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Child Development at Age Seven in Wales: Analysis of the Millennium Cohort Study

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Views expressed in this report are those of the researcher and not necessarily those of the Welsh Government

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Executive Summary

The Millennium Cohort Study in Wales

1. The UK Millennium Cohort Study (MCS) includes an overrepresentation of children living in Wales. The Welsh Government augmented funding from the Economic and Social Research Council (ESRC) to document the development of children across the board, with a special focus on social disadvantage. The cohort has been followed so far in four surveys since the year of their birth in 2000-1. At the fourth survey in 2008, when the children were seven-years-old, interviews were carried out with just over 2,000 families in Wales. This report updates analyses of the factors associated with child development in Wales that had already been examined in the age three and age five surveys, and elaborates material that has been contributed to the Welsh Government's *2011 Children and Young People's Wellbeing Monitor*.

Method

2. Multiple regression analysis is used to address the independent contribution of each of a combination of factors associated with children doing better or worse on a range of outcomes. The outcomes considered are:

   - child behaviour problems as reported by the parent at age seven

   - cognitive assessments at age seven of abilities in maths, reading and pattern construction.

3. Regression analysis was applied to ascertain the extent to which variations in these outcomes could be explained in terms of family circumstances and parenting practice in the pre-school years, and includes a special focus on the use of the Welsh language.

Social advantage, parenting and child gender

4. Consistent with findings for the UK as a whole, socio-economic disadvantage emerges as a predictor of less favourable child outcomes. Different indicators of socio-economic circumstances predict variation in different aspects of child development. Parenting behaviour also contributes, in various ways, to the explanation of differences in child outcomes regardless of the degree of socio-economic advantage. In terms of children's own characteristics, girls tended to score better on all counts than boys. Behaviour scores at age five helped to predict both behavioural and cognitive outcomes at age seven.

Predictors of behaviour problems at age seven

5. For the prediction of behaviour problems, the most important socio-demographic indicators of disadvantage to come to the fore are mother's age at first birth, lone motherhood and parental worklessness.

Predictors of cognitive skills at age seven

6. For maths and reading, low parental education and incomes below the poverty line are more predictive of poor scores. For non-verbal skill in pattern construction, the indicators of disadvantage that emerge as salient are having several older siblings and growing up in a workless family.

Reading to the child in early years

7. In terms of parenting practice, reading to the child in the pre-school years is a significant positive predictor of children's development for all four outcomes. Daily reading at age three is associated with around a five months' worth of lead in cognitive scores at age seven (independent of socio-economic circumstances). Other aspects of parental behaviour are also additionally associated with some aspect of a child's progress in Wales, but not so consistently when reading is included.

Welsh language

8. Children from homes where Welsh was spoken showed somewhat lower scores in maths than children where the home language was English, both before and after controlling for socio-economic variables. Otherwise exposure to the Welsh language at home or school was not significantly associated either way with cognitive and behavioural outcomes.

No single lever

9. The analysis suggests that parent and child behaviour, along with material adversity, all contribute to child cognitive scores, but in varied ways. The drivers are complex, and there is no single factor that appears to be a lever that can be operated in isolation.

Points of view of parent, teacher and child compared

10. A supplementary note explores the multi-dimensionality of child development further by comparing information on child wellbeing from three different sources available in the age seven survey: parents, teachers and children. It shows that the parents' account of their children's behaviour was not always in agreement with the teachers', nor, particularly, with the answers of the children themselves in a questionnaire they completed. Children who achieve the highest cognitive scores are not necessarily those who express the greatest wellbeing, although there is more alignment of lower expressions of wellbeing and lower cognitive scores. We caution that models of cognitive ability should not be treated as if they reflected children's subjective wellbeing. Instead we suggest that the association of the 'low end' of the cognitive and learning spectrum with the low end of happiness rating points to one (small) group of particular interest to policy makers.

1 Introduction

1.1 The Millennium Cohort Study in Wales

1.1.1 The UK Millennium Study (MCS) is a national, multi-purpose resource established to trace progress and diversity of the children born at the turn of the Millennium. In the UK as a whole there are over 19,000 families who have participated in at least one of the four surveys to date. These took place when the children were aged nine months (mainly in 2001), and then at ages three, five and seven. The most recent survey took place in 2008. The MCS is run by the Centre for Longitudinal Studies (CLS) at the Institute of Education, University of London. The main funder of the study is the Economic and Social Research Council, with substantial co-funding from government departments, including the Welsh Government. The Welsh Government's contribution enabled the sample selected in Wales to be more than proportionate to the population. Across the study, areas of social deprivation were oversampled by design (Plewis, 2007) and the over-representation of disadvantaged areas was enhanced in the Welsh sample. The initial survey obtained interviews with 2,760 families in Wales. By the fourth sweep, examined in this report, there were 2,018 interviews conducted in Wales, almost all with families who had been there (rather than elsewhere in UK) since the outset. Details about findings from the first three surveys are reported in sourcebooks edited by Dex and Joshi (2005), and Hansen, et al. (2010), as well as a wide scientific literature. There is comprehensive information on the data collected in all sweeps, and subsequent publications on the CLS website (www.cls.ioe.ac.uk).

1.2 Origin and aims of this report

1.2.1 This report of a short study for the Welsh Government, analyses data collected mainly at age seven. It follows an earlier one produced by CLS for the Welsh Government by Dex, Cullis and Hansen (2010), which presented multivariate analysis of data collected at ages three and five, focusing on the

development of cohort children in Wales. This earlier report studied and investigated variation in cognitive, behavioural and educational outcomes in terms of social and demographic predictors, parental behaviour and whether or not the child was bilingual in English and Welsh.

1.2.2 Here we explore some of the many possible factors that may explain variations in the behavioural and cognitive outcomes of children living in Wales at age seven. Specifically, the outcomes considered are the Total Difficulties Scale from the Strengths and Difficulties Questionnaire (Goodman, 1997) and three cognitive assessments, treated separately. We focus on social, demographic and economic circumstances and indicators of parenting practice as potential explanatory factors. In order to exploit the insights into causality presented by the longitudinal nature of the survey, we take indicators of the circumstances and parenting practice from the first two sweeps of the survey, when the children were aged nine months and three years respectively. This approach identifies long-term consequences of prior family context and parental behaviour, and largely rules out reverse causation from child's difficulties to the parent's situation or behaviour. Nevertheless, there should still be caution in treating estimated coefficients as identifying causal effects in real life. They represent statistical associations in observational data, which do not necessarily reveal what would happen in the case of an unobserved counterfactual. Hence the words 'effect' and 'impact' are presented in inverted commas.

1.2.3 This longitudinal approach also resembles analyses carried out for the UK as a whole in reports to the government of Northern Ireland (Sullivan et al. 2010a, 2010b) with which this study of Wales may, up to a point, be compared. We have compared our results for Wales with Dex et al.'s (2010) analyses of child outcomes at age three and five. However unlike that study, we have not estimated the impact of parenting and family circumstances for Wales and the UK side-by-side as UK analyses already exist.

1.2.4 We supplement the regressions with an appendix exploring further perspectives on the links and contrasts between different measures of child

development and wellbeing at the age seven survey, by comparing the reports of different informants: parent, teacher and child.

1.3   Plan of analysis

1.3.1   The analysis investigates whether there were any differences, not otherwise explained, between children who spoke Welsh at home or who were being educated in Welsh, and those children living in Wales where the English language was used at home. This is one respect in which these analyses are not directly comparable with the UK models. Another is that we do not consider ethnic group differences within Wales, as the numbers in minority groups are too small to yield significant results. We have also refined our way of presenting regression results for cognitive scores with reference to age patterns in the data. We show results for three cognitive scores separately rather than as a composite indicator, so as not to exclude up to 151 children, who did an alternative reading test in Welsh, from the analysis of the other cognitive scores.

1.4   The dependent variables

1.4.1   The three cognitive assessments we analyse are Progress in Maths, the British Ability Scales (BAS) Pattern Construction, and BAS Word Reading (Elliott, 1996). The latter is only available for children assessed in English, while the first two were assessed in Welsh as well as English. Our treatment of development indicators at age five as factors predicting the age seven outcome is another way in which these analyses differ slightly from those already published for the UK at age seven (Sullivan et al., 2001b) or Wales and UK at age five (Dex et al., 2010). Where the scores at consecutive ages are highly correlated, as they were between age three and five and are here between age five and seven, the model which relates independent predictors directly to their age seven score is picking up their full accumulated 'impact' on the score observed at age seven. Including the age five score along with the other predictors helps to show how far the socio-economic (or parenting) influences were already set at age five, and how far they contribute to

changes since then, widening (or narrowing) differentials during the first two years of primary school. In this report the inclusion of an identical age five outcome is only possible for two outcomes, the Pattern Construction Assessment, first administered at age five, and the Total Difficulties Score, which has been reported by the parent at each survey since age three. The Maths and Reading Assessments suitable for seven-year-olds were not conducted at age five.[1]

1.4.2 Finally, in another departure from the UK analysis, our models of cognitive outcome also include a measure of behavioural adjustment at age five as a potential predictor of cognitive attainment at age seven.

