Young children's cognitive achievement: Home learning environment, language and ethnic background

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Abstract
For decades, research has shown differences in cognitive assessment scores between White and minority ethnic group(s) learners as well as differences across different minority ethnic groups. More recent data have indicated that the home learning environment and languages spoken can impact cognitive assessment and other corollary outcomes. This study uses the Millennium Cohort Study to jointly assess how minority ethnic group, home learning environment and home languages predict child cognitive assessment scores. Regression analyses were conducted using two assessment measures. The following is hypothesised: (1) cognitive achievement scores vary by minority ethnic group, (2) more home learning environment in early childhood leads to higher cognitive development scores and (3) English only in the home yields the highest cognitive scores while no English in the home yields the lowest. Findings reveal that there are differences in cognitive scores along ethnic group categories although there are also some unexpected findings. Home learning environment does not play as large a role as was predicted in raising the assessment scores overall for learners while speaking English in the home does, irrespective of ethnic background.

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Introduction

This study has been undertaken in an attempt to identify and quantify the effect of specific aspects of home learning environment (HLE) and language spoken in the home on cognitive achievement of different minority ethnic groups (MEGs) compared to White British children. The importance of understanding contributors to higher cognitive achievement in early school years cannot be underestimated. While there has been a great deal of research for decades in this area, as seen in the following review of the literature, no single study has looked at HLE and language between different MEGs on specific cognitive measures. Data from the Millennium Cohort Sample (MCS) provide an ideal opportunity to investigate these issues.

According to developmentalists, home is where the child first experiences language and literacy (Strickland and Taylor, 1989). The HLE has a significant impact on children's cognitive outcomes (e.g. Beals and DeTemple, 1993; Dickinson and Tabors, 1991; Heckman, 1995; Teale, 1987). HLE is important because it impacts cognitive abilities in the early years and in turn those are predictors of future academic success (Johnson and Kossykh, 2008).

Native language, if it does not match the country of residence irrespective of country, has also been found to be a significant contributor to cognitive assessment scores. For instance, Jensen and Wuertz (2010) found a significant negative effect on cognitive assessment scores among children who only spoke their native language in the home, when it was not the native language of the residential country.

HLE

Beyond tangible resources that are provided in the home alone, parent and child interactions around those items are important components of HLE (Snow et al., 1991). HLE includes parents reading to their child, teaching songs and nursery rhymes, playing with letters and numbers, visiting the library, painting and drawing and learning the alphabet.

Parent and child joint reading, as well as encouraging independent reading, has been found to have a positive impact on language and literacy development (Burgess, 1997; Desforges and Abouchaar, 2003; Lonigan and Whitehurst, 1998; Payne et al., 1994; Sénéchal et al., 1998), and enhances motivation for the child to read later on (Baker et al., 1997; Bus, 1994; Morrow, 1983). This was found to be the case irrespective of socio-economic (SES) backgrounds (Burgess, 1997; Griffin and Morrison, 1997; Sénéchal et al., 1998) implying that HLE may aid in raising achievement levels of lower SES children.

Specifically for the lower SES groups, children whose mothers read to them at 14 months of age had higher cognitive assessment scores than did low-income children whose mothers did not read to them. This was apparent in early cognitive scores measured at age 14 months as well as in the preschool years. Most significantly, early years reading encouraged vocabulary gains that led to greater levels of reading and increased growth in word knowledge (Raikes et al., 2006).

Other aspects of HLE have been shown to enhance performance. Allowing children to become involved in computer use in the home has been shown to be useful for outcomes in later years. For instance, McCarrick et al. (2007) found that parents who reported having active interactions with children when they were using a computer had children who scored higher on verbal, quantitative,

general cognitive and memory components of assessments. It seems that interaction with the child around cognitively stimulating activities (e.g. reading, computer use) promotes higher achievement scores.

Parental interest in a child's development is also an HLE variable. A study by Carneiro et al. (2007) found an increased level of social skills in 7-year-olds if mothers increased their level of interest in their child's education. Desforges and Abouchaar (2003) indicate that children's cognitive achievement is positively influenced by parental involvement. Children who teach and play around the alphabet on a regular basis with their parents have pre-reading scores 4.5 points higher than children with parents who did not engage in this type of activity (Sammons et al., 2002).

HLE variables account for more variance when looking at cognitive assessment scores than does mothers' qualification level (Gottfried et al., 1998). Even if mothers are not particularly well qualified academically or vocationally, or do not have high incomes, the HLE may provide an environment rich in activities that support cognitive achievement in childhood. This research hints at the idea that what parents do is more important than who they are (Sylva et al., 2004). Thus, providing a rich home environment even if the parent is not particularly well educated might well increase child cognitive outcomes.

