Institute for Fiscal Studies

Cohabitation, marriage, relationship stability and child outcomes: final report

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Preface

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All views expressed are those of the authors.

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Executive summary

Introduction

- It is well known that children born to married parents tend to achieve better cognitive and social outcomes, on average, than children born into other family forms, including cohabiting unions. The existence of such gaps is potentially important, given the long-term consequences of childhood cognitive and non-cognitive skills and behaviours for education, labour market and other outcomes in adulthood.

- One of the hypotheses that is often put forward to explain why children born to married couples do better than children born to cohabiting couples is the greater stability of married compared with cohabiting unions: married couples are, on average, less likely to split up than cohabiting couples.

- In both cases, however, it must be recognised that marital status may not be the *cause* of these differences. Cohabiting couples may differ from married couples in many ways other than their formal marital status, such as their education or the love and commitment in their relationship. Differences in relationship stability or the outcomes of children born to cohabiting and married couples may simply *reflect* these differences in other characteristics rather than be *caused* by marriage.

- Goodman and Greaves, in *Cohabitation, Marriage and Child Outcomes* (IFS Commentary 114, 2010a), and Crawford, Goodman, Greaves and Joyce, in *Cohabitation, Marriage, Relationship Stability and Child Outcomes: An Update* (IFS Commentary 120, 2011) provided recent, systematic evidence on the extent to which differences in characteristics between parents who choose to marry or cohabit can help to explain differences in outcomes between children born into such families; Goodman and Greaves, in *Cohabitation, marriage and relationship stability* (IFS Briefing Note 107, 2010b) provided similar evidence on the differences in relationship stability.

- This report builds on their work in the following ways:

  a) By considering the extent to which differences in parental characteristics explain gaps in cognitive and socio-emotional development between children at older ages (for an earlier cohort of children);

  b) By documenting and exploring the differences between children born to cohabiting and married couples for a range of other non-cognitive skills, such as engagement in risky behaviours;

  c) By drawing together and extending work showing the differences in relationship stability between cohabiting and married couples, and the extent to which these differences may play a role in explaining the gaps in cognitive

and socio-emotional development between children born and raised in different family forms.

Data and methodology

- Most of the new analysis presented in this report uses data from the Avon Longitudinal Study of Parents and Children (ALSPAC). ALSPAC is a longitudinal study of around 15,000 live births in the Avon area of England in the early 1990s. It has the advantage of enabling us to follow children from birth through to age 16, and includes rich data on parents from the time of the child's conception.

- Children's cognitive development is measured using tests taken as part of the ALSPAC survey at ages 8 and 9; we also have access to children's national achievement (Key Stage) test scores at ages 7, 11, 14 and 16. Children's socio-emotional development is derived from parent and teacher responses to the Strengths and Difficulties Questionnaire (SDQ), and we are also able to capture self-reported measures of the child's locus of control (the extent to which they believe their actions make a difference), self-esteem and engagement in a range of risky and antisocial behaviours.

- The new analysis of relationship stability uses data from the Millennium Cohort Study (MCS). The MCS is a longitudinal study of children that initially sampled almost 19,000 new births across the UK in the early 2000s, with follow-ups at 9 months, 3 years, 5 years and 7 years.

- To carry out our analysis of both children's outcomes and relationship stability, we adopt a simple regression approach. We start by regressing the outcome of interest on parents' marital status at birth to estimate the 'raw' relationship between the two. We then sequentially add controls for other ways in which married and cohabiting parents differ from one another to see how the addition of these characteristics affects the 'impact' of marriage on the outcome of interest. We start with those that are most likely to reflect selection into marriage (for example, ethnicity) and move progressively towards those that might be regarded as reflecting both selection and a possible pathway through which marriage might have a causal effect on child outcomes or relationship stability (for example, relationship quality).

Evidence on the relationship between marital status and child development in ALSPAC

Cognitive development

- Compared with children born to married couples, those born to cohabiting couples exhibit a small deficit (less than 10% of a standard deviation) in cognitive development at ages 8 and 9, but a larger deficit (20–30% of a standard deviation) in educational attainment, particularly at older ages.

- In both cases, however, these deficits are largely accounted for by the fact that cohabiting mothers grew up in poorer environments than married mothers, and that cohabiting parents have lower educational qualifications than married parents. Differences in parental income, occupation and housing tenure also play a role in explaining the gaps in educational attainment at age 16.

- While it is possible that the decision to get married might lead some parents to attain higher educational qualifications, or to work longer or in higher paying jobs, our judgement (and the consensus of the literature to date) is that this effect is likely to be small. Our view is thus that the gap in cognitive development between children born to cohabiting and married couples is largely accounted for by the fact that different types of people choose to get married, and is not a consequence of parental marital status. These results are in line with our previous research, summarised here and in Crawford et al. (2011).

Socio-emotional development

- Children born to cohabiting couples are reported to have lower socio-emotional development between the ages of 6 and 13 than children born to married couples. These deficits are around 20% of a standard deviation: larger than the gap in terms of survey measures of cognitive development found in ALSPAC, but smaller than the gap in terms of educational attainment.

- In line with the findings for cognitive development, most of the deficit in socio-emotional development is accounted for by differences in the mother's background, plus parental education, income and work status. Our view is therefore that the gaps in socio-emotional development are also more likely to arise from the fact that different types of people choose to get married, rather than because getting married confers positive benefits on children's behaviour.

- These results are stronger than our previous work based on the Millennium Cohort Study, as the differences in socio-emotional development are accounted for using fewer potentially endogenous characteristics in ALSPAC than they were in the MCS.

Other non-cognitive skills and behaviours

- There are very small differences between children born to cohabiting and married couples in terms of their locus of control at ages 8 and 16, and their self-esteem at age 8. This suggests that parents' marital status is highly unlikely to causally affect these traits.

- Children born to cohabiting couples are, however, significantly more likely to engage in a range of risky and antisocial behaviours between the ages of 10 and 16 than children born to married couples. These differences are especially large at older ages; for example, children born to cohabiting

couples are around 10 percentage points more likely to have tried smoking tobacco or cannabis by age 16 than children born to married couples.

- Unlike the results for cognitive and socio-emotional development, controlling for a range of observable characteristics does not fully explain the differences in engagement in risky and antisocial behaviour, on average, between those born to married and cohabiting couples.

- One interpretation of these results is that parents' marital status has some influence on the behaviour of their children during the teenage years. Another is that some characteristics of the parents that differ between those who are cohabiting and married and strongly influence young people's engagement in risky behaviours (such as the parents' communication and attitudes that pre-date their marriage decision) are not fully captured using the measures available in the survey data that we use. If this were the case, then it might be possible to eliminate the remaining differences if we had access to richer data. Bearing in mind these two possible explanations, we would strongly caution against interpreting a remaining significant association between parents' marital status and their child's participation in risky and antisocial behaviours as evidence of a positive causal effect of marriage on children's behaviour.

The link between marital status and relationship stability in the MCS

- Parents who were cohabiting at the time of their child's birth are, on average, significantly more likely to have experienced a period of separation by the time the child turns 7 than couples who were married at the time of their child's birth. Moreover, children raised by parents who experience a period of separation before the child turns 7 tend to have worse cognitive and socio-emotional development, on average, than children raised by parents who stay together throughout this period.

- This does not necessarily imply that marriage *causes* an improvement in relationship stability, or that relationship breakdown *causes* a deterioration in child development, however: in fact, a sizeable proportion of the difference in relationship stability and the vast majority of the difference in child outcomes between cohabiting and married couples can be explained by the observable characteristics at our disposal. This suggests that the selection of different types of people into marriage plays a key role in explaining the lower rates of relationship breakdown and higher average child development that we see for married compared with cohabiting couples.

- Like our findings on risky behaviours, we are able to explain a smaller proportion of the difference in relationship stability between cohabiting and married couples than for some other outcomes. Even in situations where a significant association remains, however, this does not necessarily imply that a causal relationship exists; factors that are not observable in the survey

(such as the couples' communication and attitudes) may affect both the probability of marriage and the probability of separation, and so drive this association. This seems particularly plausible in the case of relationship breakdown: it is likely to be very difficult to identify and adequately measure the reasons why some couples stay together and others separate, even when those couples look very similar in many other respects. This means it is possible that, with access to richer data, the small but significant association between marital status and relationship stability could be explained. This is an important distinction from a policy perspective: unfortunately it is easier to show what does not drive a particular relationship than to prove what is causing it.

Conclusions

- Overall, our findings suggest that the differences in relationship stability between cohabiting and married parents, and the cognitive and non-cognitive skills and behaviours of their children, mainly or entirely reflect the fact that different types of people choose to get married (the selection effect), rather than that marriage has a direct positive causal effect on relationship stability or children's outcomes. On the basis of this evidence, therefore, there does not seem to be a strong rationale for policies that seek to encourage couples to get married, at least not if the aim is to increase these measures of relationship stability or child development.

1. Introduction

It is well known that children born to married parents tend to achieve better cognitive and social outcomes, on average, than children born into other family forms, including cohabiting unions.[1] The existence of such gaps is potentially important, given the long-term consequences of childhood cognitive and non-cognitive skills and behaviours for education, labour market and other outcomes, such as health and crime, in adulthood.[2] It has also been shown that married couples, on average, tend to have more stable relationships – for example, are less likely to separate – than cohabiting couples.[3] In both cases, however, it is not clear that marital status is the *cause* of these differences.

Goodman and Greaves (2010a) and Crawford et al. (2011) provided recent, systematic evidence on the extent to which differences in characteristics between parents who choose to marry or cohabit can help to explain differences in outcomes between children born into such families. Goodman and Greaves (2010b) provided similar evidence on the differences in relationship stability. This report builds on their work in the following ways:

- by considering the extent to which differences in parental characteristics account for differences in cognitive and socio-emotional development for children at older ages (amongst an earlier cohort);
- by documenting and exploring the differences between children born to cohabiting and married couples in terms of a range of other non-cognitive skills, such as engagement in risky behaviours;
- by drawing together and extending work showing the differences in relationship stability between cohabiting and married couples, and the extent to which these differences may play a role in helping to explain the gaps in cognitive and socio-emotional development between children born and raised in different family forms.

According to official birth registry statistics, there has been a very large increase in births outside marriage, particularly to cohabiting parents, in England and Wales since the late 1970s. Just over 47% of all live births occurred outside marriage in 2011, a rate that has been steadily increasing in the last three decades, from less than 10% in the late 1970s. Of these, it is estimated that the majority – amounting to *around 30% of all live births* – are to cohabiting parents.

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[1] See, for example, Manning and Lichter (1996), Graefe and Lichter (1999), Bumpass and Lu (2000), Acs and Nelson (2002, 2003, 2004), Manning (2002), Smock and Gupta (2002), Manning and Lamb (2003), Brown (2004), Manning, Smock and Majumdar (2004) and Artis (2007) for the US, Kiernan (1999), Benson (2006), Ermisch and Pronzato (2008) and Kiernan and Mensah (2010) for the UK and Andersson (2002) for international evidence.

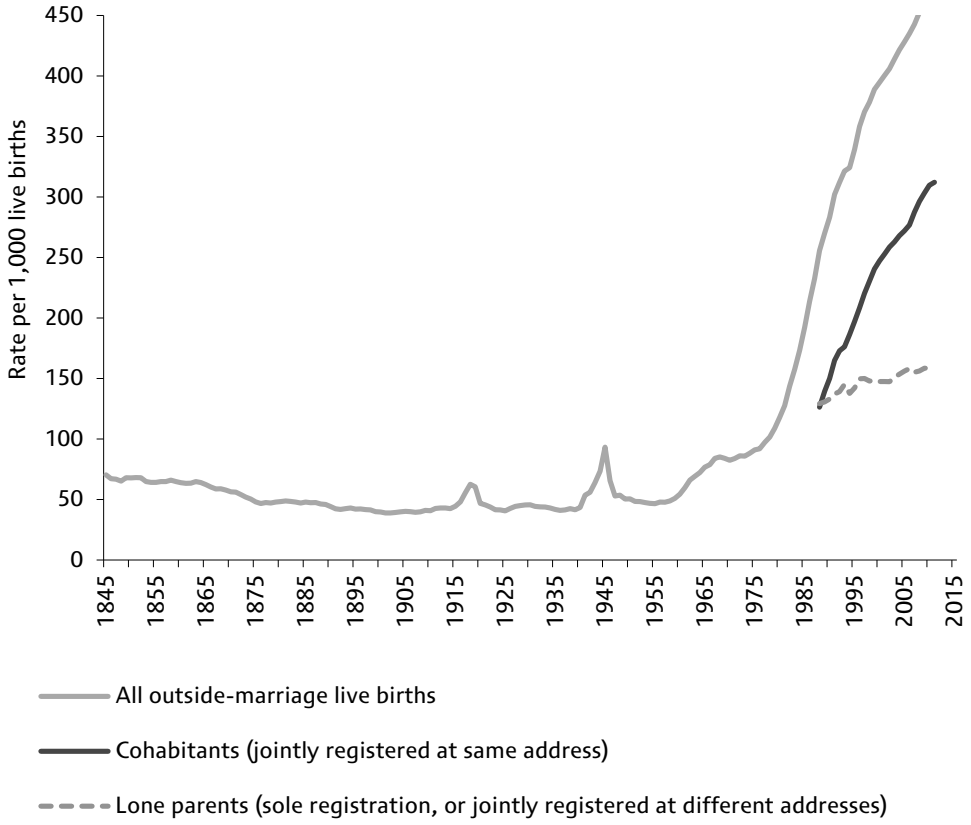
[2] See, for example, Feinstein (2000), Heckman, Stixrud and Urzua (2006) and Carneiro, Crawford and Goodman (2007).

[3] See, for example, Benson (2009) and Kiernan and Mensah (2010).

It is also interesting to note that *almost all the rise* in births out of wedlock since the late 1980s, when official records began to distinguish between cohabiting and lone-parent non-marital births, can be attributed to cohabiting parents; the proportion born to lone parents has risen only slightly over this period. (See Figure 1.1, based on official Office for National Statistics birth statistics.)

There are some theoretical reasons why marriage might encourage more stable relationships or improve child outcomes: for example, the greater social and legal commitment inherent in formal marriage might lead to greater *cooperative behaviour* between parents, might give women greater *bargaining power over household resources* or might reduce *parental stress*.[4] Understandably, therefore, the consequences of the growth in non-marital births have become the subject of considerable scrutiny.

Figure 1.1. Outside-marriage live births (rate per 1,000 live births), 1845–2011



Sources: Office for National Statistics, Birth Statistics PBH11 Live Births, 1838–2004, occurrence within/outside marriage and sex. Office for National Statistics, Series FM1, editions 30 and 36, tables 1.1, 3.9 and 3.10; edition 37, tables 1.1b (corrected), 3.9 and 3.10. Office for National Statistics, Characteristics of Mother 1, England and Wales, table 2 (for data post 2009).

[4] These issues are discussed in detail by Goodman and Greaves (2010a).

Our own previous work has shown that, on average, married couples tend to have more stable relationships, and raise children with higher cognitive and socio-emotional development, than cohabiting couples. For example, children born to married parents score around 10–20% of a standard deviation higher in cognitive tests and 30% of a standard deviation higher in terms of socio-emotional development in early childhood (ages 3 to 7) than children born to cohabiting parents (Goodman and Greaves, 2010a, and Crawford et al., 2011). Similarly, while 27% of couples who were cohabiting when their child was born are no longer living together when their child turns 5, the figure for married couples is just 9% (Goodman and Greaves, 2010b).

It is widely recognised that marital status may not be the cause of these differences, however. Cohabiting couples may differ from married couples in many ways other than their formal marital status, such as their income, ethnicity, education or the love and commitment in their relationship.[5] Differences in a couples' relationship stability or the outcomes of children born to married or cohabiting parents may therefore simply *reflect* these differences in other characteristics rather than be *caused* by marriage. This is sometimes referred to as the 'selection issue'.

Empirically, researchers have struggled to find strategies that adequately deal with this selection issue. One common approach is to try to take account of observable differences between married and cohabiting parents using simple regression techniques. Goodman and Greaves (2010a) and Crawford et al. (2011) adopted this methodology to provide the first systematic evidence of the differences in cognitive and socio-emotional development between children born to married and cohabiting couples for recent cohorts of children born in the UK. These studies started by documenting the gaps in cognitive and socio-emotional development between children born to cohabiting and married parents, before moving on to show how the children born and raised in these different family forms differed in other observable ways, such as their parents' ethnicity or level of education. Once these other differences were taken into account, both studies found that the 'raw' gaps in cognitive and socio-emotional development were greatly reduced. This corroborates the findings of other, similar studies[6] and suggests that most of the difference in outcomes between children born to and raised by cohabiting and married parents is accounted for by the fact that parents who choose to get married differ from parents who do not, rather than being a causal effect of marriage.

Goodman and Greaves (2010b) applied the same approach to the issue of relationship stability, with similar results: they found that the difference in the likelihood of separating between cohabiting and married parents by the time the

[5] See, for example, McLanahan and Sandefur (1994), Manning and Lamb (2003), Acs and Nelson (2004), Ribar (2004), Ermisch (2005), Brien, Lillard and Stern (2006), Manning and Brown (2006), Acs (2007), and Björklund, Ginther and Sundström (2007).

[6] For example, Brown (2004).

study child turned 5 was greatly (although not completely) reduced once account was taken of the other ways in which these couples differed from one another.

The difficulty of such an approach is the choice of characteristics to include as controls. Ideally one would like to include factors that *already* differed between cohabiting and married couples when marriage decisions were made and exclude factors that may themselves have been affected by marriage. This is important because if some characteristics – such as parents' education or socio-economic status – *had* already been affected by the decision of whether or not to marry, then controlling for them necessarily implies 'controlling away' part of the effect of marriage on child outcomes or relationship stability. On the other hand, of course, not controlling for them would very likely result in estimates of 'marriage effects' that were biased upwards due to selection. This dilemma has been recognised in other studies.[7]

Crawford et al. (2011) shed new light on this important issue by using data from the children of the British Cohort Study (BCS). The BCS is a longitudinal survey that contains detailed background information about a cohort of individuals born in 1970, thus providing information about them throughout their lives, starting long *before* their marriage decisions were taken. The availability of such information ensures that the selection of parents into marriage can be better accounted for, without worrying that we might be controlling away any of the potential effects of marriage.

This analysis confirmed the results of Goodman and Greaves (2010a), who only had access to data on parents at the time of the birth of the study child (i.e. after marriage decisions had been made). The analysis presented in this report relies on similar data to that used by Goodman and Greaves (2010a) – from the Millennium Cohort Study (MCS) and the Avon Longitudinal Study of Parents and Children (ALSPAC), two recent cohorts of children born and raised in the UK – hence the findings of Crawford et al. (2011) from the BCS provide some reassurance that the results presented here are unlikely to be driven by 'over-controlling' for characteristics that may themselves have been affected by marriage.

Of course, it must be remembered that all such analyses can only hope to control for *observable* differences between married and cohabiting couples. As such, we cannot fully address the 'selection issue' referred to above, which may arise as much because of unobserved differences between married and cohabiting parents (such as a couple's level of communication, their aspirations and their attitudes, values and priorities in life) as because of observed ones.

This report now proceeds as follows:

- Chapter 2 discusses the data and methods that we use for this study.

[7] For example, Ribar (2004).

- Chapter 3 describes the characteristics of married and cohabiting couples in ALSPAC, the main data set we use for our analysis of child outcomes in this report.

- Chapter 4 focuses on differences in cognitive development between children born to cohabiting and married couples. It summarises the evidence from the MCS and BCS provided in Crawford et al. (2011) and provides new evidence on the differences amongst older children (from the ALSPAC cohort). It also examines the extent to which these gaps are driven by differences in observable characteristics between cohabiting and married parents.

- Chapter 5 repeats the same analysis for children's socio-emotional development.

- Chapter 6 provides new evidence on the extent to which there are differences in a wider range of non-cognitive skills and behaviours amongst children born to married and cohabiting couples using the ALSPAC data, and examines the extent to which these gaps are driven by differences in observable characteristics between cohabiting and married parents.

- Chapter 7 draws together and extends the evidence provided in Goodman and Greaves (2010a) and (2010b), showing the differences in relationship stability between married and cohabiting parents with children in the MCS, and examining the extent to which these differences can help to explain the gaps in children's cognitive and socio-emotional development that we observe by family form.

- Chapter 8 draws upon the analysis of the previous chapters to offer some conclusions.