1.5 The explanatory variables

Child characteristics and mother health

1.5.1 The predictor variables we considered form four groups. The first is a set established at or before the child's birth: the child's sex, birth weight, birth order (proxied by the number of older siblings at age five), and the age of the mother at the birth of her first child, which may also be a marker of social disadvantage (Joshi and Hawkes, 2006). Secondly, we considered two measures of parental health at the age three survey: the mother's Body Mass Index (BMI) and whether the main informant, usually the mother, had a longstanding illness or disability. Mother's depression at age three was not significant in any of the models and so was excluded.

Indicators of social and economic advantage

1.5.2 Thirdly we considered a group of indicators of social and economic circumstances in the child's early years. Those which appear in at least one

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[1] Although maths and reading are likely to be correlated with other cognitive scores measured at earlier sweeps, the possible inclusion of earlier cognitive score in age seven models has not been pursued here.

regression are: the highest level of education of either parent[2], the experience of income poverty (persistent or transient) over the first two sweeps[3], and the number of parents with and without jobs in the family at age three. The group of families with 'zero earners', which are highly correlated with the persistent poor, combines workless couples with workless lone parents ('Lone or both not in work'), as the child outcomes of parental worklessness turn out to be similar, regardless of the number of parents not in work. In fact there were more workless lone parents than workless couples in this category. We also investigated parental social class (the highest ranked class of either parent at the first two sweeps). This was significant in the UK analysis of cognitive and behaviour scores at both age five and seven, but not in any of the analyses tried for Wales. Class may be statistically redundant because the education term picks up more of the association in Wales than elsewhere. Indeed we found that at age five, educational outcomes in Wales were especially sensitive to parental education compared with the rest of the UK (Sullivan et al., 2010a)[4]. All of these socio-economic terms are fairly closely related and may be thought of as somewhat interchangeable indicators of socio-economic disadvantage. However not all of the poor are workless or minimally educated.

Parenting practice

1.5.3 We also simultaneously consider a fourth set of variables relating to parenting practice:

- breastfeeding until at least six months

- taking the child to the library at age three

- reading to him or her regularly

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[2] Over 41 per cent of families have at least one parental degree between them and around 8 per cent have no qualifications, depending on the sample used.

[3] About one in six families were below the poverty line at both sweeps and one in three in one sweep.

[4] We found an interaction in a UK model of teacher-rated ability at age five between residence in Wales and parents with highest education at NVQ3.

- having regular meal times

- helping the child learn sport.

1.5.4 These are only a small selection of a much larger range of information on parenting behaviour. They can be thought of as indicators representing a richer array of factors, rather than of great individual significance. Beneficial parenting is typically correlated with the economic and educational standing of the parent. Higher socio-economic status tends to facilitate good practice, but does not necessarily do so. The model thus allows for beneficial effects of parenting, regardless of the family's economic resources.

1.5.5 In fact there is a limit to the number of separate factors for which independent associations can be detected in the data. Many variables, including smoking during pregnancy, family structure, use of childcare before age three, rurality, rating of the area, regular mealtimes, and child's TV watching, have dropped out of our analysis, not necessarily because they have no 'effect' on the variation in the outcome variable, but because they are correlated with other variables which are already picking up that association. Nearly all of these terms were significant in the UK analyses of age seven data by Sullivan et al. (2010b). Some of them were significant in the analysis of age three and five in Wales by Dex et al. (2010).

1.5.6 The samples analysed were families living in Wales when the child was age seven, with information on each dependent variable. The numbers range from 1,604 for pattern construction to 1,696 for total difficulties. Where families had twins or triplets, only the first child's scores are used. The analysis allowed for the sampling design (clustered in wards in advantaged and disadvantaged strata) in estimating the effects of different factors and their statistical significance.

2 Results

2.1 Behavioural Difficulties

2.1.1 The dependent variable, Total Difficulties Scale, is based on four subscales (20 items) in Goodman's Strengths and Difficulties Questionnaire. These subscales tap a range of behavioural difficulties (peer problems, emotional difficulties, aggressive conduct and hyperactivity). Each item scores 1 or 2 depending on whether they are said to be 'somewhat true' or 'certainly true'. Hence an increase of two points reflects the difference between one of 20 problems being reported certainly or not at all, or two items being reported as somewhat true. A lower score on this outcome is good news: it implies fewer difficulties. Figure 1 shows two regression analyses of 1,696 children in Wales at age seven for whom there was complete data on behaviour at age seven and five and on the predictor variables, with details in Table 1.

2.1.2 Table 1 shows the results of two models, the second of which includes the Total Difficulties Score at age five. The rows of Table 1 list the predictor variables that showed a significant association with the Total Difficulties score in at least one model. Figure 1 plots these estimates as solid bars when they are statistically different from zero or as hollow bars when included but not significantly different from zero in a particular model. The blank rows in Figure 1 show variables that were investigated without yielding any significant estimates. Their contribution is set to zero in the final model. Despite not having a significant estimate in either behaviour model, the exact age at the age seven interview is always included for comparability with cognitive scores, where scores tend to rise with age. One does not necessarily expect the number and severity of a child's behavioural problems to move in an ever-increasing way as they get older, unlike their accumulation of cognitive skills.

2.1.3 Girls, other things being equal, have a lower difficulty score than boys, but their advantage does not amount to more on average than the score for one problem. Many other significant estimates are also of the same limited order

of magnitude. Having a mother who was relatively young at her first birth (which often also implies low education and low marital stability) is associated with more behavioural difficulty in the child. However the reduced estimate in Model B indicates that much of the influence was already established by age five. Being the first born is associated with more difficulties, while fewer difficulties are reported when the child has one or two older siblings. This is the opposite direction to the apparent benefits of being the first born for cognitive scores. Again the association is attenuated in Model B, but remains significant.

2.1.4   In terms of parental health, longstanding illness was a significant predictor, but only in Model A, where children with a mother in chronic poor health, other things being equal, have around one point more on the difficulties score than other children.

2.1.5   Workless families with one or two parents, and also lone parents in work, had children displaying more difficulties at age seven (by a modest margin on average) than other children. However this difference was only significant in Model A, not Model B, suggesting a pattern set at age five, but not deteriorating thereafter. Parental education and the family experience of poverty in the pre-school years do not add anything extra to the explanation of this outcome.

2.1.6   Among the parenting variables, those that emerge as beneficial for behaviour are reading to the child, home involvement in teaching sport, and having regular meal times. The latter has the biggest estimate, nearly three points on average (well over one problem), and may reflect a set of orderly parenting practices, captured here in terms of mealtimes and elsewhere in bedtimes.

2.1.7   It is perhaps surprising that neither maternal BMI, breastfeeding nor maternal depression showed any association with behaviour problems in the presence of other variables, although they did in the larger UK sample (Sullivan et al., 2010b). It is worth noting that the child's exposure to Welsh language, at home or school, showed no association either way.

2.2   Allowing for behaviour at age five

2.2.1   Including the Total Difficulties score at age five does help to explain age seven scores. For every point recorded at age five the score at age seven increases by 0.73 (also the value of the correlation coefficient between the two terms). This reduces the size of the other coefficients, considerably in all cases, and renders some statistically insignificant. The influences that remain relatively large over and above behaviour at age five are gender, birth order and regular meal times. This suggests that these factors are related to changes in behavioural adjustment between ages five and seven, whereas socio-economic background (measured as worklessness and lone parenthood at age three) had most of its impact on the score at age five, which then feeds through to the score at age seven.

2.3   Cognitive scores

2.3.1   The results of Tables 2 to 4 are summarised in Figures 2 and 3. Figure 2 shows estimates of the models without predictors from age five (Model A), while Figure 3 illustrates estimates from the full Model B that incorporates the age five behaviour score. Table 2 reports regression analyses of Models A and B for the maths scores of 1,631 seven-year-old children in Wales with valid data. Table 3 shows the analyses of word reading for 1,418 children. There are fewer children for this outcome since a number of children took a reading test in Welsh, the results of which we have not been able to incorporate. Table 4 presents four regressions on the 1,604 valid cases for a non-verbal assessment, pattern construction, with and without values of itself at age five as a predictor, as well as with and without the age five behaviour score. The figures use a metric of a month's worth of cognitive development to illustrate the relative impact of each explanatory factor. This is based on the relatively limited age differences at interview within each sample, almost all confined within twelve months. The age terms are not validated national norms, and we would be cautious of interpreting any difference as 'months of progress' if it implied more than a 12 month gap. As in Figure 1, coefficients that have been retained in the estimates, but whose margins of error include

zero are plotted in hollow bars in Figure 2 and 3. Rows are left blank for factors which were dropped from the model as insignificant, but were significant in at least one cognitive model. There are also several factors that appear in the behaviour models but none of the cognitive ones, which are not plotted in Figure 2. These include age of mother at first birth, regularity of meal times and helping the child learn sport.

