Effective Pre-school, Primary and Secondary Education 3-14 Project (EPPSE 3-14) Report from the Key Stage 3 Phase: Influences on Student's Development From age 11 - 14

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Executive summary

Background and Aims

Since 1997 the Effective Pre-school, Primary and Secondary Education project (EPPE/EPPSE) has investigated the attainment and development of approximately 3,000 children from pre-school to the end of Key Stage 3 (KS3). This current phase of the research explored how different phases of education, especially secondary school, are related to students' attainment, social behaviour and dispositions at age 14 (Year 9) and the factors that predict developmental change over Key Stages. However, schools are not the only influence on students' development; families and communities matter too and these 'social' influences are carefully studied in EPPSE 3-14. The effects of schooling are reported after taking account of individual student and background influences making them 'net' of the family and the neighbourhood.

The adolescents in this current phase of the EPPSE study shape their own pathways as much as their schools, family or neighbourhood. For this reason, this report highlights students' perceptions of themselves as learners along with their views of secondary school. The students' survey reveals substantial variation in students' experiences in secondary education and possible reasons for this are explored throughout the report.

The aims of this phase of the research were to:
- investigate the relationships between students' outcomes at the end of KS3 with individual, family and Home Learning Environment (HLE) background characteristics;
- explore the influences of pre-school, primary and secondary school experiences (singly and combined), in terms of quality and academic effectiveness, on students' later outcomes and how these change over time;
- examine differences in effects between more and less disadvantaged students;
- explore the relationships between students' dispositions and their academic and social-behavioural outcomes;
- explore the effects of students' reports of their secondary school, and classroom processes, on their outcomes.

Statistical models were used to predict students' educational outcomes and developmental progress in KS3 on the basis of knowledge of their families, home environments, schools, and neighbourhoods. However, analytic models can only identify statistical patterns and associations; they cannot take account of the unique characteristics of each child, or their personal and very individual life experiences. We have sought to capture something of the uniqueness of children's 'life stories' through 50 case studies of individual children and their families (Siraj-Blatchford et al., 2011a). The richness of individual family histories, parenting styles, the child's own agency, school traditions or community features are qualitatively analysed in detail. These put a searchlight on individuals of special interest, especially those who succeeded 'against the odds' and those who did not show such success to provide new insight into risks, protective factors and resilience in childhood and beyond.

Methodology

The research design is based on an educational effectiveness and mixed methods approach (Sammons et al., 2005; Siraj-Blatchford et al., 2006). For quantitative analyses multilevel statistical models were developed to test which factors predicted students' outcomes in different domains, academic, social-behavioural and socio-emotional. The qualitative case studies selection was based on criteria derived from the quantitative analyses, thus linking the two approaches.

The KS3 academic outcomes are attainment in English, maths and science. Social-behavioural outcomes are 'self-regulation' (problem-solving, motivation, self-confidence, assertiveness etc.), 'pro-social' behaviour (peer empathy, co-operation, altruism etc.), 'hyperactivity' (reduced self-control, impulsiveness etc.) and 'anti-social' behaviour (verbal abuse, aggression etc.). Students' dispositions are measured in six areas: 'enjoyment of school', 'academic self concept (English

and maths)', 'popularity', 'citizenship values' and 'anxiety. In studying students' views of their schools we developed measures in eight areas that we found to be important in shaping students' educational outcomes: 'teacher support for learning', 'teacher discipline', 'emphasis on learning', 'valuing students', poor behaviour climate', 'headteacher qualities', 'school environment' and 'school/learning resources'.

Measures of secondary school academic effectiveness from KS2-KS4 contextual value added (CVA) indicators produced by the DfE have been added to the EPPSE data set. In addition, selected Ofsted inspection judgements were used as external indicators of the quality of secondary schools. These complement the measures of quality and effectiveness for pre-school settings and the measures of primary school academic effectiveness collected in previous phases of the research. It has therefore been possible to explore the influences of various measures of pre-, primary and secondary school on students' outcomes in Year 9.

Although multiple imputation of missing data was conducted where appropriate in order to maximise the sample size and limit possible bias linked to missing data, we also analysed and compared results on the original non-missing data. Overall, the analyses are based on data for over 2,900 students attending over 770 secondary schools. For further details see the full Reports (Sammons et al., 2011a; 2011b; 2011c).

The 50 qualitative case studies of students' learning trajectories focussed mainly on children performing well against the odds. Four groups were included in these case studies: a) 20 low SES students, who were academically successful children and 'succeeding against the odds'; b) 15 low SES students who were 'expected low achievers'; c) 9 high SES students who were 'unexpected underachievers'; and d) 6 high SES students who were 'expected high achievers'. For further details see Siraj-Blatchford et al., (2011a).

Findings
Note that reported findings are always net of all other background influences, and only reported if statistically significant.

The contribution of the individual student, family and home learning environment (HLE) to students' development in KS3

1.   Differences in academic attainment and social development related to background emerged early (at age 3) and have remained fairly stable through to the end of Key Stage 3 (KS3; age 14). Basically socio-economic disadvantage predicted poorer outcomes in KS3 in line with results in pre-school and primary school. In addition, at age 14, neighbourhood disadvantage additionally predicted poorer social-behavioural outcomes but the effects were relatively small compared to other measures.

2.   At age 14, girls had better attainment in English (than boys) and also made more progress in English, maths and science over KS3. Girls were rated more favourably by teachers for social-behavioural outcomes, and the gender gap for these outcomes widened during KS3. Girls were more likely to report themselves as having anxious behaviours, lower 'popularity', lower 'maths academic self concept', but more favourable 'citizenship values'.

3.   Autumn born students, who were the oldest in their year group, showed higher academic attainment and appeared to increase their advantage by making more progress over KS3.

4.   The early years HLE has a continuing effect to age 14. Those students who had a more favourable early years Home Learning Environment (HLE) had better academic and social-behavioural outcomes in Year 9 and made more improvement in their social-behavioural outcomes across KS3. In Year 9, having had a good early years HLE was associated with greater 'enjoyment of school', self-reported 'popularity' and 'English academic self concept'.

5.   Other moderately strong predictors of attainment in all core subjects included birth weight, family income and free school meal (FSM) status. For English only, low income and FSM status predicted poorer progress over KS3.

The contribution of pre-school to students' development in KS3

1.   The early experience of high quality pre-school predicted better outcomes for maths and science at age 14, but not for English. Pre-school effectiveness[1] had a continuing effect on English (for pre-schools effective in promoting pre-reading skills), maths and science (for pre-schools effective in promoting early number concepts). However, these effects were slightly weaker than at younger ages.

2.   Pre-school quality predicted better social-behavioural outcomes at age 14, even after controlling for background characteristics.

3.   The continued benefits of pre-school were most evident for students who went on to attend secondary schools of medium or low academic effectiveness (based on the DfE[2] contextual value added indicator). This is in line with earlier results which showed that good quality pre-school had a similar 'protective' effect on attainment at the end of Key Stage 2.

The contribution of primary school to students' development in KS3

1.   Having attended a more academically effective[3] primary school continued to predict better academic attainment in maths and science, but not English at the end of KS3.

2.   Students who had experienced a positive transition from primary school (in terms of gaining familiarity with new routines, and continuity in the curriculum) were more likely to have higher attainment in all core subjects and also to make better progress in maths and science at age 14, although the effects were relatively small.

The contribution of secondary school to students' development in KS3

1.   The level of disadvantage of the school's intake of students had small negative effects predicting both poorer progress as well as attainment. A higher percentage of students in a school eligible for free school meals FSM predicted poorer progress for students in both English and science.

2.   EPPSE students' experiences in the first phase of secondary schooling were largely positive. Most reported they liked school and their lessons and teachers identified only a small minority as showing poor behaviour. However, both student and teacher views were less positive than in primary school. During KS3 a small proportion of students' responses indicated they were less positive about themselves, reported they enjoyed school less, liked individual subjects less, and had a poorer academic self-concept than in KS2. Teachers also reported a slight increase in the incidence of negative behaviours for a minority of students since KS2.

3.   There were strong and positive links between students' '*academic self-concept*' (whether they felt they were good at a subject) for English and maths and their attainment in these subjects. Similar but smaller effects occurred for social-behavioural outcomes. In general, girls had a lower self-concept in English and maths than boys, despite having higher attainment in English.

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[1] A 'value added' measure. For instance 'more effective' pre-schools were defined as those whose children make significantly greater cognitive/developmental gains controlling for their prior attainment/development and background characteristics from age 3 to 5 yrs. Centres where children make less developmental gains than predicted were defined as 'less effective'.
[2] The Department for Education formerly known as the Department for Children, Schools and Families.
[3] Measured by contextualised 'value-added' estimates of effectiveness based on pupils' progress between KS1 and KS2 from National Curriculum assessments (Melhuish et al., 2006).

4.   There was also better attainment where students reported they '*enjoyed school'*, especially for maths. Such relationships are likely to be reciprocal. Students' 'enjoyment of school' was strongly related to 'teacher support' and 'valuing students'. It was also positively related to the students' view of the schools 'emphasis on learning' and the overall condition of the 'school environment'. This is in contrast to findings during primary school where 'enjoyment of school' was not related to academic achievement.

5.   Specific classroom practices and climates underlie effective education in secondary schools. Particularly important appears to be students' reports of their secondary schools '*emphasis on learning'*[4] and having a positive '*behavioural climate',* which predicted greater attainment and progress in all three core subjects and better social-behavioural outcomes and progress. A poor 'behavioural climate' also predicted higher levels of anxiety in students. Students made more progress in all three core subjects if they had positive 'teacher support' and they felt they were 'valued and respected' by teachers.

6.   The following secondary school factors predicted better academic outcomes but to a lesser extent for maths and science only:
- physical '*school environment'*;
- 'valuing students';
- '*school/learning resources'.*

7.   The following secondary school factors predicted better social-behavioural outcomes and progress (11 to 14) but to a lesser extent:
- 'teacher support' for learning and a feeling that teachers 'valued students';
- '*behaviour climate'* of the school;
- '*Headteacher qualities'*;
- physical '*school environment'*;
- '*school/learning resources'*.

8.   Time spent on homework was a strong predictor of better attainment and progress in all three core academic subjects as well as better social-behavioural outcomes and improvements in these between ages 11-14. Any time spent on homework was found to be beneficial, but the strongest effects (for attainment and progress) were for those who reported spending 2 or more hours daily after school on homework. The positive benefits of homework were identified after controlling for the influence of individual family, neighbourhood and other secondary school experiences (behavioural climate, emphasis on learning, teacher support etc.)

Ofsted inspection measures of higher secondary school quality predicted better academic attainment and progress, better social-behavioural outcomes, more 'enjoyment of school' and lower 'anxiety' levels. Inspectors' judgments of 'pupils' learning' and 'learners' attendance' predicted better academic attainment and progress. Similarly Ofsted scores of a secondary school's quality in terms of the management of the 'behaviour of learners' were found to predict better social behavioural outcomes and development over KS3 for EPPSE students.

What shapes developmental change between the ages of 11 and 14?
Academic progress
Students who attended secondary schools with high proportions of Free School Meal (FSM) students made less academic progress across KS3, even after taking account of their own background. Most students on FSM reported they 'enjoyed school' more than their more advantaged peers but they were more negative about particular aspects of their school such as the behaviour of students and low aspirations. By the end of KS3 students were generally more negative about school than they had been at the end of KS2 in primary school.

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[4] Derived from responses to statements such as 'most students want to do well in exams', 'teachers expect me to do my best' 'the lessons are usually challenging but do-able', etc

1.   Neighbourhood deprivation has weak but negative effects that have become statistically significant for this age group, suggesting that deprivation may become more influential in adolescence.

2.   Students made more progress in all three core subjects where they reported their school had a strong 'emphasis on learning'. The case studies of students who 'succeeded against the odds' mirrors this; all had parents and families who emphasised the value of learning. Homework was particularly important with 2-3 hours a night spent on homework having a particularly strong effect on progress across the core subjects.

3.   Students made more progress in all three core subjects if they reported having positive 'teacher support', were 'valued' by teachers and there was a positive 'behavioural climate' in the school.' The effects of the schools' behaviour climate were especially strong. This was confirmed by our case studies where families and children valued better support from school. The parents of successful young people reported that their own relationships with their children were emotionally warm, yet firm and supportive in relation to educational aspirations. The students who succeeded 'against the odds' had parents who were 'child-centred' and provided 'active cultivation' for their children's success in spite of their poorer economic and sometimes social and cultural capital.

Social-behavioural change
4.   Students' reports of their school's 'emphasis on learning' and a positive 'behaviour climate' were also significant predictors of improvements in all four social-behavioural outcomes, i.e., increases in 'self-regulation' and 'pro-social behaviour' and reductions in 'anti-social behaviour' and 'hyperactivity'.

5.   Improvement in all four social behavioural outcomes was predicted by secondary school features including teachers 'support for learning', 'valuing pupils', and good 'school environment and resources'. These supportive school characteristics were weaker in their prediction of academic progress.

6.   The growth curve analyses of students' social behavioural trajectories over time from Year 1 to Year 9 show what factors predict initial differences and changes over KS 1, 2 and 3. Gender and family SES predict differences in social behavioural trajectories. The early years HLE predicted initial differences in Year 1 and growth in 'self regulation'. The quality and effectiveness of the pre-school shaped development in 'self regulation' from Year 1 to 9. 'Self regulation', in particular increases up to Year 6 but falls off by Year 9.

How the family and schooling interact to affect students' learning and development
1.   The quality of the early years (and to a lesser extent the KS1) home learning environment (HLE) has positive effects and still served as partial protection against the effects of disadvantage up to the age of 14.

2.   Children who had a high early years HLE, attended high quality pre-school and a more academically effective primary school had better academic attainment and social-behavioural development at age 11. Although they did not necessarily make more gains during KS3, they held on to their relative advantage and so were performing significantly better at age 14, taking into account the influence of their own background, family and neighbourhood factors.

3.   Attending a highly effective pre-school benefits students' maths attainment at age 14 if they attended a less effective primary or secondary school, suggesting a longer term protective influence of pre-school.

4.   Students who experienced a positive transition from primary school (in terms of gaining familiarity with new routines and curriculum continuity) had higher attainment in all core subjects and also made better progress in maths and science at age 14 (controlling for background factors), although the effects were relatively small.

What supports students from disadvantaged backgrounds who succeed 'against the odds'?

1.	Disadvantaged children generally do less well at school. In KS3 students from high SES, or high-income, families have higher attainment than children from low SES or low-income families.

2.	Pre-school of high quality has particular benefit for children whose families had low scores on the early years HLE. These children benefited more from higher quality pre-school compared to children who had stimulating home learning environments. In other words, children from non-stimulating homes were more responsive to the quality of pre-school provision than children from homes that had high levels of stimulation and intellectual challenge.

3.	Student's who succeed 'against the odds' had:
- Higher levels of individual agency, determination and active participation from themselves as well as from the people around them.

- Parents who valued learning and had high aspirations and standards of behaviour for their children. These parents practiced 'active cultivation'; nurturing skills and offered emotional support that enabled children to benefit from what school offered. They encouraged extra-curricular activities explicitly for learning and development whereas other low SES parents saw them just as fun. Their children had social networks that provided emotional and practical support which enhanced their self-efficacy and enabling them to become 'active agents' in their learning. These parents' resilience in the face of hardship provided a role model for their children's effort in learning.

- Parents who saw the value of pre-school. These children were nurtured through higher quality pre-schools. This was particularly important for boys from low SES families who were more likely to have a poor HLE. The boys who attended excellent pre-school settings went on to succeed above expectation.

- Parents who recognised the importance of teachers (e.g. consistently presenting a positive image of learning) and to specific school support (e.g. booster lessons to tackle difficulties). Children who made poor progress, or who were not seen as clever, developed a negative self-image which led to, or reinforced, poor learning strategies/motivation. Parents often felt let down and sometime angry with school for not meeting a child's individual needs effectively. Some high SES parents felt they had to buy extra support outside school.

- Friends that offered practical or emotional support with school or learning. This helped them to enjoy school and to deal with difficulties encountered. Children who failed to make good progress tended to have friends with negative attitudes to school and learning.

The views of teachers and parents also matter

Heads of Year 9 (HoY9) and parents were surveyed about their views on school and students during KS3. Overall, HoY9 gave a largely positive picture of their secondary school. The majority of HoY9 were:
- Satisfied with the support/training they had been given to enable them to respond to the needs of a range of students. However, two groups of students stood out as needing additional support: those with English as an Additional Language (EAL) and 'looked after' students.

- Reported positively on the general accessibility of services to support students, the exceptions being services for sexuality/health, EAL and speech/language therapy.

- Positive about how their school communicated and listened to parents, however they acknowledged that improvements could be made in the extent to which schools supported parents in helping their children learn at home.

The majority of parents:
- held positive views of their child's secondary school. Only a minority reported concerns about poor behaviour
- had high aspirations for their children and regard good GCSE English and maths results as particularly important. Also important in parents' views were their children getting good 'A' levels, vocational qualifications and going on to university.

Conclusion

Although some EPPSE findings are similar to those in other research studies many provide new evidence on the ways that families, schools and neighbourhoods shape student outcomes. This report shows the *relative* and *historical* (longitudinal) contribution of many positive and negative factors to students' pathways. It makes a strong contribution to our understanding of student attainment, behaviour and disposition by linking these to the educational experiences and practices that support development over time especially in KS3. These school effects are revealing but are best understood alongside those of family or neighbourhood influences.

It is important to stress that all the effects reported, including those of secondary school, are over and above those of students' own characteristics and their social background, showing what matters in the education of young people after taking into account detailed background histories. It is because of the richness of the EPPSE data on pre-school and early home experiences that the developmental pathways of young people are unravelled and understood. Only a large and national sample, studied intensively over time, can do this.

A strong test of an 'influencing' factor is its effect in predicting **change** on academic, social and dispositional outcomes between ages 11 and 14. In our analysis of change (academic progress and social behavioural development), the findings of the longitudinal case studies of children and their families also adds valuable explanatory detail to the quantitative statistical models. The case studies enhance our understanding of the protective factors that promote resilience, and they do this in a level of detail that goes much deeper than test scores, teacher judgements and even the reports of individual students on questionnaires.

The findings in this report point to continuing effects of disadvantage in England, to 'downward spirals' in development and to (for a minority of students) dissatisfaction and unhappiness in school. The other side to this coin is the fact that EPPSE has reported on pathways to success, on feelings of confidence and factors associated with them. Positive pre-school and school experiences can make a difference and this report describes some of the factors that may underpin success. Still, homes and communities shape development too, and the case studies show how these factors may combine to shape an individual student's success or failure. Finally the longitudinal nature of the rich EPPSE dataset allowed us to discover the long-term effects of pre-school experiences, especially those of high quality settings. Each student's pre-school and early home learning environment created the 'platform' on which the marks of primary and secondary school are then etched.

Section 1: Introduction to the EPPSE 3-14 study

The overall aim of this phase of the EPPSE research is to:

- Explore the ways in which the influences of pre-school, primary school and secondary school together with social and family background (including out of school learning) shape children and young people's educational achievement, attitudes and social-behavioural adjustment over time.

This aim incorporates the lasting effects of pre-school education. However, the study's design and data sets enables a much more sophisticated analysis that can show how the different phases of education and family characteristics <u>interact</u> in shaping students' lives, developmental trajectories and educational outcomes in the long term. While answering the overarching question, many other aims are explored in a series of overlapping themes (see Methodology).

Whilst educational effectiveness research has a long pedigree in the UK (Reid et al., 1987; Mortimore et al., 1988; Grey et al., 1990; Rutter et al., 1979 etc.) the emphasis has historically been on the compulsory phases of schooling (primary and secondary). The Effective Pre-school, Primary and Secondary Education (EPPSE 3-14) study is a longitudinal study which has been unique in exploring the ways in which pre-school, primary school and secondary school influences interact with child, family and neighbourhood characteristics in shaping young people's educational trajectories and the longer term outcomes of schooling.

Educational effectiveness research is predicated on the availability of information concerning children, their circumstances and the institutions in which they are educated. The last fifteen years has seen an expansion in the amount and detail of information which can be accessed by educational researchers when seeking to explain the strength of different influences on children's development. For instance, the availability of information on the National Pupil Database (NPD) and the Income Deprivation Affecting Children Index (IDACI; Noble et al., 2008) combined with the power of new statistical modelling, has made possible for the first time, new understanding of effective education and the way it interacts with families and neighbourhoods to influence child development. Whilst earlier longitudinal studies have indicated the importance of background characteristics such as the family socio-economic status in determining social mobility and social exclusion (Feinstein et al., 2004) few studies have as detailed information as EPPSE on a large sample of children covering the last two decades of major educational reform.

EPPSE 3-14 therefore provides a unique opportunity to explore issues relating to the cognitive, social-behavioural and affective development of young people, using a recent nationally representative sample of teenagers. The sample (recruited at entry to pre-school from 1997) is currently being monitored to their post age 16 destinations (2013). This current phase of the research which follows the sample till the end of Key Stage 3 (age 14) in secondary school has enabled the long term trajectories of a large and diverse sample (approx 2000+ children) to be studied and the separate contributions of home, pre-school, primary school and secondary school to be identified and their interactions analysed.

Earlier EPPE research (Sylva et al., 2010) has reported on key contributors to children's development to the end of Key Stage 2 (age 11). This extension study (EPPSE 3-14) focussed on what happens to the EPPE sample as they move from early childhood into adolescence.

Key Stage 3[5] (KS3)

Very few studies of secondary school effectiveness have focussed on the KS3 phase, although the DfE produces value added measures of school performance linking KS2 and KS3 results. Most research on secondary schools uses the end of compulsory schooling (Year 11) examination results as their final outcome measures. There are two important exceptions to this: the national evaluation of the KS3 pilot (Stoll et al., 2003) which pointed to the existence of substantial school and departmental differences in effectiveness (Sammons et al., 2003), and the DfE funded VITAE project (Day et al., 2006) which illustrated the existence of important differences in teacher effectiveness in promoting pupils' progress in Year 9 and pointed to the existence of departmental differences at KS3 similar to those found in studies at GCSE (Day et al., 2006). The richness of the EPPSE data on the home learning environment, as well as pre-school and primary school experiences and the wide range of outcomes (attitudinal, social-behavioural and academic) provides a uniquely detailed and powerful investigation of early secondary school influences in the under-researched middle years. The project is well placed to explore policy relevant questions concerning issues of equity and social inclusion in order to promote better long-term outcomes for disadvantaged and vulnerable groups of students.

Relationship to other UK studies

The EPPSE 3-14 study can answer questions related to students' progress that would not for instance, be answerable using data from the Avon Longitudinal Study of Parents and Children (ALSPAC) and Longitudinal Study of Young People in England (LSYPE). The ALSPAC data are not nationally representative and not as rich as the EPPE data in Early Years, while the LSYPE does not contain pre-secondary data on pupils. EPPSE provides answers to questions relating to the interaction of family, neighbourhood, pre-school, primary and secondary factors in the development of students' educational and social abilities that has details unavailable in other studies. The EPPSE findings can be compared to those of earlier longitudinal studies to provide new information on inter-generational change – findings that are important for informing policy and practice.

How EPPSE 3-14 studied children's development through to early adolescence

EPPSE builds on a long tradition of school effectiveness research. It is a mixed method longitudinal study combining quantitative and qualitative methods. It is interdisciplinary in using constructs and methods drawn from a range of disciplines including education and psychology.

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[5] Key Stage 3 covers the early secondary school phase of compulsory education. Students in KS3 are between the ages of 11 – 14 years. This is the period inclusive of Years 7 – 9.

Structure of the Report

This report has 11 sections:

- Section 1 and 2 provides an introduction and background to the EPPSE research.

- Section 3 describes the research questions and how these were answered through the EPPSE methodology, measures and analysis strategy.

- Section 4, 5 and 6 provides detailed information on academic, social-behavioural and dispositional outcomes. The outcomes described here are a distillation of much larger technical reports. For more details see https://eppe.ioe.ac.uk

- Section 7 gives details of 50 qualitative case studies undertaken to provide a more detailed explanation of students who 'succeed against the odds' and those who do not reach their early potential.

- Section 8 describes some of the findings from questionnaires from Heads of Year 9 and EPPSE parents as well as describing analyses undertaken of students who were considered to be 'vulnerable' because of their background characteristics at different time points.

- Section 9 compares the EPPSE findings to other research around the world.

- Section 10 explores the EPPSE findings relevant to the development of policy.

- Section 11 discusses the findings of the EPPSE 3-14 research.

The appendices contain information on the cohort structure of the sample and additional information on EPPE/EPPSE measures and publications.

A summary of a report on vulnerable groups is also included in Appendix 5. This provides a descriptive summary of the differences in attainment between particular groups of EPPSE students in absolute terms unlike the multilevel models analyses described in the main body of the report. This new analyses uses raw outcomes without controlling for background characteristics. The report covers 3 time points: ages 7, 11 and 14 years old). The absolute attainment gap between different groups is examined, as well as how this changes over time.

Section 2: Summary of findings from EPPE 3-7 (1997-2003) and EPPE 3-11 (2003-2008)

> **Summary of key findings from the pre-school and primary phase**
>
> The initial phases of the EPPSE study ran from 1996-2003 (pre-school, KS1) and 2003-2008 (KS2). Its findings indicated that
>
> - There is an enduring impact of pre-school on children's academic and social-behavioural development up to age 11.
> - Those who attended low quality or no pre-school had poorer outcomes.
> - Specific pedagogical and structural practices differentiated effective pre-schools.
> - The quality of the early years Home Learning Environment promoted academic and social behaviours.
> - Attending a more academically effective primary school boosted attainment and promoted progress.
> - The quality of pedagogy in Year 5 predicted both progress and social-behavioural development.
> - There were specific features that differentiated 'typical' and 'effective' classrooms.

The original Effective Provision of Pre-school Education project (EPPE, 1997-2003) was Europe's largest longitudinal investigation into the effects of pre-school education on children's developmental outcomes. Children were assessed at the start of pre-school (around the age of 3) and their developmental progress was monitored until they entered school, and then for a further three years until the end of Key Stage 1 (age 7).

Children were recruited at age 3+ years from the major types of Foundation Stage settings (approx. 2,800 children) and in addition a group of children with no pre-school centre experience (approx. 300) were studied from entry to primary school. The total sample of children is approximately 3,000. Parent interviews provided extensive information on the family and on home activities and the child's health and care history before the age of three. The EPPE study has shown the positive contribution to children's development of attendance at different types of early childhood provision. It investigated the effects of duration and quality of pre-school, and the contribution to children's outcomes of different pedagogical strategies and different levels of staff qualification (Sylva et al., 2010).

While investigating the effects of pre-school, the study also demonstrated the important contribution of family factors to children's development, including demographic influences such as social class, multiple disadvantage and also behavioural influences such as family activities that enhance young children's learning (Melhuish et al., 2008). By combining the 'education' and the 'social background' analyses, the positive influence of early childhood education has been demonstrated, especially for children from disadvantaged backgrounds and those 'at risk' of developing special educational needs (SEN).

The EPPE study has had a major impact on both national policy and everyday practices in pre-school provision (Taggart at al., 2008). In light of this, the study was extended to follow the same sample of children to the end of Key Stage 2. This stage of the research, known as Effective Pre-school and Primary Education 3-11 addressed the following questions:
   a) Do the effects of pre-school continue through to Key Stage 2?
   b) What are the characteristics of 'effective' primary classrooms and schools?
   c) Who are the resilient and the vulnerable children in the EPPE sample?
   d) What is the contribution of 'out-of-school learning' (homes, communities, internet) to children's development?

Below is a summary of some of the key findings from the pre-school and primary school phases of the study. Full details of the research questions, methodologies and analyses are contained in a vast number of research outputs. See Appendix 1 for details of additional sources of information or visit the EPPE website at http://eppe.ioe.ac.uk

Key findings from the pre-school phase

Full details of the analyses and findings of the pre-school phase of the study are contained in 11 Technical Reports and an end of project report (see Appendix 1 for outputs during this phase of the study).

The effects of pre-school

Pre-school experience enhances children's academic and social-behavioural development with some types of settings being more effective than others in promoting positive child outcomes. Children made better progress in fully integrated centres and nursery schools. The duration of attendance is important with longer duration being linked to better intellectual development and improved independence, concentration and sociability. Full-time attendance led to no better gains for children than part-time. Children who had longer hours (greater than 2,000) in group care under the age of two years had higher levels of 'pro-social' behaviour but a slightly increased 'risk' of 'anti-social' behaviour at 5 years old. These effects were most strongly related to extensive group care in the first year of life (see Melhuish, 2010 in Sylva et al., 2010). Children, in pre-schools with higher ratings of quality, had better intellectual/academic and social-behavioural outcomes when they entered school at age 5. Better quality provision was associated with settings that had more qualified staff, especially with a good proportion of trained teachers (Sylva et al., 2010). Disadvantaged children and boys in particular can benefit significantly from good quality pre-school experiences.

Children 'at risk' of learning or behavioural difficulties are also helped by pre-school, with integrated settings and nursery schools being particularly beneficial.

The early years Home Learning Environment (HLE)

The quality of the early years Home Learning Environment (where parents are actively engaged in learning activities with children) promoted intellectual and social development in all children. While parent's social class and levels of education were related to child outcomes the quality of the HLE was more important and only moderately associated with social class or mothers' qualification levels. What parents do is more important than who they are (Melhuish et al., 2001).

What differentiates effective pre-schools?

The intensive EPPE case studies undertaken during the early years (Siraj-Blatchford et al., 2003), teased out specific pedagogical and other practices associated with 'excellent' outcomes compared to those centres with 'good' or more 'average' outcomes. This and the Researching Effective Pedagogy in the Early Years Project (Siraj-Blatchford et al., 2002) research revealed that where settings viewed educational and social development as complementary and equally important, children made better all round progress.

Effective pedagogy includes some structured interactions between adults and small groups of children, traditionally associated with the term 'teaching'. Also notable in more effective settings was the provision of planned learning environments and 'sustained shared thinking' to extend children's learning. Trained teachers were most effective in their interactions with children, using the most 'sustained shared thinking' interactions. Adults in excellent settings had a good grasp of the appropriate 'pedagogical content knowledge' knowing which curricular content was most relevant to the needs of individual children. This required a deep understanding of child development.

Excellent settings adopted discipline/behaviour policies that involve staff in supporting children in rationalising and talking through their conflicts, they also shared child-related information between parents and staff, and parents were often involved in decision making about their child's learning.

Key findings from the primary phase

Full details of the analyses and findings of the pre-school phase of the study are contained in a number of Technical Reports and an end of project report (see Appendix 1 for outputs during this phase of the study).

Effects of pre-school

The positive benefits of pre-school education persisted through to the end of Key Stage 2 (age 11) with significant benefits for English, maths and 'pro-social' behaviour still apparent (for details see Sylva et al., 2008a). These effects were largely carried by pre-school settings of medium or high quality where quality was an important predictor of all children's developmental outcomes, academic and social-behavioural. This was especially important for boys, children with SEN and those from disadvantaged backgrounds or who have low qualified parents. For vulnerable children attending a primary school high on academic effectiveness showed particular benefits for children with multiple disadvantaged backgrounds in terms of English and maths attainment and also for children of low qualified mothers for maths attainment. Attending a more academically effective primary school was most important for pupils who had not attended any pre-school or had experienced only low quality pre-school.

The family and the Home Learning Environment (HLE)

Although child and family characteristics were less powerful at age 11 than they had been at age 7 a number of background characteristics (e.g. gender, mother's highest qualification level, HLE etc.) remain important at this later time point. In particular the support for learning that parents provided during the pre-school period (early years HLE) continued to show effects on several outcomes: attainment in English and maths, 'self-regulation', 'pro-social' behaviour and 'hyperactivity' at the end of primary school. In line with findings for the sample in younger ages, gender was particularly important for 'pro-social' behaviour and 'hyperactivity', with girls being more 'pro-social' and boys more 'hyperactive'. Boys had slightly higher attainment in maths and girls showed better outcomes in English.

The effects of primary school

The academic effectiveness of the primary school between Key Stage 1 and 2 was measured independently of the EPPE 3-11 longitudinal sample, by analysing National assessments for all pupils in all state primary schools in England using a value added approach (Melhuish et al., 2006). The EPPE sample was then extracted from these analyses for more detailed attention. Further analyses showed that more academically effective primary school had a positive influence on the EPPE 3-11 pupils' English and particularly maths outcomes. Not only was the effectiveness of the school linked to pupils' absolute attainment at age 11, it also predicted the amount of progress the EPPE 3-11 pupils made between the ages of 7 and 11. For social-behavioural outcomes, the academic effectiveness of the school did not show a significant effect across all pupils. However, certain groups of pupils, such as those with SEN or whose mothers had low educational qualifications, showed significantly better social-behavioural outcomes if they attended schools that were more academically effective (Sylva et al., 2008a, Sammons et al., 2008a, Sammons et al., 2008b).

Primary school and classroom processes

An important aspect of the primary school phase of the EPPE 3-11 study was the exploration of school and classroom practices which related to both child outcomes and the effectiveness of the primary school.

Classroom observations were conducted in 125 Year 5 (age 10) primary classrooms and these revealed important insights into 'what matters' in primary school. Pupil and teachers behaviours were explored through both quantitative and qualitative lines of enquiry. Combining quantitative and qualitative methodologies is typical of the EPPE team's approach to effectiveness (Sammons et al., 2005; Siraj- Blatchford et al., 2006).

The quantitative analyses revealed considerable variation in the quality of pupils' educational experiences during Year 5 (Sammons 2006a; 2006b; 2008f). The overall measure of 'quality of teaching' was a significant predictor of greater academic progress between ages 6 and 10: reading and maths. Whereas the overall measure of the 'quality of pedagogy' and 'classroom control' were significant for progress in maths. The 'quality of pedagogy' was also related to reduced 'hyperactivity' and better 'pro-social' behaviour and 'self-regulation'. High levels of classroom 'disorganisation' predicted poorer progress in reading and maths and worse 'hyperactivity'.

As well as classroom observations Year 5 teachers returned questionnaires which included questions about their school context and processes. The analyses revealed that teachers' self reports of their school context and processes (particularly the five factors concerning homework: 'school standards', 'pupils' agency and voice', 'anti-academic ethos', 'school communication with parents', and 'parental support of their child's learning') were related to better progress in maths and social outcomes. In schools where teachers reported active school 'communication with parents', pupils made better academic progress in reading and maths and showed better 'self-regulation'. In addition, where teachers reported strong 'parental support for their child's learning', pupils made better progress in reading and 'pro-social' behaviour.

The quantitative analyses also considered inspection judgements made by the Office for Standards in Education (Ofsted) on the 125 focal schools and found that there were moderately strong relationships between inspection measures and pupils' outcomes, particularly for maths and a number of social-behavioural measures (Sammons et al., 2007a; Sammons et al., 2007b).

A separate sub-study called Effective Primary Pedagogy in English and Mathematics (EPPSEM) in Key Stage 2 (Siraj-Blatchford, 2011b), analysed the observer's field notes and using a qualitative analytical framework revealed significant differences in the strategies used by teachers in excellent, good and poor schools. The research identified a 'bundle' of strategies that, taken together, can make a difference to children's development and progress and therefore their later life chances. Eleven strategies were described illustratively to provide 'real life' examples of classroom interactions which differentiated schools with different levels of effectiveness and quality of pedagogy. The key findings centred on the importance of:
1. organisational skills;
2. sharing learning objectives;
3. the use of homework;
4. positive classroom climate;
5. behaviour management;
6. collaborative learning;
7. personalised teaching and learning;
8. making learning links explicit;
9. dialogical teaching and learning;
10. assessment for learning practices;
11. the use of the plenary.

Pre-school and primary school interactions
EPPE 3-11 was the first study to investigate the combined effects of pre-school and primary school on a wide range of child outcomes. The combination of attending a higher quality pre-school and then moving on to an academically effective primary school had additional benefits for pupils' academic outcomes at age 11, especially so in maths. High quality pre-school appears to provide some 'protection' against attending an ineffective primary school compared to pupils who had not attended pre-school: weakly for English, and much more strongly for maths; or those who had attended pre-schools of lower quality.

Pupils' self-perceptions
The EPPSE pupils were surveyed (age 10) about themselves as people and learners (Sammons et al., 2008e). These pupils' self-perceptions (also termed students' dispositions) and views of

school revealed interesting relationships with learning and social-behavioural development. For instance gender was the strongest predictor of 'behavioural self-image', whereas for 'academic self-image' the strongest predictors were fathers' highest qualification level and the early years HLE. 'Enjoyment of school' was somewhat higher for pupils who were eligible for FSM and for those who had previously attended high quality pre-school versus low quality.

Pupils' self-perception factors were differentially associated with educational outcomes. Pupils' 'academic self-image' was the strongest predictor of progress in reading, maths and 'self-regulation', whereas pupils' 'behavioural self-image' was the strongest predictor of improvement in 'pro-social' behaviour and reduction in 'hyperactivity' and 'anti-social' behaviour (from Year 1 to Year 5). These findings indicate a strong *reciprocal* relationship between 'academic self-image' and academic achievement and progress, and between 'behavioural self-image' and social-behavioural outcomes and development.

Pupils' views of primary school were also related to their academic and social-behavioural outcomes as well as progress and development in these outcomes. Pupils' positive views about their social environment were a predictor of better cognitive progress and social-behavioural development from Year 1 to Year 5 (Sammons et al., 2008e full details of analyses and findings).

Other influences

This summary of the first two phases of EPPSE research has focussed largely on the impact of pre-school and primary school on pupils' academic and social-behavioural outcomes. See Appendix 1 for research outputs detailing a wider range of influences and their relative strengths (measured in Effect Sizes). These outputs contain detailed information on the impact of pre-school and school for particular groups of pupils (disadvantaged, those with SEN etc.). They also explore more fully the influence on child outcomes of child (gender, birth weight etc.), family (mother qualifications, household salary etc.) and the home learning environment (including out of school learning) characteristics.

Sub-studies of the main EPPSE research have explored the following in detail:
   a) Children who succeed against the odds – see Siraj-Blatchford (2010)
      Key findings:
   • the importance of the early years HLE;
   • the importance of parental support for learning, including valuing education and having high expectations;
   • students being active agents in their own learning.

   b) Mobility & neighbourhood during primary school – see Tracking pupil mobility over the pre-school and primary school period (2008): Evidence from EPPE 3-11.
      http://eppe.ioe.ac.uk/eppe311/eppe311%20pdfs/eppepapers/TrackingMobility16Sept08.pdf
      Key finding:
   • high mobility predicted lower levels attainment and social behaviour after controlling for background characteristics.

   c) Transition to Secondary School – see Evangelou et al. (2008)
      Key findings:
   • poor transition is a barrier to future success;
   • successful social adjustment, institutional adjustment and curriculum interests are aspects of good transition strategies.

Section 3: Aims, sample, measures, methodology and analysis strategy

Summary
- The same 3,000 children have been followed from age 3 -14 through pre-, primary and secondary school for academic, social-behavioural and dispositional outcomes.
- The mixed method design combines both quantitative and qualitative components.
- Data from KS3 has been linked to data from previous phases of education.
- Academic, social behaviours and disposition were studied in the light of individual, family, home learning and educational influences.
- Multi-level, structural equation and growth curve models were used to investigate influences on student outcomes.
- Risk and protective factors were explored through qualitative case studies of students and their families to insights into processes that can help young people 'succeed against the odds'.

The EPPSE 3-14 study uses a school effectiveness methodology and analyses strategy. The start of this section contextualises the study in terms of the previous school effectiveness research and then explicitly details the aims, sample, measures, methodology and analyses strategy adopted during this phase of the study.

School effectiveness research and the context for the EPPSE analyses

School and teacher effectiveness research attempts to measure variation between schools, departments or teachers in their impact on students' educational outcomes, taking into account differences in the prior attainments and other characteristics of their student intakes (Sammons, 1996; Scheerens & Bosker, 1997). Such research indicates the size and significance of school effects on students' academic, social and affective outcomes using value added approaches to measure student progress (Teddlie & Reynolds, 2000).

In England the availability of national pupil data sets has allowed the value added investigation of pupil progress. The DfE has developed its own value added methodology based on multilevel modelling and has adopted contextualised value added measures in School Achievement Tables (DFES, 2005)[6]. A more effective school or teacher is defined as one where student outcomes are better than that predicted on the basis of intake. Effectiveness is thus a relative and sometimes politically contested term that is outcome, context and time specific (Sammons, 1996).

Reynolds (1995) proposes that the 'touchstone' criteria for evaluating different educational policies or practices should be their impact on pupil learning outcomes. The choice of these outcome measures is of particular importance since they become the criteria for judging effectiveness. However a focus on a narrow range of outputs, taking no account of student background, motivation or social, cultural, economic and organisational contexts provides, at best, only partial indicators of effectiveness. Sammons (1996) has argued that, in addition to cognitive measures, social, behavioural and affective outcomes should be studied and that greater attention should also be given to equity implications (effectiveness for different pupil groups, e.g. gender, ethnicity or socio-economic status). This area of enquiry is commonly referred to as *differential effectiveness.* The EPPSE research has laid emphasis on collecting data about a wide range of outcomes including behaviour, attitudes, motivation and attendance to supplement national assessment data on academic attainments in the core subjects.

Experts in the field (Gray et al., 1999; Gray, 2004; Sammons, 1996) argue that studies of effectiveness should consider three questions:
1) Effective for **which** student outcomes (cognitive and social affective)?
2) Effective over **what** time period (stability, improvement or decline)?
3) Effective for **whom** (equity – effectiveness for different groups)?

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[6] See page 19 for details of CVA measures

Luyten (1995; 1996; 2006) provides an overview of the size of school effects compared to teacher effects and challenges the general consensus that teacher effects generally outweigh school effects. Research by the international MORE (Methodology of Research on Effectiveness) group (Kyriakides & Luyten, 2006), set up by the International Congress for School Effectiveness and School Improvement (ICSEI), is has explored a range of ways of measuring school effects and EPPSE has been mindful of their analyses which takes account of new developments in the field.

School effectiveness research (SER) indicates that schools are best studied as organisations with nested layers - pupils within classrooms, departments within schools. The most pervasive view on cross-level influences in nested (i.e., multilevel) models of school effectiveness is that higher-level conditions (e.g. school leadership, policy and organisation) *facilitate* conditions at lower levels (teaching and learning in classrooms), which, in turn, have a direct impact on pupils' academic outcomes (see Goldstein, 1997; Bosker and Scheerens, 1994, Hill and Rowe, 1996, 1998).

In research on effectiveness the framework of *input-process-output* is commonly adopted, and the importance of *context*, particularly socio-economic, is recognised. The levels involved comprise the pupil, the classroom, the school and the school environment (including national or local context). The EPPSE research adopts such multilevel models and approaches and pay particular attention to the impact of secondary school and neighbourhood context and their interactions with individual student characteristics taking into account recent developments in the SER field.

The centrality of teaching and learning

A number of authors draw attention to the centrality of teaching and learning and of classroom processes in determining schools' academic effectiveness (see Creemers, 1994; Scheerens & Bosker 1997; Hill & Rowe 1998; Teddlie & Reynolds, 2000). Creemers (1994) and Scheerens (1992) argue that theories of learning and instruction are at the core of educational effectiveness models, with school factors seen as facilitating conditions for classroom factors. Teddlie and Reynolds (2000) have integrated the results of SER review studies on effective school processes.

Table 3.1: The processes of effective schools

1. The processes of effective leadership	Being firm and purposeful / Involving others in the process / Exhibiting instructional leadership Frequent personal monitoring / Selecting and replacing staff
2. The processes of effective teaching	Unity of purpose / Consistency of practice Collegiality and collaboration
3. Developing and maintaining a pervasive focus on learning	Focussing on academics Maximising school learning time
4. Producing a positive school culture	Creating a shared vision / Creating an orderly environment / Emphasising positive reinforcement
5. Creating high and appropriate expectations for all	For students / For staff
6. Emphasising student responsibilities and rights	Responsibilities Rights
7. Monitoring progress at all levels	At the school, classroom and student level
8. Developing staff skills at the school site	Site based Integrated with professional development
9. Involving parents in productive and appropriate ways	Buffering negative influences / Encouraging productive interactions with parents

(Teddlie and Reynolds, 2000).

Henchley and Rahan (2002) have drawn attention to the characteristics of high performance low SES secondary schools in Canada. The results confirm and extend earlier research and draw attention to the importance of leadership and school culture.

Muijs et al. (2004) provides a review of research on effective schools in challenging circumstances. Harris (2000) emphasises that it is how schools and teachers interpret, understand and respond to lists of characteristics of effective schools or teachers which is key to linking effectiveness and improvement at the teacher, school and departmental level. Reynolds (2004) has investigated the impact of improvement programmes seeking to encourage schools to become High Reliability Organisations while Hopkins (2001) has similarly identified school improvement strategies for schools in challenging circumstances.

Inspection evidence and School Effectiveness Research

Ofsted inspections provide evidence on school performance based on professional judgements of trained inspectors according to a Framework (see Matthews & Sammons, 2004 for an evaluation of the impact of inspection on improvement). This differs from research evidence on effectiveness based on student progress measures but is an important complementary source of evidence on school quality. Researchers have successfully linked inspection and value added effectiveness measures to support the evaluation of different educational initiatives, e.g. the London Leadership Strategy (Matthews et al., 2006). In EPPE3-11 Ofsted data for primary schools provided evidence of quality that has been linked with value added measures of school effectiveness (Melhuish et al., 2006) and is used to complement observational data (Sammons et al., 2006) on Year 5 classrooms in the primary school analyses of progress across KS2.

Classroom processes and School Effectiveness Research

The Hay McBer (2000) report on *Research into Teacher Effectiveness* in England developed a model of teacher effectiveness that links three factors (professional characteristics, teaching skills and classroom climate) to pupil progress. The report suggests that over 30% of the variance in pupil progress can be predicted by these three factors. The teacher's role in creating an '*excellent classroom climate*' is stressed. At the secondary level the biggest differences were in high expectations, planning and homework. They conclude that effective teachers make use of their professional knowledge by consistently deploying appropriate teaching skills whilst using a range of professional characteristics – ongoing patterns of behaviour- which make them effective. Although the Hay McBer study has been criticised on methodological and theoretical grounds[7] the main conclusions of the Hay McBer study are in accord with much previous literature in the field of teacher/instructional effectiveness.

Effectiveness across different curriculum subjects

Most school and teacher effectiveness studies have focused on effects on only one or two curriculum subjects. Two school effectiveness studies that have addressed the question of variations in GCSE (General Certificate of Secondary Education) subject results at the departmental level have produced some comparable findings (Harris, Jamieson and Russ, 1995; Sammons, 1997). The Forging Links study (Sammons et al., 1997) shows that there is greater stability in overall measures of examination performance than in subject results. This suggests that departmental effects can vary significantly over a three-year period of study and this may reflect variations in teacher effectiveness as well as changes in staff and departmental policy and practice. Nonetheless the study suggested that common aspects of policy and practice were related to greater effectiveness as measured by overall GCSE performance and subject results.

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[7] For details of criticisms of the Hay McBer research see Bassey (2001).

Aims

The overall aim of the research is to:

> Explore the ways in which the influences of pre-school, primary school and secondary school interact with social and family background (including out of school learning) in shaping children's and young people's educational achievement, attitudes and social-behavioural adjustment over time.

This aim has embedded within it information about the lasting effects of pre-school education. However, the study's design and considerable existing data enables a much more sophisticated analysis that can show how the different phases of education and family characteristics <u>interact</u> in shaping students' lives, developmental trajectories and educational outcomes in the long term. While answering the main research question, other aims are explored summarised below:

- Investigate the associations between students' academic attainment in KS3 (Year 9, age 14) and background individual student, family and home learning environment (HLE) characteristics.
- Model pupils' current academic *attainment* in Year 9, and their *progress* over KS3.
- Explore the influence of pre-school experience, particularly in terms of attendance, quality and academic effectiveness on later academic outcomes.
- Examine the combined impact of the Home Learning Environment (HLE) and pre-school characteristics.
- Investigate the influence of primary school academic effectiveness on attainment and progress, when individual student, family and home learning environment (HLE) characteristics have been taken into account.
- Investigate the combined effect of pre-school experience and primary school experience on academic attainment.
- Assess whether the impact of pre- and primary school differs for more and less disadvantaged groups of students.
- Investigate the influence of secondary school academic effectiveness and quality on academic attainment, when individual student, family and home learning environment (HLE) characteristics have been taken into account.
- Investigate the combined effect of secondary school experience with pre- and primary school experiences on academic attainment.
- Explore the effects of teaching, school processes and self-views on academic attainment.

Objectives

Subsumed within these aims are a set of objectives which are presented below as a series of overlapping themes:

Themes

Theme 1 - Pre-school and school influences

1.1 Does the impact of pre-school, evident at earlier phases of education, continue to the end of KS3?

1.2 How do pre-school, primary school and secondary school influences interact with social background to affect student's learning trajectories?

1.3 What are the contextual school characteristics (e.g. proportion of FSM, SEN) and processes that differentiate effective secondary schools?

1.4 What are the classroom practices and climates that underlie effective education in relation to better student achievement, attitudes and social behaviour?

1.5 What are young people's perceptions of the impact of school influences?

Theme 2 - Child and family influences
2.1 How does the family background of parents contribute to their children's development in the longer term? Does the pattern of influence increase or reduce as children grow older?
2.2 How does the 'home learning environment' (HLE) and other forms of parent support influence young people's outcomes at the end of KS3?
2.3 What are young people's perceptions of the impact of family influences?

Theme 3 - Neighbourhood influences
3.1 What is the role/influence of 'neighbourhood' in shaping young people's outcomes?
3.2 What is the relative influence of 'place' poverty compared with 'people' poverty and are they cumulative in shaping educational outcomes over time?
3.3 Are neighbourhood factors such as crime/disorder and population characteristics important in shaping young people's academic and social-behavioural adjustment?
3.4 Are neighbourhood influences stronger or weaker than family or pre-school and school influences in shaping education outcomes over time?
3.5   What are young people's perceptions of the impact of neighbourhood and peer influences?

Theme 4 - Overlapping school, family and neighbourhood levels to focus on disadvantage
4.1 What are the interactions between family disadvantage and school influences?
4.2 To what extent can higher quality educational experiences at secondary school combat social disadvantage? For example, are socio-economically disadvantaged students more likely to attend poorer quality primary and later poorer quality secondary schools?
4.3 Do disadvantaged students benefit more from certain kinds of secondary school experiences?
4.4 Is poverty a greater risk factor for pupils of low ability or students who attend schools with high proportions of students on free school meals (FSM)?
4.5 Are neighbourhood influences stronger for some student groups (e.g. boys from low SES families, older compared with younger students)?

Theme 5 - Out of school learning
5.1 How does learning outside school (such as private tutoring, weekend schools, computing in the home, leisure activities like sport and exercise) interact with and add to learning at school? The influences of 'neighbourhood' will be an important consideration in this topic.
5.2 Do extended schools support better educational and developmental outcomes at KS3?

Theme 6 - Resilient and vulnerable students
6.1 Who are the resilient and vulnerable students in the EPPE sample? What are their characteristics and does this profile change over time?
6.2 When and why do some 'at-risk' students succeed 'against the odds' while others fall further behind?
6.3 What factors act as protective influences in combating poor outcomes and what factors increase the risk of poor outcomes? What are positive or negative influences for certain groups of young people with particular needs e.g. EAL or SEN?
6.4 What are the views of vulnerable and resilient students of their own educational experiences? How do they perceive the events and people that have shaped them?
6.5 What are the key factors within families that shape the educational and developmental outcomes of resilient and vulnerable young people? How does this vary with ethnicity?
6.6 What is the role of the school and teachers in enhancing or undermining young people's academic and social potential at different ages i.e. leading to resilience or vulnerability?
6.7 What factors, external to school and family, influence young people's views of themselves as successful learners (e.g. community, computer use, extra-curricular activities)?

As the project developed it was not feasible to robustly analyse all questions in the overlapping themes.

The Sample

The EPPSE longitudinal study of the influences which shape children's development as they progress through pre-school, primary and secondary school involves a total original sample of 3172 children (including a 'home' group recruited at primary school entry). Over 2,800 children were recruited around the age of 3+ at their pre-school settings together with over 300 'home' children without pre-school experience recruited at the start of school (see Sammons et al., 1999). The first children were recruited in early 1997 to the project and they are currently being followed up into adolescence to age 16 plus. See Appendix 2 for the cohort structure of the sample, and see the analysis strategy for details of the background of the sample.

Sample attrition

The EPPSE 3-14 study explores students' experiences and outcomes measured in Year 9, at the end of Key Stage 3 (KS3) in secondary education when students are age 14. Inevitably, as in all longitudinal studies, there has been some attrition of the sample over more than a decade. A total of 2812 (in Year 9) students were active members of the sample at the end of KS3 (representing 89% of the original total). In addition, analyses are complicated by the fact that not all active students have data returned for each of the outcomes studied in Year 9. Moreover, some previously 'lost' students have been re-found at matching for KS3 assessments. Survey response rates for the teacher completed 'Pupil Profile' measuring social-behavioural outcomes and the student completed 'All About Me' and 'All About Me in School' questionnaires are high for such a long study (over 60%) though not as high as in primary school (around 80%). In addition, KS3 national assessment test data are missing for the last 2 of the 4 cohorts of students in the sample (due to a change in policy), and Teacher Assessment (TA) level data are available for approximately 2463 (88%) of the 'active' sample (see 'Methodology and analytical strategy' for more detail).

Measures at different time points

Academic outcomes

Taking account of developmental change, the study uses different cognitive assessments at different time points:

- Start of pre-school: British Ability Scales (BAS, Elliot, Smith & McCulloch, 1996) assessments
- Start of primary school: British Ability Scales (BAS) assessments, plus Pre-reading and Early number concepts.
- Year 1: NFER-Nelson Primary Reading Level 1 and Mathematics Age 6 tests
- Year 2: Key Stage 1 National Assessments: Reading, maths and TA for Science
- Year 5: NFER-Nelson Primary Reading Level 2 and Mathematics Age 10 tests
- Year 6: Key Stage 2 National Assessments Tests: maths and English (a combined measure of Writing, Spelling and Reading -via comprehension).
- Year 9 Key Stage 3 National Assessments reported via Teacher Assessments[8]: English, maths and science.

Note that the measure of pre-reading when children entered reception class and measures of reading and English attainment can all be regarded as measures of literacy. Similarly the measure of early number concepts (from BAS) used when children entered reception class and measures of maths attainment can be regarded as measures of numeracy.

National Assessments

Test levels were collected at the end of Year 6, using 6 categories: from working towards Level 1 to Level 6. However in Year 9, the levels of the National Assessments were awarded differently for English and maths. For English, pupils were categorised in 6 groups from working towards Level 3 up to Level 7. For maths, students were classified in 5 groups, which were sub

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[8] See National Assessment at age 14

categorised within 'tiered' bands. For example, the levels for Tier 3-5 went from Level 1 through to Level 5, while for Tier 6-8, levels went from Level 4 to Level 8.

In addition to test levels, during KS2 (Year 6) data were also collected on pupils' individual test scores within levels. This allowed the creation of more finely differentiated outcome measures (which are referred to as decimalised levels) for the multilevel analysis.

To ensure comparability over time, an internal age standardisation and normalisation procedure was applied to the decimalised data. This procedure takes account of age effects within one school year: hence age of student does not feature as a significant predictor of attainment /progress although it was included in the models at KS2. The scores presented in this paper are internally standardised to a mean of 100 and a standard deviation of 15. Therefore, all pupils scoring better than 100 at a certain time point are scoring at or above the attainment level expected for their chronological age (belong to the upper half of the sample of that assessment, controlling for age effects). Due to the use of internally standardised attainment scores, the scores can only be used to investigate the progress or improvement of certain groups of pupils *relative* to the total EPPSE 3-14 sample, but cannot be used to show *absolute* progress over time.

National Assessments at age 14
On 24 October 2008 the Secretary of State, Ed Balls, cancelled the KS3 National Assessment tests, although Teacher Assessment (TA) levels remained. This posed a challenge for the EPPSE project, as two of the four cohorts from the EPPSE sample were left without results for the KS3 National Assessment test scores. Thus, analysis in the present report uses TA levels in English, maths and science as academic outcomes and not the results of the KS3 National Assessment test scores. TA levels were obtained from the National Pupil Database (NPD) at the end of Year 9 or directly from the schools when these were missing. TA levels are less differentiated measures of attainment compared to tests as the levels are only ordinal categories placing students into a few ranked attainment groups. In Year 9, students were awarded TA levels from Level 1 to Level 8 and the same levels applied to English, maths and science.

Social-behavioural outcomes
Near the end of Year 9 teachers were asked to rate students' behaviour using the Strengths and Difficulties Questionnaire (Goodman, 1997) plus additional items to measure different features of children's social-behavioural development. The social-behavioural child profile was completed by a teacher who knew the student well. Principal component analysis and confirmatory factor analysis were used to identify the main underlying dimensions of social behaviour in Year 9. The four main aspects of social behaviour are:
- 'self-regulation';
- 'pro-social' behaviour;
- 'hyperactivity';
- 'anti-social' behaviour.

Specific questionnaire items associated with each of the four social-behavioural dimensions are presented in Figure 3.1. Scores on each social-behavioural dimension were calculated as a mean of all items corresponding to each dimension. Higher scores indicate better behaviour for 'self-regulation' and 'pro-social' behaviour; lower scores indicate better behaviour (lower incidence from teacher ratings) for 'hyperactivity' and 'anti-social' behaviour'.

Note that scores on all social-behavioural measures are skewed towards the more desirable end of the scale. This is in line with findings from earlier research on the sample at younger ages.

Figure 3.1: Measuring social-behavioural outcomes in Year 9: Structural Equations Confirmatory Factors Analysis (SEM CFA)

Year 9: SOCIAL/BEHAVIOURAL Outcomes: Measurement Equations
Structural Equations Confirmatory Factor Analysis (SEM CFA)
Full-Information Maximum Likelihood (FIML) Estimation

Note: Standardized estimates reported.

