

# Millennium Cohort Study

Initial findings from the Age 11 survey







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The MCS team responsible for the Age 11 survey were Lucinda Platt, Lisa Calderwood, Jon Johnson, Kate Smith, Rachel Rosenberg, Robert Browne, Denise Brown, Peter Deane, Alexandra Frosch, Samantha Parsons, Matthew Brown and Tarek Mostafa.

Several of these team members have also contributed to this publication, as well as having responsibility for the development of instruments, deposit of the data and documentation of the survey.

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# Chapter one: Introduction

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**Lucinda Platt**



# Chapter 1: Introduction

**Lucinda Platt**

This volume presents initial findings on a number of key topics arising from the fifth survey of the Millennium Cohort Study (MCS), carried out when the children were aged around 11 years old. It draws attention to some of the important features of contemporary 11-year-olds' lives, particularly those that feed into current policy agendas. It also places this information in the context of what we already know about these children, going back 10 years to when they were first surveyed at around 9 months old. By doing so, it demonstrates the critical value of a cohort study such as the MCS.

Age 11 represents a pivotal moment in children's lives. For many of them, this is their final few months of primary school; and we are surveying them as they are on the cusp of adolescence and all that brings, physically, emotionally and educationally. This is therefore an interesting and important time to consider issues such as growing up and moves towards greater independence and more 'teenage' experiences and behaviours (Chapter 2), as well as educational transitions and attitudes towards the move to secondary school (Chapter 4). Physical development and the complex association of weight gain with pubertal development is a further critical issue at this age (Chapter 6), as is cognitive development and assessment of neuropsychological traits such as propensity to risk-taking and use of strategy in simple 'games' (Chapter 5). Linked to many of these experiences and outcomes is the family context. This is picked up in more detail in Chapter 3, which describes the evolution of family structure across the survey, and discusses the extent to which the nature of family composition per se can be identified with children's outcomes, in particular their behaviour. Chapter 7, meanwhile, explores patterns of poverty across the five surveys and the different family circumstances implied by low income across all five rather than just one or none.

Each chapter is intentionally longitudinal in intention and focus, looking across the children's childhoods from 9 months to 11 years. As the volume title suggests, the chapters are also intended to be exploratory, identifying initial patterns and suggestive relationships and indicating how they might stimulate more in-depth research or further research questions. Technical details are kept to a minimum in this volume, though all analyses have been carried out with an appropriate degree of rigour, ensuring all analysis adjusts for the survey design and non-response and that any statements or claims are based on statistically robust relationships. Only those differences that are statistically significant are highlighted in the text; while tables follow a common format which indicates the base sizes for the relevant analyses. These typically reflect all non-missing observations on the relevant variables. Some chapters contain more detail on measurement than others, where it is needed to understand the topic being discussed (e.g. Chapter 5: Cognitive development, and Chapter 7: Poverty), while others focus more on providing diversity of findings within the thematic content (e.g. Chapter 2: Growing up, and Chapter 4: Education).

The chapters have been written by researchers at the Centre for Longitudinal Studies, which is responsible for the MCS. Most of

the authors were directly involved with the Age 11 survey. Each chapter is designed to be read on its own, but the chapters are also complementary, in that read together they aim to reveal something of the full potential of the study and the ways that different topics can be analysed together to provide additional insight.

Each chapter opens with a statement of its key findings; and this volume is accompanied by short briefing papers, summarising the chapters, and also a podcast series, in which one of the authors for each chapter discusses the findings and their implications, as well as potential developments of the research, both using the Age 11 survey and looking forward to the next survey.

Hence, this introduction does not summarise the chapter content further. Instead, in the next few pages, it provides some background information on key features of the Age 11 survey, the data collection instruments used, response rates, and some insight into the representativeness and composition of the study over time.

## The Age 11 survey

The MCS Age 11 survey took place during 2012, when the children were in the school year in which they turned 11. The vast majority were therefore interviewed when they were either aged 10 or, more often, 11. A few had already turned 12 by the time the data collection ended. The survey started at the end of January 2012 and concluded in January 2013. During the course of that year 13,287 families containing 13,469 MCS children participated in the study, providing rich information on the children as they reached the end of primary schooling. This survey is the most recent of the five MCS surveys covering their lives to date (other surveys were conducted at age 9 months and 3, 5 and 7 years).

As on previous occasions, families were contacted in their own homes, where the survey interviews were carried out. Parents and children were asked to complete tasks. These are summarised in Table 1.1, along with the number successfully completing each task. These survey elements included direct interviews with parents, or more specifically with the main carer (typically, but not always, the mother) and the main carer's partner (again typically, but not always, the father). The interviewer asked questions of parents and recorded the answers on their laptop and, for more personal or sensitive questions, asked the parent to complete the answers themselves on the interviewer's laptop. Other survey elements were self-completion questionnaires on paper for children, cognitive/neuropsychological assessments administered by the interviewer and taken by the children, and direct measures of the child's height, weight and body fat percentage, conducted by the interviewer using specialist equipment. In addition, parental and child permission was sought to contact the child's class teacher to help carry out a teacher survey in England and Wales, and both parents were asked for their consent to match Department

► **Table 1.1: Survey elements and numbers of respondents eligible for and completing each element among the 13,287 participating families**

Element	Number eligible	Number completed (%)
Main carer interview	13,287	13,177 (99.2%)
Resident partner interview	10,153	8,814 (86.8%)
Child cognitive assessments	13,469	13,235 (98.3%)
Child physical measurements	13,469	13,259 (98.4%)
Child self-completion questionnaire	13,469	13,160 (97.7%)
Consent to teacher survey in England and Wales only	10,652	9,981 (93.7%)
Consent to DWP data linkage (main carer)	13,287	11,680 (87.9%)
Consent to DWP data linkage (partner)	8,814	7,748 (87.9%)
Teacher survey in England and Wales	9,610	7,430 (77.3%)

*Note: Further information can be found in the Millennium Cohort Study Fifth Sweep (MCS5) Technical Report (Gallop et al., 2013b) and in the MCS5 Teacher Survey Technical Report (Gallop et al., 2013a), both available on the Centre for Longitudinal Studies website: [www.cls.ioe.ac.uk/mcs](http://www.cls.ioe.ac.uk/mcs).*

for Work and Pensions records on their receipt of benefits or participation in employment programmes to their MCS records. The subsequent teacher survey in England and Wales, which involved responses from teachers for 9,610 cohort children and took the form of a short, individual mail and phone survey, was carried out following the home-based interviews.

Most of these survey activities had been conducted at a previous survey and so were, by and large, familiar to the parents and children. However, there were some innovations at age 11. Specifically, instead of taking a suite of cognitive assessments from a recognised battery such as the British Ability Scales, one such assessment was undertaken (verbal similarities) complemented by two somewhat different neuropsychological assessments developed by Cambridge Cognition and adapted for use in the survey setting. For these latter two assessments the children carried out the exercises using a touch screen on the interviewer's computer. This meant that the child's direct engagement with the assessment via the touch screen could be measured. For example, the speed of response could be recorded. These assessments are discussed further in Chapter 5 of this volume and in Atkinson (2014).

Further innovations, which we do not discuss in detail in this volume but which were important for the ongoing representativeness and maintenance of the sample, included the development of a version of the parent/carers questionnaire for those who were being looked after by the local authority in institutional settings. While this was only used in two cases, in principle it enabled the participation of children who might otherwise be excluded, and substantial effort was made to identify cohort members living in these situations. In addition, for the first time we set out to involve those families who were known to have emigrated and where we had some contact

information for them, a total of 326 families. This was in order to gain some basic information on the context of their lives, as well as asking the children in these families to complete the self-completion questionnaire issued to their counterparts in the UK. Sixty parent questionnaires and 58 child self-completion questionnaires were returned as a result of this exercise. This mailing provided not only additional responses but also important continuity for these families, given that many of them are likely to return to the UK at some point.

Involvement in the Age 11 survey was not conditional on participation at the previous survey (at age 7). While the majority of children had participated four years earlier a few of them had had a long gap, with 153 of the Age 11 survey families having last been interviewed at the first, Age 9 Months survey. Table 1.2 shows the number of families that the Age 11 survey aimed to reach and gives information on how many interviews were achieved by last survey at which an interview was obtained. It also shows the co-operation rate, which relates to those responding positively and agreeing to take part once they had been successfully contacted and were known to be eligible (e.g. living in the UK).<sup>1</sup> Unsurprisingly, the co-operation rate was highest among those who had participated in the last sweep. Among these participant families from the previous sweep, 10,448 (or 79% of the age 11 sample) had participated in all four previous surveys, and this group had a response rate of 92 per cent.

Table 1.2 also shows the numbers participating and the response rate by UK country and by original sampling stratum. The strata were the nine types of ward that were used in the original MCS sample design to ensure that there were sufficient numbers of relatively disadvantaged families and families from ethnic minority backgrounds. For further detail on the sample design see Plewis (2007).

<sup>1</sup> Non-contacts amounted to around 2 per cent of the issued sample. Families are ineligible if the child has died or if the family has emigrated. A very small number of families fell into these categories.

► **Table 1.2: Numbers participating and response rate by sweep of last participation and by type of ward**

	Number participating	Response (co-operation) rate (%)
<b>Last survey participated in:</b>		
4th (Age 7)	12,039	89.7
3rd (Age 5)	822	54.0
2nd (Age 3)	273	46.7
1st (Age 9 months)	153	38.8
Participated in all four previous sweeps	10,448	91.6
<b>UK country</b>		
England	8,684	84.4
Wales	1,832	81.4
Scotland	1,466	80.9
Northern Ireland	1,305	83.0
<b>Sampling Stratum*</b>		
England advantaged	3,598	87.8
England disadvantaged	3,316	82.4
England ethnic minority	1,704	81.6
Wales advantaged	596	86.4
Wales disadvantaged	1,285	79.3
Scotland advantaged	774	85.0
Scotland disadvantaged	706	77.0
Northern Ireland advantaged	500	84.6
Northern Ireland disadvantaged	808	81.9

*Note: in the sampling strata 'advantaged' simply refers to those wards which were neither 'disadvantaged' nor (in England) 'ethnic minority'. The latter refers to those wards with 30 per cent or more from Black or Asian ethnic minority groups in 1991. 'Disadvantaged' refers to those wards that had a value on the Child Poverty Index (CPI) in 1998 that was at or above the value of the cut-off for the top 25 per cent of wards on the England and Wales CPI. The specific wards were then sampled within strata according to the desired properties of the final sample. For further details see Plewis (2007).*

## The Age 11 survey in context

This chapter now goes on to consider the age 11 sample in the context of the MCS families participating in previous surveys. Overall, 18,552 families containing 18,818 cohort children (including twins and triplets) participated in the first survey at age 9 months. These families were sampled using Child Benefit records to identify children born within the relevant time periods who were resident in the selected sample of wards. Since at the time of the initial survey almost all families were eligible for Child Benefit, and take-up among those eligible was almost 100 per cent, Child Benefit provided an almost complete sampling frame for recent births. Those eligible were all babies living in any the 398 sampled wards at age 9 months who were born between 1st September 2000 and 31st August 2001 in England and Wales (an academic-year cohort), and between 23rd November 2000 and 11th January 2002 in Scotland and Northern Ireland. In these latter two countries the earliest birth date was put back to 23rd November to avoid an overlap with an infant feeding survey and the latest birth date was put back to make up for a shortfall in numbers of eligible/sampled children that became apparent during fieldwork.

At the second survey, an additional 692 families joined the study, the so-called 'new families', who were, in principle, eligible at the first survey through living in one of the sampled wards and having a child of the relevant age, but had not been identified through the Child Benefit records in time to enable them to be included in the initial survey. Thereafter children in all the 19,244 families (original and 'new') formed the basis of the fieldwork sample for subsequent surveys. Table 1.3 shows the evolution of the sample size across all five surveys.

Next, this chapter looks across some key characteristics of cohort children's families, to show the evolution of the sample over time. Table 1.4 shows the distribution of the sample according to family characteristics measured at baseline (i.e. at the Age 9 Months survey, or for the 692 'new' families, the Age 3 survey). It shows the sample sizes for each of these key characteristics at each survey, as well as the weighted and unweighted percentages. Following the unweighted percentages over time reveals the extent to which sample loss has been greater or lower for some types of family compared to others. The weighted percentages show the proportions adjusted for the sample design and the differential selection of particular types of ward in order to be representative of the national population of families with a child of this age. Non-response weights at each

► **Table 1.3: Families participating at each MCS survey**

	Age 9 months	Age 3	Age 5	Age 7	Age 11
Total number of families	18,522	19,244	19,244	19,244	19,244
Number participating	18,522	15,590	15,246	13,857	13,287
Participating families as a % of total	100%	81%	79%	72%	69%



survey, combined with this sample adjustment, enable this representativeness to be maintained: as we would expect, the weighted distributions remain roughly constant over time.

Reassuringly, in addition, the unweighted distributions also vary little over time. There is some indication that different sorts of

family are slightly more likely than others to be lost from the study. For example, those with parents who had no qualifications by the time of the initial survey made up 16 per cent of the age 9 months sample, compared to about 14 per cent at age 11. However, overall there is little evidence of strong differential attrition by family background.

► **Table 1.4: Numbers of (unweighted) families and weighted percentages across sweeps by baseline family characteristics**

Family characteristic	Age 9 months	Age 3	Age 5	Age 7	Age 11
<b>UK country</b>					
England: N	11,533	10,050	9,717	8,839	8,618
Weighted %	81.70%	82.70%	82.30%	81.80%	82.60%
(Unweighted %)	-62.20%	-64.50%	-63.70%	-63.80%	-64.90%
Wales: N	2,760	2,261	2,181	2,018	1,881
Weighted %	5.10%	4.90%	4.90%	5.00%	4.80%
(Unweighted %)	-14.90%	-14.50%	-14.30%	-14.60%	-14.20%
Scotland: N	2,336	1,814	1,814	1,628	1,480
Weighted %	9.40%	8.80%	9.00%	9.30%	8.60%
(Unweighted %)	-12.60%	-11.60%	-11.90%	-11.80%	-11.10%
N Ireland: N	1,923	1,465	1,534	1,372	1,308
Weighted %	3.80%	3.60%	3.80%	3.90%	4.00%
(Unweighted %)	-10.40%	-9.40%	-10.10%	-9.90%	-9.80%
<b>Main carer's ethnic group</b>					
White groups (N)	15,543	12,692	12,502	11,428	10,837
Weighted %	88.50%	88.50%	88.60%	87.60%	86.60%
(Unweighted %)	-84.00%	-85.40%	-85.40%	-85.70%	-84.80%
Mixed groups	191	134	132	115	115
Weighted %	1.00%	0.90%	1.00%	1.00%	1.10%
(Unweighted %)	-1.00%	-0.90%	-0.90%	-0.90%	-0.90%
Indian	480	380	365	328	324
Weighted %	1.90%	2.00%	1.90%	2.00%	2.10%
(Unweighted %)	-2.60%	-2.60%	-2.50%	-2.50%	-2.50%
Pakistani & Bangladeshi	1,264	949	918	828	881
Weighted %	4.20%	4.30%	4.20%	4.70%	5.00%
(Unweighted %)	-6.80%	-6.40%	-6.30%	-6.20%	-6.90%
Black groups	679	463	482	433	411
Weighted %	2.80%	2.80%	2.80%	3.30%	3.50%
(Unweighted %)	-3.70%	-3.10%	-3.30%	-3.20%	-3.20%
Other groups	346	248	244	199	217
Weighted %	1.60%	1.50%	1.50%	1.40%	1.70%
(Unweighted %)	-1.90%	-1.70%	-1.70%	-1.50%	-1.70%
<b>Family poverty status</b>					
Poor	11,610	9,798	9,621	8,911	8,502
Weighted %	69.80%	69.50%	69.70%	67.60%	64.40%
(Unweighted %)	-62.90%	-66.00%	-65.80%	-66.90%	-66.50%
Not poor	6,860	5,059	5,012	4,416	4,275
Weighted %	30.20%	30.50%	30.30%	32.40%	35.60%
(Unweighted %)	-37.10%	-34.00%	-34.20%	-33.10%	-33.50%

► **Table 1.4: Numbers of (unweighted) families and weighted percentages across sweeps by baseline family characteristics *continued***

Family characteristic	Age 9 months	Age 3	Age 5	Age 7	Age 11
<b>Family structure</b>					
Two parents	15,358	13,091	12,783	11,704	11,245
Weighted %	85.50%	84.70%	84.80%	83.70%	82.00%
(Unweighted %)	-82.80%	-84.10%	-83.90%	-84.50%	-84.70%
One parent	3,194	2,479	2,450	2,140	2,031
Weighted %	14.50%	15.30%	15.20%	16.30%	18.00%
(Unweighted %)	-17.20%	-15.90%	-16.10%	-15.50%	-15.30%
<b>Main carer's highest qualification</b>					
NVQ level 1	1,562	1,296	1,241	1,097	1,055
Weighted %	8.30%	8.60%	8.30%	8.60%	9.30%
(Unweighted %)	-8.40%	-8.30%	-8.20%	-7.90%	-8.00%
NVQ level 2	5,363	4,481	4,393	3,988	3,787
Weighted %	29.70%	29.80%	30.00%	30.20%	30.30%
(Unweighted %)	-29.00%	-28.80%	-28.90%	-28.90%	-28.60%
NVQ level 3	2,611	2,207	2,160	1,998	1,911
Weighted %	14.20%	14.00%	13.90%	14.00%	13.70%
(Unweighted %)	-14.10%	-14.20%	-14.20%	-14.50%	-14.40%
NVQ level 4	4,754	4,250	4,169	3,885	3,750
Weighted %	28.90%	28.40%	28.70%	26.90%	25.00%
(Unweighted %)	-25.70%	-27.30%	-27.40%	-28.10%	-28.30%
NVQ level 5	618	552	545	504	488
Weighted %	3.60%	3.50%	3.50%	3.20%	2.80%
(Unweighted %)	-3.30%	-3.60%	-3.60%	-3.60%	-3.70%
Overseas only	559	443	439	379	387
Weighted %	2.40%	2.50%	2.60%	2.60%	2.90%
(Unweighted %)	-3.00%	-2.90%	-2.90%	-2.70%	-2.90%
None	3,032	2,316	2,258	1,972	1,876
Weighted %	12.90%	13.10%	12.90%	14.40%	15.90%
(Unweighted %)	-16.40%	-14.90%	-14.80%	-14.30%	-14.10%
<b>Total number at survey</b>	<b>18,522</b>	<b>15,590</b>	<b>15,246</b>	<b>13,857</b>	<b>13,287</b>

*Note: All characteristics are measured at the first (Age 9 months) survey, except for those ('new') families that joined at the second survey, for whom baseline is the Age 3 survey. NVQ level 1 equates to a lower level GCSE (D-G), while level 2 is a GCSE at C or above. Level 3 is equivalent to A levels; level 4 represents a BA degree and level 5 a higher degree. Small numbers of missing values are excluded from the distributions.*

Nevertheless, even without different *rates* of attrition over time, if the raw sizes of particular subsamples of interest decline too much, then there will be a loss of analytic power for research purposes. Maintaining the sample has thus been, and remains, a key aim for the study and its fieldwork. In this light, gaining a total sample size that was 96 per cent of that achieved at the

Age 7 survey (13,287 families) after a gap of four years is a key achievement of the Age 11 survey. For future sweeps it will be important to maintain – or even improve upon – such a high level of sample retention to maximise the extraordinary value of the study, and all it can tell us about the millennium generation's lives as they unfold.



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# Chapter 2:

## Growing Up and Independence

---

**Kate Smith and Samantha Parsons**

### Chapter summary

- Most 11-year-olds had a mixture of friends, in terms of gender and ethnicity.
- Nearly three quarters (72%) of them saw friends at least once a week when not at school. Almost half (47%) hung out with their friends without adult supervision most weekends and around one in three did this most days after school.
- Nearly a quarter of all 11-year-olds exchanged messages with friends via the internet or visited social networking sites on most days.
- Nearly three quarters had their own mobile phone, a huge increase from the 15 per cent who had one at age 7.
- Very few children had engaged in risky behaviours – 13 per cent had tried an alcoholic drink, 3 per cent had smoked a cigarette.
- Children are far more likely to experience and perpetrate bullying with their siblings than with other children. Around three-quarters had bullied or been bullied by a sibling at some stage. More than half of all 11-year-olds reported that they had hurt another child on purpose or been picked on by other children.

## Chapter 2: Growing Up and Independence

Kate Smith and Samantha Parsons

### Introduction

At age 11 and in their final year of primary school the MCS children were at an important cusp in their lives. They were about to begin secondary education, which involves a change of school, new friends and increasing independence (Evangelou et al, 2008). However, their parents were still very important to them and played a central role in their lives, helping them make important decisions, and structuring day-to-day living.

To reflect the children's increasing age and maturity, the Age 11 survey included a substantial self-completion questionnaire for cohort members, providing the opportunity for their voices to be heard. There were questions on such topics as their life at school, their friendships, and how they see themselves and their future. In this chapter we analyse responses from the 13,160 children who completed the questionnaire and focus on gender and ethnic differences. There were few differences by country and parental education or family employment status.

We discuss what the children say about their friendships, the time they spend with friends and the risk-taking (smoking and drinking, for example) and antisocial behaviours they have participated in. We combine this with parent reports on their child's use of transport (independent or otherwise), their access to and use of the internet, computers and mobile phones, whether they spend unsupervised time with friends, and the discipline measures used with their children.

### Friends

Friendships become increasingly important to children of this age and they begin to spend more time with their friends both inside and outside school. Friendships can provide support and are important to the development of children's social skills (Hartup 1996) and healthy development generally (Dunn 2004).

A lack of friendships in childhood has been associated with such negative outcomes as loneliness, isolation and anxiety (Crick & Ladd 1993).

Additionally, as the UK population becomes increasingly diverse and multi-ethnic, the friendships children make, particularly inter-ethnic friendships, may become especially salient for their social development and competence. Research, largely carried out in the United States, has shown that inter-ethnic friendships can have positive effects for children. For example, Fletcher, Rollins & Nickerson (2004) found that children who had inter-racial friendships that extended outside of school had higher levels of social competence and self-esteem.

### Variety of friends

Most 11-year-olds said they had a mixture of friends, in terms of gender and ethnicity. Over half of boys and girls (54%) had both boys and girls as friends and over 70 per cent had friends from different ethnic groups. More girls than boys were likely to have friends of the opposite sex (58% to 52%) and more boys than girls said that most of their friends were the same sex (46% to 39%).

Table 2.1 shows that Pakistani (78%) or Bangladeshi (74%) cohort members were the most likely to say that most of their friends were of the same gender (i.e. mostly boys or mostly girls) and Black Caribbean boys and girls were the most likely to have a mixture of boys and girls as friends (65%). This was particularly so among the girls, 71 per cent to 60 per cent for boys.

Table 2.2 shows that around one in five children only had friends from their own ethnic group, but that this was particularly so for White, Pakistani and Bangladeshi 11-year-olds. Nearly a quarter (24%) of White 11-year-olds, 17 per cent of Pakistani and 18 per cent from Bangladeshi backgrounds only had friends from the same ethnic group compared to no more than 6 per cent of

► **Table 2.1: Gender of friends by ethnicity (percentage)**

	Mostly boys	Mostly girls	A mixture of boys and girls	Don't have any friends	N
White	24.3	18.6	56.8	0.4	10,855
Mixed	23.1	18.8	58.1	0.1	372
Indian	32.8	26.6	40.3	0.3	333
Pakistani	36.9	40.2	21.5	1.4	632
Bangladeshi	36.1	37.7	26.3	0.0	274
Black Caribbean	23.4	11.6	64.6	0.4	136
Black African	29.6	19.7	50.3	0.5	248
Other	29.4	23.7	46.9	0.0	213
All	25.2	19.8	54.6	0.4	13,063

Notes: Millennium Cohort Study Age 11 survey. Weighted per cent; unweighted observations.  $P < 0.000$ . Where totals do not add up to 100%, this is due to rounding.



► **Table 2.2: Proportion of friends from the same ethnic group by ethnicity**

	All of them	Most of them	Some of them	None of them	Don't have any friends	Total
White	23.7	44.1	26.0	5.9	0.4	10,238
Mixed	4.1	25.6	54.1	16.2	0.1	343
Indian	4.5	30.4	49.5	15.5	0.1	311
Pakistani	17.1	39.4	38.0	4.8	0.7	595
Bangladeshi	18.1	39.3	37.5	5.1	0.0	263
Black Caribbean	5.7	40.7	45.6	7.7	0.5	129
Black African	2.7	29.8	58.8	8.3	0.5	231
Other	5.4	26.9	55.2	12.5	0.0	201
<b>All</b>	<b>21.4</b>	<b>42.4</b>	<b>29.3</b>	<b>6.5</b>	<b>0.4</b>	<b>12,311</b>

Notes: Millennium Cohort Study Age 11 survey. Weighted per cent; unweighted observations.  $P < 0.000$ . Where totals do not add up to 100%, this is due to rounding.

► **Table 2.3: Frequency of falling out with friends by ethnicity (percentage)**

	Most days	At least once a week	At least once a month	Less often than once a month	Never	Don't have any friends	Total
White	5.4	10.5	20.1	38.4	25.4	0.3	10,838
Mixed	5.2	10.3	19.4	33.9	31.2	0.0	370
Indian	3.1	9.2	10.4	38.6	38.6	0.1	332
Pakistani	7.2	6.5	12.0	30.0	43.8	0.5	633
Bangladeshi	3.8	7.0	13.5	30.6	45.0	0.0	274
Black Caribbean	2.5	11.0	16.6	38.2	31.3	0.4	137
Black African	4.9	7.1	21.7	29.8	35.5	1.0	248
Other	4.3	6.7	18.5	35.1	35.4	0.0	212
<b>All</b>	<b>5.3</b>	<b>10.1</b>	<b>19.5</b>	<b>37.6</b>	<b>27.2</b>	<b>0.3</b>	<b>13,044</b>

Notes: Millennium Cohort Study Age 11 survey. Weighted per cent; unweighted observations.  $P < 0.000$ . Where totals do not add up to 100%, this is due to rounding.

children in all other groups. These findings do, however, need to be interpreted with caution. Qualitative piloting of these questions in the development work for the Age 11 survey showed that the terms 'ethnicity' and 'ethnic group' proved problematic for this age group to interpret.

Perhaps surprisingly, friends were not necessarily local or from the same school. Just 9 per cent of 11-year-olds only had friends who lived in the same area as they did, 41 per cent had 'most', 41 per cent 'some', leaving 9 per cent with no friends in their home area.

Children also had a mix of friends from in and out of school, although school remained the main source of friendship for the

majority. Around one in five (22%) children only had friends who went to the same school they did, with 67 per cent having some friends at a different school. However, 9 per cent of children said that most of their friends attended a different school and 2 per cent said that all of their friends were at a different school. Boys were more likely than girls to say that most or all of their friends attended a different school (13% to 9%). Bangladeshi (37%), Pakistani (30%) and Indian (27%) children were more likely only to have friends who attended the same school. Having a mix of friends from out of school may demonstrate the diversity of some children's social lives. For example, some children will have friends from different clubs and activities that they are involved in, and also 'virtual' friends from social networks that they only have contact with online.

## Falling out

Children's relationships with each other can be volatile. They can easily argue and fall out, which can affect a child's general wellbeing. Falling out with a school friend can impact on their learning and desire to go to school. However, in the main, children make friends again just as quickly as they fall out. A quarter of all children said they never fell out with their friends, though this was more the case for boys (31%) than for girls (23%). Table 2.3 shows that Indian, Pakistani and Bangladeshi children seemed to have the most stable friendships, with around four in ten never falling out with their friends.

## Hanging out

Unsurprisingly, MCS 11-year-olds spent a lot of time with their friends outside of school. Nearly three quarters (72%) of them saw friends at least once a week when not at school. Reflecting their growing independence, children also often hung out with their friends without adults or older children around. Nearly half (47%) spent time with their friends without adult supervision most weekends and around one in three did this most afternoons after school. However, parents may place more overall restrictions on daughters than sons, or they may monitor certain behaviours more closely in one gender than the other (Crouter & Head 2002; Leaper 2002). Answers from both the MCS children and parents suggest that boys are allowed more freedom than girls. For example, the MCS child reports showed that boys were more likely than girls to see their friends outside of school most days (45% to 38%). They were also more likely than girls to hang out with their friends with no adult supervision. Over half of boys (51%) hung out with their friends unsupervised most weekends compared to 43 per cent of girls. A third of boys also saw their friends after school without adults around compared to a quarter of girls.

Table 2.4 shows that children from Bangladeshi families were the least likely to see their friends outside school. Four in ten

never saw them outside school or did so less than once a month, compared with just 12 per cent of White children. Indian, Bangladeshi and Pakistani children were also least likely to spend time hanging around with their friends with no adult supervision at weekends or on weekdays after school. Many Indian (59%), Bangladeshi (53%) and Pakistani (48%) children did not spend unsupervised time with their friends in the afternoons after school at all compared with around one in five (22%) White 11-year-olds.

Parents were also asked how often their 11-year-old children saw friends outside of school and how often this was unsupervised. There was general agreement between parents and children about how often they saw their friends outside of school, and whether and how often this was unsupervised. Around a quarter of parents never allowed their children unsupervised time with their friends – 29 per cent on weekdays and 25 per cent at weekends. This was slightly higher among parents of girls than boys, but, again, the parent reports (Table 2.5) show big differences by ethnicity. For example, 22 per cent of White children's parents never allowed them unsupervised time at the weekends, compared to 35 per cent of Black Caribbean children, 41 per cent of Black African children and 62 per cent of Indian children

Parents who did not allow their children unsupervised time with friends on weekdays or weekends were asked why. From a long list of possible options, the main reasons chosen were: their child was not old enough, the child had other things to do and that parents had concerns about their safety. Basing percentages on all parents and not the subset who were asked the reasons why, more parents of girls than boys thought they were not old enough (10% to 6%) and had concerns over child safety (8% to 5%).