Evidence from the United States shows that head start programmes, which are a combination of educationally and HLE-focused centre-based child care and home visits for disadvantaged children aged from birth to 3 years, increase the quantity and the quality of interactions children and parents have with each other (Love et al., 2005). In the United Kingdom, Sylva et al. (2007) recently assessed a number of factors, of which HLE was one, and have determined that it was the strongest contributor to childhood education outcomes (compared to SES, income and parents' education).

There are many factors that contribute to HLE. It is worthwhile to ascertain the relative importance of aspects of HLE. Reading to children early in life provides an educationally stimulating environment; those children are in turn active in engaging in their own educationally stimulating activities. When parents hold high expectations for children and when children receive regular support and encouragement from parents, they are more likely to be academically successful in adolescence. The research summarised earlier indicates that HLE is not predetermined; rather, it could be fostered. Parenting behaviours can be learnt and are likely to increase cognitive outcomes of young children.

Language

As stated above, the language spoken in the home has significant effects on children's cognitive achievement scores (Jensen and Wuertz, 2010). This finding is supported by UK data from 2007/2008, which shows that the approximate 15 per cent of 5-year-olds who have English as an Additional Language (EAL) typically have lower levels of attainment in early school years on verbal skills (DCSF, 2008), but achievement levels were as high as native English-speaking children on non-verbal reasoning (Melhuish et al., 2001). However, using the British Ability Scale (BAS), Hansen and Joshi (2008), Jones and Schoon (2008) and Sammons et al. (2002) found that by 5 years of age, UK EAL children produced lower scores in both language and numeracy than their native language–speaking peers.

This mixed picture of how well each language group performs on achievement tests, and differences depending on the type of test and subtest, makes it difficult to ascertain what might raise cognitive achievement in some native or native and foreign language groups more than others.

Ethnicity

This study endeavours to assess how HLE and language spoken at home contribute to cognitive outcome scores and whether this varies by MEG category. The following is a summary of that literature.

MEG represents one in eight UK students enrolled in mandatory education. There is mixed performance depending on which MEG is being considered. White European, Black African, Pakistani and Bangladeshi groups all perform less well than do UK Whites on cognitive assessment measures (Connor et al., 2004).

One also finds variation by cognitive assessment scale and MEG. When looking at specific subtests within cognitive assessment measures, studies have shown that Black African and Caribbean children have higher than expected literacy scores but lower than expected numeracy scores (Sammons et al., 2002). Young UK children of Pakistani, Indian, Bangladeshi and mixed MEG background typically have lower achievement rates than White heritage learners in both literacy and numeracy (Sylva et al., 2009).

However, findings vary depending on which assessment measures are used. Bangladeshi heritage children had lower non-verbal scores than did their White UK counterparts (Sylva et al., 2004). Indian heritage children had higher mathematics scores than White UK children (Sammons et al., 2007). At early school age, Black African children have higher scores in reading than White UK children, but by later school years, this difference ceases to exist. In the late primary school years (Key Stage 2), while Black African heritage children are behind White UK children in mathematics, Pakistani and Bangladeshi heritage children are performing better than White UK children. In order to assess performance more rigorously, samples that are representative of the population should be used.

The naming vocabulary subtest of the BAS was administered to children in the MCS cohort at age 5 years. The subtest is a series of assessments examining children's expressive language skills. White children performed the best and Bangladeshi and Pakistani heritage children poorest (Jones and Schoon, 2008), but this was on this subscale of the test alone. This mixed picture of performance does not aid educators in developing initiatives to increase cognitive assessment scores. Further research is needed to determine some of the factors underlying the varied picture on performance.

There is research available from the United States on cognitive assessment by MEG. This will be reviewed only briefly because although it is relevant, US MEGs are different than those in the United Kingdom, and therefore, one might question the generalisability of the findings. Nonetheless, this evidence may shed some light on what to expect with respect to cognitive assessment differences between ethnic majority and minority learners.

Lee and Burkam (2002) show that by age 5, there are significant cognitive score differences based on ethnicity. Using US ethnic categories, math achievement is 21 per cent lower for Black and 19 per

cent lower for Hispanics than it is for Whites. Being a working mother in the United States was found to have negative impact for cognition of non-Hispanic White children; this was not the case for Black children (Han et al., 2001).

As can be seen, there is much data on performance based on ethnic category but insufficient data to understand the reasons for variations in performance. Studies that have looked at performance differences have been limited in their examination of ethnic differences due to small sample sizes of minority groups, placing heterogeneous groups into a single 'minority' category, often restricting analyses to White versus minority comparisons. It is important to determine whether there are differences in cognitive assessment in the early years between different MEGs and their White counterparts.

This study looks at HLE and language spoken in the home to determine the impact they have on cognitive performance of children at 3 years of age in different MEGs. Data are looked at in groups (factors related to ethnicity, home environment and language in the home). The groupings are discussed in more detail later in the article.

