommon in Scotland (and insufficient in size to analyse in the Scotland data), they were important and over-represented groups in the England sample and therefore in the UK sample as a whole.⁶ The factors listed above and considered in our analyses had been found to be significant predictors of child poverty in earlier studies or in

² This difference is significant on a Chi square test comparing destinations of those who started out above poverty by country. Chi square = 20.26, > critical Chi stat 3.84 at 0.05 df=1

³ This difference is significant on a Chi square test comparing destinations of those who started out in poverty by country. Chi square = 10.86, >critical Chi stat 3.84 at 0.05 df=1.

⁴ It is worth noting that the family income measure of poverty has considerably fewer observations for analysis than the means-tested benefit model. This is because there was a larger item non-response from MCS2 families on the income question than on other questions.

⁵ There is large overlap between these measures, but they are not identical; 86% of those on means tested benefits are also poor on a low income measure although only 60% of those who are poor on low income are receiving means-tested benefits. We focus on family income poverty since this is the only measure that is different at the mean in Scotland and the rest of the UK at the outset. The results were largely similar from the multivariate logistic regressions showing the relationships between being on means tested benefits and the same set of factors in combination as were explored using the family income measure as the dependent variable.

⁶ The results of including ethnicity variables into the models are not included since they did not alter the main findings on other variables.

analyses of the Millennium Cohort Study Sweep one data (Gregg et al, 1999; Bradshaw, 2001; Bradshaw et al, 2005).

Defining Poverty in the Millennium Cohort Study

3.4 The derivation of an income poverty rate for the MCS is not straightforward. In order to maintain response rates, respondents were asked to specify which of 18 income bands their family income⁷ belonged to, instead of asking them to specify an actual figure for their income. The survey questionnaire used separate income bands for lone parents and for couples. In order to produce an estimate of family income we assigned the central value of the income band to all the families belonging to that particular band. For the top and bottom categories of the income bands, we took respectively, the top and bottom thresholds of the band as the household income. This procedure artificially reduces the estimated range of family income.

3.5 Having established income we need to “equivalise” it to take account of the needs of families of different sizes and compositions. For the calculation of equivalent income we used a modified version of the McClements equivalence scale⁸ which excludes other adults in the family since we did not have information about their income, also used by the government in its annual publication of Households Below Average Income around the time of the first sweep of MCS data in 2001-02. Also, we did not take account of the detailed child weights in the McClements scale partly on the grounds that it gives a weight of only 0.09 for babies, 0.18 for a child aged 3. Instead we assigned to children under 16 in the household the average of the child weights of 0.23. This approach to equivalence was adopted in this Report, since it was the approach used in MCS1 and thus allows for comparison with earlier findings from sweep 1.

Income poverty

3.6 Two measures of poverty are offered in this Report. One is based on family income and the other on means-tested benefits. The mean of total equivalised family income for MCS2 families was £341.33 per week and the median was £281.43 per week.

Family income poverty.

3.7 The poverty threshold, creating a binary value 0/1 equal to ‘1’ if MCS family income was below 60 percent of national median income before housing costs. The proportion of families with equivalent income below a poverty threshold was 26.8 percent. This MCS poverty measure is higher than the national child poverty estimate around the same time of 21 percent in the HBAI (DWP 2005) although the HBAI calculation includes families with children of all ages and MCS families are a selective sample who all had at least a baby age 9-10 months at Sweep 1 and age 3 at Sweep2.

Means tested benefits

3.8 This measure is a binary value and equals 1 if the MCS family was in receipt at MCS2 of any of Income Support, Housing Benefit, Job Seekers Allowance, Working Tax Credit or Council Tax credit.

⁷ Family income is only asked of lone parents and couples and does not include income earned by other adults living in the household.

⁸

McClements equivalence scale	
Number of people in family	Equivalence scale
Head	0.61
Spouse	0.39
Each additional adult (over 16) (<i>Not used in our calculations</i>)	(0.45)
Each child (<i>modified to 0.23 in our analysis</i>)	(0.09-0.36)

3.9 Analysing the family income poverty measure, Scotland's advantage is fully explained by the mother's personal characteristics (ethnicity, age at birth, family size, her education level and employment and partnership status) (Tables A3.2). We can conclude therefore, that the characteristics of MCS mothers in Scotland, and particularly their higher levels of education, employment and partners are responsible for the lower rate of family poverty in the MCS data in Scotland compared to the rest of the UK.

3.10 When examining the other potential explanatory variables in this analysis, the results are as we would expect. These relationships are the same across both measures of poverty.

3.11 The risk of poverty is lower:

- as mothers' educational qualifications increase;
- if the mother was employed during the pregnancy;
- if mothers were over 20 at the birth of the cohort child;
- in two earner families.

3.12 The risk of poverty is higher:

- as family size increases to 3 or more children;
- living in a ward that is classified as disadvantaged;
- in lone parent families and especially where the lone parent is not earning;
- for mothers in certain minority ethnic groups.

3.13 As a second stage, we examined the odds ratios of being in poverty for the Scotland sample only and the rest of the UK sample only (Tables A3.3, A3.4). This allowed for the relationships between independent predictors and the poverty measure to vary between Scotland and the rest of the UK. However, one has to recognise that the sample size for this exercise is much lower for Scotland than for the rest of the UK and we would expect, therefore, that fewer of the explanatory variables would reach significance levels in Scotland, compared to the rest of the UK. This expectation turned out to be correct.

3.14 The risk of poverty, due to larger family size or living in a disadvantaged area was found to be less in Scotland than in the rest of the UK. On the other hand, the risk of poverty due to being in a married no-earner family, a cohabiting no-earner family, a cohabiting one-earner family or a lone parent no-earner family was found to be very substantially higher in Scotland than in the rest of the UK, for the equivalent family economy.⁹

3.15 In conclusion, the MCS Scotland advantage of experiencing lower family income poverty than the rest of the UK is to be explained by Scotland's MCS mothers and their families having characteristics that are keeping them out of poverty to a greater extent than mothers in the rest of the UK. However, the analyses found there were a few ways in which the treatment of Scotland's MCS mothers differs from those in the rest of the UK, given their characteristics. The combined differences in MCS2 mothers' characteristics between

⁹ The relationships shown between means-tested benefits varied a little from those shown with family income poverty. Having a large family size was significantly associated with being more likely to be on means-tested benefits in the rest of the UK, but was not associated with these benefits in Scotland. On the other hand, living in a disadvantaged area or having no earners in the family had a higher chance of being on means-tested benefits in Scotland than in the rest of the UK.