2. Data and methodology

This report primarily uses data from the Avon Longitudinal Study of Parents and Children (ALSPAC), which follows around 15,000 children born in the Avon area of England in the early 1990s. This chapter describes the ALSPAC data in more detail (Section 2.1) and compares the characteristics of parents in this sample to those of the nationally representative Millennium Cohort Study (MCS) (Section 2.2). It also explains how we measure cognitive and non-cognitive skills and behaviours in ALSPAC (and briefly in the MCS – which we use when assessing the extent to which differences in observable characteristics can explain why children's outcomes differ according to their parents' relationship stability in Chapter 7) (Section 2.3), and relationship status in the MCS and ALSPAC (Section 2.4). Finally, Section 2.5 outlines our methodology.

2.1 The Avon Longitudinal Study of Parents and Children

The Avon Longitudinal Study of Parents and Children (ALSPAC) was designed to be a census of all births in the Avon area of South-West England in the early 1990s. This means that ALSPAC cohort members were born around 10 years earlier than the children surveyed as part of the Millennium Cohort Study (MCS). To be eligible for inclusion in the study, mothers had to be resident in the former Avon Health Authority and to have an expected date of delivery between 1 April 1991 and 31 December 1992. The study captured more than 75% of known live births in the area, resulting in a total sample of 14,775 live births (Boyd et al., 2013).[8]

ALSPAC cohort members and their families have been surveyed via high-frequency postal questionnaires from the time of pregnancy onwards, with information collected on a wide range of family background characteristics, including mother's and father's education, family income and housing tenure, plus parents' marital status at birth (asked of the mother when the child was around eight-months old). The cohort members' cognitive and non-cognitive development was assessed using various instruments in a series of special 'focus' clinic sessions between ages 8 and 11, and survey questions regarding their engagement in a range of risky and antisocial behaviours were asked frequently during their teenage years. These measures are described in more detail in Section 2.3. ALSPAC cohort members have also been linked to their national achievement (Key Stage) test scores at ages 7, 11, 14 and 16.

[8] The study website contains details of all the data that is available through a fully searchable data dictionary: see http://www.bris.ac.uk/alspac/researchers/data-access/data-dictionary/. Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees.

The main advantages of ALSPAC over the MCS – which was used in Goodman and Greaves (2010a) and Crawford et al. (2011) – are that it is possible to observe a wider range of outcomes (including engagement in risky and antisocial behaviours), that we have slightly more detailed information about parents' background, thus enabling us to better control for the selection of individuals into marriage, and that we can observe outcomes for children at older ages, thus enabling us to examine how the link between parents' marital status and children's development changes over time.

The disadvantages are that the survey is not nationally representative, and there is a relatively higher level of attrition. For example, while 72% of the original MCS cohort participated in a face-to-face interview at age 7, the equivalent figures for a postal questionnaire at around age 7 and a focus clinic session at around age 8 amongst ALSPAC cohort members are around 50%. This is perhaps not surprising given the different modes of interview, however.

Moreover, while the background information we have about parents in ALSPAC is richer than in the MCS, we are still only able to observe parents from around the time that their child is born (albeit slightly earlier than in the MCS: at eight weeks' gestation as opposed to nine months after birth). This means that, while we can be more certain than with the MCS that we are mostly capturing the selection of individuals into marriage, we cannot entirely rule out the possibility that some of the characteristics we include in the later specifications of our models – such as parents' socio-economic status – could potentially have been affected by their marital status. We discuss this issue in more detail below.

2.2 The ALSPAC sample

Table 2.1 presents some selected descriptive statistics of the ALSPAC cohort, and compares them to the younger, nationally representative MCS sample. Columns 1 and 3 refer to all family types, while Columns 2 and 4 restrict attention to children born to married or cohabiting parents (the groups on which our analysis is based). (See Section 2.4 for further discussion of this issue.)

There are clear differences in parents' marital status between the two cohorts: the proportion of children born to lone parents is more than twice as large in the MCS as it is in ALSPAC. Amongst births to couples, 72% were to married couples in the MCS (similar to the official birth registration data for England and Wales from around the same time[9]), while 84% were to married couples in ALSPAC.

[9] This figure was calculated from data from the ONS Birth Statistics for 2000 (see http://www.statistics.gov.uk/downloads/theme_population/Fm1_29/FM1_29_v3.pdf: Table 3.1 shows the number of births to mothers within marriage, while Table 3.10 shows the number of births outside marriage that were jointly registered by parents living at the same address).

Table 2.1. Characteristics of parents in the MCS and ALSPAC samples

	MCS		ALSPAC	
	All family types	**Married and cohabiting parents****	**All family types**	**Married and cohabiting parents**
Lone parent at birth	16.8%	NA	7.8%	NA
Cohabiting parents at birth	24.8%	28.4%	15.2%	16.5%
Married parents at birth	58.4%	71.6%	77.0%	83.5%
White*	84.1%	91.7%	97.4%	98.1%
Born outside UK*	13.7%	8.5%	4.6%	4.5%
No religion*	46.3%	44.5%	15.4%	14.6%
In care as child*	1.6%	0.9%	2.9%	2.2%
Experienced separation as a child*	29.7%	26.2%	19.4%	16.9%
Mother highly educated (undergraduate degree or above)*	20.3%	29.0%	12.6%	14.4%
Father highly educated (undergraduate degree or above)*	28.4%	33.4%	17.4%	19.9%
Father has high managerial/professional job	16.4%	19.6%	11.0%	11.9%
Father has routine job	15.0%	11.8%	2.9%	2.6%
Own home/have mortgage	58.5%	76.4%	73.2%	80.9%
Sample size	18,740	8,562	11,272	10,396

Notes: * denotes that the characteristic relates to the main respondent. ** This sample for the MCS is additionally restricted to households for which the cohort member's cognitive and socio-emotional development is observed at ages 3, 5 and 7. No such restriction is made for ALSPAC because the larger number of outcomes over a wider variety of ages that we consider here means that this would be a far more stringent restriction. The ALSPAC sample includes all cohort members for whom we observe parents' marital status when the study child is eight months old.

The fact that the number of births outside marriage has been rising over time (see Figure 1.1) may help to explain this difference, although the composition of the ALSPAC sample may also contribute: as Table 2.1 shows, there are many other differences between the two samples. For example, the ALSPAC sample contains substantially fewer ethnic minorities and immigrants, and has a substantially smaller proportion of parents who report having a degree than the MCS.

It is also worth noting that while we impose a common sample for our work on relationship stability using the MCS (discussed in Chapter 7) – by which we mean that we use the same individuals when looking at all outcomes at all ages – we do not do the same for our ALSPAC analysis, because the larger number of outcomes that we use over a wider variety of ages means that this would be a far more stringent restriction than it is for the MCS. The number of young people included in our ALSPAC analysis therefore varies by outcome, from 4,366 for whether the

respondent has tried cannabis by age 16 to 8,832 for externally marked school assessments at age 16. (See Table A1 in the appendix for full details.) When comparing the magnitude of estimates across outcomes or ages we do, however, check that our conclusions are robust to the imposition of a common sample covering the outcomes and ages of interest, and in general find that the conclusions still hold. It is therefore unlikely that our results are driven by the rather more selected sample, or higher level of attrition in ALSPAC.

2.3 Measuring child development

Cognitive development

The ALSPAC data contains a variety of measures of cognitive ability:

- The Wechsler Intelligence Scale for Children (WISC) is a measure of IQ comprising five verbal tests and five performance tests which are combined to give a total IQ score (see Wechsler et al., 1992). The five verbal elements test information (assessing the child's knowledge), similarities, mental arithmetic, vocabulary and comprehension. The five performance elements test picture completion, coding (shapes corresponding to different numbers which must be copied as quickly as possible), picture arrangement (to make a meaningful sequence), block design (pictures of specific patterns of blocks are copied with real blocks) and object assembly (putting together puzzles).

- The Wechsler Objective Language Dimensions (WOLD) test assesses the child's listening comprehension (Rust, 1996). The child listens to the tester read aloud a paragraph about a picture, which the child is shown. The child then answers questions on what they have heard.

- The revised Neale Analysis of Reading Ability (NARA II) assesses the child's reading and comprehension skills (Neale, 1997).

The WISC and WOLD measures of ability were measured at the 'Focus at 8' clinics around the time of each child's eighth birthday, and the NARA scales were measured at the 'Focus at 9' clinic.

ALSPAC cohort members have also been linked to their national achievement (Key Stage) test scores at ages 7, 11, 14 and 16, all of which were externally marked (as opposed to teacher assessed). At age 7, pupils were assessed on the basis of reading, writing, speaking and listening, maths and science. At the end of primary school (age 11) and midway through secondary school (age 14), they were tested in English, maths and science. At the end of compulsory education (age 16), pupils took exams in a range of subjects – usually around eight in total – including English, maths and science, which lead to General Certificate of Secondary Education (GCSE) or equivalent qualifications. These are high-stakes exams that are often used to assess a pupil's ability to continue into post-compulsory education. We use a summary measure of attainment at each age,

combining test score information from all subjects assessed at ages 7, 11 and 14, and the best eight subjects at age 16.

For comparability, each measure of cognitive development is standardised to have a mean of zero and a standard deviation of one using all cohort members (i.e. including all family types) for whom the relevant outcome is observed.

In the MCS, children's cognitive development is measured using the British Ability Scales (BAS) at ages 3, 5 and 7. These scales comprise a mixture of measures of educational attainment and cognitive abilities, with children tested on vocabulary at age 3, on vocabulary, picture similarity and pattern construction at age 5 and on word reading, pattern construction and maths at age 7.[10]

To account for the small differences in age that arise from variation in interview dates (of up to 12 months for children living in England and Wales, and up to 19 months for those living in Scotland and Northern Ireland), we run an unweighted ordinary least squares (OLS) regression for each component of the BAS, with each child's BAS score regressed on their age in months at the time of the test. This allows us to strip out the effect of age on test scores by using the residuals from these regressions as our age-adjusted measure of cognitive development. We then standardise each age-adjusted measure to have mean zero and standard deviation one using the sample mean and standard deviation, and create an average BAS score based on all age-adjusted components available for each child in each wave.

Socio-emotional development

Children's socio-emotional development in both the MCS and ALSPAC is derived from responses to the Strengths and Difficulties Questionnaire (SDQ). We use parental responses at ages 6, 9, 11 and 13, and teacher responses at ages 8 and 11 in ALSPAC, and parental responses at ages 3, 5 and 7 in the MCS. The SDQ is a short behavioural screening questionnaire for children aged 3 to 16. It comprises five questions in each of five sections, designed to capture emotional symptoms, conduct problems, hyperactivity/inattention, peer-relationship problems and pro-social behaviour. Respondents are presented with a series of statements about the child's behaviour and asked to decide whether the statement is 'not true' (receiving a score of 0), 'somewhat true' (receiving a score of 1) or 'certainly true' (receiving a score of 2). A total difficulties score is derived by summing the scores available from the first four of these five sections.[11] For our analysis, we invert the scale so that a higher score indicates higher socio-emotional development, and standardise scores to have a mean of zero and a standard

[10] See http://www.gl-assessment.co.uk/health_and_psychology/resources/british_ability_scales/british_ability_scales.asp?css=1.

[11] Pro-social behaviour is regarded as a strength rather than a difficulty and as such is not included in the total difficulties score. For more details on the SDQ, see http://www.sdqinfo.org/.

deviation of one using all cohort members (i.e. including all family types) for whom the relevant outcome is observed.[12]

Other non-cognitive skills and behaviours

The fact that ALSPAC cohort members have been followed from birth until the teenage years (to date), plus the regularity of follow-ups and the breadth of topics covered by the ALSPAC survey, means that it is possible to consider differences between children born to married and cohabiting couples across a much wider range of non-cognitive skills and behaviours than was possible in our earlier analysis. We discuss below the other measures that we use in this report.

Locus of control and self-esteem

Locus of control refers to the extent to which an individual believes they can affect their own destiny. Individuals classified as having an internal locus of control feel that they are in control of their own destiny, while those classified as having an external locus of control do not. Individuals can also be classified as having a neutral locus of control, feeling neither strongly in nor out of control. ALSPAC cohort members were asked a shortened version of the Nowicki–Strickland internal–external scale (Nowicki and Strickland, 1973) at ages 8 and 16.[13] The total score at each age was standardised on the whole sample (i.e. across all family types) to have a mean of zero and a standard deviation of one, with higher values indicating a more 'internal' locus of control. Cohort members were also classified as having an external, neutral or internal locus of control according to the number of positive responses given.

Self-esteem was measured at age 8 using a 12-item shortened form of Harter's Self Perception Profile for Children (Harter, 1985) comprising the global self-worth and scholastic competence subscales, which we analyse separately. The task was conducted using postboxes and envelopes to make the task more interesting for the child and to increase privacy of responses. The child was asked to post envelopes containing a positive or negative statement about themselves into slots named 'sort of true for me' and 'really true for me'. The total score for each scale was standardised on the whole sample (i.e. across children born into

[12] The MCS scores are also age-adjusted in a similar way to that described above for cognitive development. It is less important to age-adjust the ALSPAC scores, as there is much less variation in interview date amongst children born on a particular date.

[13] The questions are: Do you feel that wishing can make good things happen? Are people nice to you no matter what you do? Do you usually do badly in your schoolwork even when you try hard? When a friend is angry with you is it hard to make that friend like you again? Are you surprised when your teacher praises you for your work in school? When bad things happen to you is it usually someone else's fault? Is doing well in your schoolwork just a matter of 'luck' for you? Are you often blamed for things that just aren't your fault? When you get into an argument or fight is it usually the other person's fault? Do you think that preparing for things (tests at age 8) is a waste of time? When nice things happen to you is it usually because of 'luck'? Does planning ahead make good things happen?

all family types) to have a mean of zero and a standard deviation of one, with higher values indicating higher self-worth and scholastic competence.[14]

Engagement in risky and antisocial behaviours

We observe a variety of self-reported measures of engagement in risky and antisocial behaviours amongst ALSPAC cohort members. We make use of information on smoking, drinking and drug use during the teenage years, plus a wider antisocial behaviour scale at a range of ages. In particular, we focus on whether cohort members report that they have ever smoked a cigarette at ages 13 and 16, whether they are a frequent smoker (defined as usually smoking between one and six cigarettes per week) at ages 13 and 16, whether they have ever tried cannabis at ages 13 and 16, and whether they have drunk alcohol at age 16. We also make use of scales of antisocial behaviour at ages 8, 10 and 14. These scales are based on questions taken from the Self-reported Antisocial Behaviour for Young Children questionnaire (Loeber et al, 1989). At age 8, each child was asked to respond to eleven questions covering topics such as truancy, vandalism, fighting, stealing and engagement in underage risky behaviours.[15] At age 10, they were asked eleven different questions on similar topics.[16] At age 14, each child was asked to respond to 15 questions[17], but they were also asked to give the frequency of participation in particular behaviours over the past year.

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[14] The global self-worth subscale includes statements relating to whether the child is unhappy or pleased with themselves, likes the way they are living their life, happy or unhappy with themselves as a person, likes the kind of person they are, are happy being the way they are (or would prefer to be different), are happy with the way they do things. The scholastic competence scale includes statements relating to whether the child feels that they are good at their school work, are just as clever as other children their age, finish their schoolwork quickly, remember what they learn, do well at their classwork, can almost always work out the answers in class.

[15] The questions are: Have you ever stolen, or tried to steal, a bicycle or skateboard? Have you ever taken something from a shop without paying for it? Have you ever taken something out of somebody's house, garden or garage that did not belong to you? Have you ever taken something that does not belong to you from a car? Have you ever drunk alcohol without your parents' permission? Have you ever tried a cigarette? Have you ever deliberately set fire, or tried to set fire, to a building, a car or other property? Have you ever carried a weapon in case you needed it in a fight? Have you ever gone into or tried to go into a building to steal something? Have you ever snatched someone's purse or wallet (or 'picked someone's pocket')? Have you ever been cruel to an animal or bird on purpose?

[16] The questions are whether the young person had ever skived/bunked off school, destroyed something just for fun (e.g. broken a window), set fire to something (e.g. a shed, a car), stolen something, beaten anyone up/got into fights, been cruel to animals or birds on purpose, been in trouble with the police, smoked cigarettes, drunk alcohol without parental permission, been offered illegal drugs, smoked cannabis.

[17] The questions are, in the last year, how often have you: skipped or bunked off school? broken into a car or van with intention of stealing something out of it? hit, kicked or punched someone on purpose? deliberately set fire or tried to set fire to somebody's property or a building? taken money or something else that did not belong to you from home without permission? used force, threats or a weapon to get money or something else from somebody? written things or sprayed paint on property that did not belong to you? gone into or broken into a house or building with the aim of stealing something? deliberately damaged or destroyed property that did not belong to you? carried a knife or weapon with you for protection or in case it was needed in a fight? taken money or something else that did not belong to you from school? stolen or ridden in a stolen car or van or on a stolen motorbike? been rowdy or rude in a public place so that people complained or you got into trouble? taken something from a shop without paying for it? not paid the correct fare or not paid at all on a bus or train?

The scale at each age is created by summing the total number of positive responses to these questions (frequency is also taken into account at age 14), which is then standardised within the whole ALSPAC sample (i.e. including all family types) to have a mean of zero and a standard deviation of one.

2.4 Measuring relationship status

We primarily classify children according to the relationship between their biological parents when they were born. This information was asked of the main respondent to the survey retrospectively when the child was around eight- or nine months old in both the MCS and ALSPAC. As shown in Table 2.1, the majority of children in both surveys were born to married parents, with just under 60% of children in the MCS and over three quarters of children in ALSPAC born to married parents, compared with around 25% (MCS) and 15% (ALSPAC) born to cohabiting parents.

For our analysis of relationship stability using the Millennium Cohort Study (reported in Chapter 7), we additionally make use of information on the relationship between the child's biological parents at ages 3, 5 and 7. In particular, we group couples into the following categories:

- those who were married in every wave;
- those who were married when their child was born, but were recorded as living separately in at least one of the surveys taken at ages 3, 5 or 7;[18]
- those who were cohabiting in every wave;
- those who were cohabiting when their child was born, but were recorded as having got married by the time the child turned 7;
- those who were cohabiting when their child was born, but were recorded as living separately in at least one of the surveys taken at ages 3, 5 or 7.[19]

When we focus on how relationship stability affects the differences in child outcomes measured at a particular age, we create additional categories to compare the outcomes for children born to couples who separated *before* the outcome was measured and those who separated *after* the outcome was measured: lower outcomes for children living with parents that subsequently separate suggest that the characteristics of couples that separate, as well as the separation, may have negative consequences for children's outcomes.[20]

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[18] There were a very small number of couples who appeared to have gone from being married to simply cohabiting (rather than living as a married couple or living separately) in some later wave. These individuals are not included in our analysis.

[19] If a couple who were cohabiting at birth had subsequently both married and lived separately, they would be counted as a cohabiting couple that had subsequently separated rather than a cohabiting couple that had subsequently got married.

[20] For this not to be the case, the quality of the parents' relationship (and hence its effect on child outcomes) would have to be as bad before the parents separated as afterwards. This may be plausible when focusing on a period just before and just after the parents separated, but our relationship stability measures include separations that may have occurred several years before or

As an example, when considering measures of cognitive or socio-emotional development at age 3, we present differences between children whose parents were married when they were born and stayed married up until age 7 and those whose parents:

1. were married when their child was born, but were recorded as living separately at age 3 (separated before);
2. were married when their child was born and at age 3, but were recorded as living separately at age 5 or age 7 (separated after);
3. were cohabiting in every wave;
4. were cohabiting when their child was born, but were recorded as having got married by the time the child turned 7[21];
5. were cohabiting when their child was born, but were recorded as living separately at age 3 (separated before);
6. were cohabiting when their child was born and at age 3, but were recorded as living separately at age 5 or age 7 (separated after);

Groups 1, 2, 5 and 6 are changed accordingly when considering outcomes measured at age 5.

2.5 Methodology

To carry out our analysis, we adopt a simple regression approach, using ordinary least squares (OLS) models for continuous outcomes and probit models for binary outcomes. We start by regressing relationship stability or child development on parents' marital status in order to estimate the 'raw' relationship between the two. For continuous outcomes, these differences are expressed in standard deviations. For binary outcomes, we report the marginal effects, which are expressed in terms of percentage point differences.

To account for the fact that different types of people may choose to get married rather than to cohabit, we then sequentially add a variety of controls to our model, to account for the other ways in which married and cohabiting couples may differ from each other. As discussed in the introduction, there is a fine line between including enough controls to account for the 'selection' of different types of people into marriage and not 'controlling away' part of the effect of marriage by including characteristics that could potentially have been affected by this choice.

Our sequential approach reflects the need to judge this balance very carefully. We follow Goodman and Greaves (2010a, b) and Crawford et al. (2011) by starting

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after the outcome is observed, thus making it more likely that selection plays at least some role in driving these results.