2.3.2 Considering first the models of the three cognitive scores without the age five behaviour score in Figure 2, by contrast with the UK as a whole, girls do significantly better than boys only on reading. Otherwise the results for both maths and reading are fairly similar. The socio-economic factors that are strong for both maths and reading are parental education and persistent poverty. The estimates suggest that the contrast between being below the poverty line at both early surveys and being above it on both occasions is associated with about six months progress on both scores. This is after allowing for parental education, which has the largest 'impact'. The estimated difference between the child of at least one graduate and a child whose parents have no qualifications is 9 months for maths and 11 months for reading. There is an even greater contrast if a parent has a post-graduate degree, but translation into months of progress would be unreliable as it takes us beyond the observed age range. The non-verbal (pattern construction) score is the only cognitive one displaying sensitivity to the number of parents and earners, factors which were shown to influence the behaviour score. Lack of earners may, for these variables, 'swamp' the relationship with poverty or education found for the other two outcomes. This non-verbal ability also appears sensitive to different predictors than maths and reading such as mother's smaller BMI, being the first born and having been breastfed.

2.3.3 Simply reading to the child every day at age three shows a significant relationship with all three cognitive outcomes. Comparing reading 'every day' with 'once or twice a week' at age three suggests it 'advances' reading and maths by the equivalent of five to six months at age seven, a similar order of magnitude to the margin associated with keeping above or below the poverty line at two consecutive surveys.

2.3.4 Overall the cognitive scores show sensitivity to both socio-economic background and parenting behaviour, but not in a uniform fashion. Different outcomes show different degrees of association with a given predictor.

2.4 **Welsh language**

2.4.1 Although the variable identifying those children who come from Welsh speaking homes or attend Welsh speaking schools at age seven was included in all the models, it only proved significant for maths. Children from Welsh speaking families did a little worse in maths (equivalent to under two months progress on average) than the other children, including those from English speaking homes attending Welsh schools, despite the option of doing a Welsh version of the assessment. This disadvantage in maths (and only maths) was also apparent in the bi-variate analysis (not shown). Characteristics of Welsh speaking families other than bilingualism have not been exhaustively investigated, and may help to explain this finding. The pattern construction score was not significantly lower in children from Welsh speaking homes, and indeed was not at age five either. It is not surprising that the exercise did not pick up any difference in relation to word reading, since many Welsh speaking children were not included in the assessment. There were insufficient numbers doing the reading test in Welsh for separate analysis, and the scores cannot be pooled especially in the absence of national norms for the Welsh Reading data. Among those children who took the English Word Reading test at age seven[5], we did not find the shortfall noted at age five for children from Welsh bilingual families who attempted the Naming Vocabulary in English (Dex et al., 2010).

2.5 **Behaviour at age five**

2.5.1 Figure 3 shows the results of including the child's behaviour score at age five in each model. This allows for the possibility that behavioural difficulties may

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[5] In the word reading analysis there were 82 children from Welsh speaking homes and 142 at Welsh speaking schools.

disrupt learning, and may also be a pathway through which early adversity leads to disadvantage in the school years[6]. There is evidence that behaviour problems at age five are linked to slower cognitive progress up to age seven. In each model an extra two problems reported at age five (that is, an increase in the Total Difficulties score by 4) is associated with about two months' cognitive delay at age seven. At the same time, the estimated independent influence of other predictors is reduced in almost all cases. The paler shaded bars beneath those repeated from Figure 1 are almost all somewhat shorter than the bars immediately above them, as would be expected. However, the reductions are not substantial: one might expect more shrinkage if behavioural maladjustment at age five was a major route to low cognitive scores at age seven. Indeed, some estimates are strengthened by the inclusion of age five behaviour, such as the advantage of being first born for reading.

2.6   Cognitive score at age five

2.6.1   The inclusion of the pattern construction score at age five in Models A and B of pattern construction at age seven, is also reported in Table 4 (but not plotted). The age five score is strongly related to the age seven score, a unit at age five raising the score at age seven by 0.95 points, suggesting vicious and virtuous circles at play. Including the early pattern construction score accounts for the relationship at age seven with birth order, parental earning status at age three and taking the child to the library at age three. This suggests that the 'impact' of these variables had already been felt by age five, and the 'effect' was indirectly transmitted through the accumulation of cognitive advantage over the following two years. However the beneficial effects of breastfeeding and reading to the child at age three are still apparent at age seven, over and above their association with the score at age five. The inclusion of the age five score on pattern construction also eclipses the estimate of behaviour at age five on pattern construction at age seven.

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[6] The simple correlations between total difficulties at age five and maths, word reading and pattern construction at age seven were -0.22, -0.30 and -0.15, all significant but smaller than their correlation with difficulties at age seven, of 0.73.

3　Conclusion

3.1　The shadow of social disadvantage in early years

3.1.1　Socio-economic disadvantage emerges through different indicators to predict different aspects of child development, as do different aspects of parenting practice. What we do see of Wales is not unlike the more detailed picture emerging in UK-wide samples (Dex et al., 2010, Sullivan et al., 2010a and 2010b). The 'failure' of a fuller picture to emerge may in part reflect the difficulty of obtaining well-defined estimates in the smaller sample, around 1,400 to 1,700 in Wales compared to the 10,000 to 11,000 available for analysis of the UK sample at age seven. The study of some processes for Wales may well benefit from the details discernible in the larger pooled sample, which has not been pursued here.

3.1.2　Girls tended to score better on all counts than boys, as they did in UK analysis, and had done in the analyses of Wales at ages three and five. However the estimates for Wales at age seven were not all well determined. Birth weight was significantly, and positively, related to only one outcome considered here, pattern construction, as it had been at age five. It was also significantly related to educational outcomes in the UK study (Sullivan et al., 2010b).

3.1.3　The socio-demographic indicators of disadvantage that come to the fore for the prediction of behaviour problems at age seven are: the mother having been young at first birth, lone motherhood, low birth order and parental worklessness at age three. The analyses for age three and age five (Dex et al., 2010) also found raised difficulties for first born children and significant associations with a similar set of socio-economic conditions: mother's education, family income, renting home, the type of area they live in, and maternal depression, among others. For the UK analysis of a combined

cognitive score for the seven-year-olds, there were also significant estimates for a similar longer list of indicators (Sullivan et al., 2010b).

3.1.4 Low scores on pattern construction at age seven are also associated, like problem behaviour, with parental worklessness at age three, but for this outcome it had become an advantage to be first born (this term was insignificant at age five but advantageous on vocabulary at both age three and five in the analysis of Dex et al.). For maths and reading, the most salient socio-economic predictors are parental education and poverty in the first two surveys. This difference within models explaining cognitive scores contrasts with the analyses of age three and age five outcomes, where the socio-economic indicators used by Dex et al. (2010) and Sullivan et al. (2010b) were more consistently significant across all outcomes.

3.2 **The contribution of positive parenting**

3.2.1 Turning to parenting practice, reading to the child in the pre-school years is the only predictor of children's development that is significant for all four outcomes at age seven. The same was found at age five. Children whose parents read to them daily at age three were around five months more advanced in cognitive scores by age seven, compared to children whose parents only read to them twice a week or less at age three, all else equal. Reading is not the only predictor of a child's progress in Wales (and elsewhere), but it contributes to cognitive scores over and above socio-economic circumstances. It may also reflect a mechanism whereby children benefit from social advantages, and may be a marker of a whole range of positive parenting practices.

3.2.2 In two out of three models of cognitive scores, the positive effects of reading to the child at home are independently enhanced if the child is regularly taken to the library at age three. Even where this term does not have an independent estimated 'effect', it is likely to support the activity of reading at home. Another aspect of home learning, sport, shows up with a significant effect in the prediction of good behaviour. Few other aspects of parenting

emerge from these models with an independent contribution to the outcomes. This does not necessarily mean that they are not beneficial, just that independent influences are not detected.

3.3 Any offset to the benefits of a bilingual home only minor

3.3.1 Specific to this analysis of Wales was investigation of the role in cognitive outcomes of children being bilingual in Welsh and English. Children from homes where Welsh was spoken showed somewhat lower scores in maths than those whose home language was English (even if the latter went to a Welsh speaking school), after controlling for other background factors. No difference was detected in the models on the behaviour or non-verbal scores, and no conclusion can be drawn about reading, as the scores for reading in Welsh are not comparable. Furthermore we could not replicate the findings of Dex et al. (2010) that children in Wales who came from bilingual homes had lower scores on English vocabulary. This was not included in the age seven survey.