Scotland and the rest of the UK fully explained, therefore, the lower poverty rate among MCS2 families in Scotland. In part this difference in mothers' characteristics was due to differential response rates of MCS1 families at the MCS2 interview in Scotland compared with the rest of the UK. These differences in responses have left the MCS2 sample of mothers in Scotland proportionately more highly educated and more prosperous than those in the rest of the UK. The lower poverty rate in Scotland is therefore an artefact of the data.

4. BREASTFEEDING OF BABIES

4.1 At the first interview of the Millennium Cohort Study (age 9-10 months) mothers were asked whether they had ever breastfed the cohort baby. Rates of ever breastfeeding varied considerably by UK country. The highest rate of ever breastfeeding was 72.2% in England, and the lowest was in Northern Ireland at 51.2%. In Scotland 64.7% of mothers said they had breastfed their baby for at least one day, a rate that is lower than the rest of the UK average (67.3%). Clearly the much higher rate of ever breastfeeding among England mothers has pulled up the average substantially. Scotland mothers' rate of breastfeeding for at least one month, 42.2%, was also lower than the UK average of 44.8%. The England sample of the Millennium Cohort Study contained sizeable numbers of mothers from minority ethnic groups, and minority ethnic mothers are known to have higher rates of breastfeeding than white mothers in England. This difference may be responsible in part or in whole for the much higher rates of breastfeeding in England and the higher average for the rest of the UK.

4.2 This analysis set out to examine whether the lower rate of breastfeeding among the MCS Scotland sample of mothers could be explained by the varying characteristics of MCS mothers in Scotland compared with the rest of the UK. The analysis examined whether a range of factors in combination, either known or suspected to influence mother's breastfeeding decisions, explained the difference between Scotland and the rest of the UK. Earlier studies suggested the following factors separately influenced mother's decisions to start breastfeeding their baby; whether the pregnancy was planned, attending an antenatal class, the mode of delivery, whether the mother was accompanied at the birth, whether the baby was admitted to special care and the duration of hospital stay, socio-economic status, ethnicity, mothers' educational qualifications, lone mother status, age at birth, age at first ever live birth, and parity (Bartington et al, 2006; Beresford, 2002; Griffiths et al, 2005; Hamlyn et al, 2002).

4.3 The factors that were analysed (in a logistic regression model) to examine whether they explained breastfeeding behaviour included: the mother's marital status, her highest educational qualification, whether she worked in pregnancy, mother's age at the birth of the cohort child, mother's ethnicity, the number of siblings to the cohort child and a selection of experiences around the birth. These variables were all collected at the first interview of MCS, and relied in most cases on mothers' recall about a period 9-10 months earlier. We also considered whether the sex of the child had any explanatory value. Other potential explanatory factors were analysed but dropped due to their lack of statistical significance, sometimes because they were highly correlated with existing variables.¹⁰

4.4 The odds ratio of a mother in Scotland ever breastfeeding the cohort child was lower at 0.834 ($p=0.000$) compared with a mother in the rest of the UK ever breastfeeding.

¹⁰ The other variables which were considered but, in the end, dropped, included National Statistics-Socio Economic Classification groups (NS-SEC) which did not retain significance along with highest education and some of the other variables; whether the mother 'never worked'; whether mother took maternity leave; whether mother received maternity payments in addition to the statutory minimum; housing tenure; whether father was not employed; whether employed fathers took paternity leave at the birth; whether employed fathers took annual leave or sick leave at the birth; a wider range of variables to cover other children in the family and their ages, whether the baby was taken to special care or intensive care unit after the birth; whether the pregnancy was planned.

4.5 After considering the range of explanatory factors in combination using the whole UK sample, the effect on ever breastfeeding of living in Scotland continued to be significant, and the odds ratio was reduced further (Table A4.1). A mother in Scotland is two-thirds as likely to breastfeed as a mother in the rest of the UK, after all of the other factors in combination were taken into consideration. So differences between UK countries in the MCS mothers' characteristics did not explain the lower rate of breastfeeding among Scotland's mothers.

4.6 The other predictors in the model were largely similar to those found in other studies of mother's breastfeeding behaviour. However, some of the predictors found to be significant in other studies were not significant in this analysis, (eg. the baby going to a special care unit after birth), largely through having correlations with other entered variables.

4.7 Factors that increased the chance of ever breastfeeding included:

- Being married over being cohabiting;
- Having higher educational qualifications compared with none;
- Being an older mother compared with the youngest mothers (14-21);
- Being the first child;
- The mother attending antenatal classes before the birth;
- Having a boy child.

4.8 Mothers from all of the minority ethnic groups were far more likely than white mothers to breastfeed their babies.

4.9 Factors that decreased the chance of ever breastfeeding included:

- Being a lone parent;
- Having a caesarean section delivery;
- Being alone at the birth.

4.10 In all of these cases mothers in Scotland had similar odds of breastfeeding as mothers in the rest of the UK with the same characteristics. However, due to the smaller sample size for Scotland, the odds ratios were not always significant in the Scotland model.

4.11 In conclusion, the lower rate of breastfeeding among mothers in Scotland compared to the rest of the UK is still a puzzle. It is not explained by the differences in characteristics between MCS mothers in Scotland and those in the rest of the UK, as far as we have been able to investigate. The lower rates of breastfeeding in Scotland are robust to the adjustment for a wide range of confounders. In fact, they were lower once these other factors are taken into account which suggests that there is a Scottish effect at work. This may have implications for policy and research. Attendance at antenatal class appears to have a stronger positive effect on mothers taking up breastfeeding in Scotland than in the rest of the UK. This suggests that policy should seek ways of encouraging attendance at antenatal classes in order to boost breastfeeding rates in Scotland.