MODEL INFORMATION:
Chi square = 2990.576
df = 431
p = .000
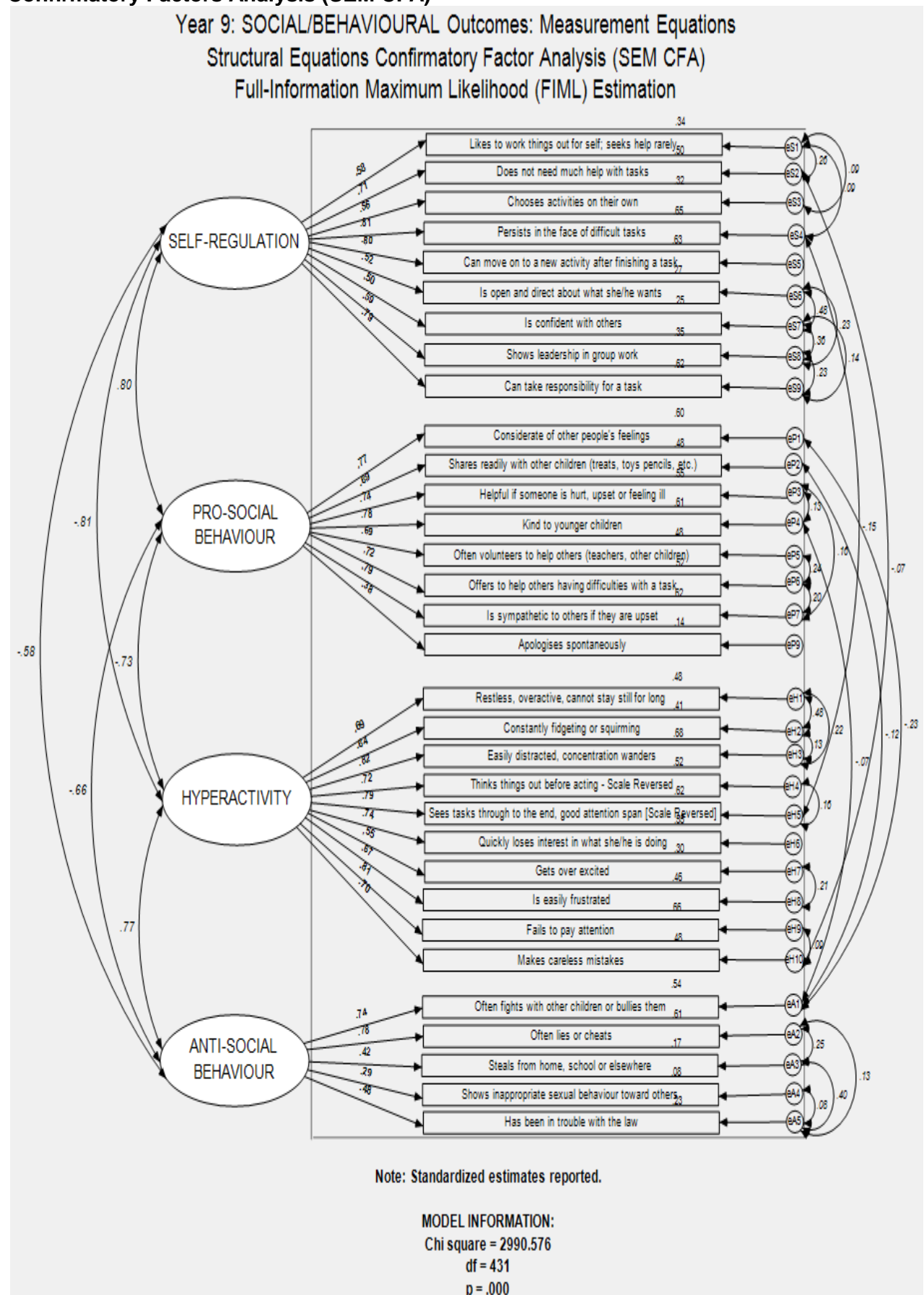
Self-perceptions and students' views

During Year 9, students completed two questionnaires about their personal and academic life while in secondary school. One questionnaire ('All About Me in School') focused on their academic life, specifically on their perceptions of the school, their teachers, headteachers and other students but also on their experiences as students in secondary schools. Based on this survey, several indicators were created reflecting school and teaching processes (for details see Sammons et al., 2011a).

Students' school related perceptions and experiences were explored using Exploratory and Confirmatory Factor Analysis (EFA & CFA) and several factors related to teaching and school processes were created (see Sammons et al., 2011a). These factors included:
- Teacher support
- School environment
- Valuing students
- Headteacher qualities
- Poor behaviour climate
- Emphasis on learning
- Teacher discipline
- School/learning resources

Based on the 'All About Me' questionnaire, the following indicators were created (see Sammons et al., 2011a report for the technical details):
- Enjoyment of school
- English academic self-concept
- Maths academic self-concept
- Citizen values
- Popularity
- Anxiety

Measures of 'other' influences at different ages
Individual students and their families
Data were collected about individual students and family characteristics that may influence students' academic attainment, development and progress. Parental interviews were administered when the children entered the study in the pre-school period and information was collected on demographic characteristics such as education, employment and number of children in the household. At the same time, information was collected on the child's early care history, birth weight and developmental problems. This information was updated through parental questionnaires towards the end of Key Stage 1 (KS1 age 7) and again towards the end of primary school (KS2 age 10).

The Home Learning Environment (HLE) and out of school learning activities
The pre-school parent interview collected information on the early years HLE: (reading with children, number/letter activities, etc.), and other activities such as bedtime, TV viewing etc. when the children were in the first phase of the research. Similar information on 'informal' learning opportunities (age appropriate) was collected at the end of Key Stage 1 (when children were age 7) through parental questionnaires. Information on home and 'other learning' activities (outside of the home) were again collected by questionnaire at the end of KS2. This included computer access and use at home, homework and out of school learning opportunities. The early years HLE is used extensively in KS2 analyses because it is a stronger predictor of outcomes at age 11 than the KS1 HLE.

Primary school academic effectiveness

To establish the academic effectiveness of each primary school, separate measures of primary school effectiveness in English, maths and science were derived from independent value added analyses of pupil progress for three successive national cohorts (2002-2004) using National Assessment data matched between Key Stage 1 and 2 for all pupils (see Melhuish et al., 2006a; 2006b) for every primary school in England.

Multilevel models are used to investigate children's progress during Key Stage 2 by controlling for a child's prior attainment, as well as for a number of background influences. These allow measurement of the contribution of the primary school attended. Primary schools where children make significantly greater progress than predicted (on the basis of prior attainment and intake characteristics) can be viewed as *more academically effective,* and schools where children make less progress than predicted can be viewed as *less effective*. The phrase 'academic effectiveness' here therefore refers solely to these value-added measures of progress. The analyses focussed on **progress**, rather than absolute attainment, in the three subject areas of English, maths and science, and in average key stage scores. The value added models controlled for pupil background characteristics such as gender, ethnic group, English as an additional language, free school meal (FSM) eligibility and special educational needs (SEN) as well as prior attainment and school intake characteristics.

Further development of the value added models measured the differential effects for boys and girls in different ethnic groups, as well as considering area effects. The child's postcode was used to relate the child's residence to the Index of Multiple Deprivation (IMD – for further details see Noble et al., 2004; 2008) and to variables derived from the 2001 Census. In these analyses Key Stage 1 (KS1) results were linked to Key Stage 2 (KS2) results at the pupil level supplemented with additional pupil and school level data (including FSM, EAL, ethnicity etc), and area characteristics to provide additional contextual controls. From these analyses, it was possible to identify trends in effectiveness in terms of academic outcomes over the three successive years.

In analysing progress, the value added models include measures of a child's ability at the start of Key Stage 2, i.e. Key Stage 1 attainment, as well as predictor variables that might explain progress. The consequences of this strategy are as follows:

- The inclusion of Key Stage 1 attainment in the value added models will absorb the effects of several child, parent, family, home and area factors, if their effects do not persist additively over the Key Stage 2 period. Hence the relative importance of these factors in measuring progress may appear substantially less than would be the case if Key Stage 1 scores are excluded in the models, i.e. attainment only is considered.
- Some children who start from a very low point may make a lot of progress across KS2 but nonetheless their overall attainment by age 11 may still be below average.

These analyses were used to produce measures of the academic effectiveness of all primary schools in England. Measures of academic effectiveness for schools attended by study children were used in analyses.

Secondary school academic effectiveness

Secondary school academic effectiveness

The secondary school academic overall effectiveness was represented by the contextual value added (CVA) score at the school level. This measure[9] was calculated for all state secondary schools in England by the DfE and a mean CVA score was calculated based on KS2 to KS4 (KS2-4) CVA scores for four years from 2006 to 2009 for the secondary schools attended by EPPSE students.

Inspection measures

Inspection judgements from the Office for Standards in Education (Ofsted) provided overall measures of school quality linked with the framework for the inspection of schools. Ofsted inspectors made judgments about key aspects of secondary schools and data were collected on a rating scale (range 1 to 4) of the:
1. level of attendance of their pupils;
2. quality of pupils' learning.

Neighbourhood measured

Multiple measures of the neighbourhood environment were explored in the analyses. Several measures were available either from census statistics or from the National Pupil Data (NPD). The project used the Index of Multiple Deprivation (IMD) which is a measure of a range of characteristics evident in a neighbourhood. The index includes percentage of White British citizens in the neighbourhood, level of crime, level of employment, percentage of residents with limiting long-term illness, the Income Deprivation Affecting Children Index (IDACI). In addition, a measure the parent's perception of neighbourhood safety was derived from parent questionnaires.

Data collection

Full details of data collection procedures, instruments and response rates are contained in the technical reports associated with each phase of the study (see www.ioe.ac.uk/projects/eppe).

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[9] At the time of these analyses the DfE's contextualised VA measure sought to control for differences in the characteristics of student intakes to schools, as well as measures of prior attainment, and in this way reflects the typical approaches developed and used in international school effectiveness research studies. At the pupil level, the CVA score was calculated as the difference between predicted attainment (i.e., the average attainment achieved by similar pupils) and real attainment in KS4. The predicted attainment was obtained by using multilevel modelling controlling for pupils' prior attainment and adjusting for their background characteristics (i.e., gender, age, ethnicity, SEN, FSM, mobility etc.). For each school, all individual pupil scores were averaged and adjusted for the proportion of pupils attending the school in a specific year. This final averaged score represents the school level CVA and it is presented as a number based around 1000 (for more technical details see
http://www.education.gov.uk/performancetables/schools_08/2007_2008_Guide_to_CVA.pdf
Since these analyses the DfE calculate KS2-KS4 value added as follows: "The pupil's value added score is based on comparing their exam performance with the median exam performance of other pupils with the same or similar prior attainment at KS 2. The median value is the middle value - with half of the pupils having a capped point score at or below the median, and half at or above.
A school's value added measure is a simple average (arithmetic mean) of the value added scores for all pupils in the school see
http://www.education.gov.uk/performancetables/schools_05/sec9.shtml

Methodology and analytical strategy

A number of statistical techniques from descriptive and correlation analysis to multilevel (hierarchical) regression methods were used to examine the way various individual student, family and home characteristics influence students' academic and social-behavioural outcomes and progress up to the end of KS3.

In these analyses we establish the effects associated with pre-school, primary and secondary school characteristics. However, this can only be adequately achieved if account is taken of the influence of a range of background factors that also affect development as shown in Figure 3.2. In the statistical analyses, multilevel modelling is used as it capitalizes on the hierarchical structure of the data (i.e. students clustered within schools; see Goldstein, 1995), and therefore produces more accurate estimates of the net effects of different predictors.

Figure 3.2: Influences on students' development
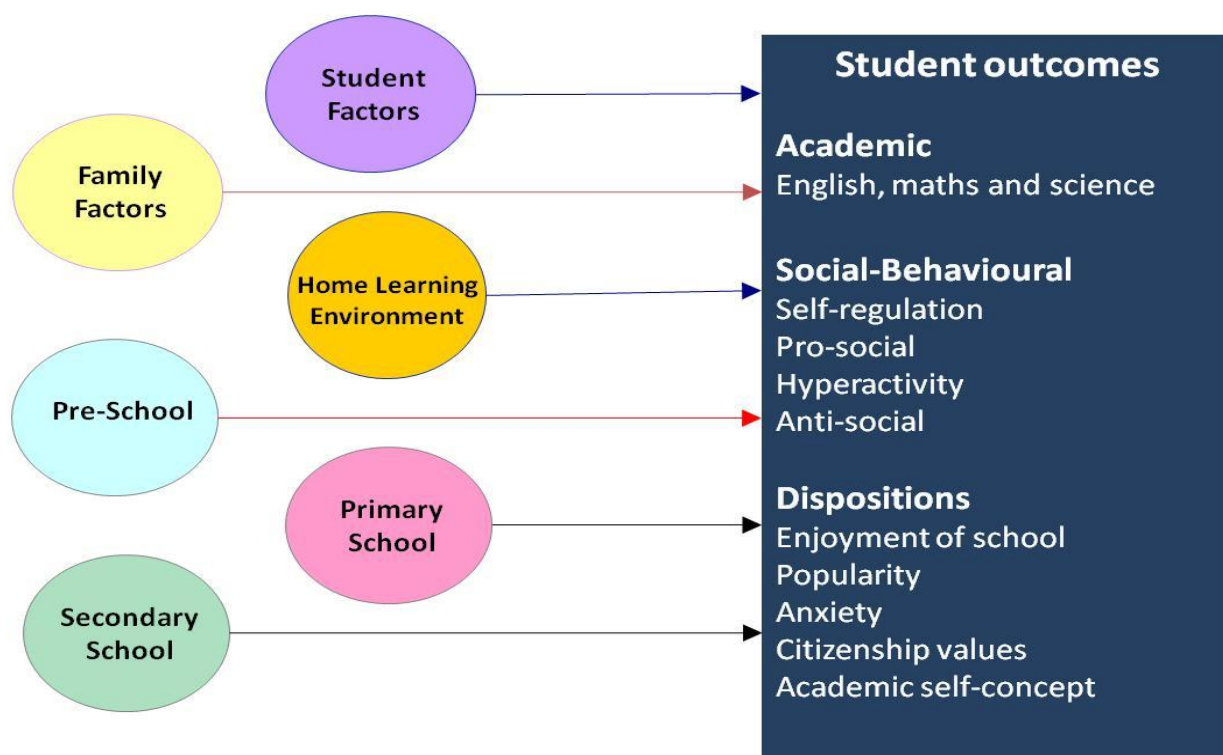
Multiple imputation

In line with recent advances in analytic techniques, multiple imputation of missing data has been adopted to further develop the EPPSE analysis strategy, and enhance the rigor and confidence that can be placed in results by maximising sample size. Two alternative imputation approaches have been tested (ICE and AMELIA procedures in STATA) and comparisons between results from non-imputed and imputed data have been conducted. In both the academic and social-behavioural analyses it was deemed appropriate to impute data for students where data were available for 3 separate time points. Comparisons of imputed and non-imputed data for the English, maths and science TA outcomes indicate that the results of estimates based on the imputed data are very similar to those based on the non-imputed data. This is also the case for social-behavioural outcomes. The advantage of the inclusion of analyses on imputed data is the maximisation of sample size that facilitates the ability to identify moderate and small effects that are statistically significant. It adds to the study's rigour and the robustness of the reported results. In conducting the analyses of students' self-perceptions multiple imputation was not used to study the various affective outcomes because the nature of the measures changed as the children have grown older.

As previously stated analyses were conducted on both original and imputed data for both academic social-behavioural outcomes. The technical reports associated with these analyses Sammons et al., 2011a; 2011b give full details on both sets of analyses. This final report provides a summary and overview of the main analyses drawn from these technical reports and details results from one type of analyses for ease of reading (original for academic and imputed for social-behavioural) where the findings were significant on both. There are a small number of factors which are exceptions to this where the imputed data slightly altered significance for social-behavioural outcomes. These findings are more robust using imputed data (see above).

The samples for both sets of outcomes (academic and social-behavioural) differ very slightly. The tables below (taken from the academic sample) provide details of the demographics of the EPPSE students at age 14. These tables includes both original and imputed data for comparison but, as stated previously, the outcomes sections of this report refer to only one set of analyses for ease of reading.

Table 3.2: Characteristics of students in Year 9 - Original and Imputed Data (N=3002)

	Year 9 Original sample		Year 9 Imputed sample	
	N	%	N	%
Gender				
Male	1543	51.4	1543	51.4
Female	1459	48.6	1459	48.6
Ethnicity				
White UK Heritage	2206	73.5	2206	73.5
White European Heritage	110	3.7	110	3.7
Black Caribbean Heritage	109	3.6	109	3.6
Black African Heritage	61	2.0	61	2.0
Indian Heritage	64	2.1	64	2.1
Pakistani Heritage	160	5.3	160	5.3
Bangladeshi Heritage	31	1.0	31	1.0
Mixed Heritage	181	6.0	181	6.0
Any Other Ethnic Minority Heritage	78	2.6	78	2.6
Missing	*2*	*0.1*	*2*	*0.1*
Number of siblings in the house (age 3/5)				
No siblings	600	20.0	608	20.3
1 - 2 siblings	1896	63.2	1920	64.0
3+ siblings	466	15.5	474	15.8
Missing	*40*	*1.3*		
SEN status				
No special provision	2161	72.0	2346	78.2
School Action	321	10.7	348	11.6
School Action Plus	187	6.2	204	6.8
Statement of SEN	97	3.2	105	3.5
Missing	*236*	*7.9*		
Type of pre-school				
Nursery class	580	19.3	580	19.3
Playgroup	587	19.6	587	19.6
Private day nursery	488	16.3	488	16.3
Local Authority day nursery	401	13.4	401	13.4
Nursery schools	495	16.5	495	16.5
Integrated (Combined) centres	170	5.7	170	5.7
Home	281	9.4	281	9.4

Table 3.3: Family characteristics of students in Year 9 - Original and Imputed Data (N=3002)

	Year 9 Original sample N=3002		Year 9 Imputed sample N=3002	
	N	%	N	%
Mother's qualifications				
None	626	20.9	651	21.7
Vocational	434	14.5	448	14.9
16 Academic	1093	36.4	1120	37.3
18 Academic	242	8.1	247	8.2
Degree or Higher degree	484	16.1	492	16.4
Other professional	44	1.5	44	1.5
Missing	79	2.6		
Father's qualifications				
None	477	15.9	786	26.2
Vocational	337	11.2	470	15.7
16 academic	668	22.3	856	28.5
18 academic	215	7.2	268	8.9
Degree or Higher degree	508	16.9	586	19.5
Other professional	32	1.1	36	1.2
Absent father	724	24.1		
Missing	41	1.4		
Family highest SES (age3/5)				
Professional Non manual	264	8.8	266	8.8
Other Professional Non manual	749	25.0	756	25.2
Skilled Non manual	953	31.7	967	32.2
Skilled manual	442	14.7	450	15.0
Semi-skilled	390	13.0	400	13.3
Unskilled	74	2.5	76	2.5
Unemployed / Not working	84	2.8	87	2.9
Missing	*46*	*1.5*		
FSM at Year 9				
No Free School Meals (FSM) (at Year 9)	2267	75.5	2431	81.0
Free School Meals (FSM) (at Year 9)	534	17.8	571	19.0
Missing	*201*	*6.7*		
Family Earned Income at age 7				
No salary	565	18.8	788	26.3
£ 2,500 – 17,499	480	16.0	615	20.5
£ 17,500 – 29,999	410	13.7	511	17.0
£ 30,000 – 37,499	271	9.0	328	10.9
£ 37,500 – 67,499	468	15.6	565	18.8
£ 67,500 – 132,000+	170	5.7	195	6.5
Missing	*638*	*21.3*		
Early years Home Learning Environment (HLE) Index				
<13	283	9.4	294	9.7
14-19	645	21.5	665	22.1
20-24	706	23.5	732	24.4
25-32	934	31.1	965	32.1
>33	338	11.3	347	11.5
Missing	*96*	*3.2*		

Analysis Techniques

The Year 9 analyses all adopt a similar analysis strategy including using a range of simple descriptive techniques and more complex multivariate analyses. All reports include descriptive details of the sample based on non-imputed data. The sample characteristics of students with outcome data and those students missing data are compared. In addition, exploratory and confirmatory factor analysis has been used to identify underlying dimensions (e.g. of social behaviour or affective outcomes such as 'academic self-concept' or 'enjoyment of school').

Multilevel (hierarchical) regression was used to study the influences of various individual student, family, home learning environment (HLE) and neighbourhood factors as predictors of variation in students' Year 9 outcomes in three domains. These include *academic attainment* in English, maths and science, various *social-behavioural measures* ('self-regulation', 'pro-social' behaviour, 'hyperactivity' and 'anti-social' behaviour) and various *affective* outcomes (e.g. 'enjoyment of school', 'maths academic self-concept', 'English academic self-concept', 'anxiety' etc). In addition, value added analyses of student's developmental progress are conducted to explore change over time in these outcomes from Year 6 (end of KS2, age 11) to Year 9 (end of KS3, age 14). These multilevel analyses adopt very similar approaches to those used in previous phases of the research to study development at younger ages (Sammons et al., 2008a; 2008b; 2008c; 2008d).

For social-behavioural development some additional analyses are being employed to examine developmental progress in more depth using multilevel growth curve models. These allow us to explore the trajectories of children's social-behavioural development from age 7 to 14. This is a new development not used in earlier phases of the research. Unfortunately, it has not been possible to conduct such analyses using growth curve models for academic outcomes due to the lack of comparable measures at age 14 for English, maths and science following the abolition of national assessment tests. We judge that Teacher Assessment (TA) levels are not sufficiently differentiated to use in growth curve models. In addition to descriptive analyses of the outcomes for key groups of students (e.g. by gender, FSM, SEN) in Year 9 in terms of attainment (e.g. TA levels), the multilevel analyses show the net strength of the influence of different measures as predictors using effect sizes (ES) that allow comparisons across different outcomes and at different ages.

After exploring individual student, family and HLE influences multilevel analyses investigated:
- the continued influence of pre-school (duration, quality and effectiveness);
- the continued influence of academic effectiveness of the primary school (CVA measures);
- the influence of secondary school (Ofsted inspection ratings of school quality, the DfE CVA measures of secondary school academic effectiveness).

From the Year 9 'All About Me in School' questionnaire various additional measures have been collected e.g. on the amount of time student reports spending on homework and several indicators of school and teaching processes. These have been developed using Exploratory and Confirmatory factor analysis (EFA & CFA). These are being tested as predictors of academic and social-behavioural outcomes as well as of student attitudes in the various multilevel models. These analyses will help to provide insight about the way secondary school experiences help to predict variation in different kinds of student outcomes in Year 9.

In addition to modelling students' outcomes in Year 9 in the three domains described above (academic, social-behavioural and affective) some further simple subgroup analyses were conducted to report the outcomes of students who had different transition experiences (e.g. showed better or poorer experiences. The estimates from the cognitive models of TA results also indicate the relative size of effects in terms of TA levels (e.g., 0.5 of a TA level) to aid interpretation. This is not possible for the social-behavioural outcomes, so here the results are expressed in terms of standard deviation units (e.g., 0.5 of a standard deviation) and also in terms of what such a difference might mean in terms of students' position in the overall population distribution (e.g., top 10%; bottom quartile). These other metrics are included in the full report on KS3 social-behavioural outcomes (Sammons et al., 2011b). In this report we give basic effect size information.

Section 4: Academic attainment and progress at age 14

> **Summary of key findings**
> - High quality or highly effective pre-school continued to predict better academic outcomes at age 14.
> - The continued benefits of pre-school were most evident for students who went on to attend secondary schools of medium or low academic effectiveness.
> - More academically effective primary school continued to predict better outcomes at age 14.
> - Differences in attainment related to background influences that emerged at age 3, particularly birth weight, family income, the early years HLE and FSM status, remained fairly stable to age 14.
> - Girls and older students (Autumn-born) had, on the whole, higher attainment and made more progress in KS3.
> - The Ofsted inspection measures of secondary school 'quality of learning' and 'students' attendance' as well as attending a secondary school judged 'outstanding' by Ofsted predicted better attainment and progress.
> - Students' reporting a stronger 'emphasis on learning' and more positive 'behaviour climate' in their secondary school had higher attainment and made greater progress.
> - There were strong and positive links between students' 'academic self-concept' for English and maths and their attainment in these subjects. There was also better attainment where students reported they 'enjoyed school'.
> - Time spent on homework, strongly predictor better attainment and progress especially where students spent 2-3 hours per day after school on homework.
> - Students who experienced a positive transition from primary school were more likely to have higher attainment and make better progress at age 14.

This section of the report presents the results of analyses related to the influence of pre-school, primary and secondary school on students' academic attainments at the end of Year 9 when the EPPSE students were aged fourteen. It also charts their academic progress from the ages of 11 to 14 (during Key Stage 3). This section extends and develops findings from earlier time points (ages 7, 11 etc.), and is a synopsis of the analyses and findings related to academic development up to age 14. For further details see the full report on academic outcomes, and the companion reports on social-behavioural development and dispositions (Sammons et al., 2011a; 2011b; 2011c.)

Throughout its research, EPPSE 3-14 has gathered a wide range of data on individual student, family, home learning environment (HLE), pre-school and primary school characteristics that influence child development. In addition, information on the secondary school's academic effectiveness[10] derived from KS2-KS4 contextual value added (CVA) indicators produced by the Department for Education (DfE) have been added to the EPPSE data set. Also, various Ofsted inspection judgements were used to provide independent indicators of the quality of secondary schools. These complemented the measures of quality[11] and academic effectiveness[12] for pre-school settings and the measures of primary school effectiveness[13]. It was therefore possible to

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[10] Secondary school academic effectiveness scores were obtained from the Department for Education (DfE). The measure of academic effectiveness is represented by the average KS2 to KS4 contextual value added (CVA) school level scores over 4 years (2006-2009) when EPPSE students were in secondary school. Secondary school quality was derived from Ofsted inspection judgments.

[11] Pre-school quality was measured using aggregate scores from the ECERS-E (see Glossary) for the curricular activities of Literacy, Numeracy, Science, and Diversity of provision (Sylva et al., 2010).

[12] Measures of the effectiveness of pre-schools were derived from Value Added (VA) models of the sample's actual progress during pre-school, controlling for prior attainment and children's background characteristics (Sammons et al., 2004a).

[13] Primary school academic effectiveness scores were obtained from National Assessment data for several cohorts across all primary schools in England. Value-added scores were calculated across the years 2002-4, for each primary school in England and then extracted for schools attended by the EPPE sample (Melhuish et al, 2006a; 2006b).

explore pre-school, primary and secondary school influences on students' outcomes in Year 9 both separately and in combination.

EPPSE students' academic outcomes at Year 9 were based on National Curriculum levels as judged by Teacher Assessments (TA) in English, maths and science. These provide measures of students' educational outcomes in Year 9 (age 14). Standardised scores of National Assessments in English and maths in Year 6 (age 11) were used as the measures of prior attainment to study progress in KS3. The sample included 3002 pupils for whom we had at least three academic assessments from age 3 to age 14.

The aims of the KS3 phase of the research were to:
- investigate the relationships between students' academic attainment in KS3 (Year 9, age 14) and background individual, family and home learning environment (HLE) characteristics;
- explore the influence of pre, primary and secondary school experiences, particularly in terms of quality and academic effectiveness on later academic outcomes and progress;
- examine the combined impact of pre-school characteristics with the HLE and primary school experience on academic attainment;
- assess whether the impact of pre and primary school differs for more and less disadvantaged students;
- investigate the combined effect of secondary school experience with pre and primary school experiences on academic attainment;
- model students' current academic *attainment* in Year 9, and their *progress* over KS3;
- explore the effects of teaching, school processes and students' self-perceptions on academic attainment.

Key findings
Previously the EPPSE project has demonstrated that a range of factors related to child and family characteristics and the early years HLE are important predictors of children's academic attainment and progress up to the end of primary school (Sammons et al., 2008a; Sylva et. al., 2010). The impact of these influences can be detected from a young age and can also affect later educational attainment. Many of the EPPSE reports point to the negative influence of socio-economic disadvantages. Previous EPPSE findings have contributed to policy development in England associated with issues of equity and social inclusion (see The Equalities Review, 2007).

This current follow up of the sample in adolescence (Year 9 age 14) provides new evidence about the size of the equity gap, measured by TAs in the three 'core' curriculum areas of English, maths and science. The sample for these analyses is shown in the tables over.

Table 4.1: Characteristics of sample in Year 9

	Year 9 English TA N=2574		Year 9 Maths TA N=2574		Year 9 Science TA N=2575	
	N	%	N	%	N	%
Gender						
Male	1311	50.9	1306	51.9	1312	51.0
Female	1263	49.1	1268	48.1	1263	49.0
Ethnicity						
White European Heritage	85	3.3	85	3.3	83	3.2
Black Caribbean Heritage	101	3.9	100	3.9	101	3.9
Black African Heritage	53	2.1	54	2.1	54	2.1
Any Other Ethnic Minority Heritage	59	2.3	59	2.3	59	2.3
Indian Heritage	58	2.3	58	2.3	58	2.3
Pakistani Heritage	132	5.1	125	4.9	134	5.2
Bangladeshi Heritage	25	1.0	25	1.0	25	1.0
Mixed Heritage	149	5.8	151	5.9	149	5.8
White UK Heritage	1911	74.3	1916	74.5	1911	74.2
Number of siblings in the house (at age 3/5)						
No siblings	514	20.2	513	19.7	514	20.2
1 - 2 siblings	1618	63.7	1619	63.6	1617	63.6
3+ siblings	409	16.1	409	16.8	411	16.2
SEN status at age 14						
No Special Provision	1976	78.4	1973	78.3	1976	78.3
School Action	299	11.9	299	11.9	300	11.9
School Action Plus	163	6.5	168	6.7	165	6.5
Statement of SEN	84	3.3	81	3.2	83	3.3
Type of pre-school						
Nursery class	515	20.0	518	40.7	518	20.1
Playgroup	531	20.6	532	17.0	530	20.6
Private day nursery	356	13.8	357	11.6	353	13.7
Local Authority day nursery	338	13.1	336	15.6	340	13.2
Nursery schools	440	17.1	440	1.9	439	17.0
Integrated (Combined) centres	145	5.6	145	.1	145	5.6
Home	249	9.7	246	13.1	250	9.7
Mother's highest qualification						
None	559	22.3	558	22.3	561	22.4
Vocational	386	15.4	385	15.4	386	15.4
16 Academic	1002	40.0	1004	40.1	1001	40.0
18 Academic	197	7.9	197	7.9	197	7.9
Degree or Higher degree	323	12.9	323	12.9	322	12.9
Other professional	37	1.5	38	1.5	38	1.5
Father's highest qualification						
None	430	16.9	429	16.9	433	17.0
Vocational	308	12.1	307	12.1	306	12.0
16 academic	623	24.5	624	24.6	623	24.5
18 academic	179	7.1	178	7.0	179	7.0
Degree or Higher degree	333	13.1	337	13.3	334	13.1
Other professional	29	1.1	29	1.1	29	1.1
Absent Father	637	25.1	635	25.0	636	25.0

Table 4.1 continued: Characteristics of sample in Year 9

	Year 9 English TA N=2574		Year 9 Maths TA N=2574		Year 9 Science TA N=2575	
	N	%	N	%	N	%
Family highest SES (age3/5)						
Professional Non-manual	165	6.5	167	6.6	163	6.4
Other Professional Non-manual	605	23.9	605	23.9	606	23.9
Skilled Non-manual	876	34.6	879	34.7	874	34.5
Skilled Manual	398	15.7	395	15.6	400	15.8
Semi-Skilled	349	13.8	348	13.7	349	13.8
Unskilled	68	2.7	68	2.7	69	2.7
Unemployed / Not working	73	2.9	72	2.8	74	2.9
FSM in Year 9 (age 14)						
No Free School Meals (FSM)	2041	80.2	2040	80.2	2044	80.3
Free School Meals (FSM)	504	19.8	504	19.8	503	19.7
Family earned income at KS1 (age 7)						
No salary	488	24.2	485	24.1	488	24.2
£ 2,500 – 17,499	442	21.9	440	21.8	442	21.9
£ 17,500 – 29,999	375	18.6	375	18.6	376	18.7
£ 30,000 – 37,499	245	12.2	246	12.2	245	12.2
£ 37,500 – 67,499	375	18.6	379	18.8	374	18.6
£ 67,500 – 132,000+	90	4.5	90	4.5	90	4.5
Early years HLE Index						
<13	238	9.6	235	10.3	238	9.5
14-19	576	23.1	576	25.0	579	23.2
20-24	621	24.9	623	23.4	622	24.9
25-32	779	31.3	783	29.7	777	31.2
>33	278	11.2	276	11.6	277	11.1

In terms of parents' qualification, thirteen per cent of mothers and fathers had a degree or a higher degree. With respect to the family's social economic status[14] (SES), just under a third (30%) were in the professional categories. A higher percentage (50%) were classified as skilled (either manual or non manual) and only a very small number were unemployed (3%). Nearly twenty per cent of the students were eligible or receiving free school meals (FSM) in Year 9[15]. Almost half of the sample (46%) lived in families with very low (below £17,500) or no income. Seventy- eight per cent did not have any SEN provision, while only three per cent had a full SEN statement.

In contrast to earlier research using this sample (during KS2), by age 14, due to a shift in Government policy[16], it was not possible (for the full sample) to study outcomes measured by national assessment **test** scores. The outcome measure at KS3 relies on **Teacher Assessment** (TA) judgments. These are less finely differentiated (based on levels and not individual scores) and it has been argued are more likely to reflect greater subjective bias due to possible 'halo

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[14] Family SES was calculated by considering the highest SES status of the mother or the father.
[15] The FSM information collected by the Pupil Profile questionnaire, which was completed by teachers, had a high percentage of missing values (46%). Therefore, this information was combined with the FSM information available from the National Pupil Database (NPD). EPPSE variable represents the students who received FSM, while the NPD variable indicates pupils who are eligible for FSM. NPD's definition of FSM eligibility is as follows: *"Pupils should be recorded as eligible (true) only if a claim for FSM has been made by them or on their behalf by parents and either (a) the relevant authority has confirmed their eligibility and a free school meal is currently being provided for them, or (b) the school or the LEA have seen the necessary documentation (for example, an Income Support order book) that supports their eligibility, and the administration of the free meal is to follow as a matter of process."*
[16] National Assessment Testing was abolished in October 2008 by the Secretary of State, Ed Balls and replaced by Teacher Assessment (TA) levels.

effects' (see Bew, 2011; Harlen, 2004). However, teacher judgments of attainment in Year 9 are likely to play an important role in shaping students' future educational decisions and in particular their subject choices in KS4 and therefore, should be viewed as important measures of educational outcomes. Throughout this section the results are reported as Effect Sizes (ES) or in 'real world' metrics (relating to National Curriculum levels) where relevant.

This section contains a summary of the main findings with full details of the analyses reported in a separate report (see Sammons et al., 2011a). The analyses in this section identify which child, family and HLE characteristics predict EPPSE students' KS3 academic outcomes. The results show similarities to earlier findings for this sample (see Sylva et al., 2010). While many relating to gender or SES are in accord with those from other research, this report reveals the continued importance of the early years HLE. The EPPSE project is the only study that has explored this topic across different phases of education and identifies the way that the early years HLE continues to predict attainment up to age 14. In addition, the research discussed in this report demonstrates that various family background characteristics continue to influence students' academic progress across KS3.   It should be noted that in the progress analyses, prior attainment in national assessment tests at the end of primary education (Year 6 KS2) was controlled for in the statistical models.

As well as investigating the impact of child, family and HLE background, the EPPSE research has explored the continued influence of pre-school and primary school as predictors of students' later attainment at age 14 and also tested a range of measures related to secondary school experiences. The results therefore provide new evidence on the way different educational settings (pre-school, primary and secondary) affect attainment and progress in KS3.

In order to maximise the sample size in both the academic and social-behavioural outcomes multiple imputation of missing data was used (see Analysis Strategy). Careful comparisons of the results from both imputed and non-imputed data sets were conducted and these indicated that both sets of results were similar. In this section, results are reported for the original sample (non-imputed) for ease of reading but details of both analyses are contained in the full report for this outcome (see Sammons et al., 2010).

Overall differences in attainment for different student groups

First we report on (raw) differences in attainment for different groups of students in KS3 before exploring the impact of background factors as (net) predictors of these outcomes.

EPPSE students had higher average attainment in maths than in either science or English (a difference of around 0.51 of a national curriculum level comparing maths and English, and 0.36 of a level comparing maths and science) at the end of KS3. This pattern of higher results in maths is in line with the most recent TIMMS 2007 survey (see Sturman et al., 2008) that revealed England as the highest performing country in Europe in maths with the most improved results since 1995. It should be noted that EPPSE students had experienced the National Numeracy Strategy (DfEE, 1998) during their time in primary school and this is likely to have benefited their attainment as research has shown (Tymms & Merrell, 2007) that this significantly raised overall attainment standards in maths.

Gender

In Year 9, girls had significantly higher attainment in terms of average TA English results than boys by around 0.4 of a national curriculum level (approximately half a standard deviation in size) but there were no significant gender differences in maths or science results. At younger ages girls had been shown to have higher attainment in reading and English and there were also smaller differences in maths and science outcomes in primary school. However, by age 14 these differences have disappeared.

Ethnicity

There was some evidence of ethnic differences in attainment but due to low numbers for most groups in the EPPSE sample the results should be interpreted with caution. Nonetheless, the differences found in average results by ethnic group are in line with those found in other studies indicating higher attainment for some groups e.g. Indian and lower for others e.g. those from Pakistani heritage.

Family characteristics

There were marked differences in attainment related to parents' qualification levels. Students with highly qualified parents (degree level) had much higher attainment on average than those students whose parents had no qualifications (the difference was 1.4 for English, 1.7 for maths and 1.5 for science in terms of TA levels).

There were similarly large differences related to family socio-economic status (SES) between those from professional non-manual and those from semi/unskilled, manual/unemployed groups. Moreover, students eligible for Free School Meals (FSM[17]) had lower average attainment than students who were not eligible for FSM. The differences were around 0.7 (English and science) and 0.8 (maths) of a national curriculum level.

The quality of the early years HLE was also strongly associated with differences in average attainment at KS3. Those who had experienced a high compared to low early years HLE were generally one (1.0) national curriculum level higher for English and science, and 1.3 higher for maths.

The net impact of student, family and HLE characteristics on attainment in Year 9

The average group differences described above do not take into account the relative influence of other characteristics. Multilevel modelling provides more detailed results of the 'net' contribution of individual characteristics, whilst controlling for other predictors and so enables the identification of the 'strongest' net predictors. For instance, the higher attainment of students with mothers who have degrees is compared to those with no qualifications, net of the influence of other family and student characteristics (SES, income, HLE or gender). Mother's qualification level was the strongest predictor of better attainment for English, maths and science. The next strongest predictor was gender but for English only, where the effect (strongly positive for girls) was larger in KS3 than was the case when these students were in primary school.

There were also a number of additional strong/moderately strong predictors related to student background (listed in decreasing order of ES):

English: family income, birth weight, father's highest qualification level, early years HLE
Maths: birth weight, early years HLE, father's qualification level, ethnicity, family SES
Science: father's qualification level, early years HLE, family SES, ethnicity[18].

It should be noted that ethnicity was not a significant predictor of TA levels in English, but it was for maths and science; students of Indian heritage obtained significantly better results in maths and science than White British students, controlling for the influence of other characteristics. FSM (the low income indicator) and family SES also had moderately strong effects on attainment in English, maths and science. These effects were similar to the size of effects related to the early years HLE for English. The early years HLE had stronger effects for maths and science than FSM (the low income indicator).

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[17] FSM = Free school meals which is an indicator of low income/poverty.
[18] The number of students in minority ethnic groups is small, thus differences for specific groups should be treated with caution.

Older students (for their age group e.g. Autumn-born) also show better results although the effect is not strong. There are also small positive effects related to the age of the child's mother (at birth); the older the mother then the better the outcomes, compared to children of younger mothers.

There is evidence that the 'social composition' of the school, as measured by the percentage of students entitled to free school meals, (FSM, an indicator of poverty) can influence individual student's outcomes over and above their own FSM status. EPPSE students who attended a secondary school with higher proportions of students receiving FSM showed poorer attainment in English, maths and science, although the effects were relatively weak.

Table 4.2: Characteristics with a significant 'net' effect on English (TA) Year 9

Characteristic	Effect Size	Description
Age	0.19	Older pupils = better than younger
Gender	0.46	Females = higher attainment than males
Birth weight	0.37	Normal birth weight = higher attainment than low
Early developmental problems	0.21	1+ early developmental problems = lower achievement
Early behavioural problems	0.18	1+ early behavioural problems = lower achievement
Number of siblings	0.31	Three siblings or more = lower achievement
Mother's age	0.16	Older mothers = better achievement
Mother's qualifications	0.61	Higher qualification level = better achievement
Father's qualifications	0.36	Higher qualification level = better achievement
Year 9 FSM	0.30	Eligible for FSM = lower achievement
Family SES	0.29	Higher SES = better achievement
Family earned income	0.40	High income = better achievement
School level FSM	0.19	High % of students receiving FSM = lower attainment
Early years HLE	0.29	Higher scores on Early Years HLE = higher achievement
KS1 HLE	0.24	Frequent outdoors activities = higher achievement
KS2 HLE	0.19	Moderate computing usage is better than frequent computer usage

Table 4.3: Characteristics with a significant 'net' effect on maths (TA) Year 9

Characteristic	Effect Size	Description
Age	0.15	Older pupils = better than younger
Birth weight	0.40	Normal birth weight = higher attainment than low
Ethnicity	0.37	Indian heritage = better outcome than White UK heritage
Early developmental problems	0.16	1+ early developmental problems = lower achievement
Early behavioural problems	0.18	1+ early behavioural problems = lower achievement
Number of siblings	0.19	Three siblings or more = lower achievement
Mother's qualifications	0.50	Higher qualification level = better achievement
Father's qualifications	0.37	Higher qualification level = better achievement
Year 9 FSM	0.31	Eligible for FSM = lower achievement
Family SES	0.36	Higher SES = better achievement
Family earned income	0.21	High income = better achievement
School level FSM	0.20	High % of students receiving FSM = lower attainment
Early years HLE	0.38	Higher scores on Early Years HLE = higher achievement
KS2 HLE	0.17	Moderate computing usage is better than frequent computer usage

Table 4.4: Characteristics with a significant 'net' effect on science (TA) Year 9

Characteristic	Effect Size	Description
Age	0.16	Older pupils = better than younger.
Birth weight	$0.33^{ns}(0.35)$[19]	Normal birth weight = higher attainment than low.
Ethnicity	0.30	Indian heritage = better outcome than White UK heritage
Early developmental problems	0.15	1+ early developmental problems = lower achievement
Mother's Age	0.09	Older mothers = better achievement
Mother's qualifications	0.61	Higher qualification level = better achievement
Father's qualifications	0.48	Higher qualification level = better achievement
Year 9 FSM	0.31	Eligible for FSM = lower achievement
Family SES	0.31	Higher SES = better achievement
Family earned income	0.29[20]	High income = better achievement
School Level FSM	0.22	High % of students receiving FSM = lower attainment
Early years HLE	0.41	Higher scores on Early Years HLE = higher achievement
KS1 HLE	0.15	Frequent outdoors activities = higher achievement.
KS2 HLE	0.17	Moderate individual activities are better than frequent ones.

These results broadly confirm patterns identified at younger ages indicating that differences in attainment related to individual student and family background influences emerge early (at age 3) and remain fairly stable as students progress through primary and secondary school.

Neighbourhood influences

A number of neighbourhood measures were tested as potential predictors of pupils' KS3 cognitive attainments. Previous research has suggested that contextual influences outside the family (such as school and neighbourhood composition) may influence student attainment. Living in a disadvantaged area and attending a school with a higher representation of disadvantaged students, may affect individual student and family aspirations and attitudes to education. These influences may also affect teacher expectations of a student performance.

The DfE's national Contextual Value Added (CVA) measure for schools has demonstrated that both the school measure of percentage of FSM students and students' neighbourhood measures such as the IMD (Noble et al., 2004; 2008) and IDACI (Noble et al., 2008) scores predict pupil progress. As noted above the percentage of pupils on FSM in a secondary school also predicts attainment for the EPPSE sample.

In primary school, neighbourhood level of disadvantage was not found to predict the EPPSE sample's attainment or progress when additional information about families (e.g., early years HLE etc.) was controlled for. It should be noted that additional information regarding students' families (e.g., the HLE) is not available in the National Pupil Database. Thus, the EPPSE analyses provide a unique approach to testing neighbourhood influence because of the greater ability to control for other individual student and family characteristics. In contrast to the primary school analyses, in KS3 the level of neighbourhood disadvantage does predict attainment at age 14. This may be because neighbourhood influences increase as young people move through secondary education and are given more opportunities to interact outside the home and with their local peer group.

Both the Index of IMD and the IDACI measures proved to be statistically significant predictors of young people's attainment in English, maths and science. It should be noted that these two measures were themselves closely correlated.

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[19] Effect size in the contextualised model that does not control for Year 9 FSM status.
[20] Significant only in the contextualised model that does not control for Year 9 FSM status.

Other neighbourhood measures were also obtained by the EPPSE research. These included the level of employment and the percentage of residents with limiting long term illnesses, but neither of these was found to predict students' attainment. In contrast, the percentage of the population who were classed as White British was statistically significant with small negative effects found for each of the core subjects. The level of crime recorded in a neighbourhood was also found to have small negative effects on attainment and progress in English and science. Similarly, parents' perceptions of the safety of their neighbourhood also showed small positive effects on attainment (maths and science) and progress (science).

Taken together the results indicate attainment was lower for pupils who lived in more disadvantaged neighbourhoods compared to those in more advantaged neighbourhoods, over and above their own and their family characteristics. The neighbourhood influence though relatively small seems to have become stronger as the EPPSE sample go through early adolescence.

Pre-school

The EPPSE research was designed to follow up children recruited at pre-school into primary and later secondary school in order to identify and investigate the contribution of different educational influences on their later progress and development in different phases of education. In addition to investigating individual student, family, HLE and neighbourhood influences, further analyses sought to establish whether pre-school influences identified as significant predictors of attainment and progress in both cognitive and social-behavioural outcomes at younger ages continued to show effects nine years later.

Figure 4.1: Strategy of statistical analysis of 'net' pre-school effects
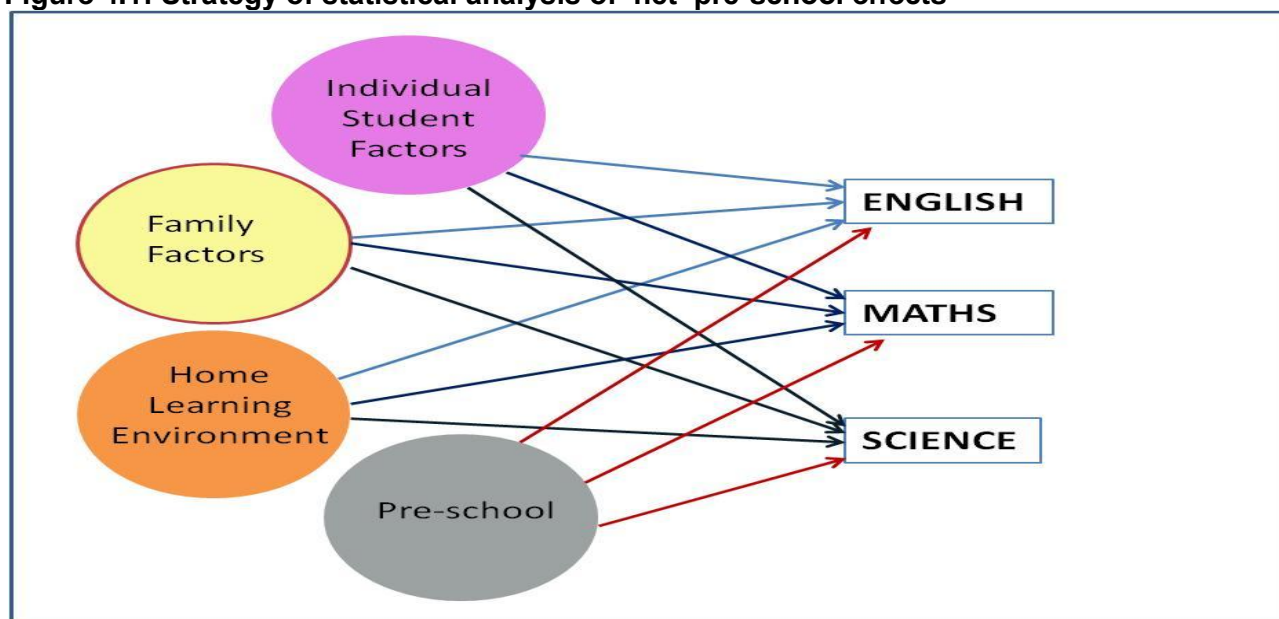
Three measures were tested: whether or not the student had **attended** a pre-school (compared to the 'home' group); the **quality** of the pre-school attended (as measured by the ECERS-R and ECERS-E see Sylva et al., 2010) and the **effectiveness** of the pre-school attended.

Attendance

Just having attended a pre-school was found to be a statistically significant predictor of better attainment in both maths and science (but not English) at the end of KS3, compared with the 'home' group. Although relatively weak (ES=0.26 for maths and ES=0.22 for science), these effects were still stronger than those found for 'age' (being Autumn born) and similar to the effect for family income (in both maths and science).

Quality

The quality of pre-school also continued to predict better outcomes in maths and science nine years after leaving pre-school. The effects for medium and high quality were slightly larger than for low quality (compared to the 'home' group). For example, the ES for high quality was 0.28 for maths (see Table 4.5). In science, only those who had attended a medium or high quality pre-school continued to show significantly better attainment than the home group at age 14 (see Table 4.6).

Table 4.5: Contextualised models for maths (TA Levels) in Year 9 - Pre-school quality measured by ECERS-E

		Year 9 Maths TA			
Number of students		2500			
Number of schools		536			
Fixed effects		Coef	SE	ES	Sig
Pre-school quality (compared to no pre-school)	Low quality	0.25	0.11	0.22	*
	Medium quality	0.31	0.10	0.27	*
	High quality	0.32	0.11	0.28	*
% Reduction school variance		83%			
% Reduction student variance		17%			
% Reduction total variance		29%			

* *p* <0.05

Table 4.6: Contextualised models for science (TA Levels) in Year 9 - Pre-school quality measured by ECERS-E

		Year 9 Science TA			
Number of students		2465			
Number of schools		534			
Fixed effects		Coef	SE	ES	Sig
Pre-school quality (compared to no pre-school)	Low quality	0.16	0.09	0.17	
	Medium quality	0.21	0.08	0.23	*
	High quality	0.20	0.09	0.22	*
% Reduction school variance		89%			
% Reduction student variance		16%			
% Reduction total variance		34%			

* *p* <0.05

Effectiveness

The indicator of pre-school effectiveness in promoting pre-reading skills continued to predict better outcomes in English in KS3. However, only the highly effective category was statistically significant (ES=0.20) in predicting better attainment when compared to the 'home' group (see Table 4.7).

For maths, all groups (ES=0.36 for high; ES=0.22 for medium; and ES=0.30 for low effectiveness) had significantly better results than the 'home' group after controlling for other characteristics (see Table 4.8). For science, attending a high (ES=0.33) or medium effective (ES=0.19) pre-school (in promoting early number concepts) predicted significantly better outcomes than not attending a pre-school (see Table 4.9). Those who had attended a low effective pre-school showed no better outcomes in science by the end of KS3 than the 'home' group.

Table 4.7: Contextualised models for English (TA Levels) in Year 9 - Pre-school effectiveness (Pre-reading)

		Year 9 English TA			
Number of students		2463			
Number of schools		533			
Fixed effects		Coef	SE	ES	Sig
Pre-school effectiveness: Pre-reading	Low effectiveness	0.06	0.08	0.07	
(compared to no pre-school)	Medium effectiveness	0.14	0.07	0.17	
	High effectiveness	0.16	0.08	0.20	*
% Reduction school variance		81%			
% Reduction student variance		24%			
% Reduction total variance		38%			

* *p* <0.05

Table 4.8: Contextualised models for maths (TA Levels) in Year 9 - Pre-school effectiveness (Early number concepts)

		Year 9 Maths TA			
Number of students		2500			
Number of schools		536			
Fixed effects		Coef	SE	ES	Sig
Pre-school Effectiveness: Early number concepts	Low effectiveness	0.35	0.12	0.30	*
(compared to no pre-school)	Medium effectiveness	0.26	0.10	0.22	*
	High effectiveness	0.41	0.11	0.36	*
% Reduction school variance		84%			
% Reduction student variance		17%			
% Reduction total variance		30%			

* *p* <0.05

Table 4.9: Contextualised models for science (TA Levels) in Year 9 - Pre-school effectiveness (Early number concepts)

		Year 9 Science TA			
Number of students		2463			
Number of schools		534			
Fixed effects		Coef	SE	ES	Sig
Pre-school Effectiveness: Early number concepts	Low effectiveness	0.15	0.09	0.16	
(compared to no pre-school)	Medium effectiveness	0.18	0.08	0.19	*
	High effectiveness	0.30	0.09	0.33	*
% Reduction school variance		90%			
% Reduction student variance		16%			
% Reduction total variance		34%			

* *p* <0.05

Joint effects: pre-school attendance and HLE

Further analyses also explored the joint effects of pre-school and the early years HLE. The results showed that those who had a low early years HLE did much better in terms of later English, maths and science results if they had attended a pre-school. The net differences were equivalent to between 0.4 and 0.7 of a national curriculum level (ES=0.37 English; ES=0.56 maths; ES=0.48 science).

Joint effects: pre-school effectiveness and HLE

The effectiveness of the pre-school (in promoting early number concepts) and the early years HLE was important in combination for science outcomes in Year 9. For both low and high HLE groups there was an overall similar pattern of results. Those students who had a low early years HLE benefitted the most from attending a highly effective pre-school (ES=0.61). The strongest joint effect was seen for those students who had both high early year HLE and attended a highly effective pre-school. These results again suggest that a highly effective pre-school experience may have some compensatory benefits in promoting better later academic outcomes in science up to age 14.

Figure 4.2: The combined impact of early years HLE and pre-school effectiveness (Early number concepts) on science (TA Levels) in Year 9

The Combined Effect of Early Years HLE and Pre-school Effectiveness (Early Number Concepts) Science TA Original

Reference group: Low HLE and No Pre-school
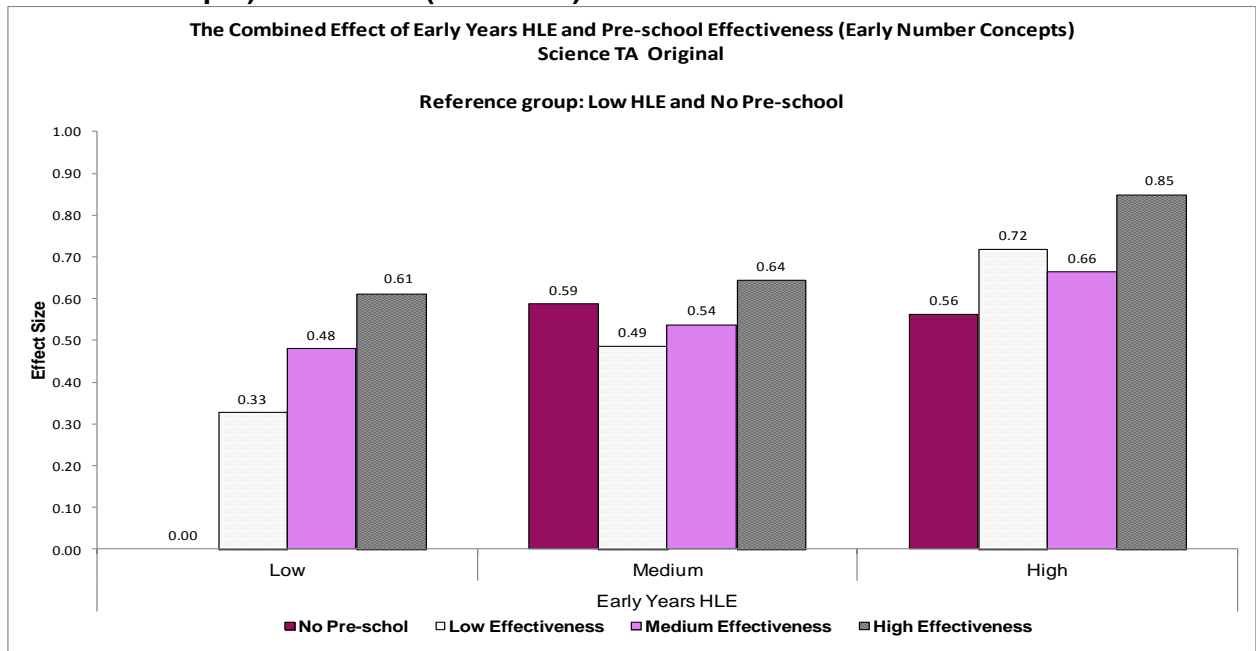
Primary school

Past research in the field of educational effectiveness has suggested that primary schools can continue to influence students' longer term academic outcomes at secondary school (e.g., Goldstein & Sammons, 1997; Leckie, 2009). Two measures, primary school academic effectiveness in English and maths, were available to the EPPSE study in order to investigate this issue. At the end of primary school (age 11) moderately strong effects were found for the primary school's academic effectiveness as predictors of better attainment and better progress across KS2. The primary school analyses revealed that primary school academic effectiveness had significant effects for both English and maths, but the positive benefits were stronger for maths.

Figure 4.3: Strategy of statistical analysis of 'net' primary school effects
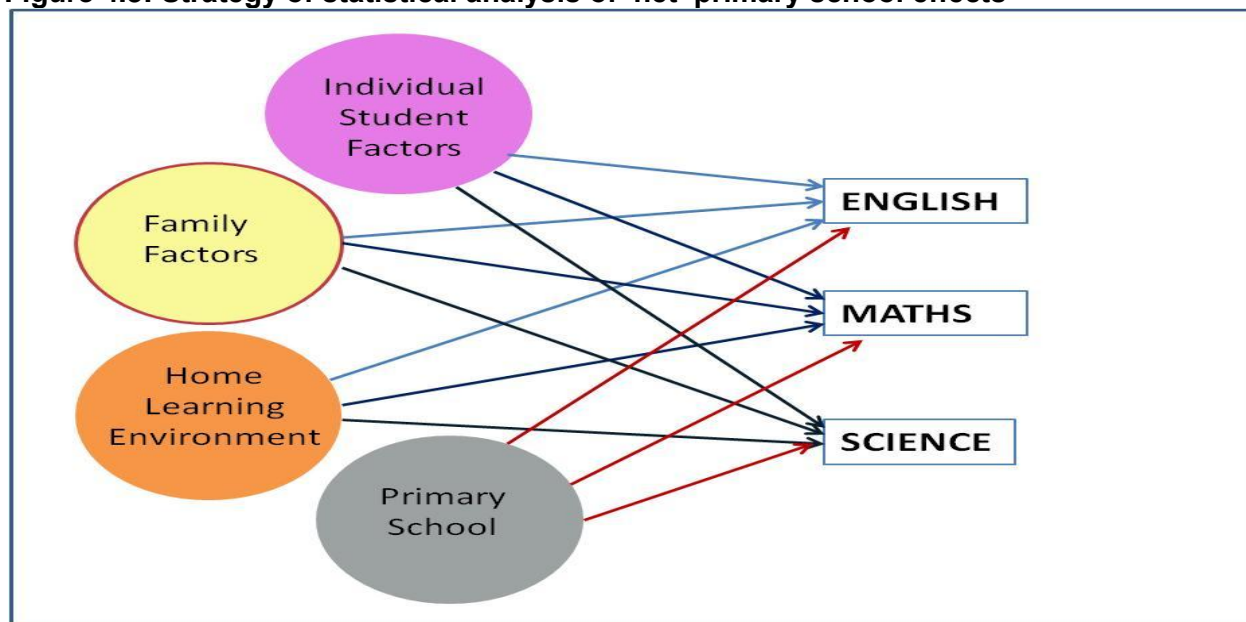
The follow up analyses of outcomes at age 14 revealed that the academic effectiveness of the primary school the EPPSE students had attended still predicted better outcomes for both maths and science attainment three years after students transferring to secondary school. However, there were no statistically significant effects for English attainment.

Controlling for student, family and HLE background characteristics, by the end of KS3, the extra benefit of attending a medium effective primary school was relatively small compared with the low effective group (ES=0.13 maths; ES=0.10 science). The net effects of attending a high academic effective primary school on later attainment compared with the effects of attending a low effective one were rather stronger (ES=0.31 maths; ES=0.29 science). These effects are similar in size to those attributable to FSM status. The effect measured in TA levels, is a third of a level for maths and a quarter of a level for science.

Further analyses explored joint effects for different student groups. For students whose parents had low educational qualifications, the boost in maths predicted from attending a high effective primary school compared with a low effective one was larger (ES=0.33) than the boost provided for students of parents with higher qualification levels (ES=0.17). A similar pattern of results was found for Year 9 science TA levels. This suggests some continuing compensatory impact of previous attendance at a more academically effective primary school for students whose parents had lower educational qualifications.

The joint effects of pre-school quality and primary school effectiveness were also investigated. These also pointed to the continued benefits of primary school academic effectiveness even when pre-school effects are taken into account for both maths and science outcomes in Year 9.