3.4 Disadvantages at age five tend to persist at age seven, little evidence of gaps continuing to widen

3.4.1 The child's behaviour score at age five helps to predict all four developmental scores at age seven, particularly behaviour. It does not in general wipe out the predictive power of the other regressors. We can only trace the widening or narrowing of gaps since age five in the behaviour score and pattern construction, which was also measured at age five. This was highly correlated with its age seven score and embodied much of the contribution of the child's circumstances and parental behaviour from the early years.

3. 5 Caveats

3.5.1 We should note, by way of caveat, that there was no attempt to predict behaviour scores from the child's cognitive ability. Nor was there any attempt to allow for changes in economic circumstances or parental behaviour after

age three. The analysis was testing the lasting effects at age seven of variables measured four or more years previously. Our results do not say anything, for example, about what would happen to child outcomes if parents stop, or start, reading to their child at a later date.

3.5.2 As we show in the Appendix, another caveat is that the parents' account of children's behaviour is not always in agreement with the perspectives of the children themselves or their teachers, and the variables which predict these other accounts may not be the same as those used here. The Appendix also shows that the children who achieve the highest cognitive scores are not necessarily those who express the greatest wellbeing, although there is more congruence at the lower end of wellbeing and cognition. We therefore warn against treating models of cognitive ability as if they reflected children's subjective wellbeing.

3.6 Diversity of drivers

3.6.1 In sum, these analyses suggest that parent and child behaviour, along with material adversity, contributes to delay in child cognitive development, but in rather varied ways. The drivers are complex, and none of them emerge as a single lever that can be operated in isolation to improve children's attainment or behaviour.

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Figure 1 Increase or decrease in Total Difficulties score at at age 7, by factor, when all others held constant
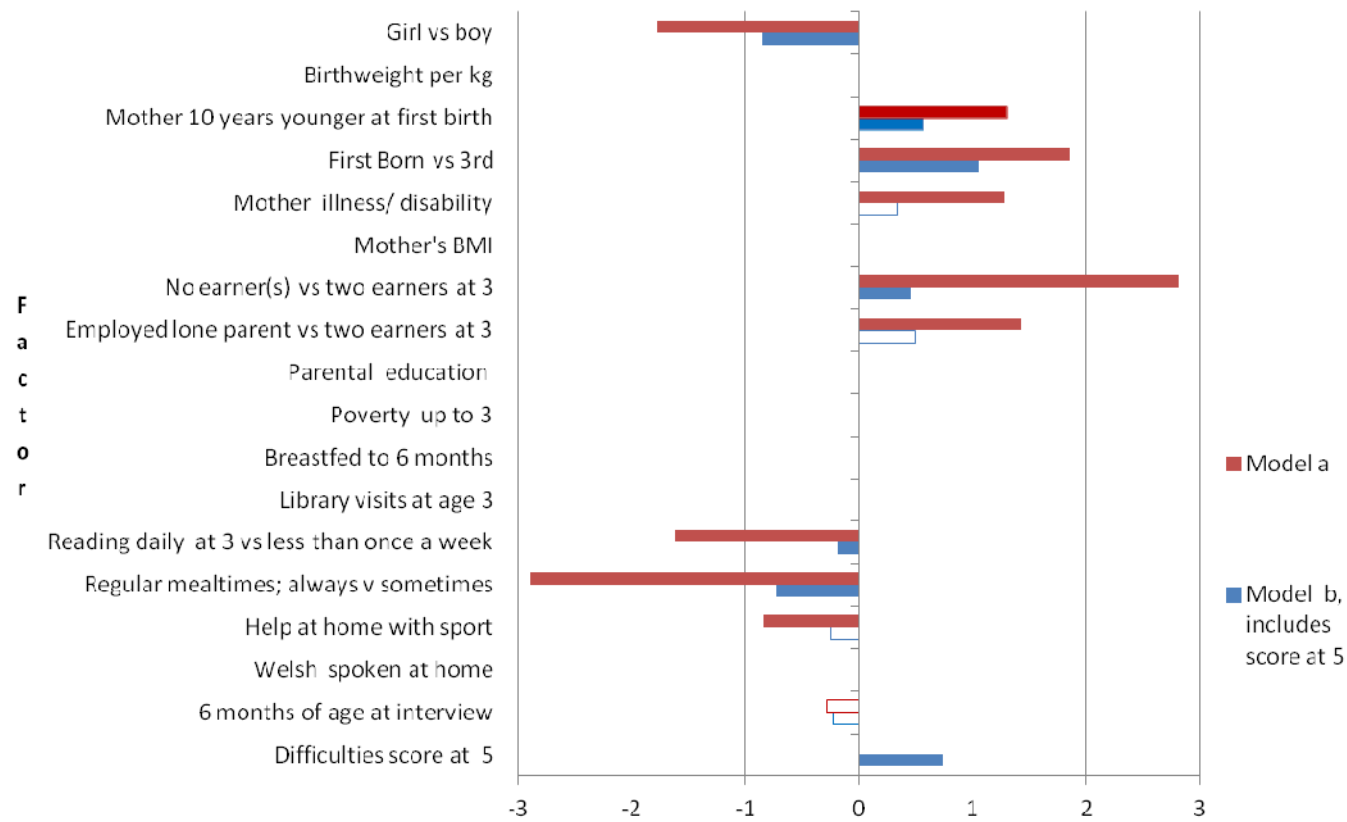
Factors not entered into Model a as as not significant are shown as blank, factors included but not sigificant are shown with hollow bars. One difficulty out of 20 reported 'certainly' raises score by 2 units

Figure 2 Estimates of differentials in three cognitive scores at age 7 for Wales: predictors up to age 3, when controlling for other included factors
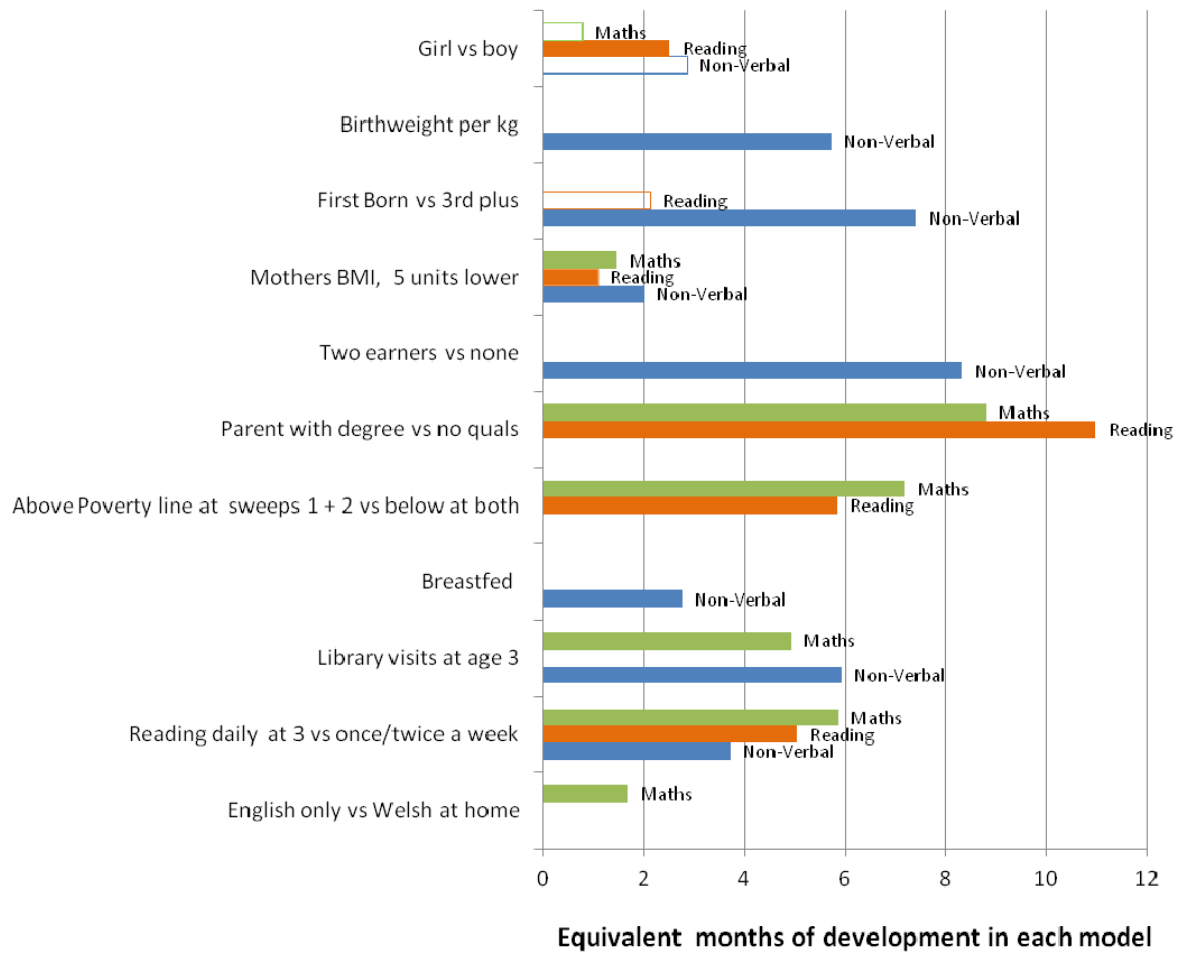
Figure 3 Estimates for models 3 cognitive scores at age 7 in Wales: predictors up to age 3 and (Model b) behaviour score at age 5