REFERENCES

- Bartington,S. Griffiths,L. Tate,R. Dezateux,C. (2006) ‘Are breastfeeding rates higher among mothers delivery in Baby Friendly accredited maternity units in the UK?’ *International Journal of Epidemiology* 35 pp.1178-86.
- Beresford, B. (2002) ‘Children’s health’ in Bradshaw,J. (ed) *The well-being of children in the UK*, London: Save the Children.
- Bracken, B. A. (1998). *Bracken. Basic Concept Scale - Revised*. San Antonio, TX: The Psychological Corporation.
- Bradshaw,J. (2001) *Poverty: The outcomes for children*, London: Family Policy Studies Centre.
- Bradshaw,J. Mayhew,E. Dex,S.Joshi,H. and Ward,K, ‘Socio-economic origins of parents and child poverty’, in Dex,S. and Joshi,H. (eds.) (2005) *Children of the 21st Century*, Bristol: The Policy Press.
- Bricker, D., Squires, J., Mounts, L., Potter, L., Nickel, B., & Farrell, J. (1995). *Ages and Stages Questionnaire*. Baltimore: Paul H. Brookes.
- Brooks-Gunn,J. and Duncan,G.J. (1997) ‘The effects of poverty on children’, *The Future of Children*, 7(2), pp.55-71.
- Dubow,E.F. and Ippolito,M.E. (1994) ‘Effects of poverty and quality of home environment on changes in academic and behavioural adjustment of elementary school-age children’, *Journal of Clinical Child Psychology*, 23 (4), 401-12.
- DWP (2005) *Households Below Average Income (HBAI) 1994/95-2004/05*, London: Department of Work and Pensions.
- Elliott, C. D. (1983). *British Ability Scales*. Windsor, UK: NFER-Nelson.
- Fenson, L., Dale, P. S., Resnick, J. S., Thal, D., Bates, E., Hartung, J. P., et al. (1993). *MacArthur Communicative Development Inventories (CDI)*. San Diego, CA: Singular Publishing Group.
- Fergusson,D.M. and Horwood,L.J. (2003) ‘Resilience to childhood adversity: results of a 21-year study’, in Luthar (ed) (2003), pp.130-155.
- Frankenburg, W. K., & Dodds, J. B. (1967). Denver Developmental Screening Test *J. Paediatrics*, 71, 181-191.
- Frankenburg, W. K., & Dodds, J. B. (1990). *Denver II screening manual*. Denver, CO: Denver Developmental Materials.
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A Research Note

Journal of Child Psychology and Psychiatry, 38, 581-586.

Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire (SDQ) *Journal of the American Academy of Child and Adolescent Psychiatry*, 40(1337-1345).

Goodman, R., Meltzer, H., & Bailey, V. (1998). The Strengths and Difficulties Questionnaire: A pilot study on the validity of the self-report version *European Child and Adolescent Psychiatry*, 7, 125-130.

Gregg, P., Harkness, S., and Machin, S. (1999) *Child development and family income*, York: Joseph Rowntree Foundation.

Gregg, P. and Washbrook, L. (2005) 'The effects of maternal employment on child development', *Economic Journal*,

Griffiths, L., Tate, R., Dezateux, C. (2005) 'The contribution of parental and community ethnicity to breastfeeding practiced: Evidence from the Millennium Cohort Study', *International Journal of Epidemiology*, 34, pp.1178-86.

Guo, G. (1998) 'The timing of the influences of cumulative poverty on children's cognitive ability and achievement'. *Social Forces*, 77 (1), pp.257-87.

Hamlyn, B., Brooker, S., Oleinikova, K., Wands, S. (2002) *Infant feeding 2000*. London: The Stationery Office.

Luthar, S.S. (ed) (2003) *Resilience and vulnerability: Adaptation in the context of childhood adversities*, Cambridge: Cambridge University Press.

Owens, E.B. and Shaw, D.S. (2003) 'Poverty and early childhood adjustment' in Luthar (ed) (2003). pp. 267-292.

Rutter, M. and Madge, N. (1976) *Cycles of disadvantage: A review of research*, London: Heinemann.

Schoon, I., Sacker, A., Hope, S., Collishaw, S., & Maughan, B. (2005). Children's development in the family environment. In S. Dex & H. Joshi (Eds.), *Babies of the New Millennium* (pp. 159-174): Polity Press.

ANNEX OF TABLES

Details of Millennium Cohort Study

Table A1.1 Achieved Samples in MCS1 and MCS2

	Number of sample 'wards' *	Achieved Responses **							
		Children		Families interviewed		Partners***		Single Parents	
Sweep		1	2	1	2	1	2	1	2
Total UK	398	18,818	15,808	18,552	15,590	13,599	10,479	3,194	2,738
England	200	11,695	10,188	11,533	10,050	8,558	6,849	1,853	1,775
of which									
MCS1 and 2			9489		9,358		6,482		1551
MCS2, New			699		692		367		224
Wales	73	2,799	2,288	2,761	2,261	1,957	1,542	590	440
Scotland	62	2,370	1,841	2,336	1,814	1,758	1,189	375	259
N Ireland	63	1,955	1,491	1,923	1,465	1,326	899	376	264

Notes to table

* counting 'superwards' as a single unit ** all productive contacts ***excluding proxy interviews All numbers unweighted

Table A1.2 MCS1 productives by MCS1 and MCS2 country

		MCS2 UK Country					
		England	Wales	Scotland	Northern Ireland	Country Unknown	Total
MCS1 UK Country	England	83.0	0.3	0.2	0.1	16.5	100
		9305	24	22	7	2175	11533
	Wales	2.0	80.3	0.0	0	17.7	100
		56	2204	1	0	499	2760
	Scotland	1.6	0.2	76.7	0.1	21.4	100
		33	4	1775	2	522	2336
	Northern Ireland	1.1	0	0.1	76.2	22.6	100
	22	0	2	1441	458	1923	
		49.5	13.2	10.6	8.6	18.0	100
	Total	9416	2232	1800	1450	3654	18552

Notes to table

Unweighted numbers and row percents. Country unknown combines unproductive and ineligible'