[21] As above, if a couple who was cohabiting at birth had subsequently both married and lived separately, they would be counted as a cohabiting couple that had subsequently separated rather than a cohabiting couple that had subsequently got married.

with characteristics that are most likely to reflect selection into marriage (for example, ethnicity) and moving progressively towards those that might be regarded as reflecting both selection and possible pathways through which marriage might have a causal effect on our outcomes of interest (for example, relationship quality).

For clarity, we differentiate two broad groups of characteristics, each of which is further divided into up to five subcategories:

1. fixed, or predetermined, characteristics that cannot be affected by marriage (exogenous variables);
2. characteristics that mainly reflect selection, but potentially capture causal pathways of marriage (potentially endogenous variables).

The top panel of Table 2.2 reports the characteristics that are included in each subcategory in our analysis of the differences in outcomes between children born to cohabiting and married couples using ALSPAC data (discussed in Chapters 4–6), while the bottom panel reports the characteristics that are included in each subcategory in our analysis of relationship stability and its link with child outcomes using the MCS (discussed in Chapter 7).

Compared with the MCS, ALSPAC contains additional information about parents that is likely to affect both their children's outcomes and the likelihood that they will marry or separate. A number of these additional variables are included in the analysis, for example whether the mother was in trouble with the police at a young age, the stability of the relationship of the mother's own parents and whether the mother smoked cigarettes and/or cannabis before her pregnancy. This means that we are better able to account for the selection of individuals into marriage in ALSPAC than in the MCS, although not as well as Crawford et al. (2011) were able to in the BCS, which contained rich information on one parent from their own childhood, well before marriage decisions were taken.

The child's gender and date of birth (Column A), and the mother's demographic characteristics and circumstances in which she grew up (Columns B and C), represent the characteristics that we regard as exogenous, i.e. that cannot be affected by marriage. Controlling for these characteristics should therefore enable us to account for the selection of individuals into marriage on the basis of these characteristics, without 'controlling away' any of the potential effects of marriage on child development. Columns D to H represent potentially endogenous characteristics, i.e. characteristics that may wholly or partially reflect selection, but may also potentially be capturing pathways through which marriage has a causal effect on child development. These characteristics range from parental education (in Column D), which is highly likely to reflect selection into marriage, to relationship quality (in Column H), which may perhaps be a route through which marriage might reflect child development.

This sequential approach allows the reader to make their own judgement about the extent to which the differences presented affect 'selection' into marriage or a causal effect of marriage on child development.

Table 2.2. Characteristics added sequentially in each category in ALSPAC and the MCS

Predetermined characteristics			**Characteristics mainly reflecting selection, but potentially capturing causal pathways**				
A Raw	**B Ethnicity**	**C Mother's background**	**D Education**	**E Occupation and income**	**F Family characteristics**	**G Mother's characteristics**	**H Relationship quality**
Characteristics used in ALSPAC analysis of child outcomes							
Child's gender and year and month of birth	Mother's ethnicity (white/non-white), immigration status and religion	Ever in care, parents separated – and stability more generally – whether often had serious arguments, presence of half- and step-children when child is born and whether previously lived with another partner, height, left home before 18, pregnant before 17, trouble with police before 17, and whether childhood was happy	Highest educational qualifications of both partners and whether the mother liked and/or valued school	Father's occupation, housing tenure and parents' work status at 8 weeks' gestation, report of financial difficulties at 32 weeks' gestation	Mother's age at birth, whether a multiple birth, birth order, length of cohabitation prior to birth, whether the pregnancy was planned, feelings about pregnancy, whether grandmother is used as childcare	Smoking, cannabis use and parents' alcohol consumption prior to pregnancy, locus of control, initial feelings about pregnancy, whether suffered from depression, BMI, neighbourhood, personality	Relationship quality at 12 weeks' gestation

Table 2.2 continues

Table 2.2 continued

Predetermined characteristics			**Characteristics mainly reflecting selection, but potentially capturing causal pathways**				
A Raw	**B Ethnicity**	**C Mother's background**	**D Education**	**E Occupation and income**	**F Family characteristics**	**G Mother's characteristics**	**H Relationship quality**
Characteristics used in MCS analysis of relationship stability and child outcomes							
Child's gender, year and month of birth	Mother's ethnicity, immigration status and religion	Ever in care, parents separated presence of half- and step-children when child is born, height	Highest educational qualifications of both partners and whether the mother has problems reading	Father's occupation, housing tenure, parents' work status and household income, all at 9 months	Mother's age at first birth, parents' age at this birth, whether a multiple birth, birth order, length of cohabitation prior to birth, whether pregnancy was planned, frequency of contact with maternal grandmother	N/A	Relationship quality at 9 months

3. How do married and cohabiting parents differ?

The aim of this report is to examine whether the differences in relationship stability or child development between married and cohabiting couples arise because marriage has a positive causal effect on relationship stability or children's development, or because the types of people that choose to get married have other characteristics that are associated with more stable relationships and/or higher child development, such as being richer or more educated.

In order to inform this analysis, it is important to document the ways in which married and cohabiting couples differ from one another. Crawford et al. (2011) documented these differences for parents in the Millennium Cohort Study (MCS). Table 3.1 uses data from the Avon Longitudinal Study of Parents and Children (ALSPAC) to report selected characteristics of married and cohabiting parents, and whether they are significantly different from one another. All other characteristics are reported in the appendix.

Table 3.1 shows that, amongst cohabiting and married couples for whom we observe the characteristic of interest:

- Mothers who were married when their child is born are 50% more likely to have a degree than mothers who were cohabiting, with 10.6% of cohabiting mothers having a degree compared with 15.1% of married mothers; the equivalent difference for fathers is 65% (12.8% versus 21.3%).
- Mothers of all religious faiths are significantly more likely to be married than mothers who associate themselves with no religion.
- Married fathers are more than twice as likely as cohabiting fathers to have a professional occupation, with 5.6% of cohabiting fathers working in such jobs, compared with 13% of married fathers.[22]
- Couples that are married typically have higher income than cohabiting couples: for example, around the time the study child is age 3, married couples are almost twice as likely to be in the highest fifth of the sample in terms of household income and around half as likely to be in the lowest fifth of the sample. Married couples are also much more likely to own or have a mortgage for their home than cohabiting couples (86% versus 54%), and are less likely to report having trouble affording food (19.9% versus 29.2%).

[22] Defined as the highest social class on the 1991 Office of Population Censuses and Surveys (OPCS) classification.

- Mothers in cohabiting couples are more than twice as likely to have become pregnant for the first time below the age of 17, and to be younger when giving birth to the study child: 11% of mothers in cohabiting couples became pregnant by this age, compared with 5% of married mothers. Similarly, over 36% of cohabiting mothers were less than 25 when they gave birth to the study child, compared with just over 12% of married mothers.

- In line with this finding, married couples are much more likely to have lived together for a longer period of time prior to their child's birth than cohabiting couples: over half of married couples have lived together for more than six years prior to the birth of the child in ALSPAC, compared with just over 20% of cohabiting couples. By contrast, just over 20% of cohabiting couples had lived together for less than two years, compared with less than 2% of married couples.[23]

- Married mothers are much more likely to report that their pregnancy was planned; this was the case for 78% of mothers who were married at the time of their child's birth compared with 55% of cohabiting mothers. Married mothers are also more likely to report being 'overjoyed' and 'pleased' when they discovered they were pregnant.

- There are substantial differences in the likelihood of married and cohabiting mothers smoking tobacco or cannabis prior to their pregnancy, but only relatively small differences in the use of alcohol. For example, around 87% of mothers who were married at the time of their child's birth did not smoke before their pregnancy, compared with 67% of mothers who were cohabiting. Married mothers are also less likely to have used cannabis prior to their pregnancy (2% versus 12% of cohabiting mothers).

- Mothers in cohabiting couples are less likely to have an internal locus of control (and more likely to have an external locus of control), which suggests that they feel less in control of their future than married mothers. Measures of personality taken during the mother's pregnancy suggest that mothers that were married when their child was born have lower scores on measures of separation anxiety, and fragility, but higher scores on scales on measures of timidity and need for approval.

- There are some small differences in 'early' relationship quality between married and cohabiting couples. Measures taken early in the mother's pregnancy suggest that cohabiting mothers are slightly more likely to be in relationships with levels of aggression classified as 'high', and slightly less likely to be in relationships with levels of affection classified as 'medium' or 'high'.

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[23] It is unclear why these figures are substantially lower than those for parents in the MCS (where the figures are 40% and 8%, respectively). One possibility is that the greater attrition of cohort members in ALSPAC means that the sample is, on average, more advantaged than the sample in the MCS – although this does not show up in all characteristics, hence is unlikely to be the sole reason for the differences.

Table 3.1. Characteristics of parents that are married and cohabiting when their child is born: ALSPAC analysis sample

Characteristic	Married	Cohabitants	Difference (married – cohabiting)
Mother: white	0.982	0.977	0.005
Mother: born outside UK	0.046	0.035	0.011**
Mother's religion			
None	0.122	0.277	–0.155***
Christian: RC	0.088	0.072	0.016**
Christian: CofE or equivalent	0.663	0.556	0.107***
Christian: Other	0.092	0.034	0.058***
Other	0.035	0.062	–0.027***
Mother: in care as a child	0.019	0.039	–0.020***
Mother: parents separated	0.144	0.303	–0.160***
Mother: pregnant before 17	0.048	0.111	–0.063***
Mother: highest level of education			
CSE	0.15	0.253	–0.103***
Vocational	0.089	0.103	–0.014*
O level	0.359	0.344	0.016
A level	0.25	0.195	0.055***
Degree	0.151	0.106	0.046***
Father: highest level of education			
CSE	0.194	0.312	–0.118***
Vocational	0.082	0.109	–0.027***
O level	0.223	0.21	0.013
A level	0.29	0.242	0.048***
Degree	0.213	0.128	0.084***
Father: social class			
Highest (professional)	0.13	0.056	0.075***
2nd highest	0.365	0.29	0.075***
3rd highest	0.119	0.088	0.031***
4th highest	0.283	0.392	–0.109***
2nd lowest	0.082	0.12	–0.037***
Lowest	0.021	0.055	–0.034***
Household housing tenure			
Other	0.024	0.04	–0.016***
Rent from LA/HA	0.079	0.26	–0.181***
Rent privately	0.038	0.157	–0.119***
Own/mortgage	0.86	0.544	0.316***
Mother: trouble affording food	0.199	0.292	–0.093***
Household income quintile			
Lowest	0.138	0.298	–0.160***
2nd lowest	0.189	0.231	–0.043***
3rd highest	0.221	0.176	0.045***
2nd highest	0.224	0.157	0.066***
Highest	0.228	0.137	0.091***

Characteristic	Married	Cohabitants	Difference (married – cohabiting)
Mother's age at birth of cohort member			
14–19	0.005	0.067	–0.061***
20–24	0.12	0.295	–0.176***
25–29	0.427	0.328	0.099***
30–34	0.336	0.209	0.127***
35+	0.112	0.101	0.011
Length of cohabitation prior to cohort member's birth			
0–9 months	0	0.023	–0.023***
10 months–2 years	0.016	0.18	–0.165***
2–4 years	0.149	0.377	–0.229***
4–6 years	0.263	0.203	0.060***
6–8 years	0.229	0.116	0.114***
8+ years	0.343	0.101	0.242***
Pregnancy was planned	0.782	0.546	0.236***
Mother: smoking behaviour prior to pregnancy			
None	0.87	0.665	0.205***
1–9	0.055	0.121	–0.066***
10–19	0.057	0.17	–0.113***
20–29	0.017	0.039	–0.022***
30+	0.001	0.005	–0.003*
Mother has ever smoked	0.427	0.68	–0.253***
Mother: cannabis use prior to pregnancy			
Everyday	0.003	0.024	–0.021***
2–4 times per week	0.005	0.033	–0.028***
Once per week	0.002	0.006	–0.003*
< once per week	0.011	0.057	–0.046***
Not at all	0.979	0.881	0.098***
Mother: alcohol use prior to pregnancy			
Mother and father consume less than 1 glass per week	0.261	0.229	0.032***
Mother and father consume less than 1–2 glasses per day	0.527	0.482	0.044***
Mother or father consume at least 1–2 glasses per day	0.15	0.196	–0.046***
Mother and father consume at least 1–2 glasses per day	0.062	0.093	–0.030***
Mother: locus of control			
Internal	0.597	0.434	0.163***
Neutral	0.349	0.452	–0.103***
External	0.054	0.114	–0.060***
Mother's personality (standardised scale): interpersonal awareness	0.813	0.786	0.026
Mother's personality (standardised scale): need for approval	0.654	0.595	0.060***

Characteristic	Married	Cohabitants	Difference (married – cohabiting)
Mother's personality (standardised scale): separation anxiety	0.805	0.88	–0.076***
Mother's personality (standardised scale): timidity	0.78	0.709	0.071***
Mother's personality (standardised scale): fragile inner-self	0.807	0.881	–0.074**
Mother: feelings about pregnancy			
Overjoyed	0.434	0.306	0.128***
Pleased	0.324	0.275	0.050***
Mixed feelings/unhappy/indifferent	0.242	0.419	–0.177***
Couple's relationship			
Low affection; high aggression	0.152	0.194	–0.042***
Low affection; medium aggression	0.063	0.059	0.003
Low affection; low aggression	0.015	0.013	0.002
Medium affection; high aggression	0.211	0.247	–0.036***
Medium affection; medium aggression	0.209	0.172	0.037***
Medium affection; low aggression	0.104	0.091	0.013
High affection; high aggression	0.056	0.059	–0.003
High affection; medium aggression	0.081	0.062	0.018***
High affection; low aggression	0.11	0.103	0.007

Notes: The sample for each household attribute (for example housing tenure or income quintile) varies as it excludes those with missing values. The proportions in the columns therefore reflect the proportion of couples that were married or cohabiting (respectively) that have each value of the household attribute (for example the highest to lowest income quintile). The difference between the proportion of married and cohabiting couples is given in the third column, where statistical significance is denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

There are only a very small number of non-white mothers in ALSPAC; hence, it is not possible to break down the non-white group any further into those of different ethnic minority backgrounds. Amongst these more aggregated groups, we find no significant differences in the proportion of 'white' and 'non-white' mothers in ALSPAC that are married and cohabiting when their child is born.

This analysis makes clear that there are large differences in observable characteristics between married and cohabiting parents which are also likely to affect their chances of splitting up and the outcomes of their children, thus highlighting the likely importance of accounting for the selection of parents into marriage when attempting to identify the causal effect of marriage on relationship stability and child development.

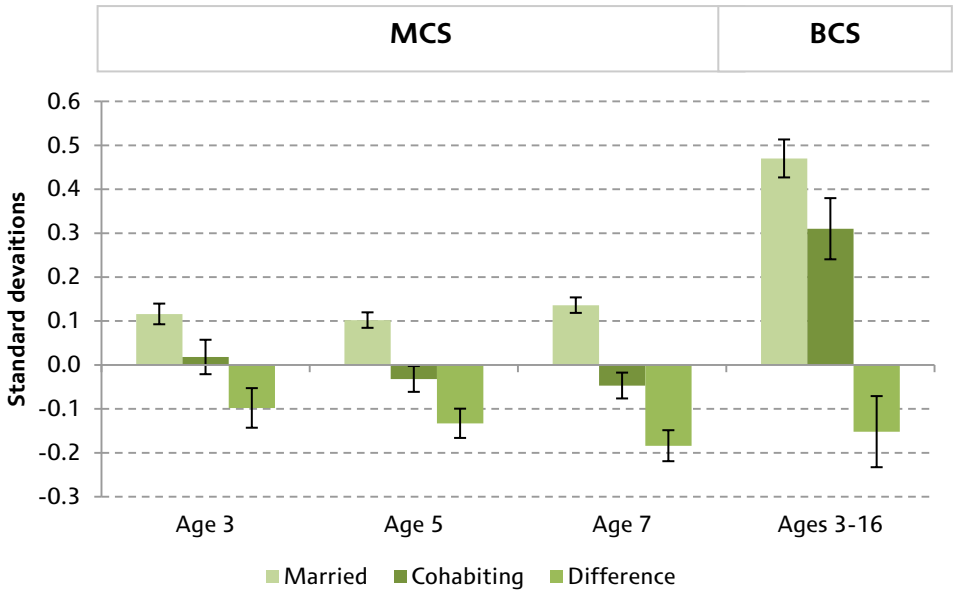
4. Children's cognitive development

This chapter focuses on differences in cognitive development between children born to cohabiting and married couples. Section 4.1 summarises the evidence from Crawford et al. (2011), documenting the gaps in cognitive development between children born to married and cohabiting couples during early childhood and illustrating the extent to which differences in other observable characteristics can help to explain these gaps. Section 4.2 then extends this analysis to show how these gaps change over time, as children get older, using ALSPAC data, and Section 4.3 investigates the changing role of 'selection' into marriage as a potential explanation for these differences.

4.1 Evidence from the MCS and BCS in Crawford et al. (2011)

Figure 4.1 shows the average cognitive development of children born to married and cohabiting couples, relative to the population of children born to all family

Figure 4.1. Raw differences in cognitive development between children born to cohabiting and married couples from Crawford et al. (2011)



Notes: measures of cognitive development have been standardised to have a mean of zero and a standard deviation of one across children born into all family types (within sample for the MCS and using national figures for the BCS) for whom we observe all relevant assessments. The horizontal line at 0.0 thus represents the average level of development for all children with all assessments available. See Crawford et al. (2011) for further discussion of how we select our sample and standardise these scores.

types, in the MCS (left-hand panel) and BCS (right-hand panel).[24] Both samples focus on younger children: although the BCS sample covers children aged 3 to 16, 60% were aged 3 to 7 at the time of survey. The graph shows that, while the levels of cognitive development differ substantially across the two samples, in all cases, children born to cohabiting couples have lower levels of cognitive development, on average, than children born to married couples. These differences are between around 10% and 20% of a standard deviation, and appear to increase as children get older (although the gaps are not significantly different from one another).

However, Crawford et al. (2011) also showed that married and cohabiting couples in the MCS and the BCS differ in a number of ways other than their marital status that might be relevant for child outcomes. For example, married parents in the BCS are 50% more likely to have been in the top quintile of cognitive ability at age 10 than cohabiting parents, while married mothers in the MCS are more than twice as likely to have a degree and slightly less likely to have problems reading in day-to-day life than cohabiting mothers in the MCS.[25] If we do not take into account the fact that more able or educated people are more likely to get married, then we may overestimate the association between parents' marital status and children's cognitive development.

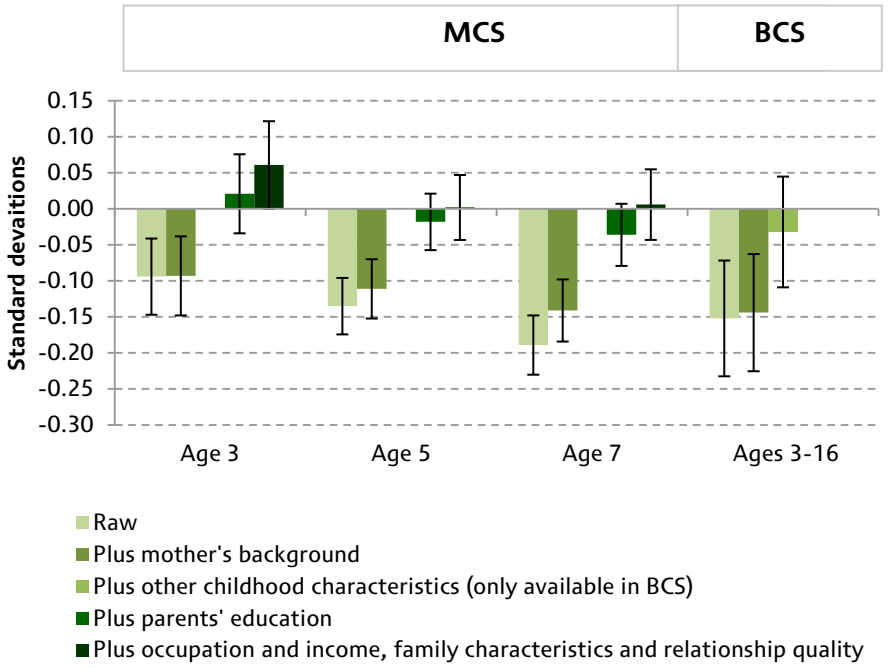
Figure 4.2 shows how the gap in cognitive development between children born to married and cohabiting couples changes once we take account of the differences in characteristics between parents who are married and those who cohabit. The specifications progressively add characteristics, going from those that we think are exogenous (i.e. unlikely to be affected by the marriage decision) to those that may partially reflect a potential pathway through which marriage might affect children's cognitive development. (Full details of the coefficient estimates underlying these figures can be found in Crawford et al. (2011).) These results show that the association between parents' marital status and children's cognitive development becomes much smaller and not significantly different from zero as we move through these specifications, and, importantly, that this occurs after the addition of mostly exogenous characteristics (i.e. up to and including the third specification).