However, it was ethnicity that showed the most notable differences. Parents from all minority ethnic groups were around

► **Table 2.4: How often child reports they see their friends by ethnicity (percentage)**

	<b>Most days</b>	<b>At least once a week</b>	<b>At least once a month</b>	<b>Less than once a month</b>	<b>Never</b>	<b>Don't have any friends</b>	<b>Total</b>
White	43.7	31.2	13.0	7.3	4.5	0.3	10,832
Mixed	42.3	31.0	12.2	8.7	5.8	0.0	370
Indian	17.0	31.6	19.9	19.6	11.8	0.1	333
Pakistani	30.5	26.6	12.0	12.2	18.3	0.5	633
Bangladeshi	24.2	28.1	7.1	13.0	27.5	0.0	275
Black Caribbean	24.7	32.1	13.5	21.0	8.6	0.0	137
Black African	29.0	27.6	11.5	14.6	16.4	1.0	248
Other	28.1	25.6	18.5	16.1	11.6	0.0	213
<b>Total</b>	<b>41.6</b>	<b>30.8</b>	<b>13.0</b>	<b>8.3</b>	<b>5.9</b>	<b>0.3</b>	<b>13,041</b>

Notes: Millennium Cohort Study Age 11 survey. Weighted per cent; unweighted observations.  $P < 0.000$ . Where totals do not add up to 100%, this is due to rounding.

► **Table 2.5: How often parent reports child allowed unsupervised time with friends at weekends by child's ethnicity (percentage)**

	<b>Most weekends</b>	<b>At least once a month</b>	<b>Less often</b>	<b>Never</b>	<b>Total</b>
White	48.2	19.0	10.5	22.3	11,082
Mixed	38.8	18.6	11.0	31.6	385
Indian	10.9	12.2	14.9	62.1	339
Pakistani	26.1	12.1	12.7	49.1	648
Bangladeshi	23.2	8.8	14.1	53.9	280
Black Caribbean	24.3	17.8	22.8	35.1	143
Black African	28.2	13.6	17.4	40.9	260
Other	23.0	17.4	13.0	46.7	222
<b>All</b>	<b>44.9</b>	<b>18.3</b>	<b>11.1</b>	<b>25.8</b>	<b>13,359</b>

Notes: Millennium Cohort Study Age 11 survey. Weighted per cent; unweighted observations.  $P < 0.000$ . Where totals do not add up to 100%, this is due to rounding.

twice as likely as White parents (7%) to say their child was not old enough – highest at 19 per cent among parents of Bangladeshi children – or that they had concerns about child safety (White parents 5%, compared with Indian parents, 16%). Black Caribbean and Indian parents were the most likely (7%) to say homework was a reason for not allowing unsupervised time, while only 3 per cent of White parents said this. Parents with no qualifications were the least likely to give this reason (2%).

Parents' education level was quite strongly related to the proportion reporting their child had other things to do – 3 or 4 per cent without or with GCSE qualifications compared with 11 per cent with postgraduate qualifications.

## Independent journeys and use of transport

Parents were asked how much freedom their child was allowed to make independent journeys around their local area. Again we see some evidence of greater independence for boys.

Boys were more likely than girls to make a journey on their own on a bike (36% to 23%) or on foot (54% to 44%). Independent journeys on foot were most likely to be made by Black Caribbean children (55%) and least likely by Indian and Bangladeshi children (23% and 25% respectively).

The survey clearly showed the ever-greater reliance on the family car for all journeys. Very few children had travelled on public transport on their own (4%), while a surprisingly high proportion (48%) had never even travelled on public transport with an adult. The main exceptions were Black Caribbean children. More than one in four (29%) of them had travelled on their own and just 18 per cent had never used public transport. See Chapter 4 for details on how children travel to school.

## Feeling safe in local area

Most 11-year-olds felt that the area they lived in was safe, with almost nine in ten (89%) saying it was 'safe' or 'very safe'. Girls were slightly less likely than boys to say that their home area was very safe. Just 9 per cent of children felt where they live was 'not very safe' and 1 per cent 'not at all safe'.

Pakistani and Bangladeshi children were the most likely to think their area not very or not at all safe (19% and 18% respectively). Since children from these groups were less likely to be allowed out unsupervised this finding may reflect perceptions more than reality. On the other hand, the greater anxiety about safety may indicate the reason why they were allowed out less.

## Use of technology

The ever-increasing reliance on technology for entertainment and communication is found across all ages and social groups, including young children. In 2011, a survey of 2,445 UK children aged 5 to 16 by Child Wise found that 70 per cent of them had their own mobile phone and that this increased to 97 per cent for 11- to 16-year-olds (CHILDWISE 2012). Almost two in three 5- to 16-year-olds had their own computer (62%) and nearly half had internet access in their own room (46%). A lack of a home internet connection or a computer can create a 'digital divide' amongst children. This can exacerbate educational disadvantage for those with no internet or computer access – usually poorer children – as they will be unable to research homework or access school websites that allow pupils to submit work digitally and receive feedback from teachers. The 2011 ONS Family Spending Survey found that the digital divide remained a significant factor in the UK, with 29 per cent of the poorest households having no computer, 36 per cent no internet and 43 per cent no internet connection via a computer (Office for National Statistics 2011).



## Mobile phones

Among 11-year-olds in MCS, nearly three quarters (72%) had their own mobile phone, a huge increase from the 15 per cent at age 7. More girls (77%) than boys (67%) had their own mobile phone, as was also true at age 7, with more than a third of those with a mobile phone being able to access the internet from it (37%). The 2012 Ofcom report showed that 62 per cent of 12- to 15-year-olds have a smart phone with internet capability (up 50% from previous year).

Figure 2.1 shows there were very big differences in the percentage of children in different ethnic groups having a mobile phone, ranging from 78 per cent among Black Caribbean children to just 12 per cent of Bangladeshi 11-year-olds.

## Computers and the internet

At age 11, 96 per cent of MCS children had access to a computer and 95 per cent were linked to the internet at home. This had increased from 82 per cent and 81 per cent respectively when the children were age 7. Children in families where parents had no qualifications were the least likely to have access to a computer at age 11 (85%) or the internet (82%). More than four in ten children (42%) had their own computer, with this being slightly higher for girls (46%) than boys (39%). However, there were large disparities between ethnic groups. Figure 2.2 shows that whereas around two in ten Bangladeshi (21%), Black African (22%) and Pakistani (24%) children had their own computer, this was almost double at around four in ten for all other ethnic groups.

Over half of all 11-year-olds used the internet most days when they were not at school, and a further third used it at least once a week. Nearly half of all children used the internet for homework at least once a week but, perhaps surprisingly, 20 per cent of boys and 14 per cent of girls never used it to do homework. Black African children were the most likely (31%) to use the internet for homework on 'most' days – more than twice the figure for White children (14%), even though they were one of the ethnic groups least likely to have their own computer at age 11.

## Recreational screen time

In terms of time spent watching TV or a video on a computer on a weekday, 17 per cent of children said they spent three or more hours a day and 3 per cent seven or more hours. Just 1 per cent of children spent no time watching TV or a video on a computer.

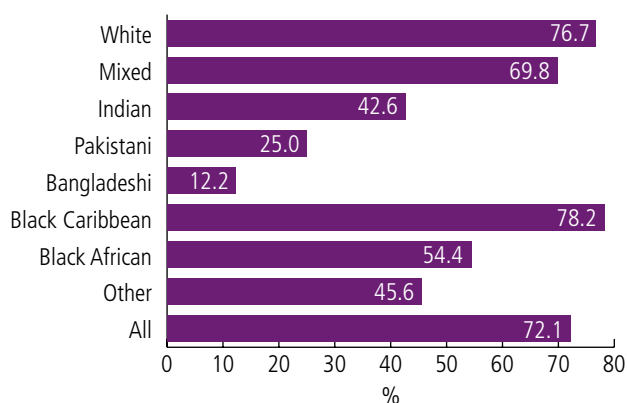
MCS children were also more likely to have a TV in their bedroom at age 11, with 60 per cent having one compared to 45 per cent at age 7. More boys (63%) than girls (57%) had a TV in their room at age 11, reversing the picture at age 7 (44% boys to 46% girls).

Children with parents with low-level qualifications or in low-grade work were the most likely to have a TV in their bedroom (e.g. 76% with low-grade O level/GCSE qualifications, 76 per cent with lower supervisory and technical occupations). Least likely were children with parents with higher qualifications (47% with a degree, 34% postgraduate qualifications) or in professional/managerial occupations (47%). Again, there were also large ethnic differences (Figure 2.3). Just 15 per cent of Bangladeshi and 19 per cent of Pakistani children had a TV in their bedroom compared to 65 per cent of White children.

Boys and girls spent very different amounts of time playing games on a computer on a weekday. Whereas just 9 per cent of boys did not spend any time playing games on a weekday and 23 per cent of boys spent two or more hours, the comparable figures for girls were almost the mirror image at 21 per cent and 9 per cent respectively. Nearly one in three Black African children (30%) did not spend any time on a computer or playing games.

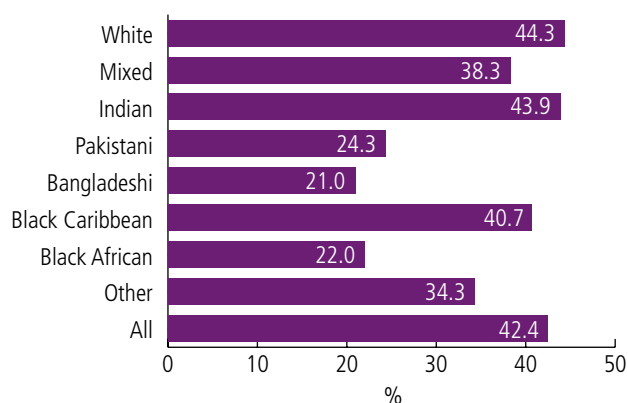
The overwhelming majority of parents had rules about the amount of time their child could spend on the computer and the material they could watch on it, but the percentage increased along with parent qualification level. For parents with no qualifications, 84 per cent had rules on time and 90 per cent on content compared with 93 per cent and 97 per cent respectively among parents with post-graduate level qualifications. Black African parents were most likely to have time and content rules.

► **Figure 2.1: Percentage of children having their own mobile phone by ethnicity**



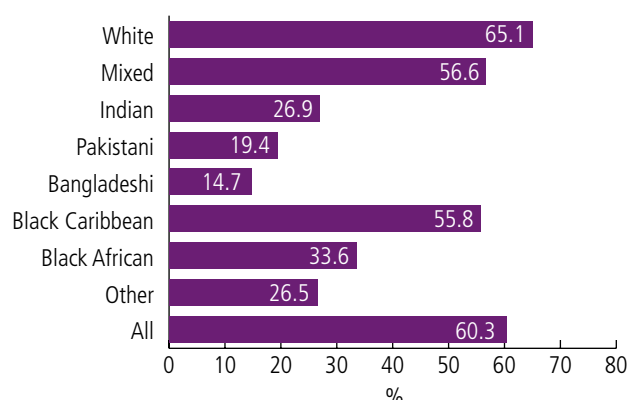
Notes: Millennium Cohort Study Age 11 survey. Weighted per cent.

► **Figure 2.2: Percentage of children with their own computer by ethnicity**



Notes: Millennium Cohort Study Age 11 survey. Weighted per cent.

► **Figure 2.3: Percentage of children with a TV in their bedroom by ethnicity**



Notes: Millennium Cohort Study Age 11 survey. Weighted per cent.

### Social media, tweeting and messaging

The social media world is a key part of many MCS children's lives. It provides new ways for them to communicate with each other and new definitions of what friends are. With the evolution of social networking sites such as Facebook and Twitter, friends have become redefined as not only those they see but virtual friends, communication with many of whom exists solely in a virtual world.

Although children should be aged 13 to sign up to the most popular social media sites such as Facebook and Twitter, a report by Ofcom (2012) found that 80 per cent of 12- to 15-year-olds and 22 per cent of 8- to 11-year-olds have an active social network profile. Among 12- to 15-year-olds, the average number of 'friends' on their social network site was 286, many of whom they will never have met in person. Social network sites such as Moshi Monsters and Club Penguin allow children to use the sites and make virtual friends at younger ages than 13.

Nearly a quarter of all MCS 11-year-olds exchanged messages with friends via the internet on most days, but girls (28%) did this more frequently than boys (19%). However, using the internet in this way was not universal as nearly half of boys (46%) and a third of girls (31%) never messaged their friends.

Similarly, although more girls than boys visited social networking sites on most days (24% to 18%), more than half of boys (56%) and girls (52%) never used social networking sites.

Pakistani and Bangladeshi children were least likely to exchange messages with friends or to use social networking sites. Nearly half never exchanged messages with friends (46% and 47% respectively), and Table 2.6 shows that three quarters never visited social networking sites (77% of Bangladeshi and 73% of Pakistani children). Twice as many White and Mixed ethnicity children social-networked on most days compared with Bangladeshi and Pakistani children (over 22% compared to 9%). This may be related to the earlier finding that these groups were also the least likely to have a computer or their own mobile phone.

### Home rules and discipline

As children get older and more autonomous, parents typically exert less direct control over them. However, all parents have certain rules and behaviour expectations that children must adhere to and use a range of discipline measures to try to enforce them. A survey of 2,672 mothers in 2010 by the website Netmums found that although 51 per cent thought it was wrong to treat boys and girls differently, more than one in five (22%) of the mothers surveyed agreed that they let their sons get away with more, turning a blind eye to behaviour for which they would reprimand their girls. In the Age 11 survey, MCS parents were asked about bedtime rules, the discipline measures they employed with their children, household chores and pocket money.

► **Table 2.6: Frequency of using social networking sites by ethnicity (percentage)**

	Most days	At least once a week	At least once a month	Less than once a month	Never	Total
White	21.7	14.2	6.2	5.4	52.4	10,841
Mixed	25.5	12.0	8.8	5.2	48.6	374
Indian	11.9	11.0	5.5	5.8	65.9	334
Pakistani	9.1	10.4	3.6	4.1	72.7	631
Bangladeshi	9.1	7.3	3.5	3.1	77.0	274
Black Caribbean	14.8	18.8	3.5	5.6	57.3	138
Black African	15.5	12.8	4.6	4.1	63.1	251
Other	11.9	12.8	8.7	6.9	59.7	212
<b>Total</b>	<b>20.7</b>	<b>13.8</b>	<b>6.2</b>	<b>5.3</b>	<b>54.0</b>	<b>13,055</b>

Notes: Millennium Cohort Study Age 11 survey. Weighted per cent; unweighted observations.  $P < 0.000$ . Where totals do not add up to 100%, this is due to rounding.

## Bedtime

More than half of all children had a regular bedtime that parents reported was always kept to (56%), whereas just 3 per cent did not have a regular term-time weekday bedtime at all. Black African children (41%) and children with parents with no or low grade O level/GCSE qualifications (49%) were the least likely to have a regularly imposed bedtime. Just over one in three (36%) of the children who did have a regular bedtime went to bed around 8pm and 54 per cent at 9pm. More Bangladeshi children also had a later bedtime with 14 per cent going at 10pm or later compared to 6 per cent overall.

## Discipline measures

The use of parental discipline measures had reduced by age 11. At age 7, 20 per cent of parents 'often' or 'daily' sent their child to their bedroom (or naughty chair), 17 per cent 'often' or 'daily' took treats away from them and 57 per cent 'often' or 'daily' tried to reason with them. The comparable figures at age 11 were 11 per cent, 10 per cent and 31 per cent respectively.

Contrary to the Netmums survey, the discipline measures asked about in the Age 11 survey were used more frequently with boys than with girls. For example, Table 2.7 shows that 14 per cent of boys were 'often' or 'daily' sent to their room compared with 9 per cent of girls; 14 per cent of boys and 7 per cent of girls 'often' or 'daily' had treats taken away from them; and a substantial minority of parents had to 'often' or 'daily' reason with their sons (43%) or daughters (35%).

A comparison by ethnicity revealed some big differences. Whereas 13 per cent of all children were never sent to their

room, this was more common among Bangladeshi (41%), Pakistani (26%) and Indian (25%) children. Black Caribbean children were the most likely to 'often' or 'daily' have treats taken away from them (17%) and Indian children the least likely (6%).

Lower qualified or out of work parents were more likely than those with postgraduate qualifications or in managerial or professional occupations to 'often' or 'daily' send their child to their room (e.g. 18% low-grade O level/GCSE qualifications, 7% postgraduate qualifications) or to take treats away from them (e.g. 15% not working, 8% managerial or professional occupation).

More than one in four parents (29%) reported having frequent battles with their child – son or daughter – and 59 per cent felt extremely close to them, slightly more so if a daughter (61%) than a son (57%). Frequent battles were least likely to be reported by parents of Bangladeshi, Pakistani, Indian or Black African children (between 13% and 18%), but fewer parents of Black African (43%), Bangladeshi or Pakistani (47%) parents also reported being extremely close to their child.

## Pocket money and chores

Reflecting the traditional division of labour, girls have been more likely than boys to be assigned household tasks during childhood and adolescence (Blair 1992; Mauldin & Meeks 1990). The MCS data confirm that this is still the case, with more 11-year-old girls than boys doing household chores every day (37% to 29%) and around twice as many boys as girls never doing any household chores (10.5% to 5.5%). Black Caribbean children were the most likely to do daily chores (41%) and more children

► **Table 2.7: Discipline measures used by parents by child's gender (percentage)**

	Never	Rarely	Sometimes	Often	Daily	Don't know	Total
<b>How often sends child to bedroom</b>							
Male	11.5	40.0	34.3	12.0	1.7	0.5	6,357
Female	15.1	43.3	31.9	8.5	0.5	0.8	6,278
Total	13.2	41.6	33.1	10.3	1.1	0.6	12,635
P<0.000							
<b>How often takes away treats from child when naughty</b>							
Male	9.1	38.4	38.5	12.4	1.2	0.4	6,357
Female	14.8	44.9	32.5	6.8	0.2	0.8	6,278
Total	11.8	41.6	35.6	9.7	0.7	0.6	12,635
P<0.000							
<b>How often tries to reason with child when naughty</b>							
Male	5.2	17.9	32.7	31.4	11.2	1.5	6,357
Female	6.2	20.4	36.3	27.3	7.6	2.2	6,278
Total	5.7	19.1	34.4	29.4	9.5	1.8	12,635
P<0.000							

Notes: Millennium Cohort Study Age 11 survey. Weighted per cent; unweighted observations. Where totals do not add up to 100%, this is due to rounding.



with origins in the Indian subcontinent were never called on to do chores (11-12%).

Over half of all 11-year-olds got regular pocket money (59%), though the amount they received was not asked. There was no difference between boys and girls and most ethnic groups, however only 40 per cent of children from Indian backgrounds received pocket money compared to at least 50 per cent in all other groups. Parents with low-grade O level/GCSEs were more likely than other groups to give their children regular pocket money, as were those from non-working households.

## Risky behaviours

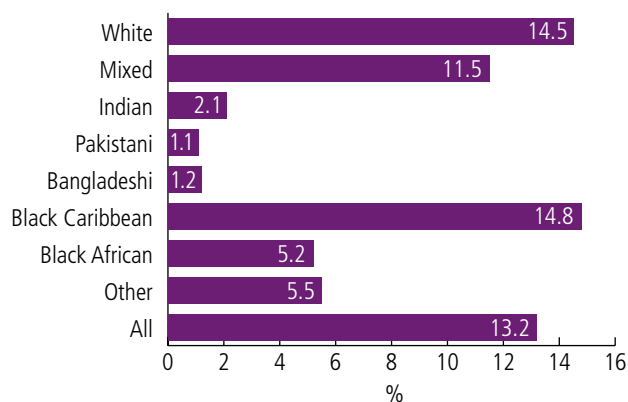
### Smoking and drinking

Smoking and alcohol consumption are long standing public health concerns. The smoking bans and stricter penalties for selling cigarettes to minors have helped to reduce underage smoking – and indeed smoking generally. However, early onset and binge drinking – defined as drinking more than five alcoholic drinks at one time – are particular policy concerns, as both are associated with later health and social problems and other risk factors (Agrawal et al. 2006; Hingson et al. 2009; Donovan 2004). Despite tighter regulations there is still a range of drinks that holds particular appeal to a younger taste – alcopops, fruit ciders etc.

Figures from an annual survey of 11- to 15-year-olds in English secondary schools show that smoking and alcohol consumption among schoolchildren is steadily declining. For example, in 2001 44 per cent of this age group said they had smoked compared with 25 per cent in 2011 (Mandalia 2012). The proportion of 11- to 15- year-olds who had ever had an alcoholic drink fell from 61 per cent to 45 per cent over the same period (Walley 2012). The same survey showed that 6 per cent of 11-year-olds in 2011 had smoked but none were regular smokers, 11 per cent had drunk alcohol and 1 per cent had had alcohol in the previous week. Boys were more likely than girls to have ever smoked (7% to 4%) or have drunk alcohol (14% to 8%).

The Health Behaviour in School-Aged Children Study (HBSC), a World Health Organisation collaborative cross-national study that collects data on the health and wellbeing of 11-, 13- and 15-year-old boys in 43 countries and regions across Europe and North America, also showed that very few 11-year-olds smoke tobacco and drink alcohol on a regular basis. Figures for 2010, showed the proportion of boys and girls smoking a cigarette at least once a week was just 1 per cent in England, with no 11-year-olds in Scotland or Wales smoking regularly. Consuming alcohol at least once a week was higher among boys than girls. Five per cent of boys in Wales and England and 4 per cent in Scotland had an alcoholic drink every week compared with 2 per cent of girls in Wales and Scotland and 1 per cent in England (Currie et al 2012). MCS 11-year-olds were still at primary school, thus they might reasonably be expected to have had less exposure to the slightly higher rates of drinking and smoking among older children – either at school or at parties.

► **Figure 2.4: Percentage of children ever having an alcoholic drink by ethnicity**



Notes: Millennium Cohort Study Age 11 survey. Weighted per cent.

Just 4 per cent of boys and 2 per cent of girls had tried a cigarette, although interestingly, when asked about their friends' smoking behaviour, around 5 per cent thought they had tried smoking. Children whose parents were not working were the most likely to have tried a cigarette by age 11 (6% compared to 1% of those with parents in professional/managerial jobs).

More children had tried an alcoholic drink than had smoked by the age of 11 (13%). More boys than girls had had an alcoholic drink (15% to 11%). Only 1 per cent of all 11-year-olds reported ever having had enough alcohol to feel drunk, with 2 per cent of boys compared with less than 1 per cent of girls having done this. Figure 2.4 shows that Black Caribbean and White children were far more likely (15%) than other children to have had an alcoholic drink by age 11. The least likely were Indian, Pakistani and Bangladeshi children (at no more than 2%).

We also looked at the relationship between smoking and drinking alcohol and unsupervised time and found – perhaps unsurprisingly – that more children who were allowed unsupervised time with their friends had tried smoking or drinking alcohol. For example, 10 per cent of children who were never allowed unsupervised time with their friends on week days had drunk alcohol and 2 per cent had tried smoking. This compared with 17 per cent and 6 per cent respectively among children who were allowed unsupervised time with their friends on most days.

Among the 13 per cent who had tried alcohol by age 11, two fifths (41%) had their first proper alcoholic drink at age 10, with a further fifth having had their first drink at either age 9 (20%) or age 11 (18%). Eight per cent of boys and girls reported their first alcoholic drink at age eight. Of those who had ever had a drink, only 3 per cent had experienced binge drinking.

Over a quarter who had ever had a drink had not drunk any alcohol in the previous year, and more than a half had only had drinks on one or two occasions. One in eight 11-year-olds had drunk alcohol between three and five times in the previous year and around 6 per cent had done so on more than six occasions.

The cohort members were also asked about their friends' drinking, and fewer reported that they knew their friends had tried an alcoholic drink – 7 per cent. Unsurprisingly, some did not know (14%). Around nine in ten children from Indian, Pakistani and Bangladeshi backgrounds reported that none of their friends drank alcohol compared with around three in four of those from White, Mixed and Black African backgrounds. Interestingly, they were also far more certain of their friends' drinking behaviour than other groups, with only 6 per cent saying they did not know compared with 14 per cent overall.

### Antisocial behaviour

Cohort members were asked about a range of antisocial activities that they might have taken part in. Boys were more likely than girls to admit to antisocial behaviour. Very few had been antisocial but 24 per cent of boys and 14 per cent of girls admitted they had been noisy or rude in a public place. Only 5 per cent of 11-year-olds reported having taken something from a shop, again higher among boys than girls (7% compared to 4%). Even fewer had graffitied or damaged public property.

Although percentages reporting this antisocial activity were small, there was a near linear association between the likelihood of children reporting they had taken something from a shop without paying for it and their parents' working situation (Figure 2.5) or their highest academic qualification. Children with parents out of work or with no or low-grade qualifications were the most likely to have said they had taken something from a shop without paying for it, while those with parents in professional/managerial occupations or with a degree or higher were the least likely to have admitted to this.

### Morality

In addition to questions about activities that they might have taken part in, the children were asked their attitudes ('very wrong', 'a bit wrong' or 'not wrong') to antisocial activities, including starting a fight, writing graffiti, taking something from a shop without paying for it and illegally copying or

downloading music. Very few children thought wrongdoing was not wrong. However, Figure 2.6 shows that girls were consistently more likely than boys to think these antisocial activities 'very wrong'.

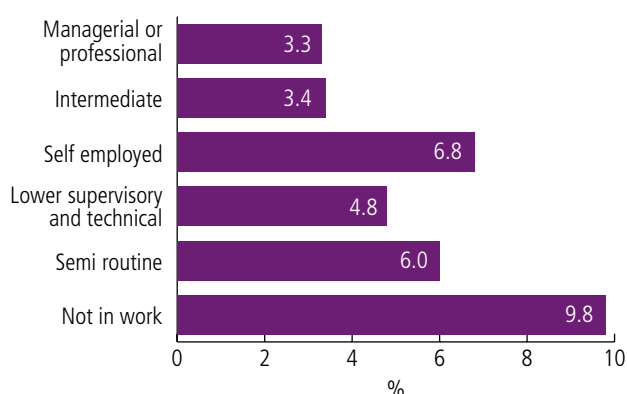
The vast majority of children thought taking things from shops without paying was very wrong (93%) and a further 5 per cent thought it was a bit wrong. Less than 1 per cent thought it was not wrong at all, meaning that even amongst the small proportion of 11-year-olds who admitted taking something from a shop without paying for it (5%), most must have thought it was wrong to some extent.

### Truancy

Department for Education figures show that during the 2012-13 school year, primary pupils in England were absent from 4.8 per cent of all school sessions, increasing to 5.8 per cent among secondary pupils. Overall, for pupils in Year 6, the last year of primary school and when they turn 11, the authorised absence rate was 3.9 per cent and the unauthorised absence rate was 0.7 per cent (Department for Education 2013). Comparable figures for Scotland are 3.8 per cent and 1.3 per cent (Scottish Government 2013), for Wales 5.4 per cent and 0.9 per cent (Welsh Government 2013) and for Northern Ireland 3.7 per cent and 1.4 per cent (Department for Education Northern Ireland 2014). These low levels are not surprising as security is much higher at primary schools and having one teacher for most lessons means there are fewer opportunities to skip school or lessons than at secondary school.

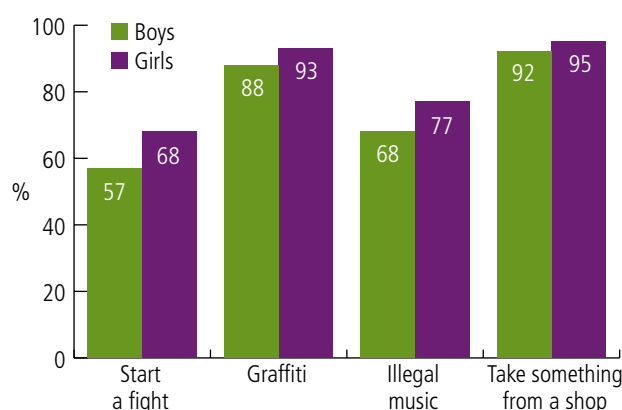
The MCS children were asked if they had missed school, even a single lesson, without their parents' permission. Although low at only 4 per cent, this is much higher than official figures, but the increase may be accounted for by missing a single lesson. Official absenteeism relates only to morning or afternoon sessions. It may also be that the MCS children were also including missing school due to illness, so figures should be treated with caution.

► **Figure 2.5: Percentage of children reporting taking something from a shop without paying for it by parent occupation**



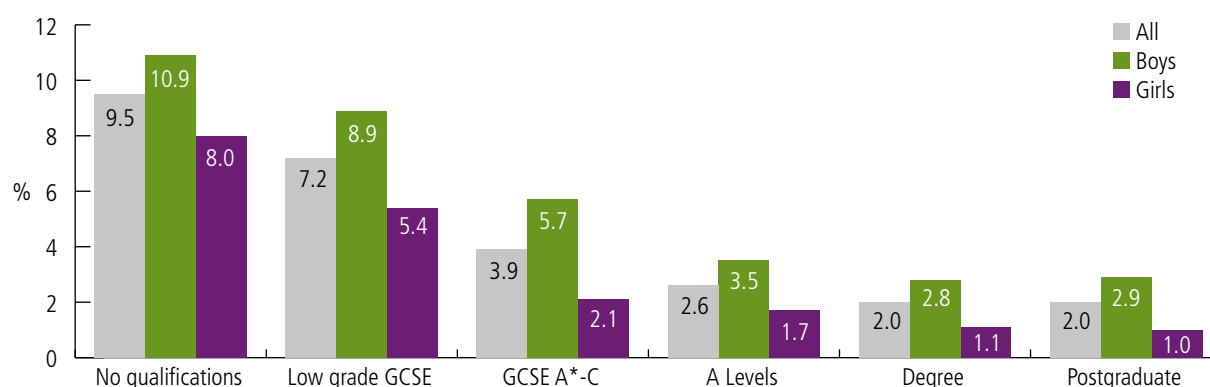
Notes: Millennium Cohort Study Age 11 survey. Weighted per cent.

► **Figure 2.6: Percentage of 11-year-olds thinking antisocial activities 'very wrong'**



Notes: Millennium Cohort Study Age 11 survey. Weighted per cent.

► **Figure 2.7: Percentage of children missing school at age 11 by parents' highest qualification**



Notes: Millennium Cohort Study Age 11 survey. Weighted per cent.

There were, however, differences between boys and girls in MCS with nearly twice as many boys as girls (5 per cent to 3 per cent) saying they had missed school without their parents' permission. Pakistani children were more likely than other groups to have missed some school without their parents' knowledge – 7 per cent compared to a low of only 1 per cent among Indian children. The higher rate among Pakistani children was true for both boys (8%) and girls (5%).

There was a strong linear association between parents' highest education level and children's tendency to miss school. Ten per cent of children with parents with no qualifications missed school compared to 2 per cent of those with parents who had postgraduate qualifications. Figure 2.7 shows this is true for both boys and girls.