Table A1.3

MCS2: Summary of MCS2 Survey Elements

Respondent	Mode	Summary of Content
Mother/Father	Interview	Household Module
Mother/main	Interview	Household Module Module A: Non-resident parents Module C: Pregnancy, labour and delivery Module D: Baby's health and development Module E: Childcare Module F: Grandparents and friends Module G: Parent's health
	Self-completion	Module H: - Child's temperament & behaviour - Relationship with partner - Previous relationships - Domestic tasks - Previous pregnancies - Mental health - Attitudes to relationships, parenting,
	Interview	Module J: Employment, income, education Module K: Housing and local area Module L: Interests and time with baby Module N : Older Siblings
Father/Partner	Interview	Module B: Father's involvement with baby Module C: Pregnancy, labour and delivery Module F: Grandparents and friends Module G: Parent's health
	Self-completion	Module H: Self-completion - Baby's temperament & behaviour - Relationship with partner - Previous partners - Previous children - Mental health - Attitudes to marriage, parenting, work,
	Interview	Module J: Employment and education Module L: Interests
Interviewer	Observations	Home Environment Neighbourhood
Child	Assessment	BAS Naming Vocabulary Bracken Basic Concept Scale Height & Weight Oral fluids
Older Siblings (England only)	Self-completion	

Notes to table

* In the vast majority of cases the Main interview was undertaken by the natural mother and the Partner interview was undertaken by the father/father figure.

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		33	4	1775	2	522	2336
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	22	0	2	1441	458	1923	
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Interviewer	Observations	Home Environment Neighbourhood
Child	Assessment	BAS Naming Vocabulary Bracken Basic Concept Scale Height & Weight Oral fluids
Older Siblings (England only)	Self-completion	

Notes to table

* In the vast majority of cases the Main interview was undertaken by the natural mother and the Partner interview was undertaken by the father/father figure.

Table A1.4 Distribution of cohort member's age at MCS2

Age (Months)	UK- N	UK - %	Scotland N	Scotland %
31-34	10	0.063		
35	1756	11		
36	6802	43		
37	3294	21		
38	1506	9.5		
39	731	4.6		
40	410	2.6		
41	267	1.7		
42	179	1.1		
43	158	1.0		
44	140	0.89		
45	149	0.94		
46	104	0.66		
47	102	0.65		
48-54	191	1.2		
Total number of children, %	15799	100		100

Notes to table

Base: MCS2 main sample Note: Interview date is missing for 9 cases.

Table A1.5 Rates of attrition MCS1 to MCS2 by country by NVQ at MCS1 and family income at MCS1

Percent of MCS1 sample non-productive at MCS2

Status At MCS1	England		Wales		Scotland		Northern Ireland	
	%	(N)	%	(N)	%	(N)	%	(N)
NVQ5	9	(364)	7	(53)	13	(98)	16	(83)
NVQ4	9	(2853)	10	(665)	11	(676)	15	(486)
NVQ3	14	(1466)	17	(379)	19	(484)	21	(269)
NVQ2	16	(3256)	19	(881)	25	(615)	24	(579)
NVQ1	20	(1033)	18	(271)	30	(99)	28	(156)
Overseas	25	(436)	19	(44)	32	(37)	30	(34)
None	27	(1989)	29	(446)	37	(287)	30	(295)
Total	15	(11397)	17	(2739)	20	(2296)	22	(1902)
* Income								
Above 60% median income	13	(7470)	15	(1809)	17	(1613)	19	(1191)
Below 60%	25	(3719)	24	(900)	29	(662)	29	(696)
Total*	16	(11426)	17	(2744)	20	(2303)	22	(1912)

Notes to table

* missing on income at MCS1 included in total

Table A2.1 Coefficients on Scotland dummy variable for UK sample as a whole for cognitive and behavioural scores.

	Scotland Dummy No other covariates included	Level of significance P value
BAS Vocabulary	0.242	0.000
Bracken School Readiness	0.155	0.000
SDQ Behaviour Problems	-0.108	0.000
N= 13843		

Notes to table

Base: All MCS2 families one child in family who took the relevant cognitive tests.

Table A2.2 Regression coefficients for British Ability Scale Vocabulary

	BAS – Rest of UK				BAS- Scotland		BAS – All UK	
	Model 1		Model 2		Coefficient, 95 % CI		Coefficient, 95 % CI	
	Coefficient	95 % CI	Coefficient	95 % CI	Coefficient	95 % CI	Coefficient	95 % CI
Constant	0.217	0.10,0.34	0.128	-0.0-0.26	-0.245	-0.62, 0.14	0.160	0.04,0.28
Number of Parents at MCS2								
2 parent family (REF)								
Lone parent or step parent	-0.073	-0.18,0.03	-0.023	-0.13,0.09	0.137	-0.17, 0.44	-0.056	-0.15,0.04
Mother’s highest qualification MCS2								
NVQ level 4 or 5 (REF)								
NVQ Level 3	-0.099	-0.16,-0.04	-0.075	-0.14,-0.01	-0.163	-0.30,-0.03	-0.103	-0.16,-0.05
NVQ Level 3	-0.219	-0.29,0.15	-0.190	-0.26,-0.12	-0.425	-0.63,-0.22	-0.229	-0.29,-0.17
NVQ Level 1	-0.286	-0.40,-0.17	-0.303	-0.42,-0.18	-0.267	-0.61,0.08	-0.286	-0.39,-0.18
No qualifications	-0.471	-0.62,-0.32	-0.587	-0.76,-0.42	-0.469	-0.91,-0.03	-0.469	-0.61,-0.32
Gender								
Girls (REF)								
Males	-0.237	-0.28,-0.19	-0.228	-0.27,-0.19	-0.227	-0.36,-0.09	-0.235	-0.28,-0.19
Mother’s ethnicity								
White (REF)								
Mixed and other	-0.266	-0.41,-0.12					-0.266	-0.41,-0.12
Black	-0.674	-0.83,-0.52					-0.616	-0.78,-0.45
Asian	-0.877	-1.07,-0.68					-0.877	-1.07,-0.68
Household income at MCS2								
Below 60% median income (REF)								
Above median income	0.134	0.06,0.21	0.193	0.12,0.27	0.159	-0.12,0.44	0.133	0.06,0.20
Income missing	0.110	0.01,0.21	0.097	-0.02,0.21	0.053	-0.29,0.39	0.106	0.01,0.20
Country at MCS2								
England, Wales, NI (REF)								
Scotland							0.118	0.04,0.20
Household employment status MCS2								
No earners (REF)								
1 parent working	0.227	0.11,0.35	0.218	0.10,0.34	0.520	0.12, 0.92	0.247	0.13,0.36
2 parents working	0.206	0.10,0.31	0.186	0.08,0.30	0.488	0.07,0.91	0.230	0.13,0.33
Highest parental occupation status MCS2								
Professional/managerial (REF)								
Intermediate	-0.080	-0.15,-0.01	-0.086	-0.15,-0.02	-0.023	-0.24,0.19	-0.079	-0.14,-0.01
Small employer and self employed	-0.064	-0.14,0.01	-0.082	-0.16,-0.00	-0.100	-0.34,0.14	-0.065	-0.14,0.01