In the case of the BCS analysis, this is unequivocal: once we have added a rich set of characteristics available from the childhood of one of the parents, the difference in cognitive development between children born to married and cohabiting couples becomes small and not significantly different from zero. In the case of the MCS analysis, the same is true once we account for the mother's background, plus the educational qualifications of the child's parents. Given that 97% of parents do not gain any higher educational qualifications after their

[24] Cognitive development in both the MCS and BCS is measured using various components of the British Ability Scales. See Crawford et al. (2011) for full details of the construction of these measures.

[25] See Crawford et al. (2011) for full details of these differences.

Figure 4.2. Differences in cognitive development between children born to cohabiting and married couples after controlling for other characteristics from Crawford et al. (2011)



Notes: see notes to Figure 3.1 for details of the standardisation and sampling procedures used, and Crawford et al. (2011) for full details of the characteristics included in each specification.

child's birth, our judgement is that educational qualifications are highly likely to reflect the selection of parents into marriage and highly unlikely to reflect a key pathway through which marriage affects child development. Taken together, these results suggest that most of the gap in cognitive development between children born to married and cohabiting couples arises from the fact that different types of people choose to get married, rather than because being raised by married parents has a positive causal effect on a child's cognitive development.

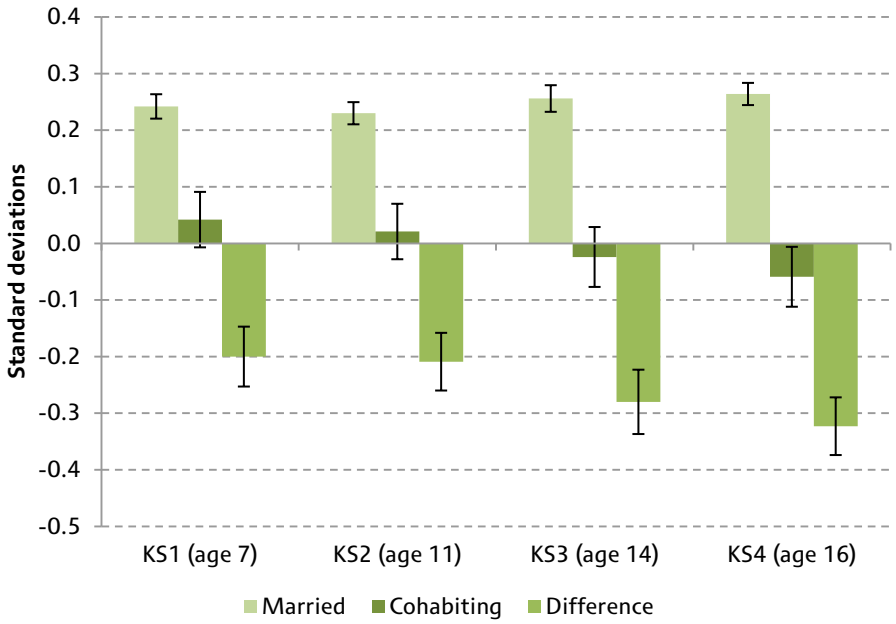
4.2 Outcomes of children born to married and cohabiting couples in ALSPAC

The results from Crawford et al. (2011) focused on the differences in cognitive development between children born to married and cohabiting couples whilst they were still relatively young. The ALSPAC sample enables us to examine the extent to which these differences persist as children get older (albeit for an earlier cohort). It also enables us to look at a wider range of measures of cognitive development.

Figure 4.3 shows the average national achievement (Key Stage) test scores of children born to married and cohabiting couples, relative to the whole population of children in ALSPAC, at ages 7, 11, 14 and 16. The graph shows that, on average,

the cognitive development of children born to cohabiting couples is just (4%) above average at age 7, while the cognitive development of children born to married couples is, on average, just under 25% of a standard deviation above average at the same age.[26] This means that there is an average gap in terms of cognitive development between children born to married and cohabiting couples of around 20% of a standard deviation at age 7. This gap remains roughly similar at age 11, but increases in magnitude at age 14 and again at age 16 (although not significantly so). This increase arises both from a small rise in the cognitive development of children born to married couples and a larger fall in the cognitive development of children born to cohabiting couples, which takes them below average performance at ages 14 and 16.

Figure 4.3. Differences in national achievement test scores between children born to cohabiting and married couples in ALSPAC



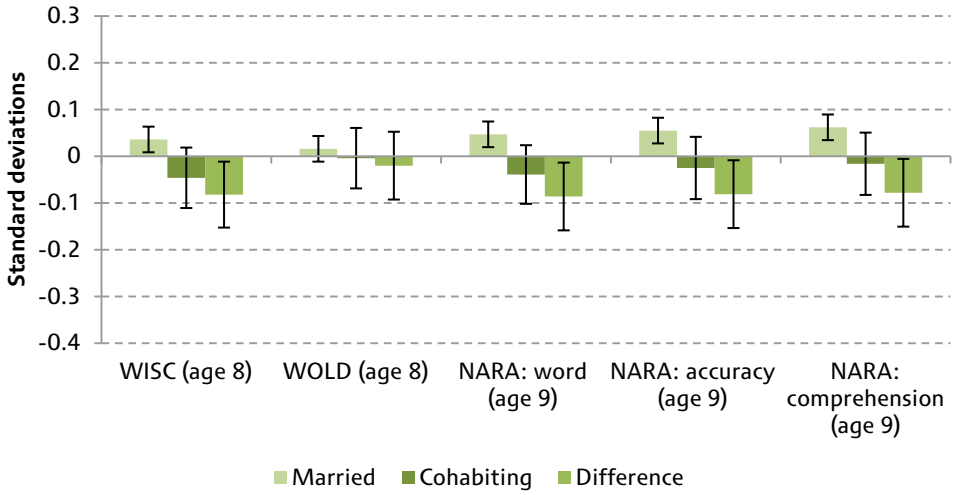
Notes: measures of academic attainment have been standardised to have a mean of zero and a standard deviation of one for the sample of children born into all family types (i.e. including single parent families). The horizontal line at 0.0 therefore represents the average level of development for children with non-missing test scores.

Figure 4.4 shows the average cognitive development of children born to married and cohabiting couples, relative to the whole sample of children in ALSPAC, measured using IQ and various reading and comprehension tests. It shows that there is a smaller difference in cognitive development on these measures (all assessed when the children were between 8 and 9 years old) than for the measures of cognitive development based on externally marked national achievement tests taken in schools (shown in Figure 4.3). This could arise either

[26] This is possible because these scores are standardised across children of all family types and those born into lone parent families have cognitive development that is substantially below average at each age.

because the samples of children taking the tests are different, or because national achievement test scores are more susceptible to influence by other characteristics that differ between parents and children in married and cohabiting unions.

Figure 4.4. Differences in cognitive development between children born to cohabiting and married couples in ALSPAC



Notes: measures of cognitive development have been standardised to have a mean of zero and a standard deviation of one for the sample of children born into all family types (i.e. including single parent families). The horizontal line at 0 therefore represents the average level of development for children with non-missing test scores.

To investigate the first possibility, we re-ran the analysis of national achievement test scores for the sample of children for whom we observe all measures of cognitive development shown in Figures 4.3 and 4.4. The difference in Key Stage test scores between children born to married and cohabiting couples approximately halves in this restricted sample, suggesting that the sample that participates in the focus clinic sessions at ages 8 and 9 is different from the sample that does not. The gap in Key Stage test scores is still slightly larger than the gap in cognitive assessments undertaken as part of the ALSPAC focus clinic sessions, but because of the large standard errors associated with the survey measures, they are not significantly different from one another.

Nevertheless, the fact that the gap in development between children born to cohabiting and married couples is slightly larger for Key Stage tests than for tests taken as part of the survey may provide some suggestive evidence that married parents may have been more willing or able to encourage their children to perform well in Key Stage tests, for example by working with them on practice tests at home or paying for extra tuition. It is not possible to examine potential differences in such behaviour using the ALSPAC data, but amongst children in the MCS, married parents reported themselves to be slightly more likely to pay for extra lessons for their child at age 7 than cohabiting parents. If such investments continued over time, then this might provide a potential explanation for the

increasing differences in Key Stage test scores over time (shown in Figure 4.3) as well.

4.3 Regression analysis

Section 4.2 showed that there remain significant differences in children's cognitive development between those born to married and cohabiting couples, even at older ages. In fact, if anything, the differences appeared to increase as children got older, as the test scores of those born to married couples increased slightly and the test scores of those born to cohabiting couples fell below average. However, Chapter 3 also showed that there were some substantial differences in observable characteristics between couples who were married and those who were cohabiting at the time of their child's birth. In this section, we show how controlling for these differences affects our estimates of the association between parents' marital status and children's cognitive development. As described in Section 2.5, our intention is to control for selection into marriage as far as possible, without inadvertently controlling away any of the potential routes through which marriage might affect child development.

Table 4.1 shows the results for all of our measures of cognitive development in ALSPAC. In each case, the table presents the estimated coefficient on the main variable of interest – a binary (0 or 1) indicator for whether or not the parents were cohabiting at the time of the child's birth.[27] As such, a negative number means that children born to cohabiting couples perform worse, on average, than those born to married couples. Each *row* of the table shows estimated coefficients for a different outcome, while each *column* shows results from a different regression specification, when additional control variables are sequentially added to the model.

Column A of Table 4.1 shows the difference in cognitive development between children born to cohabiting couples and children born to married couples, accounting only for a child's gender and year and month of birth (which we would not expect to differ significantly between cohabiting and married couples). As such, it is not surprising that these results are very similar to the raw differences shown in Figures 4.3 and 4.4, with the gap in Key Stage test scores being around twice as large as the gap in survey assessments: children born to cohabiting couples score, on average, at least 20% of a standard deviation lower in national achievement tests at all ages, while they score less than 10% of a standard deviation lower in terms of cognitive ability tests administered at around age 8 or 9 as part of the survey.

[27] Coefficient estimates for all other variables are available from the authors on request.

Table 4.1. Differences in cognitive development between children born to cohabiting and married parents in ALSPAC

	Predetermined characteristics			Characteristics mainly reflecting selection, but potentially capturing causal pathways				
	A Raw	B Ethnicity	C Mother's background	D Education	E Occupation and income	F Family characteristics	G Mother's characteristics	H Relationship quality
Key Stage test scores								
KS1 (age 7): S.D. [N=8,307]	–0.213***	–0.185***	–0.061*	–0.010	0.039	0.003	–0.003	–0.003
KS2 (age 11): S.D. [N=9,506]	–0.216***	–0.213***	–0.088**	–0.020	0.034	0.011	0.001	0.001
KS3 (age 14): S.D. [N=7,753]	–0.286***	–0.277***	–0.130***	–0.055	0.000	–0.018	–0.024	–0.024
KS4 (age 16): S.D. [N=8,832]	–0.331***	–0.314***	–0.154***	–0.088**	–0.017	–0.025	–0.021	–0.021
ALSPAC survey measures								
WISC (age 8) : S.D. [N=6,140]	–0.078*	–0.111**	–0.007	0.033	0.061	0.051	0.040	0.040
WOLD listening comprehension (age 8): S.D. [N=6,256]	–0.014	–0.031	0.027	0.053	0.077*	0.085*	0.080	0.080
NARA comprehension (age 9): S.D. [N=5,787]	–0.075*	–0.097**	0.006	0.052	0.078*	0.035	0.026	0.026
Child's gender, year and month of birth	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's ethnicity, immigration status and religion	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's background	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Parents' education	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Father's occupation, housing tenure, parents' work status, report of financial difficulties	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*
Family structure	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*
Mother's BMI plus non-cognitive skills and behaviours	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*
Relationship quality at 12 weeks' gestation	*No*	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*

Notes to Table 4.1
The number of observations for each outcome is shown in square brackets. The table shows regression coefficients on a dummy variable 'biological parents were cohabiting at the time of the child's birth'; the omitted group is therefore children whose biological parents were married at the time of their birth. All other coefficient estimates are available on request. A common sample is not imposed: all children whose biological parents were either married or cohabiting at the time of their birth are included for each outcome that is not missing. Standard errors are clustered by family. * $p < 0.05$, ** $p < 0.01$. WISC refers to the Wechsler Intelligence Scale for Children; a reduced form of the measure was used in the ALSPAC 'focus at 8' assessment. WOLD refers to the Wechsler Objective Language Dimensions; only one part of the listening comprehensions subtest was applied, in which the child answers questions about a paragraph which is read aloud to them, again at the 'focus at 8' assessment. NARA refers to the revised Neale Analysis of Reading Ability (NARA II), where each child was asked to read passages from a booklet and was then asked a series of questions on the content of the story. The word and accuracy scores are not reported here. The comprehension score refers to the total number of correct answers the child gave for each passage. This assessment took place at the 'focus at 9' assessment. See Table 2.2 for full details of the characteristics included in each specification.

Column B of Table 4.1 presents the difference in cognitive development between children born to cohabiting and married parents after additionally accounting for the mother's ethnicity, immigration status and self-reported religion. A comparison of the estimates in Columns A and B shows that they do not change dramatically once we control for these characteristics, even though Chapter 3 showed that there are substantial differences between married and cohabiting couples in terms of these characteristics. This suggests that these characteristics do not significantly affect children's cognitive development, or at least not in terms of the measures that we observe in ALSPAC.

Column C of Table 4.1 shows that the gap in cognitive development between children born to cohabiting and married couples is, however, substantially reduced once we account for other characteristics of the mother's background, such as the quality of her own parents' relationship when she was growing up. In the case of the Key Stage test scores, the differences are more than halved in all cases – and reduced by a greater proportion amongst the earlier compared with the later test scores – while in the case of the cognitive outcomes measured as part of the ALSPAC focus sessions, the differences become very close to zero (or even turn positive) and are no longer significantly different from zero. This suggests that the background characteristics of mothers that were married or cohabiting when their child was born, such as whether they were in trouble with the police as a child or whether their own parents separated, account for a sizeable proportion of the difference in cognitive development observed between their children.

Once the highest educational qualifications of both parents (plus whether the mother liked or valued school as a child) are taken into account (in Column D of Table 4.1), the differences in Key Stage test scores between children born to cohabiting relative to married couples decline in all cases (and are no longer significantly different from zero at ages 7, 11 and 14). This suggests that the lower educational attainment of children born to cohabiting rather than married

parents is to a large extent accounted for by their parents' lower education, rather than their parents' marital status, especially at younger ages.

There are many reasons why we might expect parents' education to influence (or at least be strongly correlated with) children's development. A full discussion of these issues is outside the scope of this report, but we highlight three possibilities here as examples:

- Achieving a high level of education may increase access to resources or networks that could be used to improve children's development.
- Parental education is likely to be highly correlated with cognitive ability. If we believe that cognitive ability is passed across generations either directly or indirectly, then we might expect parental education to be correlated with children's development.
- Acquiring a high level of education may be a signal that the individual is willing to delay gratification to improve their later life. This characteristic may affect children's development directly – for example, if the parent is willing to invest more in their young child – or indirectly – for example, if the parent is willing to delay having a child until they are 'ready'.

Of course, it is possible that parental education decisions may be affected by the choice of whether or not to get married; however, given that a very high proportion of parents complete their education before they get married – fully 99% of cohort members in the British Cohort Study – our judgement is that educational qualifications are highly likely to reflect the selection of parents into marriage and highly unlikely to reflect a key pathway through which marriage is likely to affect child development. Taken together, these results suggest that selection plays a significant role in accounting for the differences in cognitive development between children born to married and cohabiting couples, corroborating the findings of Goodman and Greaves (2010a) and Crawford et al. (2011).

The one remaining significant difference is for national achievement test scores at age 16. Column D of Table 3.1 shows that, even after accounting for exogenous background characteristics of the mother, plus both parents' highest educational qualifications, those born to cohabiting couples still score around 9% of a standard deviation lower across their eight best GCSEs than children born to married couples. However, this difference is substantially reduced – and is no longer statistically significant – once we account for parents' occupation and household income (measured early in the child's life) in Column E. While there is a small chance that the act of getting married may have affected an individual's choice of whether or not to work and if so in which type of job and whether full- or part-time, the literature on this topic to date suggests that these measures are

again more likely to reflect the selection of individuals into marriage rather than a pathway through which marriage causally affects child development.[28]

The results presented in Table 4.1 demonstrate that the gap in cognitive development between children born to married or cohabiting couples is largely explained by the other ways in which such parents differ from one another that also matter for cognitive development. While we must be mindful of the fact that some of the characteristics that are included in later specifications, such as household income, may have been affected by a couple's decision to get married, we would argue that most of the difference can be explained by exogenous characteristics – those that are fixed (such as ethnicity) or that were either definitely or highly likely to have been determined long before the decision to marry was taken (such as various aspects of the mother's childhood, and parents' educational qualifications). Thus, while it is possible that our analysis may underestimate the influence of marriage on child development, it is our view that this risk is small. We would therefore argue that our results highlight that most of the difference in cognitive development between children born to married or cohabiting parents can be accounted for by the selection of individuals into marriage, rather than because the act of getting married confers a positive benefit on children's cognitive development.

4.4 Summary

Taken together, these findings confirm the broad conclusions reported in Goodman and Greaves (2010a) and Crawford et al. (2011). In particular, we find that:

- Children born to cohabiting parents exhibit a deficit in cognitive development compared with children born to married parents. This deficit is present in both cognitive tests taken as part of the ALSPAC survey and national achievement tests taken in school. The gap is larger in terms of national achievement test scores, and also appears to increase as children get older.
- However, these gaps in cognitive development between children born to married and cohabiting couples, particularly at younger ages, can largely be explained by the mother's fixed demographic characteristics, the circumstances in which she grew up and by both parents' highest educational qualifications. As these characteristics were, on the whole, determined long before marriage decisions were taken, these results provide strong suggestive evidence that the difference in cognitive development between children born into different family forms can largely be accounted for by the selection of different types of parents into marriage.

[28] For example, Gupta, Smith and Stratton (2005) find no difference in wages between married and cohabiting men in Denmark, and Stratton (2007) finds no difference between the wages of married individuals and long-term cohabitants. Similarly, Ginther and Sundström (2008) find that couples who get married in response to a financial incentive in Sweden experienced no change in total household income or housing tenure after they married.

- Parental income and work status also appear to play an important role in explaining differences in educational attainment at age 16 between children born to cohabiting and married couples. While it is possible that the decision to get married might lead some parents to make different decisions about whether or not to work, and if so how much, our view (and the consensus in the literature to date) is that this effect is likely to be small. Our judgement is therefore that the gap in cognitive development between children born to cohabiting and married parents is largely accounted for by 'selection', leaving little room for marriage itself to be having a strong positive effect on children's cognitive development.

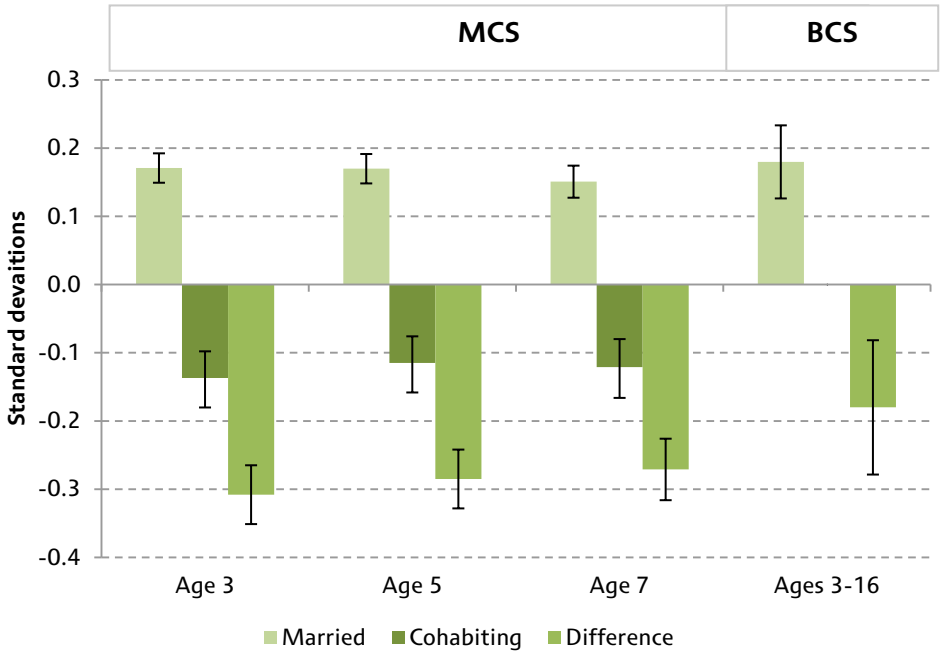
5. Children's socio-emotional development

In this chapter, we document the gaps in socio-emotional development (as reported by parents and teachers) between children born to married and cohabiting couples, and explore the extent to which differences in other observable characteristics can help to explain these gaps. We start (Section 5.1) by summarising the evidence on younger children from Crawford et al. (2011), before moving on to documenting and exploring the differences in socio-emotional development up to the age of 13 using ALSPAC data (Sections 5.2 and 5.3).