## Bullying

Bullying amongst children is a major policy concern. There is evidence that it is experienced by children of all ages, but is especially high among our target age range for this MCS survey. According to government figures, just under half of all children say that they have been bullied at some point in school and around 20 per cent have experienced this outside school. These figures rise to over a half and over a quarter, respectively, for those aged around 11 in England (Department for Children and Schools, 2010). In Wales nearly half of Year 6 pupils reported being bullied in school in the previous year (Welsh Assembly Government 2010). Bullying is damaging for children's wellbeing and can affect their academic performance and school participation (Wolke et al. 2000; Woods and Wolke 2004). It potentially has long-term consequences (Wolke et al. 2013), and may therefore be an important route to understanding adult wellbeing.

The MCS children were asked about their experience of bullying as both victim and perpetrator, with siblings and other children. More than half of all 11-year-olds reported that they were hurt or picked on by other children (58%), with this being slightly

higher among boys (60%) than girls (56%). Among all children, 9 per cent reported being bullied at least every week and a further 7 per cent on 'most days'. Indian children were the least likely to experience bullying on most days (3%) and Black Caribbean the most (8%).

Thirty per cent of 11-year-olds admit to having picked on or hurt other children, but the vast majority said they had only done this less than once a month. Just 1 per cent admitted to doing this 'most days'. Boys were more likely than girls (36% to 24%) to say that they had picked on or hurt other children.

Children are far more likely to experience and perpetrate bullying with their siblings than with other children, with around three quarters having experienced it or done it to a sibling at some stage. Nearly twice as many 11-year-olds report having been picked on by their siblings on most days (21%) than admit to doing it most days (12%).

Being bullied by siblings did not differ by gender, but was more likely among White children than other ethnic groups. For example, 79 per cent of White children had been bullied by their brothers or sisters compared to 68 per cent of Black African and 65 per cent of Black Caribbean children.

## Summary and Conclusions

Friends had become increasingly central to the lives of our 11-year-olds as they grew more independent. They had a mixture of friends – in and out of school – in terms of gender and ethnicity. They were spending a lot of time with friends and were starting to see them without parental supervision. However, differences by gender and ethnicity were apparent, with boys seemingly allowed more freedom and Indian, Pakistani and Bangladeshi children granted less freedom by parents.

With three quarters of children having their own mobile phone, contact with friends was as likely to be via technology as it was



face-to-face. Social media undoubtedly play a central role in the lives of most of these children. Almost all of them had access to a computer and the internet at age 11 and the majority had a TV in their bedroom. However, most parents set rules about the content they could access and the time they could spend on their computer or other devices.

Bullying was very much in evidence, judging by the children's reports. They were more likely to experience or perpetrate bullying with their siblings than with other children, with around three quarters having experienced it or done it to a sibling at some stage. However, more than half of all 11-year-olds reported that they had been deliberately hurt or picked on by other children.

On a more positive note, while there is increasing concern about early onset of risky and antisocial behaviours, responses from the MCS 11-year-olds showed little evidence of this. Very few had tried alcohol or smoked a cigarette, although such experimentation was more common among boys than girls. Few had truanted from school, specifically missed a lesson without their parents' permission, or engaged in antisocial behaviour – though boys were more likely than girls to have been rude in a public place.

These data have, however, highlighted some areas that would benefit from further research, for example the association between increased independence, risky behaviours and risk-taking (as detailed in Chapter 5).

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# Chapter 3:

## Family Structure and Stability

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**Roxanne Connelly, Heather Joshi and Rachel Rosenberg**

### Chapter summary

- Four out of ten MCS children had experienced some family disruption by age 11 compared with one in ten 11-year-olds in 1969.
- Family stability is associated with older and more educated parents, and with South Asian ethnic origins. While White children in this study experienced most family change, a disproportionate number of Black children are being brought up by long-term lone parents.
- Parents of children in 'two-natural-parent' families reported fewer behaviour problems than those in lone parent and step-families. Disadvantaged backgrounds account for some of this difference, especially for long-term lone parents. Children in step-families are most likely to have troubles directly associated with the family structure.

## Chapter 3: Family Structure and Stability

Roxanne Connelly, Heather Joshi and Rachel Rosenberg

### Introduction

This chapter looks at the immediate family living in the cohort child's home – their parents, brothers and sisters. We start by asking how many family members there were at the Age 11 survey, and what changes there have been since the first survey. We then look at some features of the various family types, and some of the differing outcomes for adults and children. Among two-parent families we distinguish between couples who both identify themselves as the child's natural parents (also known as 'intact' families'), and those where only one does. We refer to the latter as 'blended' families. Some lone parents had split from their partner after living as a couple while others appear to have brought their child up on their own from the outset. The stability of parental partnership, as well as its type may affect the child. A longitudinal study, like this, is better suited than cross-sectional sources to identify family structures that have changed, and to relate them to the circumstances of the adults and the experiences of the children.

Censuses and surveys provide snapshots of changing family configurations in the UK. Recent decades have seen a decline in nuclear families with two married parents, countered by an increase in the proportion of families with dependent children headed by a cohabiting couple or a lone parent, usually the mother. According to the Labour Force Survey, UK families headed by married couples, though still the majority, fell from 71 per cent to 60 per cent of all with dependent children from 1996 to 2012, the year of the MCS Age 11 survey. Families with cohabiting parents increased from 7 per cent to 14 per cent and lone parents from 22 to 26 per cent (ONS, 2012). At any one point in time, the higher the age of the youngest child, the smaller are the chances of a family being headed by a cohabiting couple and the greater are the chances of it being headed by a married couple or a lone parent (ONS, 2004, 2014; Smallwood & Wilson, 2007).

It is also worth remembering that the experience of children in the MCS cohort at one age would not reflect an overall average for all children. The census data for the broader age groups to which the Millennium cohort belonged (0-4 years in 2001 and 5-15 years in 2011) showed a fall in the proportion of families with married parents (from 61% to 57%), and in the proportion cohabiting (17% to 11%), but an increase in lone parent families (rising from 22% to 32%). With the longitudinal data from the MCS, we can explore the dynamics of family change in the history of living arrangements.

There is a plausible theory that children may suffer emotional and behavioural problems if their parents divorce or separate. There are multiple and complex possible reasons: 'parental distress and inattention, financial difficulties, social stigma, relocation' (Maughan & McCarthy (1997). In step-families, children not only have to adjust to a new parent, but may be in conflict or competition with new siblings (Dunn 1995). Family disruption can lead to mental health problems in children and adolescents which are, in turn, associated with instability or

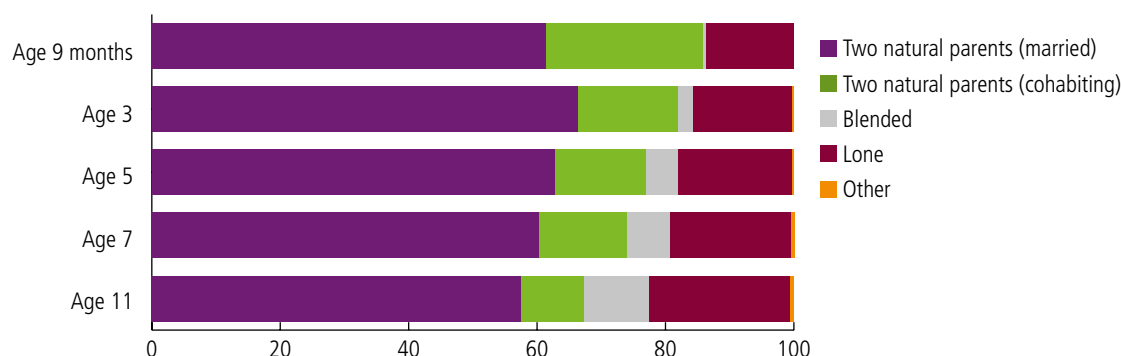
quality of partnership in their adulthood (Richards & Abbott 2009). Disadvantaged women are more likely to become lone mothers (through unpartnered childbearing or couples' break-up), and their children can then suffer compounded disadvantages of a lack of material and parenting resources. While family status may be the starting point for a child's experience, it also reflects parents' earlier experience. As the years go by, the lives of child and parents are shaped by the evolution of the family unit, which may itself reflect external factors, the nature of parental relations, and the health and behaviour of all family members.

Much of the existing research on earlier MCS data suggests that child wellbeing is not determined simply by the marital status of parents. Differing child outcomes are often largely or completely accounted for by other factors.

For example, most analyses of the MCS children's cognitive development to age 5 find that the apparent disadvantage of children with unmarried parents is accounted for by social and economic circumstances, especially mothers' education (Ermisch et al. (2012); Hatton et al. 2010; Crawford & Goodman 2010). Children's behavioural adjustment has been studied using responses to the Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997). On the face of it, children experiencing one or more break in parental partnership showed more behaviour problems than those in families where parents were always together. The behaviour difficulty scores were not exceptionally high for the few MCS families with more than one parental change, but they were where the mother was alone at all surveys. Once parental income and education and other controls were allowed for, these differentials in behaviour were lessened, though they were still significantly different from the continuing two-parent families (Ermisch et al 2012; Kiernan & Mensah (2010) or between the married and the cohabiting (Crawford & Goodman 2010). This does not necessarily mean that family structure causes the child's problems, as there could be still other factors, for example in the psychology of the mother, father or children, influencing both family form and child behaviour. Panico et al. (2014) find some evidence that child behaviour can also have a small influence on adult mental health. The addition of maternal depression to the other factors completes the explanation of the association of family structure with a child's emotional difficulties (Kiernan & Mensah 2010). In their analysis of behaviour problems (and socio-economic wellbeing) of seven- year-olds in the 'Growing Up in Scotland' study, Parkes et al. (2014) found that the association of problems with family structure was more directly accounted for by a set of factors reflecting parental relations, parenting practices and the child's adjustment at school.

By age 11, we are able to focus on the trajectory of family changes, rather than just whether couples were married or cohabiting at a particular time. This chapter summarises histories of stable and less stable parental situations, and relates them to marital status and the presence of siblings at the Age 11 survey. It then relates the family structure to some background

► **Figure 3.1: Family structure of Millennium Cohort Study families from the Age 9 Months survey to the Age 11 survey**



Notes: Millennium Cohort Study Age 11 Survey. Weighted percentages; unweighted observations. 'Cohabiting' includes couples at the MCS Age 9 Months, Age 3 and Age 5 surveys, whose marital status was unknown.

characteristics. This is an aid to interpreting, in the last part of the chapter, why selected outcomes of children may differ across different family pathways. It also helps us to see how far family instability in itself may put children at risk.

## Results

### Family structure across surveys

Family forms began to diversify during the final decades of the previous century. For example, back in 1969 when the National Child Development Study cohort born in 1958 was aged 11, nearly nine out of ten 11-year-olds lived with both natural parents, 6 per cent with lone natural parents, 3 per cent in step-families and 2 per cent in other arrangements (including adoption, which was then more common).

Children in the MCS also predominantly live with both natural parents, as shown in Figure 3.1. From the first survey to age 11, the proportion of families with two natural parents has reduced from 85 per cent to 61 per cent (60% to 50% also married). At age 9 months, relatively few families (15%) were headed by a lone parent (nearly always at that time the natural mother). There were very few other arrangements (under 1%) where the nine-month-old cohort child lived with one natural parent and someone else, and even fewer (0.05%) where no natural parent was present. Over the years, more situations have arisen outside the two-natural-parent norm. By age 11, just over one in four families (26%) were headed by lone natural parents, a further 12 per cent were 'blended' (or step-families), a marked change since 2001, let alone 1969. Lone fathers now headed a larger minority (6%) of lone-parent families, and among the blended families there were more step-mothers than initially, though the proportion remains small (also 6% of blended families). At age 11, nearly 1 per cent of the children were not living with any natural parent. Over half of these children were with one or two grandparents, the rest were living with other

relatives or with adoptive or foster parents. There are too few of these cases to permit separate analysis. The same applies to the tiny number of same-sex couples. In what follows we do not distinguish between fathers and mothers among lone natural parents or those forming blended families, again due to small numbers, but we chose not to exclude lone fathers or step-mothers altogether.

### Family structure and its dynamics

The series of snapshots gives an impression of some families consolidating over time, and others splitting up. Lone parents form partnerships, and partnership breakdown leads to new lone parents. In some cases there will have been a series of partnership changes leading, perhaps, to extreme instability. The pattern of individual family histories is not well captured by the snapshots when there are changes going on between surveys. Our first step was to derive a nine-fold summary of family status sequences classified by first and last state reported and whether there were any different values in between. Table 3.1 shows the distribution among the 13,287 families taking part in the Age 11 survey. We divided families into those whose situation had been stable since the first survey, and for the others, according to the number of changes in situation over the whole sequence of surveys for which there were observations. As most of those (85%) with two or more changes showed no more than two changes, the small number of multiple changes could not be analysed separately.

The largest group of families recorded at the Age 11 survey are those with two natural parents (61%), shown in the first two rows of Table 3.1. Most of these are families that have only ever appeared as having two natural parents. The second category (5% of families) has a last entry as 'two natural parents' but with at least one other arrangement at an intervening survey. In most of these the natural father had moved in at some point after the first survey, in some other cases, one parent appears to have left and then come back.



► **Table 3.1: Sequences of family structure; from first survey to 11 years**

	Percentage present at age 11
1. Two natural parents at all sweeps	56.0
2. Two natural parents at 11, but some other states previously	4.5
3. Lone natural parent formerly in a two parent-couple, one change only	14.2
4. Lone natural parent formerly in a two parent-couple, more than one change	1.6
5. Lone natural parent at all surveys	8.0
6. Lone natural parent at first survey and age 11, with other situations in between	2.3
7. Blended family, no more than one change since first survey	6.8
8. Blended family, two or more changes since first survey	5.3
9. No natural parent	1.3
<b>Total</b>	<b>100</b>
<b>Sample size</b>	<b>13,287</b>

*Notes: First survey is generally at 9 months, but the table also includes the families joining at the Age 3 survey. Weighted percentages, unweighted observations.*

Lone natural-parent families, in rows three to six of Table 3.1, constitute just over one quarter of those who took part in the Age 11 survey. Fourteen per cent of all families are lone parents who started out in two-parent families and had lost one parent by the age 11 sweep without (as far as we can tell), any intervening transition. Around 2 per cent of all families were formerly partnered lone parents who had made more than one switch of status. Rows five and six show two further groups who were lone parents at the Age 11 survey. Each of them had also been classified as lone parents at their first contact with the survey. The 8 per cent, in row five, always recorded at all interviews as lone parents are almost all lone mothers in what appear to be stable situations. The sixth group of families (2%) had changed from lone parent to other arrangements and back again. Blended families (rows seven and eight of Table 3.1) comprise 12 per cent of the cohort at age 11. Children in this group have almost by definition undergone some family change during their lives. Seven per cent of the families have experienced just one change that we know of and in the remaining 5 per cent children have undergone more than one, typically on a pathway from two natural parents, via lone parenthood to a blended family. In most of the small number of cases (1%) where the cohort child was not living with either natural parent there had mostly been at least one change in living arrangements.

Overall, this indicates a picture of family stability for the majority of the cohort (64% if we add 'stable' one- and two-parent

families). Nevertheless, at least one change in parental situation is not uncommon: around 16 per cent living with a lone natural parent after previously living with both, and a further 12 per cent in a blended family with only one natural parent. Yet there were relatively few records within the sequences of interviews showing more than one change. Table 3.1 shows 14 per cent of cases with more than one recorded transition for those present at age 11 (adding rows two, four, six and eight). This is up from the 7 per cent estimated by Panico et al. (2010) to age 5, as one might expect after six more years.

Families that have experienced disruption are less likely to have responded to the MCS surveys, either because circumstances make it more difficult for the family to take part, and/ or because it is harder for the survey to trace them. Lone parent and blended families who were observed at the Age 11 survey were less likely to have been present at all the earlier sweeps than two-natural-parent families. The standard adjustment for attrition bias that is made in Table 3.1, and used elsewhere in this report, goes some way to compensating for this bias. It may not, for example, do so completely for the small minority of very complex histories. Note also that we do not take account of changes between sweeps – or between the child's birth and the first survey. This chapter does not attempt to fill in all the details of all family changes, however it provides an overview of the main patterns of stability and change.

Because of their relatively small sample numbers we do not present details of the more complex trajectories. For the purpose of analysing other variables, but retaining an overview of family dynamics, in subsequent illustrations, we regroup the categories from Table 3.1 into five groups: all the two-natural-parent families at age 11 together (i.e. rows one and two); all the lone parent families in the Age 11 survey with another situation at a previous survey (rows three and four, plus row six); the 'stable' lone parent families (row five); the blended families (rows seven and eight), and the small group with no natural parent (row nine).

### Family structure and marital status

Table 3.2 shows the number of cohort children (not the number of families) analysed by the longitudinal summary of family states derived above. It also shows some further, perhaps more familiar, details of MCS parents' marital status at the time of the Age 11 survey (which form the base for percentages).

From Table 3.2, we see that those 11-year-olds living with married couples were most likely to have two natural parents. Relatively few of the married couples headed up step-families, or were grandparents or adopters. The children of cohabiting parents were almost as likely to have a step-parent (44%) as both natural parents at home (55%). Among children living with previously married lone parents (i.e. currently divorced, widowed or separated) 16 per cent had been in this situation at all surveys. This could be because the parents' marriage ended before the child's birth or after the birth but before the first survey. Conversely, those with never-married lone parents are about evenly divided between those who have always been observed with a lone parent and those where there has

► **Table 3.2: Partnership of MCS children's resident natural parents at Age 11 survey by family structure and change**

		Residence with natural parents and changes up to Age 11 survey					
		1. Two natural parents % (n)	2. Lone ex two- parent % (n)	3. Lone all surveys % (n)	4. Blended % (n)	5. No natural parent % (n)	Total % (n)
Partnership status at Age 11 survey	Married	92.2	n.a.	n.a.	6.6	1.2	100.0 (8,016)
	Cohabiting	55.4	n.a.	n.a.	44.0	0.6	100.0 (2,259)
	Lone	n.a.	68.0	30.0	†	1.9	100.0 (3,194)
	Lone – prev. married	n.a.	80.6	16.1	†	3.2	100.0 (1,943)
	Lone – never married	n.a.	50.9	48.9	†	0.1	100.0 (1,251)
	Total	60.4 (8,886)	18.2 (2,254)	8.0 (892)	12.0 (1,328)	1.3 (109)	100.0 (13,469)
		P < 0.001					

Note: Millennium Cohort Study Age 11 survey; Weighted percentages; unweighted observations in parentheses. † Four cases inconsistently coded

► **Table 3.3: MCS children's siblings at age 11 (of all types, including siblings who are also cohort members)**

		Residence with natural parents and changes up to Age 11 survey					
		1. Two natural parents % (n)	2. Lone ex two- parent % (n)	3. Lone all surveys % (n)	4. Blended % (n)	5. No natural parent % (n)	Total % (n)
Column percentage by number of siblings, weighted % (unweighted n)							
Only child		7.6	17.1	23.7	13.2	38.7	11.7
One sibling		45.8	41.3	31.1	35.0	40.9	42.5
Two		29.0	25.1	26.1	28.0	14.1	27.7
Three or more		17.6	16.5	19.0	23.9	6.3	18.1
Total		(8,886)	(2,254)	(892)	(1,328)	(109)	(13,469)
Average number of siblings by type, weighted mean (se)							
	mean (se)	mean (se)	mean (se)	mean (se)	mean (se)	mean (se)	mean (se)
Total number	1.65 (0.03)	1.49 (0.03)	1.51 (0.05)	1.78 (0.05)	0.96 (0.13)	1.62 (0.02)	
Cohort member siblings	0.03 (0.00)	0.04 (0.01)	0.04 (0.01)	0.05 (0.02)	0.02 (0.02)	0.03 (0.00)	
Other natural siblings	1.52 (0.03)	1.09 (0.03)	0.96 (0.05)	0.85 (0.04)	0.52 (0.08)	1.30 (0.02)	
Step-siblings	0.00 (0.00)	0.01 (0.00)	0.01 (0.00)	0.15 (0.02)	0.01 (0.01)	0.02 (0.00)	
Half siblings	0.09 (0.01)	0.35 (0.02)	0.49 (0.04)	0.75 (0.03)	0.22 (0.07)	0.25 (0.01)	

Notes: Millennium Cohort Study Age 11 survey. Weighted percentages; unweighted observations. Negligible numbers of adoptive and foster siblings not shown.

sometimes been a resident partner. Among the two-parent families who were still cohabiting at the Age 7 survey, 8 per cent had married before the Age 11 survey and 20 per cent had split up. As at previous surveys, this was higher than the break-up rate among married parents (8% from age 7 to 11).

#### Non-resident parents

If a child is not living with both natural parents it is of interest to know if they are (or could be) in touch with their non-resident

parent or parents. Thirty-seven per cent of children were not living with their natural father at age 11, in lone parent or blended families. One per cent of MCS children's fathers are known to have died. Eleven per cent of all children had no contact with their father, but twice as many (24%) did have contact with a non-resident father. Contact status was not reported in just under 2 per cent of all cases. Among children in a blended family the chances of not being in contact their father (32%) was slightly higher than for children living with a lone mother (26%).

► Table 3.4: Background characteristics of MCS children and their families at Age 11 survey by family structure and change

		Residence with natural parents and changes up to Age 11 survey					
		1. Two natural parents % (n)	2. Lone ex two- parent % (n)	3. Lone all surveys % (n)	4. Blended % (n)	5. No natural parent % (n)	Total % (n)
Mother's age at Age 11 survey	Under 29	20.8	23.8	23.0	31.7	0.8	100 (489)
	30 to 34	41.7	20.9	13.6	23.4	0.5	100 (2,161)
	35 to 39	61.2	17.7	7.4	13.5	0.2	100 (3,198)
	40 to 44	73.3	15.3	4.3	6.8	0.4	100 (4,308)
	45 to 49	74.0	15.2	5.3	4.3	1.3	100 (2,447)
	Over 50	63.1	12.1	6.1	2.9	15.8	100 (623)
	<b>Total</b>	<b>61.4 (8,837)</b>	<b>17.2 (2,097)</b>	<b>8.0 (874)</b>	<b>12.2 (1,316)</b>	<b>1.2 (102)</b>	<b>100 (13,226)</b>
							P < 0.001
Ethnicity of cohort member	White	59.8	18.6	7.1	13.2	1.3	100 (11,153)
	Mixed	41.2	26.1	20.1	10.8	1.8	100 (388)
	Indian	87.0	5.5	3.9	3.6	0.0	100 (342)
	Pakistani	82.5	11.4	3.6	1.7	0.8	100 (668)
	Bangladeshi	86.0	7.1	2.3	4.4	0.3	100 (286)
	Black Caribbean	29.5	31.3	29.6	5.6	3.9	100 (144)
	Black African	49.6	19.1	23.9	6.4	1.0	100 (262)
	Other	66.1	13.4	16.3	4.2	0.0	100 (223)
	<b>Total</b>	<b>60.4 (8,885)</b>	<b>18.2 (2,253)</b>	<b>8.0 (892)</b>	<b>12.0 (1,327)</b>	<b>1.3 (109)</b>	<b>100 (13,466)</b>
							P < 0.001
Parents' highest academic qualification at Age 11 survey	None	49.6	21.1	16.6	11.5	1.3	100 (1,852)
	NVQ1	49.0	20.8	9.6	18.5	2.1	100 (1,186)
	NVQ2	59.3	17.6	8.2	14.3	0.6	100 (3,862)
	NVQ3	67.0	16.1	3.5	12.0	1.4	100 (1,149)
	NVQ4	72.3	14.5	4.1	8.4	0.6	100 (3,651)
	NVQ5	74.0	12.4	2.7	8.7	2.1	100 (1,034)
	<b>Total</b>	<b>61.6 (8,514)</b>	<b>17.2 (2,024)</b>	<b>7.9 (839)</b>	<b>12.2 (1,275)</b>	<b>1.0 (82)</b>	<b>100 (12,734)</b>
							P < 0.001
Country / Region at Age 11 survey	England	59.9	18.5	8.2	12.0	1.4	100 (8,792)
	<b>London</b>	<b>61.1</b>	<b>18.6</b>	<b>13.6</b>	<b>5.5</b>	<b>1.1</b>	<b>100 (1,357)</b>
	<b>Rest of England</b>	<b>59.7</b>	<b>18.5</b>	<b>7.4</b>	<b>13.0</b>	<b>1.4</b>	<b>100 (7,435)</b>
	Wales	58.6	17.7	7.3	15.5	0.8	100 (1,853)
	Scotland	63.5	17.7	5.5	12.5	0.9	100 (1,496)
	N. Ireland	67.7	13.9	10.7	7.3	0.5	100 (1,328)
	<b>Total</b>	<b>60.4 (8,886)</b>	<b>18.2 (2,254)</b>	<b>8.0 (892)</b>	<b>12.0 (1,328)</b>	<b>1.3 (109)</b>	<b>100 (13,469)</b>
							P < 0.001
Gender of cohort member	Male	59.6	17.9	8.7	12.3	1.4	100 (6,792)
	Female	61.3	18.5	7.3	11.7	1.1	100 (6,677)
	<b>Total</b>	<b>60.4 (8,886)</b>	<b>18.2 (2,254)</b>	<b>8.0 (892)</b>	<b>12.0 (1,328)</b>	<b>1.3 (109)</b>	<b>100 (13,469)</b>
							p>0.05

Notes: Millennium Cohort Study Age 11 survey. Weighted percentages; unweighted observations in parentheses. Where totals do not add up to 100%, this is due to rounding.

A much smaller proportion (4%) of the children were not living with their natural mother (in one in ten of these cases the mother had died). A similar number were not in contact, though nearly half were (1.6% of all children). For about 1 per cent of all cases, contact with a non-resident mother was not reported. The questions which may arise about the quality of contacts with non-resident parents, and their contributions in cash or kind, are beyond the scope of this chapter. We note, however, that most of the MCS children's non-resident parents are not completely absent from their lives, and that this adds another facet of complexity to some family structures.

### Siblings

Table 3.3 shows an average of 2.6 children in the MCS families at the time of the Age 11 survey – the cohort child (or children if there was more than one) plus 1.6 siblings. Family size seems to have stabilised since age 7. At age 11, around 12 per cent of the cohort children had no siblings in the family, down from 42 per cent at birth but a similar level as at age 7 (de la Rochebrochard & Joshi, 2013). This mainly reflects the low rate at which their mothers were continuing to give birth. The proportion in large families with three or more siblings (18%) is also similar to age 7. Very few of these exceed four, though the maximum is ten. There is a higher than average incidence of large families (24%) among the blended families, where there are, unsurprisingly, above average numbers of half-siblings.

There is some polarisation within the long-term lone parent families where there are above average proportions of only children (no siblings) and three or more children. The vast majority of brothers and sisters were full natural siblings (1.3 on average) with a minority of half-siblings (average 0.25). There was also a much smaller number of step-siblings, mainly in the blended and disrupted lone parent families, implying that family changes have seldom resulted in a cohort child living with a sibling with whom there is no natural parent in common. The questions of how many of the siblings are older or younger, same or opposite sex, close in age, or their relations with each other, and any impact on child wellbeing or development, could be addressed in the data but are beyond the scope of this chapter.

### Family structure and change by background factors

Table 3.4 presents the tabulation of a selection of background characteristics by the five-fold variable summarising family structure. The panel for age of mother shows that only a minority of younger mothers, those currently under 35 who had been in their teens or early twenties when the cohort child was born, were living in a two-natural-parent family when the child was 11. These mothers, who also tend to be economically disadvantaged, were the most likely to appear in the Age 11 survey with a new partner, and also had above average chances of becoming or remaining a lone parent. Conversely, mothers currently over 40 were most likely still to be living with the child's father least likely to be in lone and blended families.

The age pattern in entry into and progress through parenthood is also reflected in the parents' education level (we use the

higher level attained by either parent where two are present). Parents with graduate-level qualifications tend to be older and the great majority (over 70%) are in natural parent couples. The proportion in such partnerships falls to around half when the highest qualification, if any, is at NVQ level 1. Conversely, the proportion in the lone and blended family categories falls with rising education. Long-term lone parents are particularly likely to have no qualifications. Not only is there no second parent who might raise the combined level, but they are likely to be early education leavers who had their child at a young age.

Ethnic groups have quite distinct family profiles. South Asian (Indian, Pakistani and Bangladeshi) children are very likely to be living with both natural parents (usually married). Black children are the least likely to be in any sort of two-parent family. Black Caribbean children are strongly over-represented in the long-term lone parent category. Black families together form 11 per cent of this group, though only 3 per cent of the whole cohort. White families have an intermediate profile, very like the total cohort of which they are the majority.

In the four nations of the UK, the family structure profile is fairly similar, though with somewhat lower proportions of children in two-natural-parent families in England (60%) and Wales (59%) than in Scotland (63%) and Northern Ireland (68%). Within England, London has considerably greater family diversity. Nearly 14 per cent of London children were in families headed by lone parents at all contacts (compared with 8% nationally) and relatively few were in blended families.

Girls and boys have more or less the same distribution across family types. There is no evidence here that parents of either one or the other are more likely to stay together.

### Outcomes for family and children

In this section we review just a few of the circumstances in which families and children are found at the Age 11 survey, which may represent concomitants or consequences of the family structure or change. In Table 3.5 we consider two features of family circumstances at the Age 11 survey: poverty and housing tenure. We also include just one indicator of child health: overweight/obesity. The children's own account of their level of happiness is presented in Figure 3.2 and there is a more detailed examination of behaviour problems in Table 3.6.