Method

Participants

The MCS is a national survey that collects data to represent the lifespan of the population at a current point in time. It assesses medical information, schooling, marital status and so on. The MCS currently consists of 18,819 children born in the United Kingdom from September 2000 to August 2001. Cohort members were approximately 9 months old in the first sweep and 3 years old in the second sweep. There are regular sweeps of data collection with the MCS. Early on, participants were the child's main caregiver with data coming from interviews and a computer-aided self-completion questionnaire for the first sweep. In the second sweep, additional data were collected from participants along with a cognitive assessment of the children at age 3. The data set selected wards such that minority groups are over-sampled. This analysis takes account of the over-representation of the minority groups. Data used in this report are from the first and second sweeps of the MCS.1 In the final model for this study, 9106 participants were used in one analysis for one of the two dependent variables and 9537 participants were used in the second analysis for the other dependent variables.

Design and measures

In this research, it was hypothesised that cognitive achievement scores vary by MEG status (H1), more HLE in early childhood leads to higher children's cognitive development scores (H2) and English only in the home yields the highest cognitive scores while no English in home yields the lowest (H3). Ordinary Least Squares (OLS) regression analysis was done with child cognitive outcomes on the Bracken Basic Concept Scale–Revised (BBCS-R), dependent variable 1, and the BAS Naming Vocabulary, dependent variable 2.

Each regression was run twice, once using the BBCS-R and once the BAS. In each regression, the ethnicity variable was entered first. Following that, the HLE was entered and finally language in the home was entered into the model.

Dependent variables. The BBCS-R and BAS were used for children at age 3; the scales assess overlapping yet distinct skills, and the results from the data complement each other well (described in the data description section). They are widely used in research and were selected carefully for the MCS national study.

Independent variables. Independent variables were grouped such that ethnicity of the family was taken into account first. The home environment and language in the home are also assessed as independent variables.

The BAS Naming Vocabulary is a measurement instrument for children aged 2 years 6 months to 7 years 11 months. The test measures spoken vocabulary and expressive language ability. Picture recognition is also crucial. The scale requires children to recall words from long-term memory. Expressive language skills, vocabulary knowledge of nouns, ability to attach verbal labels to pictures, general knowledge, general language, development and retrieval of names from long-term memory are assessed using this scale. The BBCS-R is used for similar aged children. Six BBCS-R subtests were used with the total MCS data set assessing the concepts of colours, letters, sizes, numbers/counting, shapes and comparisons.

As may be seen in Table 1 (mean standardised score on the BAS and BBCS-R by ethnic group), there are some differences in cognitive scores by ethnic group. The Pakistani and Bangladeshi heritage children do less well than the others on both measures. English language skills may well be a factor that negatively impacts the scores of Pakistani, Bangladeshi and Black African students. This would be particularly the case on the BAS, which relies on competency in English more so than does the BBCS-R.

The HLE scale was created by combining a number of variables from the parenting activities portion of the MCS questionnaire, which dealt with the intellectual environment in the home. Those variables that are of interest for this study (e.g. HLE) are used while the others (e.g. medical information) are omitted. The HLE scale does take into account a number of the HLE variables previously assessed in other research reviewed earlier in the article. The study also incorporates some HLE not regularly used in the MCS. As can be seen from the list below, the MCS uses questions that fit logically into an HLE scale. It is important to note that this study has not attempted to assess every facet of HLE that has ever been measured previously. Rather, it takes data with a pre-existing set of questions and attempts to investigate HLE within that sample.

Questions used addressed the following areas:

How much television the child watches?

How often the child is taken to the library?

How often the child is taught counting at home?

How often the child is taught the alphabet at home?

How often the child is taught songs/poems/rhymes at home?

How often the child paints/draws at home?

How often the child is read to?

How often the child is helped at home to learn sports?

How often the child eats with the family?

Whether anything special was done for the child's third birthday?

How often the main caregiver has friends with young children over?

The questions are asked using a Likert scale ranging from 1–5 to 1–7 responses on each question. The scale is a composite of the scores on each of those individual questions. For the HLE, quintiles were created by dividing the data into five groups. This is standard practice in using the British Birth Cohort studies (e.g. Dearden et al., 2011; Hansen and Vignoles, 2010; Schoon et al., 2010). As may be seen in Table 2, every family in the data set has some level of home learning. The labels (i.e. little home learning, moderate home learning, etc.) are therefore relative terms. They are used to compare between the families in the data set rather than a fixed definition of 'little', 'moderate' and 'lots'.

Data description

Overall, 95 per cent of the babies were 9 or 10 months old during the first survey. When the cognitive assessments were done, more than 90 per cent were between the ages of 2 years 9 months and 3 years 5 months. Families of some children withdrew from the study, and others were added in the second sweep of data collection, which accounts for the different percentages within the age ranges. The data are normed so that the varying ages of the children are taken into account when looking at assessment scores.