Lower supervisory	-0.148	-0.24,-0.06	-0.135	-0.22,-0.05	-0.101	-0.29,0.09	-0.146	-0.23,-0.06
Semi routine and routine	-0.193	-0.29,-0.10	-0.217	-0.32,-0.12	-0.213	-0.52,0.09	-0.195	-0.29,-0.10
Gross motor skills at 9 months								
No delays (REF)								
1+ delay	-0.129	-0.20,-0.05	-0.125	-0.20,-0.05	-0.225	-0.50,0.05	-0.134	-0.21,-0.06
Fine motor skills at 9 months								
No delays (REF)								
1+ delays	0.049	-0.03,0.13	0.024	-0.06,0.11	-0.035	-0.22,0.15	0.045	-0.03,-0.06
R squared	0.126		0.091		0.093		0.125	

Notes to table

Base: All MCS2 families one child in family who completed the BAS Vocabulary test at 3 years and had complete information on other covariates. Dependent variable test scores converted to Z scores

Table A2.3 Regression coefficients for Bracken School Readiness scale

	Bracken – Rest of UK				Bracken- Scotland		Bracken – All UK	
	Model 1		Model 2		Coefficient, 95 % CI		Coefficient, 95 % CI	
	Coefficient	95 % CI	Coefficient	95 % CI	Coefficient	95 % CI	Coefficient	95 % CI
Constant	0.384	0.25,0.52	0.343	0.20,0.48	-0.132	-0.56,0.30	0.336	0.20,0.47
Number of Parents MCS2								
2 parent family (REF)								
Lone parent or step parent	-0.089	-0.20,0.02	-0.068	-0.18,0.05	0.015	-0.25,-0.12	-0.079	-0.18,0.03
Mother’s highest qualification MCS2								
NVQ level 4 or 5 (REF)								
NVQ Level 3	-0.199	-0.27,-0.13	-0.192	-0.26,-0.12	-0.256	-0.41,-0.10	-0.204	-0.27,-0.14
NVQ Level 3	-0.374	-0.44,0.30	-0.363	-0.43,-0.29	-0.382	-0.62,-0.14	-0.374	-0.44,0.31
NVQ Level 1	-0.470	-0.58,-0.36	-0.479	-0.59,-0.37	-0.303	-0.75,0.14	-0.463	-0.57,-0.35
No qualifications	-0.604	-0.75,-0.46	-0.655	-0.80,-0.51	-0.550	-1.0,-0.08	-0.604	-0.74,0.47
Gender								
Girls (REF)								
Males	-0.239	-0.29,-0.19	-0.235	-0.28,-0.19	-0.247	-0.37,-0.12	-0.240	-0.29,-0.19
Mother’s ethnicity								
White (REF)								
Mixed and other	-0.024	-0.17,0.12					-0.028	-0.17,0.11
Black	-0.489	-0.73,-0.25					-0.450	-0.69,-0.21
Asian	-0.327	-0.50,-0.16					-0.329	-0.50,0.16
Household income MCS2								
Below 60% median income (REF)								
Above median income	0.244	0.17,0.32	0.264	0.19,0.34	0.271	0.03, 0.51	0.245	0.17,0.32
Income missing	0.114	0.02,0.21	0.102	0.00,0.20	0.359	0.06, 0.65	0.132	0.04,0.22
Country MC2								
England, Wales, NI (REF)								
Scotland							0.049	-0.04,0.14
Household employment status MCS2								
No earners (REF)								
1 parent working	0.106	-0.02,0.23	0.108	-0.01,0.23	0.523	0.16 ,0.88	0.134	0.02,0.25
2 parents working	0.095	-0.04,0.23	0.101	-0.03,0.23	0.412	0.05, 0.77	0.115	-0.01,0.24
Highest parental occupation status MCS2								
Professional/managerial (REF)								
Intermediate	-0.100	-0.18,-0.02	-0.105	-0.18,-0.03	-0.244	-0.40,-0.09	-0.109	-0.18,-0.04
Small employer and self employed	-0.234	-0.33,0.14	-0.234	-0.33,-0.14	-0.468	-0.77,-0.17	-0.248	-0.34,0.16
Lower supervisory	-0.326	-0.42,-0.24	-0.320	-0.41,-0.23	-0.274	-0.52,-0.03	-0.319	-0.40,-0.23
Semi routine and routine	-0.326	-0.42,-0.24	-0.333	-0.42,-0.24	-0.500	-0.78,-0.22	-0.336	-0.42,-0.25
Gross motor skills at 9 months								
No delays (REF)								
1+ delay	-0.115	-0.19,-0.04	-0.116	-0.19,-0.04	-0.122	-0.32,0.08	-0.112	-0.18,-0.04

Fine motor skills at 9 months								
No delays (REF)								
1+ delays	0.081	-0.01,0.17	0.072	-0.02,0.16	0.039	-0.24,0.32	0.075	-0.01,0.16
R squared	0.154		0.150		0.152		0.153	

Notes to table

Base: All MCS2 families one children age 3 who took the Bracken assessment and had complete information on other covariates. Dependent variable test scores converted to Z scores