Girl vs boy
Birthweight per kg
First Born vs 3rd plus
Mothers BMI, 5 units lower
Two earners vs none
Parent with degree vs no quals
Above Poverty line at sweeps 1 + 2 vs below at both
Breastfed
Library visits at age 3
Reading daily at 3 vs once/twice a week
English only vs Welsh at home
Two fewer problem behaviours at age 5

- Maths a
- Maths b
- Word Reading a
- Word Reading b
- Pattern construction a
- Pattern construction b

Equivalent months of development

Table 1: Analysis of Total Difficulties score, age 7 (Sweep 4), Wales

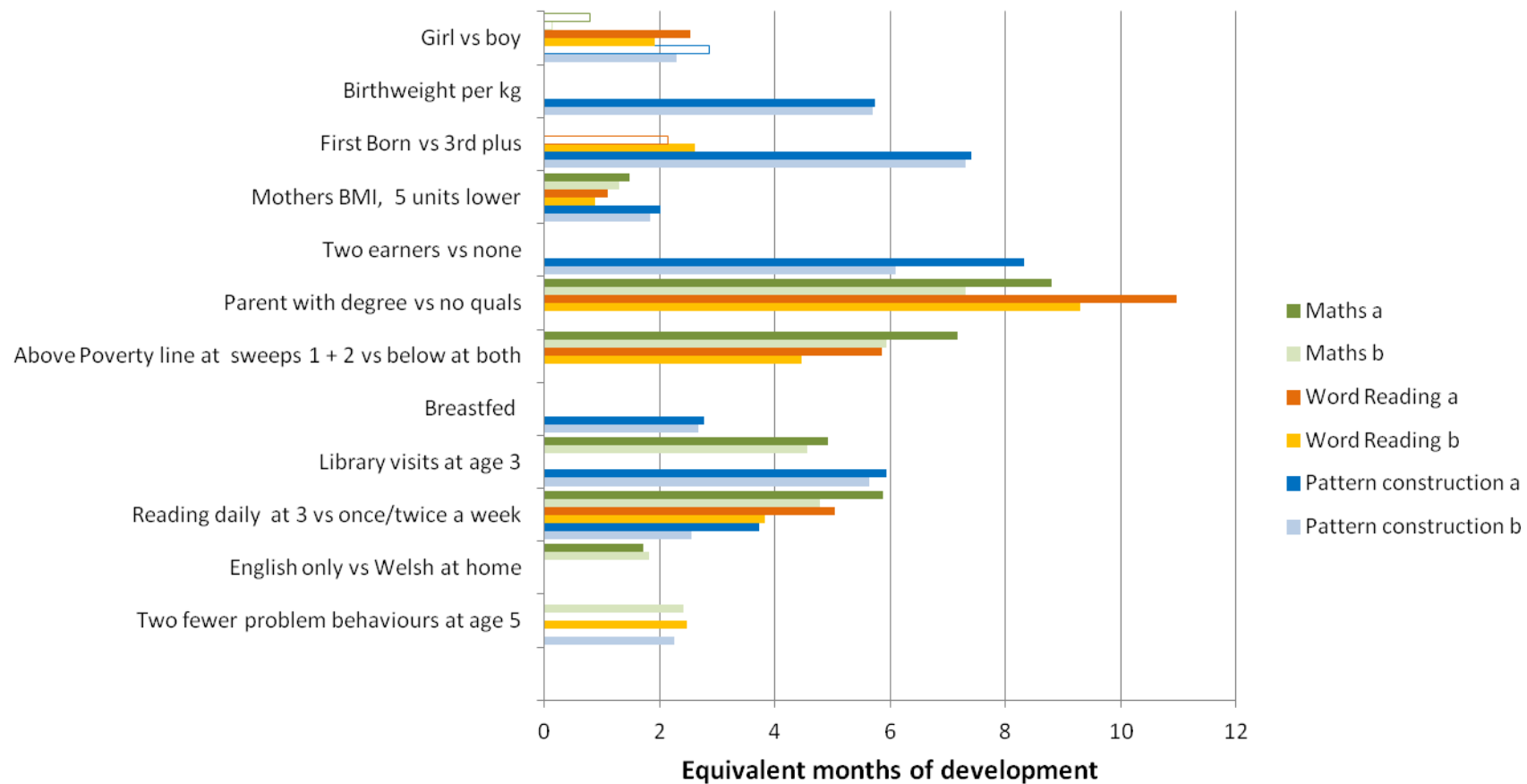| Mean (SD) of dependent variable: 7.6 (5.6)		Descriptive statistics: analysis sample		Model A		Model B	
Variable and Sweep measured		Weighted column % or *mean*	Actual sample size	Estimate	[95% CI]	Estimate	[95% CI]
Sex of child	Boy	53.3	887	0		0	
	Girl	46.7	809	-1.770***	[-2.24,-1.30]	-0.851***	[-1.19,-0.51]
Age at interview sweep 4	Per month	*87.3*	1696	-0.0464	[-0.11,0.02]	-0.0375	[-0.09,0.02]
Age of mother at first birth	Per year	*24.4*	1696	-0.130***	[-0.17,-0.09]	-0.0562**	[-0.09,-0.02]
Number of cohort child's older sibs	None	42.1	711	0		0	
	One	36.7	605	-1.081***	[-1.70,-0.46]	-0.713**	[-1.16,-0.27]
	Two	14.0	253	-1.847***	[-2.61,-1.09]	-1.062***	[-1.59,-0.53]
	Three or more	7.2	127	-1.081	[-2.26, 0.10]	-0.878*	[-1.59,-0.16]
Longstanding illness/disability, main parent sweep1/2	No	76.3	1280	0		0	
	Yes	23.7	416	1.283***	[0.65,1.91]	0.337	[-0.09, 0.77]
Parental combined labour market status, age 3	Both in work	38.0	661	0		0	
	One in a couple in work	26.6	463	0.355	[-0.21, 0.92]	0.0579	[-0.42, 0.53]
	Lone parent in work	5.8	97	1.428**	[0.41,2.44]	0.495	[-0.30, 1.29]
	Lone or both not in work	18.7	293	2.820***	[1.81,3.83]	0.458	[-0.23, 1.15]
	Partner or main non response	11.0	182	0.700	[-0.44, 1.83]	0.0415	[-0.52, 0.60]
How often do you read to the child? Age 3	Every day	58.0	997	0		0	
	Several times a week	17.4	301	0.487	[-0.23, 1.21]	0.271	[-0.18, 0.73]
	Once or twice a week	15.8	265	1.302***	[0.55,2.06]	0.184	[-0.43, 0.80]
	Less often or not at all	8.8	133	1.621*	[0.36,2.88]	0.181	[-0.65, 1.01]
Regular meal times, age 3	Sometimes	10.1	173	2.891***	[1.94,3.84]	0.733*	[0.08,1.38]
	Usually	37.9	663	0.247	[-0.23,0.73]	-0.156	[-0.56,0.25]
	Always	52.0	860	0	[0.00,0.00]	0	[0.00,0.00]
Helping child to learn sport, age 3	Yes	79.7	1352	0	[0.00,0.00]	0	[0.00,0.00]
	No	20.3	344	0.836*	[0.02,1.65]	0.245	[-0.33,0.82]
Total Difficulties at age 5	Score at age 5	7.6	1696			0.732***	[0.68,0.79]
	Constant			14.36***	[8.53,20.19]	7.202**	[2.55,11.85]
Weighted analysis sample				1678.4		1678.4	
Unweighted sample				1696		1696	
	Model F(p)			7.83e-18		1.23e-28	
95% confidence intervals in brackets			*p* < 0.05, **p* < 0.01, ***p* < 0.001				