Figure 4.4: The combined impact of pre-school effectiveness (Early number concepts) and primary school academic effectiveness on maths (TA Levels) in Year 9
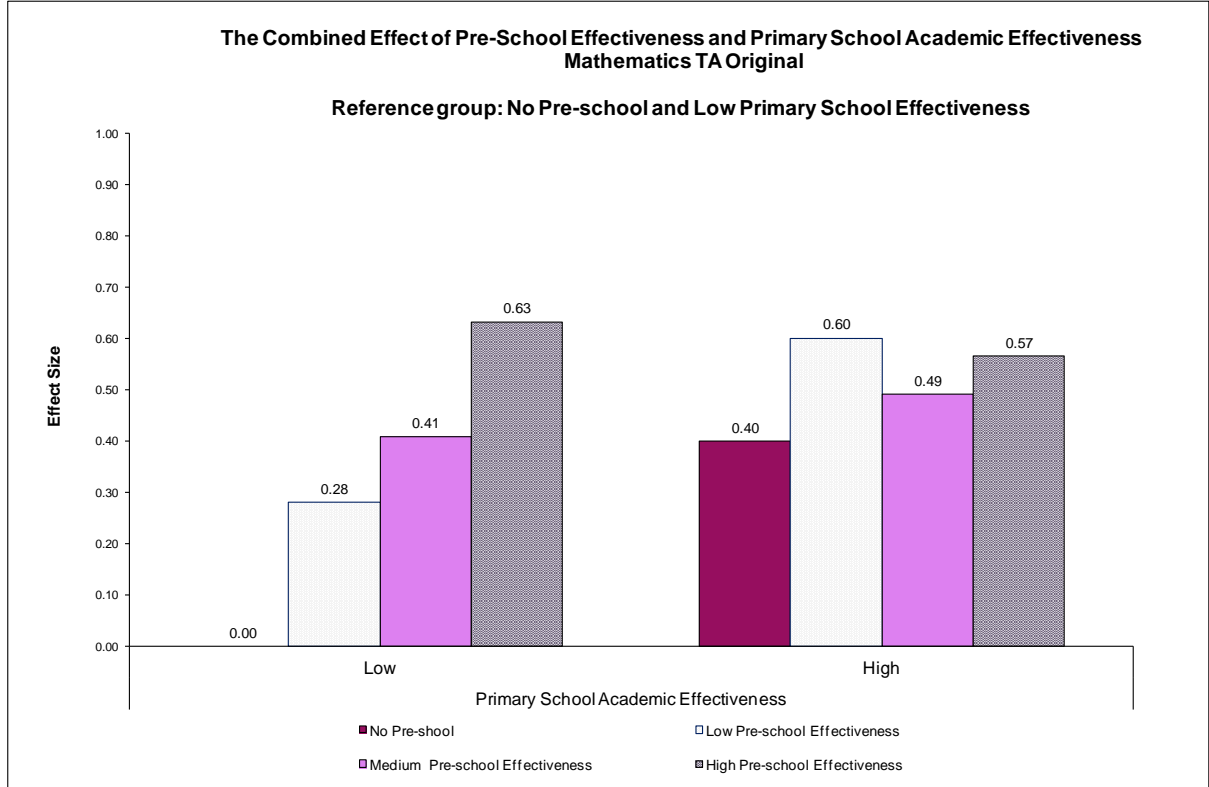
The effectiveness of the pre-school in promoting children's early number concepts was tested jointly with the primary school academic effectiveness measure and results indicated that attending a high effective pre-school offered some protective effects even if a student went on to a less effective primary school in terms of longer term maths and science outcomes. Likewise, having attended a more academically effective primary school mitigated the effects of experiencing no or only a low effective pre-school. The longer term protective effects of pre-school effectiveness were shown most clearly for pupils who then attended a low academically effective primary school when we studied their later attainment in Year 9 of secondary school (see Figure 4.4).

Secondary school

The academic effectiveness of secondary schools was analysed using CVA measures derived from the DfE's National Pupil Database. These measures show relative progress from KS2 to KS4 (across 5 years). In contrast to our primary school academic effectiveness measure that examined results in English, maths and science separately (Melhuish et al., 2006a), we did not have subject specific results for these secondary CVA indicators. The secondary school CVA measure of effectiveness did not predict EPPSE students' differences in attainment in Year 9, after control for individual student, family and HLE measures.

Figure 4.5: Strategy of statistical analysis of 'net' secondary school effects
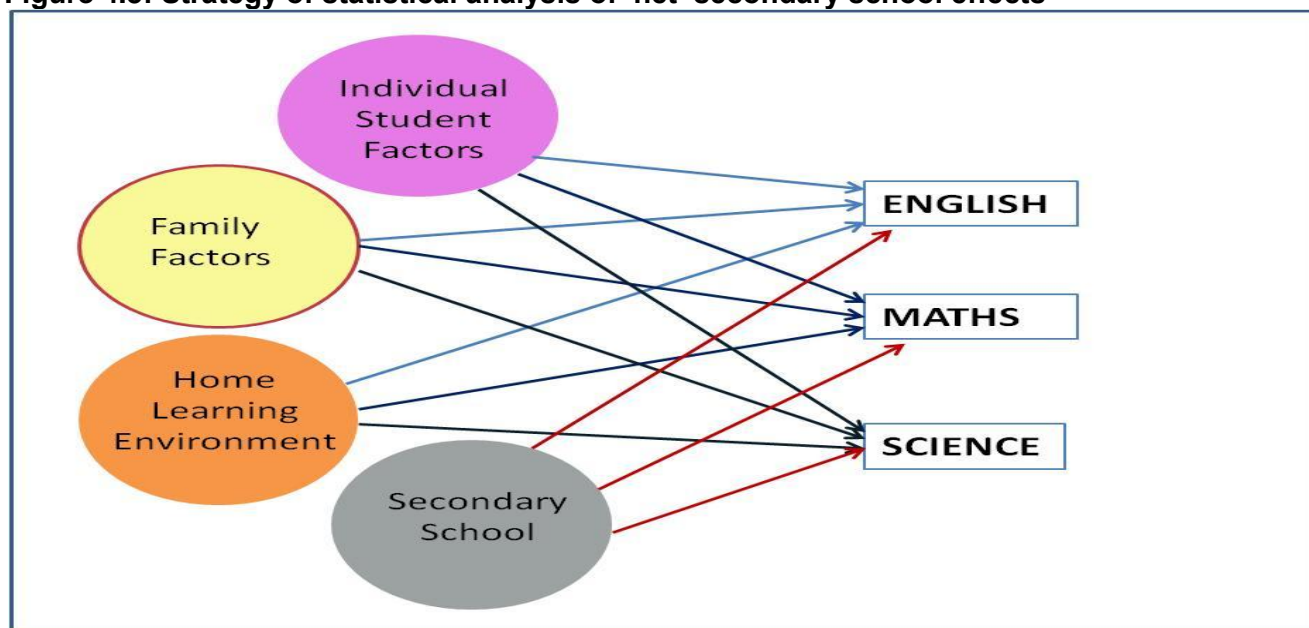
Additional measures of secondary school quality, based on Ofsted inspection ratings, were available for analyses. We tested whether these indicators of school quality predicted better outcomes for the EPPSE sample at age 14.

Taking account of individual students, family and HLE measures we found that there was a statistically significant positive impact on attainment for the Ofsted judgment of the 'quality of pupil learning'. For both English and science the difference was statistically significant (and moderately strong) for the 'outstanding' schools category compared with the 'inadequate' category (ES=0.42 for English, ES=0.51for science).

For maths attainment, schools judged by Ofsted as 'good' (on the quality of pupils' learning) showed more modest but significant positive effects (ES=0.26) and those judged as 'outstanding' showed stronger effects (ES=0.56) compared with the 'inadequate' category.

These results support the hypothesis that secondary school quality remains important in shaping students' academic attainment, over and above the impact of background characteristics. The effects are equivalent to between 0.34 and 0.64 of a TA level for those who attended an 'outstanding' rather than an 'inadequate' school (in terms of the Ofsted judgement 'quality of learning'). A similar strong pattern was identified for Ofsted judgments of learners' attendance. It should be noted that these two Ofsted measures (quality of pupils' learning and attendance of learners) are correlated.

Table 4.10: Contextualised models for English (TA Levels) in Year 9 - Ofsted judgments for quality of pupils' learning

	Year 9 English TA Original Data			
Number of students	**2463**			
Number of schools	**533**			
Fixed Effects	**Coef**	**SE**	**ES**	**Sig**
Ofsted Judgment: The Quality of Pupils' Learning Outstanding	0.34	0.11	0.42	*
(compared to inadequate) Good	0.04	0.09	0.05	
Satisfactory	0.07	0.08	0.08	
Missing	0.08	0.12	0.10	
% Reduction school variance	81%			
% Reduction student variance	25%			
% Reduction total variance	38%			

* *p* <0.05

Table 4.11: Contextualised models for maths (TA Levels) in Year 9 - Ofsted judgments for quality of pupils' learning

	Year 9 Maths TA Original Data			
Number of students	**2500**			
Number of schools	**536**			
Fixed Effects	**Coef**	**SE**	**ES**	**Sig**
Ofsted Judgment: The Quality of Pupils' Learning Outstanding	0.64	0.14	0.56	*
(compared to inadequate) Good	0.29	0.11	0.26	*
Satisfactory	0.25	0.11	0.22	*
Missing	0.43	0.16	0.37	*
% Reduction school variance	85%			
% Reduction student variance	17%			
% Reduction total variance	30%			

* *p* <0.05

Table 4.12: Contextualised models for science (TA Levels) in Year 9 - Ofsted judgments for quality of pupils' learning

	Year 9 Science TA Original Data			
Number of students	**2465**			
Number of schools	**534**			
Fixed Effects	**Coef**	**SE**	**ES**	**Sig**
Ofsted Judgment: The Quality of Pupils' Learning Outstanding	0.46	0.11	0.51	*
(compared to inadequate) Good	0.15	0.09	0.16	
Satisfactory	0.06	0.08	0.07	
Missing	0.17	0.12	0.19	
% Reduction school variance	89%			
% Reduction student variance	17%			
% Reduction total variance	34%			

* *p* <0.05

Table 4.13: Contextualised models for English (TA Levels) in Year 9 - Ofsted judgments for attendance of learners

		Year 9 English TA Original Data			
Number of students		2463			
Number of schools		533			
Fixed Effects		Coef	SE	ES	Sig
Ofsted Judgment: The Attendance of Learners	Outstanding	0.57	0.11	0.70	*
(compared to inadequate)	Good	0.44	0.10	0.53	*
	Satisfactory	0.43	0.10	0.52	*
	Missing	0.42	0.12	0.51	*
% Reduction school variance		83%			
% Reduction student variance		25%			
% Reduction total variance		39%			

* *p* <0.05

Table 4.14: Contextualised models for maths (TA Levels) in Year 9 - Ofsted judgments for attendance of learners

		Year 9 Maths TA Original Data			
Number of students		2500			
Number of schools		536			
Fixed Effects		Coef	SE	ES	Sig
Ofsted Judgment: The Attendance of Learners	Outstanding	0.82	0.14	0.71	*
(compared to inadequate)	Good	0.60	0.12	0.52	*
	Satisfactory	0.48	0.12	0.42	*
	Missing	0.65	0.15	0.56	*
% Reduction school variance		90%			
% Reduction student variance		17%			
% Reduction total variance		30%			

* *p* <0.05

Table 4.15: Contextualised models for science (TA Levels) in Year 9 - Ofsted judgments for attendance of learners

		Year 9 Science TA Original Data			
Number of students		2465			
Number of schools		534			
Fixed Effects		Coef	SE	ES	Sig
Ofsted Judgment: The Attendance of Learners	Outstanding	0.51	0.11	0.56	*
(compared to inadequate)	Good	0.36	0.10	0.40	*
	Satisfactory	0.26	0.10	0.28	*
	Missing	0.33	0.13	0.36	*
% Reduction school variance		91%			
% Reduction student variance		17%			
% Reduction total variance		34%			

* *p* <0.05

Further analyses of the joint effects showed that the continued benefits of pre-school were most evident for EPPSE students who went on to medium or low effective secondary schools. Again this suggests a protective influence of pre-school for students who go on to low effective secondary schools.

Student progress across Key Stage 3 (KS3)

Student's academic progress across KS3 was studied by controlling for their prior attainment at the end of primary school and taking account of individual student, family and HLE factors. Fewer background factors predicted progress across KS3 than were significant for attainment. The patterns were similar to those found to be at younger ages when we studied pupils' progress across KS2 for this sample.

Figure 4.6: Strategy of statistical analysis of the influence of prior attainment
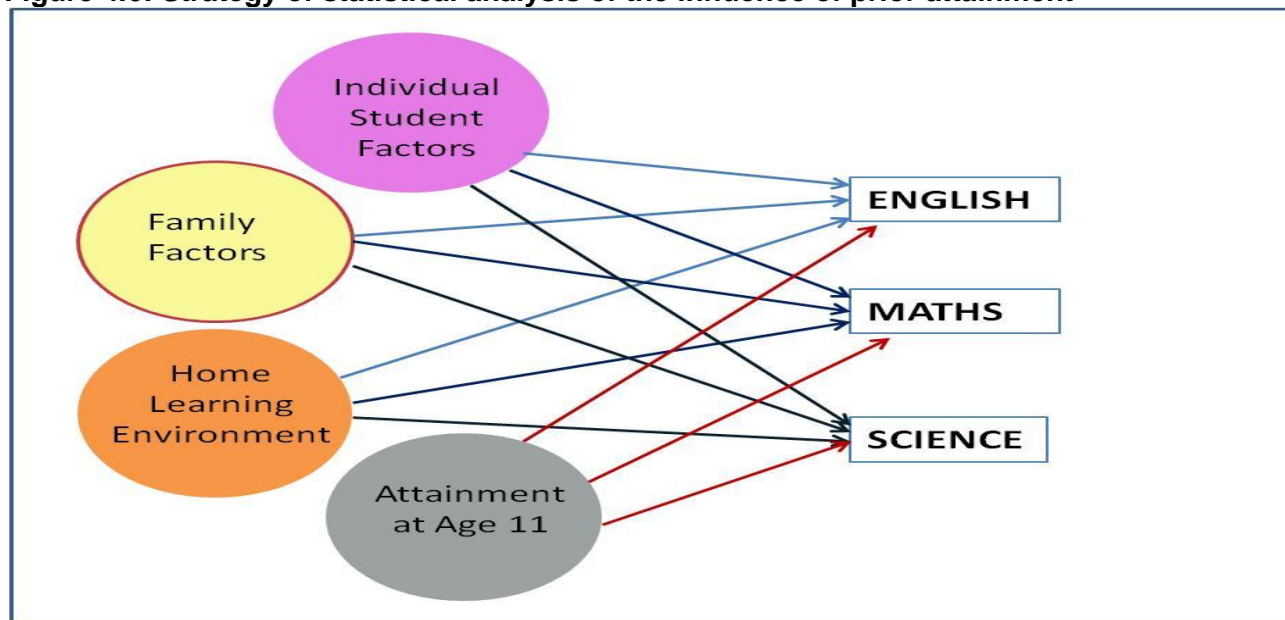
Overall, there was evidence that students made more progress in English, maths and science over KS3 if they were:

- older for their year group (Autumn-born) (ES=0.24 English; ES=0.32 maths; ES=0.20 science);
- girls (ES=0.32 English; ES=0.16 maths; ES=0.17 science);
- with highly qualified fathers (ES=0.28 English; ES=0.28 maths; ES=0.43 science).

Students whose mothers were highly qualified (degree/higher degree) made better progress in English (ES=0.34) and science (ES=0.33). Additionally, students whose families had high incomes also made better progress in English (ES=0.39).

A higher percentage of students in a school eligible for FSM predicted poorer progress for the EPPSE sample in both English (ES=0.18) and science (ES=0.21). Of the neighbourhood measures tested, only the percentage of White British and the level of reported crime were significant predictors of poorer student progress for English. For progress in science however, reported crime, perceived neighbourhood safety, the IMD and IDACI were statistically significant predictors. These findings indicate that the disadvantage of the school's intake and neighbourhood had small negative effects predicting both poorer progress and attainment. This shows that schools in some areas face more challenging circumstances in improving student learning outcomes.

There were no significant effects on student progress in KS3 related to the pre-school measures or the primary school academic effectiveness measure. However, the overall academic effectiveness of the secondary school attended was found to be a statistically significant predictor for progress in English. Higher Ofsted measures of the 'quality of pupils' learning' and 'attendance of learners' were also significant predictors of better progress in all three core subjects.

EPPSE students who attended an 'outstanding' secondary school in terms of the 'quality of learning' made significantly more progress in the three core subjects than those in schools judged to be 'inadequate' (ES ranged between 0.29 and 0.36). Additionally, students from secondary schools characterised as 'outstanding', 'good' or even 'satisfactory' in terms of 'pupils' attendance' made significantly more progress in English (ES=0.48 for outstanding) and maths (ES=0.35 for outstanding). These findings provide some evidence of external validity for the use of Ofsted inspection judgments and are in line with earlier results on a sub-set of primary schools investigated as part of the EPPE 3-11 phase of the research (Sammons et al., 2008c).

Students' experiences and reports of secondary school

Students' secondary school experiences were measured using self-report questionnaires administered in Year 9. Measures were tested to see if they predicted academic attainment and progress after controlling for individual, family and HLE characteristics including the percentage of students on FSM in the school.

The results indicate that students who reported their school placed a higher 'emphasis on learning' had significantly higher attainment. The difference was half a TA level in English and science and three quarters of a TA level for maths (ES ranged between 0.20 and 0.22).

Table 4.16: Contextualised models for English (TA Levels) in Year 9 - Student report on 'emphasis on learning'

	Year 9 English TA			
Number of students	1460			
Number of schools	387			
Fixed effects	Coef	SE	ES	Sig
Emphasis on learning (continuous)	0.51	0.14	0.21	*
% Reduction school variance	85%			
% Reduction student variance	29%			
% Reduction total variance	43%			

* *p* <0.05

Table 4.17: Contextualised model for maths (TA Levels) in Year 9 - Student report on 'emphasis on learning'

	Year 9 Maths TA			
Number of students	1475			
Number of schools	387			
Fixed Effects	Coef	SE	ES	Sig
Emphasis on Learning (continuous)	0.77	0.19	0.22	*
% Reduction school variance	89%			
% Reduction student variance	21%			
% Reduction total variance	34%			

* *p* <0.05

Table 4.18: Contextualised models for science (TA Levels) in Year 9 - Student report on 'emphasis on learning'

	Year 9 Science TA			
Number of students	1463			
Number of schools	387			
Fixed Effects	Coef	SE	ES	Sig
Emphasis on Learning (continuous)	0.54	0.15	0.20	*
% Reduction school variance	87%			
% Reduction student variance	22%			
% Reduction total variance	37%			

* *p* <0.05

EPPSE students' attainment was also found to be higher where they perceived a more positive 'behaviour climate' in their secondary school. The difference was particularly noticeable for maths (ES=0.46). The perceived 'quality of their school environment'[21] was also a predictor of better attainment, although the effects were smaller and only significant for maths and science (ES=0.13 for both). Similar, small but positive effects were identified for the factor related to students' perceptions of how much they felt teachers valued and respected them. The factor 'learning resources' (related to whether students felt the school was well equipped with computers and technology) also predicted better attainment in maths (ES=0.13) and science (ES=0.15) in KS3. Although the effect sizes were relatively small, this is the equivalent of around half a TA level for both these subjects.

After testing these factors separately as predictors of attainment, they were also tested together to investigate which ones are the most important in predicting academic outcomes in Year 9 when still controlling for individual student, family and HLE characteristics. The two factors 'emphasis on learning' and 'behaviour climate' together significantly predicted Year 9 academic attainment in all three core subjects when tested together.

The analyses of students' progress during KS3 revealed that 'behaviour climate', 'valuing pupils' and 'teacher support' were significant predictors of progress in English, maths and science. 'School environment' and 'learning resources' were only significant for maths and science. 'Headteacher qualities' was a significant predictor for progress in maths (ES=0.15). Finally, 'teacher behaviour management' was a significant predictor of progress in science (ES=0.14).

After controlling for individual student, family, HLE and school experience ('behavioural climate', 'emphasis on learning', 'teacher support') the daily time spent on homework, as reported by students, was found to be an important strong predictor of better attainment and progress (ES for 2-3 hours of homework/day ranged between 0.69 and 0.85 for the three core subjects). Spending time on homework is likely to increase study skills and opportunities to learn, it may also be influenced by self-regulation. When prior self-regulation was taken into account, the effects of doing homework remained significant. It is also likely to reflect secondary school policies and teacher expectations and the academic emphasis in the school as well as encouragement from parents to take school work seriously.

The relationships between academic outcomes and students' views of themselves and reports of their secondary school

Earlier EPPSE research (Sammons et al., 2008c), has shown positive relationships exist between academic self-concept and attainment. Higher 'academic self-concept' predicted better attainment and vice versa. Patterns of attainment and self-concept in younger children can shape their future identities as learners. The results for EPPSE students in secondary school show fairly strong links between 'maths academic self-concept' as a predictor of attainment in Year 9 (ES=1.2; nearly 1 TA level). By contrast, 'English academic self-concept' was a weaker predictor of Year 9 English attainment (ES=0.74; equivalent to approximately a half of a TA level). Students' self-reported 'enjoyment of school', also predicted attainment, with stronger effects for maths (ES=0.38 maths; ES=0.31 science; ES=0.29 English).

Students who rated their secondary school more favourably in terms of 'behavioural climate' had significantly better attainment in all three subjects, taking account of other influences. Students' views of their secondary school's 'emphasis on learning' predicted significantly higher attainment and also greater progress in all three core subjects.

Time spent on homework, as reported by students, was a relatively strong predictor of better attainment and progress in all three core areas. Spending any amount of time was beneficial, but the strongest effects were for spending 2-3 hours per day after school.

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[21] This factor includes attractive and well decorated buildings, cleanliness of toilets etc.

There were strong and positive links between students' 'academic self-concept' (whether they felt they were good at a subject) for English and maths and their attainment in these subjects. There was also better attainment where students reported they 'enjoyed school', especially for maths. The relationships between these measures tend to be reciprocal e.g. academic attainment predicts 'students' self-concepts' and vice versa. Thus, we can see these outcomes as interdependent.

Two Ofsted measures of the secondary school's quality (inspectors' judgments of 'pupils' learning' and 'learners' attendance') predicted better attainment and progress for the EPPSE sample. Students who attended an 'outstanding' secondary school had better attainment in English, maths and science and made better progress in English and maths, (taking account of students' individual and family background influences), than those who attended a school judged as 'inadequate'. For science, only those who attended a secondary school judged as 'good' rather than 'inadequate' made significantly more progress.

Transition from Primary to Secondary School

A sub-sample of 550 EPPSE students and parents were sent questionnaires in November of the first year in the new secondary school. They were asked about personal experiences and views related to their transition from primary school to secondary school. The questionnaire probed issues such as settling down in the new school, the academic work, their friendships and things that primary/secondary schools did to assist/smooth their transition (see Evangelou et al., 2008 for full details).

The analyses suggested that five factors were important in making a good transition:
- developing friendship, self-esteem and confidence;
- settling into school life;
- showing interest in school and schoolwork;
- getting used to new routines;
- experiencing curriculum continuity.

These five factors were tested in multilevel analyses to see whether they predicted attainment in Year 9, after controlling for background characteristics related to individual students or families. Additionally, the same factors were tested in contextualised value added models, controlling for background characteristics and attainment in Year 6.

Two sets of multilevel analyses were conducted. In the first set of multilevel models, a KS3 outcome was analysed for the effects of a transition dimension, controlling for all student, family, home, area and pre-school characteristics. In the second set of multilevel models, variables reflecting primary school and secondary school effectiveness were also included as predictors. This second set of analyses test whether transition dimensions influence KS3 outcomes independently of primary or secondary school characteristics.

The results of both sets of analyses were extremely similar, indicating that the transition dimension effects were largely independent of primary or secondary school effectiveness. The results for analyses controlled for primary and secondary school effectiveness are summarised here.

Table 4.19 shows the results for the transition dimension 'getting used to new routines', and Table 4.20 shows the results for the transition dimension 'experiencing curriculum continuity'. In both cases, all three KS3 academic outcomes are predicted by the transition experience.

Table 4.19: Contextualised models for Year 9 cognitive attainment - Getting used to new routines

	Year 9 English TA				Year 9 Maths TA				Year 9 Science TA			
Number of students	461				467				461			
Number of schools	221				224				221			
Fixed Effects	**Coef**	**SE**	**ES**	**Sig**	**Coef**	**SE**	**ES**	**Sig**	**Coef**	**SE**	**ES**	**Sig**
Getting used to new routines	0.17	0.08	0.23	*	0.34	0.11	0.32	*	0.24	0.09	0.29	*
Log restricted-likelihood	-602.83				-738.87				-642.13			
Random Effects												
School variance	0.08				0.09				0.05			
Residual variance	0.65				1.28				0.84			
Intra-school correlation (ICC)	0.1090				0.0667				0.0593			
Null model												
School variance	0.06				0.19				0.18			
Residual variance	0.94				1.59				0.98			
Intra-school correlation (ICC)	0.0585				0.1081				0.1522			
% Reduction school variance	-36%				53%				70%			
% Reduction student variance	31%				20%				15%			
% Reduction total variance	27%				23%				23%			

* $p < 0.05$

Table 4.20: Contextualised models for Year 9 cognitive attainment - Experiencing curriculum continuity

	Year 9 English TA				Year 9 Maths TA				Year 9 Science TA			
Number of students	486				491				485			
Number of schools	234				237				233			
Fixed Effects	**Coef**	**SE**	**ES**	**Sig**	**Coef**	**SE**	**ES**	**Sig**	**Coef**	**SE**	**ES**	**Sig**
Experiencing curriculum continuity (continuous)	0.18	0.07	0.26	*	0.28	0.10	0.28	*	0.15	0.08	0.21	*
Log restricted-likelihood	-644.88				-790.53				-663.14			
Random Effects												
School variance	0.09				0.08				0.09			
Residual variance	0.67				1.37				0.75			
Intra-school correlation (ICC)	0.1146				0.0582				0.1046			
Null model												
School variance	0.06				0.19				0.18			
Residual variance	0.94				1.59				0.98			
Intra-school correlation (ICC)	0.0585				0.1081				0.1522			
% Reduction school variance	-49%				56%				50%			
% Reduction student variance	29%				16%				23%			
% Reduction total variance	24%				19%				27%			

* $p < 0.05$

The results show that the transition dimensions, 'getting used to new routines, and experiencing 'curriculum continuity', both have significant effects on all three KS3 core subjects. The effect sizes are all in the range 0.21 to 0.32, with the strongest effects for KS3 maths.

One other transition dimension, 'settling into school life', had a significant effect on KS3 maths only. However, this effect became non-significant when primary and secondary school effectiveness were controlled for, indicating that this was not an independent transition effect. The remaining transition dimensions, 'developing friendships', 'self-esteem and confidence' and 'showing interest in school and work' appeared to be unrelated to KS3 academic outcomes.

The fact that other factors were less predictive of school success, suggests that familiarity with the school building and routine practices, along with the material in the lessons were more important than the psychological dimensions of self-esteem and confidence or the social dimension of settling into school (social) life. In summary, it appears that having a successful primary to secondary school transition can improve KS3 outcomes 3 years later. In particular the aspects of the transition included in the dimensions, 'getting used to new routines', and experiencing 'curriculum continuity', seem to be most important.

Conclusions

This research shows that the socio-economic characteristics of the individual EPPSE student's family continued to influence academic attainment at the end of KS3 in the three core curriculum areas. In addition, it provides evidence that the school and neighbourhood in which students are positioned can also affect outcomes. The early years HLE remains an important predictor of better attainment at age 14 and this has relevance for the development of policy regarding families and parenting. The research has implications for the debate on the drivers of social inequality and has messages for both policy and practice that may help to narrow the gap in educational outcomes and improve children's and young people's learning over their life course.

The research reveals that specific characteristics of educational institutions predicted attainment up to the end of KS3. Firstly, the child's experiences within a pre-school centre continue to predict attainment through primary and into secondary school. Pre-school attendance and quality continued to predict later attainment in maths and science.

The findings also provide evidence that the academic effectiveness of the primary school not only influences EPPSE students' attainment and progress during KS2, but also continues to predict better outcomes in maths and science later on in KS3.

There is also evidence of secondary school effects on students' progress across KS3. The Ofsted inspection indicator of school 'quality' predicts both attainment and progress over and above individual student, family, HLE and neighbourhood characteristics. Attending a school judged to be 'outstanding' by Ofsted provided a moderately large boost to student attainment outcomes in all three core areas of the curriculum.

Moreover, the results point to the importance of the students' own perceptions and their views. Students' reports on school processes predicted differences in attainment and progress.

Section 5: Social-behavioural development at age 14

> **Summary of key findings**
> - Differences relating to background influences emerged at age 3 and remain fairly stable to age14.
> - Socio-economic and neighbourhood disadvantage predicted poorer social-behavioural outcomes.
> - High quality pre-school still showed lasting benefits by age 14.
> - The majority of student behaviour is rated positively by teachers in Year 9.
> - Girls and those with better early years HLE had better outcomes and made more progress in improving these. The gender gap widened during KS3.
> - Ofsted inspection measure of secondary school's 'behaviour of learners' predicted social behaviours.
> - Students' reports of their school, particularly good quality teaching ('emphasis on learning', 'teacher support', feeling 'valued'), positive 'behaviour climate', 'Headteacher qualities'; physical 'school environment/resources all predicted better outcomes and progress from age 11 to age 14.
> - 'Academic self-concept' (in English and maths) predicted better social-behavioural outcomes.
> - Homework was a strong predictor of better outcomes and positive improvements between ages 11-14.
> - Growth curve analyses showed increases in 'self regulation' during primary school but this dropped by KS3. 'Self regulation' trajectories (from Year 1 to Year 9) were influenced by gender, family SES, HLE, pre-school quality and effectiveness.

The EPPSE research has always held both academic and social-behavioural outcomes in equal regard as students do not exist in an academic 'bubble' and both domains are important for life-long learning. This section of the report details the social-behavioural outcomes of students in the EPPSE sample measured by teacher assessments conducted in Year 9 at the end of Key Stage 3 (KS3). The investigation builds on earlier research that has followed this group of students from early childhood at age 3 years through primary school and into secondary school up to age 14.

The results on social behaviour complement those reported on academic and affective outcomes for this age group at the end of KS3 (see Section 6 and Sammons et al., 2011a; 2011b).

In this section the focus is on four measures of social behaviour that have been derived using exploratory and confirmatory factor analysis. These include two positive forms of behaviour: 'self-regulation' and 'pro-sociability, and two negative behaviours: 'hyperactivity' and 'anti-social' behaviour.

In line with other research we find that most students' behaviour was rated favourably by teachers in Year 9. Teachers' ratings are skewed towards the positive end of the rating scales and only a small minority of students were identified as showing poor behaviour. For example, approximately 17 per cent of the EPPSE sample was rated unfavourably in terms of high scores for 'hyperactivity' and even fewer (no more than 14%) for 'anti-social' behaviour in Year 9.

The patterns of social behaviour studied now that students are in adolescence can be compared with earlier findings for this sample at younger ages (in pre-school and primary school). Although most students are still rated favourably in terms of social-behavioural outcomes at age 14, more students have high scores for negative behaviour compared with earlier findings.

Social-behavioural outcomes at earlier time points

At younger ages the EPPSE research has shown that a range of factors related to child, family and the home learning environment (HLE) are important predictors of children's academic attainment and progress and their social-behavioural development up to the end of primary school (Sammons et al., 2008a, b). The influence of such factors can be detected from a young age and predict later educational outcomes. While the relationships between individual student, family and home learning environment characteristics and student outcomes tends to be weaker for social-behavioural measures than for academic attainment, the results of our past research show that early experiences of socio-economic disadvantage predict poorer behavioural outcomes in both pre-school and primary school. The earlier EPPSE results have contributed to current understanding about the relationships between social behaviour and children's academic development and the factors that increase the risk of poor outcomes or that promote resilience. The findings have informed policy development in England, for example EPPE's contribution (The EPPE 3-11 Team, 2007) to The Equalities Review, 2007.

Social-behavioural outcomes in secondary school

Following the EPPSE student sample in adolescence (Year 9 age 14) provides new evidence about the continuing influence of individual, family and home learning influences. We rely on the ratings of teachers who knew the EPPSE student best in Year 9 to measure social behaviour in school, as teacher judgments have been found to be predictive of later development and provide an important perspective on behaviours that can also be compared with self-reports of students' perceptions of their own behaviour and dispositions and their experiences of secondary school.

This section of the report summarises which individual student and family characteristics predict EPPSE students' social behaviour at the end of KS3. Whilst other studies have information on gender, family SES or income, EPPSE has additional data on the early years Home Learning Environment, (HLE) and parental qualifications that allows us to explore family influences on students' outcomes in greater depth. In addition when considering developmental progress in KS3, prior social behaviour measured at the end of primary education (Y6 KS2) is considered in the statistical models. For full details of the methodology and analyses see Sammons et al., 2011b).

As well as investigating the impact of student, family and HLE background, the EPPSE research has explored the continued influence of pre-school and primary school as predictors of students' later social-behavioural outcomes at age 14 by testing a range of measures related to the secondary school experiences. The findings provide evidence on how different educational settings (pre-school, primary and secondary) affect students' social behaviour and developmental progress during KS3.

The aims of this aspect of the research were to:
- investigate the variation in students' social-behavioural outcomes at the end of KS3;
- identify which student background characteristics (individual, family and HLE factors) predict social-behavioural outcomes at age 14;
- explore the influence of pre, primary and secondary school experiences on later social-behavioural outcomes and developmental progress;
- examine the combined impact of pre-school characteristics with the HLE as predictors of social-behavioural outcomes and to establish how far any continuing pre-school effects are conditional on the HLE;
- assess whether the continued impact of pre-school and primary school influences on social behaviour differs for more and less disadvantaged students;
- explore the effects of teaching and school processes on students' perceptions.

In order to maximise the sample size and limit any possible bias linked to missing data, multiple imputation of missing data was undertaken. Careful comparisons of the results from both imputed and non imputed data sets were conducted and indicate that the results are robust producing patterns which are broadly consistent, with occasional variations that do not affect the substantive implications in interpreting the results. The results in this section are reported for imputed data except where there is some notable variation in which case both imputed and original effect sizes are given. Overall the analyses reported in the full report associated with this outcome (Sammons et al., 2011b) are based on data for a sample of a maximum N= 1,508 students attending at most 444 secondary schools (original data set) and N= 2,933 students attending 775 secondary schools (imputed)[22].

Key findings

The influence of a wide range of demographic and socio-economic measures from parental interviews and questionnaires as predictors of behaviour at age 14 were investigated. These include individual characteristics, such gender, age, ethnicity, early childhood behavioural history, and family factors, including family size (number of siblings), parents' marital status, family earned income, family highest socio-economic status (SES), as well as the highest level of parents' qualifications. Additionally, factors specific to schooling, such as eligibility for Free School Meals (FSM) and Special Education Needs (SEN) status have also been explored. A summary of the findings is reported below (for full details see Sammons et al., 2011b).

Student and family characteristics

Girls show better social-behavioural profiles than boys at age 14 in all four outcomes (e.g., ES=0.45 for 'self-regulation' and ES=-0.42 for 'anti-social'). Family SES, income and parents' highest qualification levels are also strong predictors. For example, the ES for mothers having a degree or equivalent was 0.47 for 'self-regulation' and 0.40 for 'hyperactivity'. By contrast, there are weaker effects linked to parents' marital status, although there is a tendency for increased 'hyperactivity' and 'anti-social' behaviour scores for those from single parent families (ES=0.20 for 'hyperactivity' for single parents versus married parents).

Taking into account the influence of other individual and family factors, those students who experienced a more positive HLE in the early years and later on in Key Stage 2 were rated more favourably by teachers in terms of various social-behavioural outcomes in Year 9 (ES=0.48 for high versus low HLE). Students with a history of SEN in secondary school show significantly poorer behavioural outcomes. It should be noted that the link between behaviour problems and learning difficulties is often reciprocal. The strength of relationships is in line with the SEN research literature and findings for this group at younger ages (Anders et al., 2005; Taggart et al., 2006).

The project developed an index of multiple disadvantage that provides a summary measure of overall disadvantage experienced by children in the EPPSE sample during the early years. This continues to be a strong predictor of differences in students' later social behaviour up to age 14. Those who had experienced several disadvantages in the early years show poorer 'self-regulation' and 'pro-social' behaviour and increased scores for 'hyperactivity' and anti-social' behaviour in KS3.

Overall, these findings on the individual and family factors that predict social-behavioural outcomes show similar patterns to those reported elsewhere for EPPSE students' academic attainments measured by TAs in the three core curriculum (English, maths and science) at the end of KS3 (see Sammons et. al., 2011a).

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[22] There is considerable variability in the sample size for the original data, depending on the fraction of 'missingness' for the various predictors included in each estimated model. For the imputed data the sample size is relatively constant, except for models with structurally missing data (which we do not impute for substantive reasons). In each table we therefore indicate the number of students and the number of schools on which the estimates are based.

Table 5.1: Summary of background, pre-, primary and secondary school on social behaviour in Year 9
(Only the largest, statistically significant effect sizes for the imputed data are reported; comparison group in brackets)

	Self-regulation	Pro-social	Hyperactivity	Anti-social
Student characteristics				
Gender (boys)	0.45	0.61	-0.54	-0.42
Age (continuous)	0.12	0.08	-0.08	ns
Birth weight	ns	ns	ns	ns
Number of siblings (none)				
1 sibling	0.13	0.11	-0.15	-0.12
Ethnicity (White UK heritage)				
Indian heritage	0.33	ns	-0.33	ns
Bangladeshi heritage	0.37	ns	-0.48	-0.34
Early behavioural problems (none)				
1 Behavioural Problem	-0.30	-0.28	0.36	0.32
2+ Behavioural Problems	-0.34	ns	0.44	0.33
Family characteristics				
Parents' highest SES at KS2 (unemployed/not working)				
Unskilled	ns	ns	ns	ns
Semi-skilled	ns	ns	0.17	ns
Skilled, Manual	ns	ns	ns	ns
Skilled, Non-manual	0.30	0.20	-0.20	-0.20
Other Professional, Non-manual	0.31	0.23	-0.24	-0.19
Professional, Non-manual	0.45	0.31	-0.28	-0.25
Mother's highest qualification (none)				
16 academic	0.17	0.15	-0.15	-0.13
18 academic	0.31	0.22	-0.25	-0.21
Degree or equivalent	0.47	0.36	-0.40	-0.37
Higher degree	0.54	0.35	-0.43	-0.36
Marital status of parent/guardian/carer (married)				
Single	-0.13	ns	0.21	0.15
Separated/divorced	ns	ns	0.21	0.18
Living with partner	-0.18	-0.13	0.21	0.14
Widow/widower	ns	ns	ns	ns
Home Learning Environment (HLE)				
Early years HLE index (Grouped) (Very low)				
Low (14-19)	0.15	0.13	ns	ns
Average (20-24)	0.17	ns	ns	ns
High (25-32)	0.32	0.27	-0.25	ns
Very high (33-45)	0.48	0.30	-0.35	ns
Early years Home Learning Environment Index (Continuous scale)	n/a	n/a	n/a	-0.12*
Pre-school quality				
ECERS-R (high quality vs. low quality)	0.12	ns	ns	ns
ECERS-E (high quality vs. low quality)	0.14	0.14	-0.13	-0.14
Secondary school quality				
Behaviour of learners (outstanding vs. inadequate)	0.55	0.63	ns	ns

*Continuous scale – no statistically significant differences associated with categorical HLE measure. However, a statistically significant marginal effect was found when testing this variable as a continuous scale.

Neighbourhood influences

Various measures of neighbourhood disadvantage were tested to see if they predicted students' social-behavioural outcomes at age 14. There was evidence that the level of overall disadvantage in the neighbourhood, measured by the Index of Multiple Deprivation (IMD; Noble et al., 2004; 2008) and the Income Deprivation Affecting Children Index (IDACI; Noble et al., 2008) scores, as well as other measures such as lower participation in employment, the incidence of crime, and the incidence of limiting long-term illness in the population, all predicted poorer social-behavioural outcomes for the EPPSE sample.

The analyses showed that higher levels of deprivation among children aged under 16 (IDACI) predicted poorer 'self-regulation', and higher levels of 'hyperactivity' and 'anti-social' behaviour. Moreover, higher neighbourhood scores for the IMD predicted increased 'hyperactivity'. Higher levels of criminality in neighbourhoods also predicted poorer outcomes in all four social behavioural domains (e.g., ES=0.14 for hyperactivity). Higher levels of unemployment in the area predicted higher 'hyperactivity' among Year 9 EPPSE students. Finally, a higher incidence of limiting long-term illness in the neighbourhood predicted lower 'self-regulation' at the end of KS3. All these relationships had effect sizes in the range of ES=0.08 to ES=0.14 (for imputed data) after controlling for the influence of individual, student family and HLE characteristics.

Pre-school

In order to assess whether the impact of early educational settings on social behaviour continued throughout KS3, measures related to pre-school: exposure (i.e., attending pre-school or not), duration, quality and effectiveness were tested.

The results indicate that attending any pre-school centre, regardless of quality, did not predict social-behavioural outcomes in Year 9. Further, the influence of pre-school effectiveness measures was no longer visible at age 14, in contrast to findings when the EPPSE sample were in primary school.

However, the quality of the pre-school attended (as measured by the ECERS scales) continued to predict all four social-behavioural outcomes at the end of KS3, both separately and when tested in combination with the early years HLE. Overall, students who had attended higher quality pre-schools showed significantly better social-behavioural outcomes at age 14 than the home group or than those who had experienced low quality pre-school. These effects were relatively weak, for 'self-regulation' (ES=0.14 high quality versus 'home' children), 'pro-social' (ES=0.14), 'hyperactivity' (ES= -0.13) and 'anti-social' (ES= -0.14).

The pre-school results may be partly dependant on other experiences such as the quality of the early years HLE. Attending a medium or higher quality pre-school showed lasting benefits for students from most HLE groups. There were significant positive benefits for 'self-regulation' and 'pro-social' behaviour for attending a higher quality pre-school (compared to low quality) for those children who had low or average HLE (ES≅0.50 for 'self-regulation').

Figure 5.1: Interaction effects between pre-school quality (ECERS-E) and early years HLE on self-regulation in Year 9

Self-Regulation: Interaction Effects:
Pre-School Quality (ECERS-E) and Early Years Home Learning Environment
[Effect sizes based on estimates averaged across 10 multiply imputed datasets using Rubin's (1987) Rules]
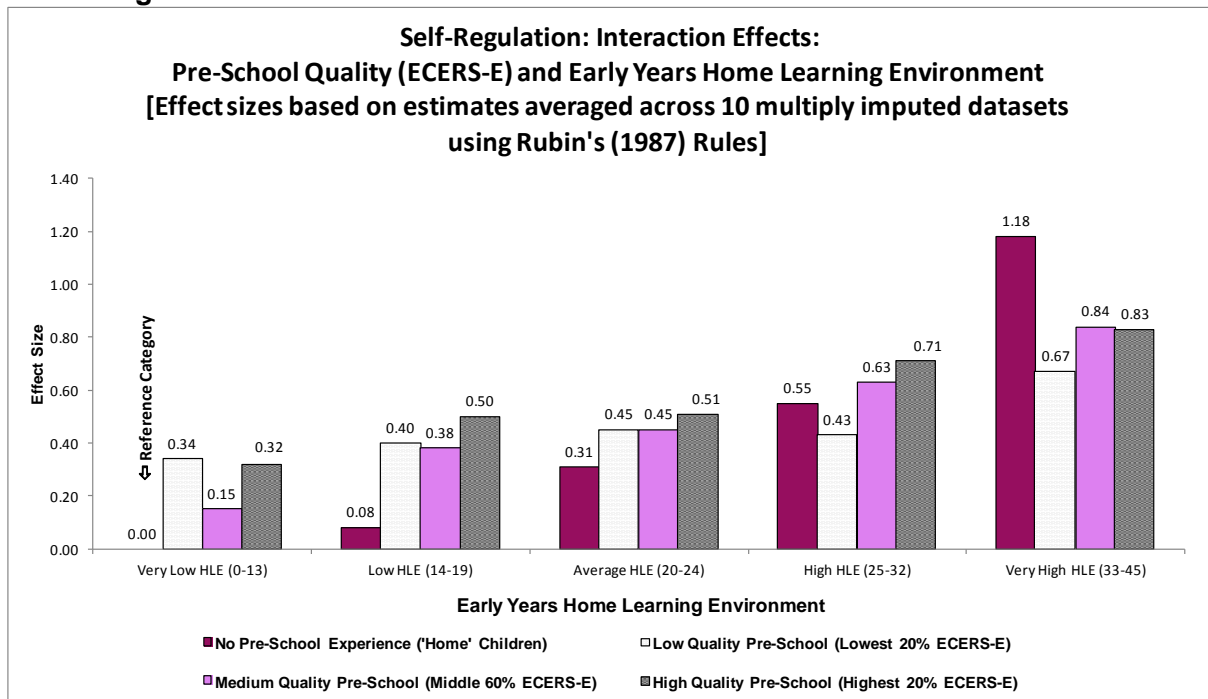
For hyperactivity, only high quality pre-school offered benefits for students who had a low early years HLE (ES=-0.40). For those who with a high early years HLE, however, low quality pre-school did not offer extra benefits in terms of predicting better social-behavioural outcomes in Year 9. This pattern fits with predictions made of interactions between home and out-of-home experiences by Melhuish (1991) and findings of interactions when the EPPSE students were in Key Stage 2 (Sammons et al., 2008a; 2008b).

Figure 5.2: Interaction effects between pre-school quality (ECERS-E) and early years HLE on hyperactivity in Year 9

Hyperactivity: Interaction Effects:
Pre-School Quality (ECERS-E) and Early Years Home Learning Environment
[Effect sizes based on estimates averaged across 10 multiply imputed datasets using Rubin's (1987) Rules]
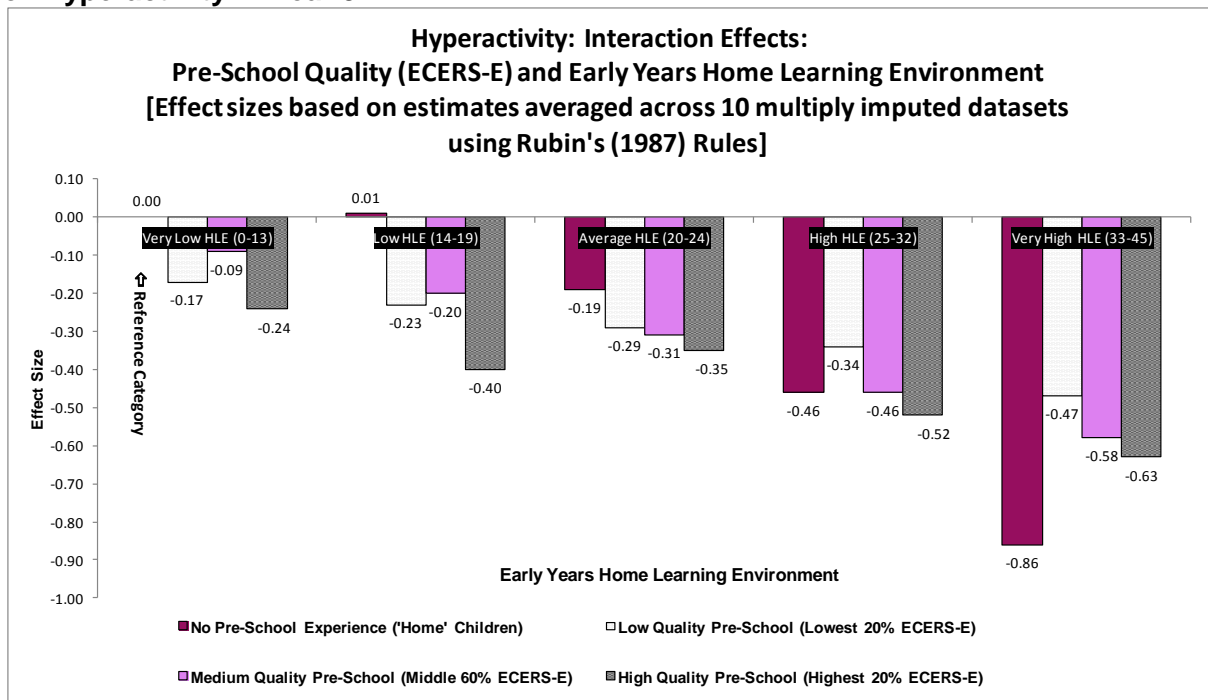
In combination with the findings for academic outcomes the results suggest that higher quality pre-school experiences can have lasting positive benefits for all round development, although by age 14 these effects are relatively modest for social behaviour. We conclude that pre-school experience on its own, while of benefit, should not be regarded as a magic bullet to overcome the long lasting effects of disadvantage, but may provide help to ameliorate its impact, particularly if it is of high quality.

Primary school

There were no statistically significant effects of the academic effectiveness of the primary school in terms of predicting better later social-behavioural outcomes at the end of KS3. This is in contrast to findings for academic attainment where we have identified longer term positive benefits from attending a more academically effective primary school that last to the end of KS3 (Sammons et al., 2011a).

Secondary school

Two indicators of secondary schools were investigated:
  i) effectiveness - measured by the DfE Contextual Value Added (CVA) measures calculated to measure secondary school effectiveness in promoting students' academic progress from KS2 to KS4;
  ii) quality - measured by the Office for Standards in Education (Ofsted) inspection judgements.

EPPSE tested whether students who attended better secondary schools (as defined by the above indicators) showed better social-behavioural outcomes at the end of KS3.

Effectiveness measures

The average CVA score for secondary schools (taken over 4 years) did not predict differences in student's social-behavioural outcomes in KS3 either positively or negatively, when account was taken of the influence of individual student, family, HLE and neighbourhood factors. This is in contrast to findings for the EPPSE students' academic outcomes at the end of KS3.

Quality measures

The overall Ofsted inspection judgments of the 'behaviour of learners' did predict better social-behavioural outcomes for EPPSE students. The differences were most notable when comparing satisfactory/good/outstanding secondary school to inadequate schools. Students who attended a secondary school judged inadequate on at least one occasion in the four years studied, showed significantly poorer 'pro-social' behaviour, taking into account the influence of other factors (e.g., ES ranged between 0.56 and 0.63 for attending a satisfactory, good or outstanding school versus an inadequate one for self-regulation).

As well as identifying a net effect after controlling for other influences, interaction effects were also studied. These showed that attending an outstanding or a good school (judged by Ofsted) offered the greatest benefits in promoting better social-behaviour outcomes for students with lower scores on the multiple disadvantage index, those from non-manual family SES groups and those whose mothers had higher qualification levels.

Figure 5.3: Interaction effects between secondary school quality (Ofsted) and Index of Multiple Disadvantage on self-regulation in Year 9

Self-Regulation: Interaction Effects :
Ofsted Evaluation of Secondary School by Index of Multiple Disadvantage
[Effect sizes based on estimates averaged across 10 multiply imputed datasets using Rubin's (1987) Rules]
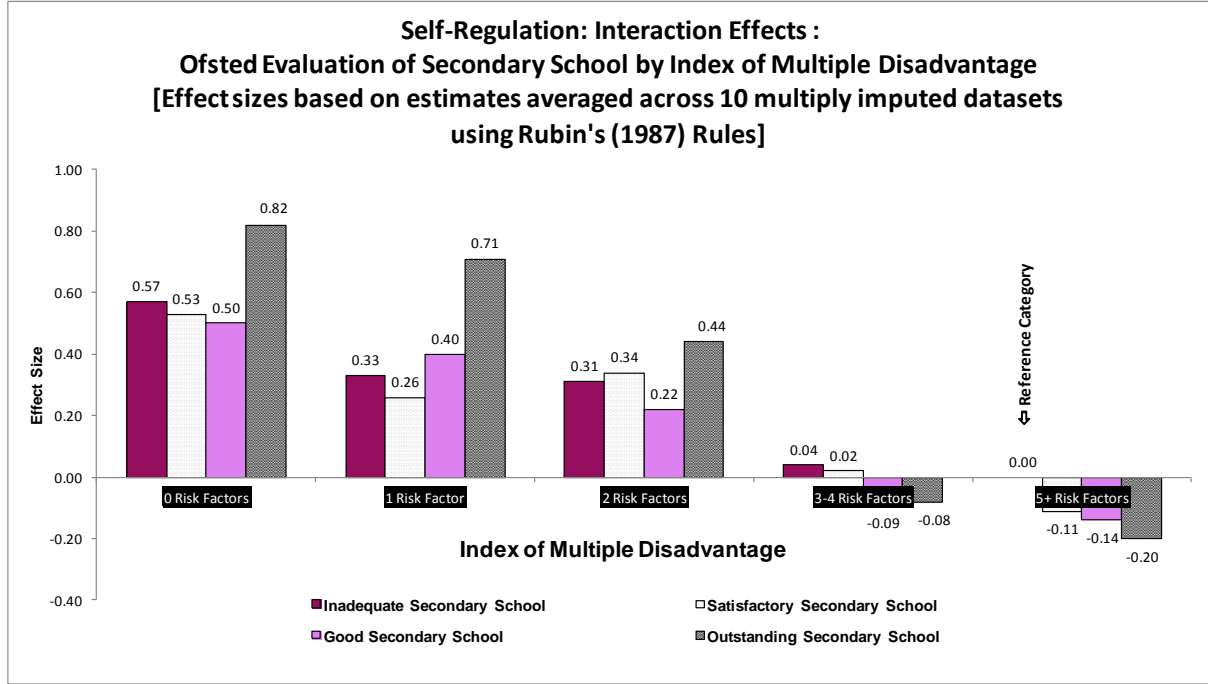
Attending a better secondary school seems to confer less benefit for those students who are more disadvantaged. This is in contrast to findings at younger ages which indicated that the disadvantaged children benefited more from attending higher quality pre-schools and more academically effective primary schools. It is possible that teachers in outstanding schools are applying different standards in rating 'self-regulation', which impacts differentially upon disadvantaged students. It may also be that by secondary school some of the problems of disadvantaged are so deeply entrenched, that for those who are the most disadvantaged, that it is much more difficult to influence, even for very good secondary schools.

Figure 5.4: Interaction effects between secondary school quality (Ofsted) and Index of Multiple Disadvantage on pro-social behaviour in Year 9

Pro-Social Behaviour: Interaction Effects :
Ofsted Evaluation of Secondary School by Index of Multiple Disadvantage
[Effect sizes based on estimates averaged across 10 multiply imputed datasets using Rubin's (1987) Rules]

54
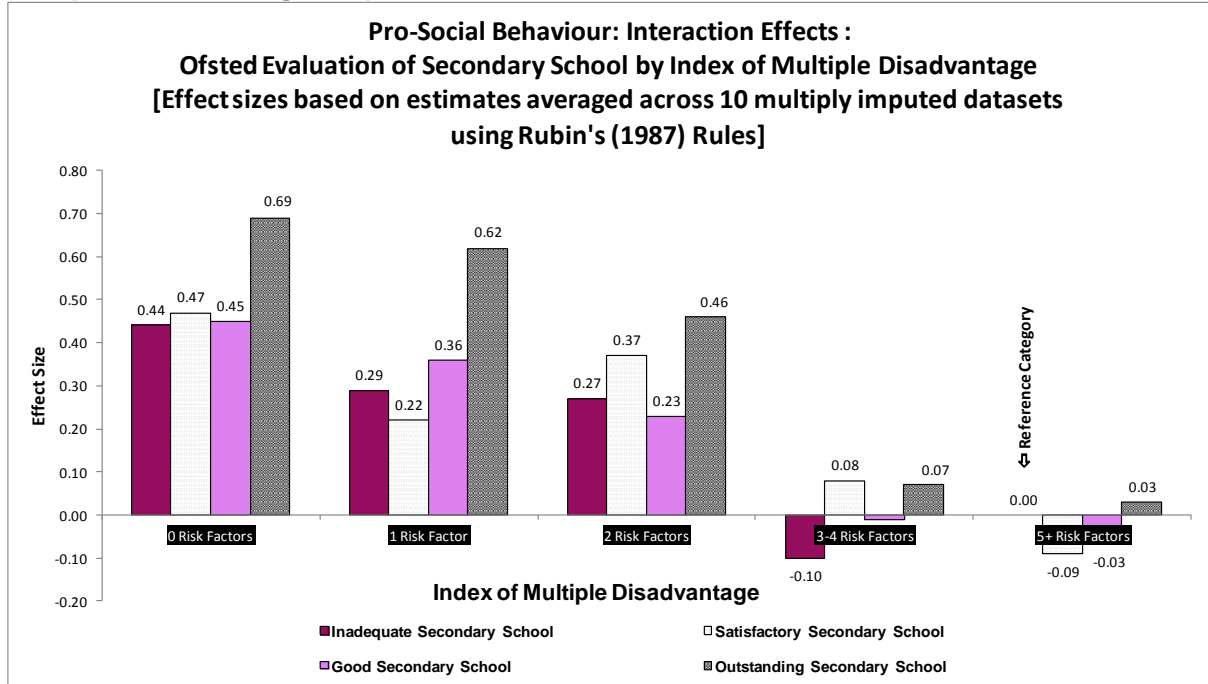
Compositional effects

A compositional effect is measured by the percentage of students (at school level) who are eligible for Free School Meals (FSM) and the percentage of students with SEN. Neither of these aggregate measures were significant predictors of social-behavioural outcomes at KS3. These findings are in contrast to the results for academic outcomes in Year 9 were attending a secondary school with a more disadvantaged intake had a weak but negative impact on EPPSE students' own attainment levels.

Students' experiences and views of secondary school

Homework

Students' self reported time on homework predicted better social-behavioural outcomes in Year 9 (2-3 hours per night had ES=0.72 'self-regulation'; ES=0.62 'pro-social', ES= -0.71; ES= -0.55 'anti-social'). This strong relationship held after taking account of individual student, family and HLE influences. The positive impact of spending time on homework for social-behavioural outcomes mirrors results found for academic attainment. It fits with other research which has pointed to the reciprocal links between behavioural patterns including effort and motivation that predict attainment. Of course it must be recognised that spending time on homework is a form of self-regulated behaviour in itself, and can be seen to demonstrate higher levels of motivation and commitment to school work, and also possible family support and encouragement to take study seriously. Also a teacher may be positively influenced by whether a student completes homework when assessing their behaviour and their attainment. In interpreting this finding it should also be remembered that some schools lay more emphasis on setting and marking homework and thus school processes may be at work in shaping students' attitudes to and engagement in homework.

Teaching and school processes

Students' views about secondary school education in KS3 were obtained from self report questionnaires. Various measures were derived that related to their school experiences (Sammons et al., 2011 b).

Where students reported that their schools laid a greater 'emphasis on learning' this predicted better 'self-regulation' (ES=0.17) and 'pro-social behaviour' (ES=0.16) and reduced 'hyperactivity' (ES=-0.20) and 'anti-social' behaviour (ES=-0.16). Elsewhere, EPPSE shows that an 'emphasis on learning' factor also predicted better academic attainment in KS3.

Another, student reported factor, 'teacher support' (teachers supporting students' learning), predicted better social-behavioural outcomes (ES=0.17 'self-regulation'; ES=-0.20 'hyperactivity'). This factor measures such teacher behaviours as, providing helpful comments on students work, use of praise, formative feedback and making lesson aims clear. It is a measure that relates to the quality of teaching.