5.1 Evidence from the MCS and BCS in Crawford et al. (2011)

Figure 5.1 shows the average socio-emotional development of children born to married and cohabiting couples, relative to the population of children born to all family types, in the MCS (left-hand panel) and BCS (right-hand panel). All

Figure 5.1. Differences in socio-emotional development between children born to cohabiting and married couples from Crawford et al. (2011)



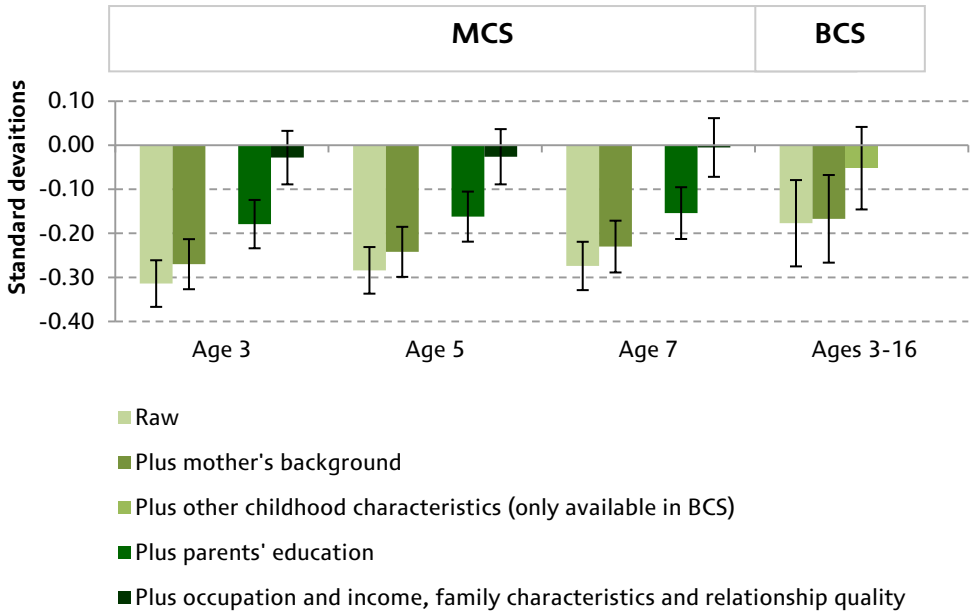
Notes: measures of socio-emotional development have been standardised to have a mean of zero and a standard deviation of one across children born into all family types (within sample for the MCS and using national figures for the BCS) for whom we observe all relevant assessments. The horizontal line at 0.0 thus represents the average level of development for all children with all assessments available. See Crawford et al. (2011) for further discussion of how we select our sample and standardise these scores.

measures are based on an inverted score from the Strengths and Difficulties Questionnaire (described in Section 2.3) and were reported by the child's main parent. The graph shows that the levels of socio-emotional development amongst children born to married couples are between 15% and 20% of a standard deviation above average at all ages and across both samples. By contrast, the socio-emotional development of children born to cohabiting couples is judged to be at or below average in the MCS and BCS. In both cases, this means that children born to cohabiting couples have lower levels of socio-emotional development, on average, than children born to married couples. Moreover, these differences are substantially larger than was the case for cognitive development (see Figure 4.1).

However, as discussed in detail in Crawford et al. (2011), married and cohabiting couples in the MCS and BCS also differ in a number of ways other than their marital status that might be relevant for child outcomes; if we do not take into account these differences then our estimates of the association between parents' marital status and children's socio-emotional development may be biased.

Figure 5.2 shows how the gap in socio-emotional development between children born to married and cohabiting couples changes once we take account of the other ways in which these parents differ. (See Crawford et al. (2011) for full details of the coefficient estimates underlying this figure.) As was the case for cognitive development, we start by adding characteristics that we regard as being wholly exogenous (i.e. those that are fixed or that definitely occurred before

Figure 5.2. Differences in socio-emotional development between children born to cohabiting and married couples after controlling for other characteristics from Crawford et al. (2011)



Notes: see notes to Figure 4.1 for details of the standardisation and sampling procedures used, and Crawford et al. (2011) for full details of the characteristics included in each specification.

marriage decisions were taken and hence cannot be affected by this choice), before successively adding characteristics that may potentially reflect a pathway through which marriage might affect children's development.

In line with the findings for cognitive development, discussed in Chapter 4, Figure 5.2 shows that the association between parents' marital status and children's socio-emotional development becomes smaller as we move through these specifications, and is eventually no longer significantly different from zero. In the case of the BCS, this occurs once we have added a rich set of characteristics available from the childhood of one of the parents and hence can be regarded as entirely reflecting the selection of different types of people into marriage. In the case of the MCS analysis, however, these differences are not entirely eliminated until we have added characteristics that were observed after marriage decisions were taken, such as family income, structure and parents' relationship quality.

While the MCS results raise the possibility that marriage might be conferring some positive benefits in terms of children's socio-emotional development, it must be remembered that correlation does not necessarily imply causation. In particular, there may be characteristics of parents that strongly influence children's socio-emotional development that are difficult to observe in a survey, and correlated with whether parents choose to marry. Moreover, the strength of the results from the BCS analysis – in which the much richer set of characteristics to which we have access enable us to fully explain the differences in socio-emotional development between children born to cohabiting and married couples – still lead us to conclude that most of the gap in socio-emotional development between children born to married and cohabiting couples arises from the fact that different types of people choose to get married, rather than because being raised by married parents has a positive causal effect on a child's socio-emotional development.

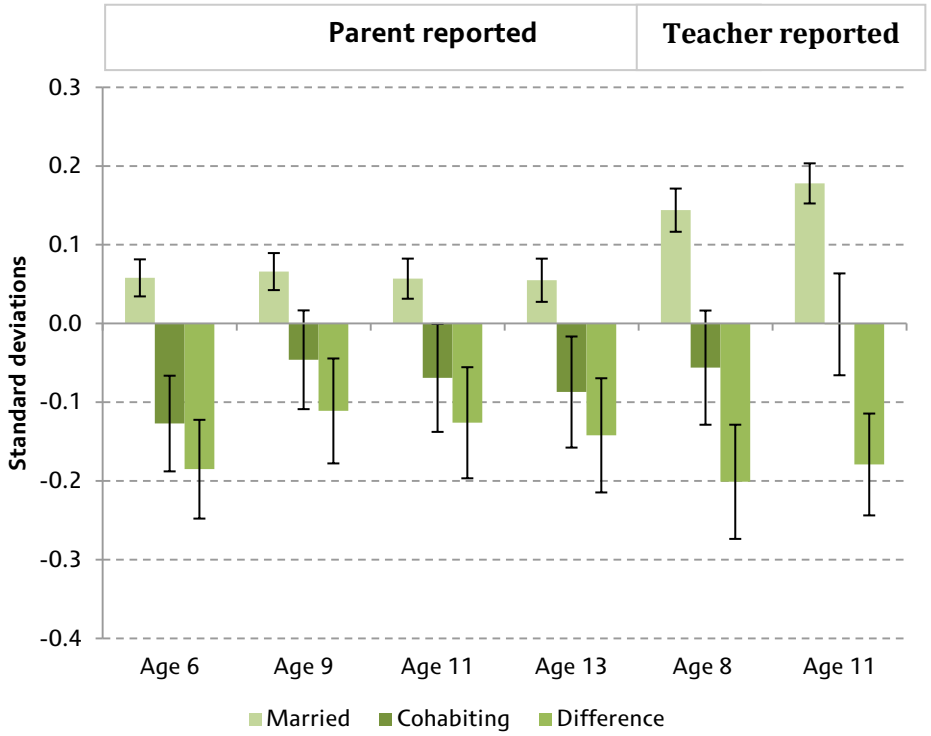
5.2 Outcomes of children born to married and cohabiting couples in ALSPAC

The next two sections build on the analysis of Crawford et al. (2011) by documenting the differences in socio-emotional development between the ages of 6 and 13 between children born to married and cohabiting couples (this section), and examining the extent to which these differences can be explained by the other ways in which parents who choose to get married differ from those who do not (Section 5.3). As was the case for the MCS and BCS analysis, the measure of socio-emotional development used is derived from the Strengths and Difficulties Questionnaire (SDQ). The total score calculated from the questionnaire has been inverted, to make it comparable with the cognitive development measures presented in Chapter 4, so higher scores relate to better socio-emotional development.

Figure 5.3 shows the average socio-emotional development of children born to married and cohabiting couples, relative to the whole sample of children in

ALSPAC. It does so both for reports from the child's main parent at ages 6, 9, 11 and 13 (left-hand panel), and for reports from the child's class teacher at ages 8 and 11 (right-hand panel). It is clear from these figures that children born to married parents are judged to have higher socio-emotional development than average, while children born to cohabiting couples are judged to have below average socio-emotional development at all ages and regardless of whether it is reported by a parent or teacher. These differences amount to between 10% and 20% of a standard deviation, substantially lower than Crawford et al. (2011) found for younger children from the later Millennium Cohort Study (around 30% of a standard deviation). They are also substantially smaller than the differences in Key Stage test scores found amongst the ALSPAC sample (which were equivalent to around 20–30% of a standard deviation), although they are larger than the differences in terms of cognitive tests assessed as part of the survey (which tended to show gaps of less than 10% of a standard deviation).

Figure 5.3. Differences in socio-emotional development between children born to cohabiting and married couples in ALSPAC



Notes: measures of socio-emotional development have been standardised to have a mean of zero and a standard deviation of one for the sample of children born into all family types (i.e. including single parent families) who have non-missing observations at each age. The horizontal line at 0.0 therefore represents the average level of development for children with non-missing test scores.

These differences seem to be particularly pronounced when we use measures of socio-emotional development reported by the child's class teacher rather than by their parents. This seems to be driven by the fact that teachers assess the development of children born to married parents as being rather better, on average, than parents do. This may perhaps in part reflect different views regarding behaviour amongst married and cohabiting parents, which may be

leading married parents to regard their own children's development as being closer to the average than it is by a third party, such as a teacher. These differences across outcomes are relatively small and not always significantly different from zero, however, so we would not place too much emphasis on these findings.

5.3 Regression results

While Section 5.2 showed that there are sizeable differences between the socio-emotional development of children born to cohabiting and married parents, we also saw in Chapter 3 that there were some substantial differences in observable characteristics between couples who chose to get married and those who chose to cohabit. In this section, we show how controlling for these differences affects our estimates of the association between parents' marital status and children's socio-emotional development. As described in Section 2.5, our intention is to control for selection into marriage as far as possible, without inadvertently controlling away any of the potential routes through which marriage might affect child development.

Table 5.1 presents the results for socio-emotional development, following a similar format to Table 4.1. The way in which the association between parents' marital status and children's socio-emotional development changes as we add more characteristics to the model is very similar to the pattern we saw in Table 4.1 for children's cognitive development. The addition of mother's ethnicity and religion (in Column B) again makes very little difference to the estimated relationship, but the addition of more detailed background information about the child's mother, including some details of her own childhood, makes a greater difference. Column C in Table 5.1 shows that the gap in terms of socio-emotional development between children born to cohabiting and married couples is reduced by as much as half by the addition of these exogenous characteristics of the mother (i.e. characteristics that are either fixed or provide information from well before marriage decisions could have been taken). In some cases, this is enough for the estimates to no longer be significantly different from zero.

In contrast to the results for cognitive development, the addition of controls for parents' highest educational qualifications (in Column D of Table 5.1) makes only a small difference to the magnitude of the gap in socio-emotional development between children born to cohabiting and married couples. This suggests that parental education plays a relatively smaller role in determining children's socio-emotional development than it does in driving their cognitive development.

Table 5.1. Differences in socio-emotional development between children born to cohabiting and married parents in ALSPAC

	Predetermined characteristics			Characteristics mainly reflecting selection, but potentially capturing causal pathways				
	A Raw	B Ethnicity	C Mother's background	D Education	E Occupation and housing tenure	F Family characteristics	G Mother's characteristics	H Relationship quality
Parent reports								
SDQ (age 6): S.D. [N=7,532]	–0.190***	–0.180***	–0.119***	–0.100**	–0.062	–0.030	–0.005	–0.004
SDQ (age 9): S.D. [N=6,877]	–0.113***	–0.108**	–0.057	–0.033	0.006	0.030	0.050	0.052
SDQ (age 11): S.D. [N=6,319]	–0.135***	–0.129***	–0.064	–0.045	–0.007	0.011	0.032	0.039
SDQ (age 13, parent): S.D. [N=6,041]	–0.146***	–0.153***	–0.092*	–0.069	–0.011	0.021	0.054	0.060
Teacher reports								
SDQ (age 8): S.D. [N=4,843]	–0.210***	–0.194***	–0.114**	–0.089*	–0.044	–0.009	–0.007	–0.006
SDQ (age 11): S.D. [N=5,497]	–0.189***	–0.182***	–0.104**	–0.070*	–0.014	0.014	0.017	0.025
Child's gender, year and month of birth	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's ethnicity	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's background	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Education	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Father's occupation, housing tenure and parents' work	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*
Family structure	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*
Mother's characteristics	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*
Relationship quality at 12 weeks' gestation	*No*	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*

Notes: the number of observations for each outcome is shown in brackets. The table shows regression coefficients on a dummy variable 'biological parents were cohabiting at the time of the child's birth'; the omitted group is therefore children whose biological parents were married at the time of their birth. All other coefficient estimates are available on request. A common sample is not imposed: all children whose biological parents were either married or cohabiting at the time of their birth are included for each outcome that is not missing. Standard errors are clustered by family. * $p < 0.05$, ** $p < 0.01$. See Table 2.2 for full details of the characteristics included in each specification.

In common with the results for GCSE attainment at age 16, it is only when we add controls for household income and parent's work status in Column E of Table 5.1 that all of the estimated relationships between parents' marital status and children's socio-emotional development – at all ages and whether reported by parents or teachers – become smaller and no longer statistically different from zero. Compared with the results from the Millennium Cohort Study – in which we were only able to explain the relationship between marital status and SDQ scores after including more potentially endogenous variables, such as parents' relationship quality measured when the study child was nine months old – we might regard these results as 'stronger' evidence of the key role played by the selection of parents into marriage in explaining the differences in socio-emotional development between children born to cohabiting and married parents. As we argued above, while there is a small chance that the act of getting married may have affected an individual's choice of whether or not to work and if so in which type of job and whether full- or part-time, it is our judgement (supported by the findings of the literature to date) that these measures are more likely to reflect the selection of individuals into marriage rather than a pathway through which marriage causally affects child development.

As was the case for cognitive development, therefore, we take the view that the results presented in Table 5.1 highlight that the gap in socio-emotional development between children born to cohabiting and married couples is largely explained by the other ways in which parents differ from one another that also matter for socio-emotional development, rather than because marriage confers a positive benefit on children's socio-emotional development. While we recognise that any characteristics observed in adulthood that are not fixed over time have the potential to be affected by marriage decisions, our judgement is that most of those that are added in Columns A to E are either wholly or largely exogenous and hence considerably more likely to reflect selection into marriage rather than a potential route through which marriage might affect child development.

5.4 Summary

Taken together, these findings confirm the broad conclusions reported in Goodman and Greaves (2010a) and Crawford et al. (2011). In particular, we find that:

- Children born to cohabiting parents exhibit a deficit in socio-emotional development compared with children born to married parents. This gap is slightly larger when reported by teachers than when reported by the child's parents, but – in contrast to the findings of Crawford et al. (2011) – the deficit in terms of socio-emotional development is not consistently larger than that in terms of cognitive development: it is larger than the survey measures of cognitive development available in ALSPAC, but not the national achievement test scores, particularly at older ages.

- In line with the findings for cognitive development, most of the deficit in socio-emotional development can be accounted for by the mother's background, plus parental education, income and work status; after controlling for these characteristics, the association between marital status and children's socio-emotional development becomes much smaller and is no longer significantly different from zero.

- While there is a small chance that the act of getting married may affect an individual's choice of whether or not to work and if so in which type of job and whether full- or part-time, it is our judgement that these measures are more likely to reflect the selection of individuals into marriage than a pathway through which marriage causally affects child development. Moreover, we are able to account for the association between marital status and children's socio-emotional development using fewer potentially endogenous characteristics than was the case in Crawford et al. (2011) using the MCS data. As such, our view is that the gap in socio-emotional development between children born to cohabiting and married parents is largely accounted for by 'selection', thus leaving little room for marriage to be having a strong positive effect on children's socio-emotional development.

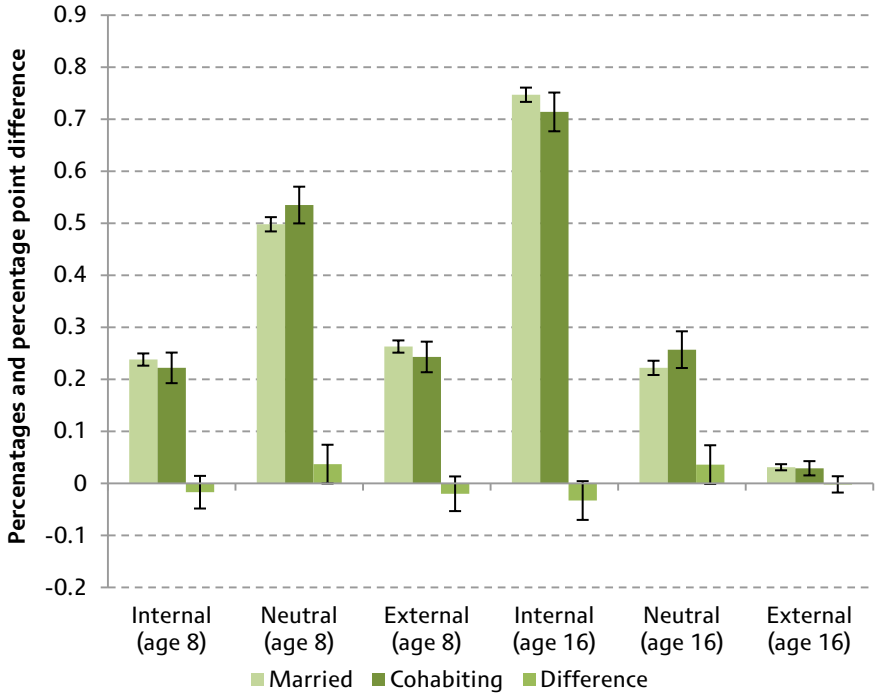
6. Other non-cognitive skills and behaviours

In this chapter, we extend the work of Goodman and Greaves (2010a) and Crawford et al. (2011) by documenting the differences between children born to married and cohabiting couples in terms of other non-cognitive skills and behaviours between the ages of 8 and 16. In particular, we consider differences in locus of control, self-esteem and engagement in a range of risky and antisocial behaviours. In line with the other chapters in this report, we also examine the extent to which the differences in other observable characteristics between married and cohabiting parents outlined in Chapter 3 can help to explain the gaps that we find.