The association of lone parent families with economic disadvantage, apparent in earlier surveys (and other sources), is confirmed by Table 3.5. This shows the proportion of children in families whose income (adjusted for household size) is below 60 per cent of the national median, approximately the measure used in official statistics on relative child poverty. Only 14 per cent of two-natural-parent families were estimated to have income below this poverty threshold, whereas more than half (53%) of the long-term lone parents had income at or below the poverty line, reflecting low employment rates (not shown). The other group of lone parents (formerly partnered) also had relatively high poverty levels (26%). Blended families, despite



► **Table 3.5: Outcomes for child and family at Age 11 survey by family structure and change. Column percentages**

		Residence with natural parents and changes up to Age 11 survey					
		1. Two natural parents % (n)	2. Lone ex two- parent % (n)	3. Lone all surveys % (n)	4. Blended % (n)	5. No natural parent % (n)	Total % (n)
Poverty at Age 11 survey	Yes	14.1	25.8	53.1	31.7	18.9	21.6
	Total	(8,886)	(2,254)	(892)	(1,328)	(109)	(13,469)
		P < 0.001					
Housing tenure	Home owner	76.6	33.6	8.8	37.7	48.9	58.3
	Private Rent	7.3	22.9	20.0	24.9	8.2	13.3
	Other Rent (e.g. Local authority)	14.5	39.7	65.3	35.8	41.8	26.1
	Other	1.6	3.8	6.0	1.7	1.1	2.4
	Total	(8,717)	(2,222)	(878)	(1,306)	(105)	(13,228)
		P < 0.001					
Weight Status	Not overweight	65.7	62.0	60.9	66.7	72.6	64.9
	Overweight	15.4	15.7	15.9	13.3	9.8	15.1
	Obese	18.9	22.3	23.2	19.9	17.7	20.0
	Total	(8,630)	(2,179)	(851)	(1,279)	(103)	(13,042)
		p<0.05					

Notes: Millennium Cohort Study Age 11 survey. Weighted percentages; unweighted observations in parentheses.

having two adults potentially to bring in income, had the second highest poverty rate. This is likely to be partly the legacy of earlier disadvantage (e.g. low qualifications and early motherhood).

Another indication of the differing levels of advantage of these various family types is the social class category of the parents. The two-natural-parent couples had the highest proportion with someone in the top category (managerial and professional). The long-term lone parents were at the opposite end of the scale, with 47 per cent in the lowest (routine) category if they were employed at all.

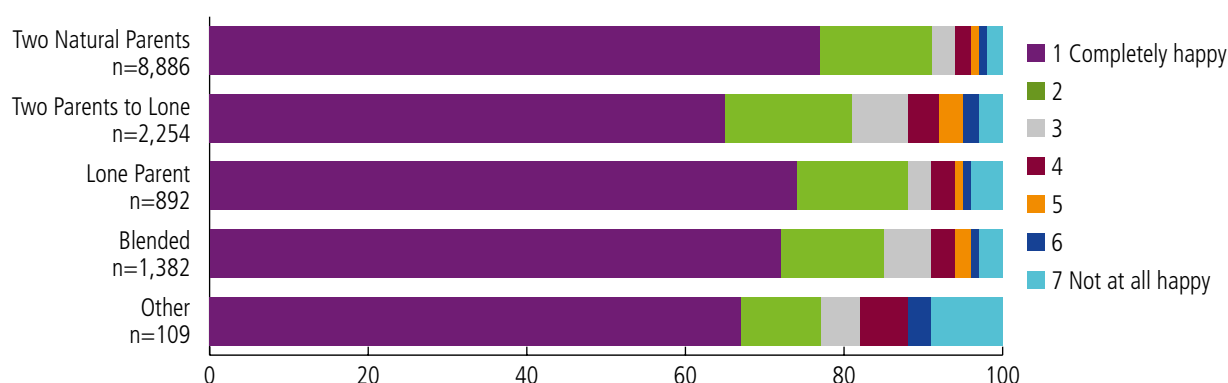
Housing tenure is also strongly related to family structure. The two-natural-parent families were most likely to own their homes (77%). Less than half the parents in the other groups were home-owners. The most common housing tenure for all the non-intact families was social renting— from a local authority or housing association— which provided for 65 per cent of long-term lone parents, 40 per cent of formerly partnered lone parents, and 36 per cent of the re-partnered.

As a possible indicator of health differentials between the various family states we look at the children's body mass, conventionally categorised as overweight or obese on the UK 1990 cut-off points. For more details see Chapter 6, Physical Development. The proportions who were above normal weight were somewhat higher for both sets of lone parents (around

40%) than for two-parent families (around 35%), with no difference by previous partnership history. Supplementary investigations suggest that the higher incidence of problematic weight among the children of lone parents is partly associated with the parents' lower educational attainment and with Black groups. The apparent excess obesity of the latter may be overstated by the use of cut-offs which have not been adjusted for ethnic origin. At the Age 7 survey, Pearce et al. (2013) also found more children of lone parents to be overweight/obese than in intact families, by a small margin. This was statistically accounted for by age, gender, mother's depression at the first survey, ethnicity, maternal education and occupation, and a broader definition of poverty than used here.

We now turn to one of the children's own accounts of their life at age 11. In their paper-and-pencil questionnaire on how they rated themselves on a seven-fold scale from 'completely happy' to 'not at all happy', around half (52%) of all children rated themselves 'completely happy'. When asked how happy they felt about their family, even more (75%) rated themselves completely happy. Figure 3.2 shows that, perhaps surprisingly, there are only small differences across the family types in the proportions of children reporting that they were 'completely happy' with their families. The children of two natural parents were most likely to say this (77%) while those with a formerly partnered lone parent were least likely to give this response (65%). Children in long-term lone parent families and in blended families fell between these two groups (74% and 72%

► **Figure 3.2: MCS children's happiness with family, by family structure changes from the first survey to the Age 11 survey**



Notes: Millennium Cohort Study Age 11 Survey. Weighted Percentages.

respectively). Few children report themselves 'very unhappy'. Apart from the small group of families with no natural parent, the proportion who were 'very unhappy', with their families, or life in general, was no higher than 4 percent. This is the figure for the children of long-term lone parents, who provided the most polarised answers.

#### Family change and children's behaviour problems

The literature suggests that of all the child outcomes measured in MCS, behaviour problems are most likely to be associated with family structure and change, particularly conduct problems. It is widely believed that children's problem behaviour reflects troubled relationships between parents. We address this issue by examining the answers given by the main respondent to the Strengths and Difficulties Questionnaire (Goodman, 1997). Table 3.6 reports the incidence of behaviour problem scores over the conventional threshold, analysed in terms of family structure and change to age 11. For Total Difficulties (the sum of the four five-item scales for emotional problems, conduct problems,

hyperactivity and peer problems), and all of these four components, children in stable two-parent families show the lowest level of problems (12% for the Total Difficulties score against the overall average of 17%). The small group living apart from both natural parents have the highest reported level of Total Difficulties (35%). The next highest group is those with long-term lone parents (29%). Children from blended families (26% with problematic behaviour) and formerly partnered lone parent families (22%) fall between the 'stable' couples and the 'stable' lone parent families. For conduct problems, the level of difficulties among blended families (33%) is just above that of the long-term lone parent families (32%). Further examination by the nine sub-divisions of the history of family change from Table 3.1 showed a small tendency for those with a more complex family history to report more problems in their children. Questionnaire responses also suggested a small advantage, given the number of changes, for children of previously partnered lone parents compared to those living with step-parents. Note that there is a contrast between the children's

► **Table 3.6: Behaviour problems by family structure: percentage of children at or above conventional borderline on SDQ Total Difficulties sub-scales**

	Residence with natural parents and changes up to Age 11 survey					Total % (n)
	1. Two natural parents % (n)	2. Lone ex two- parent % (n)	3. Lone all surveys % (n)	4. Blended % (n)	5. No natural parent % (n)	
Total Difficulties	12.3	21.6	28.5	25.9	35.0	17.2
Emotional Problems	16.1	23.4	25.2	23.5	31.1	19.2
Conduct Problems	16.6	26.9	32.0	33.4	41.8	22.0
Hyperactivity	13.6	22.2	28.2	27.6	34.9	18.3
Peer Problems	18.1	23.9	30.4	25.2	37.2	21.3
Total	(8,505)	(2,185)	(845)	(1,289)	(99)	(12,923)

Notes: MCS Age 11 Survey. Weighted percentages; unweighted observations in parentheses.

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reports of happiness, shown in Figure 3.2, and the parental report of troubled behaviour (e.g. aggression or withdrawal). The children of long-term lone parents were mostly as happy, if not happier, than the rest, on their own report, whereas they appear to be almost the most likely to have troubled behaviour, according to the parent.

The pattern of association shown in Table 3.6 could reflect a causal influence of troubled parental relationships affecting children, but it could also reflect any number of common factors that are associated with both family circumstances and child behaviour. We have done some exploratory regression analyses, simultaneously allowing for some of the factors presented in Tables 3.4 and 3.5: child's gender and ethnic group, income below poverty line, mother's age, parental education, and housing tenure. All of these show some relationship with the chance of having above normal levels of Total Difficulties and, within that, of conduct problems. Most of them have a significant independent relation to hyperactivity and peer problems and fewer to emotional problems.

Once these associations are taken into account, differences between intact and other families are reduced but do not disappear. Lone parents are still significantly more likely to report behaviour problems, but no clear difference remains by whether and how many previous partnerships were recorded. A somewhat higher incidence of unexplained difficulties among blended families is also evident, but again no significant difference is detected by number of previous changes.

The few children not living with either natural parent had the highest adjusted rates for all behaviour problems. This is more likely to reflect the unspecified circumstances that had brought about their situation than the direct consequence of current arrangements. The relatively high rates of problems for children of long-term lone mothers were reduced to around or below those for step-families when these socio-economic disadvantages were taken into account. Despite the adjustments we have made, it is still not clear that the remaining gaps in behaviour scores are necessarily the result of family disruption. They might be further reduced by accounting for factors such as poor health in the family, particularly mental health, but these factors themselves may also be adverse outcomes of, or exacerbated by, family stress.

## Conclusion

We have focused on the instability in family forms experienced over the first 11 years of the MCS children's lives. Although our analysis has shown that there was more turnover in living arrangements than would be apparent in a snapshot survey, it appears that only a minority of MCS children experienced multiple changes. It is also clear that the relatively few children who had more than one change in parental arrangements were not at exceptional risk of the outcome we examined in depth, parent-reported behaviour problems.

This does not mean that children in certain family types did not experience disadvantages. For obesity, the differences between children in the various family types were effectively accounted for once the selected background socio-economic characteristics were taken into consideration. However, behaviour difficulties showed more of an independent association with family structure (particularly blended families) even after allowing for a preliminary selection of associated factors. This is very much in line with previous research on this question at earlier stages of the cohort's lives. It is noteworthy that the disadvantages of family break-up may impinge more directly on the adult's experience, in the labour and housing markets, and on their mental health, and the stress of single-handed parenting, than on the 11-year-olds themselves. The children's report of their own happiness is less differentiated by family structure than the parents' report of behavioural difficulties (although even these affect only a minority of children).

Most children report themselves reasonably happy whatever the family status. This applies especially to the children in long-term lone parent families, despite their markedly greater risk of income poverty. Perhaps the stigma of family disruption is now less acute than in the days when there was less of it.

What evidence have we found for family status being a marker as opposed to a driver of disadvantage and social inequality? We have not attempted to repeat the finding that marital status is not per se, a driver of child wellbeing, and is hence not a good potential policy lever. We have looked for a link between the instability to which cohabitation is thought to give rise and outcomes for children and parents. We have not disproved a causal link driving or exacerbating social disadvantage, but neither was it within the scope of this exercise to estimate how strong such a link may be. We have marshalled familiar evidence for the high risk of income poverty facing lone parents (mostly women), which is one aspect of gender inequality. We have traced some of the long-term accumulation of disadvantage affecting women who enter motherhood at an early age with low or no qualifications. A host of factors (economic and psychological) may break the link between family disruption and disadvantage, probably best in combination. This should involve co-ordinating education, health and social services, preserving the family-friendliness of the employment arena, and providing support for couples and families whatever their marital status.

The scope of this chapter means that we have paid minimal attention to non-resident parents, and none whatsoever to people other than the nuclear family who may be living in the more complex households. We should finish by suggesting some areas requiring further investigation: analysis of changes in family structure which occur between sweeps, family relationships, contributions (cash and care) of non-resident parents, parenting, health (especially mental) of both parents as well as the children, and other outcomes such as cognitive scores and teacher rating of behaviour. Our partial exploration of the territory may serve as guide for others to follow.

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# Chapter 4: Schooling and Transition to Secondary School

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**Kirstine Hansen**

## Chapter summary

- At age 11, the majority of children attended mixed-sex, non-faith, state schools (78%).
- Most children (68%) had only attended one school by age 11 but 8 per cent of pupils had moved at least twice since age 5, thus attending at least three different primary schools by age 11.
- Although the transition to secondary school is a potentially stressful time, the majority of children (52%) were completely happy with school and 60 per cent were looking forward to secondary school a lot.
- Almost four in five (78%) families had already found out which secondary school their child would be going to, and 92 per cent of them had managed to secure their first-choice school.

## Chapter 4: Schooling and Transition to Secondary School

Kirstine Hansen

### Introduction

Schooling is a big part of the lives of the Millennium Cohort children. At the Age 11 survey, most were in their final year of primary school and were getting ready to transfer to secondary school. This chapter takes stock of where the children were at age 11, what schools they went to, what their school day looked like, and how much they liked school. It moves on to examine how they were coping with the transition to secondary school, and parental decisions around school choice.

### Data

This chapter uses data from the Age 11 survey of the Millennium Cohort Study (MCS), but also incorporates information on schooling at ages 7 and 5. It focuses on individual-level variables, but incorporates family-level factors, such as reports on school choice decisions, parental educational level and household income. These family-level variables come from the main interview, which in most cases was completed by the mother on behalf of the family. All results discussed in this chapter are statistically significant at the 5 per cent level.

### Results

#### The schools that children attended at age 11

The majority of children interviewed at the Age 11 survey (95%) were in Year 6 (or Primary 7 in Scotland and Northern Ireland). However, a small minority (around 1%) were in Year 5 (or Primary 6), and a further 4 per cent had already started secondary school. Table 4.1 shows the type of schools the cohort members were in

at age 11. The majority of children (just over 95%) were in state schools. Some 76 per cent were in mixed-sex, non-faith schools, and a further 19 per cent were in mixed-sex, faith schools. Only around 1 per cent of children were in single-sex state schools, with most of those in non-faith schools. Just under 5 per cent of children were being educated in the independent sector at age 11. As in the state sector, the majority of these children were in mixed-sex, non-faith schools (3%), with a further 1 per cent in mixed-sex, faith schools. The remaining 1 per cent were in private, single-sex schools, and the majority were non-faith schools.

Grouping all the independent schools and all the faith and non-faith schools together, Table 4.2 shows that the percentage of children in private education varies by country from 5 per cent in England, to 4 per cent in Scotland, 2 per cent in Wales and 1 per cent in Northern Ireland. We also see from Table 4.2 that England had the most children attending state faith schools, at 25 per cent. Fifteen per cent of children in Scotland attended state faith schools, 13 per cent in Wales and less than 1 per cent in Northern Ireland. However, while state schools in Northern Ireland are open to all faiths, in practice the education system persists in being highly segregated by community, though the number of 'integrated' schools is increasing.

#### Languages in school

In Scotland, Wales and Northern Ireland, children can be taught in English or in Gaelic, Welsh or Irish respectively. Table 3 shows that the majority of children were taught in English, but this varies across country. In Northern Ireland, 88 per cent of children were taught solely in English, in Scotland this figure is 81, while in Wales only 38 per cent of children were taught in English only. A significant number of children had at least some exposure to Gaelic, Welsh or Irish. In Scotland, only around 1 per cent were

► Table 4.1: Types of schools cohort members attended at age 11

State school				Independent school				Total
Mixed-sex, non-faith	Mixed-sex, faith school	Single-sex, non-faith	Single-sex, faith school	Mixed-sex, non-faith	Mixed-sex, faith school	Single-sex, non-faith	Single-sex, faith school	
75.6 (9,696)	19.2 (2,499)	0.8 (99)	0.1 (13)	2.6 (346)	0.9 (121)	0.7 (87)	0.2 (29)	100.0 (12,890)

Notes: MCS Age 11 survey. Weighted percentages. Unweighted observations in parentheses.

► Table 4.2: Type of school attended at age 11 by UK country

	Independent	State, non-faith	State, faith	Total
England	5.4	70.0	24.6	100.0
Wales	2.3	84.7	13.0	100.0
Scotland	3.5	82.0	14.5	100.0
Northern Ireland	1.4	98.2	0.4	100.0
Total	4.3 (583)	76.4 (9,795)	19.3 (2,512)	100.0 (12,890)

Notes: MCS Age 11 survey. Weighted percentages; unweighted observations in parentheses

► **Table 4.3: Medium of instruction by country**

	Mainly Gaelic/Irish	Mostly Gaelic/Irish	Mostly English	English only	Total
Scotland	0.4	0.7	17.7	81.2	100.0 (237)
Northern Ireland	0.3	1.2	10.9	87.6	100.0 (161)
	Welsh only	Mainly Welsh	Half and half	Mainly English	English
Wales	7.8	6.6	7.5	40.6	37.5
					100 (425)

Notes: Age 11 survey. Weighted percentages; unweighted observations in parentheses.

► **Table 4.4: Number of school moves between the ages of 5 and 11**

	Same school	1 move	2 moves	3+ moves	No. of moves unknown	Moved to secondary school	Total
Not poor	70.3	19.8	5.8	1.5	2.0	0.6	100.0
Poor	60.6	24.1	8.0	4.3	1.8	1.2	100.0
Total	68.3 (9,199)	20.7 (2,446)	6.3 (675)	2.1 (183)	1.9 (317)	0.7 (70)	100.0 (12,890)

Notes: MCS Age 11 survey. Weighted percentages; unweighted observations in parentheses.

mainly or mostly taught in Gaelic, but 18 per cent were mostly taught in English, implying they were partially taught in Gaelic. In Northern Ireland, less than 2 per cent were mainly or mostly taught in Irish, with 11 per cent mostly taught in English (so having some exposure to Irish). In Wales, 8 per cent of children were taught in Welsh only, a further 7 per cent were mainly taught in Welsh and 8 per cent were taught jointly in Welsh and English. Forty-one per cent were mainly taught in English (with some teaching in Welsh).

### School moves

The bottom rows of Table 4.4 show that while the majority of children (68%) were in the same school they started in at age 5, 21 per cent of children had moved school once, 6 per cent had moved school twice (so had attended three primary schools), and a further 2 per cent had moved three or more times, thus attending at least four primary schools between the ages of 5 and 11. While over two thirds had had stable primary school careers, the small majority with multiple moves is a potential cause for concern, as research has shown that mobility is associated with negative impacts on attainment (Mehana and Reynolds 2004).

In Table 4.4, we examine school moves by family income. The upper rows divide the children by poverty status, using a relative poverty threshold of 60 per cent of median adjusted family income (see Chapter 7). Families living in poverty were more likely to move than other families. While 70 per cent of children from better off families were in the same school as they were at age 5, this was the case for only 61 per cent of children in poverty. Twenty-four per cent of poor children had moved once (compared to 20% of non-poor children), 8 per cent had moved twice (compared to 6%) and 4 per cent had moved three or more times (compared to 2%).

### Breakfast and after-school clubs

The average primary school day starts around 9am and finishes soon after 3pm. However, many children are away from home for longer periods. A significant minority of children attend breakfast and after-school clubs, which spread the school day from around 8am until 5 or 6 pm. At age 11, 7 per cent attended breakfast clubs at least once a week, 23 per cent attended after-school clubs at least once a week, and 7 per cent attended both breakfast and after-school clubs (see the bottom rows of Table 4.5). Around 63 per cent of children attended neither breakfast nor after-school clubs.

At age 11, children were more involved in clubs before and after school than they were at age 7. Hansen and Jones (2010) showed that at the Age 7 survey, 73 per cent of children did not attend either breakfast or after-school clubs, 6 per cent attended breakfast clubs and 17 per cent after-school clubs. Only 5 per cent attended both breakfast and after-school clubs at age 7.

Breakfast clubs provide a morning meal for disadvantaged children who otherwise might turn up for school having had nothing to eat. The clubs' advocates argue that they work to reduce the socio-economic gap in children's attainment by helping to improve punctuality, academic results, concentration and behaviour. We would therefore expect to see differences in attendance of breakfast clubs by household income. On the other hand, after-school clubs are primarily used by working families to provide care for the children while mothers and fathers complete a working day. Thus, we would not necessarily expect the same kind of differences in attendance by income measure. The upper rows of Table 4.5 show that children living in poverty were more likely to attend breakfast clubs. Nine per cent of children



► **Table 4.5: Breakfast and after-school clubs**

	Neither	Breakfast club only	After school club only	Both breakfast and after-school club	Total
Not poor	64.5	6.3	22.9	6.3	100.0
Poor	59.3	8.9	23.5	8.3	100.0
Total	63.4 (8,089)	6.9 (882)	23.0 (3,021)	6.7 (895)	100.0 (12,887)

Notes: MCS Age 11 survey. Weighted percentages; unweighted observations in parentheses.

► **Table 4.6: Frequency of bicycle use by whether received formal cycle training, row percentages**

	Every day or almost every day	Several times a week	Once or twice a week	At least once a month	Every few months	At least once a year	Less often or never	Total
Received cycle training	14.4	18.1	24.1	20.8	13.0	1.6	8.0	100 (5,528)
No cycle training	10.1	14.3	19.5	15.7	13.1	3.2	24.1	100 (7,814)
All	11.9 (1,566)	16.0 (2,139)	21.5 (2,909)	17.9 (2,376)	13.1 (1,741)	2.5 (337)	17.1 (2,274)	100 (13,342)

Notes: MCS Age 11 survey. Weighted percentages; unweighted observations in parentheses.

in poverty attended breakfast clubs, compared to 6 per cent of children in higher-income households. Moreover, 8 per cent of children in poverty attended both breakfast and after-school clubs, compared to 6 per cent of other children. However, attendance at after-school clubs showed little variation by poverty status.

### Travel to school

The majority of MCS children spent between five and 15 minutes travelling to school (56%), although many (23%) took less than five minutes to get to school. A further 18 per cent spent between 15 and 30 minutes on their school journey, while 3 per cent spent between 30 and 45 minutes. Only 1 per cent had an each-way journey longer than 45 minutes. Almost half of the children walked to school (49%), a further 40 per cent were taken by car, 5 per cent travelled on a school bus, 3 per cent on public transport and 2 per cent rode a bike.

Even though very few rode a bike to school, we also looked at overall bicycle use, to see whether children were cycling at other times. Children were asked how often they used a bicycle (including travel to school). They were also asked whether they had received any training, such as 'Bikeability'. Table 4.6 shows the extent of cycle use broken down by whether or not cycle training had been received.

We can see from Table 4.6 that the general rate of bicycle use is much higher than the proportion of children getting to school by bike: 28 per cent of children use their bike several times a week or more often. The rates of cycle use are also higher among those who have received formal cycle training, compared to those who have not. A third (33%) of children who had received cycle training were using the bikes at least several times of

week; while nearly a quarter of those with no cycle training use a bike less than once a year. This was the case for only 8 per cent of those who had received training.

The low rate of cycling to school is also reflected in the fact that less than one in five of the children made their own way to school. The majority of MCS children travelled to school with an adult (46%), and 33 per cent travelled with other children. However, 17 per cent went to school on their own.

### Homework

At age 11, children spent an average of two hours and four minutes per week doing homework. This varied by gender, with girls spending around 18 minutes more than boys per week (i.e. two hours and 13 minutes compared to one hour and 55 minutes).

Most children received help with their homework. As the bottom rows of Table 4.7 show, 22 per cent of families said that someone always helped with homework, 25 per cent said someone usually helped, 43 per cent sometimes helped and 10 never or almost never helped with homework. We might expect that help with homework would vary by the educational level of the parent. This is examined in the upper rows of Table 4.7, which clearly show patterns of help varied by the highest qualification of the parents. Parents with the lowest level of educational qualifications were both more likely to always help than other parents, but were also more likely to never help. The percentage of parents that always help with homework appears to decline in a linear fashion as parents' qualifications increase so that parents with the most education are the least likely to always help their children. This perhaps reflects the fact that their children are more able, so in less need of help. Infrequent help with homework increases with

parental education, so that the most educated parents are the most likely to say they help their children ‘usually’ or ‘sometimes’. Conversely only 8 per cent of the most educated families never helped with their children’s homework, compared to 16 per cent in households where parents had the lowest qualifications.

### Happiness with school

Social scientists have, over the years, become increasingly concerned about happiness (Layard, 2005) including the happiness of our children and what makes for a good childhood (Layard and Dunn (2009). In 2007, a UNICEF report showed that children in the UK were at the bottom of the league table of child wellbeing (UNICEF 2007). This prompted considerable concern; academics, policy makers and social commentators alike have searched for explanations. A subsequent report in 2013, which demonstrated that the UK had only risen to around the mid-point in the league table, kept these concerns alive. The cause of childhood unhappiness in the UK has variously been attributed to the number of tests that children sit in primary school (The Guardian, 2009; The Daily Telegraph, 2013), the hours that their parents work, consumerism and economic inequality (UNICEF, 2011).

At age 11, the MCS children were asked if they were happy with school and how much they liked their school. On a scale of one to seven, where one is completely happy and seven is not at all happy, over half the children (52%) said they were completely happy with school. Indeed, well over 80 per cent of all children were in the top three categories of this scale, with only 10 per cent in the bottom three categories. Similarly, when children were asked if they liked school ‘a lot’, ‘a bit’ or ‘not a lot’, most children reported liking school – 46 per cent liked it a lot, 48 per cent liked it a bit, while 6 per cent did not like it.

Parents also felt their children were happy with school. When asked whether they thought their child enjoyed school, 52 per cent of mothers said they thought the child always enjoyed school and a further 39 per cent believed they usually enjoyed school. Only around 8 per cent of those interviewed said their child only sometimes enjoyed school, while 1 per cent thought they never enjoyed school.

Parental interest in their children’s education has been shown to be positively related to educational success. If we accept attendance at parents’ evening as a proxy for interest in their children’s education, then most families in the MCS were interested. Indeed, as the final column in Table 4.9 shows, in 97 per cent of families someone attended a parents’ evening. However, the table also shows that this varied by the education of the parents. Only 2 per cent of households where at least one parent had a degree or higher failed to attend a parents’ evening, compared to 6 per cent of households with the lowest educational level.

Parents’ aspirations for their children also varied according to their qualifications. When asked if they wanted their children to stay on at school past the compulsory school leaving age, 89 per cent of mothers said they did (Table 4.9). This figure is slightly lower than at age 7, when 98 per cent of parents wanted their children to stay on at school. At both ages, this varied by the educational qualifications of the parents. While children will now have to remain in some form of education or training after age 16, 15 per cent of parents with less than GCSE level education wanted their children to leave school at 16, compared to 8 per cent of the most highly-educated households.

► **Table 4.7: Help with homework by level of parental education**

	<5 GCSEs grade A-C, or equivalent	5 GCSEs grade A-C, or equivalent	A levels	Degree or higher	Total
Always	25.2	21.3	23.4	19.7	21.7
Usually	21.6	25.3	24.5	27.7	25.4
Sometimes	36.9	43.5	43.5	44.3	42.6
Never or almost never	16.3	10.0	8.7	8.3	10.3
Total	100.0 (2,063)	100.0 (3,069)	100.0 (1,908)	100.0 (5,301)	100.0 (12,341)

Notes: MCS Age 11 survey. Weighted percentages; unweighted observations in parentheses.

► **Table 4.8: Whether parents attended parents’ evening, by highest parental qualification**

Attended parents’ evening	<5 GCSEs grade A-C, or equivalent	5 GCSEs grade A-C, or equivalent	A-levels	Degree or higher	Total
Yes	94.4	96.1	96.5	97.9	96.6
No	5.6	3.9	3.5	2.1	3.4
Total	100.0 (1,969)	100.0 (2,956)	100.0 (1,822)	100.0 (5,045)	100.0 (11,792)

Notes: MCS Age 11 survey. Weighted percentages; unweighted observations in parentheses.

► **Table 4.9: Ambitions for post-compulsory schooling by parental education**

Ambitions for post-compulsory schooling	<5 GCSEs grade A-C, or equivalent	5 GCSEs grade A-C, or equivalent	A-levels	Degree or higher	Total
Stay on	84.7	86.2	88.4	92.0	88.6
Leave	15.3	13.8	11.6	8.0	11.4
Total	100.0 (2,047)	100.0 (3,072)	100.0 (1,888)	100.0 (5,239)	100.0 (12,246)

Notes: MCS Age 11 survey. Weighted percentages; unweighted observations in parentheses.

► **Table 4.10: Parents' estimation of how likely it is that their children will attend university, by highest parental qualification**

How likely is it that the cohort member will go to university?	<5 GCSEs grade A-C, or equivalent	5 GCSEs grade A-C, or equivalent	A-levels	Degree or higher	Total
Very likely	26.6	23.5	29.3	45.4	33.6
Fairly likely	37.1	43.6	44.5	40.0	41.1
Not very likely	26.8	26.4	21.7	12.2	20.1
Not at all likely	9.5	6.5	4.6	2.5	5.2
Total	100.0 (2,041)	100.0 (3,055)	100.0 (1,889)	100.0 (5,248)	100.0 (12,233)

Notes: MCS Age 11 survey. Weighted percentages; unweighted observations in parentheses.

At age 7, 97 per cent of parents said they would like their child to go to university. At age 11, the question was slightly different: mothers were asked how likely or unlikely they thought it was that their children would attend university. Table 4.10 shows that there was marked variation by parental education in perceived likelihood of attending university. Forty-five per cent of the most educated families thought it very likely that their child would go to university, a further 40 per cent thought it fairly likely. This compares to 75 per cent (29% very likely plus 45% fairly likely) of families where A levels were the highest parental qualification. In families where at least one parent had the equivalent of five or more GCSEs, the comparable figure is 68 per cent (24% very likely plus 44% fairly likely). Among families where parents had fewer qualifications, only 64 per cent (27% very likely and 37% fairly likely) thought that their child would go to university.

### Transition to secondary school

When interviewed at age 11 most children were in their final year of primary school and were anticipating the transition to secondary school, which is always an important milestone in a child's education.

Figure 4.1 shows how both children and parents perceived the child's feelings about this move. Most children were looking forward to going to secondary school. Sixty per cent were looking forward to it a lot, a further 35 per cent were looking forward to it a bit, with only 5 per cent not looking forward to the transition. Similarly, most parents also thought their children

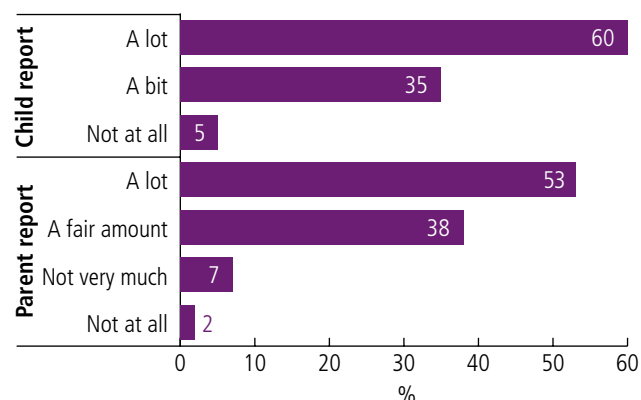
were looking forward to secondary school. Fifty-three per cent of mothers thought the cohort member was looking forward to secondary school a lot and 38 per cent a fair amount.