Table 2: Analysis of Progress in Maths score, age 7 (Sweep 4), Wales

Mean (SD) of dependent variable:18.6 (5.8)		Descriptive statistics: analysis sample		Model A		Model B Includes SDQ at age 5	
Variable and sweep measured		Weighted col % or *mean*	Actual sample size	Estimate	[95% CI]	Estimate	[95% CI]
Sex of child	Boy	52.8	848	0		0	
	Girl	47.2	783	0.196	[-0.37,0.76]	0.0315	[-0.55,0.61]
Age at interview Sweep 4	Per month	*87.3*	1631	0.248***	[0.12,0.38]	0.247***	[0.12,0.38]
Mother's Body Mass Index Sweep2 Age 3	Unit of BMI	*25.2*	1631	-0.0733**	[-0.12,-0.02]	-0.0636*	[-0.11,-0.01]
Parents' highest level of education (age 0 or 3)	No quals	7.9	120	0		0	
	Overseas only	0.9	15	-1.635	[-5.30,2.03]	-1.724	[-5.47,2.02]
	NVQ1	7.0	110	0.539	[-1.19,2.27]	0.401	[-1.21,2.01]
	NVQ2	23.8	401	1.885**	[0.68,3.09]	1.549**	[0.41,2.69]
	NVQ3	18.0	292	1.582*	[0.28,2.88]	1.226	[-0.00,2.45]
	NVQ4	36.3	603	2.183***	[1.05,3.31]	1.806**	[0.72,2.90]
	NVQ5	6.0	90	2.251*	[0.49,4.01]	1.885*	[0.09,3.68]
Experience of income poverty at either of both of first two sweeps	Above at both	48.3	799	0		0	
	Below or above at one	28.7	491	-0.756	[-1.55,0.04]	-0.658	[-1.46,0.14]
	Below at both	21.3	322	-1.779***	[-2.67,-0.88]	-1.465**	[-2.40,-0.53]
	Missing data at both	1.7	19	0.375	[-1.91,2.66]	0.341	[-2.08,2.76]
Anyone at home take child to the library (age 3)	Yes	36.6	607	0		0	
	No	63.4	1024	-1.221***	[-1.76,-0.68]	-1.128***	[-1.67,-0.59]
How often do you read to the child? (age 3)	Every day	57.6	954	0		0	
	Several times a week	18.0	296	-1.085**	[-1.77,-0.40]	-1.011**	[-1.71,-0.32]
	Once or twice a week	16.2	260	-1.455**	[-2.31,-0.60]	-1.179**	[-2.01,-0.35]
	Less often / not at all	8.3	121	-0.886	[-2.34,0.57]	-0.587	[-2.07,0.90]
Welsh language spoken? (age 7)	No	78.6	1263	0	[0.00,0.00]	0	[0.00,0.00]
	Home	8.6	151	-2.413***	[-3.49,-1.33]	-2.485***	[-3.57,-1.40]
	School only	12.8	217	-0.423	[-1.28,0.43]	-0.449	[-1.30,0.41]
Difficulties Score (age 5)	Score at age 5	*7.4*	1631			-0.149***	[-0.20,-0.09]
	Constant			-0.908	[-12.42,10.60]	0.240	[-11.45,11.92]
Weighted analysis sample				1607.4		1607.4	
Unweighted sample				1631		1631	
	Model F(p)			1.60e-12		4.44e-14	

95% confidence intervals in brackets   *p* < 0.05, **p* < 0.01, ***p* < 0.001

Table 3: Analysis of word reading score (in English), age 7 (Sweep 4), Wales

Mean (SD) of dependent variable, 99.7 (33.1)		Descriptive statistics Analysis sample		Model A		Model B	
Variable and sweep measured		Weighted column % or mean	Actual sample size	Estimate	[95% CI]	Estimate	[95% CI]
Sex of child	Boy	53.7	747	0		0	
	Girl	46.3	671	5.105***	[2.41,7.80]	3.891**	[1.12,6.66]
Age at interview sweep 4/ age 7	Per month	87.2	1418	2.022***	[1.46,2.58]	2.031***	[1.48,2.58]
Number of cohort child's older siblings	None	42.6	596	0	[0.00,0.00]	0	[0.00,0.00]
	One	36.9	510	-0.860	[-4.98,3.26]	-1.461	[-5.49,2.57]
	Two	13.8	210	-5.134	[-10.49,0.22]	-6.313*	[-11.40,-1.23]
	Three or more	6.7	102	-4.335	[-12.31,3.64]	-5.284	[-12.62,2.05]
Mother's Body Mass Index sweep 2/ age 3	Unit of BMI	25.3	1418	-0.441**	[-0.72,-0.16]	-0.354*	[-0.62,-0.08]
Parents' highest level of education (age 0 or 3)	No quals	8.0	109	0		0	
	Overseas only	0.9	14	-0.815	[-26.06,24.43]	-0.596	[-24.93,23.74]
	NVQ1	6.8	95	7.726	[-3.20,18.66]	6.156	[-3.46,15.77]
	NVQ2	24.5	358	16.43***	[9.32,23.54]	13.48***	[7.12,19.83]
	NVQ3	18.2	251	16.69***	[8.64,24.74]	13.22***	[6.27,20.18]
	NVQ4	36.2	522	22.17***	[15.73,28.61]	18.86***	[12.79,24.94]
	NVQ5	5.4	69	31.10***	[22.00,40.20]	27.49***	[19.15,35.83]

Experience of income poverty at either of both of first two sweeps	Above at both	47.8	687	0		0	
	Below or above at one	28.5	426	-6.747**	[-10.81,-2.68]	-5.826**	[-9.71,-1.94]
	Below at both	22.0	287	-11.82***	[-17.14,-6.51]	-9.058***	[-14.14,-3.98]
	Missing data at both	1.8	18	3.255	[-11.43,17.94]	3.193	[-11.36,17.74]
How often do you read to the child? (age 3)	Every day	57.6	826	0		0	
	Several times a week	17.9	257	-6.279**	[-10.82,-1.74]	-5.368*	[-10.03,-0.71]
	Once or twice a week	16.2	228	-10.19***	[-15.05,-5.34]	-7.750**	[-12.51,-2.99]
	Less often or not at all	8.4	107	-5.506	[-13.75,2.74]	-3.595	[-11.61,4.42]
Difficulties Score, age 5	Score at age 5	7.5	1418			-1.252***	[-1.63,-0.87]
	Constant			-76.11**	[-121.47,-30.74]	-67.43**	[-111.96,-22.89]
Weighted analysis sample				1407.2		1407.2	
Unweighted sample				1418		1418	
	Model F(p)			1.06e-18		1.25e-19	

95% confidence intervals in brackets * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Analyses of pattern construction, age 7 (Sweep 4), Wales

Mean (SD)of dependent variable, 118.7 (14.7)		Descriptive statistics, analysis sample		Model A.1		Model A. 2 + PC at age 5		Model B.1 +SDQ at age 5		Model B.2 + PC and SDQ at age 5	
		Weighted column % or mean	Actual sample size	Estimate	[95% CI]	Estimate	[95% CI]	Estimate	[95% CI]	Estimate	[95% CI]
Sex of Cohort Member	Boy	52.6	833	0		0		0		0	
	Girl	47.4	771	1.160	[-0.26,2.57]	0.0220	[-1.20,1.24]	0.934	[-0.49,2.35]	-0.0319	[-1.25,1.18]
Age at interview Sweep 4/ Age 7	Per month	87.3	1604	0.411**	[0.17,0.65]	0.667**	[0.24,1.09]	0.412**	[0.17,0.65]	0.670**	[0.25,1.09]
Birth weight	Per KG interval	2.9	1604	2.771***	[1.52,4.02]	1.609**	[0.60,2.62]	2.762***	[1.50,4.02]	1.613**	[0.60,2.63]
Number of older sibs,	None	42.2	674	0		0		0		0	
	One	36.9	574	-0.165	[-1.91,1.58]	0.470	[-0.77,1.71]	-0.274	[-2.04,1.49]	0.439	[-0.82,1.70]
	Two	13.7	235	1.047	[-1.62,3.72]	0.637	[-1.40,2.68]	0.911	[-1.80,3.63]	0.604	[-1.46,2.67]
	Three or more	7.2	121	-3.350**	[-5.62,-1.07]	-1.944	[-4.07,0.19]	-3.314**	[-5.62,-1.01]	-1.941	[-4.08,0.19]
Mothers Body Mass Index Age 3	Unit of BMI	25.3	1604	-0.198**	[-0.32,-0.07]	-0.128*	[-0.23,-0.03]	-0.185**	[-0.31,-0.06]	-0.125*	[-0.23,-0.03]
Parental combined labour market status, Age 3	Both in work	39.2	642	0		0		0		0	
	One in a couple in work	26.4	437	-0.273	[-2.13,1.58]	0.167	[-1.43,1.77]	-0.238	[-2.12,1.64]	0.174	[-1.44,1.79]
	Lone parent in work	5.6	87	2.632	[-1.38,6.64]	1.875	[-1.67,5.42]	2.894	[-1.11,6.90]	1.946	[-1.64,5.53]
	Lone or both not in work	17.7	263	-3.400**	[-5.68,-1.12]	-0.727	[-2.98,1.53]	-2.505*	[-4.88,-0.13]	-0.507	[-2.87,1.85]
	Partner or Main non response	11.0	175	-1.223	[-3.09,0.65]	-1.818*	[-3.63,-0.00]	-1.110	[-2.96,0.74]	-1.786	[-3.61,0.03]