6.1 Outcomes of children born to married and cohabiting couples in ALSPAC

Figure 6.1 shows the percentage of children born to married and cohabiting couples that are classified as having an internal, neutral or external locus of control, and the percentage point difference between the two, at ages 8 and 16. An internal locus of control means that a person is more likely to believe that

Figure 6.1. Differences in classifications of locus of control between children born to cohabiting and married couples in ALSPAC

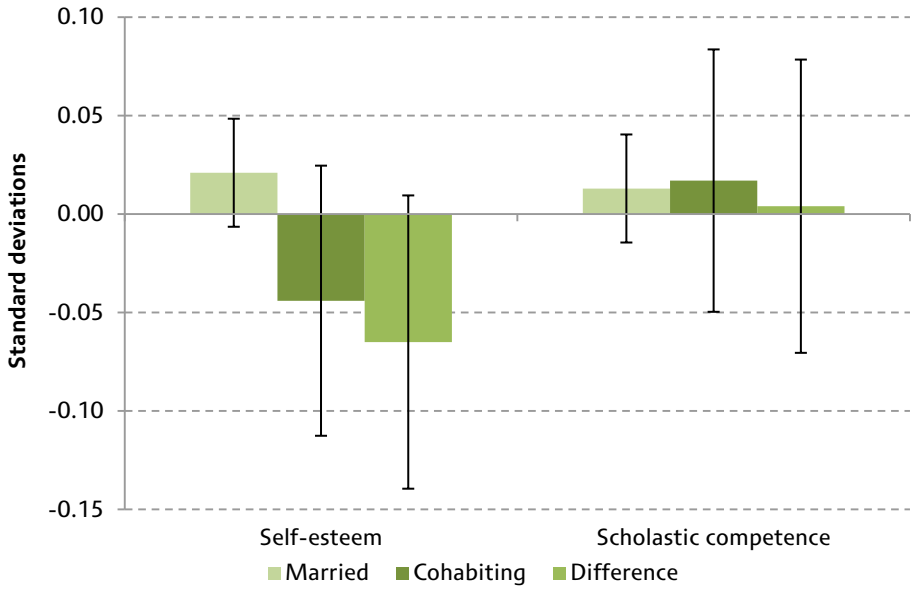


Notes: the percentage of children born to married and cohabiting couples with each classification of locus of control are shown by the first two bars. The third bar shows the percentage point difference between married and cohabiting couples (which is zero if there is no difference in this category between children born to married and cohabiting couples).

their actions shape their future. An external locus of control means that a person is more likely to believe that factors outside their control, such as luck, influence the future. Around half of those surveyed via ALSPAC are classified as having a neutral locus of control (i.e. neither strongly internal nor strongly external) at age 8, and there is only a small difference in terms of parents' marital status at birth. By age 16, most young people are classified as having an internal locus of control, suggesting that this aspect of a young person's character changes as they get older.[29] The difference between children born to married and cohabiting couples remains small and not statistically significantly different from zero, however.

Figure 6.2 presents self-reported assessments of a child's global self-worth (general self-esteem) and scholastic competence (confidence in their own ability) at age 8. The differences in general self-esteem are very small indeed: less than 2% of a standard deviation. The differences in scholastic competence are somewhat larger, but – at less than 10% of a standard deviation – are still substantially smaller than the differences in terms of either socio-emotional development or Key Stage test scores at around the same age. The fact that the differences between children born to cohabiting and married couples in terms of both locus of control and self-esteem are so small to start with makes it highly

Figure 6.2. Differences in self-esteem and scholastic competence between children born to cohabiting and married couples in ALSPAC



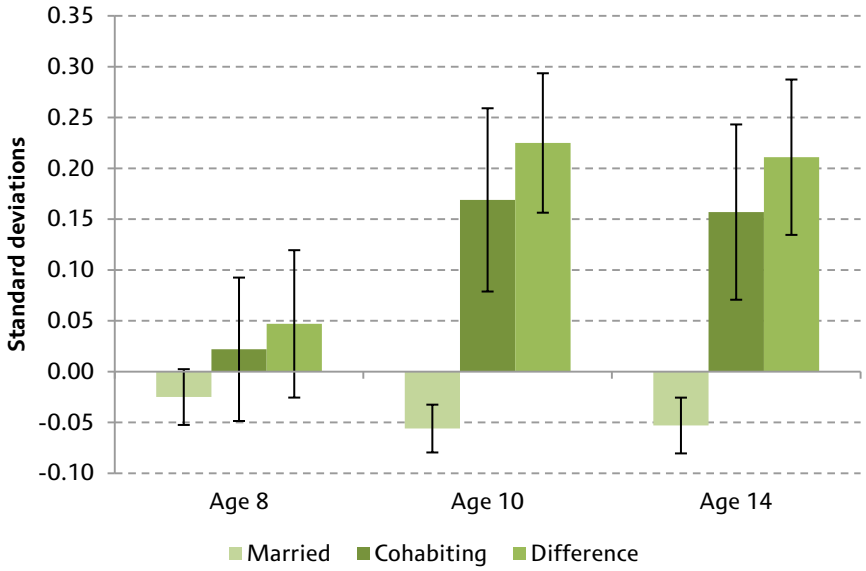
Notes: measures of self-esteem have been standardised to have a mean of zero and a standard deviation of one for the sample of children born into all family types (i.e. including single parent families) who have non-missing observations at each age. The horizontal line at 0.00 therefore represents the average level of development for children with non-missing test scores.

[29] Breet et al (2010) cite evidence from Hopkins (1983) that a person's locus of control can change and develop with age: Hopkins suggests that younger children are more likely to act according to an external locus of control, compared with older learners that are more likely to act according to an internal locus of control, which is consistent with the patterns we see.

unlikely that marriage has a causal effect on either of these aspects of children's development.

Figure 6.3 presents the levels of antisocial behaviour that children born to married and cohabiting couples engage in at ages 8, 10 and 14, together with the standard deviation difference between them. These scales of antisocial behaviour are created from a series of questions covering behaviours such as truancy, vandalism, fighting, stealing and engagement in underage risky behaviours. At age 8, relatively few children engage in antisocial behaviour; hence, there is only a very small difference between the behaviour of those born to married and cohabiting couples. At ages 10 and 14, however, these differences are much greater: children born to married couples tend to engage in less antisocial behaviour than average, while those born to cohabiting couples exhibit substantially more. As such, there are relatively larger differences of around 20% of a standard deviation in terms of antisocial behaviour amongst children born to married and cohabiting couples.

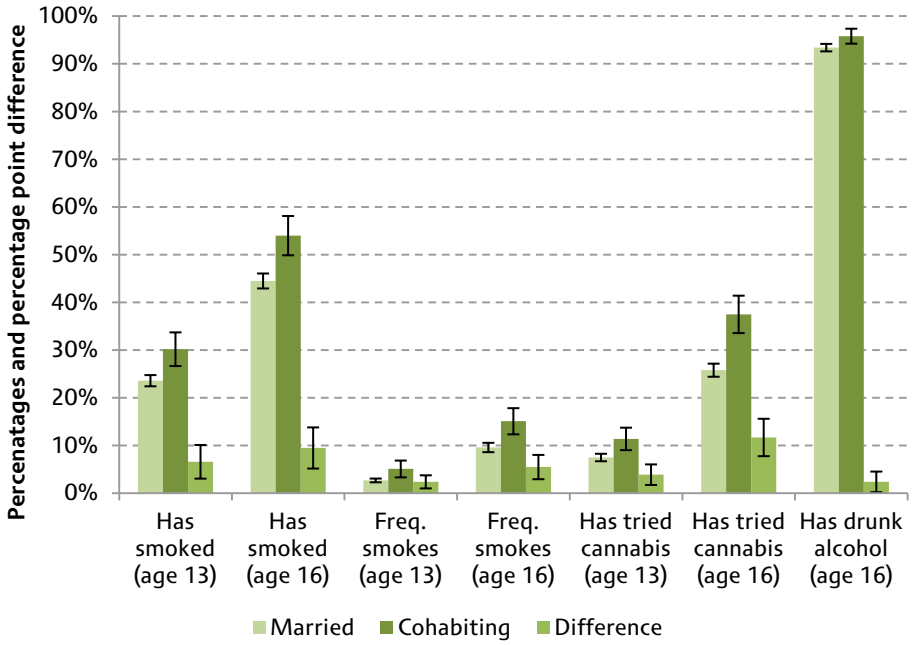
Figure 6.3. Differences in engagement in antisocial behaviour between children born to cohabiting and married couples in ALSPAC



Notes: measures of antisocial behaviour have been standardised to have a mean of zero and a standard deviation of one for the sample of children born into all family types (i.e. including single parent families) who have non-missing observations at each age. The horizontal line at 0.00 therefore represents the average level of development for children with non-missing test scores.

Figure 6.4 shows that this is also the case in terms of engagement in specific risky behaviours – such as the consumption of alcohol, cigarettes and cannabis – during the teenage years. The proportion of children who engage in each type of behaviour increases as they get older, as does the difference between those born to married and cohabiting couples. In some cases, these differences are very large indeed: for example, young people born to cohabiting couples are nearly 10 percentage points more likely to report that they have ever tried smoking tobacco or cannabis at age 16.

Figure 6.4. Differences in engagement in 'risky' behaviours between children born to cohabiting and married couples in ALSPAC



Notes: the percentage of children born to married and cohabiting couples that engage in each 'risky' behaviour is given by the first two bars for each category. The third bar shows the percentage point difference between married and cohabiting couples (which is zero if there is no difference in this behaviour between children born to married and cohabiting couples).

In the next section, we consider to what extent the differences in observable characteristics between couples who choose to get married rather than cohabit that we saw in Chapter 3 can help to explain the small differences in locus of control and self-esteem, and the more sizeable differences in risky and antisocial behaviours between children born into different family forms that are evident in ALSPAC. As described in Section 2.5, our intention is to control for selection into marriage to the best of our ability with the data available, without inadvertently controlling away any of the potential routes through which marriage might affect young people's skills and behaviours.

6.2 Regression results

Table 6.1 presents the results for locus of control and self-esteem, while Table 6.2 presents the results for engagement in risky and antisocial behaviour. Each table follows the same format as Tables 4.1 and 5.1, with each row showing, for a different outcome, the estimated coefficient on a binary (0–1) indicator for whether or not the parents were cohabiting at the time of the child's birth, and each column showing a different model specification.[30]

[30] Coefficient estimates for all other variables are available from the authors on request.

Table 6.1. Differences in locus of control and self-esteem between children born to cohabiting and married parents in ALSPAC

	Predetermined characteristics			Characteristics mainly reflecting selection, but potentially capturing causal pathways				
	A Raw	B Ethnicity	C Mother's background	D Education	E Occupation and housing tenure	F Family characteristics	G Mother's characteristics	H Relationship quality
Classification of locus of control								
Internal (age 8): P.P. [N=5,765]	–0.017	–0.014	–0.043**	–0.050**	–0.059***	–0.069***	–0.066***	–0.067***
Neutral (age 8): P.P. [N=5,765]	0.037	0.046*	0.057**	0.056**	0.060**	0.056*	0.057*	0.057*
External (age 8): P.P. [N=5,765]	–0.020	–0.032	–0.014	–0.005	0.004	0.019	0.016	0.016
Internal (age 16): P.P. [N=4,395]	–0.033	–0.029	0.007	0.022	0.032	0.035	0.032	0.032
Neutral (age 16): P.P. [N=4,395]	0.035	0.033	0.000	–0.011	–0.015	–0.018	–0.012	–0.012
External (age 16): P.P. [N=4,395]	–0.002	–0.003	–0.006	–0.008	–0.011*	–0.011*	–0.010*	–0.009*
Self-esteem								
Self-esteem (age 8): S.D. [N=5,892]	0.006	0.004	0.032	0.038	0.050	0.051	0.045	0.068
Scholastic competence (age 8): S.D. [N=5,904]	–0.070	–0.083*	–0.037	–0.028	–0.027	–0.027	–0.059	–0.055
Child's gender, year and month of birth	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's ethnicity	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's background	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Education	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Father's occupation, housing tenure and parents' work	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*
Family structure	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*
Mother's characteristics	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*
Relationship quality at 12 weeks' gestation	*No*	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*

Notes: the number of observations for each outcome is shown in brackets. The table shows regression coefficients on a dummy variable 'biological parents were cohabiting at the time of the child's birth'; the omitted group is therefore children whose biological parents were married at the time of their birth. All other coefficient estimates are available on request. A common sample is not imposed: all children whose biological parents were either married or cohabiting at the time of their birth are included for each outcome that is not missing. Standard errors are clustered by family. * $p < 0.05$, ** $p < 0.01$. See Table 2.1 for full details of the characteristics included in each specification.

Table 6.2. Difference in engagement in risky and antisocial behaviours between children born to cohabiting and married parents in ALSPAC

	Predetermined characteristics			Characteristics mainly reflecting selection, but potentially capturing causal pathways				
	A Raw	B Ethnicity	C Mother's background	D Education	E Occupation and housing tenure	F Family characteristics	G Mother's characteristics	H Relationship quality
Antisocial behaviour								
Antisocial behavior (age 8): S.D. [N=6,040]	0.043	0.029	–0.005	–0.012	–0.021	–0.010	–0.046	–0.048
Antisocial behavior (age 10): S.D. [N=6,255]	0.151***	0.150***	0.107***	0.096***	0.071*	0.053	0.034	0.032
Antisocial behavior (age 14): S.D. [N=5,275]	0.215***	0.194***	0.140**	0.128**	0.100*	0.130*	0.094	0.092
Risky behaviours								
Has smoked (age 13): P.P. [N=5,059]	0.071***	0.061**	0.027	0.019	0.014	0.030	0.010	0.013
Has smoked (age 16): P.P. [N=4,376]	0.096***	0.092***	0.067**	0.062*	0.059*	0.077**	0.045	0.044
Freq. smokes (age 13): P.P. [N=5,081]	0.026**	0.027**	0.015*	0.011	0.007	0.010	0.006	0.005
Freq. smokes (age 16): P.P. [N=4,893]	0.054***	0.057***	0.043**	0.040**	0.033*	0.041*	0.028	0.027
Has tried cannabis (age 13): P.P. [N=5,059]	0.043***	0.033**	0.020	0.018	0.015	0.020	0.003	0.004
Has tried cannabis (age 16): P.P. [N=4,366]	0.121***	0.102***	0.084***	0.084***	0.086***	0.102***	0.059*	0.059*
Has drunk alcohol (age 16): P.P. [N=4,375]	0.023**	0.022*	0.018	0.019*	0.022*	0.025**	0.016	0.016*
Child's gender, year and month of birth	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's ethnicity	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's background	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Education	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Father's occupation, housing tenure and parents' work	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*
Family structure	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*
Mother's characteristics	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*
Relationship quality at 12 weeks' gestation	*No*	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*

Notes: the number of observations for each outcome is shown in brackets. The table shows regression coefficients on a dummy variable 'biological parents were cohabiting at the time of the child's birth'; the omitted group is therefore children whose biological parents were married at the time of their birth. All other coefficient estimates are available on request. A common sample is not imposed: all children whose biological parents were either married or cohabiting at the time of their birth are included for each outcome that is not missing. Standard errors are clustered by family. * $p < 0.05$, ** $p < 0.01$. See Table 2.1 for full details of the characteristics included in each specification.

Column A of Table 6.1 confirms the graphical evidence shown in Section 5.1: that there are very small differences between children born to married and cohabiting couples in terms of both the extent to which young people believe their own actions determine their future and their self-esteem: none of the coefficients are significantly different from zero, and most are very small. Once we start accounting for the other ways in which cohabiting and married parents differ from one another, however, some significant differences do start to emerge in terms of self-reported locus of control: once we compare children born to observationally similar cohabiting and married couples, those born to cohabiting couples are significantly less likely to believe that their own actions influence their future (i.e. are significantly less likely to have an internal locus of control) at age 8. This pattern appears to have reversed by age 16, with those born to cohabiting couples significantly less likely to have an external locus of control (i.e. to believe that they have little control over their own destiny). These differences are relatively small (less than 10% of a standard deviation), and it is difficult to think of plausible explanations for why we see this reversal in fortunes between ages 8 and 16; hence we do not place too much weight on these estimates. Nonetheless, it is interesting to note that these differences only emerge once we account for the other ways in which cohabiting and married couples differ.

Column A of Table 6.2 confirms that there are no significant differences in terms of engagement in risky or antisocial behaviour below the age of 10 between children born to married and cohabiting couples, but that these differences emerge as children get older, in line with the descriptive evidence presented above.

The addition of exogenous factors from the mother's own childhood (in Columns B and C of Table 6.2) helps to explain these differences to some extent, reducing the coefficients in absolute terms by around 30% in each case. Adding controls for parental education (in Column D) also makes a small difference – enough for the gaps in engagement in risky behaviours at age 13 between children born to cohabiting and married couples to no longer be significantly different from zero – but it is notable that these characteristics explain a smaller proportion of the difference in risky and antisocial behaviours than for cognitive and socio-emotional development. This is not altogether surprising: previous research has shown that a given set of observable characteristics is often better able to explain educational attainment or cognitive development than to explain engagement in risky behaviours.[31]

Indeed, for most outcomes it is the addition of a richer set of characteristics relating to the mother, such as her own locus of control and engagement in risky behaviours prior to pregnancy, that are able to help explain a sizeable fraction of the differences in participation between children born to cohabiting and married couples, and in most cases render them small and no longer significantly different from zero (Column G). For example, as shown in Table 3.1, mothers who give

[31] See, for example, Chowdry, Crawford and Goodman (2009).

birth in a cohabiting relationship are more likely to have smoked tobacco and cannabis than mothers who give birth whilst married; hence, it is plausible that this may help to explain why children born into cohabiting unions are more likely to engage in such behaviours themselves. These traits were in most cases recorded prior to the birth of the child, but we cannot rule out the possibility that they might have been affected by a couple's marriage decision.

Even after accounting for all of the observable characteristics to which we have access, however, there remains a small but significant difference between the proportions of children born to cohabiting and married couples that have tried cannabis or alcohol by age 16. While this keeps open the possibility that parents' marital status has a role to play in helping to explain why some young people participate in risky and antisocial behaviours and some do not, association does not necessarily imply causation. Moreover, there are also highly likely to be unobservable characteristics of couples – such as their love and commitment towards one another, and their commitment to parenting – that are evident in their relationship in advance of their decision to marry or cohabit that are likely to affect both child outcomes and to be associated with the probability of marriage. In that sense, we might regard our ability to explain the differences in risky and antisocial behaviours between married and cohabiting parents on the basis of observable characteristics alone as underestimates (rather than overestimates) of the variation that could be explained if we were able to account for differences in unobservable characteristics as well.

For these reasons, we do not conclude from our results that marriage is responsible for reducing engagement in risky and antisocial behaviours, but instead that this is a more likely area than cognitive or socio-emotional development in which marriage might have a causal role to play. However, more research is needed before such a strong conclusion could be drawn.

6.3 Summary

Taken together, our findings show that:

- There are only very small differences between children born to cohabiting and married couples in terms of their locus of control (the extent to which they believe their own actions determine their future) and self-esteem. This suggests that parents' marital status is highly unlikely to causally affect these traits.

- Children born to cohabiting couples are, however, significantly more likely to engage in a range of risky and antisocial behaviours than children born to married couples, particularly at older ages. For example, they are around 10 percentage points more likely to have tried smoking tobacco or cannabis by age 16.

- Unlike the results for cognitive and socio-emotional development, we are not able to fully account for the differences in these outcomes by controlling for

the range of observable characteristics at our disposal. While this does not rule out the possibility that parents' marital status has some influence on the behaviour of their children during the teenage years, we would caution against interpreting a significant association as evidence of causation: unobservable characteristics are likely to have an important role to play in understanding engagement in risky behaviours. It is therefore possible that richer data, for example including information on parents' attitudes to risk and discipline, would enable us to account for the remaining differences that we observe.

7. Relationship stability

This chapter moves from the relationship between parents' marital status and child development in ALSPAC to the link between parents' marital status and relationship stability in the MCS. It draws together and extends the work of Goodman and Greaves (2010a, 2010b) to illustrate, using data from the Millennium Cohort Study, the differences in relationship stability between cohabiting and married couples, and the extent to which these differences account for the gaps in cognitive and socio-emotional development between children born into different family forms.

Specifically, Section 7.1 documents the proportions of cohabiting and married couples who have experienced a period of separation by the time their child turns 3, 5 or 7, and shows how the characteristics of those separating and staying together differ. Section 7.2 goes on to use our simple regression approach to explore the extent to which these differences in characteristics between couples who do and do not split up can account for the higher likelihood of separation amongst cohabiting couples. Finally, Section 7.3 uses the same regression approach to first document how child outcomes differ according to these more detailed measures of relationship stability amongst cohabiting and married couples, and then explore the extent to which we can explain these gaps by accounting for the other ways in which these families differ from one another.

7.1 Descriptive statistics

Table 7.1 documents the proportion of couples in the Millennium Cohort Study (MCS) who were cohabiting or married at the time the study child was born who go on to experience a period of separation by the time their child turns 3, 5 or 7. For cohabiting couples, it also shows the proportion who go on to get married after the birth of the study child.[32]

Table 7.1 shows that just 12% of couples who were married when their child was born have experienced a period of separation by the time the child turns 7, with these separations split approximately equally over time. By contrast, nearly three times as many cohabiting couples (32%) have experienced a period of separation by the time their child turns 7, with most of these separations occurring between birth and age 3. It is also interesting to note that just over a quarter of couples who were cohabiting when the study child was born have got married (and stayed together) by age 7.

[32] Note that if a couple who were cohabiting at birth get married and experience a period of separation by the time the study child turns 7, they will be classified as a couple that separates rather than marries.