Three quarters of parents also thought that the transition to secondary school would be either very easy or fairly easy for the child, with only 12 per cent thinking it would be difficult or very difficult. The remaining 13 per cent judged it would be neither difficult nor easy.

### School choice

For most parents in England, securing a place for their child in the school of their choice involves applying through the local education authority (LEA). They apply listing up to six schools (but with a minimum of three) in October of the calendar year before their child is due to start secondary school. Independent schools have their own admission procedures, so parents apply directly to the schools rather than the LEA. Arrangements for admission to state-maintained schools in Wales are similar to those in England and are governed by the Welsh School Admissions Code. Parents can apply for their preferred school or schools through the unitary authority that the school or schools are in. In Northern Ireland, parents receive a transfer form from their children's primary schools. They have to list three secondary schools in order of preference. They must do so by February of the calendar year they are due to transfer to secondary school. In Scotland, children are automatically allocated a secondary school place that is dependent on the catchment area in which they live. Parents only need to request

► **Figure 4.1: Parent and child views on how much the child is looking forward to secondary school**



Notes: Age 11 survey. Sample: Weighted percentages; unweighted observations = 12,736.

a place if they want their child to attend a school outside their catchment area.

Table 4.11 charts the schools that MCS parents applied to by country, as the application procedures differ. The first thing to note is, as expected, very few people in Scotland requested a place at secondary school. The second point to note is that while in England, Wales and Scotland the majority of parents apply for or request a place at a comprehensive school (74%, 72% and 89% respectively). In Northern Ireland, only 43 per cent of families apply to comprehensive-type schools (i.e. not grammar schools). Instead, the largest percentage of families apply to grammar schools (53%). This reflects a much bigger availability of grammar school places in Northern Ireland. Nearly 11 per cent of families applied to faith schools in England, a higher percentage than in the other countries (8% in Scotland, 7% in Wales and 2% in Northern Ireland, though clearly the structure of schooling in Northern Ireland is still very much split along religious community lines). MCS families in Scotland had the highest percentage requesting places at independent schools (13%), perhaps

reflecting the particular composition of the sample, followed by England (5%), Wales (2%) and Northern Ireland (1%).

Parental choice in decisions regarding the school a child attends was first introduced in England by the 1988 Education Reform Act and has expanded substantially following the publication of league tables. These tables highlight differences in the performance of schools, theoretically enabling parents to make more informed decisions about which schools they want their child to attend.<sup>2</sup> In the Age 11 survey, mothers were asked what the most important reason was behind their choice of school. The responses are examined in Table 4.12, which shows that the most popular reasons for secondary school choice were “child liked the school” (33%) and “exam results” (26%). It is interesting that despite families having access to many different measures of school quality, a third of parents say they are letting their 11-year-old children make decisions about their future education. As Table 4.12 shows, reasons for school choice varied by both parental education and household income. Thirty-four per cent of mothers in the most educated households and 35 per cent of mothers in the highest income households cited good exam results as the most important reason for school choice, compared to only 17 per cent of mothers in the least educated households and 18 per cent of mothers in the lowest-income households. These parents were also the most likely to say that attending the nearest school was the most important factor in their school choice (13%), while only 8 per cent of mothers in the most educated and highest income households cited proximity as a factor in school choice. Those parents with fewer than the equivalent of five GCSEs and those in the lowest income quintile group were also more likely to cite having friends or family already at the school as the most important reason for their school choice (20%, compared to 11% in the most educated households and 9% in the highest income households).

Using MCS data, Hansen (2014) showed that some parents moved home in the pre-school years in order to ensure that their children would attend<sup>2</sup> a good primary school. The steps parents in the Age 11 survey said they went to in order to secure their

► **Table 4.11: Type of secondary school applied to by country**

	England	Scotland	Wales	Northern Ireland
Comprehensive	49.0	71.7	88.7	42.6
Academy	23.1	NA	NA	NA
Free School	2.0	NA	NA	NA
Grammar	7.6	4.1	0.4	52.7
Faith	10.9	7.7	6.5	1.6
Independent	5.1	13.4	2.0	0.7
Other	2.3	3.1	2.4	2.4
Total	100.0 (8,139)	100.0 (186)	100.0 (1,708)	100.0 (1,191)

Notes: MCS Age 11 survey. Weighted percentages; unweighted observations in parentheses. NA = School type not applicable.

<sup>2</sup> In Wales, schools appear in Banding Tables which group schools across a range of criteria, providing information to better inform parents.



secondary school of choice are shown in Table 4.13. The majority of families had taken no action at all (83%). However, examining the upper panels of the table shows that this again varied by highest parental qualification, with the least educated families taking no action to secure a secondary school place, compared to 78 per cent of the most educated families. The same pattern emerges when we examine the lower parts of Table 4.13, which looks at the steps taken to secure school choice by household income. Eighty-nine per cent of the lowest income families do nothing to secure their school of choice, compared to 75 per cent of the highest income families.

Of the action taken, the most popular route to securing a school of choice is extra tuition and extra-curricular activities. This option was taken by 6 per cent of families overall. Again, there are variations by parental characteristics, with only 2 per cent of the least educated and lowest income families opting for this route, compared to 10 per cent of the most educated families and 12 per cent of the highest income families.

Among those with the lowest parental education and income, only 2 per cent of families took address-related action to get their children into the first choice school. This includes both moving closer to the school of choice, renting temporarily or using a false address. Three per cent of the most educated families took these types of measures as did 3 per cent of the highest income families.

Two per cent of families also said they had placed their child in a specific primary school to aid their chances of securing a place in a particular secondary school. One per cent of the least educated and lowest income families took this step to get into their secondary school of choice compared to 2 per cent of the most educated and 3 per cent of the highest income families. The disparity between those at the top and bottom of the distribution was slightly greater by household income than by parental education.

By the time they were interviewed at age 11, around 78 per cent of families had already found out which secondary school their child would be going to, and 92 per cent of these had managed to secure their first choice school. Securing a first-choice school was not associated with parental education or income, nor was it associated with steps that parents had taken to gain a place at this school. This may merely reflect the fact that this cohort is small, so as with primary schools (Hansen and Vignoles, 2012) most parents were fortunate enough to secure their first choice as there was less demographic pressure on schools.

## Summary and conclusions

Most children are currently attending mixed-sex, non-faith state schools. While the majority of children had only attended one

► **Table 4.12: The most important reason behind school choice, by highest parental qualification and family income**

	Most important reason for school choice								
	Child liked school	Nearest	Friends / family already there	Good exam results	Good policies / Curriculum / facilities	General good impression	Religion	Other reason	Total
By highest parental qualification									
<5 GCSEs A-C	32.7	12.9	19.5	17.2	9.0	4.4	1.9	2.5	100.0
5 GCSEs A-C	35.3	10.8	15.7	23.3	6.8	5.3	1.3	1.6	100.0
A levels	36.4	8.9	12.4	22.4	8.4	7.7	1.4	2.4	100.0
Degree+	30.0	8.2	11.4	33.5	5.0	7.3	2.5	2.1	100.0
Total	32.9 (3,102)	9.8 (918)	14.1 (1,323)	26.2 (2,703)	6.7 (605)	6.3 (613)	1.9 (201)	2.1 (205)	100.0 (9,670)
By family income quintile group									
Lowest	32.2	13.1	19.8	18.2	8.5	4.9	1.4	1.9	100.0
Second	33.9	10.1	15.4	23.9	8.8	4.9	1.6	1.5	100.0
Third	35.7	8.9	12.2	25.9	5.9	6.7	2.6	2.2	100.0
Fourth	31.7	9.7	13.9	28.9	5.3	6.3	1.9	2.4	100.0
Highest	30.2	8.2	8.6	34.6	4.7	9.1	1.9	2.6	100.0
Total	32.8 (3,214)	10.0 (978)	14.1 (1,384)	26.0 (2,794)	6.7 (635)	6.3 (633)	1.9 (210)	2.1 (213)	100.0 (10,061)

Notes: Age 11 survey. Weighted percentages, unweighted observations in parentheses.

► **Table 4.13: Steps parents have taken to secure a place in preferred choice of school**

	Address related	Specific primary school	Extra tuition / Extra-curricular activities	Attended church	Other	No action taken	Total
<b>By highest parental qualification</b>							
<5 GCSEs A-C	1.6	1.0	2.3	0.7	6.4	88.0	100.0
5 GCSEs A-C	2.4	1.7	3.8	0.7	5.3	86.0	100.0
A levels	4.2	1.9	4.6	0.7	5.5	83.2	100.0
Degree+	3.2	2.3	9.6	0.8	6.1	78.0	100.0
Total	2.8 (324)	1.8 (215)	5.9 (706)	0.7 (87)	5.9 (636)	82.9 (8,826)	100.0 (10,794)
<b>By family income quintile group</b>							
Lowest	1.8	1.2	2.3	0.3	5.7	88.6	100.0
Second	2.7	1.1	3.7	0.4	6.4	85.7	100.0
Third	3.0	2.1	5.4	1.0	6.3	82.2	100.0
Fourth	2.7	2.3	8.2	0.8	5.3	80.6	100.0
Highest	4.0	2.5	11.5	1.2	5.4	75.4	100.0
Total	2.8 (334)	1.8 (218)	5.9 (739)	0.7 (90)	5.9 (672)	82.9 (9,236)	100.0 (11,289)

Notes: MCS Age 11 survey. Weighted percentages; unweighted observations in parentheses.

primary school, a small percentage had been to three or more schools since age 5, and as we would expect this is related to family income. Children's school days are quite diverse: a small percentage of children use breakfast clubs, after-school clubs and wrap-around care (both breakfast and after-school clubs). The vast majority of children spent less than half an hour travelling to and from school, but some children have a return journey of up to one and a half hours. The average time spent on homework per week is just over two hours, but boys devote less time to homework than girls.

Despite being a potentially stressful time for children, most felt happy at school. Reports from mothers confirmed this. In general, most parents were interested in their children's education, as evidenced by attendance at parents' evenings, and had high expectations for their educational futures. However, this was found to be related to parental education and household income, with the more educated and higher income households having higher expectations for their children.

Most parents had applied for places in comprehensive schools, although this varied by country, with a relatively high proportion of parents applying for places in grammar schools in Northern Ireland. The most popular reason for secondary school choice was that the child liked the school, followed by exam results. However, families' reasons differed by both parental education and household income. The most educated and highest income families were more likely to cite exam results as the most important reason. Despite an emphasis on parental choice, very few families had taken any additional steps to secure their first choice school. A small number had hired tutors or encouraged their child to take part in extra-curricular activities aimed at

securing a place in a particular secondary school. A few had taken address-related action, including moving closer to the desired school or temporarily renting in a different catchment area. Another small group reported securing a place in a primary school that was a feeder school for the secondary school they wanted. The likelihood of taking action was again associated with parental education and income.

Of those parents who had been informed of their children's secondary school placement by age 11, 92 per cent had succeeded in obtaining a place in their first-choice school. This is likely to be in part a consequence of the relatively small cohort that the MCS children were born into, which means that relatively few schools were oversubscribed. Obtaining first choice was unrelated to parental education, family income or the steps families had taken to secure a place in a specific school.

This chapter highlights some inequalities based on parental education and household income, in terms of the decisions parents make, their engagement with the education system and their aspirations for their children's future. Such disadvantages need to be addressed if vulnerable children are to achieve the same schooling opportunities as other children.

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# Chapter 5: Cognitive Development

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**Matt Brown and Alice Sullivan**

## Chapter summary

- At age 11, parents' education and family income were the most powerful predictors of cognitive test performance across the board.
- Gender differences in cognitive performance, although occasionally statistically significant, were very small.
- However, the biggest gap in risk-taking scores was that between girls and boys, with girls more risk averse on average.

## Chapter 5: Cognitive Development

**Matt Brown and Alice Sullivan**

### Introduction

In this chapter we examine the cognitive development of the Millennium Cohort Study (MCS) children. The Age 11 survey included three assessments that focused on the children's mastery of language, their ability to make good decisions, their memory and their problem-solving strategies. The assessments administered were as follows:

- British Ability Scales (BAS) – Verbal Similarities
- Cambridge Neuropsychological Test Automated Battery (CANTAB) – Spatial Working Memory task
- CANTAB– Cambridge Gambling Task.

We examine performance on these three assessments and provide an account of how scores differ across a range of background characteristics.

All three assessments are new to MCS. The BAS Verbal Similarities assessment measures verbal reasoning and verbal knowledge, an area that the MCS has been assessing using other measures for a considerable period of time allowing us to examine the longitudinal development of vocabulary and language. The BAS Naming Vocabulary test, assessing expressive language, was administered at ages 3 and 5, and the BAS Word Reading test, assessing receptive language, was administered at age 7. The Verbal Similarities assessment was introduced: a) to provide a new assessment so as to maintain interest for participants as Word Reading had already been administered twice; and b) to allow for comparability with the 1970 British Cohort Study where the same assessment was conducted in 1980 when study members were aged 10.

The two CANTAB assessments measure various aspects of neuropsychological development. They were administered via touch-screen (either using the interviewer's own touch-screen CAPI machine or via a touch-screen add-on that was attached to the interviewer's laptop).

The first test assesses ability to retain spatial information in working memory and to employ a strategy to solve a problem. The second assesses decision making and risk-taking behaviour. The MCS child self-completion questionnaire included a number of questions on risky behaviours including smoking, drinking alcohol and antisocial behaviour. We compare the risk-taking scores from the Cambridge Gambling Task for those who have engaged in these behaviours with those who have not.

Longitudinal measurements of verbal and non-verbal cognition are a great strength of the British cohort studies. The growth in cognitive inequalities according to socio-economic status during childhood has been documented by analyses of the British cohort studies of 1946, 1958 and 1970 (Douglas, 1964; Feinstein, 2003, 2004; Fogelman, 1983; Fogelman & Goldstein, 1976; Sullivan & Brown, 2013). Cognitive inequalities up to age 7 for the MCS children have also been analysed (Ermisch, 2008; Kiernan & Mensah, 2011; Sullivan et al., 2013). Researchers will now have

the opportunity to extend these analyses up to age 11, at least in the case of verbal scores, which have been collected since age 3. Verbal scores are an important dimension of crystallised intelligence or acquired knowledge, while spatial working memory assessments are designed to capture an aspect of fluid intelligence, the ability to think logically and solve problems independently of acquired knowledge (Richards & Sacker, 2003). Childhood cognitive scores have been shown to be important predictors of adult outcomes, including in employment (Breen & Goldthorpe, 2001) and health (Batty et al., 2007).

It is important to acknowledge that scores in cognitive tests can be affected by motivation and compliance, as well as potential stereotype-threat, that is the perceived threat that one may conform to a negative stereotype about one's social group (Croizet & Claire, 1998; Spencer et al., 1999). We also acknowledge that multiple-choice tests do not capture the full range of academic skills, and girls tend to fare worse in multiple-choice tests than in other forms of assessment (Gipps & Murphy, 1994). We do not interpret the tests used here as providing an estimate of innate intelligence. They are simply tests of attainment based on the capability and motivation to complete a particular task under given conditions.

The assessment of risk taking is new for this cohort, and was not assessed for previous cohorts. While risk taking is not a cognitive skill as such, it has been suggested that attitudes to risk may have an impact on decisions regarding education and future careers, and in very different ways depending on socio-economic background (Callender & Jackson, 2008). Attitudes to risk may also influence engagement in risky behaviours, including smoking, alcohol consumption, drug use, criminal activity and risky sexual behaviour (Chowdry et al., 2013).

### Sample and data

The sample used for this chapter is all children who participated in the assessments. A total of 13,287 families participated in the Age 11 survey, which included 13,469 children. The verbal similarities assessment was completed by 98 per cent of participating children, the Cambridge Gambling task by 95 per cent and the Spatial Working Memory task by 94 per cent. The exact number of observations reported in the following analyses will vary as a result of missing data on either outcome variables or demographic variables. All analyses have been weighted to adjust for sampling and attrition. Unweighted sample sizes are reported in each table.

### Results

#### BAS Verbal Similarities

The verbal similarities assessment measures verbal reasoning and verbal knowledge (Elliott et al, 1996). For each item, the interviewer reads three words and the child must say how the words (e.g. banana, apple and orange) go together. In total, there are 37 scored items in the assessment, but the assessment

terminates early or moves to an easier set of items when the child answers multiple questions incorrectly. In Wales, children were given the opportunity to participate in a Welsh language version of the assessment, but just 13 out of the 1,810 children chose to do so.<sup>3</sup>

Raw scores were transformed into an ability score that takes into account the number and difficulty of the items administered. The ability score is then transformed into a T-score, which is standardised based on the child's score relative to the average score of the BAS norming sample for children of the same age

group. In the following analyses, we use these T-scores, which have the advantage of being adjusted for the age of the child at the time they took the assessment. The T-score has a mean of 50.

Descriptive statistics for the Verbal Similarities assessment are shown in Table 5.1. The mean T-score was 59, a score considerably higher than the average score achieved by children of the same age in the norming sample (50). Standard errors are included in this table and the majority of the tables in the chapter as an indicator of the precision of the estimated mean. Lower standard errors are indicative of greater precision. Table 5.1 also shows how

► **Table 5.1: Mean T-Scores for BAS Verbal Similarities**

	Mean	Standard Error	n
Full sample	58.69	0.09	13,168
<b>Sex</b>			
Male	59.02	0.13	6,611
Female	58.35	0.12	6,557
<b>Country at interview</b>			
England	58.36	0.11	8,589
Wales	59.18	0.24	1,810
Scotland	58.70	0.26	1,466
Northern Ireland	60.16	0.27	1,303
<b>Highest parental academic qualification</b>			
Higher degree	62.30	0.22	1,751
Degree	61.05	0.14	4,111
A levels	58.88	0.28	1,105
GCSE A-C (or equivalent)	57.23	0.16	3,683
GCSE D-G (or equivalent)	55.42	0.35	907
Overseas qualifications	55.51	0.58	337
No qualifications	53.28	0.31	1,241
<b>Parental social class</b>			
Managerial and professional	61.18	0.12	5,339
Intermediate	59.53	0.23	1,582
Small employers and self-employed	57.95	0.28	1,225
Lower supervisory and technical	56.79	0.43	555
Semi-routine	56.30	0.24	1,807
No working parent	54.82	0.25	2,033
<b>Ethnicity</b>			
White	59.05	0.09	10,869
Mixed	59.32	0.52	374
Indian	61.21	0.59	336
Pakistani and Bangladeshi	53.17	0.36	917
Black groups	58.86	0.47	422
Other	58.57	0.83	174

<sup>3</sup> These 13 assessments are included in all analyses



performance differed by sex, country of residence at the time of interview, highest parental academic qualifications, parental social class and ethnicity. In two-parent families, the parental qualification and social class variables are based on whichever was the highest.

Boys achieved higher scores than girls. However, the difference, while statistically significant, was less than one T-score point. Children in Northern Ireland had the highest scores and children in the England the lowest. There is a very clear gradient in terms of parental academic qualifications, with the difference between those with at least one parent with a higher degree and whose parents have no qualifications amounting to just over nine T-score points. A similar, although slightly less pronounced, gradient is found in terms of parental social class. The difference between those with at least one parent in the highest social class and those whose parents are in the lowest social class amounted to almost five points. There were also significant differences by ethnicity, with Indian children achieving the highest scores (significantly higher than White, Black, and Pakistani or Bangladeshi children). Differences between White, Mixed ethnicity and Black children were small and not statistically significant. However, the scores achieved by Pakistani and Bangladeshi children were significantly lower than all other children, with the difference between these children and Indian children amounting to just over eight T-score points.

Of course a number of these background characteristics will co-vary and so regression analysis (not shown) was used to test whether these bivariate associations remained once the other characteristics were controlled for. Family income quintile was also included in the regression analyses. This analysis showed that, all things being equal, the small difference between boys and girls persisted. It also remained the case that children from Northern Ireland outperformed children from England. Higher levels of parental qualifications were significantly associated with better scores: having a parent with a higher degree was associated with almost four additional points compared to having parents with no qualifications, once other factors were taken into account. This difference was of the same magnitude as that between children from families in the top income quintile and those in the bottom income quintile. The effect of parental social class was also significant but of a smaller magnitude than the effect of parental qualifications and family income; having a parent with a managerial or professional occupation was associated with almost two additional points in comparison with having no working parent. The ethnic differences described above remained once parental characteristics and other factors were taken into account.

## Longitudinal development of language and vocabulary

As mentioned above, the Age 11 survey was the first time that the Verbal Similarities assessment has been administered but the

development of language and vocabulary has been a key focus of the study. Naming Vocabulary (administered at age 3), Word Reading (administered at ages 5 and 7) and Verbal Similarities all measure different aspects of verbal ability, which means they are not entirely comparable.<sup>4</sup> Nevertheless, when comparing the relative performance of children with different characteristics over time we see some interesting changes (Figure 5.1). However, it must be acknowledged that it cannot be known to what extent these patterns result from genuine changes in verbal ability or the fact that the assessments are measuring different components of verbal ability, or both.

Figure 5.1 shows verbal skills scores as measured at ages 3, 5, 7 and 11 as percentiles by sex, country, ethnicity and parental qualifications. In terms of sex, in previous sweeps it has consistently been girls who have shown the highest level of verbal skill (although at age 5 the difference in Naming Vocabulary scores was not statistically significant), whereas at age 11 we see that for the first time boys are outperforming girls.

At the country level, Figure 5.1 shows that at ages 3 and 5 Scottish children were the highest performing but by age 7 this was no longer the case. At age 7, children from Northern Ireland and Wales achieved the lowest scores on the Word Reading assessment, but at age 11, Northern Irish children achieved the highest scores in the Verbal Similarities assessment.

In terms of ethnicity, at ages 3 and 5 White children achieved the highest scores, with considerably lower scores being achieved by all other ethnic groups except the Mixed group. Pakistani and Bangladeshi children achieved the lowest scores on both occasions. At age 7 ethnic differences were much smaller and Indian children achieved the highest scores, which remained the case at age 11. At age 7, the gap between Pakistani and Bangladeshi children and those from other ethnic groups had closed considerably in comparison to ages 3 and 5, but at age 11 we see that the gap has once again widened.

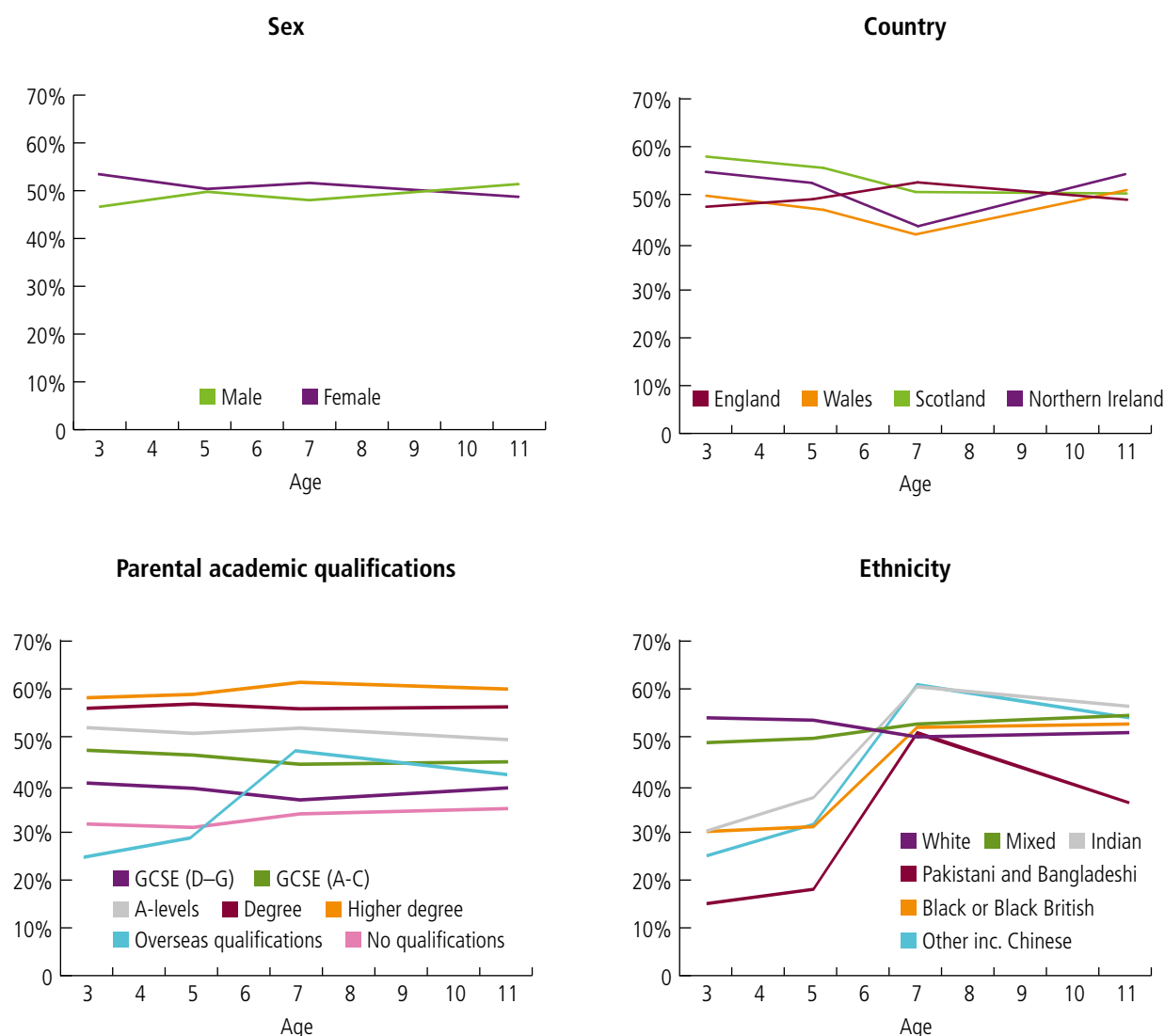
There has been little change over time in the magnitude of differences in verbal skills scores achieved by children whose parents have differing levels of education, with the exception of the small group whose parents have overseas qualifications whose relative position has fluctuated considerably. This is surprising given that previous work has shown widening cognitive differentials up to age 7 (Sullivan et al., 2013), but this disparity may be accounted for by the reliance on a particular set of tests for the analysis presented here.

## Spatial Working Memory

The Spatial Working Memory task assesses ability to retain spatial information and to manipulate remembered items in

<sup>4</sup> The correlation between Verbal Similarity scores at age 11 and Word Reading scores at age 7 is 0.33, the correlation with Naming Vocabulary at age 5 is 0.39 and with Naming Vocabulary at age 3 is 0.29.

► **Figure 5.1: Verbal skills scores as percentiles at ages 3, 5, 7 and 11 by sex, country, ethnicity and parental qualifications**



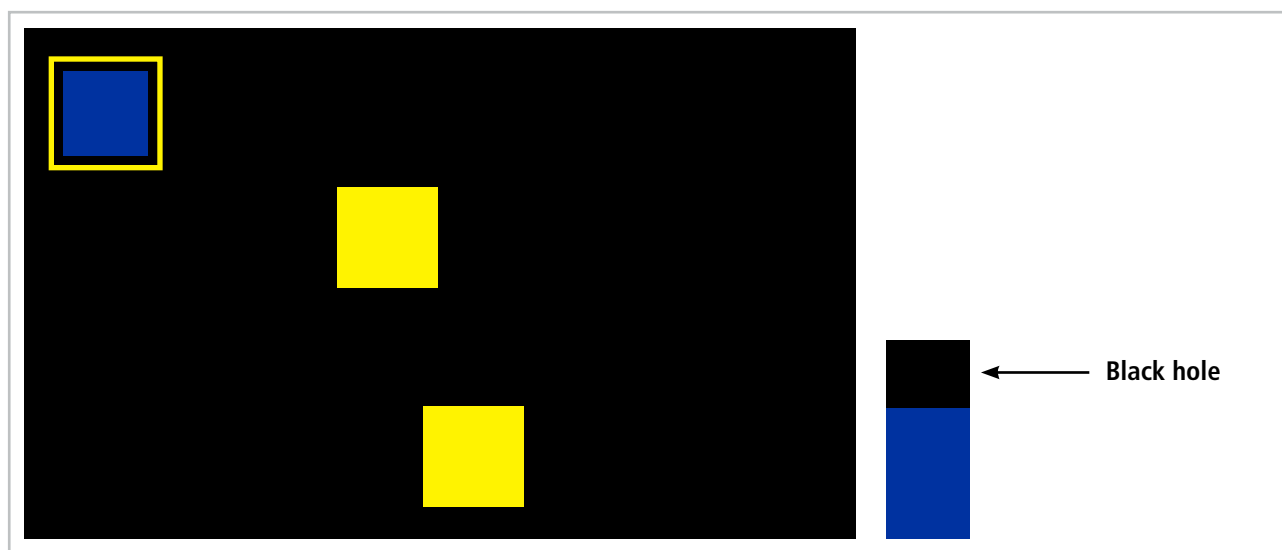
Base: All children completing tests at ages 3, 5, 7 and 11 (n = 9,909)

working memory. It also assesses use of strategy. The aim of this task is that, by process of elimination, the child should find one blue 'token' in each of a number of coloured boxes displayed on the screen and use them to fill up an empty column (black hole) on the right hand side of the screen. To see if a blue token is beneath a coloured box, the child has to touch it with their index finger. If a blue token is revealed to be beneath a coloured box, the child moves it to the black hole by touching the black hole with their index finger (see Box 5.1). The child completed three practice trials, which involved three coloured boxes each. They then moved on to complete the assessed trials. These comprised a total of 12 trials with increasing numbers of boxes to make the task more difficult. They completed four trials with four boxes per trial, four trials with six boxes and four trials with eight boxes.