Table A2.4 Regression coefficients for Total Difficulties scale

	Rest of UK				Scotland		All UK	
	Model 1 Coefficient, 95 % CI		Model 2 Coefficient, 95 % CI		Coefficient, 95 % CI		Coefficient, 95 % CI	
Constant	-0.178	-0.33,0.02	-0.162	-0.31,-0.01	-0.042	-0.48,0.40	-0.158	-0.31,-0.01
Number of Parents MCS2								
2 parent family (REF)								
Lone parent or step parent	0.028	-0.10,0.15	0.017	-0.11,0.14	0.044	-0.18,0.27	0.030	-0.09,0.15
Mother's highest qualification MCS2								
NVQ level 4 or 5 (REF)								
NVQ Level 3	0.134	0.07,0.19	0.131	0.07,0.19	0.150	0.01,0.29	0.136	0.08,0.19
NVQ Level 3	0.280	0.22,0.34	0.275	0.21,0.34	0.388	0.19,0.58	0.287	0.23,0.35
NVQ Level 1	0.252	0.10,0.40	0.248	0.10,0.40	0.304	-0.17,0.78	0.257	0.11,0.40
No qualifications	0.370	0.21,0.53	0.393	0.24,0.55	0.527	-.12,0.94	0.383	0.23,0.53
Gender								
Girls (REF)								
Males	0.192	0.15,0.024	0.189	0.15,0.23	0.204	0.09,0.31	0.194	0.15,0.23
Mother's ethnicity								
White (REF)								
Mixed and other	0.022	-0.12,0.16					0.021	-0.12,0.16
Black	-0.097	-0.22,0.03					-0.093	-0.21,0.03
Asian	0.258	0.12,0.40					0.262	0.12,0.40
Household income MCS2								
Below 60% median income (REF)								
Above median income	-0.127	-0.21,-0.05	-0.138	-0.22,-0.06	-0.264	-0.53,0.01	-0.136	-0.21,-0.06
Income missing	-0.063	-0.17,0.04	-0.069	-0.17,0.04	-0.107	-0.43,0.21	-0.064	-0.17,0.04
Country MCS2								
England, Wales, NI (REF)								
Scotland							-0.038	-0.10,0.02
Household employment status MCS2								
No earners (REF)								
1 parent working	-0.165	-0.31,-0.01	-0.160	-0.31,-0.01	-0.145	-0.58,0.28	-0.175	-0.32,-0.03
2 parents working	-0.215	-0.37,-0.06	-0.213	-0.36,-0.06	-0.276	-0.69,0.14	-0.213	-0.36,-0.07

	Rest of UK				Scotland		All UK	
	Model 1 Coefficient, 95 % CI		Model 2 Coefficient, 95 % CI		Coefficient, 95 % CI		Coefficient, 95 % CI	
Highest parental occupation status MCS2								
Professional/managerial (REF)								
Intermediate	0.093	0.01, 0.17	0.100	0.02,0.17	0.221	0.05,0.39	0.104	0.03,0.18
Small employer and self employed	0.052	-0.04,0.14	0.058	-0.03,0.15	0.122	-0.10,0.35	0.057	-0.03,0.14
Lower supervisory	0.281	0.19,0.38	0.279	0.19,0.37	0.212	-0.06,0.49	0.275	0.19,0.36
Semi routine and routine	0.323	0.22,0.43	0.325	0.22,0.43	0.445	0.15,0.74	0.333	0.23,0.43
Gross motor skills at 9 months								
No delays (REF)								
1+ delay	0.030	-0.04,0.10	0.030	-0.04,0.10	0.045	-0.14,0.23	0.028	-0.04,0.10
Fine motor skills at 9 months								
No delays (REF)								
1+ delays	0.077	-0.01,0.16	0.075	-0.01,0.16	0.225	-0.05,0.50	0.086	0.01,0.17
R squared	-0.095		0.092		0.119		0.096	

Notes to table

Base: All MCS2 families -one child in family whose mother gave information about the SDQ scale and had complete information on other covariates

Table A3.1. Logistic regression odds ratios from including Scotland dummy only in the model of families living in income poverty at MCS2.

	All mothers		Couple mothers	
	95% CI		95% CI	
Country				
Rest of UK	1.00		1.00	
Scotland	0.837	0.68, 1.03	0.873	0.70, 1.10
Unweighted sample size	12343		10293	

Notes to table

Base: All UK MCS2 main respondent sample with details on income.

Table A3.2 Odds ratios -analysis of families being in poverty at MCS2 across UK sample

	All UK natural mothers				UK Couple mothers	
	Model 1 95% CI		Model 2 95% CI		Model3 95% CI	
Parent's marital status at MCS2						
Married natural parents	1.00		-			
Cohabiting natural parents	1.73	1.50, 2.00	-		-	
Lone natural mother	11.12	9.32,13.26	-		-	
Mother's highest qualification MCS2						
None on the list shown	1.00		1.00		1.00	
NVQ Level 1	0.73	0.57, 0.93	0.83	0.63, 1.10	0.75	0.36, 1.01
NVQ Level 2	0.45	0.38, 0.54	0.55	0.44, 0.66	0.52	0.41, 0.65
NVQ Level 3	0.38	0.31, 0.48	0.46	0.36, 0.59	0.45	0.34, 0.60
NVQ Level 4	0.21	0.17, 0.26	0.25	0.20, 0.32	0.24	0.18, 0.31
NVQ Level 5	0.10	0.06, 0.16	0.11	0.06, 0.19	0.12	0.07, 0.21
Overseas qualifications only	0.89	0.83, 1.25	0.95	0.67, 1.33	0.80	0.54, 1.17
Employment during pregnancy						
No	1.00		1.00		1.00	
Yes	0.28	0.24, 0.33	4.83	2.44, 6.78	4.87	3.45, 6.87
Mother's age at birth						
14 to 19	1.00		1.00		1.00	
20 to 29	0.44	0.35, 0.54	0.49	0.39, 0.62	0.37	0.28, 0.48
30 to 39	0.27	0.21, 0.37	0.31	0.24, 0.39	0.24	0.18, 0.31
40 plus	0.32	0.20, 0.51	0.33	0.20, 0.55	0.30	0.18, 0.51
Mother's ethnicity						
White	1.00		1.00		1.00	
Mixed	1.70	0.79, 3.68	1.37	0.56, 3.34	1.80	0.71, 4.58
Indian	2.49	1.47, 4.23	2.47	1.47, 4.13	2.54	1.49, 4.30
Pakistani or Bangladesh	4.61	3.28, 6.49	5.05	3.65, 6.99	5.02	3.60, 7.06
Black or Black British	1.83	1.18, 2.84	1.57	1.04, 3.18	1.90	1.16, 3.08
Other	1.78	1.07, 2.32	1.84	1.07, 3.18	1.88	1.05, 3.36
Number of siblings of baby at MCS2						
Only child	1.00		1.00		1.00	
1 Sibling	1.06	0.89, 1.25	1.04	0.87, 1.24	0.97	0.79, 1.19
2 Siblings	1.74	1.42, 2.13	1.68	1.35, 2.09	1.66	1.30, 1.19
3+ Siblings	3.51	2.80, 4.41	3.10	2.43, 3.96	3.22	2.50, 4.17
Country at MCS2						
England						
Wales						
Scotland	1.10	0.92, 1.32	1.07	0.88, 1.31	1.03	0.82, 1.27
Northern Ireland						
Type of ward						
Non-disadvantaged	1.00		1.00		1.00	
Other disadvantaged	1.69	1.46, 1.96	1.51	1.29, 1.77	1.70	1.44, 2.09
Minority ethnic	1.46	1.07, 1.99	1.26	0.92, 1.73	1.34	0.97, 1.84