A 'poor behaviour climate' in the school, as reported by students themselves, also predicted poorer social-behavioural outcomes at age 14. It predicted poorer outcomes in 'self-regulation' (ES=-0.32) and 'pro-social behaviour' (ES=-0.26) and increased scores for 'hyperactivity' (ES=-0.31) and 'anti-social' behaviour (ES=0.25).

The factor 'valuing pupils' was also found to predict better outcomes for all four social-behavioural measures. This factor captures aspects of the emotional climate of the school, such as how friendly teachers are and the extent to which students feel valued and involved. The findings also highlight the importance of the headteacher's leadership. Students' views on 'headteacher qualities' in KS3 predicted better social-behavioural scores for all four outcomes (ES=0.09 to ES=0.13). The effects were not strong and other literature suggests that headteacher leadership effects tend to operate indirectly to benefit student outcomes through improving the school's behavioural climate, school organisation and teaching quality that may have a direct impact on student outcomes (see Day et al., 2009; Leithwood et al., 2006; Robinson, 2008; Sammons et al., 2011c).

The factor 'school environment' refers to amenities including attractive buildings, classroom decorations, and standards of cleanliness. Where students rate their secondary schools more positively on this factor it predicted better social-behavioural outcomes for 'pro-social' behaviour (ES=0.10) and reduced 'anti-social' behaviour (ES=-0.07), controlling for the influence of other background characteristics.

Similarly better 'school resources' for learning, as rated by students, predicted better outcomes for all four social-behavioural measures (ES=0.12 to ES=0.15). Again though modest these results show that, taking account of other influences, students' are rated more favourably by teachers in secondary schools that are better resourced in terms of science laboratories, the library and the computer resources.

Student dispositions

Previous research has shown that there are reciprocal relationships between academic self-concept and academic attainment (Marsh & Craven, 2006). Higher self-concept predicts better academic attainment and vice versa. Earlier patterns of academic attainment and self-concept can shape students' future identities as learners. Elsewhere we have demonstrated strong links between 'maths academic self-concept' as a predictor of maths attainment in Year 9, although 'English academic self-concept' was a much less strong predictor of Year 9 English attainment. Students' self-reported 'enjoyment of school' also predicted attainment.

We tested whether these measures that we term students' 'dispositions' also predict differences in their social-behavioural outcomes as rated by teachers in Year 9.

The results indicate stronger positive effects for 'maths academic self-concept' as a predictor of 'self-regulation' and 'pro-social' behaviour than for 'English academic self-concept'. In addition, higher scores on these two measures of academic self-concept predicted reductions in negative behaviour for both 'hyperactivity' and 'anti-social' behaviour.

Due to the likely reciprocal nature of relationships between academic self-concept, attainment and behaviour it is not possible to infer causal connections. Nonetheless, the results suggest that efforts to improve attainment and academic self-concept of students in secondary schools are also likely to promote better social-behavioural outcomes and vice versa.

'Enjoyment of school' can be viewed as an important educational outcome in its own right. 'Enjoyment of school' as reported by students' consistently predicted better social-behavioural outcomes. 'Enjoyment of school' also predicted better academic outcomes in KS3.

Progress across Key Stage 3

Student and family factors

A significant gender gap was identified, with girls showing more progress in the positive social-behavioural outcomes (ES=0.34 'pro-social', ES=0.20 'self-regulation'), and also greater reductions in the negative outcomes (ES=-0.17 to 0.34). The occurrence of behavioural problems in early childhood was also a significant predictor of students' ability to make developmental progress in all four social-behavioural domains during KS3 (ES=-0.18 to ES=0.27). Conversely, the relative age position within their cohort (e.g., Autumn born and therefore older) did not predict social-behavioural changes for students during KS3.

A moderate equity gap associated with family SES was found for changes in 'self-regulation' (ES=0.28), and 'pro-social' behaviour (ES=0.22) and 'anti-social' behaviour (ES=0.27) placing students of parents in professional non-manual occupations in a clearly advantaged position. However, the results did not show a similar gap for 'hyperactivity' (ES=-010) or 'anti-social' behaviour (ES=-011).

A consistent pattern of differences in developmental progress, related mother's educational qualifications, for 'self-regulation' (ES=0.31 for higher degree), 'pro-social' behaviour and 'anti-social' behaviour; with students of mothers holding a degree or equivalent, or a higher degree, showing significantly greater improvements in the two positive social behavioural outcomes, and significant reductions in 'anti-social' behaviour (ES=-0.28 for higher degree), compared to students of mothers with no qualifications.

The marital status of parents was not significantly associated with improvements in 'self-regulation' or 'pro-social' behaviour. However it did predict increases in students' 'hyperactivity' (ES=0.15) and 'anti-social' behaviour (ES=0.13). Students in lone parent families showed significant increases in both negative behaviours, and students of divorced or separated parents being more prone to increased 'anti-social' tendencies between Year 6 and Year 9, controlling for other influences.

The Home Learning Environment (HLE)
The quality of the early years HLE was found to predict better developmental progress across KS3. A high or very high quality of the early years HLE was significantly associated with improvements in 'self-regulation' (ES=0.32) and 'pro-social' behaviour (ES=0.22) from Year 6 to Year 9, with significant reductions in 'hyperactivity' (ES=-0.20). However, the quality of the early years HLE did not predict any significant reductions in 'anti-social' behaviour during KS3.

Secondary school
Several major features of teaching and school processes in secondary schools predicted students' developmental progress across KS3 as follows:
  i) the 'emphasis on learning', a factor related to teaching strategies which promote critical reasoning and the activation of higher-order cognitive processes;
  ii) the amount of available 'teacher support', expressed through a clear delineation of learning targets and expectations placed on students, and constructive feedback;
  iii) the capacity of secondary schools to provide good learning resources, such as well-equipped computing laboratories, and well-resourced libraries;
  iv) the promotion of a culture of 'valuing pupils', whereby teachers and school management openly accept feedback and input from students, offer them a friendly and respectful treatment, and do not ascribe an excessive importance to examination performance in the GSCEs.

All of these factors predicted significant improvements in 'self-regulation' and 'pro-social' behaviour, and significant reductions in 'hyperactivity' and 'anti-social' behaviour even after allowing for background characteristics including the early years HLE.

A fifth domain refers to a range of 'poor behaviour climate' indicators such as violent confrontations, possession of weapons by students, lack of discipline and abidance by school rules, and a strong anti-school ethos where students who work hard are given a hard time by others. This factor predicted significant declines in students' levels of 'self-regulation' and 'pro-social' behaviour, and significant increases in 'hyperactivity' and 'anti-social' behaviour across KS3.

Overall, these results show that a number of features of secondary schooling predicted variation in students' social-behavioural development across KS3. Individual student, family and HLE factors play a role in shaping changes in students' social behaviour, with a tendency for the equity gap in behavioural outcomes to widen for some groups of students during early adolescence. In addition, features of the secondary school relating to 'teacher support', the 'learning resources' and 'poor behaviour climate' also predict changes in EPPSE students' social behaviour. How students' experience their secondary schools predicts both social-behavioural outcomes and development and, as we report elsewhere, also their academic attainment and progress from Year 6 to Year 9.

Social-behavioural developmental trajectories from Year 1 of primary school to the end of KS3

In addition to studying EPPSE students' social-behavioural development in KS3, further analyses were conducted to explore children's developmental trajectories from Year 1 of primary school (age 6 years) to the end of KS3. This section of the report focuses on two important aspects of children's behaviour as assessed by teachers across five time points.

The first outcome considered was 'self-regulation', an important feature of positive behaviour, chosen because it has been found to be an important learning behaviour that predicts both academic attainment and progress during different phases of education (KS1, KS2 and KS3). The second outcome measure selected was 'peer problems', a form of negative social behaviour that reflects poor adjustment to school. The 'peer problems' outcome is based on the Goodman' Strengths and Difficulties (1997) questionnaire which was chosen to allow comparison with other international research on behaviour.

In order to study developmental trajectories it is important to have a common measurement structure at different time points. The social-behavioural factors studied by EPPSE have been found to vary over time. However, it was possible to include common items that measured 'self-regulation' across five years, as well as common items that measured 'peer problems' over the same time frame.

As EPPSE has measures across five time points (Years 1, 2, 5, 6 and 9) growth curve modelling was employed to study developmental change. Ram and Grimm (2007) provide an explanation of growth curve modelling (see Glossary) and explain how it allows researchers to test hypotheses about variations within and between individuals in their developmental trajectories. The interest in this analysis is in studying the extent that individual EPPSE students differ in their initial starting points in terms of two measures of social-behavioural development (measured by the intercept) and differences in how their social-behavioural development changes time (their slope)[23]. Although there has been growing interest in identifying school effects on students' non-cognitive outcomes (Van Landeghem et al, 2002), growth curve models have only recently been used in educational effectiveness research to study changes in students' outcomes across three or more years. Such models have been used to study motivation, attainment, academic self-concepts and well being. However, there has been less us of such models for the study of social behaviour (see De Fraine et al., 2005; 2007; Van de Gaer et al., 2009).

Figure 5.5 shows the results form a model for 'self-regulation' development over time for all children from Year 1 to Year 9.[24] This growth curve shows the overall trajectory for all students taken together and indicates the percentage of overall growth that occurs in 'self-regulation' from the Year 1 baseline.

The peak occurs in Year 6 (100% of the growth measured since Year 1). Although growth seems fairly linear across KS1 and KS2 in primary school there appears to be a reduction in 'self-regulation' during KS3. This could reflect differences between primary and secondary teachers in their views and expectations of students in these different school phases. It may also reflect real changes in behaviour associated with the onset of puberty in early adolescence. Moreover, there are contextual differences in students' school experiences in the two phases.

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[23] We used AMOS to construct these latent growth curve models. The model fit statistics were good to adequate.
[24] A flexible growth curve model was adopted after testing various possible forms (e.g. linear, quadratic). This is referred to an unconditional model as it does not include any predictors. Subsequent conditional models test the impact of selected predictors on growth.

By Year 6 students are the oldest year group at primary school and are generally given greater responsibilities and autonomy and encouraged to set a good example for younger pupils. When they move into secondary school they become the youngest members of the student body and are often helped by teachers and older students to adapt to secondary school life.

Figure 5.5: Predicted average trajectory for self-regulation, Year 1 – Year 9 (whole EPPSE sample). Estimates based on Latent Growth Curve Analysis
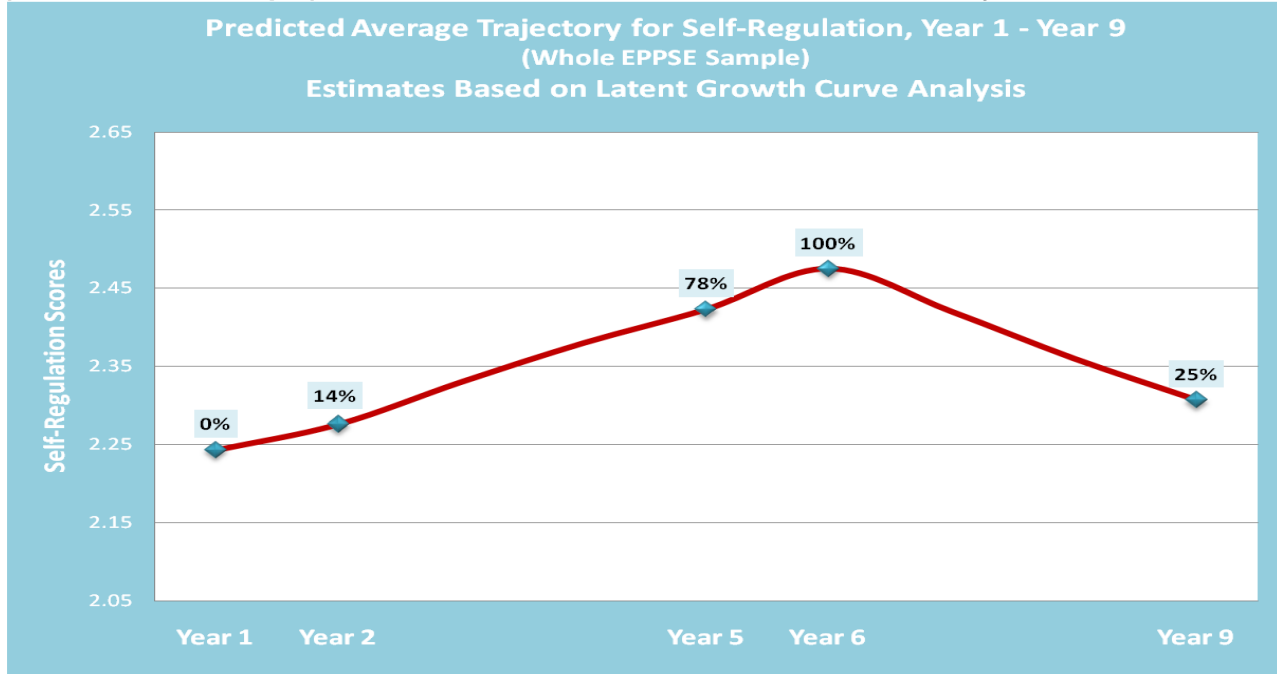
Note: Linear interpolation of data points. Data point labels indicate percent of maximum growth achieved between initial state (Year 1), and the respective data point.

In Figure 5.6 the 'self-regulation' growth trajectories are shown separately for three SES groups. It shows that although the growth curves have some similarities in shapes there are differences between the high SES group and others. First there is a clear gap in the starting point for 'self-regulation' in Year 1 with the high SES group having significantly higher scores on average.

Furthermore, all SES groups show improvement in primary school with their 'self-regulation' peak in Year 6 showing some narrowing of the 'gap'. However, by Year 9 the gap in 'self-regulation' has widened again between the SES groups. This seems to be because the high SES students show less fall off in their 'self-regulation' across KS3 compared with other SES groups. Such differences in 'self-regulation' trajectories may contribute to the maintenance and size of the SES gap in attainment in secondary school, since 'self-regulation' is a behaviour that has been shown to predict and support academic attainment and progress in the EPPSE longitudinal research (Sylva et al., 2010).

Similar analyses were conducted to study the growth curves for the negative social behaviour, 'peer problems'. The overall trajectory for 'peer problems' for all EPPSE students is shown in Figure 5.7 and the trajectories by SES group in Figure 5.8. The growth curve differs in shape. Scores for peer problems (the intercept) are very low in Year 1 but they rise slowly during primary school peaking in Years 5 then reduce slightly at the end of primary school (Year 6) and across KS3. In interpreting these results it should be remembered that most students show few 'peer problems' (teachers' ratings show a very low mean score indicating most ratings are favourable as 1 is the most favourable and 3 the least favourable score for the original items used to construct the scale).

Figure 5.6: Predicted average trajectories for self-regulation, Year 1 – Year 9 (whole EPPSE sample, grouped by SES). Estimates based on Latent Growth Curve Analyses

Note: Linear interpolation of data points. Data point labels indicate percent of maximum growth achieved by the considered group between initial state (Year 1), and the respective data point.

Figure 5.7: Predicted average trajectory for peer problems, Year 1 – Year 9 (whole EPPSE sample). Estimates based on Latent Growth Curve Analysis
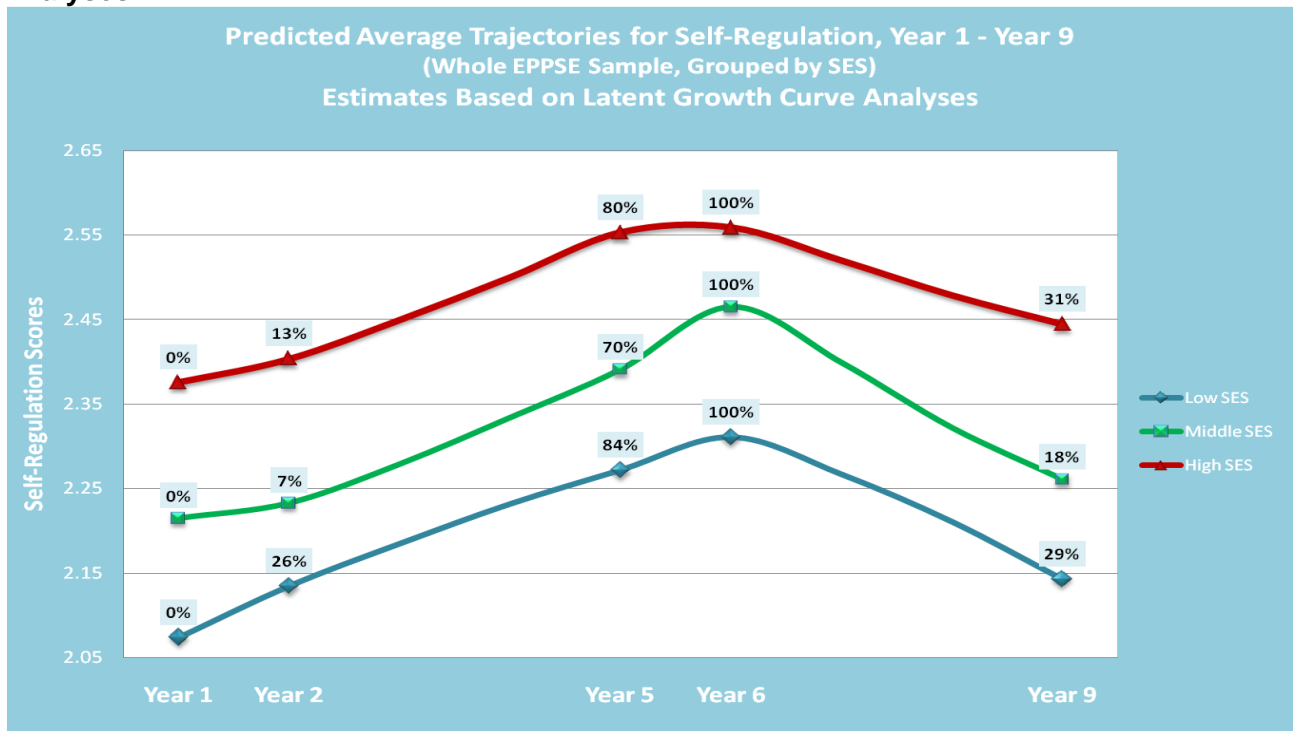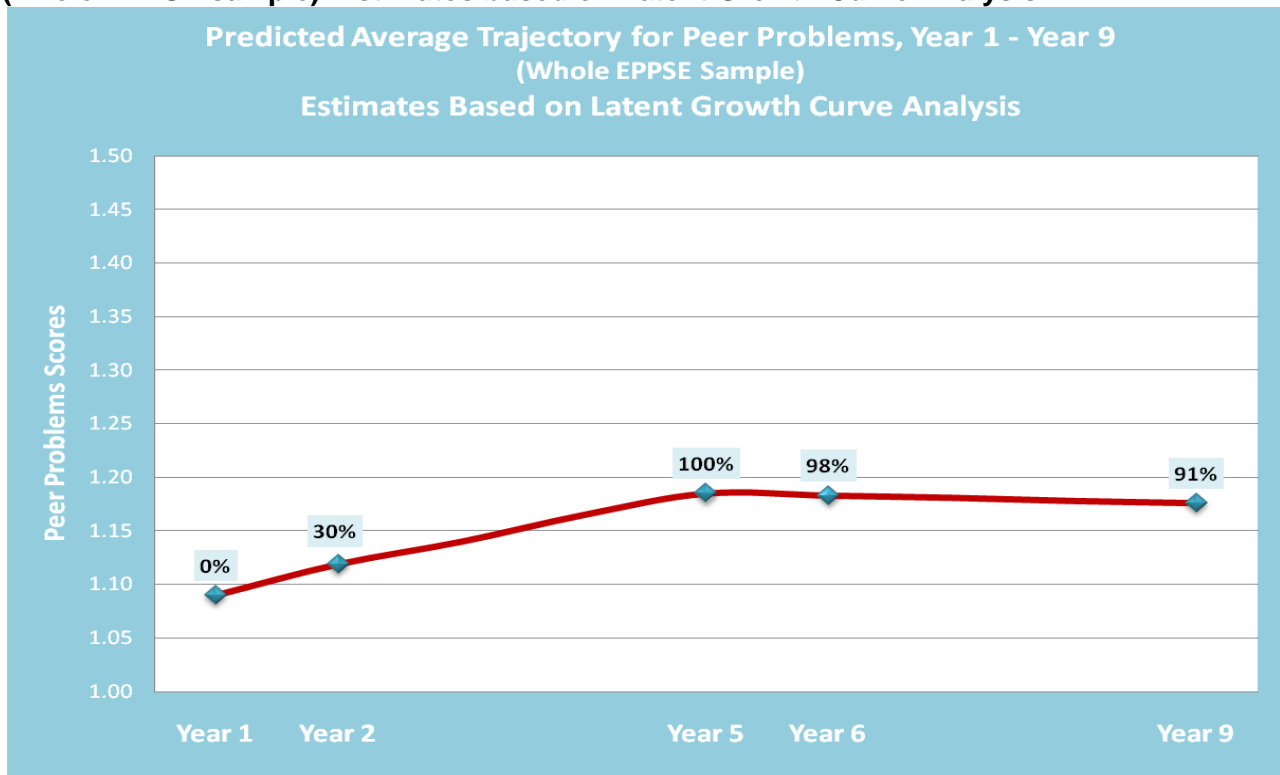

Note: Linear interpolation of data points. Data point labels indicate percent of maximum growth achieved by the considered group between initial state (Year 1), and the respective data point.

The differences in trajectories for peer problems by SES show that although there is a very modest increase across primary schools for all groups, there are also some differences in these trajectories by SES.

At all time points high SES students have lower scores on average for 'peer problems' (according to teachers' ratings) whereas low SES students on average have higher scores (indicative of more problems). However, the scores for the high SES group peak at a lower level and earlier (in Year 5) and then reduce by a third at the end of Year 6, before increasing slightly by the end of Year 9. In contrast the scores for low and middle SES groups continue to rise in Year 6, with the low SES students peaking at this point before some reduction in 'peer problems' by Year 9. This is not the case for middle SES students whose scores continue to rise to the end of Year 9. By Year 9 there is little difference between the low and the middle SES group for 'peer problems' but the scores for the high SES group of students are distinctly different and lower.

Figure 5.8: Predicted average trajectories for peer problems, Year 1 – Year 9 (whole EPPSE sample, grouped by SES). Estimates based on Latent Growth Curve Analyses
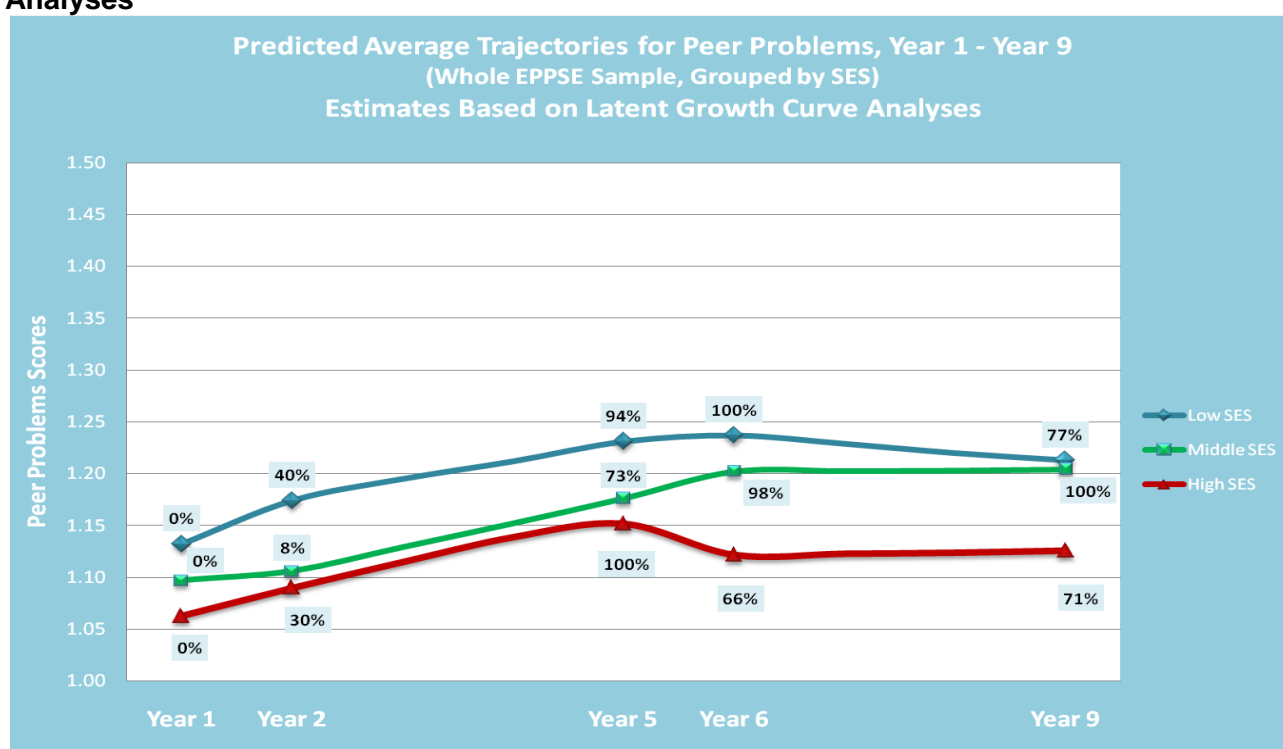
What influences students' growth trajectories?

Further analyses were used to establish what characteristics predict changes in students' 'self-regulation' and their 'peer problem' across Year 1 to Year 9. The results provide evidence of the importance of five specific measures: gender, family SES, the early years HLE and pre-school quality and effectiveness.

Given the nature of latent growth curve model analysis it is not appropriate to test large numbers of predictors simultaneously, rather the technique seeks to develop a parsimonious model. Elsewhere EPPSE have reported in detail on more complex multilevel analyses of the predictors of various social-behavioural and academic outcomes as well as their dispositions to school in KS1, KS2 and most recently in KS3 (see Sammons et al., 2011b).

Gender, SES and the early years HLE had been found to be important predictors of differences in social-behavioural outcomes while measures of pre-school experience were also found to be statistically significant. These measures proved to be predictors of both 'self-regulation' and 'peer problem'. Some measures mainly affected the starting point in Year 1 (the intercept), differences then being maintained but exercising no additional impact on the shape of the developmental trajectories. Other measures predicted the trajectory slope, but not the starting point, and others showed a significant effect on both the starting point (intercept) and the trajectory (slope).

Figure 5.9 and Figure 5.10 show the latent growth curve models for 'self-regulation' and 'peer problems'[25]. The model fit was reasonable in terms of the most appropriate statistical models; RMSEA and CFI[26] (see Footnote and Glossary). The fit was RMSEA=0.059; CFI=0.81 for 'self-regulation'. The fit for 'peer problems' was RMSEA=0.053; CFI=0.70. It should be noted that the CFI index is considered inappropriate when the RMSEA for the null model already indicates a good fit, thus the hypothesis of no relationship is rejected (Rigdon, 1996; Kenny, 2011). In this research we modelled the relationship amongst the social behavioural items and the latent factors across different time points. The unconditional model represented the relationships amongst the 'self-regulation' and latent factors (or for 'peer problems' the equivalent items and factors for this outcome) modelled over time before testing any predictors.

'Self-regulation' trajectory

Table 5.2 shows the standardized estimates of the effects of different factors in predicting the intercept and slope for 'self-regulation' growth. It can be seen that gender was a highly significant predictor of the starting point for self-regulation in Year 1, it is also weakly related to the slope for 'self-regulation' ($p<0.08$). Girls showed significantly higher 'self-regulation' scores in Year 1 and maintained this advantage with a nearly significant impact on the slope suggesting some possible widening of the gap across Years 1 to 9.

A similar pattern was found family SES. This also showed a statistically significant impact on the starting point (intercept) and weak but nearly statistically significant relationship to slope ($p<0.08$). A better early years HLE predicted a higher starting point in Year 1 but in this model does not affect the change in 'self-regulation' over time (slope). However, the model clearly demonstrates significant relationships (covariance) between gender and the early years HLE and also between SES and the early years HLE (see Figure 5.9). The HLE differences may be seen to potentially affect trajectories through the link with gender and family SES.

Table 5.2: Results of latent growth curve model for 'self-regulation' Y1-Y9

Relationship tested		Predictors	Standardised estimates
ICEPT	<---	Gender	0.187 ***
SLOPE	<---	Gender	0.091*
ICEPT	<---	Family SES	0.251***
SLOPE	<---	Family SES	0.094*
ICEPT	<---	Early years HLE index	0.226***
SLOPE	<---	Early years HLE index	-0.090
ICEPT	<---	Effectiveness of Pre-school (Independence & Concentration VA)	0.094**
SLOPE	<---	Effectiveness of Pre-school (Independence & Concentration VA)	-0.025
ICEPT	<---	Quality of pre-school ECERS –E score	-0.032
SLOPE	<---	Quality of pre-school ECERS –E score	0.118**

Flexible conditional model with time-invariant and time –varying covariates (n=2857)
Significance levels p<0.01***; p<0.05 **; p<0.08 *

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[25] The analyses also tested whether the intercept and slope were themselves significant for each outcome but the path was not statistically significant. The model was based on the EPPSE pre-school sample excluding the 'home' group who had not attended pre-school as it was not possible to test the pre-school predictors with the home group.
[26] Root Mean Square Error of Approximation (RMSEA) and The Comparative Fit Index (CFI) also see Glossary.

In addition, the latent growth curve model shows that two pre-school measures (quality and effectiveness) were statistically significant predictors of 'self-regulation' trajectories. The effectiveness of the pre-school attended by an EPPSE student (in promoting young children's 'independence and concentration') had a significant impact on their starting point 'self-regulation' in Year 1 (intercept), but not the slope. The quality of the pre-school attended (measured by ECERS-E score) -predicted the developmental trajectory (slope). In addition, there was a significant relationship between these two pre-school measures (quality and effectiveness; see Figure 5.9). Earlier EPPSE findings have shown that the quality of the pre-school attended predicted growth (progress) for both academic outcomes and in 'independence and concentration' from age 3 to 5 years (Sammons et al., 2003).

Tests were conducted to see whether the academic effectiveness of the primary school attended influenced the developmental trajectory in 'self-regulation' across Years 1 to 9 but the results showed no significant relationships. Elsewhere EPPSE has shown that the academic effectiveness of the primary school has a direct and indirect influence on 'self-regulation' during the primary school period.

'Peer problem' trajectory

A similar analyses was conducted to study the developmental trajectories for 'peer problems' across Years 1 to 9. The results showed that gender was a powerful predictor of 'peer problems'. It influenced both the starting point (girls have lower scores) and the trajectory (slope).

Table 5.3: Results of latent growth curve model for 'peer problems' Y1-Y9

Relationship tested		Predictors	Standardised estimates
ICEPT	<---	Gender	-0.371 ***
SLOPE	<---	Gender	-0.716 **
ICEPT	<---	Family SES	-0.644***
SLOPE	<---	Family SES	-0.594 *
ICEPT	<---	Early years HLE index	-0.299 ***
SLOPE	<---	Early years HLE index	0.012
ICEPT	<---	Quality of Pre-school (ECERS-E score)	-0.014
SLOPE	<---	Quality of Pre-school (ECERS-E score)	-0.314
ICEPT	<---	Effectiveness of Pre-school (Peer sociability VA)	-0.472 ***
SLOPE	<---	Effectiveness of Pre-school (Peer sociability VA)	0.226

Flexible conditional model with time-invariant and time –varying covariates (n=2857)
Significance levels $p<0.01$***; $p<0.05$ **; $p<0.08$ *

Family SES was also a powerful predictor of both starting point and trajectory over Years 1 to 9. A higher family SES links with a better starting point and reduced slope (growth) in 'peer problems'. The early years HLE predicts a better starting point and that advantage is maintained over time but it does not predict the trajectory. In contrast to the findings for 'self-regulation', the quality of the pre-school environment attended by a child (measured by ECERS–E score) does not predict the growth curve trajectory for 'peer problems'. However, the effectiveness of the pre-school centre attended in promoting 'peer sociability' between ages 3 and 5 predicts a lower score for 'peer problems' in Year 1 of primary (the intercept). Moreover, the models reveal there is a link between the effectiveness of the pre-school attended in promoting 'peer sociability' and pre-school quality measured by ECERS-E (see Figure 5.10) echoing findings from earlier multilevel analyses of pre-school effects (see Sammons et al., 2003).

Conclusions

Overall, the multilevel analyses in this section provide clear evidence concerning the factors that predict better social-behavioural outcomes for students at the end of KS3 and the factors that predict developmental change in adolescence measured from Year 6 to Year 9.

It is apparent that the influence of various individual, family and HLE factors continue to predict outcomes. An equity gap can be identified in terms of factors that promote learning and academic attainment as well as better social adjustment. The experience of multiple disadvantage in the early years enhances the risk of poorer social-behavioural development up to age 14 years, as well as predicting poorer academic attainment. The two are likely to be mutually reinforcing. By contrast positive parenting experiences especially in the early years (measured by the early years HLE) help to promote better longer term outcomes. There remains evidence that pre-school experiences continue to shape social-behavioural outcomes into secondary school, as the measure of pre-school quality continues to show a statistically significant effect at age 14.

The measure of primary school academic effectiveness predicted better attainment in Year 9 but not better (or worse) social behaviour. Similar results are found for the academic effectiveness of the secondary school. However, a poor quality secondary school as measured by Ofsted judgments predicts poorer behavioural outcomes for those who attending a school rated as inadequate.

Measures of the quality of the school's teaching' ('emphasis on learning', 'teacher support', feeling 'valued'), 'headteacher qualities', and better 'behaviour climate', 'school environment' and 'school/learning resources' (as rated by students) were found to be consistent predictors of better social-behavioural as well as academic outcomes. Likewise, time spent on homework, strongly predicts better academic and social-behavioural outcomes.

The latent growth curve analyses reported in this section supplement the more detailed analyses of social-behavioural outcomes in KS3 reported elsewhere in this report by studying the change in outcomes over a longer time period (nine years of schooling).

The models developed show both what characteristics predicted initial differences (the starting point in Year 1) and any changes in patterns over time. In accord with findings in earlier EPPSE analyses it is clear that there were statistically significant and marked differences in social-behavioural development that were predicted by gender and family SES. In addition, these characteristics (gender and SES) also predicted developmental trajectories. Early years experiences were also found to be important.

The analyses showed that a better early years HLE conferred a significant advantage in providing children with a better start to primary school and that this advantage was maintained over subsequent years. The early years HLE predicted positive growth in 'self-regulation', a key social skill linked with learning. There is also additional evidence about the importance of the quality and the effectiveness of the pre-school and their links. The quality of the pre-school attended also predicted improvements in 'self-regulation' up to the end of KS3.

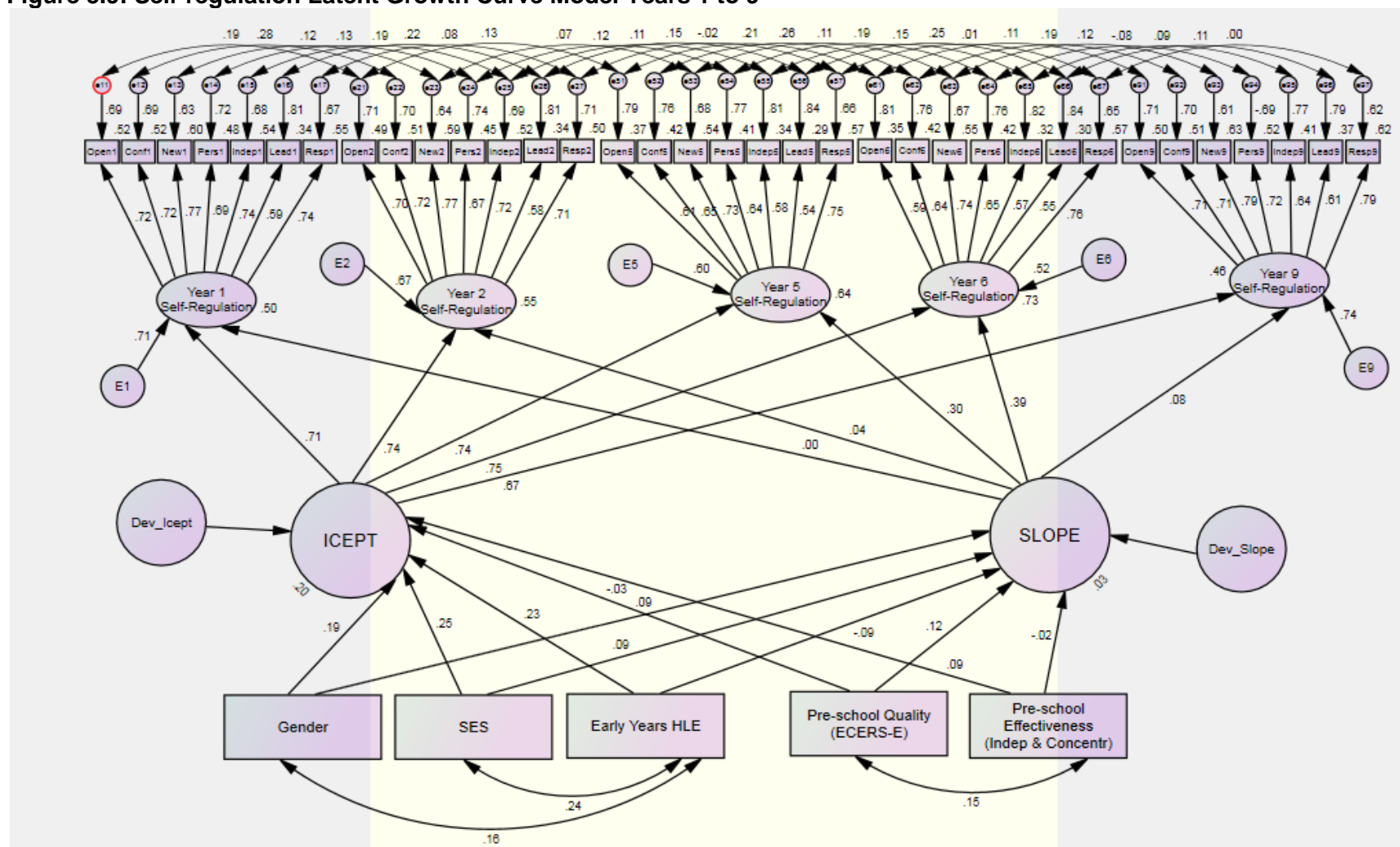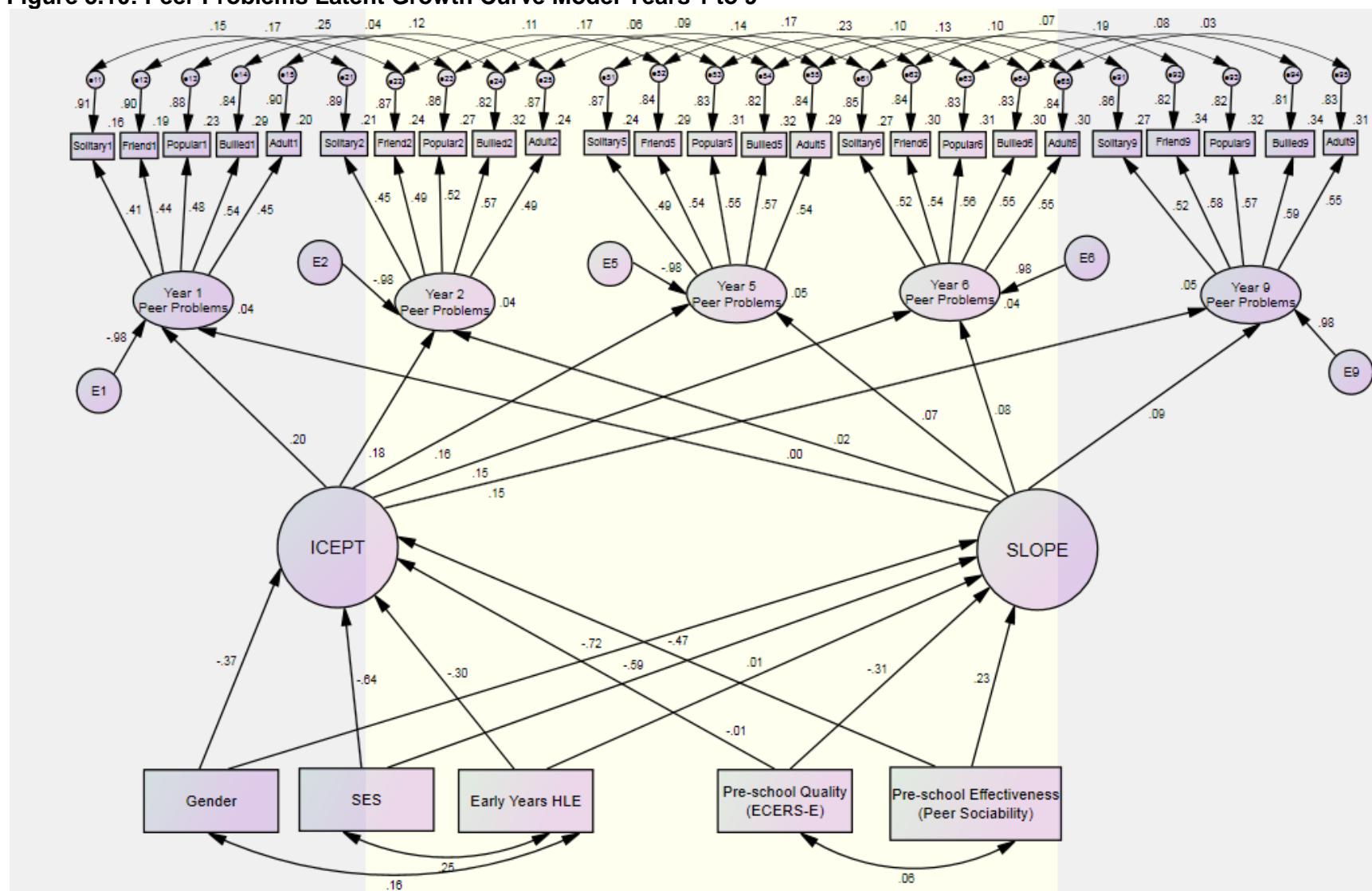**Figure 5.9: Self-regulation Latent Growth Curve Model Years 1 to 9**

Figure 5.10: Peer Problems Latent Growth Curve Model Years 1 to 9

Section 6: Students' dispositions and views of school at age 14

Summary of key findings

- Girls were more likely to report anxious behaviours, gave lower ratings of their own 'popularity', had lower 'maths academic self concept', and showed more favourable 'citizenship values'.
- Students' reports of their secondary school's 'emphasis on learning' significantly predicted academic attainment and progress.
- Students' reports on their schools 'quality of teaching' ('emphasis on, and support for learning' and feeling 'valued) were related to better social-behavioural outcomes and improvement across KS3.
- Students' reporting a stronger 'emphasis on learning' and more favourable 'behaviour climate' in their school had significantly better academic and social-behavioural outcomes. Students' ratings of their school's 'behaviour climate' were also related to students' self-reports of 'anxiety'.
- Strong and positive links were discovered between students' 'academic self-concept' for English and maths and their attainment in these subjects.
- There were better attainment and social-behavioural outcomes where students reported they 'enjoyed school', especially for maths.
- Ofsted judgements on secondary schools' quality and effectiveness were predictive of students' 'enjoyment of school' and lower 'anxiety' levels.

There is increasing interest in studying a range of student outcomes in educational research because it is recognised that, while promoting good academic attainment is an essential function of schools, they also serve a range of other important purposes. Promoting student well being, social behaviour and positive attitudes or dispositions towards learning are also important. Schools are expected to promote positive values relating to citizenship, enjoyment of school and encourage favourable views of learning capabilities amongst students.

This section presents a summary of analyses of students' perceptions of themselves in various affective domains that we term 'dispositions' and of these students' views of school. For details of student's academic and social-behavioural development at this age see Sammons et al. (2011a), Sammons et al. (2011b), and for the full details of these analyses see Sammons et al. (2011c), Sammons et al. (2011d). In addition to exploring pre-school influences, the EPPSE 3-14 research is designed to identify the influences of primary and secondary school on students' later educational outcomes and trajectories, as well as to investigate any continuing pre-school effects.

The analyses reported here are based on two separate questionnaires administered to students at the end of Year 9 (age 14). The first probed students' dispositions and the second asked about their views of school and classroom life. Similar questionnaires, although somewhat shorter, were administered at younger ages when these students were in primary school in Year 2 (age 7) and Year 5 (age 10). The EPPSE research is therefore able to link measures of individual students' dispositions at different time points to investigate changes in views over time. The questionnaire items were derived from number of existing instruments including the School Climate Assessment Instrument (Grosin & McNamara, 2001) and the Louisiana ABC+ model (Teddlie & Stringfield, 1993). Ten items were taken from existing Academic self-concept scales (Marsh & Hau, 2003). The full reports, Sammons et al. (2011c, 2011d) contains full details of the questionnaires.

Aims of the study of student dispositions and views of school in Year 9

- to explore students' dispositions and experiences of school in Year 9, compared to results found on these outcomes and experiences at younger ages;
- to investigate the relationships between students' experiences of school and their dispositions;
- to examine students' questionnaire responses for underlying dimensions (factors) related to their dispositions and experiences of school at the end of Key Stage 3 (KS3);
- to explore the influence of individual student, parent and home learning environment (HLE) characteristics on students' dispositions at the end of KS3;
- to model students' dispositions and changes in their dispositions over KS3;
- to investigate any continuing impact of pre-school, including any variations in students' outcomes for those who had experienced different levels of quality of pre-school provision (and those who had not attended a pre-school centre i.e. the 'home' group);
- to investigate the influence of primary and secondary school academic effectiveness and quality on dispositions and changes in disposition (controlling for individual, family and HLE characteristics).

Additional analyses were conducted in order to describe the variation in students' views of school and how these differed for particular student groups. These analyses identified a number of robust factors that provided summary measures of important school and classroom processes.

Students' dispositions in Year 9
Measuring students' dispositions

As previously stated the information for this section of the report was derived from two questionnaires sent to students at the end of Year 9. The first, 'All About Me', probed students' views about themselves (dispositions). The second, 'All About Me in School', asked about their experiences of school and classroom life (views of school).

A range of statistical methods have been used to investigate results for 1766 students (63% of the sample) for whom at least one disposition outcome measure was collected in Year 9. The sample was broadly in line with the full EPPSE sample (48% were girls compared to 52% of the full sample; 13% were eligible for FSM compared to 18% of the full sample; and 78% were White UK heritage compared to 73% of the full sample).

Statistical analyses were used to explore the variation in students' responses to the questionnaire items and to see whether robust measures of their dispositions could be identified at the end of Year 2, Year 5 and Year 9. The results revealed a number of underlying dimensions (factors) which reflect patterns of associations amongst the questionnaire items. Four main factors were found in Year 2 and Year 5, shown in Table 6.1

Table 6.1: Questionnaire items associated with students' dispositions in Year 2 (age 7) and Year 5 (age 10)

Disposition factors in Year 2			
'Enjoyment of school' • I like school • I like answering questions in class • I like reading • I like doing number work • I like science • School is interesting	**'Behaviour self-concept'** • I try to do my best at school • I am kind to other children • I behave well in class	**'Academic self-concept'** • I am clever • My teacher thinks I am clever • I do my work properly	**'Alienation'** • I get tired at school • I get fed up at school • I get angry at school
Disposition factors in Year 5			
'Enjoyment of school' • Lessons are interesting • I like school going to school • I get fed up at school • I get tired at school • I like English • I like maths • I like science	**'Behaviour self-concept'** • I try to do my best at school • I behave in class, • I talk to my friends when I should be doing my work • I hit other children	**'Academic self-concept'** • I am clever • I know how to cope with my school work • I am good at school work • My teacher thinks I'm clever	**'Anxiety and Isolation'** • I feel lonely • I get upset • I feel worried • Other children bully me

The analysis of the Year 9 student questionnaire revealed six underlying factors that we term dispositions, some overlapping with the outcomes at previous time points (Year 2 and Year 5).

The factors relate to:
1 'Academic self-concept for English'
2 'Academic self-concept for maths'[27]
3 'Popularity' relates to how popular students feel they are with other teenagers and how many friends they have.
4 'Anxiety' reflects the degree to which the students feel unhappy, worried, nervous, fearful in new situations or suffer from minor ailments.
5 'Citizenship values' relates to how important students feel certain behaviours are such as strong people not picking on weak people, respecting rules and laws, controlling your temper, respecting other's views, and sorting out disagreements without fighting.
6 'Enjoyment of school' reflects the degree to which students reported they like lessons and being at school, like answering questions in class, but also how much the student experiences boredom in lessons or feels school is a waste of time.

Confirmatory factor analysis was the main method used to identify these underlying dispositions because it produces more reliable and valid measures than using exploratory factor analysis alone[28].

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[27] The factors 'Academic self-concept for English' and 'Academic self-concept for maths' are based on items taken from existing well established 'academic self-concept' scales (Marsh, 1990; Marsh & Hau, 2003; Marsh & Craven, 2006).
[28] In Year 9, 15 factors were extracted from the original principle components analysis (exploratory Varimax factor analysis) and accounted for 63 per cent of the variance. Confirmatory Factor Analysis (CFA) of the six factors that had robust internal reliabilities (0.70 or above) confirmed a good factor structure.

Table 6.2: Questionnaire items associated with students' dispositions in Years 9 (age 14)

Disposition factors in Year 9		
'Enjoyment of school' • My school is a friendly place • On the whole I like being at school • I like to answer questions in class • School is a waste of time for me • I like most of the lessons • I am bored in lessons	**'English Academic Self-concept'** • I learn things quickly in my English classes • I have always done well in my English classes • Compared to others my age I am good at English • Work in my English classes is easy for me • I get good marks in English	**'Maths Academic Self-concept'** • I learn things quickly in my maths classes • I have always done well in my maths classes • Compared to others my age I am good at maths • Work in my maths classes is easy for me • I get good marks in maths
'Citizenship Values' • Making sure strong people don't pick on weak people • Respecting rules and laws • Controlling your temper even when you feel angry • Respecting other peoples points of view • Sorting out disagreements without fighting	**'Popularity'** • I make friends easily • Other teenagers want me to be their friend • I have more friends than most other teenagers my age • Most other teenagers like me • I am popular with other students in my age group	**'Anxiety'** • In class I worry about what the others think of me • I get a lot of headaches, stomach aches or sickness • I worry a lot • I am often unhappy, downhearted or tearful • I am nervous in new situations • I have many fears, I am easily scared

Table 6.3 reports the correlations between the prior disposition factors at the end of Year 5 and the factors collected at the end of Year 9. The correlations between the factors at the different time points are low, although they are generally statistically significant. It is important to note that the lower correlations are likely to reflect a number of influences, including real changes in students' attitudes at different ages, measurement error in terms of the assessments, and differences in the instruments (in terms of wording of items and number of points on the rating scales used). The strongest relationship was between 'academic self-concept' in Year 5 and 'maths academic self-concept' in Year 9 (r=0.25), closely followed by 'enjoyment of school' (r=0.24) and 'anxiety' (r=0.22).

Table 6.3: Correlations between student's dispositions in Year 5 and Year 9

	Academic self-concept maths	Academic self-concept English	Anxiety	Citizenship values	Popularity	Enjoyment of school
Enjoyment of school	0.10**	0.11**	-0.10**	0.19**	0.07**	0.24**
Anxiety & isolation	-0.07**	-0.03	0.22**	0.02	-0.16**	-0.11**
Academic self-concept	0.25**	0.19**	-0.09**	0.12**	0.10**	0.20**
Behaviour self-concept	0.07**	0.16**	-0.02	0.20**	0.04	0.22**

* Statistically significant at p<0.05; ** Statistically significant at p<0.01; all other correlations not significant

Students' perceptions of school, learning and themselves

Students were generally confident about their overall ability in Year 9 (93% agreed/strongly agreed that they thought they could do most things well; and just over three quarters (76%) agreed/strongly agreed that they were clever, but there was some variation in perceived ability in individual subjects.

The majority of students in Year 9 still reported they liked school (69% agreed/20% strongly agreed with this statement), and most liked their lessons (66% agreed/18% strongly agreed) but boredom in lessons was reported by a substantial minority (36% of students agreed/5% strongly agreed they get bored in class).

In terms of future plans, nearly all students believed it was important to get 5 good GCSEs (A*-C or equivalent) and A levels, and the majority also felt it was important to get a degree. Students had high aspirations; in total seventy-seven per cent of students felt it was fairly likely or very likely that they would go to university (41% thought it very likely, 36% fairly likely).

Most students in Year 9 believed they were popular with their friends. Only a minority of students felt they didn't make friends easily (10%). Around a fifth of Year 9 students felt unpopular, whereas two thirds strongly agreed and one in eight strongly agreed they were popular with their peers.

Anxious behaviours were a common feature for this age group, with approximately half feeling nervous in new situations and worrying a lot. Approximately one in five students indicated that they felt unhappy (14% agreed/3% strongly agreed they felt unhappy) and approximately a over a quarter suffered regularly from minor ailments (22% agreed/6% strongly agreed they suffer from minor ailments).

Comparing students' dispositions in Year 9 with those at earlier time points

At younger ages (Year 2, age 7 and Year 5, age 10) the EPPSE students were found to be more positive towards school than they were in Year 9. In line with other research (Mortimore et al., 1989; MacBeath & Mortimore, 2001; Keys & Fernandez, 1992; Thomas et al., 2000) students tend to report enjoying school somewhat less as they get older, and the results also suggest that their 'academic self-concept' and the way they view their behaviour also tends to decrease over time. This may reflect greater self awareness as well as differences in schooling demands and life pressures, plus the growing importance of the peer group in adolescents' lives and interest in activities outside school. Nonetheless, the majority of students still have fairly positive views in Year 9. For example, over half of Year 2 students reported liking school 'all the time' compared to a quarter of Year 5 students. This compares with a fifth of Year 9 students strongly agreeing that they like being at school on the whole. Students' reports indicate that they feel they are less clever and are less likely to feel safe outside the classroom as they get older. Students were also less likely to want to answer questions in class as they grew older and perceptions of their popularity also lowered. Nonetheless, it is important to note that the majority of Year 9 students enjoyed school (overall 89% agree/strongly agree that they liked being at school).

Students' liking of individual subjects also showed some reduction over time for all subjects. However, the relative popularity of individual subjects remained fairly constant. Sport and the Arts/Creative subjects were still the most popular subjects in Year 9, the least popular being modern languages (58% of students liked sports 'a lot'; 49% liked arts/creative subjects 'a lot' compared to just 20% of students who like modern languages 'a lot')[29].

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[29] Percentage of students liking other subjects 'a lot': Science=35%, ICT=35%, Maths=29%, English=28%.

Analysis of students' dispositions
Individual student background influences
In order to explore the strength of relative influences EPPSE used Effect Size measures (ES). In these analyses the influence of individual student, family and home factors are controlled for, in order to identify the net impact (strength) of different potential predictors of students' dispositions.

Girls reported significantly different dispositions than boys for four factors. Girls had a lower 'academic self-concept for maths' (ES=-0.38)[30], but there were no gender differences for 'English academic self-concept' (even though girls had significantly higher attainment in English). Girls also tended to have a poorer view of their 'popularity' (ES=-0.12) and were more likely to report 'anxiety' than boys (ES=0.48). However, girls showed higher 'citizenship values' than boys (ES=0.31).

Most ethnic groups did not differ in their perceptions from the White UK group, but there were some statistically significant patterns[31]. Students of Pakistani heritage tended to report more favourable outcomes for all dispositions, especially for 'English and maths academic self-concept' (ES=0.43; ES=0.38) and 'enjoyment of school' (ES=0.55). Students of Indian heritage also reported greater 'enjoyment of school' (ES=0.35), had higher 'maths academic self-concept' scores (ES=0.42), were more positive in assessing their 'popularity' with peers (ES=0.33) and also reported lower levels of 'anxiety' (ES=-0.47).

Students of Black African heritage also tended to have a higher 'English and maths academic self-concept' (ES=0.56; ES=0.74) and were more positive in assessing their 'popularity' than the White UK group (ES=0.60). Similarly, but to a lesser extent, the Black Caribbean heritage students also showed more favourable 'English academic self-concept' (ES=0.38) and were more positive in assessing their 'popularity' with peers than the White UK group (ES=0.44).

Students previously identified by their parents (at entry to the study) as having behavioural problems in the early years also tended to report 'enjoying' secondary school less (ES=-0.23), were more 'anxious' (ES=0.38), and had a lower 'maths academic self-concept' than other students in Year 9 (ES=-0.48).

Students who had very low birth weight also felt less 'popular' in Year 9 (ES=-0.51). This may reflect long term developmental difficulties. Number of siblings in their family at entry to pre-school was also significant. Students with two or more siblings tended to 'enjoy school' somewhat less than singletons (ES=-0.20).

Family background influences
Family poverty was measured by entitlement to Free Schools Meals (FSM) and FSM students had lower 'maths academic self-concept' scores (ES=-0.25). The highest socio-economic status of either parent (family SES) was also explored, based on parental occupation at the end of KS2. Students from Other Professional Non-manual, Skilled Non-manual and Skilled manual families had a lower 'maths academic self-concept' than students from a Professional households (ES=-0.21; ES=-0.33; ES=-0.25).

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[30] The strength of an effect is expressed as an Effect Size. An effect size is a statistical measure representing the strength of the effect of each predictor variable on the outcome after taking account of other predictor variables in the model. An ES of 0.2 can be seen as representing a small to moderate influence while a relatively strong influence would be an ES of 0.6 or above. Only statistically significant effects above 0.20 are reported here.
[31] Although significant the results are based on small numbers of students and should be interpreted with caution.

Father's employment in the early years was also found to be related to 'maths academic self-concept'. Students whose fathers were employed full-time, and those who were studying, had higher 'maths academic self-concept' in Year 9 compared to students whose fathers were unemployed (ES=0.75). Students from families in the highest earned income band (measured in KS1) were more likely to report higher 'popularity' (ES=0.34) and higher 'enjoyment of school' than students from a family with no earned income (ES=0.52).

The marital status of parents showed a small but significant effect. Students from households where their parents were living together but not legally married reported higher feelings of 'popularity' than students from married households (ES=0.21). This is in contrast to findings for both academic attainment and social behaviour where differences were found, indicating that students from households where parents were married tended to have better outcomes.

Home Learning Environment (HLE) influences
Students with higher HLE scores in the early years had significantly higher 'enjoyment of school' in Year 9 than students who had the lowest levels of HLE (see Sammons et al., 2011c). Early learning experiences had given these children a better start to primary school (Sylva et al., 2004) and this advantage continued throughout primary education (in KS2) and on into secondary school.

Home and out of school learning indicators (measured in KS1 and KS2) also showed a positive link to 'popularity' and 'English academic self-concept'. Students with high and medium levels of 'parent/child interaction' in KS1 reported higher 'popularity' levels in Year 9 compared to those with low levels of 'parent/child interaction' (High - ES=0.23; Medium -ES=0.21). In addition, students with high and medium KS2 HLE (Global measure – see Appendix 4) also showed more positive views of their 'popularity' than students with low levels (High - ES=0.28; Medium - ES=0.19). Students who had high and medium levels of 'Individual Child Activities' in the home during KS2 showed higher 'English academic self-concept' (in Year 9) compared to those with low levels of Individual Child Activities (High - ES=0.52; medium - ES=0.21).

Special Educational Needs (SEN) influences
Students who were identified as SEN in Year 9 showed less favourable dispositions for all factors except 'citizenship values'. SEN students had significantly less favourable scores for English and maths 'academic self-concepts', 'popularity' and especially 'anxiety'. After attainment was taken into account students on the SEN register showed no significant differences in 'academic self-concept' compared with other students. This suggests that the lower attainment of students with SEN in Year 9 accounts for differences in their 'academic self-concept' rather than their SEN status per se although the two (academic attainment and SEN status) are strongly related and so relationships will tend to be reciprocal.