		%	N	Model 1	95% CI	Model 2	95% CI	Model 3	95% CI	Model 4	95% CI
Whether breastfed up to six months	Per 3 month interval to 6 months	2.1	1604	1.211**	[0.47,1.96]	1.374***	[0.70,2.05]	1.169**	[0.44,1.90]	1.361***	[0.69,2.03]
Anyone at home take child to the library Age 3	Yes	80.3	1286	0		0		0		0	
	No	19.7	318	-2.609**	[-4.19,-1.02]	-1.114	[-2.45,0.22]	-2.494**	[-4.07,-0.92]	-1.090	[-2.41,0.23]
How often main respondent read to the child Age 3	Every day	57.9	942	0		0		0		0	
	Several times a week	18.0	291	-1.808*	[-3.57,-0.05]	-1.482*	[-2.89,-0.07]	-1.661	[-3.39,0.07]	-1.445*	[-2.84,-0.05]
	Once or twice a week	16.2	256	-1.420	[-3.31,0.47]	0.109	[-1.49,1.71]	-0.947	[-2.91,1.01]	0.226	[-1.36,1.81]
	Less often or not at all	7.9	115	-1.517	[-4.36,1.33]	-0.376	[-2.65,1.90]	-1.073	[-3.97,1.82]	-0.268	[-2.54,2.00]
Pattern Construction, Age 5	Score at S3	19.9	1604			0.951***	[0.84,1.06]			0.947***	[0.84,1.06]
Months of age at Age 5 interview	Age in months at S3	63.5	1604			-0.693***	[-1.09,-0.30]			-0.695***	[-1.09,-0.30]
Total Difficulties, age 5	Score at s3	7.4	1604					-0.228**	[-0.36,-0.09]	-0.0588	[-0.19,0.07]
	Constant term			79.79***	[57.86,101.72]	82.28***	[60.63,103.92]	80.98***	[59.41,102.55]	82.56***	[60.97,104.15]
Weighted analysis sample				1582.6		1582.6		1582.6		1582.6	
Unweighted sample				1604		1604		1604		1604	
	Model F(p)			1.58e-16		1.79e-21		4.90e-15		1.29e-21	

95% confidence intervals in brackets

$p < 0.05$, $p < 0.01$, $p < 0.001$

Appendix: Alternative perspectives on wellbeing and development of seven-year-olds

A1   The regression analysis, like most of the literature, focuses on well-validated instruments to measure cognitive progress and behavioural adjustment. The 4th sweep of MCS however offers some supplementary evidence, from a postal survey of teachers and less conventional evidence on child wellbeing from the paper-and-pencil questionnaire completed by the cohort children at age seven, for the first time. The postal survey of teachers yielded information on about two thirds of the children in Wales. There was a high response on the child self-completion questionnaire, with 90 per cent of children completing it during the interviewer's visit. In this appendix we triangulate the evidence from these additional sources, where available, to explore in a preliminary way how far the less standard (and less well-validated) measures of child wellbeing, reported directly by children, reflect conventional assessments of child development, as analysed in the rest of the report[7].

Teacher and parent accounts of child behaviour and emotional adjustment

A2   Both the teacher and the parent of the child completed the set of questions that made up the Strengths and Difficulties Questionnaire, a standard instrument to measure emotional and behavioural adjustment. Table A1 compares overall Difficulties scores for the sample, where there are responses from both teacher and parent (just under 1,200 cases). Teachers give children on average lower behaviour problem scores than parents, but they are more likely to identify a minority with high difficulties among boys than the parent. Teacher and parent scores are positively but not strongly correlated.

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[7] Responses from all children completing the questionnaire are covered here, including all twins and triplets.

Child responses about emotions and behaviour and those of adults

A3   Tables A2-A12 compare responses from the child, parent and teacher on those individual items that roughly corresponded to questions put to the child for just over 1,000 cases where there is a response from all three informants.

A4   While subjective ratings of behaviour problems vary to some extent between the two adults reporting on the same child, the child's own account of their worries, happiness, experience of bullying etc is markedly less positive on average, with ambivalent answers prevailing. For example, 66 per cent of children say they are 'worried' 'some' or 'all' of the time, while 32 per cent of teachers and 21 per cent of parents say it is 'somewhat' or 'always true' that the child has 'many worries; or often seems worried.' On two comparable, though not identical, questions about bullying, 92 per cent of the teachers and 78 per cent of parents say that it is 'not true' that the child is 'picked on or bullied by other children', whereas only 45 per cent of the same children reply that that they are 'never' bullied by other children. In Table A8, the children report behaving well in class more often than adults report them to be obedient.

A5   It is not surprising that the different perspectives (and sometimes different wordings and different order of asking) yield different answers, but it is nevertheless worth bearing in mind the alternative emphasis in the child and adult reports when looking at data from one perspective alone.

Child cognitive ability and subjective wellbeing

A6   Where other information is lacking, it tends to be assumed that if children are doing well on cognitive development that they can be taken to be thriving more generally. Does this appear to be the case here?

A7   Children's reports of subjective wellbeing in terms of unhappiness, worry, bullying, exclusion, and not feeling safe in the playground are compared with their cognitive scores in Tables A13 and A14. Ability is measured on a non-

verbal scale, pattern construction, available for a fuller sample of MCS children in Wales than the verbal score. On threefold ratings of wellbeing, ('all of the time', 'some of the time', 'never'), there was a tendency for the least able children to choose both extremes and the most able to give more neutral responses (i.e. 'some of the time'). This applies to subjective wellbeing questions, feeling safe in the playground and being left out by other children. For example 7 per cent of the children in the bottom fifth of the ability range say that they are sad all of the time, and 37 per cent say that they are never sad. In contrast, one per cent of those in the top fifth are always sad and 28 per cent never sad. Thus 57 per cent of the least able and 71 per cent of the most able say that they are sad some of the time. On being bullied and being horrible to other children, the most able children are unambiguously least affected. One in six of the least able children report being bullied by other children 'all of the time', against 5 per cent of the most able group. The most able children are also most likely to report never being bullied or 'being horrible to other children'. We found similar patterns using a more general composite score based on three assessments including both verbal and non-verbal dimensions, but only available for a smaller sample and not shown.

A8   Although we do not know the causal mechanisms involved, this suggests that improvements in cognitive ability may not necessarily involve positive changes in wellbeing. Although children with low scores have a tendency to report low wellbeing less infrequently than those with high scores, measures of cognitive development should not be assumed synonymous with some general notion of child wellbeing.

Activities children say they like to do and how often parents say they do them

A9   We have compared parents' and children's responses about a number of activities. Children were asked how much they enjoyed doing them, and parents were asked about how often they were done, usually together. On the whole, parents report children doing activities more often where children reports liking it. We cannot say whether the activity is more frequent because children enjoy it, or the other way round. The full set of tables is not shown,

but in view of the strong links between reading in the home and cognitive development detected in the regressions, Tables A15 and A16 compare children's claims to enjoy reading with parental reports of how often they read to the child at age seven, and how often they report that their children read to themselves. Children who like reading a lot are more likely to read and be read to on a daily basis. It leads to questions not answered here about why the children who don't read don't enjoy it.

Subjects children enjoy and how their teachers rates their skills

A10   Table A17 shows that children who report not liking reading are more likely to be bad at it, according to their teachers. We have looked at other comparisons of children's accounts of how much they like a specified school subject and how the teacher rates the child's skill in that subject – reading, maths, science and PE (not shown). A similar congruence appears with the child enjoying a classroom subject and the teacher reporting above average performance (though curiously this does not apply to PE). Again the direction of causality is not clear, but this is some indication that successful learning and enjoyment – and indeed wellbeing – are linked.

Conclusion

A11   These appendix tables illustrate that child wellbeing has various dimensions, which are evaluated differently from the point of view of different informants. They may either compensate or compound one another, but the association of the 'low end' of the cognitive spectrum with low end of happiness rating points to one (small) group that should be of particular interest to policy makers. More generally, even though they have not been investigated in the rest of the UK MCS sample and do not claim to have explained the causal mechanisms, these explorations suggest that an agenda attending to the several dimensions of child wellbeing today will also lead to better learning and investment in their future.