According to the data used in this study, 86 per cent of the sample spoke 'English only at home'. A total of 10.5 per cent spoke 'English and an additional language', while 'only a language other than English' was spoken in 3.5 per cent of homes. The ethnic minority subsets of the samples are broken down as follows: 2.5 per cent Indian, 1.8 per cent Bangladeshi, 4.6 per cent Pakistani, 1.2 per cent Black Caribbean and 1.7 per cent Black African. Other MEGs were not used as there were too few in the sample to allow for viable comparisons.

Results and discussion

The analysis describes the cognitive outcomes on the BBCS-R and BAS looking at the impact of ethnic group, HLE and language in the home. Using the BBCS-R as the dependent variable in the full model (Table 3), the variables account for 24 per cent of the variance, with 11 per cent accounted for by HLE alone. The same model using the BAS as the dependent variable accounts for 17 per cent of the variance, with 13 per cent accounted for by HLE (Table 4).

Both Tables 3 and 4 follow the same format. A regression was run by first entering the MEG. The first row shows the number of observations, while the second shows the R2, or effect size. The variable

names are across the top of the table. For ease of understanding, the F and standard deviation (SD) values are included in tables within the relevant section in the text, and not in the larger tables (Tables 3 and 4). Each new set of variables controls for variables in the previous one, allowing the statistical values to show only the contribution of the variable in that column (e.g. when assessing language, HLE is controlled).

Ethnicity

Table 5 shows performance on the BBCS-R test by ethnic group. The effect size of ethnicity is 4 per cent total. This is substantial given the volume of data, even though it appears small. As can be seen, the Bangladeshi group tends to perform the least well, followed closely by the Pakistani heritage children. The lower the F value, the less well the children performed on the test, and in contrast, the higher the value, the higher the performance scores (see Table 5). This corroborates the findings of other research, such as the study of Connor et al. (2004). The Indian heritage children perform the best of all of the MEG, although White majority children perform the best of all groups.

Unexpectedly, the Black African heritage children performed less well than the Black Caribbean. While there are many possible reasons for this and it is risky to speculate, a few suggestions are given later in the article. It might be the case that the Black Caribbeans do well early on and lose ground with respect to academic success later in the school years. Another plausible explanation is that the families of those children (Black African) might have migrated recently to the United Kingdom, and the conditions for migration (e.g. seeking asylum) disrupted life in such a way that it bears on cognitive outcomes. This should be further explored.

Table 6 shows the performance on the BAS by ethnic group. The effect size for ethnicity is 8 per cent with the White children having the highest performance scores. Interestingly, this is followed by the Black Caribbeans and then the Indian heritage children; the performance differential between the White and Indian heritage children is not surprising in the early years. Their performance is followed closely by the Black African heritage children. As prior research has found and as the results from the BBCS-R in this study research show, the Pakistani and Bangladeshi heritage children generally perform the least well across cognitive tasks.

An unexpected finding is that on the BAS, the Indian heritage children performed even less well than did the Black Caribbean children. Speculating, it could be the case that the Indian heritage children do not speak English only in the house, and this accounts for their lower score on the BAS. These findings would then be in line with the work of Wilson et al. (2006), which states that children with poor English language skills will struggle in school initially. This is atypical of performance records for these ethnic groups though. Achievement scores of the Indian and Black Caribbean heritage learners should be tracked to determine whether this is a changing trend or whether there is a critical point(s) in education and development trajectories where performance of these ethnic groups reverses. This is only a provisional thought, and therefore, further research is needed to uncover the underlying cause of these findings.

Similarly, it is interesting to note that the Black African heritage children performed less well than the Black Caribbean heritage children. As was explained based on the results of the BBCS-R, migration patterns and/or language spoken in the home might be a crucial issue. It is worthwhile to

further investigate this as the migration landscape changes in the United Kingdom and the author is simply guessing as to the cause of these findings.

HLE

The home environment plays a role in how well children perform on the BBCS-R and the BAS. On both assessment instruments, children of all ethnic backgrounds have higher scores if there are more learning items in the home (books, parent and child drawing together, learning letters, etc,), which corroborates other research (e.g. Gottfried et al., 1998; Scarborough, 1991; Sylva et al., 2004; Walker et al., 1994; Werner and Smith, 1992) and supports H2.

The effect size of HLE on the BBCS-R is 11 per cent. When looking at the specific MEG, it is clear that the finding differentially affects groups. For most of the ethnic categories, HLE has a positive influence on raising cognitive assessment scores (see Table 7). Performance is the highest among the Indian heritage learners. Nevertheless, HLE fails to be a significant predictor for high outcome scores for the Indian heritage cohort. Ability to significantly predict cognitive outcome scores based on HLE surfaced for three of the MEGs; considering that ethnicity is being controlled for in this analysis, this is a positive finding. The Black African heritage children performed at levels showing that HLE has a statistically significant positive effect. The Pakistani heritage children are the next best performers with the Bangladeshi heritage children still performing the least well; HLE predicts success of those groups in a statistically significant way. This is not the case with the Black Caribbean heritage children. The pattern of achievement on the outcome score mimics what was apparent on the ethnic category groupings alone; that is, ethnic heritage is a strong predictor of success. HLE can make an additional contribution in increasing cognitive achievement scores but not across all MEGs.