Dispositions and how they relate to academic attainment and social-behavioural outcomes
Academic attainment was found to be significantly associated with four students' dispositions; English and maths 'academic self-concept', 'anxiety' and 'enjoyment of school'. Attainment in maths was a strong predictor of 'maths academic self-concept' (ES=1.14), 'anxiety', (ES=-0.17). English was the strongest predictor of English 'academic self-concept' (ES=0.75). In Year 5 attainment was not found to be related to 'enjoyment of school' but by Year 9 it showed a significant association (e.g. maths attainment and 'enjoyment of school' - ES=0.34). This may reflect a greater awareness of students' relative levels of attainment in KS3 and its implications for future educational choices and GCSE entry in secondary schools.

Students rated more highly by their teachers for 'self-regulation' in Year 9, after controlling for background characteristics, had higher English and maths 'academic self-concept' (English - ES=0.25; Maths - 0.44), higher 'citizenship values' (ES=0.32), and greater reported 'enjoyment of school' (ES=0.41). These findings emphasise the importance of 'self-regulation' in shaping students' outcomes and predicting success in school (Sammons et al., 2011b).

Dispositions and how they relate to students' views of secondary school

There was a strong link between students' dispositions and their reports of school'. There were a range of factors related to students' views of their secondary school that strongly predicted their 'enjoyment of school' especially in relation to 'teacher support' (ES=1.27), 'valuing students' (ES=1.22), 'emphasis on learning' (ES=1.11) and the 'school environment' (ES=1.01).

Students' views of their secondary school's 'emphasis on learning' (ES=1.25), 'learning resources' (ES=0.72), how much they 'valued students' (ES=0.69) and 'teacher discipline' (ES=0.66) were strong predictors of maths 'academic self-concept'.

Teacher support' and 'emphasis on learning' were also predictive of English 'academic self-concept' (ES=0.43; ES=0.40). Students' views about 'teacher support', 'emphasis on learning' and 'valuing students' were also quite strongly predictive of the disposition outcome 'citizenship values' (ES=0.62; ES=0.61; ES=0.64 respectively). The link between the students' views of their secondary school and their dispositions was weaker for 'anxiety' and 'popularity'. However, less favourable views for the perceived 'behaviour climate' of the school were found to be quite strongly predictive of increased 'anxiety' scores in Year 9 (ES=0.58).

Pre-school influences

The analyses of EPPSE students' dispositions at the end of KS3 produced little evidence of any continuing pre-school effects (having attended pre-school compared to not having attended pre-school) in promoting better outcomes for the different dispositions factors.

Primary and secondary school effects

Measures of the primary school academic effectiveness (see Glossary) were also tested as predictors but these were not found to relate to students' dispositions in Year 9 (in contrast to findings of continued positive effects for academic outcomes in Year 9, see Sammons et al., 2011a).

Although secondary school level variance[32] was found to be not significant for all but one factor ('enjoyment of school') for the main EPPSE student dataset this may not reflect the real variation between schools due to the small number of students per school. An additional analysis of peer data from 66 of the schools that EPPSE students attended was also carried out where the average number of students per school was much higher (mean=31). This analysis showed significant school level variation for all outcomes except 'anxiety' (variation=0.2%). The largest variation amongst schools for dispositions was found for 'enjoyment of school' (11%) followed by maths 'academic self-concept' (6%), English 'academic self-concept' (5%), 'popularity' (4%) and 'citizenship values' (3%).

Ofsted inspection data was used to provide measures of secondary schools' quality and effectiveness for a range of areas and these were tested in the contextualised multilevel models. 'Enjoyment of school' was found to be predicted by a number of Ofsted judgments.

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[32] School level variance here refers to the percentage of variation in students' dispositions that can be attributed to differences between secondary schools.

Schools that were judged to be 'outstanding' in 'meeting the needs of learners' (ES=0.31), 'how well learners achieve' (ES=0.33), 'the standard reached by learners' (ES=0.36), 'progress made by learners' (ES=0.37), progress made by students with 'learning difficulties and disabilities' (ES=0.46), and in developing student's skills to promote 'economic well-being in the future' (ES=0.52) had students that reported greater 'enjoyment of school' than students from schools judged as 'inadequate' in these aspects, controlling for differences in student, family and HLE characteristics.

Schools judged as 'outstanding' in the extent to which learners 'adopt healthy lifestyles', and 'developed workplace and other skills that will contribute to their future economic well-being', had students that reported lower levels of 'anxiety' than students who attended schools judged to be 'inadequate' in these areas (ES= -0.72; ES=-0.52).

The secondary school overall academic effectiveness measure (derived from DfE CVA scores, see Glossary) was not found to be a significant predictor of any of the disposition outcomes. These results indicate that students' dispositions in KS3 do not seem to be affected by their secondary schools' academic effectiveness (or by contrast their ineffectiveness).

Estimating changes in dispositions over time
Changes in students' dispositions over time were investigated using value added analyses to explore how dispositions altered from Year 5 to Year 9. For these analyses EPPSE added a prior measure to the contextualised multilevel models, using the dispositions collected at Year 5 in addition to the background factors presented above.

Where similar measures were used at different ages, they proved to be the best predictors of later dispositions. Correlations between students' dispositions in Year 5 and Year 9 are relatively low compared to those found by EPPSE for academic or social-behavioural outcomes across years KS3 ('enjoyment of school' r=0.24 in Year 5 and Year 9; 'academic self-image' in Year 5 and maths 'academic self-concept' in Year 9 r=0.25; 'academic self-image' in Year 5 and English 'academic self-concept' r=0.19; 'anxiety and isolation' in Year 5 and 'anxiety' in Year 9 r=0.22) showing that dispositions change as students move through different phases of education in KS3.

The generally weak relationships found between dispositions in Year 5 and dispositions in Year 9, may be in part a reflection of the high fluctuation in student's dispositions that seems to be occurring over time. The results indicate that students' dispositions show greater variability and are less predictable than measures of students' academic and social behavioural outcomes. Similar weak relationships between Year 2 and Year 5 dispositions were reported in an earlier paper (Sammons et al., 2008).

Summary of students' dispositions in Year 9
This research confirms findings elsewhere (Keys and Fernandez, 1992) that students' reported attitudes tend to become less positive over time, and that in a number of areas gender differences exist. The tendency of girls to have lower 'academic self-concept' than boys, feel less popular and have higher self-reported 'anxiety', is something that is relevant to the organisation of school pastoral systems. It should be born in mind that, although student attitudes get less positive over time, the majority of students in Year 9 are still feeling positive about themselves and enjoy school.

The findings of this Year 9 analysis of students' dispositions show similarities to findings in Year 5 that suggested pupils background had only a small impact on dispositions compared to its impact on other outcomes (Sammons et al., 2011c; 2011d). This may in part be linked to greater changes in self-perceptions over time, suggesting concurrent influences play a larger role. However, gender differences were found for some outcomes, as was the case for EPPSE students' academic and social-behavioural outcomes in Year 9.

Year 9 students' dispositions were found to relate to academic attainment and 'self-regulation' (this relationship was not found in Year 5 for 'enjoyment of school'), suggesting that less academic students also had less positive experiences of learning and experience more 'anxiety'. Students with SEN were found to be particularly vulnerable to poorer self-perceptions, and this could be relevant in the development of student's personal goals.

Self-perceptions, including items related to 'enjoyment of school' become less positive over time. However, students were still generally positive in Year 9 about themselves and their school experience, with the majority of students liking school, feeling popular, and feeling that academic success was important. More specifically, almost two thirds of students thought that getting a university degree was very important and had high aspirations. A gender divides was evident with boys more inclined to like, and feel competent in, maths, science, ICT and sports. In contrast, girls liked, and felt competent in English, the Arts and modern languages. These findings are in line with national differences in subject choices found at GSCE and A level.

A good quality early years home learning environment (HLE) has been shown to benefit students' academic outcomes even in secondary school, and also their social behaviour (see Sammons et al., 2011a; 2011b). The early years HLE also predicted more favourable dispositions in Year 9. Therefore, encouraging positive learning experiences in the home and appropriate parenting skills that facilitate these could also nurture positive views of learning and school more generally in the longer term.

Explaining students' views and experiences of school in KS3

Having explored students' dispositions in some detail we now examine their views and experiences of school and investigate differences in the responses between particular student groups.

Measuring views of school in Year 9

The information for this section of the report was derived from the 'All About Me in School' questionnaire which asked about their experiences of school and classroom life (views of school). The 'All About Me in School' questionnaire was sent out in the summer term and returned by 1752 students, representing sixty-three percent of the EPPSE sample followed up to the end of Year 9.

The survey consisted of 78 questions under 14 headings (see Table 6.4).

Table 6.4: Areas covered by the All About Me in School questionnaire, Year 9

All About Me in School questionnaire: sub-headings		
1) What my school is like	6) Doing well	11) How clear are my lessons
2) My school's organisation	7) Lessons	12) Thinking back to when you first started this school in Year 7
3) My Headteacher	8) My school's extra support	
4) Being involved	9) Home and school	13) How teachers help me with my work
5) Other pupils	10) Me and my teachers	14) Behaviour in school

Exploratory and confirmatory factor analysis was used to derive underlying factors from the data, covering a number of key school and classroom experiences (see Table 6.5). All the factors exhibited strong internal reliability (Cronbachs alpha $\alpha<0.7$). This analysis revealed eight underlying factors that relate to views of school, some overlapping similar measures derived from the student questionnaires administered in Year 5 (See Table 6.5).

Table 6.5: The specific views of school items associated with each factor that cover students' views of secondary school

Views of school factors in Year 9			
Teacher support	**School environment**	**Valuing students**	**Headteacher qualities**
• Most teachers mark & return my homework promptly • Most teachers make helpful comments on my work • Teachers praise me when I work hard • Teachers tell me how to make my work better • Teachers make me feel confident about my work • Teachers are available to talk to me privately • Teachers will help me if I ask for help • I get rewarded for good behaviour	• My school has attractive buildings • Classrooms are nicely decorated & clean • Toilets are well cared for & clean • My school is well organised • People think my school is a good school	• The school values pupils' views • Teachers listen to what pupils say about school • The teachers in this school show respect for all students • Teachers are unpleasant if I make mistakes • Teachers are friendly towards me	• I often see the headteacher around the school • The headteacher makes sure students behave well • The headteacher is interested in how much we learn

Poor behaviour climate	Emphasis on learning	Teacher discipline	School/learning resources
• Most pupils want to leave this school as soon as they can • Students who work hard are given a hard time by others • Most students take no notice of school rules • There are often fights (in or around school) • Some kids bring knives or weapons into school	• Most students want to do well in exams • Teachers expect me to do my best • The lessons are usually challenging' but 'do-able' • Most teachers want me to understand something, not just memorise it • Most teachers believe that mistakes are OK so long as we learn	• Teachers make sure that it is quiet during lessons • Teachers make it clear how I should behave • Teachers take action when rules are broken • Teachers are not bothered if students turn up late	• There are enough computers • Science labs are good • We have a good library • We get enough time using computers in subject lessons

How do students in Year 9 view their experiences of school?

On the whole students were positive about their secondary school experience in KS3. Students were generally extremely positive about the 'emphasis on learning' and 'teacher support' in school but were less favourable in their views of the 'behaviour climate' and aspects of the 'school environment'. We highlight some of the key findings below (see Sammons et al., 2011d for more details).

Teacher support and emphasis on learning

In terms of 'emphasis on learning', the most positive responses related to the level of teacher care and their expectations for their students. Nearly all students agreed that teachers 'always expect me to do my best' (33% strongly agreed; 64% agreed), 'want them to understand something, not just memorise it' (25% strongly agreed; 68% agreed), 'believe that mistakes are OK so long as they learn' (21% strongly agreed; 70% agreed). A very small minority (less than one in ten students) felt that their teacher did not care whether they worked (2% strongly agreed, 7% agreed that 'Teachers don't seem to care whether I work or not').

In terms of 'teacher support', nearly all students felt that the teachers told them 'how to make their work better' (18% strongly agreed; 73% agreed), and reported that their teacher would 'help them if they asked for help' (24% strongly agreed; 71% agreed). Students were slightly less positive about 'teacher support' in other areas, although the majority of students still reported extremely favourable views. Four out of five students reported that their teacher made them 'feel confident about their work' (13% strongly agreed; 64% agreed), made 'helpful comments on their work' (15% strongly agreed; 70% agreed), that their teachers were 'available to talk to privately' (17% strongly agreed; 67% agreed) and 'praise them when they work hard' (17% strongly agree; 66% agree).

However, the one area where students were significantly less positive was the extent to which they were offered individualised work. Only a quarter of students responded that they were sometimes given individualised work to do (3% strongly agree; 25% agreed).

The school environment

Four out of five students thought their school was a good school (22% strongly agreed; 57% agreed) and nine out of ten students thought their school was well organised (17% strongly agreed; 69% agreed). However, approximately a third of students did not feel that their school buildings were attractive, or their classrooms were nicely decorated. The area where students were least positive was the condition of the school toilets. Nearly half of students felt that their school toilets were not well cared for and clean (6% strongly agreed; 39% agreed).

Valuing students

Almost three quarters of students reported that teachers in their school showed 'respect for all pupils' (14% strongly agreed; 58% agreed), and reported that their school 'values pupils' views' (17% strongly agreed; 57% agreed). Seven out of ten students reported that 'teachers listen to what pupils say about the school' (12% strongly agreed, 57% agreed). Most students reported that 'teachers were friendly' to students (18% strongly agreed; 74% agreed), and reported that 'teachers consult the pupils about school rules' (20% strongly agreed; 67% agreed).

Headteacher qualities

Headteachers were rated very favourably overall, particularly in relation to keeping good discipline and their level of interest in students. Nine out of ten students reported that their 'headteacher makes sure students behave well' (30% strongly agreed; 60% agreed), and eight out of ten students reported that their headteacher was 'interested in how much they learn' (28% strongly agreed; 55% agreed). Fewer students reported that they saw the headteacher around the school, with a quarter of students reporting that they did not "often see the headteacher around the school" (24% strongly agreed; 52% agreed; 19% disagreed; 4% strongly disagreed).

Poor behaviour climate

Students saw their own behaviour and that of other students as good in some areas, with serious behaviours such as bullying and the carrying of weapons being rarely reported. Nearly all students agreed that they 'never bully other pupils' (48% strongly agreed; 45% agreed) but one in ten pupils (11%) reported they were aware that students in their school carried weapons. However, approximately half of students reported that 'most pupils take no notice of school rules' (7% strongly agreed; 42% agreed), and that 'there are often fights (in and around school)' (8% strongly agreed; 41% agreed) in and around their school.

There were some negative reports of low level behaviour issues in the classroom with three quarters of students responding that 'other people's bad behaviour often makes it difficult to learn' (19% strongly agreed; 54% agreed), and just over a fifth of students reported that they 'mess around in lessons' (1% strongly agreed; 21% agreed).

Teacher Discipline

Teachers discipline in relation to poor behaviour was generally thought of as good. Over nine out of ten pupils believed that their 'teachers make it clear how I should behave' (16% strongly agreed; 76% agreed), that their 'teachers take action when rules are broken' (19% strongly agreed; 72% agreed), and that their 'teachers make the aims of lessons clear[33]' (19% strongly agreed; 71% agreed). Whilst the majority of students reported that their 'teachers make sure that it is quiet in lessons' (6% strongly agreed; 61% agreed), this still leaves nearly a third of students who disagreed with this statement.

School facilities

Students were generally positive about their schools facilities. For example, nine out of ten students reported that they thought their school had a good library (27% strongly agreed; 63% agreed). Three quarters of students believed that their school had enough computers (25% strongly agreed; 55% agreed). However, nearly one in five (17%) students thought they had poor sports facilities (4% strongly agreed; 13% agreed). Nonetheless, eight out of ten students (83%) were content with their schools sports facilities (31% strongly disagreed; 52% disagreed). Students were less positive about the amount of time given for computer work; a third of students thought they were not given enough time in school to work on computers (13% strongly agreed; 53% agreed).

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[33] In the analyses this item loaded on to the factor 'teacher discipline' suggesting there is a strong link between the clarity of the aims of lessons and students' behaviour.

Academic success
Nearly all students believed that doing well in exams was important (30% strongly agreed; 66% agreed), although over half reported that their 'school puts too much emphasis on GCSE results' (12% strongly agreed; 43% agreed). Approximately a third of students reported that 'pupils who work hard are given a hard time by others' (7% strongly agreed; 29% agreed), while nearly four in ten students reported that 'most pupils want to leave school as soon as they can' (8% strongly agreed; 31% agreed). Only one in ten students responded that their work was generally too hard for them (1% strongly agreed; 10% agreed).

Differences between student groups in their views of school
Gender, family poverty (measured by Free School Meals [FSM] entitlement), parents highest qualification level, and the early home learning environment (HLE) were significant predictors of students' views of school.

Gender
Gender differences in students' views of school were found for a small number of items. Boys were significantly more positive than girls on only a few items and differences were small. These items were related to the sports facilities, returning homework, and taking notice of school rules, and fights in and around school.

Substantial differences between girls and boys were found for reporting teachers being unpleasant if they make mistakes, and bullying. Boys were also more likely to report messing around in class and that 'pupils who work hard are given a hard time by others'. Smaller gender differences were discovered for further details on items see Appendix 3.

Table 6.6: Key differences in views of school by gender

	% Agreement	
Boys more positive than girls	**Girls**	**Boys**
Most teachers mark and return my homework promptly	68	75
Most pupils take no notice of school rules	52	46
The sports facilities are poor	17*	16
There are often fights (in or around school)	50**	47
Girls more positive than boys	**Girls**	**Boys**
Teachers are unpleasant if I make mistakes	12	21
I never bully others	54	41
I mess about in lessons	20	25
Pupils who work hard are given a hard time by others	34	39

* Boys were much more likely to disagree strongly (35%) than girls (28%)
** Girls were more likely to strongly agree (10%) than boys (6%)

Family poverty
Students who were eligible for free school meals (FSM) were somewhat less favourable than other students in their views of secondary school for just under half of the items, although, many of these differences were relatively small (see Appendix 3). Larger differences were found for the following domains: 'poor behaviour climate', 'teacher support', academic emphasis and 'school resources'[34], where students entitled to FSM had more negative views than other students.

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[34] **Academic emphasis** in this analysis does not constitute a separate factor but a number of items were grouped under this heading for reporting purposes. Additional items, which did not load onto a specific factor, were also grouped under existing headings e.g. 'there are not enough text books'.

Table 6.7: Key differences in views of school by family poverty

	% Agreement	
	Eligible for FSM	**Not eligible for FSM**
Poor behaviour climate		
There are often fights (in or around school)	69	47
Most pupils wanting to leave school as soon as they can	58	37
Pupils take no notice of school rules	64	48
Some kids bring knives or weapons into school	24	9
Pupils who work hard are given a hard time by others	44	36
Teacher support		
Teachers are available to talk to me privately	63	85
My teachers are easily satisfied	42	34
Academic emphasis		
My work is generally too hard for me	21	9
School resources		
There are enough computers	73	81
There are enough textbooks	34	23

The biggest differences were reported for items related to fights in and around school, teachers being available to speak to them privately and students wanting to leave school as soon as they could. For example, two thirds of students with higher levels of family poverty (eligible for FSM) reported fights in or around school (69% agreement) compared to just under half of non-FSM students (47% agreement).

These results point to some of the challenges facing students in disadvantaged communities and differences in the quality of their school experiences. These findings on students' views of the 'poor behaviour climate' in and around their school are disturbing, but are relevant given current concerns about civil unrest largely involving young people in disadvantaged neighbourhoods.

Parental qualifications

Parent's highest qualification levels[35] were found to be related to more positive student views of school. Items where the differences were particularly marked are shown in Table 6.8 and related primarily to the factors as students with higher levels of family poverty, i.e. 'poor behaviour climate', 'teacher support', academic emphasis and 'school resources'.

The items where the biggest differences were reported were 'most pupils want to leave this school as soon as they can', 'there are often fights (in or around school)', and 'most students take no notice of school rules'. For example, over half of students whose parents had no qualifications thought students wanted to leave school as soon as they could (55% agreement) compared to a fifth students with parents who had the highest level of qualifications (20% agreement). Similarly, nearly two thirds of students whose parents had no qualifications reported fights often occurred in or around their school (63% agreement) compared to a third of students with parents who had higher level qualifications (33% agreement). Smaller differences were found for other items (see Appendix 3).

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[35] The highest parental qualification was taken and qualifications were combined to form three groups: No qualifications, School/vocational qualifications (16 Academic, 18 Academic and Vocational) and higher qualifications (degree, higher degree, other professional).

Table 6.8: Differences in views of school by family qualification level (higher/positive)

	% Agreement		
	No qualifications*	**School level / vocational qualifications****	**Higher qualifications*****
Poor behaviour climate			
Most pupils want to leave this school as soon as they can	55	46	20
There are often fights (in or around school)	63	54	33
Most pupils take no notice of school rules	62	52	37
Some kids bring knives or weapons into school	21	11	6
Pupils who work hard are given a hard time by others	47	39	25
Teacher support			
Teachers are easily satisfied	49	34	30
Teachers are unpleasant if I make mistakes	25	16	12
Academic emphasis			
The work is generally too hard for me	17	11	6
School resources			
We have a lot of supply teachers	58	57	43
There are not enough textbooks	30	27	18
There often changes to the timetable	26	21	14
The sports facilities are poor	24	17	13
School environment			
This school is a good school	72	77	86

* No Qualifications; ** School/vocational qualifications; *** Degree, higher degree, professional

There were a small number of items where students whose parents had lower or no qualifications were more positive about their school than the other students. The most marked differences in views are shown in Table 6.9, and relate to the level of student consultation and rewarding good behaviour (see Appendix 3 for details of smaller differences).

Table 6.9: Differences in views of school by family qualification level (lower/positive)

	% Agreement		
	No qualifications*	**School level / vocational qualifications****	**Higher qualifications*****
Teachers consult pupils about school rules	94	88	82
Teachers rewarded good behaviour	79	71	68

* No Qualifications; ** School/vocational qualifications; *** Degree, higher degree, professional

Early years home learning environment (HLE)
During the pre-school phase of the study the early years HLE was investigated. An HLE index was compiled to give some indication of the extent of learning opportunities available in different households. The HLE groups were as follows:

Lowest HLE				Highest HLE
Score of 0 - 13	14 - 19	20 - 24	25 - 32	Score of 33 - 45

Students who had experienced a more enriched early years HLE reported more positive views of school in Year 9. The most marked differences are shown in Table 6.10. Students who had experienced a less favourable early years HLE were much more likely to report their school had a 'poor behavioural climate' and had a lack of academic emphasis.

Table 6.10: Differences in students' views of school by HLE groups - negative aspects of school

	% Agreement				
	Lowest HLE 0 - 13	14 - 19	20 - 24	25 - 32	Highest HLE 33 - 45
Poor behaviour climate					
Most pupils want to leave this school as soon as they can	56	48	43	35	27
There are often fights (in or around school)	68	57	48	43	39
Most pupils take no notice of school rules	64	55	50	44	41
Pupils who work hard are given a hard time by others	46	42	39	32	27
Academic emphasis					
The work is generally too hard for me	22	12	10	9	5
Teacher support					
Teachers are unpleasant if pupils make mistakes	24	18	18	15	8

Table 6.11 shows that students from low HLE groups reported higher levels of agreement with more negative aspects of their school experience. Moreover, there are also differences in relation to positive aspects of schooling, where again the low HLE group have less positive views of school (see Table 6.11 below). Students who had experienced a more enriched early years HLE were more likely to think their school had a good reputation, and were less likely to report that they bullied others.

Table 6.11: Differences in students' views of school by HLE groups - positive aspects of school

	% Agreement				
	Lowest HLE 0 - 13	14 - 19	20 - 24	25 - 32	Highest HLE 33 - 45
People think my school is a good school	72	74	78	81	84
	% Strong agreement				
I never bully other pupils	39	45	43	51	57

Some of these differences may reflect different educational opportunities or choices made by families of high HLE students. Elsewhere our analyses showed the net positive impact of HLE on later outcomes after control for other family factors such as parental qualifications, family income and SES. Therefore, a more enriched early years HLE may have direct benefits for some outcomes but may also pick up differences in the value placed on education and support for schooling.

There were small differences for a number of other items, see Appendix 3.

Analysis of views of school factors: secondary school effects

Substantial secondary school level variance (see Glossary) was found for some factors related to 'views of school' in Year 9. Particularly high variation between schools was found for the following factors that measured students' views: 'headteacher qualities' (15%), 'poor behaviour climate' (28%) and 'school environment' (28%). Significant variation was also found for the factors 'learning resources' and 'teacher support'[36].

Summary of students' views of school in Year 9

Most EPPSE students in Year 9 were satisfied about their experience of secondary school. In particular, students were very positive about the following areas:

- teachers always expect me to do my best (97% agreement);
- most pupils want to do well in exams (96% agreement);
- teachers will help me if I ask for help (95% agreement);
- most teachers want me to understand something, not just memorise it (93% agreement);
- teachers make clear how I should behave (92% agreement);
- teachers don't seem to care whether I work or not (91% disagreement);
- teachers tell me how to make my work better (91% agreement);
- teachers take action when rules are broken (91% agreement);
- the headteacher makes sure pupils behave well (90% agreement).

Areas where students were less positive were the amount of time allowed to work on computers, the condition of the toilets and the level of perceived respect for students. Almost half of students reported high levels of fights in school, and noise in class, while a sizeable proportion of students reported the behaviour of others in class made it difficult to learn. Although students generally wanted to do well in exams, a large minority felt that the school placed too much emphasis on GCSE exam results.

Areas that came up as having the least positive response were:

- other people's bad behaviour often makes it difficult to learn (72% agreement);
- toilets are well cared for & clean (55% thought they were not well cared for and clean);
- most pupils take no notice of school rules (49% agreement);
- there are often fights (in or around school) (49% reported fights occurring often);
- most pupils want to leave this school as soon as they can (39% agreement);
- pupils who work hard are given a hard time by others (36% agreement).

The general condition of the classrooms and attractiveness of the buildings was also thought of as less favourable by students, with approximately a third of students giving negative responses to these areas.

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[36] Peer data on views of school was also analysed and found similar school level variation to the EPPSE dataset (null models): 'headteacher qualities' (19%), 'poor behaviour climate' (18%), 'school environment' (22%), 'valuing students' (13%), 'learning resources' (12%), 'teacher support' (9%), 'teacher discipline' (6%) and 'emphasis on learning' (6%).

Conclusions

There is increasing interest in studying a range of student outcomes in educational research because it is recognised that, while promoting good academic attainment is an essential function of schools, they also serve a range of other important purposes. Promoting student well being, social behaviour and positive attitudes, or dispositions, towards learning are also important. Schools are expected to promote positive values relating to 'citizenship' and 'enjoyment of school', and encourage favourable views of learning capabilities amongst students.

The findings about students' dispositions support findings on academic and social-behavioural development reported earlier in this report. Important links exist between features of students' self-reported secondary school experience and their academic and social-behavioural outcomes, as well as their dispositions to school.

EPPSE research provides important evidence on educational influences on students' dispositions and views of school. Attending a high quality secondary school (as assessed through Ofsted judgements) appears to have some positive benefit to 'enjoyment of school' and lower 'anxiety' levels, suggesting that good quality schools also benefit emotional well-being and highlight the importance of including students' views in the school evaluation process. Some of the strongest predictors of student dispositions relate to their views and experiences of key features of secondary school and classroom processes. In particular, the 'emphasis on learning', 'teacher support', and lower scores on 'poor behaviour climate' in the school predict more favourable dispositions as well as better academic attainment and social-behavioural outcomes.

There were also some significant differences between student groups in their views of school. The most notable differences between students in their views of school were found for those students who were more disadvantaged in terms of poorer backgrounds (measured by FSM entitlement) and those whose parents had lower levels of qualifications. These students tended to have less favourable views of their experiences. These differences were most pronounced for items concerning 'poor behaviour climate', but also for some aspects of 'teacher support', 'emphasis on learning', and 'school resources'. Students who had experienced a less favourable home learning environment (HLE) in the early years were also less positive on a smaller number of items, related primarily to 'poor behaviour climate'.

It is likely that students eligible for FSM or with parents who have no qualifications were more likely to attend schools in more disadvantaged areas (often those deemed to be in challenging circumstances). These results suggest that such students have less favourable experiences of many features of their secondary school experience, especially the 'poor behaviour climate', although they were not less likely to report that they enjoyed school. These differences may exacerbate existing inequalities in achievement and reduce the chances of educational success as students move through secondary school.

Section 7: Case studies of students' learning trajectories

> **Summary of key findings**
> **Students who succeed 'against the odds' of disadvantage had:**
> - Stimulating homes where parenting was a process of 'active cultivation' that facilitated and nurtured academic and social skills allowing children to benefit from what the educational system has to offer.
> - Emotionally and practically supportive relationships with parents, peers/friends and significant other adults which nurtured their self-perceptions, self-efficacy and provided effective learning strategies, aiding them to become 'active agents' in their learning life-course.
> - Good or excellent quality pre-school settings, particularly for boys from low SES families (who are more likely to experience a poor early years home learning environment).
> - Schools that enable them to have access to teaching strategies allowing then to bond with teachers and enjoy lessons, resulting in students feeling encouraged to work to achieve beyond their predicted attainment.
> - Schools that helped them with difficulties by providing additional classes that enabled them to catch up with their peers and helped them (re)develop a positive perception of school and learning and of their ability to deal with difficulties.
> - Supportive social networks in the wider community.
> - Determination and engaged in active participation which was supported by those around them.

A focus for EPPSE has been the extent to which pre-school, compulsory education and children's home learning experiences (HLE) can reduce inequality. Following a pilot study with disadvantaged children who were 'succeeding against the odds' towards the end of primary school (Siraj-Blatchford, 2010a), this section of the reports details the findings from an extended, largely qualitative sub-study focussing on fifty Child and Family Case Studies (CFCS) conducted when the EPPSE children were in secondary school. As the CFCS study 'stands' alone and builds on the quantitative, school effectiveness datasets, this section of the report details the separate sample and methodology used in analyses as well as the summary findings of the study, for full details see Siraj-Blatchford et al. (2011a).

The case studies were designed as a mixed-methods sub-study in order to look in detail at **why** and **when** certain children manage to 'succeed or perform against the odds', i.e. showing 'resilience', while others do not. The research specifically explored the roles that people and their experiences (at home, in schools and in the wider community) play in the learning life-courses of children, how these factors affected their achievement, and the explanations and meanings given by respondents to the unique characteristics, experiences and events in their lives.

Definitions of resilience
In this report 'resilience' is defined as the 'adaptive outcome of a developmental process' (Rutter, 2007). Successful adaptation follows from the cumulative effects of 'protective' factors when facing adversity (i.e. 'risk'). What qualifies as 'adaptive' behaviour will vary from context to context, but in our case 'resilience' refers to 'achievement beyond expectation', i.e. shown by those in the EPPSE sample who obtained high attainment levels at age 11 despite the presence of numerous 'risk' factors early in their learning life-course.

The low SES children 'achieving beyond expectations', as well as those with few early risk factors from high socio-economic status (SES) backgrounds who obtain high attainment levels at age 11, are regarded as the 'academically successful' children in this study. The 'vulnerable' children in this study are those children who obtain attainment levels of academic achievement that are either below prediction (despite the presence of advantageous characteristics) or as low as predicted by disadvantageous personal or family characteristics.

Methodology and sample

The case studies developed using an adaptation of grounded theory using a mixed-methods framework. The following were all used as sources of information: quantitative data from the EPPSE project, a review of the international literature on 'risk' and 'resilience' and qualitative interview data designed and collected as part of the case studies and the pilot study.

The quantitative data from the EPPSE project was used to obtain a systematic, purposeful sample of 50 children, their parents and their teachers. Analysis was conducted on the EPPSE sample (N=2900) using multi-level models in order to obtain residual scores for each child, which indicate differences in predicted and obtained academic achievement for English and Maths at age 11, while controlling for characteristics including age, gender, birth weight, early developmental problems, parent education, SES, and family income (Melhuish et al., 2008).

Three performance groups were created based on these residuals: children 'succeeding against the odds', 'performing as predicted', and 'unexpected underachievers'. Family SES was then used to create the four groups of interest.

Two groups with low SES children:
- Group 1, n=20, academically successful children who were 'succeeding against the odds'
- Group 2, n=15, vulnerable children who were 'expected low achievers'.

Two groups of high SES children:
- Group 3, n=9, vulnerable children who were 'unexpected underachievers'
- Group 4, n=6, academically successful children who were 'expected high achievers'

The sample consists of 24 girls and 26 boys; 23 of the children come from families with Indian, Pakistani, Black African, Black Caribbean, White European and mixed heritage backgrounds, the remaining 27 have a White UK heritage.

A review of international literature from the fields of psychology, sociology and education, was conducted for several purposes. Firstly, it served to create the initial theoretical framework for the case studies. The ecological model of development as proposed by Uri Bronfenbrenner (1979) as used as an overall framework. Secondly, a wide range of literature from the field of sociology, such as the different forms of capital as proposed by Pierre Bourdieu (1986) and the concepts of 'concerted cultivation' and 'accomplishment of natural growth' as put forward by Annette Lareau (2003), and from the field of developmental psychology, such as the concept of proximal processes (Bronfenbrenner & Ceci, 1994), helped to identify processes that function as mechanisms of development.

The literature review was further used to identify general themes and focus areas for the in-depth qualitative interviews with parents, children and teachers which formed the core of the case studies. Additionally, the trajectory analyses, survey and questionnaire data available from EPPSE and findings from the pilot study were used to create 'case specific' interview questions and retrographs which were used as memory aids during these interviews.

Using NVivo software, the interviews were coded and analysed in two ways: 'bottom-up' and 'top-down'. For the 'bottom-up' analysis coding categories were created according to themes that emerged from the analysis of perceptions of the participants as expressed in the interviews. A sub-sample of children with 'ideal types' of trajectories was used to generate initial coding categories; these were subsequently reassessed using the full case study sample. For the 'top-down' analysis coding categories were created based on evidence from the EPPSE project and the literature review. Codes continued to be readjusted as we moved back and forth between the different data sources.

The analysis of the trajectories was used to specifically determine when the children from the four groups started to show differentiation in their learning life-courses. The analyses of the qualitative interviews were used to determine why certain children succeeded academically while others did not. Through the 'bottom-up' analysis we investigated the perceptions of our participants taking into account the people, events and circumstances these children, parents and teachers themselves identified as having had a positive or negative influence on the child's academic achievement over the years.

Through the 'top-down' analysis the occurrence of well-established 'risk' and 'protective' factors were analysed and the specific interplay and constellation of these factors in the learning life-courses of the children. This particular kind of mixed-methods research, which not only combines extensive qualitative and quantitative data but also creates an iterative dialogue between the two types of methods, data and analyses, is rare in educational research.

Key findings

Parenting by way of 'active cultivation' fosters academic achievement

In the homes of children 'succeeding against the odds' parenting practices took the form of 'active cultivation'. These parents engaged their young children in learning processes, for instance by reading with them, providing them with educational (computer) games and materials, talking with them about school and learning or other joint activities e.g. by cooking together. They continued this involvement throughout the child's learning life-course. Despite the fact that circumstances sometimes made it difficult for parents to provide a highly favourable early years home learning environment (HLE), these parents found ways to support their children through important learning experiences. Regardless of the child's actual early years HLE (Melhuish et. al., 2008), parents with children who 'succeeded against the odds' valued these activities as opportunities to develop academic skills that prepared the child for school; they believed these experiences helped them to develop a positive attitude to, and interest for, school related activities. Because these parents felt they were supporting their children academically by offering or facilitating a broad range of educational experiences in addition to school, they were prepared to go to great lengths to provide these experiences and demonstrated determination and creativity in doing so.

As children got older these parents continued to provide a wide range of learning experiences as well as substantial emotional and practical support with learning. If they felt they were unable to provide these experiences (to the extent they thought necessary), they found alternative ways to offer meaningful learning experiences, often by calling on their social networks and the limited cultural capital available in these networks, and by stimulating and facilitating children's participation in extra-curricular activities. Through support and guidance they fostered meaningful and strong emotional relationships with their children.

Characteristics of parents engaging in active cultivation

The parents of low SES children 'succeeding against the odds' set and reinforced high standards for behaviour and academic aspirations for the child. They explicitly expressed their high esteem for education. Although these parents acknowledged limits to their social, cultural and economic resources, this did not stop them from helping their children to succeed in school. They used their own experiences as *positive* or *negative* examples for the children and their resilience and perseverance in dealing with disadvantages often provided a positive role model. Despite some limitations to their cultural and economic capital these parents had a strong sense of self-efficacy regarding their ability to support their child's learning life-course. Their positive attitude towards school and learning, as well as their positive perception of the contribution they could make towards their child's academic success, was continuously present as children progressed from pre-school to primary school and on to secondary school. In the following quote a mother explains why she read with her daughter from a young age:

I used to read to him every night when he was little, we used to have a little bed time story, a bit of animation and a bed time prayer, every night. He had a little bunny, he had a little bunny and it was the…y'know we'd do the little 'hop little bunny, hop, hop, hop' nursery rhyme sort of things…so yeah and we…we made, we tried to make it come to life and if the story, wanted to put some action in the story… I thought perhaps reading to him, because it would help him gain an interest for books… yeah, for his education. **Mother of Jarell, boy, Group 1 (low SES, attainment higher than predicted)**

Right from the start these families 'cultivate' skills and attitudes that prepare their children for a successful academic career. School relevant early learning activities such as book reading are an inherent aspect of child rearing, or as one mother put it when asked why she felt it was important to read with her child: "What else is there in life really?" Often the parents were very creative at finding enjoyable and stimulating activities for their child that would not put an extra strain on the often limited household budget.

'Cos we didn't have a lot of money, so we made things...Used to make all sorts (laughing). We used to walk up the city and walk to parks, and we used to do art stuff didn't we? We used to make a lot of things. Anything out of nothing (laughing). We made this big dolls house out of toilet roll and glue and cardboard. We had this big cardboard box (laughing) we put a wooden plank on the bottom, and we made it into a dolls house. And it was really big; it was just out of toilet roll. It's brilliant (laughing). **Mother of Martha, girl, Group 1 (low SES, attainment higher than predicted).**

Parenting in homes with academically 'vulnerable' children

For children from low SES homes who did not 'succeed against the odds', the experiences in the home environment and attitude of parents were often less obviously aimed at the development of educational skills. Particularly for 'vulnerable' boys, the aspect of enjoyment seemed to be missing from many HLE experiences. Continuity of emotional and practical support for learning and education was uncommon. Often their parents expressed and displayed helplessness in their parenting. Many of them felt they were unable to provide support with school and learning or even to encourage their children to do well in school; by not asking about school or school work, having low aspirations for the child, or not making it clear to the child that even in primary school doing the work in class and at home and paying attention in class were important.

I mean, my husband's a manual worker, my dad was a manual worker, so none of us have been a doctor or a lawyer, or…I I think you just…you don't expect much more of them than what you know of your…close family already. There's no common example to follow, if you like…or no competition, if that's the best word to use perhaps. So, I just want him to be happy in what he's doing….You don't know, maybe in several years time he might change and think: 'Well I really want to do that now' and go and do what we thought maybe he'd never do. **Mother of Christopher, boy, Group 2 (low SES, attainment as predicted).**

This often left the children to sort out difficulties they encountered with school and learning. The cultural logic of child rearing experienced by children in these particular low SES families in many ways is similar to what Lareau (2003) has described as facilitating the 'accomplishment of natural growth'.

Early distinctions in the development of academic life-course trajectories

The children who 'succeeded against the odds' started their academic trajectories with higher rankings for early literacy skills than their low SES peers. Whereas high SES children, who 'failed against the odds' started with lower early numeracy rankings than their academically successful high SES peers.

Once in pre-school, the trajectories of 'academically successful' low SES children often showed substantial improvement, suggesting they were able to gain greater benefits from the learning experiences these settings offered. The slower pace of development found for the academically less successful children, Groups 2 and 3 seemed to indicate a poor fit between the specific needs of these children for learning and the ability of schools, teachers and parents to tailor interactions and resources to these needs. Interestingly, these same children quite regularly showed substantial improvement during the early years of secondary school. This improvement was attributed to maturation but also to the reinforcement of the curriculum and concepts addressed at the end of primary school during these initial years of secondary school (for the importance of successful transitions see Evangelou et al., 2008). A change in attitude towards school and learning in combination with repetition of the curriculum seems to provide some of those who previously struggled with a chance to fill in certain gaps in their existing skills and knowledge, at least for English and Maths.

Supporting children to become active agents of academic success

We found distinctive combinations of academic and social-behavioural characteristics in our children that seemed to facilitate or constrain their adaptation to school and learning. Children who were seen as clever, with a positive attitude towards homework and an internal locus of control had a more positive image which was continually reinforced by people at home and in school. This helped them to establish and strengthen a positive self-image. They developed a strong sense of self-efficacy with regard to school and learning which in turn encouraged them to stretch their learning beyond what might be expected. As a result of these experiences these children became 'active agents' of their academic success. From an early age onwards these children were regarded as good workers, who paid attention in class and focused on their school work and this perception was reinforced by parents and their schools.

> *The fact that she's doing so well is kind of tribute to her, her... a deep down motivation I think, which she has...* **Teacher of Sharlene, girl, Group 1 (low SES, attainment higher than predicted).**

In contrast, children who experienced learning difficulties or were not seen as particularly clever often developed a *negative* self-image, resulting in or reinforcing ineffective problem-solving strategies, diminished motivation for school and learning, and a sense of helplessness. This negative perception of children's ability was reinforced by the perception of parents and children that 'ability to learn' was 'a given' rather than something that could be shaped. This resulted in parents and schools making little effort to remedy the difficulties children experienced.

Gender specific parenting and differences related to ethnic cultural heritage

Consistent with findings for the whole EPPSE sample, far more girls than boys in our case studies had experienced medium or high early years HLEs (see Siraj-Blatchford et al., 2011). Although we did not find any indication of differences in parenting in the early years related to ethnic heritage in these qualitative case studies, our evidence showed that during adolescence parents with girls, and parents with African or Caribbean heritage, felt that children's 'self-regulation' abilities were also strongly related to their practices of teaching children practical life skills, and therefore they emphasised these practices as part of their child rearing strategies.

Foundations for academic success in the Early Years

Most parents, regardless of their SES, were motivated to send their child to pre-school because they believed that pre-schools offered children opportunities to learn and to socialise with other children (a skill they believed would help the child later on in school). In addition, parents with more academically successful children believed that pre-school would provide an opportunity for their children to become accustomed to school routines and rules, and to develop basic literacy and numeracy skills, and would reinforce the child's positive attitude to school and learning. Parents of children 'succeeding against the odds', in particular, believed that pre-schools would offer their child something in addition to what they were able to offer at home and carefully evaluated the suitability of the setting for their child.

EPPSE has previously shown that pre-school education of average or better quality or effectiveness can help to alleviate the effects of social disadvantage and can provide children with a better start to school (Sylva et al., 2010). In this small sub-sample the effect of high versus low quality pre-school settings seemed particularly important for low SES boys. First of all, these boys were more likely to have been enrolled in a low quality pre-school than boys with high SES families or girls from equally disadvantaged backgrounds. Secondly, when boys from disadvantaged families did find themselves in an excellent pre-school setting they seemed to experience longer-term benefits as all these boys went on to 'succeed against the odds' (by age 11).

In the cases studies, few children from low SES families had the combined benefit of highly favourable early years HLE and excellent pre-school education. However, the relatively frequent occurrence of medium or high early years HLE with good pre-school experiences among the children 'succeeding against the odds', underlines the significance of this combination of experiences early on in children's learning life-course.

Teaching that promotes academic success

Students and parents from low SES families 'succeeding against the odds' as well as those from 'successful' high SES families, attributed part of their success to the quality of their teachers. For instance, both parents and students thought that good quality teaching meant that teachers were able to explain topics and lessons clearly, were enthusiastic about the subject they taught, were approachable when things were difficult to understand, were friendly, had control over the class and clearly communicated their expectations and boundaries. Students bonded with these teachers; although they enjoyed the classes, more important was their feeling of being encouraged to work to achieve beyond their predicted attainment.

The 'vulnerable' children in particular mentioned that a high number of supply teachers and the disorganized lessons that came with this contributed significantly to their low attainment.

Schools' contribution to raising achievement

The one school-level factor that seemed to most clearly set apart the children who 'succeeded against the odds' from academically less successful children was their perception of the help they received from school when they were experiencing difficulties with academic work or behaviour. They felt schools had effectively helped them to deal with these difficulties through booster, remedial, homework, revision or behavioural classes. This helped children to catch up, (re)establish and reinforce a positive perception of school and learning and improved self-efficacy. Students and parents from low SES families 'succeeding against the odds' as well as from successful high SES families attributed (part of their) success in school to the quality of their teachers. For instance, they thought that good quality teaching meant that teachers were able to explain things clearly, were enthusiastic about the subject they taught, were approachable when things were difficult to understand, were generally friendly, had control over the class and clearly communicated their expectations and boundaries.

> *They [my primary teachers] were always very approachable like we, we never called our teachers by their second names, it was always the first names which, which made it a lot easier to talk to them and I think because we had the circle times and stuff like that and because when we were working we weren't just taking notes from a board we were all discussing it and stuff. You really got thinking about it a lot more and if there were any problems there would be no hesitation. You'd just ask, you know, that it wouldn't be embarrassing (laugh).* **Imogene, girl, Group 4 (high SES, attainment as predicted).**

Martha's Maths teacher described how he perceived his own teaching style to help students do well:

> *Just the explanation at the start, again, you think how you're going to explain something, you emphasise the key points. You start off easily and graduate up in their level of difficulty. You ask a lot of questions. You get an atmosphere where they don't mind getting things wrong in front of a class, if you ask such and such what the answer is and they get things wrong, they don't feel like gutted, that's just fine, that's allowed sort of thing, and you allow pupils to ask you for when they're stuck and they feel happy to do that.* **Teacher of Martha, girl, Group 1 (low SES, attainment higher than predicted).**

When asked about her Maths teacher Martha said:

> *The best! [laughing] Oh, he made Maths really fun and he didn't have favourites, but he was nice to everyone...but er...I dunno he treated everyone like the same and he was just generally nice to people and he made loads of people like him, so that they enjoy the lesson more, which I think helped. 'Cos like mum said he's quite good looking for a teacher, which was annoying sometimes [laughing] but like, I think the more people like the teacher, the more, well any teacher.. .if you like the teacher you enjoy the lesson... well most of the time. If people were naughty, he'd send them out so they don't disrupt the lesson, but he'd still make them work, he wouldn't like just let them sit outside, he'd make them do work still... which I thought was good.*
> *And you just said that he managed to make Maths fun? How would he do that?*
> *Well... he'd ask us like quite a lot like... if it was getting boring, and if someone said it was getting boring he'd just change the subject completely and he always did like... quizzes and stuff, like Maths quizzes and that made it quite fun.* **Martha, girl, Group 1 (low SES, attainment higher than predicted).**

In contrast, the academically less successful 'vulnerable' children and their parents felt let down by schools and teachers. Some of these parents, particularly those from high SES families, had organised additional help for the child after school; many felt frustrated and even angry with school policies and headteachers for not dealing effectively with their children. Some of these negative perceptions were transmitted to children and might have reinforced a negative attitude to school and learning.

Empowering relationships with peers and friends

For the 'academically successful' children, peers, especially their friends, offered practical and emotional support with school and learning that benefited their attainment. The emotional support helped them to enjoy school and to deal with any difficulties they encountered. Practical support was often reciprocal as children helped each other out during lessons and with homework and revision. Not only did this offer children opportunities to take on the role of peer tutor, it also helped them to deepen their understanding of subjects either by rephrasing the teacher's explanations to clarify things for their friends or by receiving alternative explanations from their friends. These experiences appeared to contribute to children's positive self-perception, sense of self-efficacy, and use of effective learning strategies. These children's friends also further reinforced favourable attitudes towards school and learning through their positive perception of education. This in turn stimulated them to be 'the best they could' by providing positive role models and friendly competition. Mark talked about how having competition with his friends in class helped him do better in school:

> *Just building me self-esteem, and stuff like that.*
> *How does having good self-esteem help you to do well in school?*
> *Just, more mature, like, and get more work done instead of faffing on, stuff like that.* **Mark, boy, Group 1 (low SES, attainment higher than predicted).**

Friends also further reinforced the positive attitude towards school and learning of these children through their positive perception of education and stimulated them to be the best they could by providing positive role models and friendly competition.

> *They do help me quite a bit, I mean ... as I said Elmer is the one who likes to read a lot, he seems to be sort of naturally gifted in pretty much every subject and like A and A* in everything. It sort of made me work harder and harder 'cause so, sort of reach his level and he always seems to sort rise it so... I always have to keep… [up with him].* **Steven, boy Group 1 (low SES, attainment higher than predicted).**

Although some of the 'vulnerable' children from the case studies experienced positive peer influences, these students often had friends and peers with negative attitudes to school and learning. Some seemed particularly 'vulnerable' to negative influences on their behaviour in school and in class.

> *I think on the whole he probably got into [trouble] because, people, kids there would dare him, because he's reached the age, where as he was really tall for his age, there was always challenge for him to fight or get into arguments…and I don't think he knew how to deal with that, and he wouldn't ask for help…to deal with it, he would more or less deal with it himself… so yes he did [get suspended].* Mother of Tremaine, boy, Group 2 (low SES, attainment as predicted).

In addition, it was often felt by them, as well as by parents and teachers, that their problematic or less effective behaviour and negative attitudes towards school and learning were reinforced by such friends.

Additional gateways to social and cultural capital

The low SES children who 'succeeded against the odds' and the 'successful' high SES children made good use of resources that helped with school work, such as written materials and computers. They also drew upon the help of their peers, siblings and other adults. Their positive attitude towards books and computers and their frequent use of these tools for school or as hobbies facilitated learning throughout their life-course. This may well stand them in good stead as future learners.

Families with academically successful children perceived and valued extra-curricular activities as experiences that contributed to their children's development and school achievement. Low SES parents with children who did not 'succeed against the odds' usually regarded these activities as fun and relaxing, but did not consider any educational aspects or benefits that might follow. As a result, 'vulnerable' children were less likely to be encouraged to persevere with extra-curricular activities.

Support networks of extended family, family friends and religious communities played an important role in supporting parents. This provided parents with additional social and cultural capital. A positive contribution from support networks was particularly important when it went beyond just practical help, and additionally offered parents a chance to further develop their parenting knowledge and skills. This resulted in increased sense of self-efficacy for parents with regard to the child's academic success. This particular type of support was mentioned more often by the low SES families with children 'succeeding against the odds' and by high SES families in general.

Children who 'succeed against the odds' manage to adapt very well to educational processes (in part facilitated by their general ability for learning). However, what makes them stand out even more when we compared to less successful peers is their apparent positive perception of themselves as learners, their appreciation for what school and education can bring them, and their willingness and ability to build and sustain meaningful relationships with the people around them that actually serve to facilitate their learning. These children actively engage with activities and people that can help them develop their skills and knowledge. For example, they read books for pleasure, join the Sea Cadets or Youth Groups, explain Math problems to their friends, feel encouraged by their friends' success in school, discuss their lives and interests with family members and turn to their teachers for guidance and help. They not only reciprocate offers from others to engage in learning experiences, but actively initiate these experiences; i.e. actively regulating their own learning process. As such, these children have learnt to be agents of their own academic success.

Schools, teachers, peers and other adults can all contribute to children's chances of 'succeeding against the odds' of disadvantage by facilitating their adaptation to education. Teachers, who are capable, inspiring, and able and willing to meet the specific needs of their students, not only teach them as academics but contribute to their positive perception of school and learning.

Peers and siblings can inspire high aspirations and help children do well by offering help with school work and by offering emotional support that reinforces positive perceptions of themselves as learners and of school in general.

Adults, such as family members or members from their wider community, can provide practical help and encouragement that parents might not be able to give due to their financial situation or their limited experiences with education or the education system in the UK. All these people can serve as positive role models to which a child can aspire. By supporting children in these ways, teachers, peers, siblings, family and community members become 'significant others' to the child, helping them maintain and reinforce positive perceptions of themselves as learners and of education as enjoyable and valuable.

The case studies clearly show that parents in particular play a pivotal role in helping their child 'succeed against the odds'. Parents hold the key too many of children's experiences, not just through their own interactions with the child and their involvement with school and learning but also for the learning opportunities they facilitate through their choices about children's experiences in other micro-systems such as schools, extra-curricular activities, community involvement and contact with extended family. Through their own behaviours parents set examples that show children how to behave appropriately but also of what to value and how to achieve goals.

Parents set examples that children model and reinforce which helps to facilitate successful adaptation to school and learning. In some ways the activities and experiences of these children and the beliefs of their parents are similar to activities that are typically associated with success in family life in middle or higher SES families and reflect the socialization pattern of 'concerted cultivation' rather than the pattern of 'accomplishment through natural growth' that is more common among lower SES families (Lareau, 2003). However, effective parenting in low SES families was by no means a mirror image of 'concerted cultivation'.

The children who 'succeeded against the odds' were definitely 'cultivated', in the sense that they were 'educated' and 'cultured' by their parents in a way that 'fits' the educational system. Their socialization experiences helped them to use the educational system to make the most of their potential and to extend their cultural capital. Nonetheless, this socialization process of 'cultivation' in many respects was far less 'concerted' than in high SES families, and as such is perhaps better described as 'active cultivation'. Partly, the childrearing practices of these parents were obviously less concerted because these parents simply did not have the economic capital available to high SES parents, so they could not provide their children with the same amount of

private tuition and extra-curricular activities. The fact that these low SES parents do not have the same social and cultural capital as their high SES counterparts is also important.

The low SES parents generally had little personal knowledge or family experiences of the cultivation routes that lead children to higher education in general and into the top schools and Universities in particular. This for instance meant that parents were unaware of entry exams for particular schools or that additional preparation through private tutoring had become 'the norm' for children sitting the entry exams for the best secondary schools. However, the fact that these parents managed to help their children 'succeed against the odds' even without these means and longstanding reference points to educational achievement that were typically available to middle class parents, underlines the strength of their determination to help their child move ahead. Unlike the middle class families who were helping their child to aspire to something they as parents had already achieved, these working class parents were helping their child to aspire to something more than they had managed for themselves, in effect to move upwards on the social mobility ladder. These parents were cultivating their children for educational success by staying true to their own values and beliefs while simultaneously stimulating children to make a better life for themselves.

The child rearing practices seen in the low SES families with children 'succeeding against the odds' could perhaps be more appropriately termed as 'active cultivation'. Children become part of society's culture at first by participating in family practices. Through participation they learn what is accepted and expected. The children committed to school work even if they were not particularly interested in the subject or had other things they wanted to do.

> *It's just like will power, I actually think to myself, you know, 'You've only got to sit behind the desk for an hour and concentrate for an hour, if you can do that, then you've got the rest of the day to enjoy yourself, and you've got the weekends and things like that'. I know that if there's something to be done I must do it. I can't just like let it build up and build up and if I don't understand something I'll ask for it.* **Anjali, girl, Group 1 (low SES, attainment higher than predicted).**

If academically successful students faced difficulties with a task they would actively try to solve the problem by just 'trying', 'having a go at it'. The practices these parents familiarized their children with during their day-to-day interactions, such as reading together, conversations over shared meals, routines for children to help out with the housework or going out to work and acquiring additional qualifications, socialized these children in ways that resulted in them developing skills and beliefs that matched the expectations of society. As a result they could benefit from what society had to offer through schools, teachers, friends and others in their communities. These parents were setting effective examples for their children, through their own efforts in the work place, efforts to better their social and financial positions through additional education and by taking responsibility for their lives and that of their children. They served as valuable role models, demonstrating the value of cultural capital for social and economic status and personal wellbeing.

Like their children who showed educational 'resilience', they too seemed particularly 'resilient' to the hardships they encountered in their lives. Parents used personal experiences (good and bad) to help their children move ahead and as such made the most of the capital they had available. They used their own experiences, resources and strengths to cultivate their child, but often in a less obvious way than the high SES parents. They were aware of certain limitations in their ability to facilitate the child's learning process. As a result, they did not move away from close family ties or religious communities as is often the case in more affluent families, but instead tried to make use of these social networks to find additional sources of support for the child.

Additionally, these financially less affluent parents were willing to make substantial personal sacrifices to provide the child with educational outings and family holidays, to pay extra tuition if needed, to have out-of-school classes, additional work books, a computer and internet access, and sometimes even to provide a school uniform. By doing so they once more relayed to the child how much they valued education. In some of the households visited by the case studies researcher the heating was turned off despite the winter cold; walls, windows and floors were bare and light bulbs or tea bags were a luxury. Nonetheless, these families were welcoming and seemed to enjoy the opportunity to talk to a researcher about their child, their experiences as parents, their beliefs about parenting and education, and about their hopes for their child. They were proud of their children and most often about what they as parents had achieved. This testifies to the determination of these parents to help their child succeed and make a good future.

Conclusions

To date the existing body of literature has identified a broad range of characteristics on the level of society, community, family and individual which contribute to children's success or lack of success during their academic careers. Models such as Bronfenbrenner's ecological model of human development (1979), Harkness' and Super's (1992) proposed concept of the developmental niche and Lareau's conceptualization of socialization in different socio-economic classes (2003) provide us with theoretical frameworks to study how these characteristics shape the lives and academic outcomes of children.

The case studies clearly confirm the premises of the theoretical models applied, i.e. that it is never 'just' the one factor of child, family or school, or broader social context that brings about success or failure in an academic trajectory. Rather, it appears to be the particular ecological niches that arise through the active reciprocal interactions between these factors that determine the parameters for children's pathways to academic success. In other words, the real world context of development is complex but while characteristics at macro or meso level, such as school policies and curriculum or parental jobs, exert some influence on children's day-to-day learning experiences, the best opportunities to help children are within reach right there on the micro level.

The research makes evident that unexpected academic success (i.e. academic achievement that defies the odds of disadvantage), requires effort and determination from the children themselves as well as from the people around them. By having people around them that believe in them, encourage them, challenge them and support them children develop a strong sense of self-efficacy with regard to academic success. As a result these relationships with 'significant others' help children to develop their cultural capital.

Parents in particular have the opportunity to play a pivotal role in facilitating academic success. Our analyses of parenting disadvantaged children who 'succeeding against the odds' shows that parents demonstrate 'active cultivation'. These parents encourage and facilitate academic success more directly through the proximal learning processes they choose to offer their children. They also demonstrate this indirectly through the opportunities they create for their children to engage in learning processes with others, and through the example they set their children through their own life. Through a process of 'active cultivation' parents can teach their children to develop and sustain meaningful relationships with the people around them and with learning and education. Through their interactions with these people, children learn to build and sustain relationships (i.e. develop social capital) that support and facilitate academic success.

The case studies show a sense of active agency among families with children 'succeeding against the odds' of disadvantage which is in stark contrast to the helplessness that was commonly observed and expressed by parents and students who were less academically successful. Unlike the children 'succeeding against the odds', these children and parents found it hard to recall teachers that had been particularly helpful to their learning. Instead, they often felt let down by schools and teachers alike, and frustrated by their lack of academic success. In many cases, these parents could, or would not, help their children to develop academic aspirations and sadly neither did the children's schools. Generally, low targets were set for these children with regard to National Assessments and GCSEs, and children were all too aware of what little was expected of them. As long as these basic targets were met, teachers, parents and students felt that things were as they should be. Because of this, children missed out on the experience of having someone believe in them and of being challenged to succeed beyond low expectations.