	All UK natural mothers			UK Couple mothers	
	Model 1 95% CI	Model 2 95% CI		Model3 95% CI	
Combined marital and employment status at MCS2					
Married, both employed	-	1.00		1.00	
Married, one earner	-	10.89	7.59, 15.63	10.92	7.55, 15.77
Married, zero earners	-	127.76	73.4, 222.4	125.65	71.55, 2220.7
Cohabiting, both employed	-	1.30	1.01, 1.69	1.25	0.97, 1.62
Cohabiting, one earner	-	17.99	12.4, 26.18	17.41	11.93, 23.42
Cohabiting, zero earners	-	230.73	126.9, 419.7	211.96	116.9, 384.5
Lone, earner	-	6.07	4.75, 7.76	-	-
Lone, not employed	-	378.37	240.7, 594.7	-	-
Unweighted sample size	12291		12267		10225
F statistic	89.31		75.67		59.16
P value (F)	<0.001		<0.001		<0.001

Notes to table

Base: All UK MCS2 main respondent sample with full details on income and other covariates

Table A3.3 Odds ratios - analysis of families being in poverty at MCS2 in Scotland sample and Rest of UK

	Scotland				Rest of UK			
	Scotland		All natural mothers		Rest of UK		Rest of UK	
	Model 1 95 % CI	Model 2 95% CI	Model 3 95% CI	Model 4 95% CI	Model 1 95 % CI	Model 2 95% CI	Model 3 95% CI	Model 4 95% CI
Parent's marital status MCS2								
Married natural parents	1.00	-	1.00	-	1.00	-	1.00	-
Cohabiting natural parents	2.70	1.91, 3.69	1.53	1.31, 1.79	1.53	1.31, 1.79	1.53	1.31, 1.79
Lone natural mother	13.40	8.51,20.6	10.3	8.53, 12.33	10.3	8.53, 12.33	10.3	8.53, 12.33
Mother's highest qualification MCS2								
None on the list shown	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NVQ Level 1	0.90	0.38, 2.24	1.00	0.36, 2.83	0.68	0.53, 0.87	0.77	0.58, 1.01
NVQ Level 2	0.37	0.24, 0.61	0.48	0.28, 0.81	0.43	0.35, 0.53	0.51	0.41, 0.64
NVQ Level 3	0.29	0.18, 0.48	0.36	0.20, 0.64	0.38	0.30, 0.48	0.45	0.35, 0.58
NVQ Level 4	0.17	0.09, 0.32	0.22	0.11, 0.44	0.21	0.17, 0.27	0.24	0.19, 0.31
NVQ Level 5	0.11	0.03, 0.39	0.14	0.04, 0.46	0.11	0.07, 0.19	0.13	0.07, 0.22
Overseas qualifications only	0.51	0.12, 2.16	0.40	0.12, 1.35	1.06	0.76, 1.48	1.13	0.82, 1.57
Employment during pregnancy								
No	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	0.23	0.16, 0.31	4.22	2.15, 8.25	0.28	0.24, 0.33	5.14	3.52, 7.49
Mother's age at birth								
14 to 19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20 to 29	0.45	0.22, 0.88	0.49	0.24, 1.03	0.46	0.37, 0.58	0.52	0.40, 0.66
30 to 39	0.30	0.14, 0.64	0.35	0.15, 0.81	0.27	0.21, 0.35	0.30	0.23, 0.40
40 plus	0.33	0.10, 1.02	0.26	0.06, 1.09	0.33	0.20, 0.56	0.35	0.21, 0.60
Number of siblings of baby MCS2								
Only child	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1 Sibling	0.77	0.50, 1.23	0.75	0.46, 1.19	1.06	0.89, 1.26	1.05	0.88, 1.27
2 Siblings	1.75	1.08, 2.92	1.55	0.91, 2.65	1.74	1.40, 2.15	1.72	1.36, 2.16
3+ Siblings	2.55	1.47, 4.68	2.24	1.18, 4.22	3.59	2.83, 4.54	3.20	2.48, 4.11

Type of ward													
Non-disadvantaged	1.00												1.00
Other disadvantaged	1.8	1.31, 2.52				1.05, 2.28							1.61
Minority ethnic													2.82
Combined marital and employment status MCS2													
Married, both employed	-												1.00
Married, one earner	-					6.28, 26.1							12.05
Married, zero earners	-					56.0, 615.6							130.77
Cohabiting, both employed	-					0.98, 3.52							1.19
Cohabiting, one earner	-					15.8, 75.9							16.9
Cohabiting, zero earners	-					90.2, 989.6							217.36
Lone, earner	-					4.00, 15.8							5.63
Lone, not employed	-					321.7, 1884							360.88
Unweighted sample size	1578												10716
F statistic	22.32												75.84
P value (F)	<0.001												<0.001

Notes to table

Base: All MCS2 main respondents natural mothers with full details on income and other covariates

Table A3.4 Odds ratios - analysis of couple families living in poverty at MCS2 .