Turning to the BAS (effect size 13%), there is a similar pattern. HLE is statistically significant even though the finding surfaces only for some MEGs (see Table 8). The Black Caribbean heritage learners perform the best among the MEGs although HLE has not positively and significantly impacted cognitive outcome for this group. The next best performing group is that of the Indian heritage children. Cognitive assessment scores are virtually the same with and without consideration of HLE ($F = -11.58$, $SD = 1.76$ compared to $F = -11.63$, $SD = 1.89$ when ethnicity alone was assessed). The contribution of HLE is statistically significant for the other ethnic groups (i.e. Black African, Pakistani and Bangladeshi), although it is not as impressive as one would have anticipated. Nevertheless, HLE positively raises these children's achievement scores, indicating that it is beneficial to have learning in the home for the groups.

Given the positive findings about the impact of HLE on cognitive outcomes for children in prior research, it is surprising that that was not borne out consistently across MEGs with this data set. That is not to say that HLE had no impact; rather, the anticipated outcome was higher than what was actually revealed through the data. Further research should consider how HLE, and specifically different aspects of HLE, influence cognitive outcomes of children based on MEG status. It might be the case that there are multiple factors at play, and it is difficult to tease apart which ones contribute most significantly and substantially to raising the achievement levels of minority ethnic children. It could also be the case that the MCS questionnaire taps into aspects of HLE that have fewer positive outcomes for cognitive achievement scores than other research has used to answer similar questions.

Language

Speaking English at home had a significant effect on cognitive assessment scores on both the BAS and BBCS-R. The coefficients are much higher on the BAS, -6.23 (compared to -1.95 for the BBCS-R) as English language ability is measured more directly by the BAS than by the BBCS-R.

Children living in homes in which English is the only language spoken perform the best. For the most part, these data provide support for the findings of Sammons et al. (2007) and Sylva et al. (2004). Some of the findings from this study diverge from previous findings. These are explained in the following.

Performance differences are relatively negligible whether the MEG children had EAL in the home or another language only in the home when predicting performance on the BBCS-R. The two notable exceptions to this were as follows: the Indian heritage children who performed significantly less well than the White children (F = -2.11, SD = 1.21) if they had EAL at home, and there was, oddly, no significant difference if they spoke only another language in the home (F = -1 .44, SD = 1.58) compared to speaking English only (see Table 9).

In the other exceptional case, the Bangladeshi heritage children performed less well when they did not speak English only at home. This is expected (F. = -9 .10, SD = 1.37 for the EAL and F = -11.35, SD = 1.96 for the other language only). Bangladeshis who only speak another language in the home are the most disadvantaged compared to EAL with English only performing the best with respect to cognitive achievement scores (see Table 9).

On the BAS, language ability is more important. There are no dramatic differences between the Black Caribbean, Black African and Indian heritage performance if they are EAL or another language only speakers. The differences are significant but not that different even compared with their White EAL and another language only counterparts. There is a marked difference when the Pakistani and Bangladeshi heritage children are compared with the White heritage children. Table 10 shows this with the lower numbers being weaker performance compared with the Whites in similar language categories. These differences are seen irrespective of language. White English only speakers perform better than Bangladeshi and Pakistani English only speakers. White EAL speakers perform better than Bangladeshi and Pakistani EAL speakers. White non-English speakers perform better than Bangladeshi and Pakistani non-English speakers.

Taken together, those children who do not have English only in the home are likely benefited by learning another language early on but might be disadvantaged in early cognitive assessment testing. The assessments were conducted in English, thus it is possible that cognitive skill is not being tapped into per se, and instead simply comprehension of English. Cognitive ability should be reassessed when children enter out of home care, for example, school. This might be important for children with a limited HLE and who do not speak English at home, particularly for the Bangladeshi and Pakistani heritage children.

Conclusion

These data answer the questions posed:

Hypothesis 1. The hypothesis that cognitive achievement scores vary by MEG status was supported. Minority children did less well when compared with the White children. As the coefficients are different, it is apparent that the children of minority heritage do not do equally poorly. Rather, there are nuances based on ethnic group.

Hypothesis 2. More HLE in early childhood leads to higher cognitive development scores. Findings were mixed. There were differences in predictions on cognitive assessment scores for only three of the five MEGs (Black African, Pakistani and Bangladeshi). For these groups, the higher the HLE, based on parental reporting, the higher the child's score was on the BAS and the BBCS-R.

Hypothesis 3. English only in the home yields the highest cognitive scores, while no English in the home yields the lowest. This hypothesis was supported across all MEGs. Language used in the home was important but, as expected, more so for the BAS than the BBCS-R.