Although our data does not allow inferences about causality or generalization to the overall population in the UK, the quantitative data available through the EPPSE project does seem to confirm that such differences in agency, as for instance captured in variables such as the Early Years HLE and the social-behavioural child measures, are not just apparent and influential when children start their academic careers, but also that their effect carries on and is compounded as they progress through their academic trajectories and through their life-course as learners.

Section 8: Head of Year 9 and Parents' views in Key Stage 3

Summary of key findings

Heads of Year were:
- Largely positive about secondary schooling as well as being satisfied with the support/training they were given to support students. However, additional support for English as an Additional Language and 'looked after' students was needed.
- Positive about student support services apart from: sexuality/health advice, EAL and speech/language therapy services which were more difficult to access.
- Positive about parent liaison except the extent to which they supported parents in helping their children learn at home.

Overall there was little variation between HoY9 reports of their schools except for the following attributes:
- Low FSM schools were more likely to: encourage students to take responsibility and evaluate their own learning, involve students in decision making, leadership and target high achievers
- High CVA schools were more likely to: encourage students to take responsibility and evaluate their own learning, offer a more personalised curriculum and 'catch-up' opportunities. They encouraged student to become involved in decision making, leadership skills and train students in 'emotional intelligence'.
- Outstanding schools (as judged by Ofsted) for their 'quality of teaching' were much more likely to: use 'feedback for learning strategies, encourage students to get involved in decision making and have specific strategies for high achievers.
- Outstanding schools (as judged by Ofsted) for their 'behaviour of learners' were more likely to involve students in decision making and leadership and target high achievers.

Parents:
- Were positive about secondary schools.
- Visited their secondary school infrequently.
- Had high aspirations for their children.

This section reports on a number of other influences on students during Key Stage 3 (KS3). It helps to contextualise their experiences as young people in the first decade of the 21st Century. The section consists of two parts and contains information from two sources: a questionnaire sent to Heads of Year 9 (HoY9) in EPPSE schools and a questionnaire sent to the parents of EPPSE students during KS3.

The Heads of Year 9 questionnaire

The Head of Year 9s provided information about their school that helps to contextualise the experiences of the EPPSE students in KS3 (age 14). For further details of the questionnaire see Taggart et al., (2012a forthcoming).

The sample, response rates and analyses

A questionnaire was sent to all Heads of Year 9 in schools attended by EPPSE students during their Year 9 academic year (age 14). A total of 1,002 schools were sent questionnaires with a response rate of 64 per cent (n=646) which is a good response rate for a postal questionnaire of this length. The questionnaire covered a range of topics of interest to policy makers, covering three major areas: i) General school information (background of respondents, the Senior Leadership 'Team, student support etc.), ii) Classroom organisation (student groupings) and iii) School and classroom practices (feedback for learning, the personalised learning agenda and pedagogical strategies).

The analyses were twofold:
i) descriptive information to help contextualise the experiences of Year 9 students and
ii) analyses linking teachers' views of school practices with school levels of:
- percentage of students eligible for Free school meals (FSM),
- academic effectiveness (Contextual Value Added [CVA]) scores,
- teaching quality, the Office for Standards in Education (Ofsted) rating.

This was undertaken in order to explore associations between schools characteristics of particular policy interest and the views of teachers.

Key findings

School Information

Slightly more women than men had a HoY9 post. Those who did were most likely to be aged between 31 and 40 with 11- 20 years teaching experience. The majority of schools are not involved in any formal school initiative/partnership. The most common form of partnerships was local/area school partnerships followed by schools involvement in teacher training. Generally HoY9 were very satisfied with the leadership of their Senior Management Team (SMT). The only reported weakness was the extent to which the Senior Management Team of the school supported teachers who were struggling with classroom disruption.

Support/training for KS3 staff

Most HoY9 were satisfied with the support/training provided by their school to enable them to respond effectively to students who have particular needs. Staff dealing with students with some form of 'learning' or 'behavioural' need seem particularly well supported. However, improving the support/training for staff coping with students who are 'looked after' or have English as an additional language (EAL) could improve the outcomes for these groups of students. Both of these groups have been shown to have poorer outcomes, for instance in the DfE's Statistical First Releases (2010, p.5) only 26 per cent of 'looked after' students attained 5 or more GCSEs at grades A*-C, compared with 75% of all students; although this is a marked improvement on the results in 2008 when only 17 per cent of looked after students achieved 5 or more GCSE at grades A*- C (compared to 65% of all students).

Student support services

In a very high proportion of schools, Year 9 students were reported to have private time with an adult available to them during school time, as well as having easy access to an Educational Welfare/School Support Officer. Services that were much less easily accessed were: Community Youth Workers, Police Officers and Family Support Services. The availability of breakfast provision was variable.

Services concerning sexuality and health were reported to be less easily accessible than other services designed to support teenager behaviours (e.g. bullying, etc.). Making these services more accessible is important given concerns about teenage pregnancies, sexually transmitted diseases and obesity. There appears to be much more support accessible for the victims of bullying compared to services designed to change the behaviour of those who bully others.

Services for students with English as an Additional language were not as easily accessible and those students in need of speech or language therapy, in the opinion of HoY9, may find accessing these services particularly difficult.

The majority (although not exceptionally high levels) of students were reported to have easy access to a place of sanctuary when they experience stress or disrupt lessons.

Identified group support

Low achieving students were most likely to be supported within school by the schools Special Needs Co-ordinator whereas high achievers were usually part of a Gifted or Talented programme. However, not all schools offered this latter support. Students in the care of social services were most likely to be offered 'Looked After Children Educational Services (LACES) support or 'other' provision provided by Social Services. Students who were academically borderline were most likely to be offered booster classes or a mentoring services whilst students with challenging behaviour were offered behaviour support or a mentoring service.

Student activities and challenging profiles

Where HoY9 reported their school provided particular 'activities', take up across the board was low. Around 65 per cent of schools had less than ten percent of students participating in schemes involving peer buddies and mentoring schemes involving adults. Low numbers of suspensions and exclusions were reported during Year 9. Almost 90 per cent of schools took four or fewer hard-to-place students during Year 9.

Liaising with parents

The majority of HoY9 thought their school communicated and listened well to parents. However, parent/school liaison could be improved in the area of support parents are given to help their children learn at home.

Class groupings

At entry to secondary school most students were placed in mixed ability forms/tutor groups and remained in these groups throughout KS3. Mixed ability groups were less common in the core subjects (English, maths and science) until the end of KS 3 when the majority of students were 'set' by subject ability. Where schools grouped students by mixed ability or general overall ability just over 50 per cent of schools used Cognitive Ability Tests (CAT) scores to determine groupings. The most popular 'other' determinant for grouping students was the use of Key Stage 2 National Assessment data/results.

School and classroom practices

On the whole schools have engaged with many attributes of the 'feedback for learning' agenda identified in the questionnaire. In most schools it was reported that teachers have easy access to information to support their review of student's academic and behaviour targets. However, there was less frequent use of 'personalised learning'. This occurred 'occasionally' in the majority of schools except for the use of ICT which was most often used to support individualised learning. Almost a fifth of schools reported they had no specific strategies for developing students' leadership skills.

Linking teachers views of school practices with levels of disadvantage (Free school meals)

Feedback for learning

There was very little that separated HoY9 reported practices in medium/low and medium/high disadvantaged schools. Where differences did appear it was in comparing schools with High and Low proportions of FSM students. The HoY9 in schools with low proportions of FSM students reported they made more use of the following feedback for learning strategies/practices (compared to school with high proportions of these students):

- students' taking responsibility for their own learning;
- students' evaluating their own work;
- easy access to students' personal records.

Personalised learning agenda

There were few differences between schools with different levels of FSM and their propensity to provide personalised learning plans. Only for schools that 'occasionally' used personalised learning plans were there any notable differences between FSM bands (high and low) with school with low levels of FSM more likely to use these 'occasionally' (71%). Schools with high FSM were slightly more likely to provide individual coaching for students compared to the low FSM group. It is interesting to note that 'learning intentions are made explicit to all students' was the only questionnaire response without a 'never' response recorded. It would appear that all schools used this strategy at some time.

Pedagogical strategies

In all cases the low FSM schools reported making more frequent use of the following specific strategies: 'involving students in school decision making', 'the development of leadership skills', 'targeting high achievers' and 'taking students on educational/extra-curricular visits'.

Linking teachers views of school practices with academic effectiveness (CVA)
Feedback for learning

HoY9 in the higher CVA group were more likely to 'strongly agree' that their schools supported students in taking responsibility for their own learning and encouraged students to evaluate their own work compared to schools in the lower CVA group (36% compared to 20% and 37% compared to 20% respectively).

There were very little differences between the CVA groups in the extent to which they agreed their school used assessment for learning strategies. However, higher CVA groups were slightly more likely to strongly agree with this statement (46% compared to 37%). Higher CVA schools always used this strategy. The analyses showed no difference between schools of different levels of CVA for teachers' access to student level data.

Personalised learning agenda

There was no difference between schools with differing CVA in many domains of the personalised learning agenda. However, HoY9 in higher CVA schools reported they 'often' personalised the curriculum, provided 1:1 'catch-up', and used ICT in a more personal way, as compared with schools with lower CVA.

Pedagogical strategies

There were very few differences across schools in the extent to which 'learning intentions were made explicit to students', 'students were taken on extra-curricular activities' and 'students were trained in 'thinking skills'. However, HoY9 in more academically effective secondary schools were more likely to encourage student to become involved in decision making and more likely to report using specific strategies for developing student's leadership skills. They were also more likely to offer strategies for both low and high achievers. There were also differences between schools in the extent to which they trained students in emotional intelligence, with higher effective schools more likely to provide opportunities compared to lower CVA schools.

Linking teachers views of school practices with teaching quality (Ofsted judgements)
Feedback for learning

Schools judged by Ofsted as having 'outstanding' teaching were more likely to report they used feedback for learning strategies, whereas all schools regardless of their 'quality of teaching' had easy access to students' personal and academic records. Similarly there were no distinctions in teachers reviewing academic and behaviour targets for students. In all cases the majority of HoY9 reported they 'often' had access to student level information

Personalised learning agenda

With regard to reported practices in the personalised learning agenda there was little that distinguished schools of varying 'quality of teaching'. Most schools used these strategies 'occasionally'. There were however differences in the extent to which HoY9 reported using one-to-one/small group teaching to enable students to 'catch-up'. HoY9 in schools judged to have 'outstanding' teaching reported using this strategy more 'often' compare to other Ofsted groups. In contrast, the majority of 'outstanding', 'good' and 'inadequate' schools reported using ICT to support individualised learning 'often' with only schools in the 'satisfactory' category differing as they reported less frequent use of this strategy.

Pedagogical strategies

The majority of schools in each Ofsted group for 'quality of teaching' reported that they 'often' made their learning intentions explicit to all students; took students on educational/extra-curricular visits and had teaching strategies specifically developed for low achievers. Similarly there were no differences on the use of students being trained in thinking skills and emotional intelligence for use across the curriculum although this strategy was only used 'occasionally'.

Schools rated as 'outstanding' were slightly more likely to report a higher incidence of 'encouraging students to get involved in decision making' and making more use of 'strategies specifically developed for high achievers'. By contrast 'outstanding' schools were equally split, between the 'strongly' agreeing and 'agreeing' with developing students' leadership skills. Compared to the 'satisfactory school' group those judged as 'outstanding were more than twice as likely to strongly agree they had specific strategies for developing students' leadership skills.

Linking teachers views of school practices with the behaviour of learners (Ofsted judgements

Feedback for learning

We found no differences between schools in the different Ofsted groups in the following domains; supporting students in taking responsibility for their own learning; encouraging students to evaluate their own work. The majority of schools reported they 'agreed' their schools did these. Similarly there were no differences in the extent to which HoY9 in different Ofsted groups reported that teachers have easy access to a students' personal records, review all students' individual academic targets; review some students' individual behaviour targets, with the majority of schools reporting they were 'often' involved in these activities. Only one statement was found to differentiated schools rated as 'outstanding' by Ofsted for their handling of the 'behaviour of learners'. These were slightly more likely to 'strongly agree' that they used Assessment of Learning strategies compared to other schools.

Personalised learning agenda

The personalised learning agenda showed similar patterns across all school with regard to students having personalised learning plans; a personalised curriculum experience, availability of individual coaching and timetable adaptations. The majority of all Ofsted groups reported 'occasional' use of these strategies. All schools reported that they 'often' used ICT to support individualised learning.

However, schools judged as 'inadequate' were more likely to report they 'often' made use of one-to-one or small groupings for students who needed to 'catch-up' compared to other groups who did not use this strategy as much. Schools judged by Ofsted as 'inadequate' in their management of the 'behaviour of learners' were also more likely to report they 'often' adapted class/group sizes compared to other groups who did not use this strategy so much. There was little variation in the other Ofsted groups, with all three other groups reporting they used this strategy 'occasionally'.

Pedagogical strategies
There were no differences in HoY9 reports by Ofsted categories in their use of the following pedagogical strategies; making learning intentions explicit to all students; taking students on educational/extra-curricular visits and having teaching strategies specifically developed for low achievers. The majority of schools in all Ofsted groups reported they 'often' used these strategies. Similarly there was little reported difference in training students' 'emotional intelligence', where the majority of all groups reported using this strategy 'occasionally'.

School judged as 'outstanding' by Ofsted for their management of student behaviour were more likely to state they made better/more frequent use of 'involving students in decision making', 'the development of leadership skills' and targeted strategies for high achievers'. It is interesting to note in the last strategy (developing high achievers), 25 per cent of schools judged as 'inadequate' reported 'never' using this strategy during Year 9.

Whilst the majority of 'good' and 'satisfactory' schools reported they trained students' thinking skills 'occasionally'. Roughly 50 per cent of both 'outstanding' and 'inadequate' schools reported using this strategy both 'often' and 'occasionally'.

The Parent Questionnaire
The EPPSE project has a wealth of background information on 3,000 children collected from their parents (or carer/guardians) through interviews (age 3/4) and questionnaires (age 7, 11 and 14). These sources of data have enabled the project to take account of child level information (early developmental problems etc.), family demographics (socio-economic status, mother's qualifications etc) as well as opportunities for learning within the home in the statistical analyses on academic and social-behavioural outcomes (see Sylva et al., 2010). In order to help contextualise the experiences for the EPPSE young people, a questionnaire was sent to their parents[37] at the end of KS3 (response rate of 53% when sent to 1,689 parents). The following section provides some insights into parents' perceptions about their child's school and home life and what it is like to bring up a teenager in the first decade of the 21st Century.

The questionnaire covered a range of topics (selected from educational school effectiveness literature) of interest to policy makers and moves from the macro level of the neighbourhood to the meso level concerning household composition then to the micro level of parent:child interactions. Later sections probe parents' views of their child's school, education and out of school activities. For full details of the questionnaire see Taggart et al. (2012b) forthcoming.

Key findings
The neighbourhood
The questionnaire probed parents' views about their neighbourhood as a safe and good place to bring up children and their views on teenagers in their area. The majority of parents reported positive views about their neighbourhood as a place to bring up children (74% good/excellent). Only a small number of parents (less than 14%) said they 'often' experienced low levels of anti-social behaviour (such as littering, drunkenness etc.). The majority of parents had positive views about the teenagers they knew personally, they thought them well behaved (80%), that they didn't truant (76%) didn't smoke (77%) or drink alcohol regularly (74%). Although 58 per cent of parents didn't think the young people they knew bullied others, almost a third reported that they knew teenagers who engaged in this behaviour.

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[37] Throughout this report the term 'parents' refers to: parents, carers and guardians and the small number of relatives (Aunt/Uncle/ Grandparents/ Older Sibling n=13) who have responsibility for EPPSE children. It also includes those in local authority care or 'looked after' (n=6).

Parents' views on their child's school

All parents want their children to be happy, especially at school. Reassuringly the vast majority (94%) of parents thought their child was always/usually happy in Year 9.

Figure 8.1: Child happiness
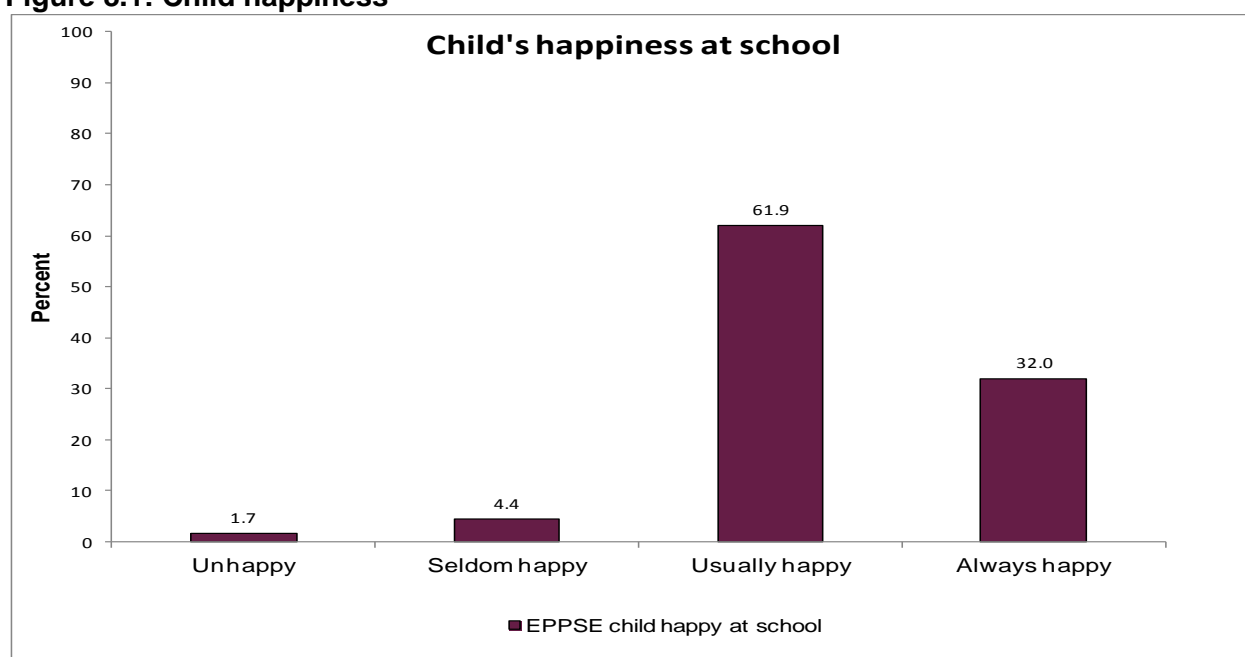
The majority of parents thought their child's school provided high standards of education (88.8%) and behaviour (84.7%). Similarly the majority of parent thought their children were given good guidance to help them improve their work (83.1%). Whilst just over a fifth of parents (22.3%) did not know what kind of career advice was given to their children, two thirds (67.3%) were content with the career advice given by the school.

Table 8.1: School standards / Good guidance/advice

	Strongly agree		Agree		Disagree		Strongly Disagree		Total	
	n	%	n	%	n	%	n	%	n	%
School has high standards of...										
Education	520	31.2	959	57.6	118	7.1	11	0.7	1664	99.9
Behaviour	480	28.7	935	56.0	171	10.2	31	1.9	1670	100
Good guidance / advice on...										
Improving work	327	19.6	1058	63.5	198	11.9	13	.8	1666	100
Careers, jobs & further learning	263	15.8	855	51.5	151	9.1	20	1.2	1660	99.9

*Education - N=1 for agree and disagree so 0.1%
*Good advice on careers, jobs and further learning: Agree and Disagree N=1 so 0.1%
**3.2% answered 'Don't know' for 'Behaviour' and 3.4% answered 'Don't know' for 'Education'.
4.2% answered 'Don't know' for 'Improving work' and 22.3% answered 'Don't know' for 'Careers, jobs & further learning'.

The vast majority of parents thought their child's school made them feel welcome when they visited and make it easy to become involved in their child's education (only 15% how disagreed/strongly disagreed with this statement). In addition they felt that schools also provided a good choice of subjects/qualifications.

Table 8.2: School ethos

	Strongly agree		Agree		Disagree		Strongly Disagree		Total	
	n	%	n	%	n	%	n	%	n	%
Feel welcome	462	27.5	1114	66.4	68	4.1	8	0.5	1678	100
Easy to be involved in child's education	287	17.2	1086	65.0	241	14.4	19	1.1	1670	99.9
Good choice of subjects/qualification	476	28.5	1081	64.7	81	4.8	7	0.4	1671	100

*Easy to be involved in child's education- Agree and Disagree N=1 so 0.1%
**1.5% answered 'Don't know' for 'Feel welcome', 2.2% answered 'Don't know' for 'Easy to be involved in child's education' and 1.6 answered 'Don't know' for 'Good choice of subjects/qualifications'.

Just over 80% of parents thought the school knew their child as an individual. This was not too dissimilar to the proportion that thought their child was set appropriate (not too easy) homework (almost 70%).

Table 8.3: Child as an individual

	Strongly agree		Agree		Disagree		Strongly Disagree		Total	
	n	%	n	%	n	%	n	%	n	%
Knows their child as an 'individual'	379	22.7	1011	60.7	178	10.7	18	1.1	1666	100
Sets homework that is too easy for their child	69	4.2	329	19.8	1058	63.7	102	6.1	1660	99.9

*Sets homework that is too easy for their child- Agree and Disagree N=1 so 0.1%
**4.8% answered 'Don't know' for 'Knows their child as an 'individual'' and 6.1% answered 'Don't know' for 'Sets homework that is too easy for their child'.

Overall parents have a positive view of their child's school and very few have a negative attitude towards their child's school regarding standards and ethos, guidance/help offered and the extent to which the school knows their child as an individual.

Parent/school liaison

**Figure 8.2: Parent/school liaison**
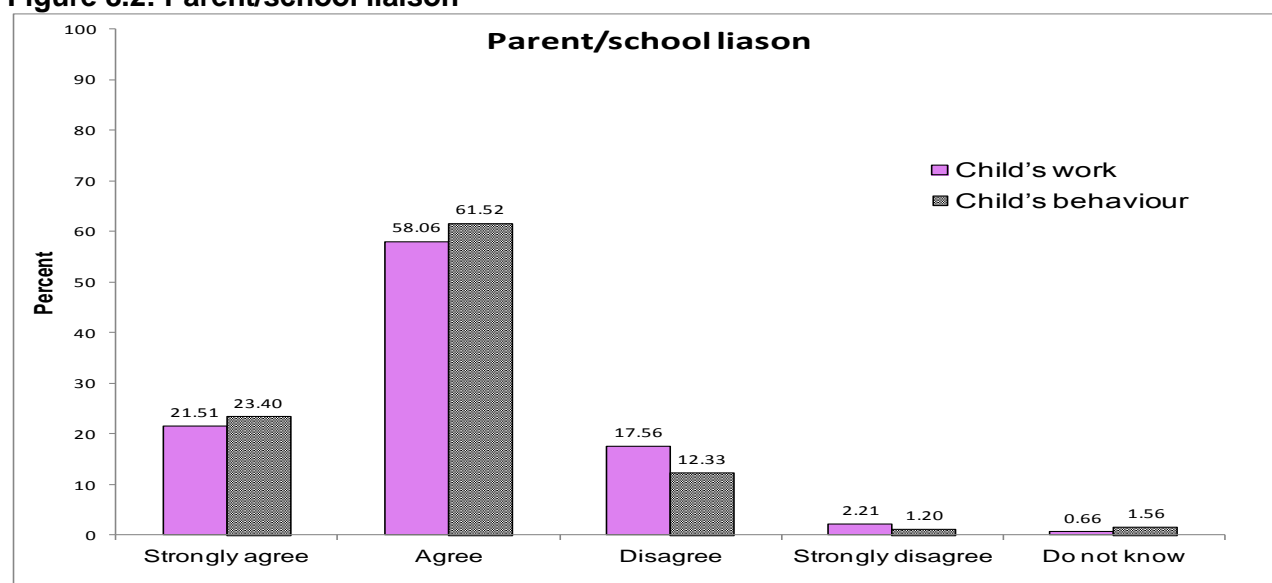
The majority of parents feel that their child's school regularly communicates with them about their child. However schools were more likely to contact them about their child's behaviour rather than their child's work.

Child Behaviour/Work

Figure 8.3 shows a comparison between parents visiting their child's school to discuss their child's work and to discuss their child's behaviour. It shows that the majority of parents (79%) visited their child's school 1-3 times during Year 9 to discuss their child's work. In contrast, nearly three quarters (72%) have never been to their child's school during Year 9 to discuss their child's behaviour. This suggests that student behaviour is only a concern for a minority.

Most schools would expect to see parents at least once a year, during a scheduled parents evening. A typical pattern might be to meet parents early in the academic year to discuss how the student is settling in their new form and at the end of the year to discuss progress.

Figure 8.3: Child Behaviour/Work
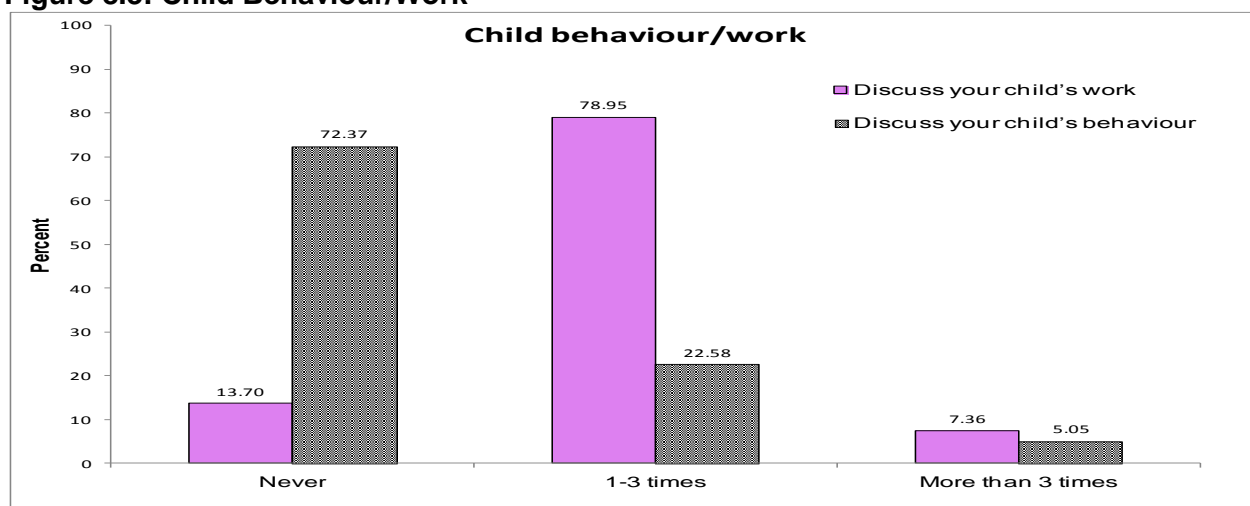
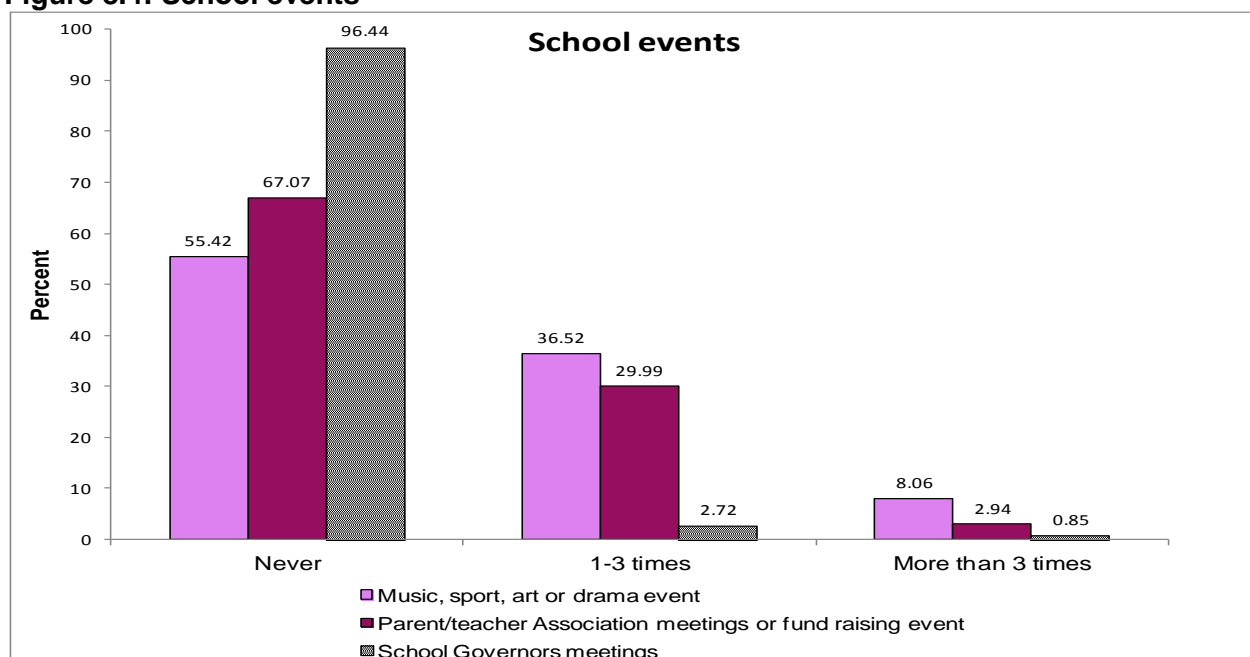### School Events

It could be argued that as children get older, parents become less involved with school. The daily routine of delivering/picking-up children from school by parents is less prevalent by age 14. Most students would travel independently to school. Therefore, the questionnaire explored 'other' opportunities for parents to be involved in secondary schools.

Figure 8.4: School events

Most parents do not visit their child's secondary school at all during Year 9 for 'any' events. When they do visit they are most likely to do this for cultural/sports events less than 4 times a year.

The most frequently reported alternative purposes for parents visiting their child's school were visits to discuss GCSE options and future academic plans.

Educational aspirations
Figure 8.5: The importance of qualifications
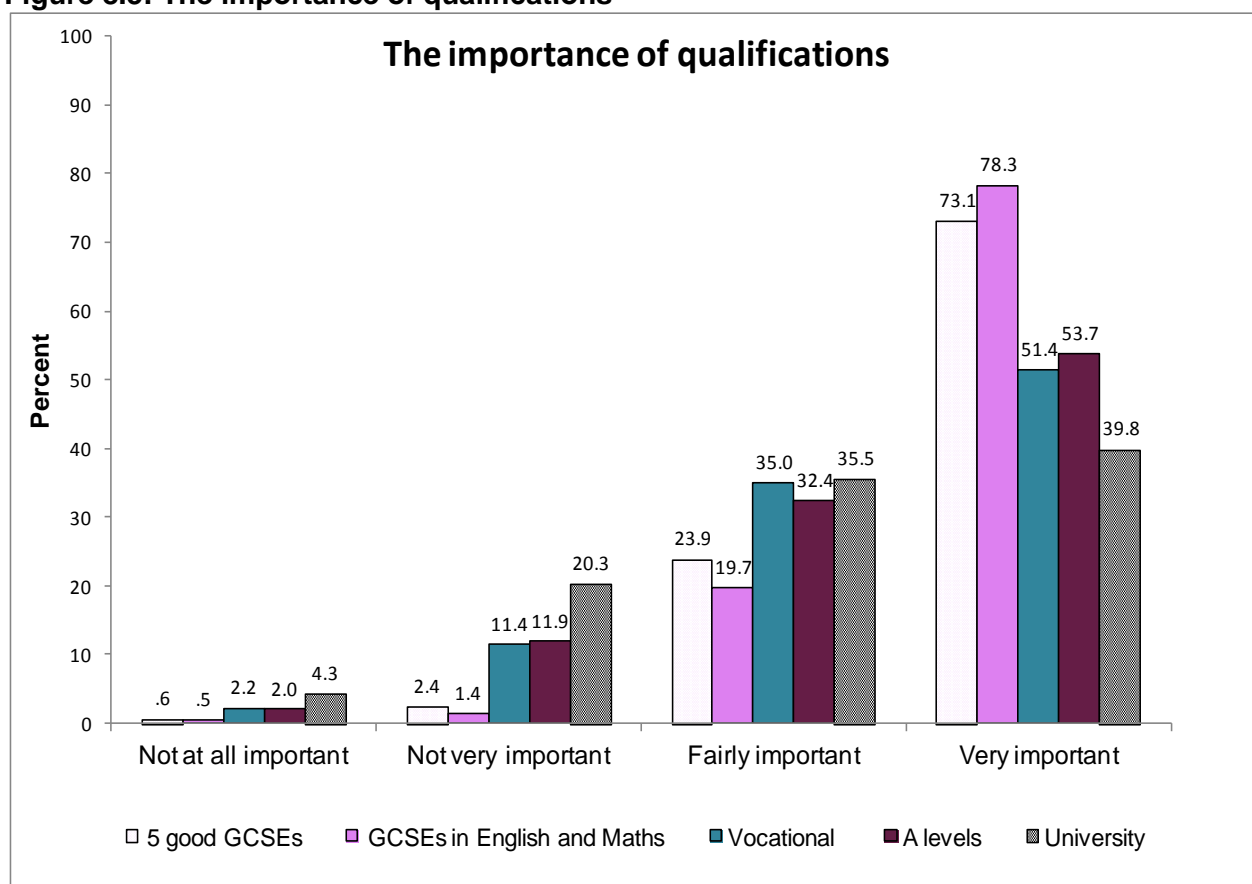
The majority of parents feel it is most important for their child to get good GCSEs (Grade A*- C) or equivalent (73%) and especially good GCSE grades in English and maths (78%) while the importance attached to A levels and degrees are somewhat lower (A levels - 54%, good vocational qualifications relevant for a job - 51% or a University degree - 40%). This may reflect that students are still in Year 9 so the most relevant qualification is the GCSE courses to be taken in Year 10.

Figure 8.6 shows that the majority of parents (74%) feel that their child should stay in education until they are 18 and then go to University/College. A small percentage of parents (3%) suggested alternative options regarding their child's future. The majority of these parents stated that they want their child to be happy, or do whatever their child chooses to do post 16. Overall parents feel that their children should get further education after school (93%) and over 85% feel that their children should stay in education until they are 17/18.

Figure 8.6: Aspirations
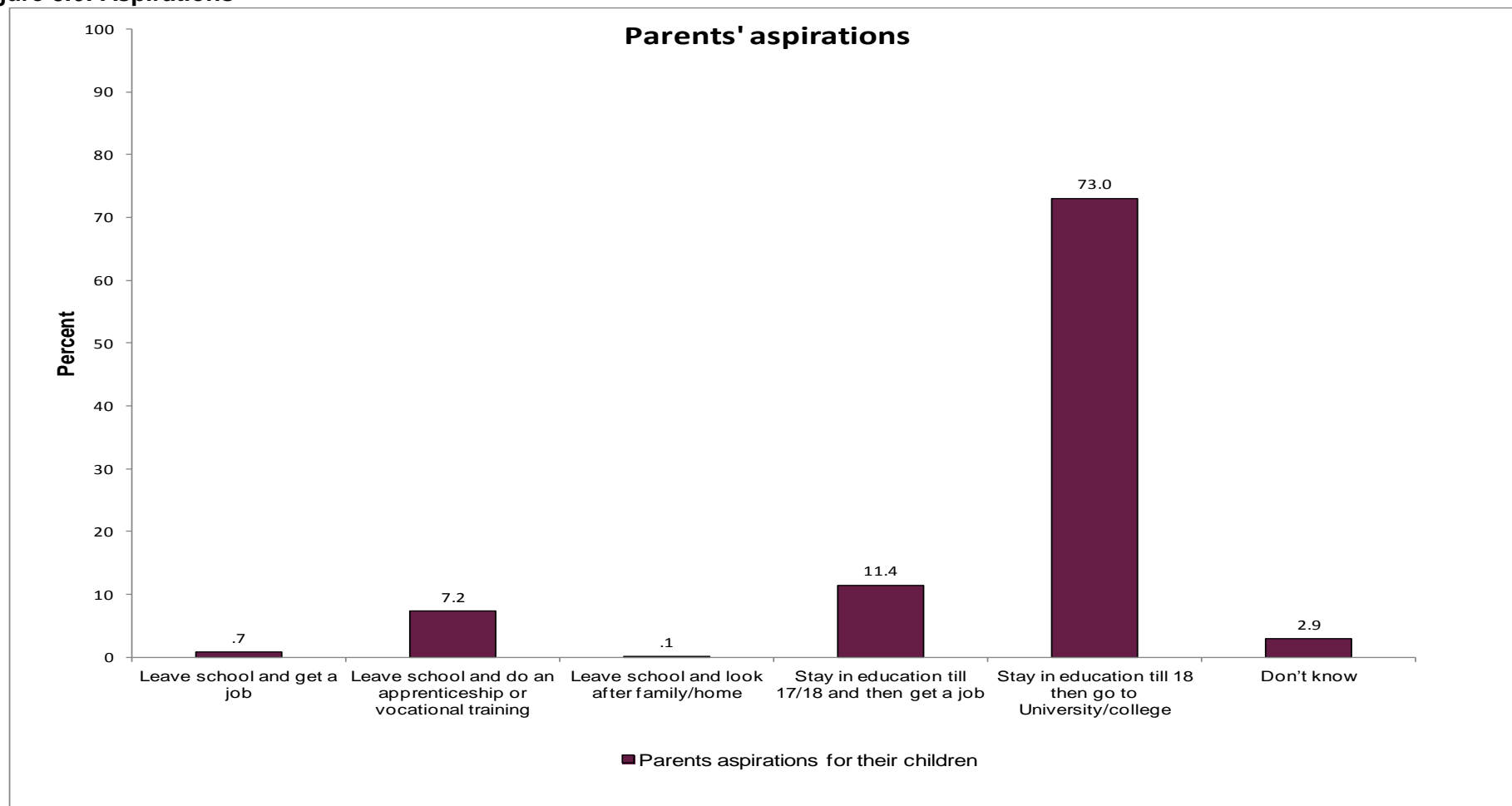
Conclusions

Heads of Year were largely positive about secondary schooling as well as being satisfied with the support/training they were given to support students. However, additional support for English as an Additional Language and 'looked after' students was needed. They were also positive about student support services apart from: sexuality/health advice, EAL and speech/language therapy services which were more difficult to access. The majority of HoY9 were positive about parent liaison except the extent to which they supported parents in helping their children learn at home.

Overall there was little variation between HoY9 reports of their schools except for the following attributes:

- Low FSM schools were more likely to: encourage students to take responsibility and evaluate their own learning, involve students in decision making and leadership and target high achievers
- High CVA schools were more likely to: encourage students to take responsibility and evaluate their own learning, offer a more personalised curriculum and 'catch-up' opportunities. They encouraged student to become involved in decision making, leadership skills and train students in 'emotional intelligence'.
- Outstanding schools (as judged by Ofsted) for their 'quality of teaching' were much more likely to: use 'feedback for learning strategies, encourage students to get involved in decision making and have specific strategies for high achievers.
- Outstanding schools (as judged by Ofsted) for their 'behaviour of learners' were more likely to: involve students in decision making and leadership and target high achievers.

Overall parents have positive views of their child's secondary school and only a minority were concerned about behaviour. However, most parents visit the school infrequently. Most parents have high aspirations for their children and regard good GCSE English and maths results as particularly important. Also important in parents' views were their children getting good 'A' levels, vocational qualifications and going on to university.

Section 9: Relationship of the EPPSE findings to other research studies

Summary of Key Findings
- Many of the EPPSE findings replicate other studies; for example the adverse impact of social disadvantage on children's development has been established wherever it has been studied.
- The influences of parenting upon child development are pervasive and have been explored in many studies which show similar findings to EPPSE.
- Similarly gender differences have been reported in many studies around the world.
- Other research on students' attitudes and dispositions supports EPPSE findings.
- A school's strong emphasis on learning has been shown in many studies to contribute to students' positive development.

The EPPSE study has identified many characteristics of young people and their families that affect students' development. The study also shows the importance of the early years Home Learning Environment (HLE) and illustrates the way social disadvantage affects students' development i.e. it increases the risk of poor outcomes. However, schools also contribute to students' development and key characteristics vary across schools in ways that affect both academic attainment and progress. Many of the EPPSE findings replicate other studies; for example the adverse impact of social disadvantage on children's development has been established wherever it has been studied. (e.g. Feinstein, 2004, Sacker, Schoon & Bartley, 2002). Also a school's strong emphasis on learning has been shown in many studies to contribute to students' positive development (Teddlie & Reynolds, 2000; Ofsted, 2009). In addition EPPSE has also found protective characteristics of children and families 'at risk' which assist them in 'succeeding against the odds' (Siraj-Blatchford, 2010; Siraj-Blatchford et al., 2011). Here we look at a range of areas where EPPSE findings are supported elsewhere.

The importance of child characteristics
This report shows how EPPSE students' own individual characteristics (gender, birth weight etc.) continue to exert an influence on their academic and social-behavioural outcomes up to the age of 14.

Gender differences
By 'gender effects' EPPSE refers to the differences between girls and boys as *groups*, although we may find that as a whole girls show better language development than boys at age 3 or 5 years, this does not of course mean that all girls have better language than all boys. There is a great deal of individual variation within as well as between groups. It is important to be aware of such patterns and to control for such differences in investigating pre- and primary school effects. It is important that all those working with children/students should not allow *group* effects to colour their judgments and expectations of individual children whether in regard to gender, ethnicity or social class.

Sammons et al. (2008a; 2008b) reported on how, as a group, young girls out performed boys on most outcomes up to age 11. At age 11, girls are still doing better than boys in English but boys had slightly better attainment in maths. During KS3 girls continue to show higher attainment and they made more progress than boys in English. In maths and science there were no significant differences in teacher assessments at age 14. Similar patterns of gender differences in educational attainment are present in numerous studies, and girls outperform boys in GCSE results (DfES, 2007). To address this differential attainment by gender in 2002 the DfES set up a project 'Raising Boys' Achievements' to consider how to raise boys' attainment in primary, secondary, and special schools. Several other strategies for raising the achievement for boys are discussed in Younger et al. (2005).

As well as academic attainment there are also marked gender differences in social-behavioural development. During primary school (age 11) boys were rated by teachers as displaying more 'hyperactive' and 'anti-social' behaviour than girls, whereas girls were rated more highly on 'self-regulation' and 'pro-social'. Differences between the genders at age 11 were especially large for 'pro-social' behaviour and 'hyperactivity'. At age 14 girls overall have better social-behavioural adjustment than boys and also make more progress in improving social-behavioural outcomes between age 11- 14, so the gender gap seems to widen during KS3. Other studies have results consistent with these findings for example Vordach (2002) shows adolescent girls scoring higher in social competence and pro-social behaviours but lower on aggressive behaviour. Culture matters also, for example, in one study Turkish adolescent males showed higher assertiveness than females, but there were no gender differences amongst Swedes (Eskin, 2007). Consistently, studies find that boys show more aggressive, antisocial, and delinquent or externalizing behaviours, while girls have more anxious, depressive or internalizing problems (Ellis & Zarbatany, 2007; Gaoni, Cooper & Baldwin, 1998; Lumley et al., 2002).

Age in year group - season of birth
A child's age within a year group was also found to be a significant influence on their development. The effect of age is smaller at age 14 than at earlier ages, being strongest during KS1. In EPPSE overall, older students within their year group made more progress in English, maths and science over Key Stage 3 (KS3). Other research shows similar findings, specifically, the younger the students (in their academic year) the poorer their performance (as a group) tends to be, compared with older students (Crawford, Dearden & Meghir, 2007). Crawford, Dearden, and Meghir (2010) analysed English national assessments data and found that when you are born matters a great deal, with younger children performing significantly worse, on average, than their older peers (at ages 7, 11, 14 and 16). Furthermore, almost all of this difference is due to the fact that younger children sit exams up to one year earlier than older cohort members. The difference in test scores at age 16 potentially affects the number of students who stay on beyond compulsory schooling, with predictable labour market consequences. Indeed, the impact of month of birth persists into higher education, with age 19/20 participation declining monotonically with month of birth. The fact that being young in your school year affects outcomes after the completion of compulsory schooling points to the need for urgent policy reform, to ensure that future cohorts of children are not adversely affected by the month of birth lottery inherent in the English education system. Recently attention has been drawn to this inequity (see Crawford, et al., 2007) and many Local Authorities are experimenting with different patterns of intake and practices (one intake per year, modified curriculum etc.) to help ameliorate this disadvantage.

The importance of parental characteristics

Much research has shown that the social status characteristics of parents such as levels of education, occupational status and family income were all associated with a wide array of academic and socio-emotional outcomes for children during their early years. It is often proposed that where parents are advantaged in these characteristics they afford their children an array of services, goods, parental actions, and social and cultural connections that greatly benefit their children and there is a concern that children of many lower status parents lack access to such material and cultural resources and experiences, which puts the children at risk of developmental problems (Duncan & Brooks-Gunn, 1997). EPPSE has illustrated the enduring influences of parents and the net effect of different factors. We find that socio-economic disadvantage predicts poorer social-behavioural outcomes in KS3 in line with results found for this sample at younger ages in pre-school and primary school, but we have also studied children who 'achieve against the odds' and documented their perceptions and behaviours (Siraj-Blatchford et al., 2011)

While many research studies document the relationship of socio-economic status (SES) to academic achievement and progress (e.g. Bloom 1964, Feinstein, 2003), as well as other aspects of children's development (e.g. Davie, Butler & Goldstein, 1972), the strength of such relationships may vary widely between cultures (OECD, 2004). In terms of which aspects of SES relate most strongly with academic achievement, there is long-standing evidence (e.g. Mercy & Steelman, 1982, Sammons et al., 2004b) that parental education is the best predictor, with maternal education being most potent in the early years, and paternal education exerting more influence as children get older.

Despite these patterns at a group level the individual child's disadvantaged background, as shown by our work on children 'succeeding against the odds', should not lead to lower expectations, rather teachers and school staff need to assess children carefully so that they can identify strengths and support children appropriately, and work in closer collaboration with home.. There is more variation within social groups than between, so stereotyping should be avoided. The evidence on the impact of background is best used to help target resources and monitor equity gaps, with early intervention strategies to support vulnerable groups and those children showing developmental delay compared with other children of their age group.

Marital status

EPPSE has found that, allowing for all other characteristics, students in lone parent families (in comparison to married families, measured at KS1) showed significant increases in both 'hyperactivity' and 'anti-social' behaviour in KS3, and students of divorced or separated parents showed increased 'anti-social' tendencies between Year 6 and Year 9. These findings are in line with other research on families where it was found that a parent's transition into new marriage is linked with children's increased negative behaviour (Dunn et al., 1998; Dunn, 2002).

The importance of the early years Home Learning Environment (HLE)

Whilst the main focus of earlier stages of the project was on pre-school provision it would have been naive to imagine that young children arrive at pre-school as 'empty vessels'. Many studies have indicated the importance of parenting generally (e.g. Melhuish et al., 2008a; Sylva, et al., 2008) in the early years and more specifically parental practices which engage children in 'learning' (Siraj-Blatchford & Mayo, 2012 forthcoming). Parenting practices such as reading to children, using complex language, responsiveness, and warmth in interactions have been shown to be associated with better developmental outcomes (Bradley, 2002). Hess, Holloway, Price & Dickson, (1982) investigated the links between SES and developmental outcomes and found that higher SES parents use more developmentally enhancing activities.

Stimulating activities may help children with specific skills enhancing development (e.g. linking letters to sounds), but also, and perhaps most importantly, by developing the child's ability and motivation concerned with learning generally. Additionally, it is possible that a feedback loop is operating whereby parents are influenced by the child's level of attainment, which would lead to children with higher ability possibly receiving more parental stimulation. Thus there may be 'reciprocal' relationships between a parent's interactions and the learning environment. Bronfrenbrenner (1979) theorises on the child at the centre of a series of nested spheres of social and cultural influence, including education.

Given the importance of learning in the home, EPPSE took this into account when looking at children nested in families. The research explored which aspects of the home environment produce effects upon children's competencies and explored which children come from homes with more or less stimulating early HLE. Parents at entry to the study, when their children were aged 3/5 were asked at interview about the kinds of activities they engaged in at home which had the potential to provide learning experiences and/or contributed to their child's social skills. The project developed an index of the early years HLE that included activities such as reading to children, singing songs and nursery rhymes, playing with friends etc. (Melhuish et al., 2001; 2008a). At age 14 the early years HLE still predicted academic outcomes. Also those who had experienced better early years HLE show better social-behavioural outcomes at age 14 and make better developmental progress across KS3.

The influences of parenting upon child development are pervasive. Parenting also varies with parents' SES and education. Parcel and Menaghan (1990) found that mothers with more intellectually stimulating jobs provided more support and stimulating materials for their children, which was, in turn, linked to children's verbal skills. The argument linking low SES to lack of stimulation and lower cognitive development has a long history, and has regularly been supported by evidence (e.g. Bradley et al., 2001; Brooks-Gunn, Duncan & Aber 1997). Recent UK research (Goodman & Gregg, 2010) also finds that children from poorer backgrounds are much less likely to experience a rich HLE than children from better-off backgrounds. At age three, reading to the child and the wider HLE are very important for children's academic development.

Support for these views also comes from other studies of interventions. Research involving 0-3 year-olds from the evaluation of the Early Head Start (EHS) program, which provided combinations of home-visits and centre childcare intervention for disadvantaged families, found that the intervention increased both the quantity and quality of parents' interaction with children, as well as children's social and cognitive development (Love et al., 2005). A review of early interventions concluded that, to gain the most impact, interventions should include both parent and child together with a focus on enhancing interactions (Barnes & Freude-Lagevardi, 2003). Such work indicates that parenting behaviours are learnable, and changes in parenting are associated with improved child development (e.g. Sylva et al., 2008b). Similar conclusions derive from a study (Hannon, Nutbrown & Morgan, 2005), where children showed better literacy progress when parents received a programme on ways to improve child literacy during the pre-school period.

Despite the strong effects of social status characteristics, EPPSE shows strong independent effects of the early years HLE on academic and social-behavioural development, even after controlling for all other variables. "What parents do is more important than who parents are" (Melhuish et al., 2001).

EPPSE also measured the home and out of school learning opportunities at age 7 and age 11. However it was primarily the early years HLE that predicted substantial variance in developmental outcomes. There are two possible reasons for this: i) early learning at home is more powerful, or ii) the interview conducted when the child was 3-4 years old yields more accurate data than the postal questionnaires used to collect information on these activities later in the study. The first reason is supported by existing evidence from other studies. In the US NICHD study results indicated (Belsky et al., 2007) that parenting sensitivity at 4.5 years predicts cognitive development at age 10. The impact of parenting in the early years on adolescent educational achievement, in England, is explored in Collins & Egeland (2008). Developmental versus environmental continuity issues pervade longitudinal research and require ongoing attention.

Does where students live (the neighbourhood) affect educational achievement and social development?

Some existing evidence indicates some small effects for young children's development associated with the neighbourhood. In the USA, Chase-Lansdale et al., (1997) found around two per cent of the variation in behaviour problems and academic achievement for 5 and 6 year olds was linked to neighbourhood effects (deprivation and ethnic diversity). Similarly in the UK McCulloch and Joshi (2001) found 4-5 year olds achieved lower cognitive scores if they came from poorer rather than more affluent neighbourhoods independently of other socio-economic measures. Also in the analysis of data for over 500,000 children per year for three successive years (2002-2004) in all state primary schools in England, Melhuish et al. (2006a; 2006b) found that children's progress from Key Stage 1 (age 7) to Key Stage 2 (age 11) was also influenced to a small extent by the level of deprivation of their neighbourhood. However, it is possible that such 'neighbourhood' effects may reflect unmeasured differences in families resulting from the non-random distribution of families across neighbourhoods.

All research discussed so far deals with the issue of neighbourhood effects by seeing whether there is a separate influence associated with neighbourhood deprivation after standard student and family demographic factors, such as gender, ethnicity and age, parental SES and qualifications, have been taken into account. Such research does not include data on families as rich as that in the EPPSE research. Thus it is possible to investigate neighbourhood influences including more control of students' individual and family factors than has previously been possible.

The EPPSE project developed a measure of the learning opportunities provided within the home, the early years Home Learning Environment (HLE) index and this measure has proved to be a powerful predictor of educational achievement (e.g. Melhuish et al., 2008a, b) and social-behavioural development (e.g. Sammons et al., 2008b). Earlier in the EPPSE study (up to age 11) we found that there were no any significant effects associated with neighbourhood measures for academic or social-behavioural outcomes once the HLE was added to the analysis. This pattern of results whereby initial neighbourhood effects disappear once the HLE is added suggests that inter-family differences may mediate neighbourhood effects for young children. Family characteristics and neighbourhood characteristics can co-vary, and when examined together family characteristics tend to overpower neighbourhood effects so that we find little evidence of independent neighbourhood effects up to age 11.

However, it may be that neighbourhood influences become more evident when children are older (e.g., teenage years) when considerations such as the peer group effect may increase. At age 14 EPPSE results indicate that neighbourhood characteristics show significant effects upon academic outcomes than were found earlier even when HLE is allowed for. Also neighbourhood disadvantage predicts social-behavioural outcomes after controlling for other factors. Children who experienced higher levels of neighbourhood disadvantage had poorer 'self-regulation', higher levels of 'hyperactivity' and increased 'anti-social' behaviour. In KS3 neighbourhood influences, although still weaker than family characteristics, become more important as students move into adolescence

Student dispositions

In EPPSE students' dispositions were linked to academic attainment. There are links between 'academic self-concept in English and maths', and attainment. Students' self-reported 'enjoyment of school', also predicted better attainment, with stronger effects for maths. The relationships between these measures are reciprocal e.g. academic attainment and students' 'self-concepts' or 'enjoyment of school' are interdependent as shown by Marsh and Craven (2008). Also academic 'self-concept in maths' (and to a lesser extent English) predicted better social-behavioural outcomes, as well as better academic attainment.

Related work on student attitudes supports these findings. The National Longitudinal Survey of Youth (NLSY), using nationally representative data on 16 year olds, found that around *two thirds* of the socio-economic gap in attainment at age 16 can be accounted for by long-run family background characteristics and prior ability, suggesting that circumstances and investments made earlier in the child's life explain the majority of the educational gap between young people from rich and poor families (Chowdry, Crawford, & Goodman, 2011). However, differences in the attitudes and behaviours of young people and their parents during the teenage years play a key role in explaining the rich-poor gap in attainment: together, they explain a further *quarter* of the gap at age 16, and the *majority* of the small increase in this gap between ages 11 and 16.

These results suggest that while the most effective policies in raising the attainment of young people from poor families are likely to start before children reach secondary school, policies that aim to reduce differences in attitudes and behaviours between the poorest children and those from better-off backgrounds during the teenage years may also make a significant contribution towards lowering the gap in achievement between young people from the richest and poorest families at age 16.

Similarly Goodman & Gregg (2010) used data from several large scale UK longitudinal studies to examine effects upon educational attainment. They found that:

- The aspirations, attitudes and behaviour of parents and children potentially play an important part in explaining why poor children typically do worse at school.

- The gap between children from richer and poorer backgrounds widens especially quickly during primary school. Some of the factors that appear to explain this are:
  - parental aspirations for higher education;
  - how far parents and children believe their own actions can affect their lives;
  - children's behavioural problems.

- It becomes harder to reverse patterns of under-achievement by the teenage years, but disadvantage and poor school results continue to be linked, including through:
  - teenagers' and parents' expectations for higher education;
  - material resources such as access to a computer and the internet at home;
  - engagement in anti-social behaviour;
  - young people's belief in their own ability at school.

- Cognitive skills also are passed from parents to children across the generations, and there are complex links between genetic and environmental influences. This also helps explain why children from poorer backgrounds underperform in school.

The effects of pre-school provision

When students were 14 years of age there are continuing effects of the quality and effectiveness of the pre-school the student had attended on academic outcomes, even after controlling for the influence of background characteristics.

High pre-school quality predicted better outcomes for maths and science at age 14, but not for English. Pre-school effectiveness has a continuing effect on English, maths and science (for those judged effective at promoting early number concepts). The continued benefits of pre-school were most evident for students who went on to attend secondary schools of medium or low effectiveness, which suggests that higher quality pre-school experiences may offer a protective influence against later poor school experiences. Also high quality pre-school has lasting benefits for development of social behaviours.

Other European evidence shows that the effects of pre-school are long term. Pre-school was associated with increased qualifications, employment, and earnings up to age 33 (Dumas & Lefranc, 2010). In France, universal free pre-school (école maternelle) is available to children starting at age 3 with over 90% take up rates. State-collected data show that pre-school had a sizeable and persistent positive effect on a child's ability to succeed in school and obtain higher wages in the labour market. Pre-school also appeared to reduce socio-economic inequalities, as children from less advantaged backgrounds benefited more than those from more advantaged backgrounds. Similarly, in Switzerland, the impact of pre-school expansion was associated with improved intergenerational educational mobility, with children from disadvantaged backgrounds benefiting most (Bauer & Riphahn, 2009). In Norway, which expanded pre-school education for 3 to 6 year-olds during the 1970s, researchers found that pre-school participation was associated with strong benefits for later educational and job outcomes (Havnes & Mogstad, 2009).

There is similar evidence of pre-school's benefits from Asia, South America, and elsewhere (e.g., Siraj-Blatchford & Woodhead, 2009). In Bangladesh, pre-school boosted primary school achievement (Aboud, 2006), with similar results reported for 10 other countries (Montie et al., 2006). When Uruguay expanded its pre-school system, studies comparing siblings with and without pre-school, and regions with varying levels of pre-school, revealed clear benefits for children attending pre-school (into secondary school, Berlinski et al., 2008). Similar analyses in Argentina found that 1 year of pre-school was associated with primary school attainment increases of 0.23 of a standard deviation (Berlinski et al., 2009).

General population studies from the U.S. (Vandel et al., 2010) indicate that it is higher-quality pre-schools that produce greater long-term benefits. The Organization for Economic Cooperation and Development (OECD) examined educational attainment data for 65 countries. It found that literacy at age 15 was strongly associated with pre-school participation in countries where a large proportion of the population use pre-schools, where preschool is available for longer periods each year, and where there were measures to maintain preschool quality. They concluded that widening access to pre-school can improve performance and equity by reducing socio-economic disparities, if extending coverage does not compromise quality (OECD, 2011).

Further evidence of the importance of the quality of pre-school provision comes from Denmark, which was one of the first countries to introduce extensive state funded pre-school provision. Bauchmuller, Gortz and Rasmussan (2011) find that long term educational outcomes show distinct effects related to aspects of the quality of earlier pre-school provision.

Secondary school

Two Ofsted measures of the secondary school's quality ('pupils' learning' and 'learners' attendance') proved to be significant predictors of better attainment and progress in English, maths and science. Also the quality of the secondary school attended by EPPSE students during KS3 (as rated by Ofsted) predicted better social/-behavioural and academic outcomes for students, even taking into account the influence of individual, family and HLE influences. Additionally, Ofsted inspection judgements of the 'behaviour of learners' predicted better social-behavioural outcomes for the EPPSE sample. These EPPSE findings are in line with the Ofsted report on practices within Twelve Outstanding Secondary Schools (Ofsted, 2009).

School effectiveness research

EPPSE is the first study to use an educational effectiveness paradigm to investigate together the influences of pre-school, primary and secondary experience upon students' development. EPPSE's qualitative data is used to drill down deeper into the quantitative findings, to through light on some of the 'why questions posed by the quantitative data e.g. Why do some disadvantaged parents offer a good, stimulating early home environment? EPPSE shows from the quantitative data that they do but not 'why'. This could only be answered by asking parents and studying their perceptions. This mixed methods approach (Siraj-Blatchford et al., 2006) has added value to our understanding of processes in homes and schools which explain why some children succeed while others fail. If we look at school effectiveness and school reform research from the past 60 years a number of conclusions can be drawn, and here we draw heavily upon the conclusions from a review by Reynolds, Stringfield, & Schaffer (2006).