Table A1: Correlations between parent and teacher scores on SDQ difficulties subscales

	Correlation	Mean score		*n*
		Teacher	Parent	
Total difficulties score	0.50	6.26	7.44	*1,185*
Peer	0.29	1.14	1.17	*1,187*
Emotional	0.31	1.46	1.53	*1,191*
Conduct	0.34	0.78	1.38	*1,192*
Hyperactivity	0.53	2.91	3.39	*1,191*

Table A2: Temper tantrums

	Often has temper tantrums or hot tempers		*How often do you lose your temper?*	
	Teacher %	Parent %		Child %
Not true	90.1	54.2	Never	30.3
Somewhat true	7.7	34.3	Some of the time	60.8
Definitely true	2.2	11.5	All of the time	8.8

Unweighted N=1,092

Table A3: Worries

	Has many worries, often seems worried		*How often do you get worried?*	
	Teacher %	Parent %		Child %
Not true	67.9	78.7	Never	33.4
Somewhat true	26.6	17.3	Some of the time	60.4
Definitely true	5.5	4.1	All of the time	6.3

Unweighted N=1,083

Table A4: Unhappy

	Is often unhappy, down-hearted or tearful		*How often do you feel....*		
				sad?	unhappy at school?
	Teacher %	Parent %		Child %	
Not true	83.1	86.9	Never	28.9	45.4
Somewhat true	12.4	9.8	Some of the time	68.5	48.2
Definitely true	4.5	3.3	All of the time	2.6	6.4

Unweighted N=1,071

Table A5: Solitary

	Is rather solitary, tends to play alone		How often do you like to be alone?	
	Teacher %	Parent %		Child %
Not true	81.8	73.2	Never	55.2
Somewhat true	12.9	21.9	Some of the time	36.7
Definitely true	5.3	4.9	All of the time	8.1

Unweighted N=1,097

Table A6: Bullied / picked on

	Is picked on or bullied by other children		How often do other children bully you?	
	Teacher %	Parent %		Child %
Not true	92.1	77.5	Never	45.6
Somewhat true	5.6	18.6	Some of the time	45.2
Definitely true	2.4	3.9	All of the time	9.2

Unweighted N=1,054

Table A7: Bullies / fights others

	Often fights with other children or bullies them		How often are you horrible to other children at school?	
	Teacher %	Parent %		Child %
Not true	86.6	92.0	Never	83.9
Somewhat true	11.0	7.0	Some of the time	13.9
Definitely true	2.4	0.9	All of the time	2.2

Unweighted N=1,094

Table A8: Obedient

	Is generally obedient, usually does what adults request		How often do you behave well in class?	
	Teacher %	Parent %		Child %
Not true	4.1	3.0	Never	2.1
Somewhat true	21.3	36.5	Some of the time	26.1
Definitely true	74.6	60.5	All of the time	71.8

Unweighted N=1,084

Table A9: Has a good friend

	Has at least one good friend		How many friends do you have?		Do you have any best friends?	
	Teacher %	Parent %		Child %		Child %
Not true	3.6	2.2	Not many	9.4	No	5.0
Somewhat true	18.0	6.9	Some	24.6	Yes	95.0
Definitely true	78.4	90.9	Lots	66.0		

Unweighted N=1,095

Table A10: Parents and teachers reporting the child is bullied by whether child reports being bullied

	Child response to: *How often do other children bully you?*		
Parent reports	*All the time*	*Some of the time*	*Never*
Not true	55.3%	73.0%	86.5%
Somewhat true	31.0%	22.9%	11.8%
Definitely true	13.7%	4.1%	1.7%
Teacher reports			
Not true	90.7%	89.3%	94.3%
Somewhat true	8.6%	7.6%	3.6%
Definitely true	0.7%	3.1%	2.1%
N(100%)	*105*	*472*	*477*

Table A11: Parents and teachers reporting the child has many worries by how often the child reports they worry

	Child response to: *How often do you get worried?*		
Parent reports	*All the time*	*Some of the time*	*Never*
Not true	65.6%	74.7%	88.2%
Somewhat true	21.9%	21.2%	9.4%
Definitely true	12.6%	6.2%	2.4%
Teacher reports			
Not true	65.4%	66.6%	70.8%
Somewhat true	28.8%	27.2%	25.0%
Definitely true	5.8%	6.2%	4.2%
N(100%)	*67*	*657*	*359*

Table A12: Parents and teachers reporting the child is unhappy, down-hearted or tearful by how often the child reports they are unhappy at school

| | Child response to: *How often are you unhappy at school?* | | |
Parent reports	*All the time*	*Some of the time*	*Never*
Not true	80.0%	85.1%	87.9%
Somewhat true	17.5%	11.0%	10.2%
Definitely true	2.5%	3.9%	2.0%
<u>Teacher reports</u>			
Not true	74.9%	79.7%	87.9%
Somewhat true	18.4%	13.8%	10.2%
Definitely true	6.7%	6.6%	2.0%
N(100%)	*72*	*507*	*492*

Table A13: Extreme values of child's feelings by pattern construction score

| | *How often do you feel…………* | | | | | | | |
| | *Happy?* | | *Worried?* | | *Sad?* | | *Unhappy at school?* | |
	All the time	Never	All the time	Never	All the time	Never	All the time	Never
1 Lowest %	45.5%	3.0%	8.2%	39.3%	6.5%	36.6%	8.9%	49.1%
2	42.0%	2.4%	7.6%	33.9%	3.0%	30.6%	8.9%	45.4%
3	44.0%	1.0%	5.3%	32.1%	2.7%	32.4%	9.9%	47.6%
4	35.8%	1.2%	4.9%	28.6%	1.3%	26.7%	5.3%	41.8%
5 Highest %	35.2%	1.4%	5.0%	30.1%	1.0%	27.8%	4.6%	40.8%

Unweighted N=1,798-1,824

Table A14: Extreme values on some indicators of peer relations, by pattern construction score

| *Pattern construction score* | *How often are you …………* | | | | | | | |
| | *Safe in the playground?* | | *Bullied by other children?* | | *Horrible to other children?* | | *Left out by other children at school?* | |
	All the time	Never	All the time	Never	All the time	Never	All the time	Never
1 Lowest %	62.2%	12.0%	16.3%	40.9%	1.8%	83.1%	11.4%	49.0%
2	58.6%	6.4%	12.9%	43.9%	1.8%	83.0%	11.7%	40.8%
3	62.5%	5.5%	9.9%	47.2%	3.2%	87.0%	5.4%	52.2%
4	66.6%	3.5%	7.2%	48.7%	1.0%	85.8%	6.4%	38.0%
5 Highest %	65.6%	3.9%	5.4%	49.4%	2.8%	88.9%	5.2%	42.0%

Unweighted N=1,798-1,824

Table A15: Parents reporting how often they read to their child by how much the child reports they like reading

| Parent reports | Child response to: *How much do you like reading?* | | |
	I like it a lot	*I like it a bit*	*I don't like it*
Everyday	42.5%	37.3%	26.0%
Several times a week	26.6%	29.4%	28.0%
Once or twice a week	22.7%	23.8%	27.7%
Once or twice a month	3.4%	4.7%	8.9%
Less often than once a month	2.5%	2.2%	5.2%
Not at all	2.3%	2.5%	4.2%
N(100%)	*1025*	*590*	*206*

Unweighted N=1,821

Table A16: Parents reporting how often their child reads by how much the child reports they like reading

| Parent reports child reads | Child response to: *How much do you like reading?* | | |
	I like it a lot	*I like it a bit*	*I don't like it*
Everyday	45.6%	25.5%	14.4%
Several times a week	21.0%	19.7%	22.0%
Once or twice a week	19.2%	26.7%	23.2%
At least once a month	4.2%	8.7%	8.0%
Every few months	2.1%	3.4%	1.6%
At least once a year	0.2%	0.2%	0.9%
Never	7.6%	15.8%	29.8%
N(100%)	*1027*	*590*	*206*

Unweighted N=1,823

Table A17: Teachers reporting the level of the child's reading skills by how much the child reports they like reading

| Teacher reports | Child response to: *How much do you like reading?* | | |
	I like it a lot	*I like it a bit*	*I don't like it*
Well above average	13.9%	10.2%	4.4%
Above average	33.1%	19.9%	17.5%
Average	35.2%	42.7%	30.9%
Below average	14.3%	20.1%	28.1%
Well below average	3.6%	7.1%	19.0%
N(100%)	*623*	*356*	*118*

Unweighted N=1,097