While the analysis supports the broad research questions, there are still limitations in this study. Data collected were insufficient to assess all aspects of HLE. A greater number of HLE variables should be considered in future work to assess whether they differentially impact cognitive achievement of children of varying ethnic heritage groups. Second, it was hypothesised that ethnicity would contribute a greater amount of variance than it in fact did based on previous research. It is possible that this is the case because of the dynamic nature of the flow of immigrants and sub-cultures within the United Kingdom. Some individuals may be better established in the United Kingdom, while others are still struggling to come to terms with the UK style of life. These data did not allow for a detailed analysis of such variations, but these should be considered, perhaps using a qualitative as well as a quantitative analysis.

Future studies should emphasise how the different factors within the home might interact. Perhaps considering the idea of home visiting and school readiness or parenting interventions might help to give children an additional head start on their cognitive assessment scores. If a government budget could support this, it is worth considering such an intervention. Another future study should reassess children through the school years to see how progression in schools impacts achievement and the relevance of ethnicity, language and HLE.

Conclusions must be drawn that while ethnic background makes a difference on cognitive assessment scores in the early years, there are other components of a child's early life that contribute to outcome scores. It is worthwhile to investigate those components (such as language and HLE) more in depth to determine how households with children who perform poorly on cognitive assessment tests may be aided through policies emphasising the importance of the home environment.

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Note

1.For full details on the MCS national data set please refer to http://www.cls.ioe.ac.uk/studies.asp?section=000100020001.

References

Arinoldo CG (1981) Black-White differences in the general cognitive index of the McCarthy scales and in the full scale IQs of Wechsler's scales. Journal of Clinical Psychology 37: 630–638.

Baker L, Scher D and Mackler K (1997) Home and family influences on motivations for reading. Educational Psychologist 32: 69–82.

Beals DE and DeTemple JM (1993) Home contributions to early language and literacy development. In: National Reading Conference Yearbook. pp. 207–215.

Burgess S (1997) The role of shared reading in the development of phonological awareness: a longitudinal study of middle to upper class children. Early Child Development and Care 127/128: 191–199.

Bus AG (1994) The role of social context in emergent literacy. In: Assink EMH (ed.) Literacy Acquisition and Social Context: The Developing Body and Mind. New York: Harvester Wheatsheaf, pp. 9–24.

Cassen R and Kingdon G (2007) Tackling Low Educational Achievement. York: Joseph Rowntree Foundation.

Connor H, Tyers C, Modood T, et al. (2004) Why the difference? A closer look at higher education minor¬ity ethnic students and graduates. DfES research report RR552. Brighton: Institute for Employment Studies.

Department for Education and Skills Great Britain (2006) Priority review: exclusion of black pupils 'Getting it. Getting it right'. Available at: www.multiverse.ac.uk/ViewArticle2.aspx?ContentId=13494

Dickinson DK and Tabors PO (1991) Early literacy: linkages between home, school, and literacy achievement at age five. Journal of Research in Childhood Education 6: 30–46.

Feinstein L and Duckworth K (2006) Development in the Early Years: Its Importance for School Performance and Adult Outcomes. London: Centre for Research on the Wider Benefits of Learning, Institute of Education, University of London.

Gottfried AE, Fleming JS and Gottfried AW (1998) Role of cognitively stimulating home environment in children's academic intrinsic motivation: a longitudinal study. Child Development 69(5): 1448–1460.

Griffin EA and Morrison FJ (1997) The unique contribution of home literacy environment to differences in early literacy skills. Early Child Development and Care 127/128: 233–243.

Han WJ, Waldfogel J and Brooks-Gunn J (2001) The effects of early maternal employment on later cognitive and behavioral outcomes. Journal of Marriage and the Family 63: 336–354.

Hansen K and Joshi H (eds) (2008) Millennium Cohort Study: Third Survey: A User's Guide to Initial Findings. Available at: www.cls.ioe.ac.uk/studies.asp?section=0001000200010011 (accessed 25 November 2009).

Heckman JJ (1995) Lessons from the bell curve. Journal of Political Economy 103: 1091–1120.

Jensen P and Wuertz A (2010) Immigrant and native children's cognitive outcomes and the effect of ethnic concentration in Danish Schools. Available at: http://research.asb.dk/ws/fbspretrieve/2952/immigrant_children_wp.pdf

Johnson P and Kossykh Y (2008) Early Years, Life Chances and Equality: A Literature Review. Frontier Economics; Equality and Human Rights Commission.

Jones E and Schoon I (2008) Child cognition and behaviour. In: Hansen K and Joshi H (eds) Millennium Cohort Study Third Survey: A User's Guide to Initial Findings. London: Institute of Education.

Joseph Rowntree Foundation (2007) Findings: poverty rates among ethnic groups in Great Britain. April. York: Joseph Rowntree Foundation.

Kaufman AS (1973) Comparison of the performance of matched groups of black children and white children on the Wechsler Preschool and Primary Scale of Intelligence. Journal of Consulting and Clinical Psychology 41: 186–191.