1. A few reforms can point to positive results from several multi-site studies of achievement outcomes (What Works Clearinghouse, 2007). The EPPSE results indicate some of the elements of student perceptions that are related to academic success.

2. All of the reforms that have 'scaled up' to significant numbers of schools, but some schools have no measureable effect.

3. Reforms have been substantially more likely to produce measured results for primary schools. Not all primary-based reforms have proven equally effective. EPPSE has demonstrated primary school effects and also that a positive transition from primary to secondary school had a beneficial effect upon later secondary attainment and progress. Other research finds that secondary school reforms have consistently found the achievement of measurable, long-term results challenging (see Fullan, 2001). A recent review of British reform efforts makes clear that difficulty in obtaining measureable, multi-school results in secondary education is not limited to the US (Reynolds, Hopkins, Potter, & Chapman, 2001).

4. Success has been greatest where schools integrate local realities with the reform design. Berman and McLaughlin (1977) referred to this as 'mutual adaptation'. More recently, others have described the process in a more active, engaging voice as the 'co-construction' of school reform (Datnow & Stringfield, 2000). There have been virtually no sites described in which a local school literally and uncritically adopted a reform *in toto*. EPPSE research has found that, based on student's views, the following factors all predicted better academic and social-behavioural outcomes and progress from age 11 to age 14:
  - quality of teaching – including a strong 'emphasis on learning' by teachers, 'teacher support' for learning, and 'valuing students';
  - 'headteacher qualities';
  - 'school environment';
  - 'school resources' for learning;
  - a positive 'behaviour climate' also significantly predicted attainment and progress.

5. Schools achieving strong implementation of reforms possessed a substantially healthy school culture prior to reform, or developed such an environment as a result of the reform. Again, EPPSE results (see 4 above) describes the students' perceptions of schools that are associated with academic success, e.g. students' own views on their school's 'emphasis on learning' were significant predictors of attainment and progress in all three core subjects. Also, students' views of a number of other school processes (e.g. positive 'behaviour climate') also significantly predicted attainment and progress, and time spent on homework, as reported by students, was an important and relatively strong predictor of better attainment and progress in all core areas.

6. Research on the sustainability of educational reforms is extremely rare. Reviewing research over previous decades, Cuban and Usdan (2002) concluded that most reforms do not last, and those that do, tended to involve structural additions to the system that do not threaten previously existing structures, e.g., the addition of near-universal kindergarten, which EPPSE has shown is important in promoting children's educational and social development (e.g. Sammons et al., 2008a; Sammons et al., 2008b; Melhuish et al., 2008b). Hargreaves and Fink (2006) examined eight secondary schools that had attempted reforms at least two decades prior to the authors' data gathering. The authors conclude that, "The overall evidence is not uplifting. The vast majority of reform efforts and change initiatives - even the most promising ones – are unsustainable." (Hargreaves & Fink, p 252). The High Reliability Schools (HRS) project (Stringfield, Reynolds & Schaffer, 2008) indicates that the problem was not the reform ideas but the reliability of implementation. Studies are needed of diverse promising programmes being implemented through HRS principles. There is evidence, however, that accountability approaches including inspection, and the growing use of data, have had success in improving the weakest schools in England (see Sammons, 2008) and in other countries (see Dobert & Sroka, 2004).

7. Teachers can affect social as well as academic outcomes. A recent review by Ko & Sammons (2011) provides a summary of key features identified through research and inspection studies. In a study of a representative sample of American elementary school children teacher effects on social development were approximately twice as large as teacher effects on academic development. However teachers who produce better academic results are not necessarily the same teachers who produce better social results. Also the development of social skills has a positive effect on academic skills, therefore it is likely that teachers who are good at teaching social skills also provide an additional indirect boost to academic skills (Booher-Jennings & Diprete, 2007). Thus current debates concerning what makes a good teacher should also take social development into account. In the EPPSE research we find that students' self-perceptions and social-behavioural development are related to academic success, e.g. academic self-concept in maths (and to a lesser extent English) had a reciprocal relationship with better social-behavioural outcomes.

8. The EPPSE findings provide evidence that the academic effectiveness of the primary school attended not only influences EPPSE students' attainment and progress during KS2, but it also continues to predict better outcomes in maths and science later on in KS3. This points to the relevance of educational effectiveness (CVA) indicators of school performance for both policy makers and practitioners in providing useful information to evaluate institutions. Other research has also demonstrated that more effective schools tend to make greater use of performance data to help improve their practice (Day et al., 2009).

Overall, other research, in many countries, support the findings from the EPPSE research. In addition much of the EPPSE findings are new and go beyond the previous research literature.

Section 10: Findings relevant to policy

Summary of Key Findings

EPPSE findings support the development of policies to help students, their families and schools by:
- Ameliorating the impact of multiple disadvantage
- Enhancing parenting skills, especially in the early years
- Supporting young people in out of school activities that develop their sense of belonging, responsibility and citizenship as members of their community
- Continuing to improve pre-school quality
- Enabling teachers to make both curriculum and pedagogical adjustments including adopting a more personalised learning agenda to enable 'vulnerable' children to make the most of their school experiences
- Consulting students and obtaining their views may be extremely helpful for school self-evaluation and action planning.

There is no 'one' predictor which explains attainment, progress and development but rather it is the combination of factors that make a difference to young people's long-term life chances. The message for policy is that there is no magic bullet because addressing one area in isolation is unlikely to have a strong impact on narrowing the gap.

The analyses contained in this report explore a wide range of evidence concerning the factors that predict academic success and positive social-behavioural development during the early stages of Key Stage 3. It also explores factors that predict academic achievement and progress and developmental changes in social-behavioural outcomes in adolescent across KS3.

Young people and their families

The background characteristics of the individual student and their family continue to influence academic attainment at the end of KS3 in the three core curriculum areas and additionally continue to predict social-behavioural outcomes. For instance, the experience of multiple disadvantage in the early years in particular increases the risk of poorer social-behavioural development up to age 14 years, as well as predicting poorer attainment in KS3 (bearing in mind the two are likely to be mutually reinforcing).

Positive parenting is important too, and improving the early years Home Learning Environment (HLE) is likely to benefit the educational attainment of children in both the short term and the whole population in the longer term since such effects are shown to last into adolescence. This has relevance for the development of policies regarding families and parenting across socio-economic groups. Also schools could further support parents in understanding what is required of them in terms of supporting their children's learning, homework and behaviours in a loving and firm but fair way. Parent's evenings could be about supportive parenting as well as the child's progress and attainment. All of these points are particularly relevant for young people growing up in disadvantaged families and neighbourhoods.

Implications from EPPSE's child and family case studies of children 'performing against the odds' (Siraj-Blatchford et al., 2011a) suggests that 'active cultivation' skills are important in the development of parenting programmes/initiatives. This sub-study of EPPSE shows that the home, as an institution, is a very powerful 'proximal' context. This helps children to establish masterful learning dispositions towards school and learning and stimulates the development of self-efficacy. The parents who show 'active cultivation' provide strong, child-centred emotional support that is sensitive to the children's developing needs. They do so, even in the face of difficulties, by being encouraging, persistent and consistent. The importance of social and cultural capital has implications for schools and communities in fostering 'learning to learn' dispositions in children and for parents, by providing support with educational experiences especially for 'vulnerable' children.

Schools can be encouraged to support vulnerable children by providing educational outings (e.g. to museums), experiences (e.g. playing musical instrument) and trips away from home (e.g. camping, visits abroad) which strengthen their knowledge and experience of living with others and their ability to socialise with a range of people.

The research also provides evidence that neighbourhood contexts can also affect outcomes, though the effects are relatively small. For instance higher levels of deprivation amongst children aged under 16 in their local area predicted poorer 'self-regulation', higher levels of 'hyperactivity' and increased 'anti-social' behaviour. Higher levels of criminality in neighbourhoods also predicted poorer outcomes in all four social behavioural domains. Higher levels of unemployment in the area predicted higher 'hyperactivity' in 14 year olds. Finally, a higher incidence of limiting long-term illness in the neighbourhood predicted lower 'self-regulation'. All these relationships were identified after controlling for the influence of individual, family and HLE factors. These findings are particularly topical as this report was written following a short period of civil unrest in a number of disadvantaged neighbourhoods (August 2011). Many of those involved in a night of 'rioting and looting' were young people. Following these events there has been much discussion about the role deprivation and youth unemployment plays in anti-social behaviour. Current policy debates have highlighted the importance of 'the community' and the need to enhance social cohesion. Policies which support young people in out of school activities that develop their sense of belonging, responsibility and citizenship as members of their community, including their schools, is very important. It is interesting to note that the civil unrest took place during the summer recess when community resources, such as school buildings, were unused and at a time when youth work was being cut.

Pre-school
It should be emphasised that pre-school education still shows beneficial effects even after nearly 10 years of intervening experiences from multiple sources. There are continuing effects of pre-school attendance and also of pre-school quality and effectiveness, particularly for later attainment in maths and science. Pre-school quality is also a significant predictor for all four social-behavioural outcomes at age 14. This is relevant to the development of policies which increase the quality and effectiveness of pre-school and is especially important given the increased numbers of children who now attend pre-school. Investment in high quality pre-school education can be an important contributor to developing the educational and social capital of the population, and thus promote longer term economic development (Melhuish, 2011; Heckman, 2006).

Early identification
Children who are on a successful learning trajectory start school with a better grasp of school relevant skills and knowledge. This has policy implications for the early identification of children who are 'struggling' to achieve such a positive start to compulsory schooling. Early identification may enable teachers to make both curriculum and pedagogical adjustments including adopting a more personalised learning agenda to enable 'vulnerable' children to make the most of their early primary school experiences. The importance of teachers in supporting and encouraging 'vulnerable' children and avoiding negative expectations and stereotypes has implications for recruiting the best teachers into schools in disadvantaged communities where there is greater risk of poor outcomes.

Primary schools
Turning to schooling there are discernible effects of the educational institutions the EPPSE students previously attended still evident at age 14. The academic effectiveness of the primary not only influences EPPSE students' attainment and progress during KS2, but it also continues to predict better outcomes in maths and science later on in KS3. This is in contrast to the findings for social-behavioural development where there were no significant lasting effects of the academic effectiveness of the primary school on these outcomes. The academic effectiveness of the primary school was derived from the analyses of contextual value added (CVA).

There has been a great deal of discussion at both national and local level about the use of performance data to stimulate school improvement. These finding add to the debate on the relevance of CVA type indicators of school performance for both policy makers and practitioners in providing useful information to evaluate institutions[38]. Research has demonstrated that more effective schools tend to make greater use of performance data to help improve their practice (Day et al., 2009; Sammons et al., 2011d). The academic effectiveness of the primary school however was not a predictor of later social behaviour or dispositions in KS3.

Secondary school

There is also evidence of secondary school effects on students' progress across KS3. The Ofsted inspection indicators predicted both attainment and progress. Over and above individual, family, home learning and neighbourhood factors, attending a school judged to be 'outstanding' provides a moderately large boost to student attainment outcomes in all three core areas of the curriculum. Ofsted measures also predicted better social-behavioural outcomes and dispositions. These findings indicate that Ofsted's judgments are reflective of important characteristics of schools. There may be many benefits in developing national initiatives/guidance which help schools to incorporate Ofsted's recommendations into their development planning in practical ways.

Findings from the student questionnaires highlighted the benefits, for academic and social-behavioural outcomes, of time spend doing homework. Encouraging schools to adopt consistent homework policies may foster better study skills, motivation, encourage independent learning and, through the extra time spent on study, increase the opportunity to learn in KS3. Other research reviews on the impact of homework have pointed to its benefits for academic outcomes at secondary level less has been written about the relationship with social behaviour (see Ramdass & Zimmerman, 2011).

There are substantial variations between secondary schools as reported by students. Taken together, the findings suggest that secondary schools differ significantly in ways that are likely to influence the quality of learning and well-being as perceived by students. Such evidence could provide valuable feedback to schools, especially where they maybe struggling to improve or are rated as inadequate by inspectors.

The quality of the secondary school experience, especially 'emphasis on learning' and the 'school's behavioural climate' has a significant impact on student attainment and progress. In addition these factors show positive relationships with students' social behaviour and their dispositions. Other factors that predicted outcomes include student support, ensuring students feel valued, and promoting a high quality physical environment and learning resources. These aspects are likely to be important for school self-evaluation and planning for improvement as well as for external evaluation. Focussing on improving these areas of school experience in secondary school may promote better academic results and improved social behaviour and student motivation and engagement (Sammons et al., 2011b; Sammons et al., 2011c).

'Enjoyment of school' can be viewed as an important educational outcome in its own right. 'Enjoyment of school' as reported by students' consistently predicted better social-behavioural outcomes. 'Enjoyment of school' also predicted better academic outcomes in KS3. These findings are relevant to policy makers and practitioners because they show that improving attainment and social-behavioural outcomes is not at variance with higher levels of student reported 'enjoyment of school'.

Given that the findings above came from students' self-reports of their experiences, this points to the importance of schools listening to the student 'voice' on a regular basis in order to assess the quality of their educational experiences and use this information for school evaluation and

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[38] See http://www.education.gov.uk/performancetables/schools_05/sec9.shtml for details of the DfE's current methods for calculating value added scores.

improvement. Schools could also play a much more active role in 'supplementing' the cultural and social capital that is available to these children. For instance, although most schools provide information about GCSE choices, and some schools provide information about or even excursions to Universities, many children and parents are not aware of the implicit expectations of institutions that need to be met before their children can become part of their culture. Offering such information before children choose their GCSE subjects or even before they start secondary school might give these children better odds to continue their unexpected academic success beyond compulsory schooling.

The case studies show a sense of active agency among families with children 'succeeding against the odds' of disadvantage which is in stark contrast to the helplessness that was commonly observed and expressed by parents and students who were less academically successful. However, for these children opportunities can be created by enhancing their social and cultural capital with the help of 'significant others', such as teachers or members from their broader social or cultural communities. Unlike the children 'succeeding against the odds', these children and parents found it hard to recall teachers that had been particularly helpful to their learning. Instead, they often felt let down by schools and teachers alike, and frustrated by their lack of academic success. In many cases, these parents could, or would not, help their children to develop academic aspirations and sadly neither did the children's schools. Generally, low targets were set for these children with regard to National Assessments and GCSEs, and children were all too aware of what little was expected of them. As long as these basic targets were met, teachers, parents and students felt that things were as they should be. Because of this, children missed out on the experience of having someone believe in them and of being challenged to succeed beyond low expectations.

This suggests that both parents and teachers could support children's learning further by showing higher expectations of their children and showing and expressing more faith in their abilities on a day-to-day basis.

The case study findings on the importance of relationships with peers and friends have implications for teachers in promoting the 'communities of learning' in classrooms. In these communities students can take responsibility for their own and others learning and work towards shared goals.

Taken together, these results indicate that optimising the pre-school, primary school and secondary school experiences has the potential to improve the attainment and all 'round development of the whole school population in the longer term. The findings build on and extend results reported for pupils at younger ages and show that better pre-school and primary school experiences can have a protective effect in terms of boosting later attainment for all students and for more disadvantaged groups in particular.

The report demonstrates the complexity and inter-connectivity of influences on the development of adolescents. Unsurprisingly there is no 'one' predictor which explains attainment, progress and development but rather it is the combination of factors that make a difference to young people's long term life chances. The message for policy is that there is no magic bullet because addressing one area in isolation is unlikely to have a strong impact on narrowing the gap.

By 2050, the working age population within Europe will decrease by approximately 12 per cent, whereas the elderly will increase by 50 per cent. In these circumstances, maximising the productivity of the working population is necessary for economic sustainability. One strategy to increase productivity is to enhance educational attainment across the population. This is especially important when the skills necessary for modern economies are rising and changing in nature and when there is still great inequality of opportunity and outcomes. The results of this study point to strategies that can help to address these issues in the medium to longer term.

Section 11: Discussion of key findings

The EPPSE project has studied the ways that different phases of education, including secondary school, are related to students' attainment, social behaviour and dispositions at age 14 (Year 9) and also to their development over time. Of course schools are not the only influence on students' development; families and communities matter too and these 'social' influences are carefully studied in EPPSE. Understanding development requires more than 'objective' measurement by outsiders. Although these may be important in understanding young people's development, important in their own right are the 'subjective' views and feelings of young people, which may also have an impact on their attainment and development. The adolescents in the EPPSE study shape their own pathways as much as their schools or family or neighbourhood.

Earlier EPPSE reports have demonstrated how the family, pre-school and primary school interact in influencing development; the current analyses includes rich data on students' experiences and reports about their lives at home and school. By the age of 14 students have particular views about teachers, classrooms, their peers and above all – their own perceptions on the supports and hindrances they encounter in their learning environment. These are reported fully and contribute to the analyses of student dispositions and their views of school. Because EPPSE also has students' self reported views and experiences at earlier time points, we can show how these views and dispositions change over time. What the latest student questionnaires reveal is substantial variation in students' experiences in secondary education and these are explored throughout the report.

EPPSE has traced the development of nearly 3,000 children between the ages of 3 and 14 through thousands of measurements and complex statistical analyses. This is, of course, only half the story and it is the 'dry' half. Although EPPSE's quantitative measures explain nearly half of the variation in students' outcomes, this leaves more than half of the variation in developmental pathways to unknown factors. We can substantially predict how a child will turn out on the basis of knowledge of his/her family, home environment, schools, and neighbourhood but our statistical predictions do not take account of the unique characteristics of each child, or their personal and very individual life experiences. It is the uniqueness of each child that the 50 EPPSE qualitative case studies of individual children and their family (Siraj-Blatchford et al., 2011a) that attempts to capture this. The richness of individual family histories, school traditions or community features are recorded in great detail and then analysed through complex qualitative procedures. These put a searchlight on individuals of special interest, especially those who succeeded or failed 'against the odds' - in their development and provide new insight into risks, protective factors and resilience in childhood and beyond.

What is new in this report over KS3 is detailed information from students about their teachers, classrooms, peers and their schools. These reports are surprisingly positive, but some are not and these are discussed. Students also describe how they view themselves as learners and as 'citizens' in their schools. They have told us how much they enjoy school and what the behavioural climate is like there.

This discussion begins with the ways the first phase of secondary schooling shapes student progress over time, more specifically, developmental change between the ages of 11 to 14. This is done through statistical 'progress models' that take account first of the effects of previous attainment and the effects of individual, home and earlier school influences **before** estimating the effects of the school on EPPSE students in it. In other words, what has been the 'value added' (or detracted) by secondary school after controlling for background influences?

Next, the effects of earlier experiences, including those from the pre-school period, are outlined. There are many lasting effects of pre-school and primary school experiences. Although a few of these continue to influence developmental progress in secondary school, many of the pre-school effects have made their mark by the end of primary schooling and then no longer influence further *change.* However, early experiences that are lasting, such as the early HLE and the quality/effectiveness of the pre-school, continue to show benefits in attainment and social-behavioural outcomes. In other words, the benefits of early experiences remain statistically significant - but they relate to relative attainment and not to continued change between ages 11 and 14. Children who experienced pre-schools of high quality continue to do better than their peers who had lower quality but they no longer continue to show accelerated progress.

The end of this discussion section attempts to draw together the threads of the complex KS3 analyses. It does this in the context of the mixed-methods approach that has characterised this longitudinal study for more than a decade.

Academic *progress* and social-behavioural development

How does the first phase of secondary schooling shape student developmental change between the ages of 11 and 14? Which factors predict whether an individual student will 'stay the same', make good progress (or improve), or sadly show poorer outcomes at age 14 when compared to their profile at age 11?

Background characteristics and academic progress

During KS3 girls made greater progress than boys in the three core subjects as did those whose fathers had higher qualifications. Students whose mothers had higher qualifications made more progress in English and science and this was also true for those with FSM. To complete the picture on family disadvantage, students from families with higher income made more progress in English, a subject more influenced by family background than maths.

Background characteristics and social-behavioural changes

EPPSE measured four aspects of student social-behavioural development, and all four were shaped to some extent by secondary schools. The social-behaviour profiles of the majority of our students revealed positive ratings by their teachers; many showed good 'self-regulation', 'pro-sociability' and low levels of 'hyperactivity' and even lower levels of 'anti-social' behaviour. Most schools appear to do a good job of supporting social-behavioural development.

On all social-behavioural outcomes girls had more favourable scores than boys. The case studies of individual children's trajectories confirms this finding and shows how girls self-regulation is encouraged and enhanced by parental expectations. Girls are expected to undertake more household chores and responsibility in family life. Families have a part to play in this, and unfortunately a minority of EPPSE students show behaviour that is disruptive, their attention is patchy, and they have difficulty with peers. In identifying the adolescent with adverse social-behavioural profiles, the 'usual suspects' surface: boys; those whose mothers have low qualifications; children from families with low scores on the early years HLE (for three outcomes); and for single parent families their children have lower 'self-regulation' and higher 'anti-social' behaviour. In our qualitative case studies children who fell into this category often struggled in their learning; they would 'lose focus', 'get distracted', 'go off-track' or 'get bored'. As a result they struggled more and more which commonly resulted in them simply "giving up" (Siraj-Blatchford et al., 2011). Once again, indices of social disadvantage predict poorer development over time, although these factors are not as strong in their prediction of adverse social-behavioural development as they are for academic progress.

Effects of secondary school social composition on academic progress and social-behavioural change

Students who attended schools with high rates of poverty (FSM) made less academic progress across Key Stage 3 compared to those attending schools with lower rates. This is often referred to as 'the Mathew Effect' in which the rich get richer and the poor get poorer - at least in terms of academic progress. Some mechanisms leading to slower progress for disadvantaged children were suggested by Sammons et al. (2008f) who demonstrated through classroom observations in Year 5 that schools with high levels of social disadvantage had lower quality pedagogy and higher levels of classroom disruption when compared to schools with more advantaged intakes. Disruption and lack of challenge in classrooms may lead to slower rates of learning.

EPPSE cannot prove that low quality teaching *causes* poorer academic progress but its consistent predictions over time and across outcomes add weight to causal arguments about the effects of low quality education on student developmental pathways.

Students' reports on their school experiences and academic progress

In order to explore which educational experiences might counter-balance the effects of social background on progress across Key Stage 3, EPPSE analysed students' responses to two questionnaires sent to them during Year 9 (age 14). In these questionnaires students provided information about themselves, their schools, classrooms, teachers and peers. As EPPSE students have participated in the study for more than a decade, they (and their parents) are used to receiving birthday cards, newsletters and updates from the project. EPPSE students have entered competitions for drawing and writing and many have received prizes. Related to this regular contact, students and parents are accustomed to reporting honestly about their home and school experiences via questionnaires and interviews. In fact, they sometimes do this with a frankness which is humbling to the researchers. Many include detailed personal information that helps us understand better teenage opinions and keeps us up to date with teenage values.

Students made more progress in all three academic subjects where they reported their school had a strong 'emphasis on learning', this was mirrored in homes too, in the case studies of students who "succeeded against the odds", all had parents and families who emphasised the value of learning and working towards a good education. Homework was particularly important. The effect of spending 2-3 hours a night on homework compared to none predicts progress in all three core subjects.

Students also made more progress in all three core subjects if they reported having positive 'teacher support' in their school. Also, they made more progress in the three subjects where they felt that they were valued and respected by teachers, and there was a positive 'behaviour climate.' Again, this was confirmed by our qualitative case studies where children who succeeded against the odds reported having better support from school. In addition, students who succeeded "against the odds" had parents who were "child-centred" and provided 'active' cultivation for their children's success in spite of their poorer economic and social capital.

Because the secondary school appears to influence so many aspects of developmental change, it is worrying that students entitled to Free School Meals (FSM) reported more negative perceptions about their schools in their questionnaire responses (although the differences were modest). There were significant differences on 28 questions between students on FSM compared to those who were not, for example in:
'There were often fights in school' / 'Some kids bring knives or weapons to school'
'Most pupils want to leave school as soon as they can' / 'My work is generally too hard for me'.

Although it is possible that students on free school meals *imagine* their schools to be more dangerous places than their more advantaged counterparts, it seems highly likely that they report accurately, especially since Sammons et al. (2008f) observed more classroom disruption during Year 5 in schools with high FSM intake. Thus, as the EPPSE sample moved through adolescence it is unfortunate to note that the influence of the FSM as an indicator of poverty is associated with more negative responses in secondary than was the case in primary school. This finding together with the finding that neighbourhood deprivation is increasing its effect in adolescence suggests that deprivation factors may be increasing in their influence during adolescence. This has important implications for targeting and attracting the best teachers and leaders to work in these schools.

Students made more progress across the three core subjects in schools where the Ofsted inspectors reported that the learning and teaching was of high quality. This is particularly interesting because the academic effectiveness of the secondary school (its 'value added') was not a significant predictor of student progress in English, maths or science. It seems likely that the Ofsted inspectors were detecting important differences between schools that the composite (across three subjects) 'value add' statistic did not pick up.

Students' reports on their school experiences and social-behavioural change

The EPPSE analyses shows that the students' reports of their school having a strong 'emphasis on learning' and a positive 'behaviour climate' were significant predictors of improvements in all four social-behavioural outcomes, i.e., increases in 'self-regulation' and 'pro-social behaviour' and reductions in 'anti-social behaviour' and 'hyperactivity'. Improvement in all four social behavioural outcomes was also associated with the supportive aspects of the school, especially teachers 'supporting their learning', 'valuing pupils, and good 'school environment and resources'. These supportive school characteristics that were associated with social behavioural development were weaker in their prediction of academic progress (between Years 6 and 9). For academic progress, the more powerful predictors were 'emphasis on learning' and 'poor behaviour climate'. It is tempting to hypothesise that valuing students is less important for academic progress than it is for social-behavioural development. However, 'emphasis on learning' is important in promoting both academic as well as social-behavioural change. Happily a strong focus on learning is not incompatible with a focus on supporting and valuing young people because many schools were high on both.

Students dispositions and self-concepts

EPPSE is unusual in large scale research studies in that it focused on students' views of themselves as well as their experiences in the classroom and the school. In the questionnaire 'All About Me' students reported on six student dispositions: 'enjoyment of school'; 'citizenship values'; 'popularity'; 'anxiety'; and 'English and maths self-concepts'.

Enjoyment of school

Compared with findings during primary school by Year 9, EPPSE students were less positive about themselves, their schools and also their 'enjoyment of secondary school'. However the majority of young people still have fairly positive views in Year 9, with a large majority reporting they like school and their lessons. However, 'enjoyment of school' is an important educational outcome in its own right and we found significant variation between schools on this item. This decline in positive attitudes is important because the KS3 data demonstrates that self reported 'enjoyment of school' predicts academic as well as social-behavioural development at age 14.

Several school factors predicted student 'enjoyment of school' and these included: students' perceptions of 'teacher support', 'valuing' students, and their school's 'emphasis on learning'. Again, our qualitative case studies suggest although parent support is vital, many of the children who "succeeded against the odds" reported these characteristics of their teachers and schools as having a profound impact on their success in their later years.

Academic self-concepts

Similar to 'enjoyment of school', by Year 9, the 'academic self-concepts' of young people are not as positive as in primary school. There are strong but predictable gender effects on student dispositions: girls have lower 'maths self-concept' than boys, which is not surprising because boys have a small but significant advantage over girls in maths attainment. However girls have a significant advantage over boys in English attainment, but surprisingly they do not have higher 'English self-concept' compared to boys. Clearly girls underestimate themselves, as they may do when self reporting on their own 'popularity'. On this disposition girls tend to have lower views of themselves compared to boys and it is possible that they underestimate themselves in general, perhaps because they reported feeling more 'anxious' than boys. Our qualitative case studies show several advantaged girls who "do well as expected" but who tend to be anxious and reserved.

Family background was related to a range of dispositions, for instance both FSM (negatively) and father's employment (positively) was related to academic 'maths self-concept'. In addition, students enjoyed school more and felt more popular if they came from families with high income. A more positive early years HLE predicted greater 'enjoyment' of secondary school – evidence of longer term effects of early experiences and the fact that they may contribute to more positive dispositions throughout schooling.

Earlier EPPSE reports have focused on the reciprocal relationship between 'academic self-concept' and attainment; both vicious and virtuous cycles were found. 'Maths self-concept' is a better predictor of maths attainment than self-concept in English, suggesting that maths success and failure may be strongly related to whether or not a student thinks of themselves as 'able' in this subject.

Effects at secondary school on academic attainment and social-behavioural outcomes

We turn first to what influences academic *attainment* at age 14. Which factors influence the attainment profiles at the end of Key Stage 3 but not the *gains* students made over KS3. This is followed by discussion of social-behavioural profiles at age 14, but not to social-behavioural change over time.

Effects of the family, the home learning environment and the pre-school

Many early influences such as pre-school quality or the HLE had made their mark on children by the age of 11, before they transferred into secondary school. For example, children who had a high HLE, attended high quality pre-school and a more academically effective primary school had better academic attainment and social-behavioural development at age 11. Although they did not necessarily make more gains during KS3, they held on to their relative advantage and so were performing significantly better at age 14. Our qualitative case studies showed that most of our children who "succeeded against the odds" had attended higher quality pre-schools and had better early HLEs than those with similar backgrounds who did poorly in their education. The case studies also suggest that boys were particularly susceptible to these contextual factors of their environment as they growing up.

Now we examine students' attainment at age 14 controlling for background influences. In line with the findings when these students were younger (Sylva et al., 2007) disadvantage (as measured through parents' educational level, income, socio-economic groups) has powerful and negative effects on academic attainment and social-behavioural profiles. However, the early years (and to a lesser extent the KS1) home learning environment (HLE) still serve as partial protection against the effects of disadvantage. EPPSE has shown that learning opportunities in the home such as reading with children, playing with letters and shapes, sharing nursery rhymes, going to the library all have positive effects later in the secondary phase, in fact, more than parental occupation or income.

Attending *any* pre-school or an *effective* pre-school did not protect against poor later social-behavioural outcomes at age 14 but attending a pre-school of high quality was related to higher attainment and better social behaviour in KS3. One of the more interesting findings to emerge from EPPSE is that children whose families had low scores on the early years HLE benefited *more* from pre-school (especially when it was high quality) compared to children from higher quality pre-schools who had stimulating home learning environments. In other words, children from non-stimulating homes were more responsive to the quality of pre-school provision than children from homes that had high levels of stimulation and intellectual challenge (as predicted by Melhuish in 1991).

Continuing influences from the primary years

The academic effectiveness of the primary school an EPPSE child attended had previously shown to influence their attainment in Key Stage 2 but not their social behaviour or dispositions. The quality of teaching in primary school was also found to be important. There were significant and lasting effects of attending an academically more effective primary school on students' later attainment in KS3 but there were no continuing primary school effects on social-behavioural development by the age of 14.

Secondary school influences

Large differences in attainment were found between students who reported their schools to have a strong 'emphasis on learning' and a positive 'behaviour climate' when compared to students who reported their schools to lack an 'emphasis on learning' or have a 'poor behaviour climate'. There was also a positive relationship between student attainment and students' views of the 'quality of the school environment', e.g. the attractiveness of facilities and good use of equipment.

In the analyses of EPPSE students' social-behavioural outcomes, the Ofsted inspection ratings also proved to be statistically significant predictors of better student profiles. The findings suggests that inspection judgments of school quality can detect positive attributes in secondary schools that foster better all round outcomes for students in KS3 and not just academic ones.

Homework practices of secondary schools were positively related to student social-behavioural profiles at age 14 although they were not related to improvement or decline in social outcomes between the ages of 11 and 14. Thus there is an association between homework and outcome profile at age 14 but not to change over time. There is little evidence in the literature on homework about its impact on social-outcomes (when compared to academic ones) and further research in this domain would be of wide interest. It may well be that a schools' homework policy is a very important feature in academic gains but not to social developmental change in social-behavioural outcomes.

It was interesting that the secondary school's overall contextualised value-added effectiveness score (CVA) did not predict student attainment at the end of Year 9. This was different from analyses at Key Stage 2 where the CVA scores were related to attainment in English and maths. Possibly this is because we had more detailed CVA measures available for primary schools. However, the Office for Standards in Education (Ofsted) inspection judgements of the 'quality of pupil learning' significantly predicted students' attainment in all three core subjects. The Ofsted judgement of student attendance was a more powerful predictor for students' attainment in English and maths than it was for science. Again, this finding suggests that Ofsted inspectors were detecting attributes in each school that are not measured by the global CVA scores.

Teacher reports on secondary school

To supplement students' views of their secondary school experience the EPPSE study also sent questionnaires to Heads of Year 9 (HoY9) for their insights and descriptions of their secondary school (Taggart et al., 2012a forthcoming). The questionnaires covered a range of topics relevant to policies and practices in Year 9.

What emerged from the questionnaires is a largely positive picture of secondary schooling. For instance most HoY9 were satisfied with the support/training they were given to enable them to respond to the needs of a range of students. However, they reported two groups of students who stood out as being in need of additional support: those with English as an Additional Language and 'looked after' students. Both of these groups have been shown to have poorer outcomes at GCSE. However a positive picture emerged with regard to the accessibility of services to support students, with only services for sexuality/health, EAL and speech/language therapy being reported as 'difficult to access'. The majority of HoY9 thought their school communicated and listened well to parents, however they acknowledged that improvements could be made in the extent to which they supported parents in helping their children learn at home.

The questionnaires probed three important areas of classroom practice: feedback for learning, the personalised learning agenda and specific pedagogical strategies. The extent to which these differed for school with high/low FSM, high/low Contextualised Value Added (CVA) and outstanding/inadequate Ofsted judgments was explored. Overall there was little variation between schools except for the following attributes:

- Low FSM schools were more likely to: encourage students to take responsibility and evaluate their own learning, involve students in decision making, develop leadership skills and target high achievers
- High CVA schools were more likely to: encourage students to take responsibility and evaluate their own learning, offer a more personalised curriculum with more 1:1 interactions and 'catch-up' opportunities. They were also more likely to encourage students to become involved in decision making, develop leadership skills and train students in 'emotional intelligence'.
- Outstanding schools (as judged by Ofsted) for their 'quality of teaching' were much more likely to: use 'feedback for learning strategies, provide more 1:1/small group teaching, encourage students to get involved in decision making and have specific strategies for high achievers.
- Outstanding schools (as judged by Ofsted) for their 'behaviour of learners' were more likely to: involve students in decision making, develop leadership skills and target high achievers.

This overall positive picture of Key Stage 3 reported by HoY9 concurs with students' report of their school where they too were very content overall with their experiences in secondary school.

Performing against the odds: Qualitative case studies of 50 children's learning life course

Many of the quantitative findings were in line with information from the case studies of individual students. In the case studies, however, the pathways towards resilience were documented in richer detail and provided insights not possible from quantitative study.

Children who 'perform against the odds' manage to adapt very well to educational processes. In part, this is facilitated by their general ability for learning. However, what makes them stand out even more when we compare them to less successful peers is their apparent positive perception of themselves as learners, their appreciation for what school and education can bring them, and their willingness and ability to build and sustain meaningful relationships with the people around them that actually serve to facilitate their learning. These children actively engage with activities and people that can help them develop their skills and knowledge. For example, they read books for pleasure, join the Sea Cadets or Youth Groups, explain math problems to their friends, feel encouraged by their friends' success in school, discuss their lives and interests with family members and turn to their teachers for guidance and help. They not only reciprocate offers from others to engage in learning experiences, but actively initiate these experiences; i.e. actively regulating their own learning process. As such, these children have learnt to be 'active' agents of their own academic success.

Schools, teachers, peers and other adults can all contribute to children's chances of 'succeeding against the odds' of disadvantage by facilitating their adaptation to education from a young age through to adolescence. Teachers, who are capable, inspiring, and able and willing to meet the specific needs of their students, not only teach academic subjects but contribute to their positive perception of school and learning. Peers and siblings can inspire high aspirations and help children do well by offering help with school work and by offering emotional support that reinforces positive perceptions of themselves as learners and of school in general. Adults, such as family members or members from their wider community, can provide practical help and encouragement that parents might not be able to give due to their financial situation or limited experiences with education or the education system in the UK. All these people can serve as positive role models to which a child can aspire. By supporting children in these ways, these teachers, peers, siblings, family and community members become 'significant others' to the child, helping them maintain and reinforce positive perceptions of themselves as learners and of education as enjoyable and valuable.

However, the qualitative case studies (Siraj-Blatchford et al., 2011a) clearly show that parents in particular play a pivotal role in helping their child 'perform against the odds'. Parents hold the key to many of children's experiences, not just through their own interactions with the child and their involvement with school and learning but also for the learning opportunities they facilitate through their choices about children's experiences in other micro-systems such as schools, extra-curricular activities, community involvement and contact with extended family. Through their own behaviours parents set examples that show children how to behave appropriately but also of what to value and how to achieve goals. Through their own example children model, reinforce and facilitate successful adaptation to school and learning. In some ways the activities and experiences of these children and the beliefs of their parents are similar to activities that are typically associated with success in family life in middle or higher SES families and reflect the socialization pattern of 'concerted cultivation' rather than the pattern of 'accomplishment through natural growth' that is more common among lower SES families (Lareau, 2003). However, effective parenting in low SES families was by no means a mirror image of 'concerted cultivation'.

The children who 'performed against the odds' were definitely 'actively cultivated', in the sense that they were 'educated' and 'cultured' by their parents in a way that 'fits' the educational and social system. Their socialization experiences helped them to use the educational system to make the most of their potential and to extend their cultural capital. Nonetheless, this socialization process of 'cultivation' in many respects was far less 'concerted' than in high SES families, and as such is perhaps better described as 'active cultivation'.

Partly, the childrearing practices of these parents were less obviously 'concerted' because parents simply did not have the economic capital available to high SES parents, so they could not provide their children with similar private tuition or extra-curricular activities. However, the fact that these low SES parents did not necessarily have the equivalence in social and cultural capital as their high SES counterparts seems to be of equal importance. The low SES parents generally had little personal knowledge or family experiences of the cultivation routes that lead children to higher education in general and into the top schools and universities in particular. This for instance meant that parents were unaware of entry exams for particular schools or that additional preparation through private tutoring had become 'the norm' for children sitting the entry exams for selective secondary schools. However, the fact that these parents managed to help their children 'perform against the odds' even without these means and longstanding reference points to educational achievement that were typically available to middle class parents, underlines the strength of their determination to help their child move ahead, their relationships with their children and the emotional support they gave them was a key factor. Unlike the middle class families who were helping their child to aspire to something they as parents had already achieved, these working class parents were helping their child to aspire to something more than they had managed for themselves, in effect to move up the social ladder. These parents were cultivating their children for educational success by promoting their own values and beliefs about the importance of education and simultaneously stimulating them to make a better life for themselves.

The child rearing practices seen in the low SES families with children 'performing against the odds' could perhaps be more appropriately termed as 'active cultivation'. Children become part of society's culture at first by participating in family practices. Through participation they learn what is accepted and expected. The practices these parents used with their children during day-to-day interactions, such as reading together, conversations over shared meals, routines for children to help out with the housework or going out to work and acquiring additional qualifications themselves, socialized these children in ways resulting in skills and beliefs that matched the expectations of society. As a result they could benefit from what society had to offer through schools, teachers, friends and others in their communities. These parents were setting effective examples for their children, through their own efforts in the work place, efforts to better their social and financial positions through additional education and by taking responsibility for their lives and that of their children. They served as valuable role models, demonstrating the value of cultural capital for social and economic status and personal wellbeing.

Like their children who showed educational 'resilience', they too seemed particularly 'resilient' to the hardships they encountered in their lives. Parents used personal experiences (good and bad) to help their children move ahead and as such made the most of the capital they had available. They used their own experiences, resources and strengths to cultivate their child, but often in a less obvious way than the high SES parents. They were aware of certain limitations in their ability to facilitate the child's learning process. As a result, they did not move away from close family ties or religious communities as is often the case in more affluent families, but instead tried to make use of these social networks to find additional sources of support for the child. Additionally, these financially less affluent parents were willing to make substantial personal sacrifices to provide the child with educational outings and family holidays, to pay extra tuition if needed, to have out-of-school classes, additional work books, a computer and internet access, and sometimes even to provide a school uniform. By doing so they once more relayed to the child how much they valued education. In some of the households we visited, heating was turned off despite the winter cold; walls, windows and floors were bare and light bulbs or tea bags were a luxury. Nonetheless, these families welcomed us into their homes and seemed to enjoy the opportunity to talk about their child, their experiences as parents, their beliefs about parenting and education, and about their hopes for their child. They were proud of their children and often also about what they as parents had achieved. This testifies to the determination of these parents to help their child succeed and make a good future for themselves.

Focus on disadvantaged students

Disadvantage and means of combating it

EPPSE research has provided evidence about the powerful influence of various individual and family characteristics that shape children's academic and social-behavioural development from a very young age (evident at age three). These remain significant and important predictors of academic outcomes as children moved through primary school and into adolescence in secondary school. The first phase of the research had, as one of its main foci, the effects of pre-school experiences on children's early development. It soon became apparent that although we identified a positive main effect, pre-school did not influence children's development in isolation but interacted with family characteristics and later schooling. A 'silver thread' running throughout the EPPSE research has been a commitment to studying the ways that disadvantage acts to shape development – from the early years through to the secondary school.

At age 14, many social disadvantages continue to influence teenage outcomes. Of the family factors, mothers' and to a lesser extent fathers' qualification are still very important indicators of disadvantage (no or low qualifications) or advantage (higher qualifications). Measures of low family SES, low or no earned income and FSM are also significant predictors of poorer outcomes but with less strong effects than parental education.

Other important individual level disadvantages that continue to predict poorer outcomes include low birth weight, the early experience of developmental or behavioural problems and being a member of a large family (four or more children). At KS3, the effects of gender are stronger than in primary school, being a boy tended to predict poorer outcomes, as girls tended to do better especially in English. It is possible that KS3 teacher assessments are affected by a 'halo' effect (Harlen, 2004; Strand, 2007) related to student characteristics such as behaviour that may magnify apparent differences. Gender remains a strong predictor of poorer social behaviour in KS3 for 'hyperactivity' and 'anti-social' behaviour. Gender remains a strong predictor of poorer social behaviour in KS3 for 'hyperactivity' and 'anti-social' behaviour.

At age 14 a students' neighbourhood has stronger effects on outcomes than was apparent during primary school. Living in a disadvantaged neighbourhood is an additional constraint that adds to family poverty and increases the risk of poorer educational outcomes, although these effects are relatively small. .Disadvantaged neighbourhoods (measured by indicators such as the IMD and IDACI) predicted poorer educational outcomes for students over and above the impact of their parents' characteristics, including education level, SES or salary.

EPPSE created a single index that 'counts' the number of student's characteristics identified with disadvantage (see Appendix 6). This showed that the experience of multiple disadvantage from a young age shapes academic and social behaviours. Figure 11.1 summarises attainment for English and maths at the end of KS3. The average attainment of students with none or one disadvantage is higher than students with four or more disadvantages.

A number of other research studies, Sammons et al., 1983; Mortimore & Blackstone 1982, Rutter & Madge 1976, and most recently Sabates & Dex 2012 have drawn attention to the cumulative impact of multiple disadvantage that increase the risk of poor educational outcomes.

Figure 11.1: Percentage awarded KS3 Levels 5 and 6 by multiple disadvantage

Percentage awarded KS3 Levels 5 and 6 by multiple disadvantage
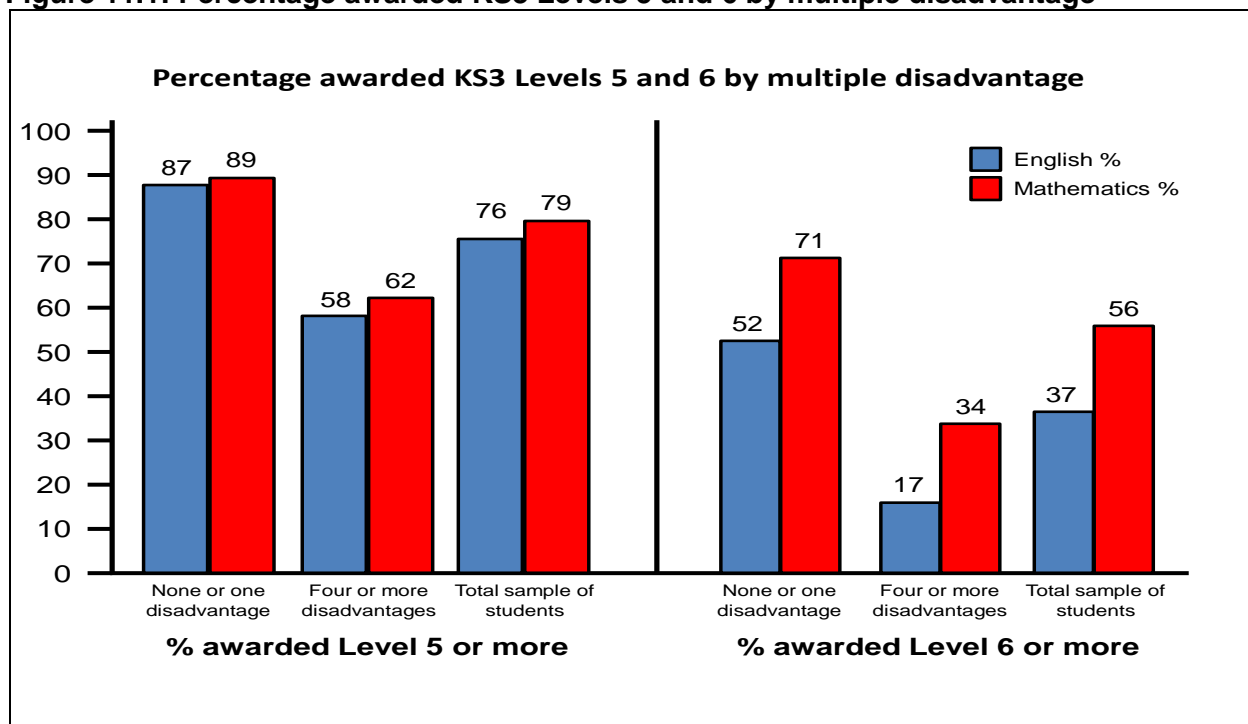
English: N=2644; maths: N=2642

It is important to recognise that while background influences are significant and important predictors they by no means account for *all* the differences in students' educational outcomes at any age. This is important because although there are major differences between social groups (e.g. low versus high SES, or low versus high family income) in average outcomes, there is considerable overlap for *individual* students within each group. An individual student's background does not **determine** exactly how they will turn out. Research can only show statistical patterns that indicate a higher risk of poorer outcomes. The EPPSE analyses show that only around a third of the differences between students in their attainments in the core subjects at the end of KS3 are predicted by their own individual characteristics and those of their families and neighbourhoods. Multiple disadvantage clearly increases the *risk* of poor outcomes, and there are major differences in average attainment between different groups of students, but for any one individual their background by no means accounts for *all* the differences in their educational outcomes. There are many 'outlier' young people and some have been the focus of qualitative case studies of those who 'succeeded against the odds' (Siraj-Blatchford et al., 2011; 2013 forthcoming). . This is a crucial message for teachers and schools since it is important not to compound the effects of existing disadvantage with lower expectations for individuals.

Although the experience of multiple disadvantage is powerful, the picture is not all grim, however, because education can also play an important role in supporting children from disadvantaged families to achieve at school and develop the 'soft skills' such as 'self regulation' and 'pro-social' behaviour that are sought by employers and contribute to harmonious social relationships. Because EPPSE young people have been studied for more than a decade, any positive effects of their early experiences have been identified, especially high quality pre-school and stimulating home environments.

Students of lower qualified parents seem to be more sensitive to the benefits of the quality of the pre-school attended when compared to the students of similar parents who did not attend pre-school. The higher the quality of the pre-school the better students' academic outcome in Year 9, in maths (ES=0.30) and science (ES=0.28). Similarly, students of lower qualified parents benefited more from attending a high and medium effective pre-school (maths ES=0.38; science ES=0.40). For children with parents who have low qualification levels, high quality pre-school

appears to provide some compensation, serving as a protective factor in their development that can ameliorate the adverse impact of disadvantage.

Numerous examples from the qualitative case studies of young people show how positive experiences in pre-school contributed to resilient developmental pathways; many parents told how it was through their child's pre-schooling that they became aware of the child's interests in books and capacity as a learner. The early years HLE was also important as a low HLE increase the risk of low attainment and poorer social behaviour at the end of KS3. Those children with more stimulating home learning environments showed many benefits.

Turning to primary school, again the quality of teaching (as judged by Ofsted) had positive effects on children's development. Although good quality teaching benefitted *all* children in primary school, these benefits matter more for those who are disadvantaged because they tend to begin from a lower base. Although most of the positive benefits of school that were good for poor children were also good for richer ones, they matter more for those who are disadvantaged because of the greater consequences for these children. We found that the academic effectiveness of the primary school attended still predicted EPPSE students'' attainment up to age 14 (for maths and science). The effect of the primary school's academic effectiveness also varied according to the level of parental education. For students whose parents had low educational qualifications, the boost in maths obtained from attending a high academic effective primary school compared to a low one was significantly greater (difference ES=0.33) compared to students from better educated families (difference ES=0.17).

In secondary schools a number of school strategies appear to have a positive effect on student attainment and behaviour. Many findings in this report describe successful school strategies that help to promote positive student outcomes. Whilst many of these strategies improve learning for all students they are especially relevant for those with many of the disadvantages previously discussed in this report. Because such students are at greater risk of poor educational outcomes, and start from a lower base, positive educational experiences can help to ameliorate the adverse impact of disadvantage. From student reports on their own school, wide variations on the 'school behavioural' climate were found. This varied more between schools than 'teacher discipline' in class, 'valuing students' or 'teacher support for pupils'. This is important because the school's overall 'behavioural climate' predicted academic progress across the core subjects during KS3 as well as social behavioural outcomes and 'enjoyment of school'.

An additional significant effect on student progress was the school's 'emphasis on learning', but this did not vary as much between schools as did 'behavioural climate'. Finally, a third facilitating factor was the amount of 'homework' students reported that they did during the week, with more than two hours a night having significant positive effects when compared to fewer hours or none. The impact of time put in to doing homework was important over and above the influence of the student's own family background and neighbourhood effects. Taken together, some school factors were found to be more important than others; all contributed to student outcomes with 'behaviour climate' and 'emphasis on learning' being especially important.

Our analyses of students' reports of their secondary school experiences suggest that students from low income families (who receive Free School Meals) are more likely to attend schools with a poorer 'behavioural climate' and somewhat less 'support for learning'. Because disadvantaged students are at greater risk of poor attainment and other educational outcomes, it is especially important that they attend primary and secondary schools that offer good educational experiences that support better outcomes (a greater 'emphasis on learning', high quality 'resources', better 'teacher support' and especially a 'positive behavioural climate').

This report presents ample evidence that various educational influences (higher quality pre-school, academically effective primary school, high quality teaching, support, and environments that emphasis learning and good behaviour) can help to ameliorate the adverse impact of social disadvantage and on young people's life course.

Using new methods to chart developmental change

Like previous EPPSE reports, 'objective' information gathered from tests, teacher assessments and structured questionnaires has been used to study the influences on student attainment and on developmental change. However, in this report what students tell us is given greater weight in making sense of the developmental data. Their views and experiences contribute towards the telling of a coherent but complicated story about secondary schooling.

This report is more complex than previous EPPSE reports for other reasons as well. It has used multiple imputation strategies for dealing with missing data. For the academic outcomes analyses national assessment tests were available for only two of the four cohorts. Therefore, analyses were conducted on original test scores from half the sample, on the Teacher Assessments (levels) on most of the sample, and on imputed data sets on all of the sample (who had valid data at three or more assessment points). EPPSE has compared several ways of dealing with missing data and is satisfied in the robustness of the imputations.

Longitudinal growth curve analyses were used for the first time in EPPSE to model social-behavioural development (from age 6 to 14) in addition to the multilevel models carried out in earlier EPPSE reports. These showed common paths among groups of students, and allowed new analyses of the effects on trajectories over time and not just on development at single time-points. Some important findings for growth curve analyses concerned the development of self-regulation which increased over the primary years but showed some fall off by Year 9. Interestingly, early experiences (HLE, pre-school quality and effectiveness) predict the initial starting point in Year 1 but also predict developmental change over time between Year 1 and 9. There were also marked differences on social-behavioural trajectories predicted by gender and family SES.

There was a greater emphasis in the KS3 research on studying the students' self-concepts of themselves as learners, here we call them 'dispositions'. EPPSE sets great store in the dispositions that are reported as outcomes but also as predictors of outcomes. In this Key Stage 3 report, the information derived from 'insider' views is considered as important as are the 'outsiders' views of teachers or Ofsted inspectors.

The case studies provide vivid insider views and thus a level of explanation simply not possible in quantitative analysis on its own. The qualitative study (Siraj-Blatchford et al., 2011) focussed on individual children and their families, in contrast to the case studies in the pre-school years that focused on educational institutions. These case 'stories' show parental beliefs, aspirations and practices that support 'positive development against the odds'. The case studies also reveal the beliefs and aspirations of children and families who do not succeed and this contrast show in high relief the processes of 'active cultivation'.

Pulling the threads together

Although many EPPSE findings are similar to those in other research studies, this report shows the *relative* and *historical* (longitudinal) contribution of many 'advantaging' and 'disadvantaging' factors in student pathways. EPPSE has made a strong contribution to our understanding of student attainment, behaviour and disposition by linking these to the educational experiences and practices that support development over time. These school effects are revealing but are best understood alongside those of family or neighbourhood influences.

It is important to stress that all the effects of secondary school reported in EPPSE are over and above those of social background, showing what matters in the education of young people after taking into account detailed background histories. It is because of the richness of the EPPSE data on pre-school and early home experiences that the developmental pathways of young people can be unravelled and understood. Only a large and national sample, studied intensively over time, can do this.

A strong test of an 'influencing' factor is its effect on **change** on academic, social and dispositional outcomes between ages 11 and 14. In our analysis of change, the findings of the longitudinal case studies of children and their families also adds valuable detail to the rather dry quantitative statistical models. The case studies enhance our understanding of the protective factors that promote resilience, and they do this in a level of detail that goes much deeper than test scores, teacher judgements and even the reports of individual students on questionnaires.

Sadly, the findings in this report point to continuing disadvantage in England, to 'downward spirals' in development and to (for a minority of students) dissatisfaction and unhappiness in school. The other side to this coin is the fact that EPPSE has reported on pathways to success, on feelings of confidence and factors associated with them. Schools do make a difference and this report describes some of the factors that underpin their success. Finally the longitudinal nature of the rich EPPSE dataset allowed us to discover the long-term effects of pre-school experiences, especially those of high quality settings. Each student's pre-school and early home learning environment created the 'platform' on which the marks of primary and then secondary school were then etched.

EPPSE 3-14 (1997 – 2011) becomes EPPSE 16+ (1997 – 2013)

This report marks the end of the third phase of the EPPSE programme of research. During this phase all of the EPPSE students have completed Key Stage 3 (age 11 – 14). The fourth phase of the study, funded by the Department of Education, will track the same group of students to the final stage of their compulsory schooling. The EPPSE 3 – 16 (1997 – 2013) project will report on not only what happens to students during their final year of secondary schooling (Year 11) but what happens to them 6 months after this date. The research is concerned with post-16 destinations and will explore how earlier phases of education have helped 'shape' students' pathways beyond compulsory schooling. It will be able to identify young people who follow a:
  a) traditional academic route beyond GCSE's onto AS/A levels;
  b) vocational training;
  c) enter the world of work;
  d) not in education, employment or training (NEET).

The aims of this next phase of the research are to:

- Investigate the relative influence of family background, home learning, pre-school, primary and secondary school experiences on young people's cognitive and social-behavioural outcomes at the end of Key Stage 4 and in terms of early post-16 pathways. It is also the aim to understand how the relative importance of these influences has changed over time (from pre-school to age 16+).

The end of project report is timed for December 2013.

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Glossary of terms

Academic self-concept EPPSE derived two measures of Academic self-concept from Year 9 student questionnaire data:
1) 'Academic self-concept for English'
2) 'Academic self-concept for maths'

Both of the above measures are based on items taken from existing well established 'academic self-concept' scales (Marsh, 1990a; 1990b; Marsh & Hau, 2003; Marsh & Craven, 2006).

Age standardised scores Assessment scores that have been adjusted to take account of the pupil's age at testing. This enables a comparison to be made between the cognitive outcome of an individual pupil, and the relative achievement of a representative sample of pupils in the same age group throughout the country or, in this case, the relative achievement of the EPPE sample.

Anxiety A factor derived from Year 9 student questionnaire items that reflect the degree to which the students feel unhappy, worried, nervous, fearful in new situations, or suffer from minor ailments.

'at risk' The term 'at risk' is a complex one which will differ depending on the particular criteria used. For instance, the definition of possible cognitive 'at risk' status used in the ETYSEN study (see Taggart et al., 2006), based on children's cognitive attainment at entry to pre-school, was a score of one standard deviation (sd) below the mean (in standardised assessments) in relation to national norms (at risk). In the more recent EPPSE case studies, there are various definitions of risk and resilience (see Siraj-Blatchford et al., 2011a).

Anti-social behaviour A social-behavioural construct identified from teachers' ratings about EPPSE students, collected through a pupil profile based on Goodman's (1997) Strength and Difficulties questionnaire. Five items formed the factor 'anti-social' behaviour e.g. Steals from home, school or elsewhere.

British Ability Scales (BAS) This is a battery of assessments specially developed by NFER-Nelson to assess very young pupils' abilities. The assessments used at entry to the EPPE study and at entry to reception were:

Block building - Visual-perceptual matching, especially in spatial orientation (only entry to study)
Naming Vocabulary – Expressive language and knowledge of names
Pattern construction – Non-verbal reasoning and spatial visualisation (only entry to reception)
Picture Similarities – Non-verbal reasoning
Early number concepts – Knowledge of, and problem solving using pre-numerical and numerical concepts (only entry to reception)
Copying – Visual–perceptual matching and fine-motor co-ordination. Used specifically for pupils without English
Verbal comprehension – Receptive language, understanding of oral instructions involving basic language concepts.

Birth weight In the EPPSE research, babies born weighing 2500 grams (5lbs 8oz) or less are defined as below normal birth weight; foetal infant classification is below 1000 grams, very low birth weight is classified as 1001-1005 grams and low birth weight is classified as 1501-2500 grams (Scott and Carran, 1989). When EPPSE uses this measure in analyses, the categories foetal infant (<1000g) and very low birth weight (1001-1005g) are often collapsed into one category due to small numbers in the former group.

Centre/School level variance The proportion of variance in a particular child/student outcome measure (i.e. Year 9 English Teacher Assessment level at the end of Key Stage 3 in secondary school) attributable to differences between individual centres/schools rather than differences between individual children/students.

Citizenship values A factor derived from Year 9 student questionnaire items that relate to how important students feel certain behaviours are such as strong people not picking on weak people, respecting rules and laws, controlling your temper, respecting other's views, and sorting out disagreements without fighting.

Comparative Fit Index (CFI) The CFI is an index of a statistical model fit that takes into account sample size. Values close to 0.95 indicate good fit (Hu & Bentler, 1999).

Compositional effects The influence of a student's peer group on that particular student's individual outcomes.. For example, the influence of attending a school where a high percentage of students are in receipt of Free School Meals (FSM) or come from disadvantaged backgrounds. This influence is irrespective of the characteristics (FSM status) of the individual student in question. For further details see Harker (2001).

Confidence intervals (at 95 or 99%) A range of values which can be expected to include the 'true' value in 95 or 99 out of 100 samples (i.e. if the calculation was repeated using 100 random samples).

Contextualised models Cross-sectional multilevel models exploring individuals' outcomes, while controlling for individual, family and home learning environment characteristics (but not prior attainment).