There are three types of outcome measure:

- i) **Errors**, which consist of '**between errors**' and '**within errors**'. Between errors occur when one re-visits a box which within the same trial has already been found to contain a token. **Within errors** are when one re-visits a box already found to be empty within the same search. Occasionally an error can be classified as a 'double error', which constitutes both a 'between' and 'within' error. The CANTAB software produces outcome measures for each type of error and for specific types of trial (four-box, six-box and eight-box). For the following analyses we will focus on total errors across all trials.
- ii) **Strategy** – a single score where low scores indicate use of a good search strategy

### ► Box 5.1: Spatial Working Memory – Three-box trial screen shot



iii) **Latencies** – the average time taken to touch the first box when presented with a new trial, the average time taken between placing a token in the ‘black hole’ and the next time they touch a box, and the average time taken to complete each trial (which is the measure we focus on here).

Atkinson (2014) provides further information about the conduct of the CANTAB assessments in the Age 11 survey and the outcome measures produced by the tests.

Descriptive statistics for these outcomes are provided in Table 5.2.

The table shows that there was no difference between boys and girls in terms of strategy use, nor in the average time taken to complete each trial. On average boys made just over one more error than girls, 36.7 compared with 35.4. Although a small difference, it was statistically significant.

Children from England, Scotland and Wales did not differ in their use of strategy, but children from Northern Ireland made significantly poorer use of strategy and also made more errors (40 compared to 37 in Wales, 36 in Scotland and 35 in England). There were no significant differences by country in time taken to complete the trials.

Performance in the assessment was strongly associated with parental education in terms of errors, strategy usage and time taken to complete the test. Children whose parents had no qualifications made, on average, 13 more errors than those whose parents had a higher degree. The difference in strategy use was around three points on a mean score of around 34 points; and the difference in time taken to complete the assessment was 320 milliseconds. A similar difference can be seen between children from the two ends of the social class spectrum.

Table 5.2 also shows that Pakistani and Bangladeshi and Black children made more errors than children from the other ethnic groups. They also made poorer use of strategy. Pakistani and Bangladeshi children and Black children also took longer than White children to complete the trials.

Regression analyses (not shown) were again performed to assess whether these bivariate associations persisted once other background characteristics were held constant. In general, the picture remained largely unchanged with parental qualifications remaining the strongest predictor on all three outcomes although as per verbal similarities, family income was also included in the regression analyses and was found to also be a very significant predictor. Having a parent with the highest level of qualifications compared to a parent with no qualifications was associated with two strategy points, seven errors and 1648 milliseconds less time to complete the trial. The relatively poor performance, in terms of errors made, of Pakistani and Bangladeshi children, and Black children remained once other factors were controlled for.

### Cambridge Gambling Task

The Cambridge Gambling Task (Rogers et al., 1999) assesses decision making and risk-taking behaviour outside a learning context. At the Age 11 survey, the assessment was described to parents and children as a ‘decision-making task’ as it was felt that the use of the term ‘gambling’ may have caused concern. The subject is presented with a row of 10 boxes, of which some are red and some blue, and told that a yellow token is hidden in one of the boxes. The subject must first decide whether they think that the token is hidden in a red box or a blue box. Secondly, they must decide how many points (from an initial 100 points) they wish to gamble on being correct. The likelihood of each choice being correct is indicated on each trial by the ratio

of red to blue boxes displayed, and hence results in outcomes of a likely probability of winning (9:2, 8:2, 7:3) or an almost equal probability (6:4 or 5:5) of winning or losing. Sequences of trials were run in blocks under two conditions: an ascending condition and a descending condition in order to differentiate impulsive

responses from genuine risk preference. In the ascending condition, the number of points that can be bet starts low and becomes increasingly larger. At first, one can bet 5 per cent of one's total points, then after a two-second interval, this increases to 25 per cent, then 50 per cent, then 75 per cent and

► **Table 5.2: Spatial Working Memory – Total errors, strategy scores and mean time to last response**

	Total errors			Strategy scores			Mean time to last response		
	Mean	SE	n	Mean	SE	n	Mean	SE	n
All cases	35.7	0.2	12,757	34.3	0.1	12,757	28,922	56.1	12,637
<b>Sex</b>									
Male	36.4	0.2	6,389	34.3	0.1	6,389	29,026	80.5	6,327
Female	35.1	0.2	6,368	34.4	0.1	6,368	28,818	78.2	6,310
<b>Country</b>									
England	34.9	0.2	8,323	34.1	0.1	8,323	28,908	67.7	8,241
Wales	36.2	0.4	1,749	34.3	0.1	1,749	28,982	153.8	1,728
Scotland	36.0	0.5	1,411	34.6	0.1	1,411	28,593	157.5	1,408
NI	39.7	0.5	1,274	35.3	0.1	1,274	29,303	212.6	1,260
<b>Highest parental academic qualification</b>									
Higher degree	30.4	0.5	1,708	33.4	0.1	1,708	27,992	134.4	1,688
Degree	32.8	0.3	3,991	33.9	0.1	3,991	28,489	96	3,954
A-levels	35.4	0.6	1,074	34.7	0.2	1,074	28,715	190.5	1,062
GCSE (A-C)	38	0.3	3,562	35.2	0.1	3,562	29,283	113.4	3,541
GCSE (D-G)	39.1	0.6	870	35.6	0.2	870	29,783	225.5	859
Overseas qualifications	39.6	1.1	335	35.7	0.2	335	29,233	352.4	330
No qualifications	43	0.5	1,185	36.2	0.1	1,185	30,104	186.1	1,171
<b>Highest parental social class</b>									
Managerial and professional	31.9	0.3	5,197	33.5	0.1	5,197	28,282	80.2	5,152
Intermediate	35.0	0.5	1,531	34.3	0.1	1,531	28,806	152.2	1,524
Small employers and self-employed	36.7	0.5	1,182	34.7	0.2	1,182	29,407	212.3	1,172
Lower supervisory and technical	38.6	0.8	535	35.0	0.3	535	29,714	305.1	527
Semi-routine	39.3	0.4	1,758	35.4	0.1	1,758	29,553	162.2	1,741
No working parent	41.1	0.4	1,948	35.4	0.1	1,948	29,647	153	1,922
<b>Ethnicity</b>									
White	35.1	0.2	10,567	34.2	0.1	10,567	28,775	60.8	10,471
Mixed	36.3	1.0	354	34.4	0.3	354	29,254	370.3	351
Indian	35.7	1.1	311	34.2	0.4	311	29,564	355.4	304
Pakistani and Bangladeshi	39.9	0.7	882	35.4	0.2	882	29,711	228.2	874
Black groups	42.6	1.0	408	35.6	0.3	408	30,261	344	406
Other inc. Chinese	34.5	1.5	163	34.1	0.5	163	28,124	408.8	160



then finally 95 per cent: so to make larger bets one has to wait. In the descending condition, the number of points available to bet starts high and becomes increasingly smaller, so the subject is required to wait to make a lower bet (Box 5.2).

The outcome measures generated by this test are:

- i) **Quality of decision making:** the proportion of trials in which the subject chooses the most likely outcome
- ii) **Deliberation time:** the mean time taken to make a colour decision
- iii) **Delay aversion:** a measure of impulsivity calculated as the difference in percentage bet in ascending versus descending trials, so that subjects that make consistently early bets (5 per cent of points in the ascending trials and 95 per cent of points in the descending trials) score highly on this index
- iv) **Risk taking:** the mean proportion of total points gambled on each trial in which they had chosen the more likely outcome, where a higher value is indicative of greater risk taking
- v) **Overall proportion bet:** the mean proportion of total points gambled on all trials regardless of whether they chose the most likely outcome, where again higher values are indicative of greater risk taking
- vi) **Risk adjustment:** the degree to which the subject varies this risk taking in response to the ratio of red and blue boxes on each trial, where higher scores indicate better risk adjustment.

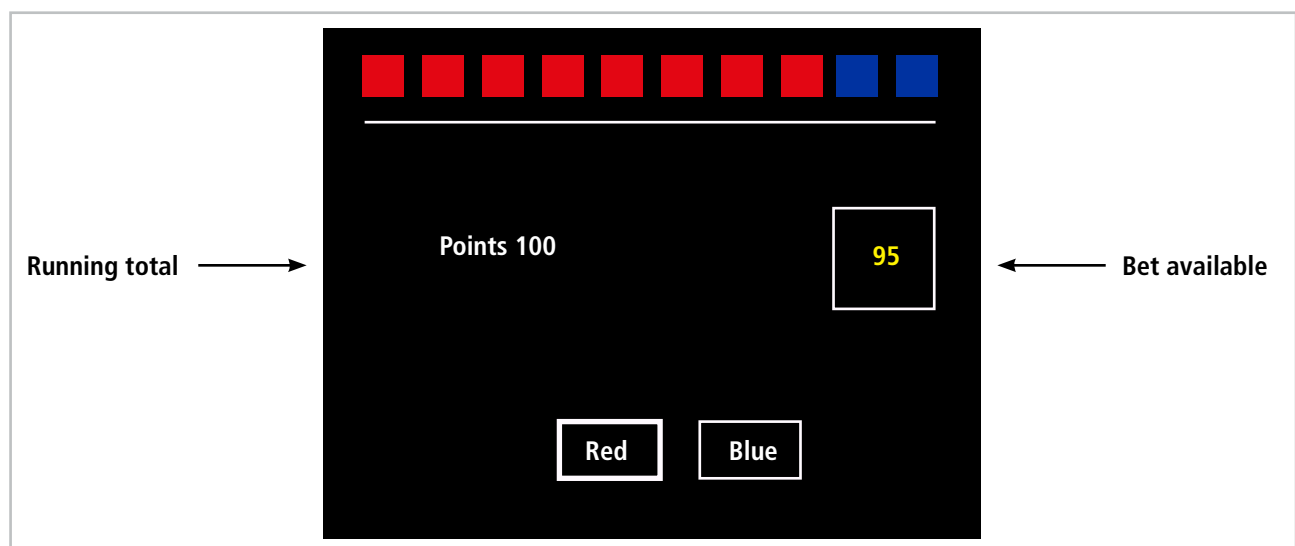
Tables 5.3 and 5.4 show how performance in this task varied across children with different characteristics. There was no difference between boys and girls in terms of the quality of their decision making, nor were there any differences in terms of risk

adjustment. However, boys were found to make decisions significantly quicker than girls, were more impulsive when it came to making decisions about how much to bet on their decision, and took greater risks when betting, both on trials in which they had made the most likely decision (as measured by the risk-taking score) and on all trials (regardless of the quality of their decision).

English children achieved significantly higher scores on the quality of decision-making index than all other children, took greater risks with their betting (on all trials and on trials when they had made the most likely decision) and were better at adjusting their risk taking (although on this measure the difference between English children and Scottish children was not significant). Scottish children made decisions most quickly (although the difference between Scotland and Northern Ireland was not significant) and Welsh children took significantly longer than all other children to make their decisions. In terms of impulsivity or delay aversion, there were no significant differences between England, Scotland and Northern Ireland, but Welsh children were significantly less impulsive than children from England and Northern Ireland, though insignificantly different from those in Scotland.

There were big differences between children based on parental education. The most striking difference was in risk adjustment, where children with at least one parent with a higher degree achieved scores over twice those attained by those whose parents had no qualifications (0.87 compared with 0.37). Higher levels of parental education were also associated with faster decision making, better quality of decision making, and less risk taking. However, the differences between children whose parents had the equivalent of GCSE grade A to C and those who had a higher degree were small and not significant. Children whose parents had any of these qualifications took significantly fewer risks than those whose parents had no qualifications. Differences in delay aversion were less pronounced; those with the most educated

#### ► Box 5.2: Cambridge Gambling Task screen shot



parents were least impulsive, significantly less so than those whose parents had only GCSEs or no qualifications.

There is a very clear social class gradient in terms of risk adjustment. Children whose parents had the highest class of occupation achieved scores that were much higher than those from families with no working parent, 0.80 and 0.45 respectively. However, the gradient is slightly less pronounced than that seen by parental education, and in fact social class differences on all measures are generally less significant than differences by parental education. Children whose parents had managerial or professional jobs scored significantly higher than all other children in terms of the quality of their decision making and took fewer risks than children with no working parent, whose parents were self-employed or, in the lowest class of occupation. In terms of speed of decision making, there was a general trend that children from lower social class families took longer, but there were no class differences in impulsivity.

There were some interesting differences by ethnicity. Indian children scored highest on the quality of their decision making, selecting the most likely outcome in 83 per cent of trials, which was significantly higher than White, Pakistani or Bangladeshi, and Black children. Black children achieved significantly lower scores on this measure than all other children, selecting the most likely outcome in only 76 per cent of trials. White children took fewer risks than all other children. There were no differences between children from the other ethnic groups. Indian, Mixed ethnicity and White children were best at adjusting their risk taking, whereas Pakistani and Bangladeshi children had the lowest scores on this area. The magnitude of the differences was large, with the average score for Black children being around half that achieved by Indian children (0.35 compared with 0.70). There were no differences by ethnicity in terms of delay aversion, and the only significant difference in deliberation time was that Pakistani and Bangladeshi children were faster than White children.

As per the previous assessments, a series of regression analyses (not shown) were performed to test whether these associations held once controlling for the other factors. In general, the bivariate gender differences remained, but controlling for other background characteristics it was found that boys scored less well on the quality of their decision making.

There were no differences in impulsivity between children in different countries of the UK. Welsh children took longer to make decisions and Scottish children were faster than other children. Welsh and Northern Irish children took fewer risks than others, and children from Wales, Scotland and Northern Ireland had poorer risk adjustment and made poorer quality decisions than English children.

Higher levels of parental qualifications remained associated with better risk adjustment, faster decision making, better quality decision making and lower levels of risk taking. However, the small bivariate association between parental qualifications and impulsivity did not remain once other characteristics were taken

into account. There were fewer associations with ethnicity once controlling for other factors. However, when compared to White children, Black, and Pakistani or Bangladeshi children took greater risks and were poorer at adjusting their risk taking.

Family income was also included in the regression analyses, and children from families with higher income were found, in particular, to be better at decision making and risk adjustment. On both measures the difference between those in the highest and lowest quintiles was slightly larger than the difference between those whose parents had a degree and those whose parents had no qualifications.

In addition to objectively measuring risk taking with the Cambridge Gambling Task, the MCS children were also asked as part of their self-completion questionnaire to self-report the extent to which they had participated in various risky behaviours (see Box 5.3). This topic is discussed in Chapter 2.

Figure 5.2 compares the risk-taking scores as measured by the Cambridge Gambling Task for children who reported these various types of antisocial and criminal behaviour, and those who have tried a cigarette or consumed an alcoholic drink with those who did not report these behaviours. In each case, risk-taking scores from the Cambridge Gambling Task were higher for those reporting the behaviour than for those who did not. However, once background characteristics were taken into account in a regression analysis (not shown) it was only reporting being noisy or rude in public that remained significantly associated with higher risk taking in the assessment.

### ► Box 5.3 Self-reported risky behaviour at MCS Age 11 survey

Not all children will have done these things. For the survey to be accurate, it is important that all children, including any who have done these things, answer honestly.

- A. Have you ever been noisy or rude in a public place so that people complained or got you into trouble?
- B. Have you ever taken something from a shop without paying for it?
- C. Have you ever written things or sprayed paint on a building, fence or train or anywhere else where you shouldn't have?
- D. Have you ever on purpose damaged anything in a public place that didn't belong to you, for example by burning, smashing or breaking things like cars, bus shelters and rubbish bins?
- E. Have you ever had an alcoholic drink? [plus additional follow-up questions for those that had]
- F. Have you ever tried a cigarette, even if it was only a single puff?

Response categories are **Yes / No**

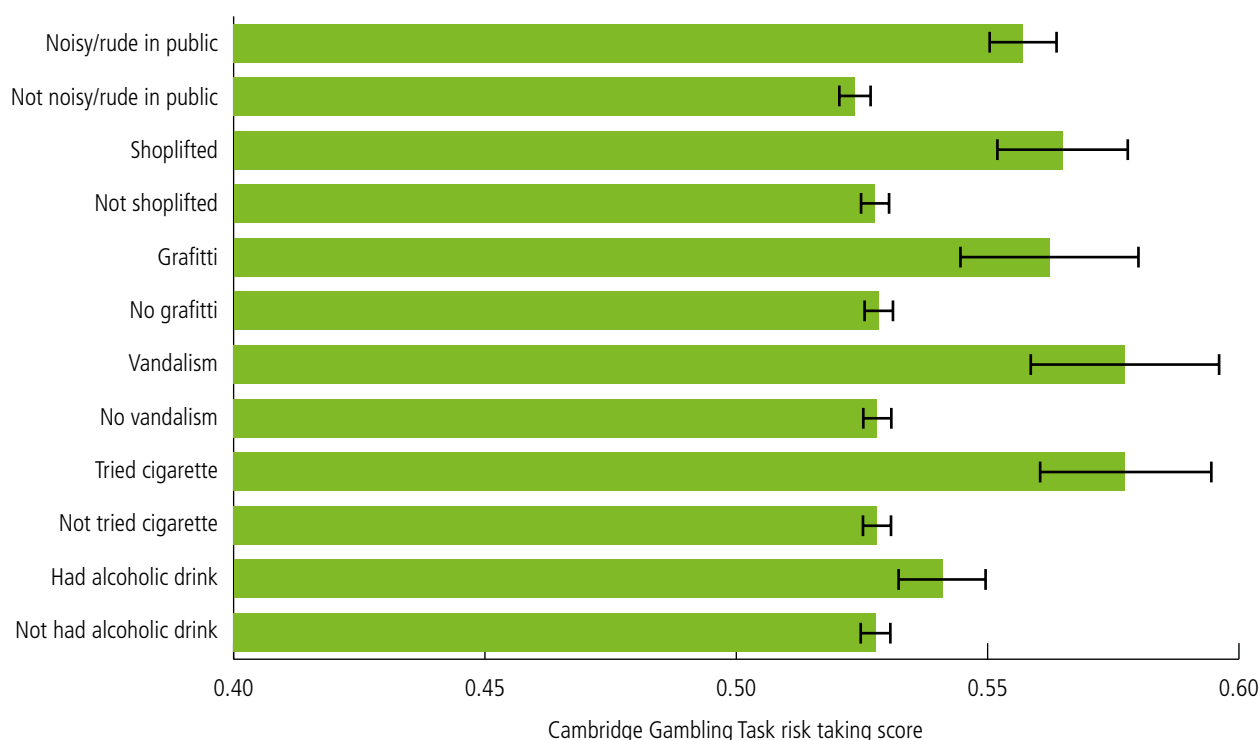
► Table 5.3: Cambridge Gambling Task – Quality of decision making, deliberation time and delay aversion

	Quality of Decision Making			Deliberation Time			Delay Aversion		
	Mean	SE	n	Mean	SE	n	Mean	SE	n
<b>All cases</b>	0.80	0.00	12,690	3,331	12	12,690	0.29	0.00	12,624
<b>Sex</b>									
Male	0.80	0.00	6,355	3,263	16	6,355	0.31	0.00	6,315
Female	0.80	0.00	6,335	3,399	18	6,335	0.26	0.00	6,309
<b>Country</b>									
England	0.82	0.00	8,280	3,317	15	8,280	0.29	0.00	8,243
Wales	0.77	0.00	1,736	3,492	35	1,736	0.27	0.01	1,721
Scotland	0.77	0.00	1,408	3,236	37	1,408	0.28	0.01	1,400
NI	0.78	0.00	1,266	3,308	36	1,266	0.30	0.01	1,260
<b>Highest parental academic qualification</b>									
Higher degree	0.83	0.00	1,695	3,220	28	1,695	0.28	0.01	1,686
Degree	0.82	0.00	3,974	3,303	22	3,974	0.27	0.00	3,963
A-levels	0.80	0.01	1,067	3,285	41	1,067	0.29	0.01	1,063
GCSE (A-C)	0.79	0.00	3,549	3,361	23	3,549	0.30	0.00	3,531
GCSE (D-G)	0.78	0.01	865	3,532	53	865	0.31	0.01	857
Overseas qualifications	0.79	0.01	332	3,196	66	332	0.30	0.02	327
No qualifications	0.76	0.01	1,176	3,428	42	1,176	0.30	0.01	1,165
<b>Highest parental social class</b>									
Managerial and professional	0.82	0.00	5,175	3,279	18	5,175	0.28	0.00	5,156
Intermediate	0.80	0.00	1,530	3,318	34	1,530	0.28	0.01	1,523
Small employers and self-employed	0.80	0.00	1,173	3,360	38	1,173	0.29	0.01	1,168
Lower supervisory and technical	0.78	0.01	531	3,341	60	531	0.31	0.01	530
Semi-routine	0.78	0.00	1,747	3,395	33	1,747	0.29	0.01	1,738
No working parent	0.77	0.00	1,933	3,414	33	1,933	0.30	0.01	1,917
<b>Ethnicity</b>									
White	0.80	0.00	10,513	3,346	13	10,513	0.29	0.00	10,463
Mixed	0.81	0.01	353	3,342	70	353	0.27	0.01	352
Indian	0.83	0.01	307	3,307	72	307	0.30	0.01	306
Pakistani and Bangladeshi	0.79	0.01	879	3,195	43	879	0.29	0.01	869
Black groups	0.76	0.01	407	3,293	82	407	0.30	0.01	404
Other inc. Chinese	0.81	0.01	160	3,158	92	160	0.28	0.02	159

► Table 5.4: Cambridge Gambling Task – Risk taking, overall proportion bet and risk adjustment

	Risk Taking			Overall Proportion Bet			Risk Adjustment		
	Mean	SE	n	Mean	SE	n	Mean	SE	n
<b>All cases</b>	0.53	0.00	12,689	0.49	0.00	12,689	0.65	0.01	12,689
<b>Sex</b>									
Male	0.58	0.00	6,354	0.53	0.00	6,354	0.66	0.01	6,354
Female	0.48	0.00	6,335	0.45	0.00	6,335	0.63	0.01	6,335
<b>Country</b>									
England	0.54	0.00	8,280	0.50	0.00	8,280	0.67	0.01	8,280
Wales	0.51	0.00	1,736	0.47	0.00	1,736	0.59	0.03	1,736
Scotland	0.52	0.00	1,407	0.48	0.00	1,407	0.61	0.03	1,407
NI	0.51	0.00	1,266	0.46	0.00	1,266	0.56	0.03	1,266
<b>Highest parental academic qualification</b>									
Higher degree	0.52	0.00	1,695	0.47	0.00	1,695	0.87	0.03	1,695
Degree	0.52	0.00	3,973	0.48	0.00	3,973	0.75	0.02	3,973
A-levels	0.53	0.01	1,067	0.49	0.00	1,067	0.63	0.03	1,067
GCSE (A-C)	0.53	0.00	3,549	0.49	0.00	3,549	0.57	0.02	3,549
GCSE (D-G)	0.54	0.01	865	0.5	0.01	865	0.46	0.04	865
Overseas qualifications	0.55	0.01	332	0.52	0.01	332	0.52	0.06	332
No qualifications	0.56	0.00	1,176	0.52	0.00	1,176	0.37	0.03	1,176
<b>Highest parental social class</b>									
Managerial and professional	0.52	0.00	5,174	0.48	0.00	5,174	0.80	0.01	5,174
Intermediate	0.52	0.00	1,530	0.48	0.00	1,530	0.68	0.03	1,530
Small employers and self-employed	0.54	0.00	1,173	0.49	0.00	1,173	0.60	0.03	1,173
Lower supervisory and technical	0.53	0.01	531	0.50	0.01	531	0.57	0.05	531
Semi-routine	0.54	0.00	1,747	0.50	0.00	1,747	0.48	0.02	1,747
No working parent	0.55	0.00	1,933	0.51	0.00	1,933	0.45	0.02	1,933
<b>Ethnicity</b>									
White	0.52	0.00	10,512	0.48	0.00	10,512	0.68	0.01	10,512
Mixed	0.55	0.01	353	0.50	0.01	353	0.64	0.06	353
Indian	0.56	0.01	307	0.52	0.01	307	0.7	0.06	307
Pakistani and Bangladeshi	0.57	0.01	879	0.54	0.01	879	0.4	0.03	879
Black groups	0.57	0.01	407	0.53	0.01	407	0.35	0.05	407
Other inc. Chinese	0.56	0.01	160	0.52	0.01	160	0.59	0.07	160

► **Figure 5.2: Mean risk-taking score by self-reported risky behaviour**



## Summary

In terms of verbal skills, boys had a very slight advantage at age 11. Children in Northern Ireland achieved the highest scores, but country differences were fairly modest. Far more pronounced differences were observed according to parents' education, family income and social class. The effects of parental qualification and family income were of a similar magnitude. Children of Indian ethnic origin achieved the highest scores of any ethnic group, and children of Pakistani and Bangladeshi ethnicity scored the lowest. Longitudinally, there are some interesting trends according to country and ethnic group. The relative positions of the UK countries on the language scores have changed from wave to wave. For example, children in Northern Ireland achieved the lowest scores in word reading at age 7, but the highest scores in verbal similarities at age 11. This suggests the need to avoid over-interpreting modest but statistically significant country differences on a given test at any given age. Ethnic differentials appeared to reduce dramatically between the ages of 5 and 7, but Pakistani and Bangladeshi children fell behind their peers again between 7 and 11. The reasons for this will require further investigation.

The Spatial Working Memory and Cambridge Gambling Task assessments are complex with multiple outcomes. When we consider strategy use and errors on the Spatial Working Memory task, children in Northern Ireland fared worse than those in other countries. Pakistani, Bangladeshi and Black children fared

worse than other ethnic groups. Performance was very strongly linked to parents' education and family income, but associations with social class are less strong once other background characteristics are controlled for.

On the Cambridge Gambling Task, quality of decision making and risk adjustment are linked to wider cognitive skills, whereas risk taking and speed of decision making can be seen as behavioural rather than cognitive indicators. Looking at risk adjustment, speed of decision making and quality of decision making, those whose parents had the highest qualifications scored substantially better than children whose parents had no qualifications. Educated parents were also associated with lower risk taking. Again, we see similar patterns by family income.

There was no difference between boys and girls in terms of the quality of their decision making and risk adjustment, but boys were significantly more impulsive and took greater risks. Indian children scored most highly on the quality of their decision making, while White children took the fewest risks. Comparing the four UK countries, overall, English children achieved higher scores on quality of decision making and risk adjustment, and took greater risks.

Risk taking scores were generally not significantly linked to self-reported risky behaviour once background demographics were controlled.



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## Conclusions

Looking across all the cognitive scores examined here, there is a common pattern in that parents' education and family income are the most powerful predictors of test performance. Gender differences, although occasionally statistically significant, are very small. Ethnic differences are broadly in line with the socio-economic composition of the ethnic groups, but some ethnic differentials remain once socio-economic factors have been controlled. Country differences are generally modest, and not consistent across the different tests.

Risk taking must be considered separately, since this is not a cognitive skill as such, and being a risk-taker is not a good or bad thing per se, but is likely to have different pros and cons in different contexts. The biggest gap in risk-taking scores was that between girls and boys, with girls more risk averse on average. In fact, the gender gap in risk taking was larger than the gaps according to self-reported risky behaviours.

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# Chapter 6: Physical Development

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**Roxanne Connelly and Stella Chatzitheochari**

## Chapter summary

- In the Age 11 survey, 15 per cent of cohort members surveyed were overweight and 20 per cent were obese.
- There was a greater proportion of overweight and obese cohort members in this survey than at younger ages. The proportion of overweight and obese children had increased by 10 percentage points (from 25% to 35%) since the Age 7 survey.
- Overweight and obesity are both associated with levels of happiness, self-esteem and the onset of puberty.



### Introduction

The Millennium Cohort Study (MCS) has collected a range of information regarding the physical development and growth of cohort members at several points in time. It therefore constitutes a unique and nationally representative UK resource for the study of contemporary patterns of growth and physical development. Additionally, the multidisciplinary nature of the study allows researchers to investigate what influences the growth of children, and could inform policy that aims to promote healthy patterns of growth.

Childhood overweight and obesity are an increasing problem in the majority of industrialised nations (Ebbeling et al., 2002) and are associated with an elevated risk of health problems such as asthma, cardiovascular disease and type 2 diabetes, as well as all-cause mortality (Li et al., 2012). Childhood overweight is also associated with psycho-social problems and depression, and can have a major and enduring impact on an individual's life (Ebbeling et al., 2002). Overweight children are at increased risk of becoming overweight adults (Li et al., 2012).

Overweight and obesity are produced through interactions between physiological, behavioural and social influences. Previous MCS analyses have examined the associations between overweight/obesity and a number of demographic, socio-economic and lifestyle factors:

- In the Age 3 survey, children with higher birth weights, Black ethnic groups, and those who had been introduced to solid foods before four months were more likely to be obese. Overweight mothers, as well as those who worked over 21 hours a week and reported smoking during their pregnancy, were also more likely to have obese children (Hawkins et al., 2009).
- In the Age 5 survey, children who were breastfed for less than four months were more likely to be overweight. Children of Indian ethnicity were the least likely to be overweight or obese at this age (Hawkins et al., 2009). Overweight cohort members were also found to have a higher weight at birth (Brophy et al., 2009). Higher levels of parental education were found to be associated with a lower likelihood of obesity, but there was no significant association with income level (Brophy et al., 2009).
- In the Age 7 survey, cohort members with a higher birth weight and those from Pakistani, Bangladeshi and Black ethnic backgrounds were more likely to be overweight. Parental social class was not found to be associated with childhood overweight. However, similarly to age 5, parental education was associated with a reduced risk of overweight (Connelly, 2011).

The psychological effects of being overweight are sometimes said to be more severe than the physiological costs (Stunkard & Wadden, 1992). It has been suggested that low self-esteem may

be an underlying psychological factor that contributes to the development of obesity. However, low self-esteem may be one of the negative psycho-social consequences of obesity.

The timing of the onset of puberty is also known to be related to the overweight and obesity status of a child based on their Body Mass Index (BMI) score, which is calculated by dividing weight in kilograms by height in metres squared (J. Lee et al., 2010; J. M. Lee et al., 2007). With increasing levels of childhood overweight and obesity, children are entering puberty at an earlier age than in previous generations.

This chapter will summarise the physical measurements (e.g. height and weight) and the reports of pubertal development in the Age 11 survey. The chapter's main focus is unhealthy weight at age 11 (e.g. overweight and obesity), which will be compared across the previous surveys (at ages 3, 5 and 7). We will also present associations between cohort members' weight status (e.g. not overweight, overweight and obese) and their happiness and self-esteem, as well as the onset of puberty.

### Data and sample

All available observations are taken into account in the analyses presented in this chapter. The data are weighted using sampling and non-response weights. Weighted percentages are presented alongside unweighted counts of total observations. We present bivariate associations between variables and a logistic regression model predicting childhood obesity. We also discuss results from other regression models not presented in this chapter.