Laosa LM (1984) Ethnic, socioeconomic, and home language influences upon early performance on measures of abilities. Journal of Educational Psychology 76: 1178–1198.

Lee VE and Burkam DT (2002) Inequality at the Starting Gate: Social Background Differences in Achievement as Children Begin School. Economic Policy Institute, University of Michigan.

Lonigan CJ and Whitehurst GJ (1998) Relative efficacy of parent and teacher involvement in a shared-reading intervention for preschool children from low-income backgrounds. Early Childhood Research Quarterly 13: 263–290.

McCarrick K, Li X, Fish A, et al. (2007) Parental involvement in young children's computer use and cognitive development. NHSA Dialog 10: 67–82.

MacMillan DL, Gresham FM and Siperstein GN (1993) Conceptual and psychometric concerns about the 1992 AAMR definition of mental retardation. American Journal on Mental Retardation 98: 325–335.

Meikle J (2007) Half school 'failures' are white working-class boys. The Guardian, 22 June, 12.

Melhuish E, Sylva K, Sammons P, et al. (2001) Technical paper 7: social/behavioural and cognitive devel¬opment at 3–4 years in relation to family background (The Effective Provision of Pre-School Education (EPPE) Project). London: DfEE/Institute of Education, University of London.

Morrow LM (1983) Home and school correlates of early interest in reading. Journal of Educational Research 76: 221–230.

Payne AC, Whitehurst GJ and Angell AL (1994) The role of home literacy environment in the development of language ability in preschool children from low-income families. Early Childhood Research Quarterly 9: 427–440.

Raikes H, Pan BA, Luze G, et al. (2006) Mother-child bookreading in low income families: correlates and outcomes during the first three years of life. Child Development 77: 924–953.

Rollock N (2007) Black pupils still pay an ethnic penalty – even if they are rich. The Guardian, 4 July, 31.

Sammons P, Sylva K, Melhuish E, et al. (2002) Technical paper 8a: measuring the impact of pre-school chil¬dren's cognitive progress over the pre-school period (The Effective Provision of Pre-School Education (EPPE) Project). London: DfES/Institute of Education, University of London.

Sammons P, Sylva K, Melhuish E, et al. (2007) Effective pre-school and primary education 3-11 project (EPPE 3-11) summary report: influences on children's attainment and progress in key stage 2: cognitive outcomes in year 5. Available at: http://www.ioe.ac.uk/schools/ecpe/eppe/eppe3-11/eppe3-11pubs.htm

Scarborough HS (1991) Early syntactic development of dyslexic children. Annals of Dyslexia 41: 207–220.

Sénéchal M, LeFevre J, Thomas E, et al. (1998) Differential effects of home literacy experiences on the devel¬opment of oral and written language. Reading Research Quarterly 32: 96–116.

Snow CE, Barnes WS, Chandler J, et al. (1991) Unfulfilled Expectations: Home and School Influences on Literacy. Cambridge, MA: Harvard University Press.

Strategy Unit Great Britain (2003) Ethnic Minorities and the Labour Market. London: Cabinet Office.

Strickland DS and Taylor D (1989) Family storybook reading: implications for children, families, and cur¬riculum. In: Strickland DS and Morrow L (eds) Emerging Literacy: Young Children Learn to Read and Write. Newark, DE: International Reading Association, pp. 147–159.

Sylva K, Melhuish E, Sammons P, et al. (2004) The effective provision of pre-school education (EPPE) pro¬ject. Technical Paper 12, November 2004. London: Institute of Education.

Sylva K, Melhuish E, Sammons P, et al. (2009) Final report from the primary phase: pre-school, school, and family influences on children's development during key stage 2 (age 7–11) (Effective Pre-school and Primary Education 3–11 Project (EPPE 3–11)). Final Report, November 2008. London: DCSF/Institute of Education, University of London.

Sylva K, Melhuish E, Siraj-Blatchford I, et al. (2007) Promoting equality in the early years. Report to the Equalities Review, February 2007. London: Cabinet Office.

Teale WH (1987) Emergent literacy: reading and writing development in early childhood. In: National Reading Conference Yearbook. pp. 45–74.

Walker D, Greenwood C, Hart B, et al. (1994) Prediction of school outcomes based on socioeconomic status and early language production. Child Development 65: 606–621.

Werner EE and Smith RS (1992) Overcoming the Odds: High Risk Children from Birth to Adulthood. Ithaca, NY: Cornell University Press.

Wilson D, Burgess S and Briggs A (2006) The Dynamics of School Attainment of England's Ethnic Minorities (CASE paper 105). London: LSE.

Youdell D (2003) Identity traps or how Black students fail: the interactions between biographical, sub-cultural and learner identities. British Journal of Sociology of Education 24(1): 3–20.