	Scotland		Rest of UK	
	Couple mothers only			
	95% CI		95% CI	
Mother's highest qualification MCS2				
None on the list shown	1.00		1.00	
NVQ Level 1	0.99	0.34, 2.94	0.68	0.50, 0.92
NVQ Level 2	0.43	0.24, 0.76	0.48	0.38, 0.61
NVQ Level 3	0.36	0.17, 0.73	0.44	0.33, 0.57
NVQ Level 4	0.22	0.10, 0.47	0.23	0.17, 0.30
NVQ Level 5	0.09	0.02, 0.37	0.14	0.08, 0.25
Overseas qualifications only	0.36	0.09, 1.34	0.97	0.68, 1.40
Employment during pregnancy				
No	1.00		1.00	
Yes	4.19	2.10, 8.37	5.22	3.55, 7.66
Mother's age at birth				
14 to 19	1.00		1.00	
20 to 29	0.39	0.16, 0.94	0.39	0.30, 0.52
30 to 39	0.27	0.09, 0.74	0.24	0.18, 0.32
40 plus	0.21	0.04, 0.97	0.32	0.18, 0.57
Number of siblings of baby MCS2				
Only child	1.00		1.00	
1 Sibling	0.65	0.40, 1.05	0.99	0.80, 1.22
2 Siblings	1.37	0.79, 2.37	1.70	1.32, 2.20
3+ Siblings	2.08	1.14, 3.79	3.35	2.56, 4.37
Type of ward				
Non-disadvantaged	1.00		1.00	
Other disadvantaged	1.61	1.07, 2.43	1.83	1.52, 2.19
Minority ethnic			3.26	2.38, 4.47
Combined marital and employment status MCS2				
Married, both employed	1.00		1.00	
Married, one earner	12.91	6.24, 26.7	12.12	8.04, 18.3
Married, zero earners	184.88	55.7, 613	129.45	70.7, 237
Cohabiting, both employed	1.78	0.94, 3.40	1.14	0.86, 1.50
Cohabiting, one earner	33.21	14.7, 74.9	16.47	10.8, 25.1
Cohabiting, zero earners	287.24	85.3, 967	200.07	103, 386
Lone, earner				
Lone, not employed				
Unweighted sample size	1358		8887	
F statistic	16.83		56.56	
P value (F)	<0.001		<0.001	

Notes to table

Base: All MCS2 main respondents living as couple with full details on income and other covariates

Table A4.1 Odds ratios of whether mothers ever breastfed their MCS baby

	All natural mothers				UK sample	
	Rest of the UK 95% CI		Scotland 95% CI		95% CI	
Parent's marital status MCS1						
Cohabiting natural parents (REF)	1.00		1.00		1.00	
Married natural parents	1.39	1.21-1.58	1.14	0.87-1.49	1.36	1.20-1.53
Lone natural mother	0.67	0.57-0.78	0.78	0.54-1.11	0.68	0.58-0.78
Mother's highest qualification MCS1						
NVQ Level 4 and 5	5.10	4.12-6.31	5.74	3.51-9.36	5.22	4.28-6.36
NVQ Level 3	2.57	2.13-3.09	1.67	1.03-2.71	2.43	2.04-2.88
NVQ Level 1 and 2	1.57	1.31-1.87	1.49	1.00-2.23	1.57	1.33-1.85
Overseas or None (REF)	1.00		1.00		1.00	
Employment during pregnancy						
No	1.00		1.00		1.00	
Yes	1.04	0.92-1.17	1.01	0.78-1.30	1.04	0.93-1.16
Mother's age at birth						
14 to 21	1.00		1.00		1.00	
22 to 26	1.42	1.19-1.67	1.31	0.97-1.75	1.40	1.20-1.62
27 to 31	1.77	1.49-2.08	1.83	1.23-2.69	1.76	1.50-2.05
32-36	2.49	2.04-3.03	2.81	1.90-4.14	2.50	2.08-2.99
37+	2.90	2.27-3.71	3.69	2.23-6.09	2.95	2.35-3.70
Mother's ethnicity						
White	1.00					
Mixed	7.27	3.80-13.88			7.25	3.80-13.81
Indian	2.80	1.89-4.15			2.88	1.95-4.25
Pakistani or Bangladesh	2.67	2.03-3.51			2.77	2.11-3.62
Black or Black British	7.61	4.16-13.89			7.71	4.24-14.02
Other	9.63	4.65-19.92			7.56	3.90-14.64
Number of siblings of baby at birth						
Only child	1.66	1.44-1.90	1.24	0.93-1.60	1.60	1.41-1.82
Has siblings	1.00		1.00		1.00	
Gender						
Girl	1.00		1.00		1.00	
Boy	1.12	1.01-1.23	1.10	0.84-1.43	1.11	1.01-1.22
Country at MCS1						
Rest of UK	1.00		1.00		1.00	
Scotland					0.66	0.55-0.77
Birth experiences						
No caesarean section delivery	1.00		1.00		1.00	
Caesarian section delivery	0.83	0.73-0.94	0.74	0.58-0.93	0.82	0.73-0.92
Birth circumstances						
Gave birth accompanied	1.00		1.00		1.00	
Gave birth alone	0.68	0.54-0.84	0.82	0.44-1.52	0.69	0.56-0.84
Antenatal care						
Not attended antenatal class	1.00		1.00		1.00	
Attended antenatal class	1.58	1.37-1.87	2.06	1.55-2.71	1.63	1.43-1.85
Sample size						
Unweighted sample size						
F statistic	48.61		12.55		55.15	
P value (F)	<0.001		<0.001		<0.001	

Notes to table

Base: All MCS1 main respondent sample in England Wales and Northern Ireland, Scotland or whole UK with full details on benefits and other covariates.

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