Overweight and obesity are operationalised in terms of BMI, a widely-used measure that has been criticised for not directly measuring how much fat there is in a person's body. In the Age 11 survey the body fat percentage of cohort members was also measured. We compared the BMI and body fat percentage measurements taken at age 11 and found a high degree of correlation ( $r = 0.86$ ;  $p < 0.001$ ). In line with previous studies (see Ochiai et al., 2010; Widhalm et al., 2001) we conclude that BMI is a meaningful measure and we therefore base our analyses on BMI.

Defining children's weight status is complex as their body types change as they progress through normal growth patterns. Furthermore, growth patterns generally differ for boys and girls (Dehghan et al., 2005). Due to changes in the expected level of fat in children's bodies over time it is not possible to use fixed BMI cut-off points for overweight and obesity, which is commonly the case for adults. Growth reference charts are used to identify age and gender-specific overweight and obesity BMI thresholds for each child. In this chapter we use the UK 1990 reference charts, which provide the conventional means of analysis within the national population (Wright et al., 2002). For the purpose of monitoring and evaluating patterns in childhood weight, children whose BMI falls at or above the 85th percentile of the UK 1990 reference population are defined as overweight, and those at or

► **Table 6.1: Weight status at age 11 and individual and family characteristics**

	Not Overweight %	Overweight %	Obese %	Total %
<b>Gender</b>				
Male	63.6	15.4	21.1	100
Female	66.3	14.9	18.8	100
n <sup>†</sup>				13,042
				P<0.05
<b>Country</b>				
England	65.2	15.2	19.7	100
Wales	59.7	17.2	23.2	100
Scotland	66.9	14.1	19.0	100
Northern Ireland	60.1	15.8	24.1	100
n <sup>†</sup>				12,727
				P<0.001
<b>Parents' social class<sup>‡</sup></b>				
1. Managerial & professional	67.9	15.4	16.8	100.0
2. Intermediate	68.0	14.7	17.3	100.0
3. Small employers & self employed	62.2	17.6	20.2	100.0
4. Lower supervisory & technical	62.2	18.7	19.1	100.0
5. Routine	62.2	16.2	21.6	100.0
n <sup>†</sup>				8,197
				P<0.001
<b>Parents' highest qualification</b>				
None	61.2	13.6	25.2	100.0
NVQ1 (e.g. GCSE D-G)	63.0	12.7	24.3	100.0
NVQ2 (e.g. GCSE A-C)	62.8	15.3	21.9	100.0
NVQ3 (e.g. A levels)	64.9	16.9	18.2	100.0
NVQ4 (e.g. HND)	69.6	16.0	14.4	100.0
NVQ5 (e.g. Degree)	70.4	15.1	14.5	100.0
n <sup>†</sup>				12,264
				P<0.001
<b>Natural mothers' weight status</b>				
Normal	76.0	12.5	11.5	100.0
Overweight	61.7	16.9	21.5	100.0
Obese	45.6	18.5	35.9	100.0
n <sup>†</sup>				10,242
				P<0.001

Note: Millennium Cohort Study Age 11 survey. Weighted per cent. <sup>†</sup>Unweighted number of observations. <sup>‡</sup>We have used the highest level of both parents if their category is different. When considered in a multiple regression analysis social class associations are no longer significant (see Table 6.2). Where totals do not add up to 100%, this is due to rounding.



above the 95th percentile are defined as obese (Barlow & Dietz, 1998). There is no standard definition of underweight in children and this is therefore not considered here.

## Unhealthy weight in childhood

By age 11, the MCS boys had reached an average of 1.46 metres in height (4ft 9ins) and girls were slightly taller at 1.47 (4ft 10ins) metres. Boys weighed, on average, 41kg (6st 6lbs) and girls were around 42kg (6st 9lbs). Based on their BMI, in relation to the UK 1990 growth reference population, 65 per cent of cohort members were not overweight or obese; 15 per cent were overweight; and 20 per cent were obese.

We compared these figures to the rates of overweight and obesity observed in the National Child Measurement Programme for England (NCMP). This measures and weighs children in the Reception year (age 4 or 5) and Year 6 (age 10 or 11) of primary school. The NCMP uses the same UK 1990 growth references and cut-off points that we have used in this chapter. Many of the MCS children will have taken part in the 2010-11 NCMP whilst in Year 6 and, indeed, the NCMP figures for overweight and obesity closely match the levels found in the Age 11 MCS survey: 19 per cent obese and 15 per cent overweight (Ridler et al., 2013).

Table 6.1 presents some bivariate associations between key socio-demographic characteristics and cohort members' weight status at age 11. We also go on to test these associations in a multivariate setting using a logistic regression of overweight status versus not-overweight (Table 6.2).

Results reveal an association between gender and overweight and obesity status. Fifteen per cent of MCS boys were overweight and 21 per cent were obese, whereas 15 per cent of girls were overweight and 19 per cent were obese. The highest levels of obesity were observed in Northern Ireland (24%) and the lowest in Scotland (19%). In Wales and Northern Ireland, around 40 per cent of MCS children were overweight or obese, compared to 35 per cent in England and 33 per cent in Scotland. In the regression model (Table 6.2) there is also evidence that the levels of overweight are significantly higher in Wales and Northern Ireland compared to England, when other characteristics are held constant.

Previous research using MCS data did not find an independent association between overweight and obesity and parents' social class (see Connelly, 2011). Table 6.1, however, shows the association between cohort members' parents' social class, measured using the National Statistics Socio-Economic Classification (NS-SEC), and overweight and obesity status at age 11. MCS children with more advantaged parents (e.g. members of the managerial and professional class) were less likely to be overweight or obese. However, similar to previous studies, when all factors were included together (Table 6.2) we did not find any independent social class differences, at conventional levels of statistical significance.

► **Table 6.2: Results from a logistic regression of overweight vs. normal weight at age 11**

Explanatory variables	Log	Odds	(SE)
<b>Female</b>			
	-0.17	*	(0.07)
<b>Age (in months)</b>			
	-0.11		(0.10)
<b>Birth weight</b>			
	0.15	*	(0.06)
<b>Parents' highest qualifications</b>			
None	0.00		(0.00)
NVQ1 (e.g. GCSE D-G)	0.01		(0.16)
NVQ2 (e.g. GCSE A-C)	-0.16		(0.14)
NVQ3 (e.g. A levels)	-0.26		(0.16)
NVQ4 (e.g. HND)	-0.43	**	(0.15)
NVQ5 (e.g. Degree)	-0.44	*	(0.18)
<b>Parents' social class</b>			
1. Managerial & professional	0.00		(0.00)
2. Intermediate	-0.08		(0.09)
3. Small employers & self employed	0.11		(0.11)
4. Lower supervisory & technical	-0.09		(0.22)
5. Routine	-0.02		(0.10)
<b>Country</b>			
England	0.00		(0.00)
Wales	0.26	**	(0.10)
Scotland	-0.03		(0.09)
Northern Ireland	0.23	*	(0.10)
<b>Mothers' weight status</b>			
Normal	0.00		(0.00)
Overweight	0.62	***	(0.08)
Obese	1.24	***	(0.08)
<b>Ethnicity</b>			
White	0.00		(0.00)
Mixed	0.24		(0.23)
Indian	0.29		(0.22)
Pakistani	0.38		(0.29)
Bangladeshi	0.29		(0.46)
Black Caribbean	1.13	**	(0.38)
Black African	0.93	**	(0.28)
Other	0.21		(0.43)
<b>Constant</b>	0.03		(1.18)
<b>Unweighted n</b>			6,557
<b>Estimated Pseudo R<sup>2</sup></b>			0.05

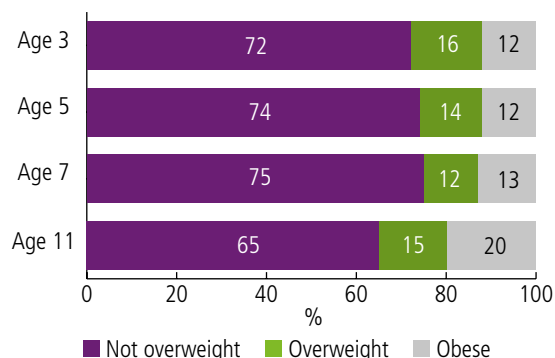
Notes: Millennium Cohort Study Age 11 survey. Overweight and Obese (1) vs. Normal (0).

The association between parents' highest educational qualification and cohort members' overweight and obesity status shows a clear gradient. The highest levels of obesity were observed among cohort members whose parents had no educational qualifications (25%), and the lowest levels in the children of the most highly educated parents (15%). Similar patterns were found for overweight and obesity combined, with 39 per cent of the children of parents with no qualifications being classed as either overweight or obese compared with 30 per cent of the children of the most educated parents. This association holds in the regression model, with significant differences between the odds of being overweight for more educated parents compared to parents with no qualifications.

We also consider the association between the weight statuses of cohort members and their mothers<sup>5</sup> at the time of the Age 11 survey (Table 6.1). Our results are similar to those of previous MCS analyses that found strong associations with maternal weight status (e.g. Connelly, 2011; Hawkins et al., 2009). Children whose mothers are not overweight are least likely to be overweight or obese, whereas the children of obese mothers have the highest levels of overweight and obesity. This association remains significant in the regression model when other characteristics are held equal.

In the regression analysis we also control for ethnic group. There are some differences in the odds of being overweight for children of Black groups compared to White children. However, comparing levels of overweight and obesity between children of different ethnicities can be very misleading, as the proportion of fat in individuals from different ethnic groups may vary, even when their BMI is the same (Deurenberg et al., 2003; Freedman et al., 2008). As childhood overweight and obesity thresholds do not account for this we may over – or under – estimate the extent of unhealthy weight in children of different ethnicities.

► **Figure 6.1: Weight status of cohort members at ages 3 to 11**



Notes: Millennium Cohort Study Age 3 to Age 11 surveys. Weighted percentages.  $P < 0.001$ .

## Longitudinal patterns of childhood weight

This section considers how cohort members' weight status has changed across the Age 3, 5, 7 and 11 surveys. Figure 6.1 shows the overall rates of overweight and obesity in each survey. Between ages 3 and 7 there was a slight increase in the percentage of children who were not overweight or obese. The levels of overweight decreased slightly and the percentage of obesity remained largely constant. However, the Age 11 survey found that levels of both overweight and obesity had increased. At age 7 around 25 per cent of cohort members were classified as either overweight or obese, but by age 11 this figure had increased to around 35 per cent.

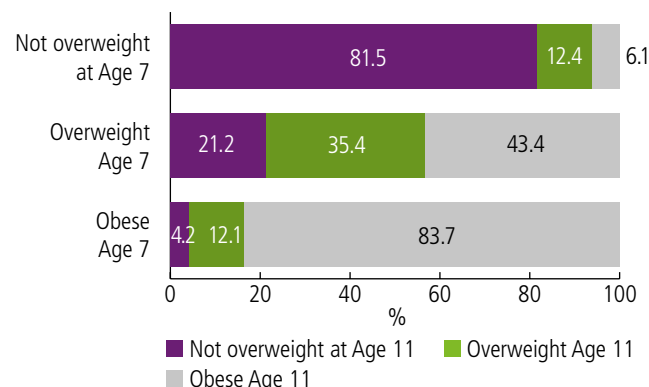
Figure 6.2 highlights the changes in weight status observed between the Age 7 and 11 surveys. Of those children who were not overweight at age 7, 82 per cent were still not overweight at age 11. However, 12 per cent of cohort members who were not overweight at 7 became overweight by age 11 and 6 per cent became obese. Around 84 per cent of children who were obese at 7 remained obese at age 11, while 12 per cent became overweight and only 4 per cent achieved a healthy weight.

Overall, we find that 51 per cent of cohort members were not overweight or obese at any of the four time points observed (the Age 3, 5, 7 or 11 surveys). Four per cent of children have consistently been overweight and 1 per cent have consistently been obese. Some 44 per cent of cohort members have changed their weight status at some point.

## Physical development and wellbeing

In the Age 11 survey, cohort members answered a series of questions that aimed to assess their general levels of wellbeing and happiness. In this section we investigate whether levels of

► **Figure 6.2: Weight status of cohort members at ages 7 and 11**



Notes: Millennium Cohort Study Age 7 and Age 11 surveys. Weighted percentages.  $P < 0.001$ .

<sup>5</sup> The measure of mother's weight status is based on self-reports of weight and height, not direct measurements.

► Table 6.3: Happiness and weight status at age 11

		Not overweight %	Overweight %	Obese %	Total %
How do you feel about the way you look?					
Boys	1 Completely happy	43.41	39.91	34.47	41.07
	2	23.32	22.44	16.42	21.79
	3	14.42	15.23	16.96	15.06
	4	8.96	11.63	14.43	10.47
	5	4.66	4.98	9.07	5.60
	6	2.44	2.72	5.74	3.15
	7 Not at all happy	2.79	3.09	2.90	2.86
	Total %	100	100	100	100
	Unweighted n				6,380
				P<0.001	
Girls	1 Completely happy	35.21	25.58	22.35	31.42
	2	25.39	25.07	16.78	23.75
	3	15.20	18.16	20.40	16.6
	4	11.77	14.31	17.64	13.23
	5	6.43	7.59	10.22	7.30
	6	3.44	5.13	6.94	4.34
	7 Not at all happy	2.56	4.17	5.68	3.37
	Total %	100	100	100	100
	Unweighted n				6,341
				P<0.001	
How do you feel about your life as a whole?					
Boys	1 Completely happy	51.34	52.08	47.36	50.64
	2	27.18	26.78	26.7	27.02
	3	10.78	9.61	11.35	10.72
	4	4.47	5.39	7.60	5.25
	5	2.22	2.46	2.98	2.41
	6	1.26	2.15	1.94	1.54
	7 Not at all happy	2.74	1.53	2.09	2.42
	Total %	100	100	100	100
	Unweighted n				6,362
				P>0.05	
Girls	1 Completely happy	52.49	48.85	48.2	51.16
	2	26.87	27.93	24.35	26.56
	3	9.61	12.21	9.41	9.95
	4	4.64	6.94	7.88	5.57
	5	2.22	2.03	4.46	2.61
	6	1.90	0.84	2.86	1.92
	7 Not at all happy	2.27	1.21	2.84	2.22
	Total %	100	100	100	100
	Unweighted n				6,324
				P<0.001	

Notes: Millennium Cohort Study Age 11 survey. Weighted percentages; unweighted observations

► **Table 6.4: Self-esteem and weight status at age 11**

	Not overweight %	Overweight %	Obese %	Total %
Normal range self-esteem	93.1	91.2	89.7	92.1
Low self-esteem	6.9	8.8	10.3	7.9
Total %	100	100	100	100
Unweighted n				13,042
				P<0.001

Notes: Millennium Cohort Study Age 11 survey. Weighted percentages; unweighted observations.

► **Table 6.5: Boys' pubertal development at age 11**

	Growth spurt %	Body hair %	Skin changes %	Voice deeper %	Facial hair %
Not yet	29.7	65.9	66.2	85.0	91.0
Barely	29.3	22.0	24.4	11.8	7.0
Definitely	41.0	12.1	9.4	3.2	2.0
Total %	100	100	100	100	100
Unweighted n	6,346	6,332	6,429	6,472	6,478

Notes: Millennium Cohort Study Age 11 survey. Weighted percentages; unweighted observations.

wellbeing are associated with their weight status. Our analysis shows a significant association between weight status and how both male and female cohort members feel about the way they look (see Table 6.3). Obese cohort members were less likely to be 'completely happy' with the way they look than those who were either not overweight or overweight.

They were also slightly more likely to say they were 'not happy at all' with their appearance. When we consider how cohort members felt about their life as a whole, we see there is a significant association with weight status for girls but not boys. Fewer obese girls reported being 'completely happy' compared with girls who were not overweight.

Cohort members also responded to a series of 'statements about you', which form a reduced version of the Rosenberg Self-Esteem Scale (RSE) (Rosenberg, 1965). The RSE is a widely validated self-report measure of self-esteem or self-worth (Byrne, 1996; Gray-Little et al., 1997; Wylie, 1989). The full scale comprises 10 questions, although reduced versions have been found to be effective without compromising the measurement of self-esteem (see Gray-Little et al., 1997).

In the Age 11 survey, MCS children completed half of the RSE (five questions) which are rated on a four-point scale: strongly agree, agree, disagree and strongly disagree. The questions were:

- On the whole, I am satisfied with myself.
- I feel that I have a number of good qualities.
- I am able to do things as well as most other people.
- I am a person of value.
- I feel good about myself.

In line with the full scale the responses to these questions have been coded from three for strongly agree to zero for strongly disagree. The scores for the full scale range from zero to 30 with scores under 15 suggesting low self-esteem. With the reduced MCS version of the RSE the scores can range between zero and 15, and scores of seven and under are taken to indicate low self-esteem.

As Table 6.4 shows, there is a significant association between self-esteem and weight status for both MCS boys and girls (the table presents the results for males and females combined). Overall, 8 per cent of cohort members had low self-esteem. Fewer normal-weight children (7%) had low self-esteem compared to those who were overweight (9%) or obese (10%).

## Puberty

By age 11, cohort members were on the cusp of puberty. Parents were asked to report on their children's pubertal development, including features such as body hair growth, breast development and menstruation. Table 6.5 shows that 41 per cent of parents felt that their sons had definitely experienced a growth spurt but voice changes and facial hair development were still quite rare at this age.

Table 6.6 shows that a larger number of parents felt that their daughters had experienced a growth spurt (56%), and 10 per cent of girls had begun menstruation. These results confirm previous findings reporting that girls are at a more advanced stage of pubertal development than boys at this age (see Kaplowitz et al., 2001 Table 6.7 presents the associations

► **Table 6.6: Girls' pubertal development at age 11**

	<b>Growth spurt %</b>	<b>Body hair %</b>	<b>Skin changes %</b>	<b>Breast growth %</b>	<b>Menstruation %</b>
Not yet	17.1	39.0	40.1	20.5	<b>No 89.4</b>
Barely	26.6	22.5	32.0	30.4	
Definitely	56.4	38.6	27.9	49.0	<b>Yes 10.6</b>
<b>Total %</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>Total 100</b>
<b>Unweighted n</b>	<b>6,277</b>	<b>6,221</b>	<b>6,321</b>	<b>6,256</b>	<b>6,281</b>

Notes: Millennium Cohort Study Age 11 survey. Weighted percentages; unweighted observations. Where totals do not add up to 100%, this is due to rounding.

between weight status and signs of pubertal development. Overall, it seems that obese or overweight children are likely to be at a more advanced stage of development than those who are not overweight. Weight status is significantly associated with all of the measures of pubertal development collected in the Age 11 survey. This finding is in line with previous research (J. Lee et al., 2010; J. M. Lee et al., 2007).

The associations have been further explored in a series of regression analyses controlling for a range of characteristics in order to explore whether the variation in cohort members' age (from 10 to 12 years) may impact on pubertal development. Our results showed that the associations of weight status with different measures of the onset of puberty remained even when age to the nearest tenth of a year was taken into account.

## Summary and conclusions

This chapter has presented descriptive statistics and associations regarding weight status and levels of wellbeing, as well as the onset of puberty. Thirty-five per cent of cohort members in the Age 11 survey were overweight or obese, an increase of 10 percentage points since the Age 7 survey. The reasons behind the sharp increase need to be examined further. The evidence from the Age 3, 5, 7 and 11 MCS surveys suggests that membership of the 'obese' or 'overweight' category is by no means inevitable.

In the Age 11 survey, overweight and obesity were both associated with country of residence; parental education; and mother's weight status. Overweight and obesity status also seem to be associated with the way cohort members feel about themselves. There was a significant association between weight status and how happy children feel about the way they look, with fewer overweight and obese cohort members stating that they were 'completely happy'. There also seems to be an association between weight status and self-esteem. Further advanced analyses are needed to understand the nature of this association, and to explore whether low levels of happiness and self-esteem result in higher levels of overweight and obesity or whether there is an inverse causal effect.

There were signs that cohort members had begun pubertal development by age 11, and girls appeared to be at a more advanced stage. There were significant associations between weight status and all of the measures of pubertal development collected in the Age 11 survey. In line with previous research (see J. Lee et al., 2010; J. M. Lee et al., 2007), overweight and obese cohort members seem to be at a more advanced stage of development. There could be wider implications of this association; relatively early or advanced puberty for their age could be a negative experience for overweight or obese children. This could constitute the focus of future research into contemporary patterns of growth among UK children.



► Table 6.7: Pubertal development and weight status at age 11

		Not overweight %	Overweight %	Obese %	Total %
How do you feel about the way you look?					
Growth spurt	Not yet	27.0	19.6	16.4	23.9
	Barely	29.7	26.7	25.1	28.4
	Definitely	43.3	53.6	58.5	47.8
	Total	100	100	100	100
	Unweighted n				12,255
					P<0.001
Body hair	Not yet	57.1	49.5	44.2	53.5
	Barely	21.4	22.7	22.6	21.9
	Definitely	21.5	27.8	33.2	24.7
	Total	100	100	100	100
	Unweighted n				12,190
					P<0.001
Skin changes	Not yet	56.8	49.1	45.3	53.5
	Barely	28.0	27.8	28.2	28.0
	Definitely	15.2	23.1	26.5	18.5
	Total	100	100	100	100
	Unweighted n				12,382
					P<0.001
Voice deeper (Boys only)	Not yet	87.6	86.7	81.1	86.1
	Barely	10.2	9.9	15.0	11.1
	Definitely	2.3	3.4	3.9	2.8
	Total	100	100	100	100
	Unweighted n				6,288
					P<0.01
Facial hair (Boys only)	Not yet	92.6	91.5	88.4	91.6
	Barely	6.1	7.1	7.8	6.6
	Definitely	1.4	1.4	3.8	1.9
	Total	100	100	100	100
	Unweighted n				6,295
					P>0.05
Breast growth (Girls only)	Not yet	27.5	6.2	6.5	20.5
	Barely	33.8	30.9	24.6	31.7
	Definitely	38.7	63.0	69.0	47.8
	Total	100	100	100	100
	Unweighted n				6,069
					P<0.001
Menstruation (Girls only)	Yes	6.1	15.9	17.8	9.7
	No	93.9	84.1	82.2	90.3
	Total	100	100	100	100
	Unweighted n				6,094
					P<0.001

Notes: Millennium Cohort Study Age 11 survey. Weighted percentages; unweighted observations.

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# Chapter 7: Poverty and Deprivation

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**Tarek Mostafa and Lucinda Platt**

## Chapter summary

- While nearly half of the Millennium Cohort Study (MCS) children do not appear to have been touched by poverty during their first 11 years, the majority have been poor at the time of at least one survey.
- Around 17 per cent have been persistently poor.
- There are significant differences in poverty risks at age 11, and in risks of persistent poverty by family characteristics, such as work status, ethnic group and family structure.
- Those who are persistently poor in income terms also face more material deprivation, and both parents and children have lower subjective wellbeing



### Introduction

Poverty is bad for children. It has been shown to lead to poorer outcomes in childhood (Dickerson and Popli, 2012; Ermisch et al., 2001) and to long-term adverse consequences in adulthood (Hills et al., 2010). Poor children are themselves more likely to become poor adults (Machin, 1998). Longer durations of poverty are commensurately more detrimental than intermittent or one-off experiences (Hill and Jenkins, 2001). Hence, child poverty is a source of great policy interest that has, arguably, increased since 1999 (Walker, 1999; Platt, 2005). This culminated in legislation covering the UK: the Child Poverty Act 2010 and the Children and Families (Wales) Measure 2010. These set targets for reducing child poverty by 2020 across defined measures and require the publication of strategies for meeting these targets (Kennedy, 2014). Such policy strategy documents regularly outline specific elements of the approach to child poverty reduction. The recent (2012) UK government consultation on child poverty measurement debated the multiple ways in which we evaluate the prevalence and correlates of child poverty, and in doing so continued to stress its significance for policy. Ascertaining the extent and patterning of child poverty across young children's lives is therefore of significant interest for policy.

As is clear from the 2012 consultation on child poverty and from much of the discussion in the academic literature, an income measure of poverty is deemed a necessary component of evaluating child poverty. It is, at the same time, often regarded as insufficient to capture fully some of the lived realities of growing up poor, and the relationship of income poverty to particular sets of disadvantaging circumstances. Moreover, a relative measure is sensitive to changes in the median, such as those that occurred during the recession. Hence, while the Households Below Average Income (HBAI) series continues to monitor various income-related thresholds to estimate progress on child poverty, it has also used a suite of measures to produce a combined low income and material deprivation measure since 2004-05. Material deprivation as a 'direct' measure of poverty has a long tradition since Townsend's 1979 work, *Poverty in the United Kingdom*, and continues to be reflected in an ESRC-funded programme of work on poverty and social exclusion based at Bristol University (<http://www.poverty.ac.uk/>). Therefore, in this chapter we look not only at the patterning of a low-income measure across children and across the five surveys, but also at material deprivation measures and the association between the two.

In addition, there is an increasing emphasis on subjective evaluations of wellbeing as an important means to capture the overall condition of the nation. While income tends to be linked to perceived wellbeing among adults, it is of interest to ascertain if income poverty is associated with children's own evaluation of their circumstances. Hence, we also describe the extent to which income poverty is associated with both MCS parents' and children's life satisfaction or 'happiness'.

Child poverty has been explicitly linked to the social mobility

agenda through the establishment of the Social Mobility and Child Poverty Commission. Efforts to increase social mobility have broad, cross-party support and have looked across childhood and youth to establish the points at which and the ways in which family advantage and disadvantage are 'transmitted' to the next generation. This acknowledges the potential long-term consequences of child poverty, but there is still some debate about when and how poverty and disadvantage make their impact. Though the relationship between child poverty and poorer cognitive, educational and behavioural outcomes is now well-attested – in part through the extensive research on the MCS – the mechanisms are still not clear cut (Jones et al., 2013). Moreover, there is still more to be understood about how both the duration of poverty and the experience of being poor at critical periods during childhood shape the impact of child poverty (Hill and Jenkins, 2001; Duncan et al., 1998).

Nevertheless, there is an accumulating level of evidence that persistent experience of poverty is more significant than intermittent or occasional experience. Indeed, using the MCS, Dickerson and Popli (2012) were able to show that persistent and early experiences of poverty were most salient in terms of their relationship to child outcomes. We know then that family poverty is highly relevant for children growing up, and that persistent poverty is a particular concern.

In this chapter we therefore set out to do two things. First, we plot family poverty across all five surveys of the MCS up to Age 11 survey. We look at how it is patterned over time and the family and contextual factors associated with experiences of no, single or multiple incidences of poverty.

Second, we look at how both poverty at age 11 and different patterns of poverty across preceding surveys (e.g. none, intermittent or recurrent poverty) are associated, or not, with other measures of child wellbeing, both material deprivation, discussed further below, and more subjective measures of wellbeing.

### Sample

All our analyses focus on the sample achieved at the Age 11 survey, which is then 'tracked back' to give the longitudinal understanding of child poverty. Sample sizes vary slightly depending on those for whom all relevant information was observed at age 11, with most analysis being carried out on around 13,187 children (including some twins and triplets) living in 13,015 families from the total of 13,469 children living in the 13,287 families who participated in the Age 11 survey in some way. The number is smaller than the total number of children in participating households given some non-response on key parent or child variables. All analyses are adjusted for the complex design of the MCS and for non-response across sweeps, using the Age 11 survey non-response weights.

It should be noted that the composition of the MCS has changed to some degree due to sample loss since the initial sample. There is a tendency for more disadvantaged and more mobile families

to have a higher risk of loss to follow-up. In addition, those who emigrate are not surveyed while they are living abroad, though the Age 11 survey did collect some information from emigrant families where it could contact them (see Chapter 1). This means that, other things being equal, we would tend to expect the (unweighted) proportions in poverty to reduce over time, counteracting to some degree the intentional oversampling of disadvantaged families at the first Age 9 Months survey. However, the use of weights and adjustment for sample design in all analysis is intended to correct for both the initial oversampling and the subsequent differential attrition. This issue is discussed further in Chapter 1. The provision of weighted estimates should in principle, then, be unaffected by differential attrition, though it is likely that they cannot fully account for the changes in composition.

### Income and poverty measurement in the MCS

We use a standard indicator of ‘poverty’ as less than 60 per cent of median equivalised family income. Further details can be found in the MCS User Guide, eighth edition (Hansen et al., 2014). It is worth noting that this indicator is MCS-specific. That is, it is derived from the aggregate income of the MCS families, and hence is relative to other families with children of this age, rather than all types of households. In addition, it uses a family-based rather than a full household-based assessment of income, since income is recorded at family not household level. In practice, the difference between family and household income is not that great. However, the reference point of families with children of this age, rather than all types of households, does mean that the poverty indicator cannot be directly compared to that used in, for example, the Family Resources Survey from which the low income measures reported in HBAI are derived. Moreover, our measure is based on a banded income variable rather than a summation of all income sources, which also makes it non-comparable with the HBAI methodology. Even when benchmarked against families with children of a comparable age in HBAI, the poverty rates in MCS have tended to be somewhat higher than HBAI rates, even though, as noted, the reference population is other families with children rather than all families. But the collection of income across the survey and of the banded income measure specifically was enhanced at the Age 11 survey and the estimate of poverty, while still referenced to other families with children, maps more closely onto overall child poverty rates.

For all these reasons, the estimates of poverty prevalence in MCS should not be treated as representing definitive poverty rates. Nevertheless, as a measure of relative poverty demarcating lower income families at risk of poverty from higher income families at lower risk of poverty, rather than as a specific cut off distinguishing in some absolute sense the poor from the non-poor, the poverty indicator is an effective measure. This is particularly the case when we utilise it as a longitudinal measure of family poverty, as discussed further below.

Table 7.1 shows the poverty rates at the different surveys based both on the sample collected at each age, and based on the Age 11 sample used in this chapter.

The improvements to income measurement at Age 11 have resulted in some discontinuities across time, which can be seen in Table 7.1 showing poverty rates across the surveys. We can also see from Table 7.1 that at each sweep, those who will continue to the Age 11 survey contain a slightly lower proportion of those who are poor than the overall sample at each sweep. This shows how sample loss since the beginning of the study tends to affect those in poor families more, as discussed above.

Table 7.1 also shows how the rates in surveys prior to Age 11 were relatively high, partly due to the measurement issues noted above. Nevertheless, this does not invalidate its use as an indicator of poverty, especially in a longitudinal context. As well as providing a reasonable proxy for risk of poverty at an individual sweep, more importantly, the indicators from each sweep provide information to construct a meaningful longitudinal measure of poverty, and in particular, of poverty persistence, as we go on to discuss next.