Table 1. Mean on cognitive assessment test by cohort member ethnic group

	Mean (BAS)	Mean (BBCS-R)
White British	75.96	104.96
Indian	60.86	100.11
Pakistani	49.25	89.28
Bangladeshi	45.49	86.49
Black Caribbean	66.41	96.83
Black African	57.98	93.75

BAS: British Ability Scale; BBCS-R: Bracken Basic Concept Scale–Revised.

Table 2. Quintiles of home learning environment

HLE	Frequency	Percent
Little home learning	3223	21.81
Little to moderate home learning	2936	19.87
Moderate home learning	3056	20.68
Moderate to high home learning	3029	20.5
Lots of home learning	2531	17.13

HLE: home learning environment.

Table 3. Sample and effect size (R_2) on the BBCS-R

Variables	White only	Ethnicity	HLE	Language			Full model
				English only	English and another	Other only	
Observations	13,067	13,067	13,067	12,989	12,617	9106	9106
R_2	0.03	0.04	0.11	0.22	0.25	0.23	0.24

BBCS-R: Bracken Basic Concept Scale–Revised; HLE: home learning environment.

Table 4. Sample and effect size (R-squared) on the on the BAS

Variables	White only	Ethnicity	HLE	Language			Full model
				English only	English and another	Other only	
Observations	13,748	13,748	13,748	13,649	13,259	9537	9537
R2	0.07	0.08	0.13	0.19	0.20	0.17	0.17

BAS: British Ability Scale; HLE: home learning environment.

Table 5. BBCS-R and MEG performance

MEG	Performance on BBCS-R
White	8.80*** (1.11)
Bangladeshi	−19.01***(1.35)
Pakistani	−14.94*** (1.14)
Black Caribbean	−6.86*** (2.12)
Black African	−9.17*** (1.58)
Indian	−3.09* (1.87)

BBCS-R: Bracken Basic Concept Scale–Revised; MEG: minority ethnic group.
***p < 0.01, **p < 0.05, *p < 0.1.

Table 6. BAS and MEG performance

MEG	Performance on BAS
White	15.99*** (1.21)
Bangladeshi	−28.60*** (2.21)
Pakistani	−24.10*** (1.44)
Black Caribbean	−7.44*** (2.05)
Black African	−13.18*** (1.89)
Indian	−11.63*** (1.89)

BAS: British Ability Scale; MEG: minority ethnic group.
***p < 0.01, **p < 0.05, *p < 0.1.

Table 7. BBCS-R, HLE and MEG performance

MEG	Performance on BBCS-R by HLE
Bangladeshi	−16.86*** (1.27)
Pakistani	−12.70*** (1.10)
Black Caribbean	−6.98*** (1.71)
Black African	−8.32*** (1.58)
Indian	−3.56** (1.67)

BBCS-R: Bracken Basic Concept Scale–Revised; HLE: home learning environment; MEG: minority ethnic group.
***p < 0.01, **p < 0.05, *p < 0.1.

Table 8. BAS, HLE and MEG performance

MEG	Performance on BAS by HLE
Bangladeshi	−26.55*** (2.11)
Pakistani	−22.35*** (1.38)
Black Caribbean	−7.04*** (1.77)
Black African	−12.36*** (1.78)
Indian	−11.58*** (1.76)

BAS: British Ability Scale; HLE: home learning environment; MEG: minority ethnic group.
***p < 0.01, **p < 0.05, *p < 0.1.

Table 9. BBCS-R, language and MEG performance

MEG	English only	EAL	Other language only
Bangladeshi	−12.97*** (1.31)	−9.10*** (1.37)	−11.35*** (1.96)
Pakistani	−9.57*** (0.95)	−6.02*** (1.02)	−5.51*** (1.39)
Black Caribbean	−4.46*** (1.58)	−3.87** (1.54)	−3.97* 2.14)
Black African	−6.70*** (1.28)	−3.71*** (1.38)	−3.47* (1.78)
Indian	−3.83*** (1.39)	−2.11* (1.21)	−1.44 (1.58)

BBCS-R: Bracken Basic Concept Scale–Revised; HLE: home learning environment; EAL: English as an additional language; MEG: minority ethnic group.
***p < 0.01, **p < 0.05, *p < 0.1.

Table 10. BAS, Language and MEG performance

MEG	English only	EAL	Other language only
Bangladeshi	−22.70*** (1.87)	−14.21*** (1.81)	−14.56*** (2.36)
Pakistani	−18.83*** (1.17)	−11.07*** (1.44)	−10.24*** (1.80)
Black Caribbean	−5.85*** (1.64)	−5.77*** (1.54)	−5.40*** (1.57)
Black African	−11.16*** (1.56)	−4.49*** (1.53)	−4.74** (2.11)
Indian	−11.05*** (1.65)	−5.61*** (1.39)	−4.93*** (1.52)

BAS: British Ability Scale; HLE: home learning environment; EAL: English as an additional language; MEG: minority ethnic group.
***p < 0.01, **p < 0.05, *p < 0.1.