Table 7.1. Relationship status over time in the MCS

	Age 3		Age 5		Age 7	
	N	**%**	***N***	**%**	***N***	**%**
			Married at birth			
Always married	5,354	88	5,354	88	5,354	88
Split before relevant survey	252	4	501	8	736	12
Split after relevant survey	484	8	235	4	N/A	N/A
			Cohabiting at birth			
Always cohabiting	991	41	991	41	991	41
Married before child turns 7	648	27	648	27	648	27
Split before relevant survey	463	19	648	27	784	32
Split after relevant survey	321	13	136	6	N/A	N/A

We know from Chapter 3 that cohabiting and married parents differ in many ways apart from their marital status. Table 7.2 makes clear that the characteristics of parents that stay together over the period between birth and age 7 of the study child differ significantly from those who separate between birth and age 3, and also differ from those who separate between age 3 and age 7.

Table 7.2. Characteristics of couples that stay together or split up

	Stable between birth and age 7	Split by age 3	Split between ages 3 and 7
	%	%	%
Mother: white	91	92	94
Mother: born outside UK	3	0.4	1
Mother's religion: none	42	59	53
Mother: in care as a child	1	3	2
Mother: parents separated	24	41	35
Mother: degree or higher	32	12	19
Father: degree or higher	36	14	20
Father: professional occ.	22	7	11
Father: routine occ.	10	23	18
Housing tenure: own/mortgage	82	39	63
Cohabitation before birth: < 9 months	4	12	8
Cohabitation before birth: 9 months to 2 years	11	26	17
First child	42	45	39
Planned pregnancy	70	45	57

Notes: couples defined according to whether they have lived separately for any length of time over the period in question.

For example, 32% of mothers who stay with their partner for the first seven years of the study child's life have a degree, compared with 19% of those who stay together for the first three years but separate at some point before the child turns 7 and just 12% of those who separate between birth and age 3. A similar pattern is evident for fathers, and for other characteristics, such as housing tenure, length of cohabitation prior to the birth of the study child, and whether the pregnancy was planned.

These stark differences in baseline characteristics highlight not only that the observable characteristics of couples that separate differ from those that stay together, but also that the characteristics of those who separate earlier in their child's life differ from those who separate later, and in ways that are likely to influence their children's development. This suggests that any differences in outcomes for those born to couples that separate, relative to those that stay together, could be accounted for, at least in part, by these pre-existing characteristics of parents.

A comparison of couples who marry versus cohabit and separate versus stay together shows that the observable characteristics of those who cohabit and those who separate are very similar, on average, suggesting that all or part of the link between marital status and relationship stability may arise because the underlying characteristics of those who choose to marry are the same underlying characteristics as those who stay together (and vice versa).[33] With this in mind, the next section explores the extent to which the differences in relationship stability between cohabiting and married parents that we saw in Table 7.1 can be explained by the other ways in which these couples differ (highlighted in Table 7.2).

7.2 Differences in relationship stability between cohabiting and married couples

This section follows the approach of the previous chapters by grouping parents into those who were cohabiting or and married at the time of the study child's birth, but this time explores the extent to which these couples differ in terms of the likelihood of experiencing a period of separation early in their child's life. It does so using the regression approach described in Section 2.4, in which our aim is to control for all of the factors that are likely to affect both the probability of getting married and the likelihood of splitting up, without 'controlling away' any of the routes through which marriage might affect relationship stability.

[33] That is not to say that having (or not having) a particular characteristics *causes* a couple to split up, but rather that couples with those observable characteristics have been found to be more likely to split up than others.

Table 7.3. Differences in the probability of separation for couples that were cohabiting when their child was born, relative to couples that were married

	Predetermined characteristics			Characteristics mainly reflecting selection, but potentially capturing causal pathways			
	A Raw	**B Ethnicity**	**C Mother's background**	**D Education**	**E Occupation and income**	**F Family characteristics**	**G Relationship quality**
Average ppt difference estimated from a probit regression, for three outcomes:							
Split before survey around age 3	0.145***	0.132***	0.122***	0.076***	0.050***	0.028***	0.018**
Split before survey around age 5	0.177***	0.160***	0.148***	0.102***	0.069***	0.036**	0.023*
Split before survey around age 7	0.209***	0.187***	0.169***	0.120***	0.079***	0.037**	0.022
Child's gender, year and month of birth	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's ethnicity, immigration status and religion	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's background	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Education	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*
Father's occupation, household income, housing tenure and parents' work status	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*
Family structure	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*
Relationship quality at 9 months	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*
No. of observations	*8490*	*8490*	*8490*	*8490*	*8490*	*8490*	*8490*

Notes: Each row represents a different outcome: the probability of separation at different ages. The table shows regression coefficients on a dummy variable representing couples that were married when their child (in the MCS survey) was born. The omitted group is couples that were married at the time of the birth. All other coefficient estimates are available on request. A common sample is used: those whose biological parents were either married or cohabiting at the time of their birth, and who are in waves 1, 2, 3 and 4 of the MCS and have non-missing SDQ and BAS scores. Standard errors are clustered by family. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Those with missing values of the following variables were excluded due to multi-colinearity: whether the mother was born outside the UK (14 observations); whether the mother was in care as a child (3 observations); whether the mother's parents separated as a child (2 observations).

Table 7.3 presents the coefficient estimates on a binary indicator for whether the parent was cohabiting at the time of the child's birth.[34] Each row shows the results for a different outcome (specifically whether the couple had experienced a period of separation by the time the study child was aged 3, 5 or 7), while each column shows a different model specification, starting from the inclusion of the most exogenous controls (Specification A) and continuing sequentially through to characteristics that are both highly likely to reflect selection, but may also reflect a potential pathway through which marriage might affect relationship stability (e.g. relationship quality in Specification G).

Column A presents the results controlling only for the study child's gender and month and year of birth, and as such closely replicates the 'raw' results shown in Table 7.1. It shows that cohabiting couples are significantly more likely to have experienced a period of separation early in their child's life, on average, than married couples. For example, couples that were cohabiting when their child was born are around 15 percentage points more likely to have experienced a period of separation by the time their child is age 3, for example, and 21 percentage points more likely by the time their child is age 7.

Accounting for differences in the mother's background (for example, her ethnicity and whether her own parents separated while she was growing up) between couples that are married and those that are cohabiting when their child is born leads to a decrease in the probability of separation of around 20% at each age (comparing the figures in Column C with those in Column A of Table 7.3). This is largely because couples who separate are themselves more likely to have experienced parental separation. Whether your parents separated whilst you were a child is a fixed attribute and therefore cannot have been affected by your own decision to marry or cohabit. Accounting for parental separation therefore unquestionably enables us to better control for the selection of couples into marriage or cohabitation, and cannot reflect a route through which getting married could plausibly have a positive causal effect on relationship stability.

We are unable to say whether the experience of parental separation affects the decision to marry or cohabit, or indeed separate from one's own partner at some point, however: whether relationship stability is transmitted (or at least correlated) across generations is an interesting question, which unfortunately we are unable to address in this research. While it is plausible that experience of parental separation leads to a greater likelihood of separation in the future (and that any benefit of increasing stability rates extends across generations), other possible explanations are that socio-economic circumstances or attributes such as resilience and communication are correlated across generations, which in turn influence the correlation between relationship stability across generations.

[34] The numbers presented are marginal effects from a series of probit regressions. As such they indicate how many percentage points more likely a cohabiting couple is to have experienced a period of separation by the requisite age than an observationally similar married couple (where 'observationally similar' changes from specification to specification according to the characteristics indicated in the table).

Accounting for differences in the highest educational qualifications of both parents (in Column D of Table 7.3) decreases the estimated difference in the probability of separation further, to around 55% of the 'raw' difference at each age. Following our previous reasoning, this suggests that a limited set of exogenous characteristics of the parents account for around half of the difference in separation between couples that are married or cohabiting when their child is born.

Additionally accounting for differences in household attributes that are arguably more likely to be affected by the decision to marry decreases the estimated difference in the probability of separation further, so that the estimated difference once relationship quality (early in the child's life) is accounted for (in Column G) is small in magnitude and not statistically different from zero when the child is age 7.

Table 7.3 suggests that the observable characteristics of the household to which we have access account for a large proportion of the difference in the likelihood of separation between couples that are married or cohabiting when their child is born. Whether the estimates presented in Column G reflect the causal effect of marriage on relationship stability is much less certain, however. While we have argued that the characteristics we have included in our analysis, particularly in the earlier specifications, are highly likely to reflect the selection of couples into marriage, they may be questioned by some, who think that they 'control away' some of the channels through which marriage has a positive effect on relationship stability. If this were the case then our analysis would understate the impact of marriage on the probability of separation. On the other hand, it is highly unlikely that we can fully account for all of the pre-existing differences between married and cohabiting couples that might affect their chances of separating, despite the richness of the survey data we use. If these characteristics – such as their attitude to commitment or their lifestyle more generally – are correlated with a lower probability of separation, then it is likely that our current analysis overstates the impact of marriage on the likelihood of separation. Our judgement is that the latter is more likely than the former, but we leave the reader to make their own judgement.

Although the higher probability of separation for cohabiting couples is unlikely to be due entirely to their marital status, it is possible that lower relationship stability could negatively influence child development and thus explain, in part, the lower outcomes, on average, for children born to cohabiting couples. In the next section we explore whether the outcomes of children born to cohabiting and married couples differ, on average, according to whether their parents separate or stay together up to age 7, and the extent to which we can explain these differences using the observable characteristics at our disposal.

7.3 Differences in child outcomes according to parents' relationship status between birth and age 7

This section documents the differences in cognitive and socio-emotional development at ages 3, 5 and 7 between children born to cohabiting and married couples who separate, or cohabiting couples who stay together or get married, relative to children born to married parents who stay together. In each case, the analysis progressively accounts for more of the other ways in which these couples differ from one another, to try to understand the extent to which the raw differences in development can be explained by the fact that different types of couples choose to get married or cohabit, and separate or stay together.

Cognitive development

Table 7.4 documents the differences in cognitive development at ages 3 and 5 (in the top and bottom panels, respectively) between children born to cohabiting and married couples who stay together or separate (before or after the outcome is observed), while Table 7.5 repeats the analysis for cognitive development at age 7.

Column A of the top panel of Table 7.4 – which controls only for a child's gender and month and year of birth – shows that there are no significant differences in cognitive development at age 3 between children born to cohabiting couples who stay together or get married compared with children born to married couples who stay together until age 7. This suggests that a large part of the reason why children born to cohabiting couples have lower cognitive development at this age, on average, than children born to married couples is because cohabiting couples are more likely to split up (or, to be more precise, have characteristics that are associated with a greater likelihood of separating), rather than because of parental marital status.

Interestingly, these results also show that the children with the lowest cognitive development, on average, at age 3 are those born to married couples who split up between birth and age 3. These children score, on average, nearly half a standard deviation lower than children born to married couples who stay together. There is a much smaller difference between the outcomes of children born to married couples who stay together and those who split up between age 3 and age 7 (14% of a standard deviation), and a somewhat smaller difference between the

Notes to Table 7.4
The table shows regression coefficients on a set of dummy variables representing the parents' relationship status at the child's birth and up to the age of 7. The omitted group is children whose biological parents were married at the time of their birth, and remain married at least until the child is 7. All other coefficient estimates are available on request. A common sample is used: those whose biological parents were either married or cohabiting at the time of their birth, and who are in waves 1, 2, 3 and 4 of the MCS and have non-missing SDQ and BAS scores. Standard errors are clustered by family. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 7.4. Differences in cognitive development at ages 3 and 5 between children born to cohabiting and married parents, who separate or stay together

	Predetermined characteristics			Characteristics mainly reflecting selection, but potentially capturing causal pathways			
	A Raw	B Ethnicity	C Mother's background	D Education	E Occupation and income	F Family characteristics	G Relationship quality
Age 3							
Married; ever split before survey	–0.458***	–0.423***	–0.394***	–0.301***	–0.229**	–0.212**	–0.192**
Married; ever split after survey	–0.141**	–0.155**	–0.132*	–0.077	–0.031	–0.038	–0.031
Cohabiting; stable	–0.047	–0.097*	–0.059	0.036	0.092*	0.056	0.061
Cohabiting; ever marry	0.025	–0.030	0.015	0.081	0.105*	0.075	0.074
Cohabiting; ever split before survey	–0.376***	–0.394***	–0.351***	–0.144*	0.024	–0.033	–0.011
Cohabiting; ever split after survey	–0.317***	–0.358***	–0.308***	–0.152*	–0.039	–0.056	–0.049
Age 5							
Married; ever split before survey	–0.202***	–0.192***	–0.169***	–0.100**	–0.072*	–0.068*	–0.065
Married; ever split after survey	–0.087	–0.089	–0.069	–0.017	0.016	0.021	0.019
Cohabiting; stable	–0.113***	–0.132***	–0.102***	–0.018	0.011	–0.003	–0.004
Cohabiting; ever marry	–0.078*	–0.102**	–0.067*	–0.002	0.012	0.010	0.009
Cohabiting; ever split before survey	–0.269***	–0.260***	–0.223***	–0.067	0.001	–0.016	–0.016
Cohabiting; ever split after survey	–0.261**	–0.270**	–0.225**	–0.102	–0.048	–0.043	–0.044
Child's gender, year and month of birth	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's ethnicity, immigration status and religion	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's background	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Education	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*
Father's occupation, household income, housing tenure and parents' work status	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*
Family structure	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*
Relationship quality at 9 months	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*
No. of observations	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*

Table 7.5. Differences in cognitive development at age 7 between children born to cohabiting and married parents, who separate or stay together

	Predetermined characteristics			Characteristics mainly reflecting selection, but potentially capturing causal pathways			
	A Raw	B Ethnicity	C Mother's background	D Education	E Occupation and income	F Family characteristics	G Relationship quality
Married; ever split before survey	–0.236***	–0.218***	–0.195***	–0.121***	–0.080*	–0.079*	–0.074*
Cohabiting; stable	–0.190***	–0.174***	–0.148***	–0.046	–0.008	–0.012	–0.008
Cohabiting; ever marry	–0.137***	–0.131***	–0.099**	–0.025	–0.005	0.004	0.004
Cohabiting; ever split before survey	–0.342***	–0.310***	–0.275***	–0.107**	–0.028	–0.029	–0.021
Child's gender, year and month of birth	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's ethnicity, immigration status and religion	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's background	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Education	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*
Father's occupation, household income, housing tenure and parents' work status	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*
Family structure	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*
Relationship quality at 9 months	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*
No. of observations	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*

Notes: The table shows regression coefficients on a set of dummy variables representing the parents' relationship status at the child's birth and up to the age of 7. The omitted group is children whose biological parents were married at the time of their birth and remain married at least until the child is 7. All other coefficient estimates are available on request. A common sample is used: those whose biological parents were either married or cohabiting at the time of their birth, and who are in waves 1, 2, 3 and 4 of the MCS and have non-missing SDQ and BAS scores. Standard errors are clustered by family. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

outcomes of children born to married couples who stay together and cohabiting couples who split up either before or after age 3 (around a third of a standard deviation). This raises two possibilities: that parental separation has a more negative effect on the children of married parents than the children of cohabiting parents (and, correspondingly, that earlier separation has a more negative effect on the children of married couples than later separation), or that the characteristics of married parents who separate earlier are associated with poorer child development than the characteristics of married parents who separate later (or the characteristics of cohabiting parents who separate at any point).

The remaining columns of Table 7.4 explore the extent to which observable differences between those who choose to get married or cohabit and subsequently stay together or split up are able to account for the raw differences in child development that we observe. The top panel shows that accounting for the education level of the child's parents (in Column D) explains about half of the gap in cognitive development between children born to cohabiting couples who split up and married couples who stay together until age 7, but only around a quarter of the gap between children born to married couples who stay together versus split up.

In all cases, however, these differences remain significantly different from zero; it is only once we control for the family's work status, occupation, income and housing tenure (in Column E) that the differences in cognitive development are, in most cases, substantially reduced and no longer significantly different from zero. In the case of cohabiting couples who stay together or get married, the differences turn positive and significant, suggesting that the cognitive development of these children is actually significantly better than that of children born to observationally similar married couples who stay together. Our judgement is that the characteristics added in Column E are more likely to reflect the selection of different types of people into marriage (and separation) than a potential pathway through which marriage might affect child outcomes, and hence that the elimination of the gap in child development once these characteristics have been accounted for provides further evidence that there is little room for a sizeable causal effect of marriage on child outcomes (or relationship breakdown).

There is one case in which a significant difference remains, however: that between children born to married couples who split up rather than stay together. Even after accounting for the characteristics of couples that are most likely to be affected by the decision to marry (in Column G), children born to married couples who split up score, on average, just under 20% of a standard deviation lower in cognitive development at age 3 than children born to married couples who stay together until age 7.

While it might be tempting to conclude from this result that relationship dissolution is having a detrimental effect on child development, we must remember that the same is not true for children born to cohabiting couples who

split up. For this to be the sole driving force, relationship breakdown would have to hurt children born to married couples much more than children born to cohabiting couples. Moreover, even if that were the case, a significant association between relationship breakdown and child development does not necessarily imply that the first causes the second; there could be an unobserved third factor driving both outcomes (e.g. the death of a family member or unexpected loss of household income). The existence of these potentially relevant household characteristics that are not observable from the survey seems particularly plausible in the case of relationship breakdown: it is likely to be very difficult to identify and adequately measure the reasons why some couples stay together and others separate, even when those couples look very similar in many other respects. From a policy perspective it is therefore important to remember that a significant association between two factors (in this case parents' stability and child outcomes) does not imply that one has a causal influence on the other. In this case, unfortunately, it is easier to show what is not driving the relationship between stability and child outcomes than to prove what is causing it.

The bottom panels of Table 7.4 and Table 7.5 show how these associations change as children get older, by reporting the differences at ages 5 and 7, respectively. It is clear that the raw difference in child development between children born to married couples who stay together and cohabiting couples who stay together or get married increases as children get older. For example, while there was no significant difference in cognitive outcomes between children born to cohabiting and married couples who stay together at age 3, those born to cohabiting couples scores just over 10% of a standard deviation lower at age 5 and just under 20% of a standard deviation lower at age 7. These differences can be explained by the exogenous household characteristics in our models, however: they become small and no longer significantly different from zero once we add controls for parents' education (in Column D).

The raw differences between children born to married couples who stay together and those born to either married or cohabiting couples who split up are more variable. It remains the case, however, that, using the observable and largely exogenous characteristics at our disposal, we are able to explain the differences in child development between children born to cohabiting couples that split up and married couples who stay together, while we cannot always explain the differences in child development between children born to married couples who stay together or split up.

Notes to Table 7.6

The table shows regression coefficients on a set of dummy variables representing the parents' relationship status at the child's birth and up to the age of 7. The omitted group is children whose biological parents were married at the time of their birth, and remain married at least until the child is 7. All other coefficient estimates are available on request. A common sample is used: those whose biological parents were either married or cohabiting at the time of their birth, and who are in waves 1, 2, 3 and 4 of the MCS and have non-missing SDQ and BAS scores. Standard errors are clustered by family. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 7.6. Differences in socio-emotional development at ages 3 and 5 between children born to cohabiting and married parents, who separate or stay together

	Predetermined characteristics			Characteristics mainly reflecting selection, but potentially capturing causal pathways			
	A Raw	B Ethnicity	C Mother's background	D Education	E Occupation and income	F Family characteristics	G Relationship quality
Age 3							
Married; ever split before survey	–0.336***	–0.304***	–0.276***	–0.196**	–0.105	–0.080	0.025
Married; ever split after survey	–0.221***	–0.210***	–0.193***	–0.148**	–0.098*	–0.091	–0.044
Cohabiting; stable	–0.250***	–0.237***	–0.213***	–0.136***	–0.078*	–0.041	0.011
Cohabiting; ever marry	–0.263***	–0.262***	–0.231***	–0.175***	–0.144**	–0.097*	–0.099*
Cohabiting; ever split before survey	–0.601***	–0.587***	–0.552***	–0.395***	–0.233***	–0.132	0.009
Cohabiting; ever split after survey	–0.465***	–0.450***	–0.420***	–0.284***	–0.175**	–0.107	–0.038
Age 5							
Married; ever split before survey	–0.308***	–0.290***	–0.267***	–0.221***	–0.169***	–0.159**	–0.069
Married; ever split after survey	–0.135	–0.121	–0.104	–0.062	–0.019	–0.011	0.006
Cohabiting; stable	–0.215***	–0.207***	–0.184***	–0.118**	–0.072	–0.045	0.011
Cohabiting; ever marry	–0.188***	–0.189***	–0.160***	–0.110*	–0.083	–0.050	–0.052
Cohabiting; ever split before survey	–0.601***	–0.576***	–0.546***	–0.425***	–0.311***	–0.258***	–0.135*
Cohabiting; ever split after survey	–0.356***	–0.335***	–0.302**	–0.202*	–0.117	–0.080	–0.018
Child's gender, year and month of birth	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's ethnicity, immigration status and religion	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's background	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Education	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*
Father's occupation, household income, housing tenure and parents' work status	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*
Family structure	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*
Relationship quality at 9 months	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*
No. of observations	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*

Table 7.7. Differences in socio-emotional development at age 7 between children born to cohabiting and married parents, who separate or stay together

	Predetermined characteristics			Characteristics mainly reflecting selection, but potentially capturing causal pathways			
	A Raw	B Ethnicity	C Mother's background	D Education	E Occupation and income	F Family characteristics	G Relationship quality
Married; ever split before survey	–0.345***	–0.330***	–0.299***	–0.255***	–0.202***	–0.183***	–0.127**
Cohabiting; stable	–0.221***	–0.215***	–0.188***	–0.123**	–0.064	–0.026	0.023
Cohabiting; ever marry	–0.192***	–0.195***	–0.157**	–0.111*	–0.084	–0.040	–0.040
Cohabiting; ever split before survey	–0.562***	–0.550***	–0.511***	–0.392***	–0.266***	–0.186**	–0.094
Child's gender, year and month of birth	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's ethnicity, immigration status and religion	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Mother's background	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Education	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*
Father's occupation, household income, housing tenure and parents' work status	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*
Family structure	*No*	*No*	*No*	*No*	*No*	*Yes*	*Yes*
Relationship quality at 9 months	*No*	*No*	*No*	*No*	*No*	*No*	*Yes*
No. of observations	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*	*8,509*

Notes: The table shows regression coefficients on a set of dummy variables representing the parents' relationship status at the child's birth and up to the age of 7. The omitted group is children whose biological parents were married at the time of their birth, and remain married at least until the child is 7. All other coefficient estimates are available on request. A common sample is used: those whose biological parents were either married or cohabiting at the time of their birth, and who are in waves 1, 2, 3 and 4 of the MCS and have non–missing SDQ and BAS scores. Standard errors are clustered by family. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Socio-emotional development

Tables 7.6 and 7.7 present the differences in socio-emotional development at ages 3, 5 and 7 between children born and raised in different family forms and those whose parents stayed married until at least age 7.