### Summary of poverty experience from age 9 months to 11 years in the MCS

We first look at how those who participated in the Age 11 survey experienced poverty from age 9 months to 11 years. Figure 7.1 illustrates the number of occasions each of the 11-year-olds was living in a family below the survey-specific income threshold.

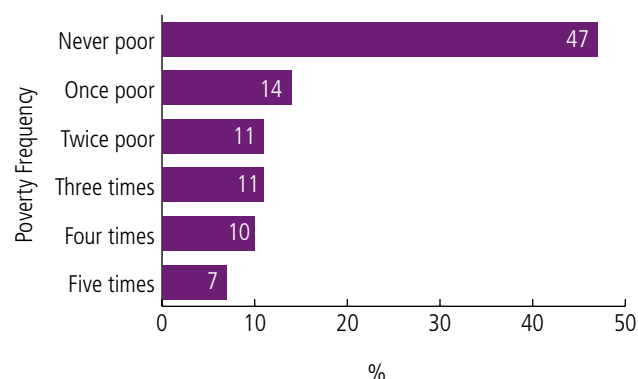
Figure 7.1 shows that a large share of children (47%) in MCS lived in families that never experienced poverty in any of the MCS surveys, while the rest of the families have experienced

► **Table 7.1: Rates of MCS child poverty across sweeps**

	Age 9 Months	Age 3	Age 5	Age 7	Age 11
Survey-specific poverty rate	30.2	29.9	30.6	29.1	21.2
(N of children)	(18,736)	(15,604)	(15,347)	(14,022)	(13,187)
Poverty based on Age 11 survey sample	26.2	27.7	28.2	27.4	21.2
(N of children)	(12,736)	(12,029)	(12,347)	(11,974)	(13,187)

Notes: Weighted percentages; unweighted observations.

► **Figure 7.1: Poverty across the five surveys of MCS (N=13,187)**



Notes: Weighted percentages

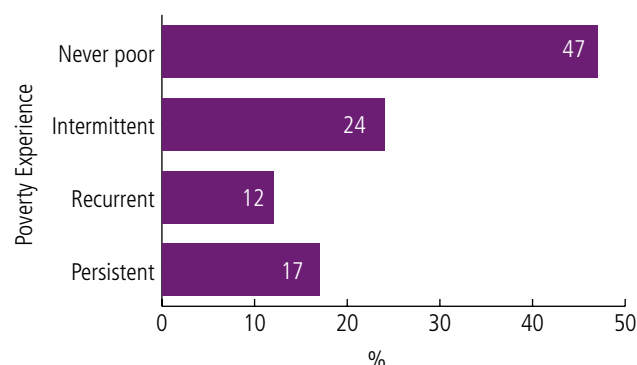
poverty at least once. Thus over half of the families have been touched by this relative measure of poverty, reinforcing the point that while low income is only a minority experience at any point in time, it tends to affect the lives of a majority at some point. Moreover, it is worth noting that this only takes account of those families whose income fell below the poverty threshold at the time of the survey. If there had been annual income measures, as in most analysis of poverty dynamics (Jenkins, 2011), we might have expected to observe a higher proportion experiencing poverty at some point over the decade, and possibly more experiencing movement above and below the poverty threshold even if not necessarily more experiencing a long duration of poverty.

A relatively small fraction of respondents (17%, or one in six) has experienced poverty in four or five surveys, which we might consider to be persistently poor. For UK child poverty measurement, persistent poverty is estimated as being poor for at least three out of four successive annual measures. MCS clearly does not measure income annually, with gaps of two to four years between surveys. Our allocation of persistent poverty to those who were found to be below the low income threshold at four out of five sweeps is thus a broad approximation taking account of intermittent measurement as well as the fact that not all children surveyed at age 11 were surveyed on every previous occasion.

More than a third of those 'persistently poor' (around 7%) both participated in all five surveys and were found to be poor every time. While the 17 per cent who were persistently poor is less than the total number experiencing any poverty, it is, nevertheless, a substantial share that might be considered the most vulnerable.

In some cases, those who responded at age 11 did not take part in all earlier surveys. We have thus (and in line with other categorisations of child poverty (see e.g. Hill and Jenkins, 2001)) schematised poverty experience as either none, intermittent (one to three continuous surveys), recurrent (two to three surveys with gaps in between) or persistent (four or five surveys poor across the whole period). Figure 7.2 shows the distributions according to these definitions. The distinction between intermittent and recurrent is least distinct, especially given

► **Figure 7.2: Types of poverty experience (N = 13,187)**



Notes: Weighted percentages

we are measuring poverty at intervals longer than a year.

Figure 7.2 makes the poverty dynamics more explicit. While almost half of the MCS families never experienced poverty (47%), some families (24%) experienced intermittent poverty for one, two or three surveys without any gaps between these experiences. Other families (12%) experienced recurrent poverty for two or three surveys but with gaps in between (i.e. moving above and below the poverty line at different times). The remaining families (17 per cent) have experienced persistent poverty for four or five surveys of the MCS.

In Table 7.2, we now look at how these poverty dynamics vary with family and contextual characteristics that have been considered important for the experience of poverty. Poverty rates have tended to differ across countries of the UK, across ethnic groups, among those who are living in lone parent or workless families, and tend to be higher among those with a long-term illness or a child with a disability.

As Table 7.2 shows, there is variation across all these characteristics, and statistical tests show that the different distributions of poverty both at age 11 and across surveys according to these characteristics are statistically significantly different. Of course, a number of these co-vary. Lone parent families are more likely to be workless, as are those with a long-term sick main carer or child, for example. Regression analysis (not shown) was therefore used to test the extent to which these relationships persisted when the other characteristics were held constant.

Controlling for all the variables that appear in Table 7.2 revealed that, other things being equal, those in Northern Ireland and Wales were more likely to be persistently poor and poor at age 11 than those in England. Scottish children were not significantly different from English children in their risks of poverty. Children from all minority groups had higher risks of being persistently poor than White children; but Mixed ethnicity and Indian children were not more likely to be poor at age 11 specifically than White majority children. Once

► **Table 7.2: Patterns of child poverty experience by contextual, family and individual characteristics at the time of the Age 11 survey (N = 13,187 children)**

		Patterns of poverty over time: cell %				N
		Poor at Age 11 survey %	No poverty	Intermittent	Recurrent	
Country of interview						
England	21	48	24	12	16	8,595
Wales	23	45	23	10	21	1,822
Scotland	16	51	25	12	13	1,476
Northern Ireland	28	38	26	16	19	1,294
Ethnic group						
White	19	50	24	11	14	10,976
Mixed groups	22	33	30	16	20	379
Indian	17	49	25	11	16	333
Pakistani and Bangladeshi	73	7	17	20	56	886
Black groups	42	24	24	15	36	426
Other	33	24	31	19	25	186
Family structure						
Two-parent families	17	55	23	10	12	10,052
Lone parent families	35	23	29	19	30	3,135
Work status*						
No workers	64	6	20	24	50	1,942
1 worker	21	38	30	15	17	4,118
2 workers	4	71	21	5	3	5,859
Disability status						
Main carer has long-term limiting illness	35	32	23	18	26	1,623
Child has long-term limiting illness	30	34	27	17	22	961
All children	21	47	24	12	17	13,187

Notes: Weighted percentages; unweighted observations. \*The total N for work status is lower (11,919) than the overall total as the measure depends on having information from partner respondents as well as main carers.

controlling for family work status, lone parents were less likely to be persistently poor or in poverty at age 11 than two-parent families, demonstrating how their poverty is linked to their work status. The same was the case for parents or children with long-term limiting illness. Unsurprisingly, having no or one worker compared to having two workers put families at much greater risk of being in poverty. The fact that, at age 11, work status of families also increased risks of persistent poverty shows how employment vulnerability tends to have long-term associations with poverty risks.

In the next section, we look at other measures of disadvantage and advantage, and explore how these relate to poverty experience as outlined above.

## Material deprivation, subjective wellbeing and poverty

We now look at other measures of economic advantage and disadvantage, and how they relate to the patterns of poverty already illustrated. Specifically, we explore two much-discussed alternatives or supplements to income measures as ways of looking at deprivation. First, we look at measures of things or experiences that families lack through income constraints – ‘material deprivation’, as measured at the Age 11 survey (see, for example, the discussion in Willits, 2006). We then go on to explore respondents’ own evaluation of how well they are doing. We look here not at their evaluation of their income, but at their life satisfaction. In line with the increasing interest in subjective

wellbeing (SWB) as a means to measure wellbeing at the individual and population level (Layard, 2005; Office for National Statistics, 2012; Stiglitz et al., 2009), we draw on reports by both main carers and the children themselves of their life satisfaction. Material deprivation has been argued to provide a better proxy than income for disadvantage or poverty (Pantazis et al., 2006), while positive measures of wellbeing have been argued to be the fundamental aim of a good society. In practice, however, both material deprivation and SWB are more commonly used as supplements to income poverty as measures of disadvantage or deprivation, rather than strictly substituting for them.

### Material deprivation

First we look at measures of material deprivation. These are a subset of measures that are used in the child poverty measurement framework of the Department of Work and Pensions (DWP). They were discussed and agreed with the DWP as providing salient indicators of material deprivation, given that the Age 11 survey could not carry the full suite fielded in the Family Resources Survey. The measures are intended to capture aspects of everyday life or normal 'participation' (Townsend, 1979) that constitute normal family life. Families are asked if they lack certain items. If they do, they are asked whether that is because they do not want or need them or because they cannot afford them. Those who say they do not have them because they cannot afford them are counted as 'deprived' on that measure, while those who lack them because they 'don't want or need' them are not considered deprived. Even though there has been

### ► Box 7.1: Deprivation measures at MCS Age 11 survey

Not all children will have done these things. For the survey to be accurate, it is important that all children, including any who have done these things, answer honestly.

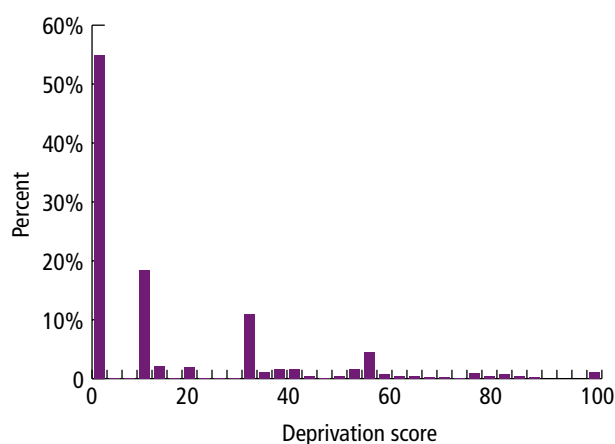
**The next questions are about the sorts of things that some families have but that other families do not want or cannot afford.**

- A.** Do you have a small amount of money to spend on yourself weekly, not on the family?
- B.** Do you and [cohort child] have a holiday once a year, not staying with relatives?
- C.** Do you have celebrations on special occasions such as birthdays, Christmas or other religious festivals?
- D.** Does [cohort child] have friends around for tea or a snack once a fortnight?
- E.** Do you replace or repair major electrical goods such as a refrigerator or a washing machine, when broken?

#### Response categories:

- 1.** We/child have/do this
- 2.** We/child would like to have/do this, but cannot afford it at the moment
- 3.** We/child do not want/need this at the moment

► **Figure 7.3: Distribution of deprivation scores across children in the MCS Age 11 survey (N = 13,037 children)**



some debate over the appropriateness of this distinction, it is utilised in the official statistics reported in HBAI.

Box 7.1 shows the five measures that were included at the MCS Age 11 survey. It has been shown that, since the recession, expectations of what is a normal entitlement have declined (Mack et al., 2013). Nevertheless, the weighted measurement of deprivation ensures that the measures remain normative in a period of recession, even if, potentially counterintuitively, this reduction in socially approved standards of living may mean that perceptions of material deprivation decrease during a time of hardship. In combining the measures of material deprivation, those things which more families have are weighted higher in a family's deprivation score than those which are already less common (for the full method see further Willits, 2006).

This enables us to calculate a total 'deprivation score', albeit based just on these five measures, which we can compare across families with different experiences. The score distinguishes those who face no material deprivation (score of 0) with those who face the maximum (score of 100). Since we do not have the full suite of measures carried in the Family Resources Survey, we do not attempt to establish a deprivation threshold. Our distribution, though still continuous, is less even than it would be with the full set of measures (see Fig 7.3). Instead, therefore, following Platt (2009), we look across the average deprivation scores for families in different circumstances. For example, we can see how much higher the deprivation score is for those who are income poor. If low income and deprivation were both capturing to some degree lower consumption or 'true' poverty, then we would expect those who are income poor to have substantially higher deprivation scores than those who are not income poor.

As we can see, deprivation measures are related to income poverty in the way we would expect. Those poor at age 11 had substantially and significantly higher deprivation scores than



► **Table 7.3: Mean deprivation score by poverty status at Age 11 survey and across all five surveys and by key characteristics (N = 13,037 children)**

	Not poor at age 11	Poor at age 11	Patterns of poverty over time				All (N)
			No poverty	Intermittent	Recurrent	Persistent	
All children at Age 11 survey	11.9	26.5	7.3	17.7	23.9	26.5	15.0 (13,037)
<b>Country of interview</b>							
England	12.7	28.1	7.8	19.2	25.6	28.0	15.9 (8,493)
Wales	11.1	24.5	7.3	15.4	20.6	24.2	14.1 (1,799)
Scotland	9.1	20.6	4.6	15.4	18.7	21.0	11.0 (1,462)
Northern Ireland	11.0	24.7	6.6	13.9	22.8	25.9	14.8 (1,283)
<b>Ethnic group</b>							
White	11.4	26.3	7.1	17.4	23.4	26.1	14.2 (10,862)
Mixed groups	15.7	<b>30.1</b>	8.0	19.1	<b>25.1</b>	<b>31.1</b>	18.9 (377)
Indian	9.4	<b>16.3</b>	6.6	<b>11.7</b>	<b>17.3</b>	<b>16.8</b>	10.6 (331)
Pakistani and Bangladeshi	16.0	24.4	<b>6.5</b>	15.8	25.2	24.5	22.1 (863)
Black groups	23.8	34.3	18.1	27.4	31.0	34.6	28.3 (419)
Other	19.0	<b>26.9</b>	<b>10.4</b>	<b>20.0</b>	<b>30.6</b>	<b>26.2</b>	21.6 (184)
<b>Family structure</b>							
Two-parent families	9.3	24.0	6.1	14.9	21.4	23.8	11.8 (9,941)
Lone parent families	21.2	29.8	15.1	23.7	27.6	29.6	24.2 (3,096)
<b>Work status</b>							
No workers	29.1	30.7	21.6	29.1	32.3	30.6	<b>30.1 (1,916)</b>
1 worker	15.9	22.9	11.1	19.7	21.7	23.3	<b>17.4 (4,072)</b>
2 workers	7.1	17.6	5.2	12.0	16.8	15.1	<b>7.5 (5,810)</b>
<b>Disability status</b>							
Main carer has long-term limiting illness	19.5	30.2	12.1	25.0	30.9	30.1	<b>23.2 (1,599)</b>
Child has long-term limiting illness	16.5	27.0	10.6	19.8	27.6	27.3	<b>19.7 (950)</b>

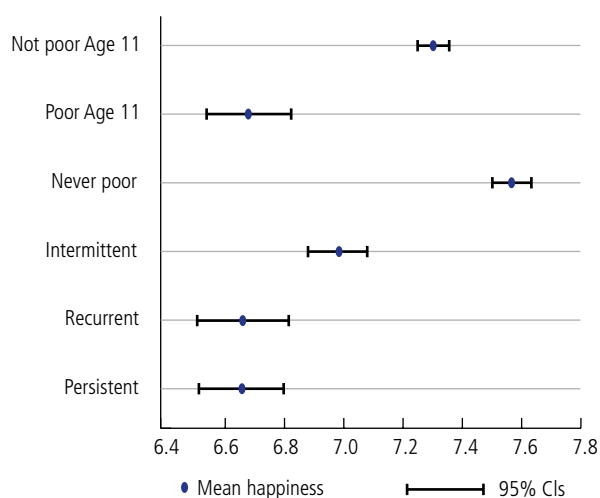
Notes: Weighted percentages; unweighted observations. Cell estimates that are based on fewer than 100 observations are italicised and should be treated with caution.

those not poor, and those with experience of poverty had increasingly high scores as they moved from intermittent to recurrent to persistent poverty.

These patterns are replicated in the various sub-populations, but there is nevertheless some variation within the different poverty statuses according to family or contextual characteristics. For example, children in Scotland have significantly lower deprivation scores than those in England among both those not poor and those poor. They also have significantly lower average deprivation scores for each of the poverty types, even among the persistently poor. While persistent poverty increases the rates of deprivation across children from all countries, those in Scotland are relatively more protected.

When we turn to ethnicity, the picture is even more mixed. Indian children have the lowest average deprivation scores and Black children the highest across all poverty statuses. Indeed, the rates of deprivation among persistently poor Indian children are insignificantly different from average deprivation among never poor Black children. Similarly, we can see that lone parents have (significantly) higher average deprivation scores than couples for every type of poverty experience. The much higher rates of deprivation among currently workless households, even if when they rank among the 'never poor' suggests that workless households at any one time capture those who are on the margins of getting by, whether or not they are out of work continuously. Thus they face increased vulnerability to deprivation even if not below the poverty

► **Figure 7.4: Life satisfaction of main carer and family poverty status (N = 12,088)**



Note: Weighted satisfaction scores.

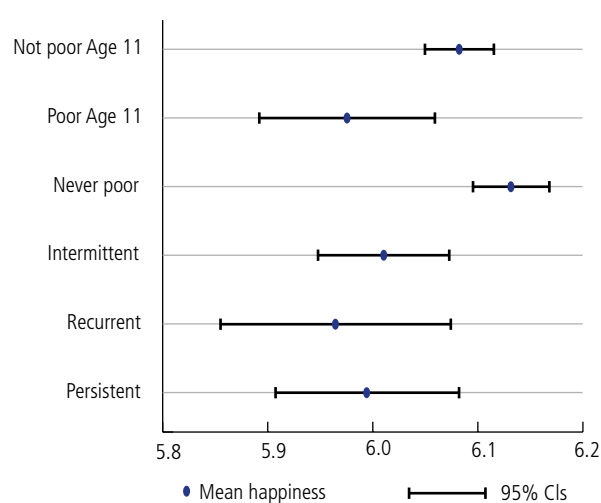
threshold at a particular moment. Many of these, it is worth noting, will be lone parents, whose incomes may not match their needs, even if they are not deemed to be below the poverty threshold.

While there may be some differences in reporting, these different patterns indicate that the relationship between deprivation and income poverty is not clear-cut. Some families may be better placed or have greater resources with which to protect their children from the effects of poverty, while others may have fewer such resources. These findings echo some of the distinctions found in earlier research, where the material deprivation of lone parents appeared to indicate that the income thresholds that divided the poor from the non-poor were set too low for lone parents. For this group, it was argued, being 'out of poverty' according to an income measure did not necessarily reflect their true standard of living (Brewer et al., 2008).

### Subjective wellbeing

Measures of SWB have been increasingly promulgated as an important means to capture the wellbeing of the nation, with the Office for National Statistics (ONS) now including a core set of SWB measures in standard surveys (Office for National Statistics, 2012). The recognition that wellbeing does not necessarily increase with income at an aggregate level has prompted many economists and others to explore 'direct' measures of 'happiness' to gauge the overall position of nations as well as individuals. A lot is now known about subjective wellbeing, particularly among adults – and including the recognition that it does tend to increase with income (Bruni and Porta, 2007). However, much less is known about the wellbeing of children, particularly younger children. Chapter 2 has illustrated MCS children's wellbeing at age 11. Here we focus just on their overall life satisfaction measure – on a seven-point scale – and the extent to which it varies with

► **Figure 7.5: Cohort child happy with life overall, by family poverty status (N = 12,727)**



Note: Weighted satisfaction scores.

their poverty status.

First, however, we look at the association between the main carer's life satisfaction and family poverty status. For main carers, their life satisfaction is measured on an 11-point scale, as in the ONS suite of measures. The average level of happiness in the data is 7.2, which is in line with ONS estimates of average happiness. However, as Figure 7.4 shows, there is some significant variation according to family poverty status.

In particular, we see that those who are recurrently or persistently poor evaluate their wellbeing less positively than those who have never been poor across the whole period. Those who are never poor have a mean score of around 7.6, which, given the limited level of variation in these life satisfaction scales, is notably higher than the overall mean of 7.2. We can also see that those who are not poor at the Age 11 survey (which will include the never poor, who make up about two-thirds of those not currently poor) also express much higher life satisfaction, though not as high as the never poor. Thus the main carers' evaluation of their wellbeing would in part appear to be influenced by past status as well as present condition. Overall, the association appears rather clear between poverty and life satisfaction, even if it is not low income itself that is causing low life satisfaction among those persistently or recurrently poor.

Now we look at the overall happiness of the child and the extent to which it maps onto their family poverty status. Is their happiness, like that of their parents, correlated with their income poverty status? Or is it independent of it? Instead of an 11-point scale, the children were asked on a seven-point scale, which is more intuitive to represent visually to children and is also a recommended metric for measuring life satisfaction (Pudney, 2010). It is worth noting that the life satisfaction measures

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asked of children and young people in the British Household Panel Survey and Understanding Society are also on seven-point scale. However, this does mean that the 'amount' of wellbeing expressed by children cannot be directly compared with the wellbeing of adults.

Overall, most of the MCS children said they were happy, with an average of just over six out of a maximum of seven across the sample. While responses to life satisfaction questions on seven-point, as on 11-point, scales tend to be skewed towards the positive end with scores typically between five and six, the MCS children expressed levels of happiness that were higher than typical adult averages. Over half of them put themselves at the top of the scale as 'completely happy', while another quarter were only one level down from that. However, a small percentage did regard themselves as not at all happy (3%) or close to that bottom point (another 2%). Figure 7.5 therefore illustrates the extent to which there is variation in average happiness according to family poverty status.

As Figure 7.5 shows, while the average happiness across all the children is high, falling between 5.9 and 6.2 on the seven-point scale, there is nonetheless some small but statistically significant variation by poverty status. Those children facing recurrent or persistent poverty expressed the lowest average scores and those who have never been poor across the five surveys showed the highest happiness scores.

Of course, this does not mean that there is a causal relationship between income poverty and child wellbeing, since there will be a whole range of variation in experience across these different families. However, it does suggest some congruence between the two, very different, evaluations of children's wellbeing and indicates that those circumstances, including material deprivation, that are on average more common in poorer families are also those which tend to make children less happy.

## Conclusion

In this chapter, we have outlined the experience of low income among the MCS children across their childhoods from age 9 months to 11 years. We have seen that while nearly half of them are never touched by poverty, defined according to a relative low income measure, a substantial proportion (one in six) of them are persistently poor.

We have shown that poverty varies with some key characteristics, which themselves co-vary: the primary driver is, as would be expected, family work status. However, we also found that being from a minority ethnic group was associated with higher risks of persistent poverty. Pakistani and Bangladeshi and Black children experienced particularly high risks of persistent poverty, which persisted even when controlling for family work status.

Measures of material deprivation arguably give a more direct measure of how poverty is experienced. A majority of the MCS

children were not deprived on any of the five measures in the Age 11 survey, but there was substantial variation across families in the distribution of material deprivation. We saw that material deprivation was strongly associated with poverty status – being in poverty and being in poverty for longer reduces resources and capacity to 'participate', or purchase or repair necessities (Berthoud et al., 2004; Gordon, 2006). However, when looking across different family characteristics, we saw that the relationship was less consistent. For example, some ethnic groups had the same rates of material disadvantage out of poverty that others had in poverty. Lone parents' material deprivation was also higher than their income poverty status might imply.

Finally, we looked at respondents' SWB and compared it to their income poverty status. We found for both parents and children a clear association between poverty status and average 'happiness'. Even though we know from the literature that income and happiness tend to be correlated (van Praag et al., 2003), it was striking how clearly the relationship for these two rather different ways of conceiving wellbeing came through, and for the children as well as their parents.

We already know that poverty is associated with a range of poorer child outcomes, but it is clear that even though these 11-year-olds seem broadly happy, they themselves have some understanding of their disadvantaged position when they come to draw conclusions about how things are going overall for them.

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# Chapter 8: Conclusions

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Lucinda Platt



This volume has highlighted some of the key topics that it is possible to investigate using the Age 11 survey of the Millennium Cohort Study. It has revealed some interesting and illuminating findings in terms of how children born around the turn of the current century are growing and developing, physically, in learning, and in independence.

It has demonstrated a predominantly positive picture of the cohort's self-evaluated wellbeing and the low prevalence of antisocial or risky behaviours they are engaging in at this age. The cohort children tend to be very positive about most aspects of their life, and overall rate their life satisfaction highly. The vast majority have friends and also have a varied friendship group, and they appear undaunted by the major transition to secondary school they are about to encounter. They are increasingly spending time independently of direct parental supervision, and are developing their cognitive skills as they approach adolescence.

Children of this generation are much less likely to live in intact families during the first 11 years of their life, than children born in Britain 40 years earlier. They are more likely to live with step-families and to have half-siblings as well as full siblings. They are also more likely to live with just one parent; but there is little evidence that this diversity in family circumstances has intrinsically detrimental effects on their wellbeing. In addition, though diversity in family forms has increased, the majority (over 60%) of MCS children have lived consistently with two natural parents, and few experience multiple changes of circumstances.

Despite concerns about antisocial and risky behaviour among the younger generation, very few MCS children have tried a cigarette (3%). Only slightly more than one in ten (13%) have ever tried an alcoholic drink and even fewer (1 in 100) have ever had enough alcohol to feel drunk. The vast majority of children also think that antisocial and illegal activities are wrong, echoing their parents' beliefs about such behaviours.

However, there were also some less positive findings. Persistent poverty across childhood is part of the experience of a substantial proportion of children and is linked to more negative outcomes in a number of areas of life and development, including cognitive outcomes. The evidence of these findings also suggests that disruptions in family composition may have an impact on children's behaviour, even if not on other aspects of their lives. The levels of overweight in this generation of children are much higher than in previous cohorts, leading to concerns about longer-term consequences.

The findings also indicate that there are clear distinctions in many areas of the children's experience according to family background, particularly parental education, and ethnic group. Such distinctions in family origins are associated with gaps in specific cognitive skills. For example, lower parental education is associated with poorer child performance across the range of skills tested. It is also associated with greater risks of being overweight at age 11 and with living in a poor or lone parent family. Hence, there remain clear social cleavages in children's

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experiences and, by implication, in their life chances. There is also in some cases variation depending on which part of the UK they live in, with, for example, rates of poverty being higher in Wales and Northern Ireland than in England and Scotland.

There are also some findings which in themselves are neither positive nor negative but are revealing about the facets of contemporary children's lives which would have been inconceivable when their parents were young – such as the very wide diffusion of mobile phones and the time they spend using the computer, for social engagement as well as homework and entertainment.

Amidst the diversity of childhood experiences, the few children who have very low perceived wellbeing, and the minority who have smoked or drunk by the age of 11 may still give cause for concern. While past MCS surveys can tell us something about the contexts that tend to be linked to such negative outcomes, it is only future surveys that will be able to confirm whether these feelings and behaviours have long-term consequences or if they are temporary or random 'aberrations'.

Overall, the chapters have given a picture of how full and varied the lives of 11-year-olds are, and how many fascinating avenues for research are possible with the five MCS surveys that are now available for analysis. Interesting and informative though they are, these initial findings are only the beginning of the possibilities that the data offer.

As the authors note, there are a number of ways the analyses could be extended or amplified. For example, in relation to families, there is scope for further work on family relationships, and contributions (cash and care) of non-resident parents. Research could usefully explore parental health (especially mental health) and its relationship to child outcomes and for comparing parent and teacher rating of children's behaviours.

Advanced analyses are also needed to understand the nature of the association between weight status and self-esteem and what the direction of the relationship is. The link of advanced pubertal development with weight and its subsequent consequences are worth further investigation too.

These are just a few of the very many ways in which further analysis of the Age 11 survey could advance our understanding of the first decade of life. Moreover, the possibilities for future research on these children's lives will be expanded when the next Age 14 survey of MCS is completed. This survey will gather detailed self-reports on their own situation from the young people, as well as direct measures of growth, cognition and physical activity. It will therefore be possible to explore the potential consequences of, for example, early risk-taking, previous weight gain and advanced puberty, and persistent poverty in the critical teenage years. It will also be possible to ascertain how successful the children's transition to secondary school has been. At age 14, young people are at the stage of making decisions and choices that could be influential for their adult lives. The extent to which these grow out of earlier experiences or reflect more proximate influences, such as their secondary schooling or their teenage peer groups, will be an important area for research. The research community will eagerly await the release of the next installment of MCS data.

Meanwhile, there is plenty to learn and plenty to investigate. As these initial findings show, the MCS provides an unparalleled resource for understanding the lives of 21st century children across the UK, and merits its enviable international position as a model for other national cohorts. It demonstrates the value of collecting high quality age-appropriate data, using the most suitable and scientifically endorsed methods, underpinned by a strong ethical approach to investigating the richness and diversity of the lives of today's children.





## About the Millennium Cohort Study

The Millennium Cohort Study (MCS) is following around 19,000 children born in the UK between September 2000 and January 2002. The study is funded by the Economic and Social Research Council and government departments, and is managed by the Centre for Longitudinal Studies at the Institute of Education, London.

The five surveys of cohort members conducted so far – at ages 9 months and 3, 5, 7 and 11 years – have built up a uniquely detailed portrait of the children of the new century. The study has collected information on diverse aspects of their lives, including behaviour, cognitive development, health, schooling, housing, and parents' employment and education.

The MCS has had a significant impact on UK policy, in areas such as breastfeeding, immunisation and child poverty. It will continue to provide a vital source of evidence for policymakers addressing social challenges for many years to come.

Find out more at [www.cls.ioe.ac.uk/mcs](http://www.cls.ioe.ac.uk/mcs).

### The Age 11 survey

The MCS Age 11 survey took place between January 2012 and February 2013. Trained fieldworkers conducted interviews with 13,287 children and their parents or guardians. Data from this survey and previous MCS surveys are available to download from the UK Data Service at [www.ukdataservice.ac.uk](http://www.ukdataservice.ac.uk).



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