In most cases, the differences in socio-emotional development are larger than the differences in cognitive development shown in Tables 7.6 and 7.7; they are certainly more systematically negative and significant. For example, while there were no significant differences between the cognitive development of children born to cohabiting couples who stayed together or got married and married couples who stayed together at age 3, the differences in socio-emotional development amount to over 25% of a standard deviation, on average. Moreover, the differences in socio-emotional development between children born to married couples who stay together and married or cohabiting couples who split up are larger between those who separate earlier than those who separate later, with the largest differences invariably between cohabiting couples who split up between birth and age 3 and married couples who stay together until age 7, while for cognitive development the picture was rather more mixed.

It is also the case that the differences in socio-emotional development between children born to married or cohabiting couples who separate, and married couples who stay together until age 7, are the most difficult to explain using the exogenous characteristics to which we have access. For example, even after controlling for parents' education, work status, income, occupation and housing tenure, the difference in socio-emotional development between children born to cohabiting couples who separate and married couples who stay together ranges from 23% of a standard deviation at age 3 to 31% of a standard deviation at age 5, while the gap between children born to married couples who stay together or split up ranges from 11% to 20% of a standard deviation.

The fact that there remain significant negative associations between relationship breakdown and children's socio-emotional development for both cohabiting and married couples who split up means that it is more plausible that relationship breakdown could be having a detrimental effect on children's behaviour than was the case for cognitive development (discussed above). Again, however, it is worth highlighting that a significant negative association does not prove that relationship breakdown is having a detrimental effect on children's socio-emotional development; it could simply be the case that the types of factors that may contribute to relationship breakdown but are difficult to observe in a survey – such as severe physical or mental health problems – also have a detrimental effect on children's behaviour (or the perceptions of that behaviour by the mother, who reports it in the survey).

7.4 Summary

This chapter has shown that:

- Parents who were cohabiting at the time of their child's birth are, on average, significantly more likely to have experienced a period of separation by the time the child turns 7 than couples who were married at the time of their child's birth.

- This does not necessarily imply that marriage *causes* an improvement in relationship stability, however; in fact, we find that couples who separate have very different characteristics from those who stay together, suggesting that all or part of the link between marital status and relationship stability may arise because the characteristics of those who choose to marry are, on average, similar to those who stay together (and vice versa).

- A sizeable proportion of the difference in relationship stability between cohabiting and married parents is accounted for by the observable characteristics at our disposal, thus suggesting that the selection of different types of people into marriage plays a substantial role in explaining why cohabiting couples are more likely to separate than married couples.

- Outcomes of children whose parents split up are worse, on average, than the outcomes of children whose parents stay together, regardless of whether their parents were married or cohabiting when they were born. For example, at age 3, we find no evidence of a significant difference between the cognitive development of children born to cohabiting and married couples who stay together from birth until age 7, while the cognitive development of children born to married couples who separate between birth and age 3 is substantially lower than that of children born to married couples who stay together, and is lower even than the cognitive development of children born to cohabiting couples who separate at any age.

- That is not to say that relationship stability has a *causal* positive effect on child outcomes, however: most of the differences in cognitive development (and a smaller but still sizeable proportion of the difference in socio-emotional development) between children raised by couples who separate and those who stay together are accounted for by the observable characteristics at our disposal.

- Moreover, even where significant differences remain, it must be remembered that correlation does not imply causation: as was the case for our findings on risky behaviours, described in Chapter 6, it is highly likely that unobservable characteristics play a larger role in explaining why some couples split up and some stay together than for educational attainment: it is plausible that the significant differences that we find would be eliminated if we had access to richer data.

8. Conclusions

It has been argued by some commentators that policymakers should encourage more couples to get married on the basis that it leads to more stable relationships and hence better child outcomes. This report has critically examined the evidence for such beliefs, by examining the impact of marriage on relationship stability and child outcomes. It has done so using a simple regression approach, in which controls for the other ways in which married and cohabiting parents differ are sequentially added to the model, in order to see how the addition of these characteristics affects the 'impact' of marriage on relationship stability and child development.

We find that:

- Children born to cohabiting parents exhibit large deficits in terms of educational attainment, socio-emotional development and engagement in risky and antisocial behaviours compared with children born to married parents, but there are no significant differences in terms of their locus of control (the extent to which they believe their actions have consequences) or self-esteem.

- There are also large differences in terms of parents' relationship stability, with couples who were cohabiting at the time of their child's birth substantially more likely to have experienced a period of separation by the time the child turns 7 than couples who were married when their child was born.

- The gaps in cognitive and socio-emotional development can largely be explained by the mother's fixed demographic characteristics and the circumstances in which she grew up, and by both parents' educational qualifications. As these characteristics were, on the whole, determined long before marriage decisions were taken, these results provide strong suggestive evidence that the differences in cognitive and socio-emotional development between children born into different family forms can largely be accounted for by the selection of different types of parents into marriage.

- By contrast, we are not able to fully explain the differences in parents' relationship stability or engagement in some risky behaviours by young people at age 16 using the observable characteristics at our disposal. While this does not rule out the possibility that marriage confers some positive benefits in terms of increasing relationship stability or discouraging young people from engaging in certain types of risky behaviours, we would caution against interpreting significant associations as evidence of causation, particularly as unobservable characteristics are likely to have a more important role to play in explaining relationship stability and engagement in risky behaviours than, for example, educational attainment. More research would therefore be needed before such a strong conclusion could be drawn.

Taken together, these findings support the broad conclusions reported in Goodman and Greaves (2010a, 2010b) and Crawford et al. (2011), and suggest that the differences in relationship stability and child outcomes between married and cohabiting couples largely reflect the fact that different types of people choose to get married (the selection effect), rather than that marriage has a direct positive effect on these outcomes.

On the basis of this evidence, therefore, there does not seem to be a strong rationale for policies that seek to encourage couples to get married, at least not if the aim is to increase these measures of relationship stability or improve these measures of child development. There is, however, good reason for policymakers to continue to try to increase the educational attainment of today's children (tomorrow's parents) as a means of improving the outcomes of future generations.

Appendix

Table A1. Characteristics of parents for a selection of outcome variables: ALSPAC analysis sample

	WISC	KS1	KS4	SDQ (age 7)	SDQ (age 8, teacher)	SDQ (age 11, teacher)	SDQ (age 13)	Locus of control (age 8)	Locus of control (age 16)	Has smoked (age 14)	Has smoked (age 16)
Cohabiting parents at birth	0.140	0.169	0.162	0.146	0.147	0.160	0.135	0.138	0.133	0.130	0.133
Married parents at birth	0.860	0.831	0.838	0.854	0.853	0.840	0.865	0.862	0.867	0.870	0.867
White	0.985	0.983	0.983	0.985	0.985	0.984	0.985	0.986	0.984	0.984	0.984
Born outside UK	0.041	0.035	0.037	0.043	0.041	0.039	0.047	0.042	0.048	0.047	0.049
No religion	0.144	0.143	0.141	0.144	0.140	0.135	0.146	0.145	0.147	0.147	0.147
In care as child	0.017	0.022	0.020	0.019	0.020	0.020	0.016	0.017	0.016	0.015	0.016
Experienced separation as a child	0.146	0.173	0.170	0.151	0.157	0.162	0.138	0.146	0.128	0.133	0.128
Mother highly educated (undergraduate degree or above)	0.173	0.112	0.121	0.163	0.137	0.128	0.181	0.170	0.210	0.190	0.210
Father highly educated (undergraduate degree or above)	0.232	0.152	0.171	0.220	0.199	0.184	0.244	0.231	0.276	0.257	0.277
Father has high managerial/professional job	0.132	0.091	0.103	0.132	0.124	0.113	0.142	0.131	0.162	0.150	0.163
Father has routine job	0.022	0.030	0.027	0.024	0.022	0.022	0.019	0.021	0.016	0.019	0.016
Own home/have mortgage	0.869	0.810	0.815	0.847	0.849	0.831	0.867	0.868	0.878	0.872	0.878
Number of observations	6,140	8,307	8,832	7,532	4,843	5,497	6,041	5,765	4,395	5,059	4,376

Table A2. Other characteristics of parents that are married and cohabiting when their child is born: ALSPAC analysis sample

Characteristic	Married	Cohabitants	Difference
Cohort member's month of birth			
Aug	0.098	0.096	0.002
July	0.109	0.093	0.015**
June	0.097	0.082	0.015**
May	0.088	0.094	–0.006
April	0.082	0.07	0.012*
March	0.057	0.072	–0.015**
Feb	0.048	0.039	0.008
Jan	0.055	0.072	–0.016**
Dec	0.083	0.086	–0.003
Nov	0.087	0.093	–0.006
Oct	0.098	0.104	–0.006
Sept	0.098	0.099	–0.001
Birth cohort			
09/1990 to 08/1991	0.217	0.178	0.038***
09/1991 to 08/1992	0.609	0.63	–0.021*
09/1992 to 02/1993	0.175	0.192	–0.017*
Cohort member: female	0.485	0.486	0
Household: step-children when cohort member is born	0.104	0.323	–0.220***
Mother: left home before 18	0.152	0.282	–0.130***
Mother: argued with parents before 17	0.247	0.333	–0.085***
Mother: in trouble with police before 17	0.023	0.067	–0.044***
Mother: previous marriage or live-in partner	0.174	0.427	–0.253***
Mother: unhappy childhood	0.199	0.311	–0.112***
Mother: stability of childhood home			
Very stable	0.477	0.39	0.087***
Fairly stable	0.42	0.436	–0.016
Unstable	0.073	0.125	–0.052***
Very unstable	0.03	0.049	–0.019***
Mother: school marks were important	0.734	0.602	0.131***
Mother liked school	0.631	0.547	0.084***
Mother valued school	0.264	0.196	0.068***
Mother in work in pregnancy			
Yes	0.65	0.6	0.051***
No: left to prepare for baby	0.147	0.114	0.033***
No: left for other reason/never in work	0.203	0.286	–0.084***
Multiple birth	0.024	0.026	–0.001
Grandmother has helped with childcare	0.623	0.579	0.044***
Mother has ever had severe depression	0.068	0.137	–0.068***
Mother assesses neighbourhood as bad	0.255	0.371	–0.116***
Mother's pre pregnancy height: standardised	0.819	0.839	–0.02
Mother's pre pregnancy BMI: standardised	0.913	0.822	0.091**

Notes to Table A2
The sample for each household attribute (for example housing tenure or income quintile) varies as it excludes those with missing values. The proportions in the columns therefore reflect the proportion of couples that were married or cohabiting (respectively) that have each value of the household attribute (for example the highest to lowest income quintile). The difference between the proportion of married and cohabiting couples is given in the third column, where statistical significance is denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

References

Acs, G. (2007), 'Can we promote child well-being by promoting marriage?', *Journal of Marriage and Family*, vol. 69, pp. 1326–1344.

Acs, G. and Nelson, S. (2002), 'The kids are alright? Children's well-being and the rise in cohabitation', Urban Institute, Policy Brief no. NSAF B-48.

Acs, G. and Nelson, S. (2003), 'Changes in family structure and child well-being: evidence from the 2002 National Survey of America's Families', Urban Institute, Research Report.

Acs, G. and Nelson, S. (2004), 'Should we get married in the morning? A profile of cohabiting couples with children', Urban Institute, *Assessing the New Federalism Project,* Discussion Paper no. 04-01.

Andersson, G. (2002), 'Children's experience of family disruption and family formation: evidence from 16 FFS countries', *Demographic Research*, vol. 7, pp. 343–364.

Artis, J. E. (2007), 'Maternal cohabitation and child well-being among kindergarten children', *Journal of Marriage and the Family*, vol. 69, pp. 222–236.

Benson, H. (2006), *The Conflation of Marriage and Cohabitation in Government Statistics: A Denial of Difference Rendered Untenable by an Analysis of Outcomes*, Bristol: Bristol Community Family Trust.

Benson, H. (2009), *Married and Unmarried Family Breakdown: Key Statistics Explained*, Bristol: Bristol Community Family Trust.

Björklund, A., Ginther, D. and Sundström, M. (2007), 'Does marriage matter for children? Assessing the causal impact of legal marriage', Institute for the Study of Labor (IZA), Discussion Paper no. 3189.

Boyd, A., Golding, J., Macleod, J., Lawlor, D., Fraser, A. Henderson, J., Molloy, L., Ness, A., Ring, S. and Davey Smith, G. (2013), 'Cohort profile: the "children of the 90s"—the index offspring of the Avon Longitudinal Study of Parents and Children', *International Journal of Epidemiology*, vol. 42, pp. 111–117.

Breet, L., Myburgh, C. and Poggenpoel, M. (2010), 'The relationship between the perception of own locus of control and aggression of adolescent boys', *South African Journal of Education,* vol. 30, no. 4.

Brien, M. J., Lillard, L. A. and Stern, S. (2006), 'Cohabitation, marriage, and divorce in a model of match quality', *International Economic Review*, vol. 47, pp. 451–494.

Brown, S. L. (2004), 'Family structure and child well-being: the significance of parental cohabitation', *Journal of Marriage and Family*, vol. 66, pp. 351–367.

Bumpass, L. and Lu, H.-H. (2000), 'Trends in cohabitation and implications for children's family contexts in the United States', *Population Studies*, vol. 54, pp. 29–41.

Carneiro, P., Crawford, C. and Goodman, A. (2007), 'The impact of early cognitive and non-cognitive skills on later outcomes', Centre for the Economics of Education (CEE), Discussion Paper no. 92.

Chowdry, H., Crawford, C. and Goodman, A. (2009), *Drivers and barriers to educational success: evidence from the Longitudinal Study of Young People in England*, DCSF Research Report no. RR102.

Crawford, C., Goodman, A., Greaves, E. and Joyce, R. (2011), *Cohabitation, marriage, relationship stability and child outcomes: an update*, Commentary 120, London: Institute for Fiscal Studies (http://www.ifs.org.uk/publications/5632).

Ermisch, J. (2005), 'The puzzling rise of childbearing outside marriage', in A. Heath, J. Ermisch and D. Gallie (eds), *Understanding Social Change*, Oxford: Oxford University Press.

Ermisch, J. and Pronzato, C. (2008), 'Intra-household allocation of resources: inferences from non-resident fathers' child support payments', *Economic Journal*, vol. 118, pp. 347–362.

Feinstein, L. (2000), 'The relative economic importance of academic, psychological and behavioural attributes developed in childhood', Centre for Economic Performance (CEP), Discussion Paper no. 443.

Ginther, D. K. and Sundstrom, M. (2010), 'Does marriage lead to specialization in Sweden? An evaluation of trends in adult earnings before and after marriage', Swedish Institute for Social Research Working Paper no. 1/2010.

Goodman, A. and Greaves, E. (2010a), *Cohabitation, Marriage and Child Outcomes*, Commentary no. 114, London: Institute for Fiscal Studies (http://www.ifs.org.uk/publications/4823).

Goodman, A, and Greaves, E. (2010b), 'Cohabitation, marriage and relationship stability', Institute for Fiscal Studies (IFS), Briefing Note no. 107 (http://www.ifs.org.uk/bns/bn107.pdf).

Graefe, D. R. and Lichter, D. T. (1999), 'Life course transitions of American children: parental cohabitation, marriage, and single motherhood', *Demography*, vol. 36, pp. 205–217.

Gupta, N. D., Smith, N. and Stratton, L. S. (2007), 'Is marriage poisonous? Are relationships taxing? An analysis of the male marital wage differential in Denmark', *Southern Economic Journal*, vol. 74:2, pp. 412–433.

Harter, S. (1985), 'Manual for the self-perception profile for children', University of Denver, mimeo.

Heckman, J., Stixrud, J. and Urzua, S. (2006), 'The effects of cognitive and noncognitive abilities on labour market outcomes and social behaviour', *Journal of Labor Economics*, vol. 24, pp. 411–482.

Hopkins, J. R. (1983), *Adolescence: The Transitional Years,* New York: Academic Press.

Kiernan, K. (1999), 'Childbearing outside marriage in Western Europe', *Population Trends*, vol. 98, pp. 11–20.

Kiernan, K, and Mensah F. (2010), 'Partnership trajectories, parent and child well-being', in K. Hansen, H. Joshi and S. Dex (eds), *Children of the 21st Century: The First Five Years*, Bristol: Policy Press.

Loeber, R., Stouthamer-Loeber, M., Van Kammen, W. B. and Farrington, D. P. (1989), 'Development of a new measure of self-reported antisocial behavior for young children: prevalence and reliability', in M. W. Klein (ed.) *Cross-National Research in Self-Reported Crime and Delinquency*. Kluwer Academic Publishers.

Manning, W. D. (2002), 'The implications of cohabitation for children's well-being', in A. Booth and A. C. Crouter (eds), *Just Living Together: Implications of Cohabitation for Children, Families, and Social Policy*, Mahwah, NJ: Lawrence Erlbaum.

Manning, W. D. and Brown, S. (2006), 'Children's economic well-being in married and cohabiting parent families', *Journal of Marriage and Family*, vol. 68, pp. 345–362.

Manning, W. D. and Lamb, K. A. (2003), 'Adolescent well-being in cohabiting, married, and single-parent families', *Journal of Marriage and Family*, vol. 65, pp. 876–893.

Manning, W. D. and Lichter, D. T. (1996), 'Parental cohabitation and children's economic well-being', *Journal of Marriage and Family*, vol. 58, pp. 998–1010.

Manning, W. D., Smock, P. J. and D. Majumdar (2004), 'The relative stability of cohabiting and marital unions for children', *Population Research and Policy Review*, **23**, 135–59.

McLanahan, S. and Sandefur, G. (1994), *Growing Up with a Single Parent: What Hurts, What Helps*, Cambridge, MA: Harvard University Press.

Neale, M. D. (1997), *Neale Analysis of Reading Ability – Revised*, Windsor: NFER-Nelson.

Nowicki, S. and Strickland, B. (1973), 'A locus of control scale for children', *Journal of Consulting and Clinical Psychology*, vol. 40, pp. 148–54.

Ribar, D. (2004), 'What do social scientists know about the benefits of marriage? A review of quantitative methodologies', Institute for the Study of Labor (IZA), Discussion Paper no. 998.

Rust, J. (1996), *The Manual of the Wechsler Objective Language Dimensions*, Sidcup, UK: The Psychological Corporation.

Smock, P. J. and Gupta, S. (2002), 'Cohabitation in contemporary North America', in A. Booth and A. C. Crouter (eds), *Just Living Together: Implications of Cohabitation for Children, Families, and Social Policy*, Mahwah, NJ: Lawrence Erlbaum.

Stratton, L. S. (2002), 'Examining the wage differential for married and cohabiting men', *Economic Inquiry*, vol. 40, pp. 199–212.

Wechsler, D., Golombok, S. and Rust, J. (1992), *Wechsler Intelligence Scale for Children – Third Edition*, UK Manual, Sidcup, UK: The Psychological Corporation.