Controlling for Several variables may influence an outcome and these variables may themselves be associated. Multilevel statistical analyses can calculate the influence of one variable upon an outcome having allowed for the effects of other variables. When this is done the net effect of a variable upon an outcome controlling for other variables can be established.

Correlation A correlation is a measure of statistical association that ranges from + 1 to -1.

Cronbach's alpha (α) A measurement of the internal reliability (or consistency) of the items on a test or questionnaire that ranges between 0 and 1 showing the extent to which the items are measuring the same thing (Reber, 1995). A value greater than 0.7 ($\alpha < 0.7$) suggests that the items consistently reflect the construct that is being measured.

CVA (Contextualised Value Added) Measures of secondary school academic effectiveness derived from KS2-KS4 contextual value added (CVA) indicators produced by the Department for Education (DfE). At the pupil level, the CVA score was calculated as the difference between predicted attainment (i.e., the average attainment achieved by similar pupils) and real attainment in KS4. The predicted attainment was obtained by using multilevel modelling controlling for pupils' prior attainment and adjusting for their background characteristics (i.e., gender, age, ethnicity, SEN, FSM, mobility etc.). For each school, all individual pupil scores were averaged and adjusted for the proportion of pupils attending the school in a specific year. This final averaged score represents the school level CVA and it is presented as a number based around 1000 (for more technical details see http://www.education.gov.uk/performancetables/schools_08/documents.shtml).

Dispositions An overarching term used to refer to factors such as *'enjoyment of school'*, *'academic self concept (English and maths)'*, *'popularity'*, *'citizenship values'* and *'anxiety'*. The EPPSE study derived these factors from questionnaires completed by students in Year 9 called 'All About Me' and 'All About Me in School'.

ECERS-R and ECERS-E The American Early Childhood Environment Rating Scale (ECERS-R) (Harms et al., 1998) is based on child centred pedagogy and also assesses resources for indoor and outdoor play. The English rating scale (ECERS-E) (Sylva et al., 2003) was intended as a supplement to the ECERS-R and was developed specially for the EPPE study to reflect the Desirable Learning Outcomes (which have since been replaced by the Early Learning Goals, the Curriculum Guidance for the Foundation Stage, and the Early Years Foundation Stage). For more information see Sylva et al., (2010).

Educational effectiveness Research design which seeks to explore the effectiveness of educational institutions in promoting a range of child/student outcomes (often academic measures) while controlling for the influence of intake differences in child/student characteristics.

Effect sizes (ES) Effect sizes (ES) provide a measure of the strength of the relationships between different predictors and the outcomes under study. For further information see Elliot & Sammons (2004).

Emphasis on learning A factor derived from Year 9 student questionnaire items that relate to teacher expectations, emphasis on understanding something not just memorising it, teachers believing that it is okay for students to mistakes as long as they learn from them, students wanting to do well in exams, and lessons being challenging.

Enjoyment of school A factor derived from Year 9 student questionnaire items that reflect the degree to which students reported they like lessons and being at school, like answering questions in class, but also how much the student experiences boredom in lessons or feels school is a waste of time.

Factor Analysis (FA) An umbrella term covering a number of statistical procedures that are used to identify a smaller number of factors or dimensions from a larger set of independent variables or items (Reber, 1995). At KS3 EPPSE used:

- Exploratory FA – a type of analyses where no prior (theoretical) knowledge is imposed on the way the items cluster/load.
- Principal Components Analysis (PCA) – a procedure that converts a set of observations of possibly correlated items into a set of values of uncorrelated items called principal components.
- Confirmatory FA – type of factor analyses used where the measure of a factor/construct are tested against a prior (theoretical) knowledge.

Family characteristics Examples of family characteristics are mother's highest qualification level, father's highest qualification level and family socio-economic status (SES).

Free school meals (FSM) An indicator of family poverty.

General Cognitive Ability (GCA) A measure of pupils' overall cognitive ability, incorporating non-verbal and verbal BAS sub-scales.

Growth Curve Modelling "In brief, the objective of growth curve modeling1 is to describe a set of time-ordered, within-person observations using only a few parameters. For example, the intra-individual change over time, or within-person learning, that occurs with practice might be described parsimoniously by two parameters, one indicating an individual's initial level of ability (e.g., intercept), and another indicating linear rate of increase or decline in performance across multiple occasions of measurement (e.g., linear slope)....Growth curve modeling methods also allow us to describe and test hypotheses about individual differences in intra-individual change. By allowing the parameters used to describe intra-individual change to vary between individuals we can also model and examine how (and potentially why) individuals differ in their initial levels of performance (intercept), rates of improvement or decline over time (linear slope), asymptotic levels of performance, etc. Examining how the inter-individual differences in particular aspects of intra-individual change captured by each parameter relate to other inter-individual differences (e.g., covariates such as trait personality) brings us one step closer to understanding how and why individuals follow different paths of development" (Ram & Grimm, 2007; p. 303).

Headteacher qualities A factor derived from Year 9 student questionnaire items that reflect the headteacher making sure that students behave well, their presence around the school and interest in how much students learn.

Hierarchical nature of the data Data that clusters into pre-defined sub-groups or levels within a system (i.e. students, schools, local authorities).

Home learning environment (HLE) characteristics Measures derived from reports from parents (at interview or using parent questionnaires) about what children do at home (with/independent of their parents). There are several HLE measures: early years HLE, KS1 HLE, KS2 HLE (please see Appendix 4 for further details).

Hyperactivity A social-behavioural construct identified from teachers' ratings about EPPSE students, collected through a pupil profile based on Goodman's (1997) Strength and Difficulties questionnaire. Several items formed the factor 'hyperactivity' e.g. Restless, overactive, cannot stay still for long.

Income Deprivation Affecting Children Index (IDACI) The IDACI represents the percentage of children in each SOA that live in families that are income deprived. For further details see Noble et al., (2008).

Index of Multiple Deprivation (IMD) The IMD is a measure of a range of characteristics evident in a neighbourhood. For further details see Noble et al. (2004; 2008).

Internal Reliability/Consistency The degree to which the various parts of a test (items) or other instrument (e.g. questionnaire) measure the same variables/construct (Reber, 1995). An example measure would be ***Cronbach's alpha*** (see earlier).

Intra-centre/school correlation The intra-centre/school correlation measures the extent to which the outcomes from children/students in the same centre/school resemble each other as compared with those from children/students at different centres/schools. The intra-centre/school correlation provides an indication of the extent to which unexplained variance in children's/students' progress (i.e. that not accounted for by prior attainment) may be attributed to differences between centres/schools. This gives an indication of possible variation in pre-school centre/school effectiveness.

Key Stage (KS) The English education system splits students into age phases known as Key Stages as follows: KS1 (age 5-7), KS2 (8-11), KS3 (12-14), KS4 (14-16).

Mean average A measure of central tendency that is calculated by summing a set of values (or scores) and then dividing by the number of values or scores (Reber, 1995).

Multilevel modelling A methodology that allows data to be examined simultaneously at different levels within a system (i.e. children/students, pre-school centres/schools, local authorities), essentially a generalisation of multiple regression.

Multiple Disadvantage Index This measure was developed as part of the Early Years Transition & Special Educational Needs (EYTSEN) Project, which focuses on the identification of children 'at risk' of SEN (see Sammons et al., 2004c). An index was created based on 10 indicators in total: three child variables, six parent variables, and one related to the Early years Home Learning Environment (HLE).

Child variables
- First language: English as an additional language (EAL)
- Large family: 3 or more siblings
- Pre-maturity / low birth weight

Parent/HLE variables
- Mother's highest qualification level: no qualifications
- Social class of father's occupation: Semi-skilled, unskilled, never worked, absent father
- Father not employed
- Young Mother (Age 13-17 at birth of EPPE child)
- Lone parent
- Mother not working / unemployed
- Low Early years Home Learning Environment (HLE)
For further details see Sammons et al., (2002).

Multiple imputation A statistical procedure that replaces missing value with a set of predicted values (Little & Rubin, 1987). This procedure generates several imputed data sets, which are then analysed and the results combined according to Rubin's Rule (Little & Rubin, 1987).

Multiple regression   A method of predicting outcome scores on the basis of the statistical relationship between observed outcome scores and one or more predictor variables.

National Assessment Levels   The table below shows the levels that could be achieved by a student at different ages in their National Assessments tests / can be awarded to a student for their Teacher Assessment (TA).

Outcome	Key Stage 1 (KS1), Age 7	Key Stage 2 (KS2), Age 11	Key Stage 2 (KS3), Age 14
Reading/ English Levels	Working towards level 1 Level 1 **Level 2 – Expected Level** Level 3 Level 4	Level 1 Level 2 Level 3 **Level 4 – Expected Level** Level 5 Level 6	Level 1 Level 2 Level 3 Level 4 **Level 5 – Expected Level** Level 6 Level 7 Level 8
Maths Levels	Working towards level 1 Level 1 **Level 2 – Expected Level** Level 3 Level 4	Level 1 Level 2 Level 3 **Level 4 – Expected Level** Level 5 Level 6	Level 1 Level 2 Level 3 Level 4 **Level 5 – Expected Level** Level 6 Level 7 Level 8
Science Levels	Working towards level 1 Level 1 **Level 2 – Expected Level** Level 3 Level 4	Level 1 Level 2 Level 3 **Level 4 – Expected Level** Level 5 Level 6	Level 1 Level 2 Level 3 Level 4 **Level 5 – Expected Level** Level 6 Level 7 Level 8

Net effect   The unique contribution of a particular variable upon an outcome while other variables are controlled.

Ofsted   The Office for Standards in Education, Children's Services and Skills (Ofsted) inspect and regulate services that care for children and young people, and those providing education and skills for learners of all ages.   See Matthews & Sammons (2004), and the Ofsted website (http://www.ofsted.gov.uk/content) for further details.

Pedagogical strategies   Strategies used by an educator to support learning. These include the face to face interactions with students, the organisation of resources and the assessment practices.

(Poor) behaviour climate   A factor derived from Year 9 student questionnaire items that relate to the general behaviour climate in the EPPSE student's school; students being given a hard time by others if they work hard, level of compliance with school rules, fighting and weapons being brought into school, and whether most students want to leave the school as soon as they can.

Popularity A factor derived from Year 9 student questionnaire items that relate to how popular students feel they are with other teenagers and how many friends they have.

Pre-reading attainment Composite formed by adding together the scores for phonological awareness (rhyme and alliteration) and letter recognition.

Pre-school effectiveness Measures of the effectiveness of pre-schools were derived from Value Added (VA) models of the sample's actual progress during pre-school, controlling for prior attainment and children's background characteristics (Sammons et al., 2004a).

Primary school effectiveness Primary school academic effectiveness scores were obtained from National Assessment data for several cohorts across all primary schools in England. Value-added scores were calculated across the years 2002-4, for each primary school in England and then extracted for schools attended by the EPPE sample (Melhuish et al., 2006a; 2006b).

Prior attainment Measures which describe a participant's achievement at the beginning of the phase or period under investigation (i.e. taken on entry to the study or school, or for Year 9 analyses, outcomes from Year 6).

Pro-social Behaviour A social-behavioural construct identified from teachers' ratings about EPPSE students, collected through a pupil profile based on Goodman's (1997) Strength and Difficulties questionnaire. Several items formed the factor 'pro-social' behaviour e.g. Considerate of other people's feelings.

Pupil Profile An instrument containing Goodman's (1997) Strength and Difficulties questionnaire plus some additional items used to collect information about EPPSE student's social behaviour. It is completed by a teacher who knows the EPPSE student well.

Quality of pre-school Measures of pre-school centre quality were collected through observational assessments (ECERS-R, ECERS-E) completed by trained researchers. For further information see **ECERS** and Sylva et al. (2010).

Quality of secondary schools Secondary school quality was derived from measures taken from Ofsted inspection judgments. See **Ofsted** for further details.

Quality of teaching Measures from Year 5 classroom observations using the IEO (Stipek) and COS-5 (Pianta) instruments. For further information see Sammons et al. (2006a; 2006b).

Root Mean Square Error of Approximation (RMSEA) The RMSEA is an index measure of model; values less than 0.06 are an indication of a good fit.

Sampling profile/procedures The EPPSE sample was constructed of:
Five regions (six Local authorities) randomly selected around the country, but being representative of urban, rural, inner city areas. Pre-schools from each of the 6 main types of target provision (nursery classes, nursery schools, local authority day nurseries, private day nurseries, play groups and integrated centres) randomly selected across the region.

School environment A factor derived from Year 9 student questionnaire items that relate to how EPPSE students view their school in terms of the physical space (the attractiveness of buildings, the decorative state of the classrooms, the condition of the toilets), as well as its reputation as a good school and how well organised it is.

School/learning resources A factor derived from Year 9 student questionnaire items that relate to practical resources for learning at the EPPSE student's school; amount of computers and getting enough time on them in lessons, and the quality of science labs and the school library.

School level variation School level variance here refers to the percentage of variation in students' outcomes that can be attributed to differences between schools.

Secondary school effectiveness Secondary school academic effectiveness scores were obtained from the Department for Education (DfE). The measure of academic effectiveness is represented by the average KS2 to KS4 contextual value added (CVA) school level scores over 4 years (2006-2009) when EPPSE students were in secondary school. See '***CVA***' as this is the same measure.

Self-regulation A social-behavioural construct identified from teachers' ratings about EPPSE students, collected through a pupil profile based on Goodman's (1997) Strength and Difficulties questionnaire. Several items formed the factor 'self-regulation' e.g. Likes to work things out for self; seeks help rarely.

Significance level Criteria for judging whether differences in scores between groups of children/students or centres/schools might have arisen by chance. The most common criteria is the 95% level ($p<0.05$), which can be expected to include the 'true' value in 95 out of 100 samples (i.e. the probability being one in twenty that a difference might have arisen by chance).

Social-behavioural development A student's ability to 'socialise' with other adults and pupils and their general behaviour to others. EPPSE uses this overarching name to refer to a range of social-behavioural outcome measures. At age 14, two of these outcomes refer to positive outcomes ('self-regulation' and 'pro-social' behaviour) and two refer to negative outcomes ('hyperactivity' and 'anti-social' behaviour).

Socio-economic status (SES) Occupational information was collected by means of a parental interview/questionnaire at different time points. The Office of Population Census and Surveys OPCS (1995) Classification of Occupations was used to classify mothers and fathers current employment into one of 8 groups: professional I, other professional non manual II, skilled non manual III, skilled manual III, semi-skilled manual IV, unskilled manual V, never worked and no response. Family SES was obtained by assigning the SES classification based on the parent with the highest occupational status.

Standard deviation (sd) A measure of the spread around the mean in a distribution of numerical scores. In a normal distribution, 68% of cases fall within one standard deviation of the mean and 95% of cases fall within two standard deviations.

Structural equation modelling (SEM) is an umbrella term for statistical modelling techniques which allow for testing causal processes and structural relationships (Byrne, 2010).

Student background characteristics Student background characteristics include age, birth weight, gender, and ethnicity.

Target centre A total of 141 pre-school centres were recruited to the EPPSE research covering 6 types of provision - ***Sampling profile/procedures***. The sample of students was drawn from these target centres.

Teacher Assessment (TA) These assessments made by teachers provide measures of students' educational outcomes for English, maths and science in Year 9 (age 14) in the form of National curriculum levels.

Teacher discipline A factor derived from Year 9 student questionnaire items that relate to the level of teacher control during lessons, in terms of behaviour, noise, rule breaking and teachers being bothered if students turn up late.

Teacher support A factor derived from Year 9 student questionnaire items that relate to support given by teachers in terms of helping students, giving them feedback, making them feel confident about their work, rewarding them for good behaviour, being available to talk privately, and marking and returning homework.

Term of birth Using EPPSE student's dates of birth, the EPPSE sample were categorised into three 'term of birth' categories: Autumn born (September to December); Spring born (January to April); Summer born (May to August).

Total BAS score By combining 4 of the BAS sub-scales (2 verbal and 2 non-verbal) a General Cognitive Ability score or Total BAS score at entry to the study can be computed. This is a measure of overall cognitive ability.

Value added models Longitudinal multilevel models exploring individuals' progress over time, controlling for prior attainment as well as significant individual, family and home learning environment characteristics.

Value added residuals (pre-school effectiveness) Differences between predicted and actual results for pre-school centres (where predicted results are calculated using value added models). See ***Pre-school effectiveness*** for further information.

Value added residuals (primary school academic effectiveness) Differences between predicted and actual results for primary schools measuring pupil progress across KS1 – KS2. For further information see ***Primary school effectiveness*** and Melhuish et al., (2006a; 2006b).

Valuing students A factor derived from Year 9 student questionnaire items that relate to whether the school values students' views, teachers listen to students views, are respectful and friendly to students, teachers are unpleasant to students if they make mistakes.

Views of school An overarching term used to refer to factors such as 'teacher support', 'school environment', 'valuing students', 'headteacher qualities', 'poor behaviour climate', 'emphasis on learning', 'teacher discipline', and 'school/learning resources'. The EPPSE study derived these factors from the questionnaire completed by students in Year 9 called 'All About Me in School'.

Appendix 1: Additional sources of information

The EPPSE website: http://eppe.ioe.ac.uk contains information on the sample, methodology, and many other aspects of the project. The website also contains links to the information listed below (see the 'Publications' sections of each phase of the study). For further information contact Brenda Taggart, Principal Investigator/Research Co-ordinator, 0207 612 6219, b.tagggart@ioe.ac.uk

The Pre-school phase:

End of pre-school phase report and research brief
Final report of the pre-school phase:
http://www.education.gov.uk/publications/eOrderingDownload/SSU-FR-2004-01.pdf
Research brief on the pre-school phase:
http://www.education.gov.uk/publications/eOrderingDownload/SSU-SF-2004-01.pdf

There are twelve technical papers associated with this phase of the research - see http://eppe.ioe.ac.uk
Technical Paper 1 (1999)
An Introduction to the Effective Provision of Pre-School Education (EPPE) Project.
Technical Paper 2 (1999)
Characteristics of the Effective Provision of Pre-School (EPPE Project sample at entry to the study.
Technical Paper 3 (1999)
Contextualising EPPE: Interviews with local authority co-ordinators and manager.
Technical Paper 4 (1999)
Parent, family and child characteristics in relation to type of pre-school and socio-economic differences.
Technical Paper 5 (2000)
Characteristics of the centres in the EPPE sample: Interviews.
Technical Paper 6 (1999)
Characteristics of the centres in the EPPE sample: Observation profiles.
Technical Paper 6A (1999)
Characteristics of pre-school environments.
Technical Paper 7 (2001)
Social-behavioural and cognitive development at 3-4 years in relation to family background.
Technical Paper 8a (2002)
Measuring the impact of pre-school on children's cognitive progress over the pre-school period.
Technical Paper 8b (2003)
Measuring the impact of pre-school on children's social-behavioural development over the pre-school period.
Technical Paper 9 (2004)
Report on age 6 assessments.
Technical Paper 10 (2003)
Intensive case studies of practice across the Foundation Stage.
Intensive case studies of practice across the Foundation Stage. Research Brief No RBX16-03
Technical Paper 11 (2004)
Report on the continuing effects of pre-school education at age 7
Technical Paper 12 (2004)
The final report

Pre-school pedagogy
Researching Effective Pedagogy in the Early Years (REPEY - 2002): Research Report 356
http://www.education.gov.uk/publications/eOrderingDownload/RR356.pdf

The Primary Phase:

End of primary school phase report and research brief
Final report from the primary phase: Pre-school, school and family influences on children's development during Key Stage 2 (2008). Research Report RR061
http://www.education.gov.uk/publications/eOrderingDownload/DCSF-RR061.pdf

Final Report from the Primary Phase: Pre-school, School, and Family Influences on Children's development during Key Stage 2 (Age 7-11 (2008). Research Brief RB061
http://www.education.gov.uk/publications/eOrderingDownload/DCSF-RB061.pdf

Academic outcomes:

Year 5
Influences on children's attainment and progress in Key Stage 2 (2007) Cognitive outcomes in
Year 5. Full Report
http://eppe.ioe.ac.uk/eppe3-11/eppe3-11%20pdfs/eppepapers/DCSF-RR048.pdf

Summary Report (2007): Influences on children's attainment and progress in Key Stage 2 Cognitive outcomes in Year 5. Research Report RR828
http://www.education.gov.uk/publications/eOrderingDownload/RR828.pdf

Influences on children's attainment and progress in Key Stage 2 (2007) Cognitive outcomes in
Year 5. Research Brief RB828
http://www.education.gov.uk/publications/eOrderingDownload/RB828.pdf

Year 6
Influences on children's attainment and progress in Key Stage 2 (2008) Cognitive outcomes in Year 6.
Research Report RR048
http://www.education.gov.uk/publications/eOrderingDownload/DCSF-RR048.pdf

Influences on children's cognitive and social development in Year 6 (2008). Research Brief RB048-049
http://www.education.gov.uk/publications/eOrderingDownload/DCSF-RB048-049.pdf

Social-behavioural outcomes:
Year 5
Influences on children's development and progress in Key Stage 2 (2007) Social-behavioural
outcomes in Year 5. Research Report RR007
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Research Report:
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Research Brief
https://www.education.gov.uk/publications/standard/publicationDetail/Page1/DFE-RB129

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http://www.education.gov.uk/publications/eOrderingDownload/RR356.pdf

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Research Report:
https://www.education.gov.uk/publications/standard/publicationDetail/Page1/DFE-RR129

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http://www.education.gov.uk/publications/eOrderingDownload/DCSF-RB019.pdf

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Early Transitions and Special Educational Needs Study
This sub-study produced 3 technical reports   See http://eppe.ioe.ac.uk
Technical Paper 1 (2002)
Special needs across the pre-School period
Technical Paper 2 (2004)
Special educational needs in the early primary years: Primary school entry to the end of Year 1
Technical Paper 3 (2004)
Special educational needs: The parents' perspective

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
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Appendix 2: Cohort structure of the sample

| Cohort | Date of birth | Pre-school | Key Stage 1 | | | Key Stage 2 | | | | Key Stage 3 | | |
		Entry to study (age 3+)	Entry to Reception (age 5)	Year 1 (age 6)	Year 2 (age 7)	Year 3 (age 8)	Year 4 (age 9)	Year 5 (age 10)	Year 6 (age 11)	Year 7 (age 12)	Year 8 (age 13)	Year 9 (age 14)
1	Sept 92 – Aug 93	Sept 95 – Aug 96	Sept 97 – Aug 98	Sept 98 – Aug 99	**Sept 99 – Aug 00**	Sept 00 – Aug 01	Sept 01 – Aug 02	Sept 02 – Aug 03	**Sept 03 – Aug 04**	Sept 04 – Aug 05	Sept 05 – Aug 06	**Sept 06 – Aug 07**
2	Sept 93 – Aug 94	Sept 96 – Aug 97	Sept 98 – Aug 99	Sept 99 – Aug 00	**Sept 00 – Aug 01**	Sept 01 – Aug 02	Sept 02 – Aug 03	Sept 03 – Aug 04	**Sept 04 – Aug 05**	Sept 05 – Aug 06	Sept 06 – Aug 07	**Sept 07 – Aug 08**
3	Sept 94 – Aug 95	Sept 97 – Aug 98	Sept 99 – Aug 00	Sept 00 – Aug 01	**Sept 01 – Aug 02**	Sept 02 – Aug 03	Sept 03 – Aug 04	Sept 04 – Aug 05	**Sept 05 – Aug 06**	Sept 06 – Aug 07	Sept 07 – Aug 08	**Sept 08 – Aug 09**
4	Sept 95 – Aug 96	Sept 98 – Aug 99	Sept 00 – Aug 01	Sept 01 – Aug 02	**Sept 02 – Aug 03**	Sept 03 – Aug 04	Sept 04 – Aug 05	Sept 05 – Aug 06	**Sept 06 – Aug 07**	Sept 07 – Aug 08	Sept 08 – Aug 09	**Sept 09 – Aug 10**

Key

☐ **Current position of each cohort**

Key Stage (KS) Assessment time points

🟪 **KS1 National Assessments (Year 2)**

🟩 **KS2 National Assessments (Year 6)**

🟨 **KS3 National Assessments (Year 9)**

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Appendix 3: Views of school

Smaller differences between student groups

Table A3.1: Differences in views of school related to gender
Girls were found to be significantly more positive (but with small differences) on the following items:

	% Agreement	
	Girls	*Boys*
I always work hard in class	89	88
Most teachers want me to understand something, not just memorise it	94	91
Teachers will help me if I ask for help	96	94

Table A3.2: Differences in views of school related to family poverty
The following were found to be significant, but with smaller differences:

	% Agreement	
	Entitled to FSM	**Not entitled to FSM**
Teachers don't seem to care whether I work or not	15	8
Teachers make sure it is quiet in class	60	66
The Sports facilities are poor	25	15
The Science labs are good	82	91
We have lots of unexpected changes to our timetable	28	18
We have a lot of supply teachers	59	53
Pupils think this is a good school	70	80
The teachers are friendly	85	92
Teachers make me feel confident about my work	75	77
I am bored in lessons	49	40
Teachers consult pupils about school rules	92	87
Lessons are usually 'challenging' but 'do-able	75	84
The teacher makes the aims of the lesson clear	87	90
I like most of the lessons	78	85
I always feel safe in the playground	77	84
I feel safe to/from school	87	94
I always work hard in class	89	84
Teachers will help me if I ask for help	90	96

Table A3.3: Differences in views of school related to family qualifications
The following were found to be significant, but with smaller differences:

	% Agreement		
	Lowest Qualifications	Middle qualifications	**Highest Qualifications**
Most pupils want to do well in exams	94	96	97
The buildings are attractive	59	59	65
The school has a good library	87	90	90
This school is well organised	85	85	88
We often see the headteacher around the school	78	77	74
Teachers arrive on time for school	87	88	92
I am often bored in class	44	44	35
Teachers check homework has been seen by parents	77	67	63
I get rewards for good behaviour	79	70	67
Teachers don't seem to care whether I work or not	11	10	5
Most teachers make helpful comments on my work	83	84	86
Teachers praise me when I work hard	87	83	82
We have enough computers	78	78	85
Teachers make sure that it is quiet during lessons	61	65	69
Teachers are not bothered if pupils turn up late	15	11	9
I always feel safe in the playground	81	82	87
Most teachers believe that mistakes are OK so long as we learn	88	91	93
Teachers make clear how I should behave	92	91	94
The Science labs are good	87	89	92

Table A3.4: Differences in views of school related Home Learning Environment

The following were found to be significant, but with smaller differences:

	% Agreement				
	Lowest HLE 0 – 13	14 - 19	20 – 24	25 - 32	Highest HLE 33 - 45
I always feel safe in the playground	79	80	80	87	88
Teachers are easily satisfied	45	41	32	34	30
We have lots of unexpected changes to our timetable	28	22	17	19	15
Teachers are available to talk to me privately	79	80	83	84	91
Teachers don't seem to care whether pupils work or not	17	11	8	9	4
Pupils want to do well in exams	95	97	96	95	97
Teachers make sure it is quiet in class	76	61	66	68	65
Other people's bad behaviour often makes it difficult to learn	80	78	72	70	65

Appendix 4 Home Learning Environment (HLE) measures

The early years home learning environment (HLE)

The early years home learning environment (HLE) index is composed of the first seven of the measures below (see Box 9), specifically those deemed the most educationally orientated, and has a scale of 0-49; the frequency of each of the activities being coded on a scale of 0-7 (0 = *not occurring*, 7 = occurring *very frequently*) (Melhuish, Phan, Sylva, Sammons, Siraj-Blatchford, & Taggart, 2008).

The specific items associated with the early years (HLE) measure

> **The early years home learning environment (HLE)**
>
> - Going to the library;
> - being read to;
> - learning activities with the alphabet
> - learning activities with numbers/shapes
> - learning activities with songs/poems/nursery rhymes
> - playing with letters/numbers
> - painting or drawing
> - playing with friends at home
> - playing with friends elsewhere
> - visiting relatives or friends
> - shopping with parent
> - watching TV
> - eating meals with the family
> - having a regular bedtime.

The Key Stage 1 (KS1) home learning environment (HLE)

> **KS1 HLE Factors and the items (from the KS1 Parent Questionnaire) loading on these factors:**
>
> - **Home Computing**
>   The Child plays on computer by themself
>   Respondent plays computer games with the child
>   Respondent uses computer with the child in educational ways
>
> - **Parent-Child enrichment outing/activity outside home**
>   Respondent visits library with the child
>   Respondent does sport/physical activity with the child
>   Respondent goes on educational visits with the child
>
> - **Parent-child one-to-one interactions at home**
>   Respondent plays with the child using toys/games/puzzles
>   Respondent reads to the child
>   Respondent listens to the child read
>
> - **Expressive play**
>   The Child plays 'make believe' or pretend games
>   The Child paints/draws/makes models
>   The Child enjoys dance music and movement

The Key Stage 2 (KS2) home learning environment (HLE)

KS2 HLE Factors and the items (from the KS2 Parent Questionnaire) loading on these factors:

- **Parent-Child Educational Computing**
  (Parent & EPPSE Child) Use the internet for learning (together)
  (Parent & EPPSE Child) Use the internet for play / recreation (together)
  (Parent & EPPSE Child) Use a computer in educational ways (together)
  (EPPSE Child) Uses the internet (on their own)
  (EPPSE Child) Uses the computer for activities related to learning (on their own)

- **Parent-Child Interactive Learning Processes**
  (Parent & EPPSE Child) Sport, dance or physical activities (together)
  (Parent) Joins in with EPPE child during games or play
  (Parent & EPPSE Child) Go on educational visits to museums, nature parks, farm etc.
  (Parent) Teaches (EPPSE Child) a school subject e.g. geography, science, English
  (Parent & EPPSE Child) Visit the library (together)

- **Individual Child Activities**
  (EPPSE Child) Reads on their own
  (EPPSE Child) Paints, draws or makes models (on their own)
  (EPPSE Child) Enjoys dance, music, movement (on their own)

- **Computer Games**
  (Parent & EPPSE Child) Play computer games i.e. Play Station, X-Box etc. (together)
  (Child) Plays computer games i.e. Play Station, X-Box etc. (on their own)

Appendix 5: Exploring outcomes for vulnerable groups at different Key Stages

Previous EPPSE research has explored the net differences in academic outcomes for each background characteristic (e.g. gender), while controlling for other characteristics (see Sylva et al., 2004; Sammons et al., 2008a; 2008b; 2011a). This part of the report provides a summary of the differences in attainment between particular groups of EPPSE students in **absolute** terms at three time points (ages 7, 11 and 14 years old). Thus, the overall attainment gap between different groups is examined, as well as how this changes over time.

A number of key groups have been identified that are of policy interest, especially in relation to the 'narrowing the gaps' priority and promoting educational equity (The Equalities Review, 2007; Field, 2010). These key groups have been shown to have a greater risk of lower educational attainment (The EPPE 3-11 Team, 2007). Therefore, there is interest in following up their educational outcomes at different ages in order to examine the ways their patterns change over the course of their school careers.

The analyses reported here focus on the following academic outcomes[39]: National Assessment tests and Teachers Assessments (TAs) at Key Stage 1 (KS1; Year 2, age 7), Key Stage 2 (KS2; Year 6, age 11), and Key Stage 3 (KS3; Year 9, age 14).

Test levels were assigned according to the students' score on the particular subject test each year. Test levels are ordinal categories (see Sammons et al., 2004a; Sammons et al., 2008a; Sammons et al., 2011a)[40]. In addition to test levels, data were also collected on students' individual test scores within levels. This allowed the creation of more finely differentiated outcome measures, which were also age standardised and normalised (mean=100; standard deviation=15). Using age-standardised scores enables a comparison to be made between the mean average attainments of different groups relative to their performance at other time points. However, when exploring the differences in attainment in relation to *Term of birth* (see Glossary), the raw scores were used (instead of age standardised scores) so, that any differences between the groups of pupils born at different times of the year could be identified. The analyses for *Term of birth* used the proportion of the sample standard deviation (SD) of the outcome[41] in order to compare any gaps between groups across time points. However, because these analyses used the raw test scores, the sample standard deviation changes for each outcome.

At the end of each Key Stage, each student should have received a Teacher Assessment (TA) level for the core subjects (English, maths and science) from the teacher who teaches them for each subject (or equivalent). TA levels are less differentiated measures of attainment compared to tests; TA levels are only ordinal categories placing students into a few ranked attainment groups.

The results for attainment in National Assessment Tests at the end of KS3 are reported in terms of age standardised scores for only two of the four cohorts[42] of the EPPSE sample, so should therefore be interpreted with caution. However, the results for attainment are also reported across all four cohorts using the less well-differentiated TA levels. Nationally, there have been some changes in the proportions of students in the Year 9 age cohort rated as level 5 plus over the 4 years spanned by students in the EPPE sample , reflecting a rising trend in national assessment results at KS3. In addition to academic attainment, these analyses also explored

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[39] For further information about the academic outcomes used in these analyses please see Sammons et al., (2012 forthcoming).

[40] For further information on levels and tiers, see Sammons et al., (2012 forthcoming).

[41] This measure was calculated by dividing the difference in means for the two groups by the outcome's standard deviation for the whole sample.

[42] In October 2008, the KS3 National Assessments were changed to just Teacher Assessment (TA) levels resulting in no statutory obligation on schools to conduct national tests. This posed a challenge for the EPPSE project, as subsequently there were no results for the KS3 National Assessment tests for two of the four cohorts of the EPPSE sample. For further details and analyses involving cognitive outcomes, see Sammons et al., (2011).

the likelihood of specific groups of EPPSE pupils *ever having been recognised as having a Special Educational Need (SEN) at the end of KS1* (e.g. boys versus girls).

Overview of findings

Table A5.1 shows the differences in mean average scores for different groups of EPPSE students at three time points (end of KS1, KS2, and KS3).

Girls achieved higher mean average scores than boys in reading/English at KS1, KS2, and KS3. In contrast, boys achieved higher mean average scores than girls in maths at KS1 and KS2. However, by the end of KS3 girls have caught up, having attained similar average scores to boys.

Autumn born students achieved higher mean average scores than Summer born pupils in reading/English at the end of all three key stages, although only just at KS3. However, in maths Autumn born pupils outperformed Summer born pupils at the end of only KS1 and KS2. By the end of KS3, Summer born pupils have caught up in maths. There is evidence that the age gap has narrowed from age 7 to 14.

Students from high socio-economic status (SES) families achieved higher mean average scores than those from Low SES families in reading/English and in maths at the end of all three Key Stages. The differences in mean average scores for family SES were equal to, or above, three quarters (0.74) of one sample standard deviation at all three time points.

Mother's qualification level showed a consistent pattern; students whose mothers had a degree or higher achieved higher mean average scores than whose mothers had a low qualification level (None) at all three time points. The differences in mean average scores were particularly large for mother's qualification level, being equal to more than one sample standard deviation for both English and maths at the end of KS2 and KS3.

At the end of all three key stages, students whose families had a high income (£37,500+) outperformed those whose families had a low income (No earned income), in terms of mean average scores for reading/English and maths. At the end of KS2 and KS3, the differences were close to being equal to one sample standard deviation. A similar pattern was found for free school meals (FSM), with students who had been in receipt of FSM having lower mean average scores for reading/English and maths at all three time points than those not in receipt of FSM; the differences were equal to or above half of one sample standard deviation.

Table A5.1: Summary of differences* in mean average test scores achieved in National Assessments for key groups

Time points	Key Stage 1 (KS1)		Key Stage 2 (KS2)		Key Stage 3 (KS3)	
Outcome[+]	Reading	maths	English	maths	English	maths
Child characteristics						
Gender (boys v girls)	0.26 (Girls)	0.05 (Boys)	0.30 (Girls)	0.14 (Boys)	0.42 (Girls)	0.001 (Girls)
Term of birth (summer v autumn)	0.08[#]	0.48	0.31	0.27	0.03	0.06
Key family characteristics						
Family highest SES (low v high)	0.90	0.74	0.88	0.85	1.02	1.04
Mother's qualification (low v high)	1.20	0.98	1.24	1.19	1.31	1.37
Family earned income (none v high)	0.89	0.76	0.91	0.88	0.90	0.99
Free school meals (FSM v non)	0.62	0.55	0.58	0.50	0.62	0.61
Multiple disadvantage (low v high)	1.01	0.80	0.84	0.77	0.90	0.93
Home Learning Environment (HLE)						
Early years HLE (low v high)	1.30	0.95	1.14	0.82	1.24	1.12

* The differences are reported as the proportion of the sample standard deviation (SD) - calculated as (Mean1 – Mean2)/SD, where the SD≈15. The exception to this is where raw scores were used for Term of birth, and the SD varied for each outcome.

[+] The groups that had the higher mean average scores are specified.

[#]Pupils were entered for the Level 2 and/or Level 3 Reading Test at the end of KS1; the Level 2 differences are provided in the table above; The Level 3 difference is 0.22, Autumn born pupils having the higher mean average score.

Students who had a low score on the multiple disadvantage index (i.e. less disadvantaged – see Glossary) had higher mean average scores for reading/English and maths than those students who had a high score on the multiple disadvantage index (i.e. more disadvantaged) at KS1, KS2 and KS3. The differences in mean average scores were above three quarters of one sample standard deviation at all three time points. Those pupils who had a high score for early years Home Learning Environment (HLE) index had higher mean average scores for reading/English and maths at all three time points than those who had a low score for the HLE index. The differences in mean average scores were above three quarters of one sample standard deviation at all three key stages.

In summary, students from high SES families, whose mothers had a high qualification level (degree or higher), whose families had a high income (£37,500+), who were not in receipt of FSM, who had a low score on the multiple disadvantage index, and a high scoring early years HLE, had higher mean average scores in reading/English and maths at the end of KS1, KS2 and KS3 when compared to students without these advantages (see Table A5.1).

When exploring the relationship between the Teacher Assessment (TA) levels awarded at each of the three time points and various background characteristics patterns were found that were similar to those from the test score analyses (see Table A5.2).

Table A5.2: Summary of differences* in mean average Teacher Assessment (TA) Levels awarded for key groups

Time points	Key Stage 1 (KS1)		Key Stage 2 (KS2)		Key Stage 3 (KS3)	
Outcome[+]	English	maths	English	maths	English	maths
Child characteristics						
Gender (Boys vs. Girls)	0.30 (Girls)	No difference	0.28 (Girls)	0.013 (Boys)	0.38 (Girls)	0.015 (Girls)
Term of birth (summer v autumn	0.38	0.43	0.21	0.24	0.17	0.20
Key family characteristics						
Family Highest SES (low v high)	0.74	0.75	0.85	0.80	0.86	0.90
Mother's qualification level (low v high degree)	0.96	0.88	1.14	1.05	1.27	1.20
Family earned income (none v high)	0.77	0.68	0.88	0.84	0.92	0.91
Free school meals (FSM v non)	0.57	0.49	0.56	0.45	0.58	0.58
Multiple disadvantage (low v high)	0.82	0.75	0.91	0.75	0.86	0.86
Home Learning Environment (HLE)						
Early years HLE (low v high)	1.18	0.96	1.14	0.91	1.02	0.96

* The differences are reported as the proportion of the sample standard deviation (SD) - calculated as (Mean1 – Mean2)/SD, where the SD≈15. The exception to this is where raw scores were used for Term of birth, and the SD varied for each outcome.
[+] The groups that had the higher mean average scores are specified.

Girls had a higher mean average TA level for English than boys at the end of KS1, KS2 and KS3. However, the average TA level for maths at the end of KS1 was the same for boys and girls, with boys having a higher TA level for maths at the end of KS2. By the end of KS3, girls were more likely to have a higher mean average TA level in maths than boys (see Table A5.2). At the end of KS3, a higher percentage of girls compared to boys were awarded a Level 5, or above, for their KS3 TA for both English and maths, although the gap is quite small (a difference of 4%) for maths. A very similar percentage of girls and boys were awarded a KS3 TA for maths that was above the expected level (6 or more), while in contrast girls were still much more likely than boys to be awarded above the expected level (6 or more) for their KS3 TA for English (see Figure A5.1).
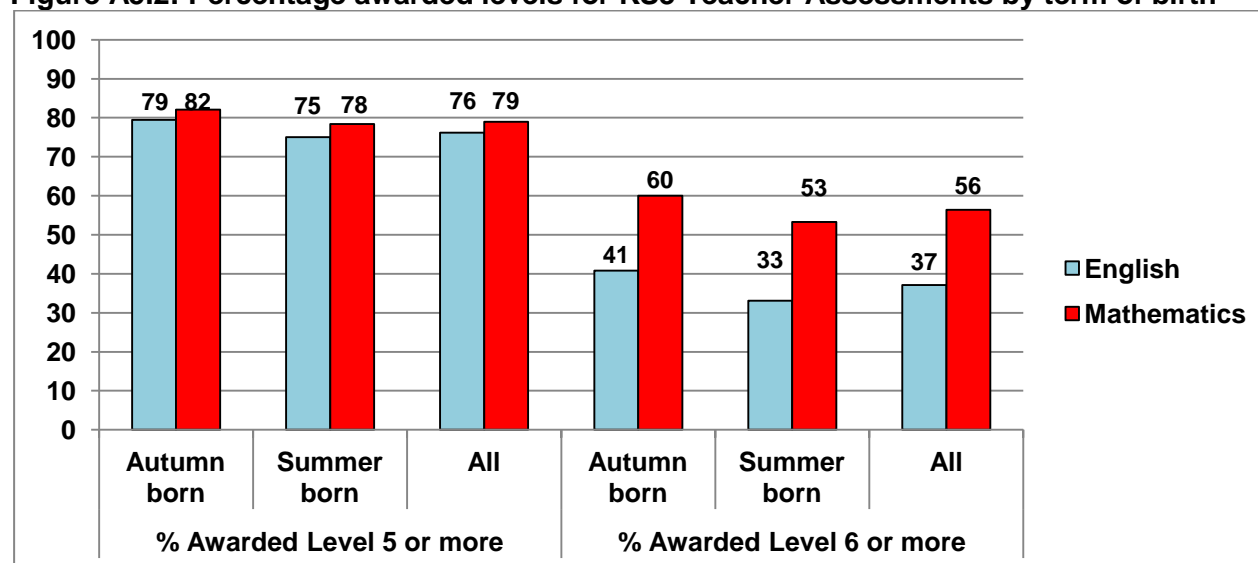
Figure A5.1: Percentage awarded levels for KS3 Teacher Assessments by gender
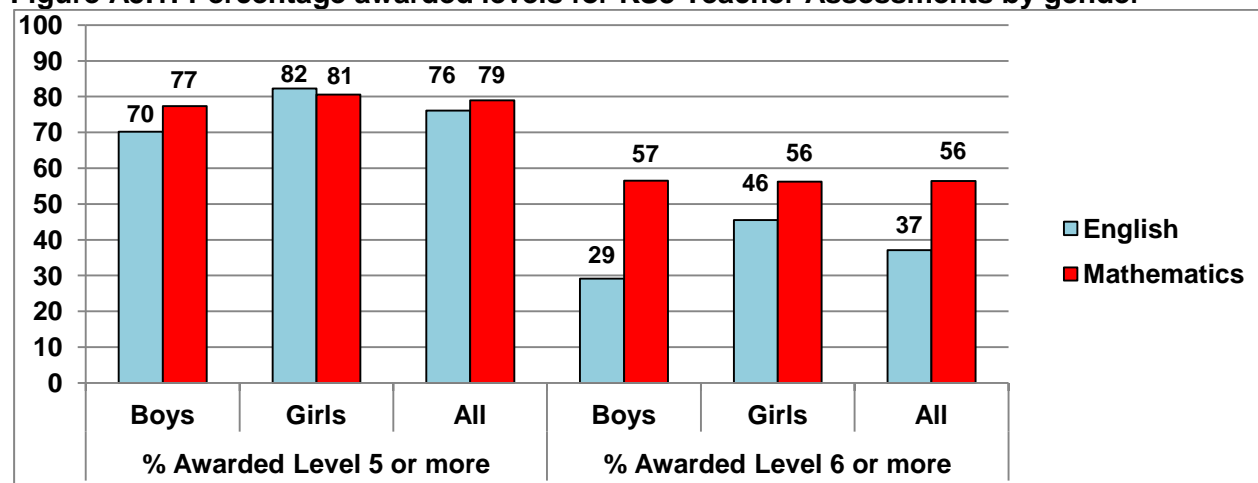
English: N=2644; maths: N=2642

Autumn born students had a higher mean average TA level for English than Summer born pupils at KS1, KS2, and KS3, although the gap narrowed as students got older (see Table A5.2). Autumn born pupils also had a higher mean average TA level for maths at all three time points than Summer born pupils, although again the gap had narrowed somewhat since the beginning of primary school (see Figure A5.2).

Figure A5.2: Percentage awarded levels for KS3 Teacher Assessments by term of birth

English: N=2644; maths: N=2642

A higher percentage of Autumn students than Summer born pupils were awarded KS3 TA levels for English and maths at the expected level (5) or more (see Figure A5.2), although the differences are small (4%). In contrast, a much higher percentage of Autumn born students compared to Summer born pupils were awarded KS3 TAs for English and maths at above the expected level (6 or more).

At all three time points, students who were from high SES families consistently had a higher mean average TA level for both English and maths than those from low SES families (see Table A5.2). The differences in mean average TA levels were equal to, or above, three quarters (0.74) of one sample standard deviation at all three time points, getting closer to one sample standard deviation by KS3. At KS3, a greater percentage of students from high SES families than low SES families were awarded a TA level for English and maths that was at the expected level or above. The same pattern is seen when looking at the percentage awarded above the expected level (see Figure A5.3).

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Figure A5.3: Percentage awarded levels for KS3 Teacher Assessments by socio-economic status (SES)
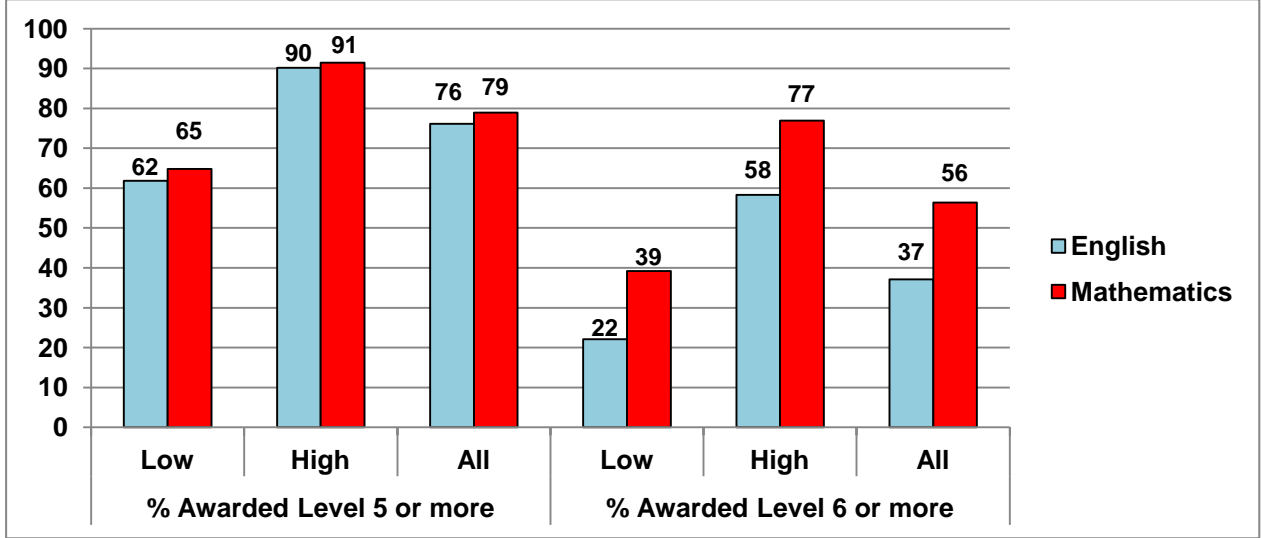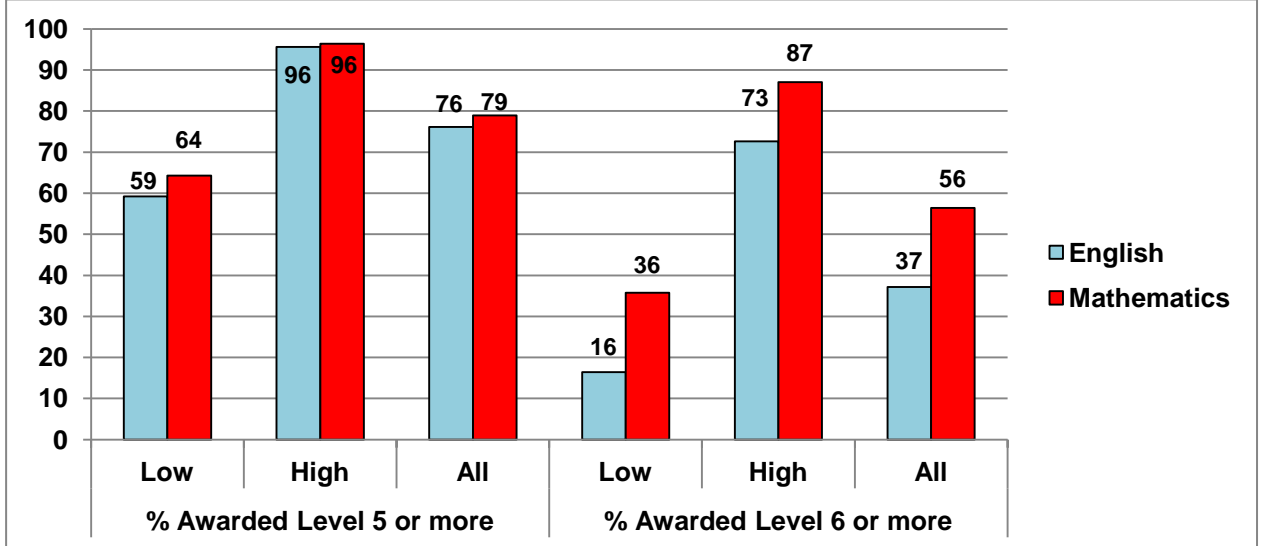

English: N=2644; maths: N=2642

At all three time points, students whose mothers had a degree or higher consistently had higher mean average TA levels for both English and maths than those whose mothers had a low qualification level (None) (see Table A5.2). The differences in mean average TA levels were particularly large for mother's qualifications, being equal to more than one sample standard deviation for both English and maths at the end of KS2 and KS3.

When examining the percentages of students awarded KS3 TA levels for English and maths at the expected level or more, and above the expected level, the differences between students whose mothers had a degree or higher and those whose mothers had a low qualification (None) were also large (see Figure A5.4).

Figure A5.4: Percentage awarded levels for KS3 Teacher Assessments by mother's qualification level

English: N=2644; maths: N=2642

At the end of KS1, KS2, and KS3, pupils whose families had a High income (£37,500+) outperformed the pupils whose families had a Low income (No earned income), in terms of the average TA level awarded to them for English and maths. The differences in mean average TA levels were larger than two-thirds of one sample standard deviation (see Table A5.2) at all three time points. At KS3, a higher percentage of those pupils whose families had a High income (£37,500+) were awarded a Level 5 or more, and level 6 or more, for their TAs for English and maths, than the percentage of pupils whose families had a Low income (see Figure A5.5).

Figure A5.5: Percentage Awarded Levels for KS3 Teacher Assessments by family income
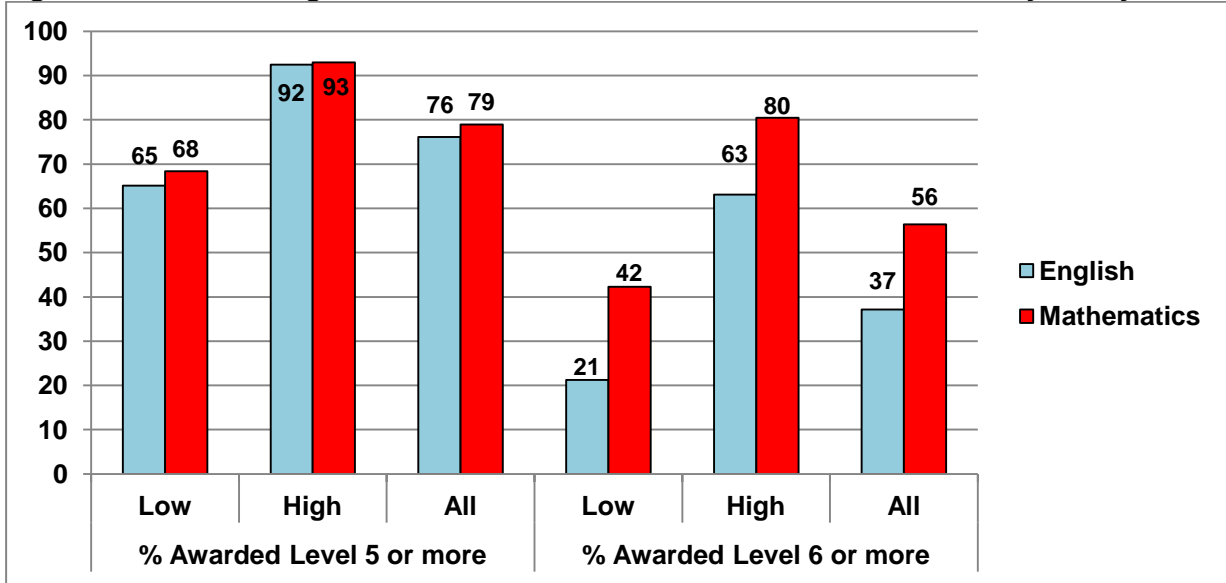
English: N=2644; maths: N=2642

At all three time points, pupils who had been in receipt of free school meals (FSM) were awarded consistently lower mean average TA levels for English and maths than pupils who had not been in receipt of FSM (see Table A5.2). At the end of KS3, a higher percentage of those pupils who had not been in receipt of FSM were awarded a level 5 or more, and level 6 or more, for their TAs for English and Maths, than the percentage of those pupils who had been in receipt of FSM (see Figure A5.6).

Figure A5.6: Percentage Awarded Levels for KS3 Teacher Assessments by FSM
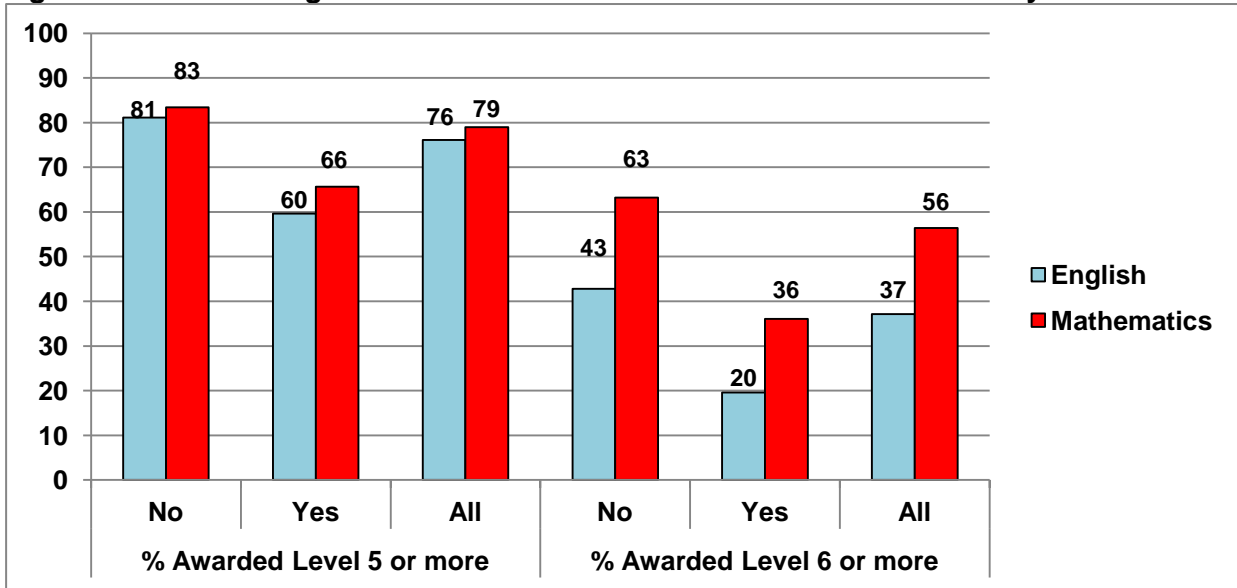
English: N=2644; maths: N=2642

Those pupils who had High multiple disadvantage consistently had lower mean average TA levels for both English and maths than those pupils who had Low multiple disadvantage. The differences in mean average TA levels were equal to, or above, three quarters of one sample standard deviation at all three key stages (see Table A5.2). By the end of KS3, a lower percentage of pupils who had a High multiple disadvantage were awarded a level 5 or more, and level 6 or more, for their TAs for English and maths, than the percentage of pupils who had a Low multiple disadvantage (see Figure A5.7).

Figure A5.7: Percentage Awarded Levels for KS3 Teacher Assessments by Multiple Disadvantage
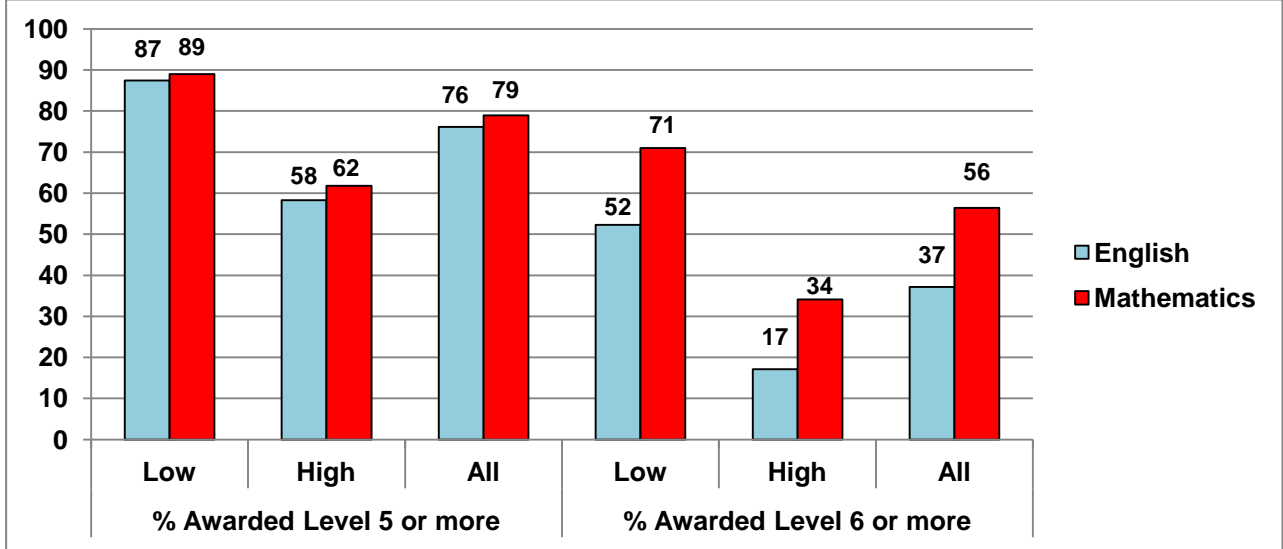
English: N=2644; maths: N=2642

Students whose families had a Low score on the early years home learning environment (HLE) index, also consistently had lower mean average TA levels for both English and maths compared to those pupils whose families had a High score on the early years HLE index. The differences in mean average TA levels were particularly large for the early years HLE, being equal to more than one sample standard deviation for English and more than nine-tenths of one sample standard deviation for maths at all three time points (see Table A5.2). At the end of KS3, those pupils who had a High score on the early years HLE index were more likely to have been awarded the expected level or above, or above the expected level, for their TA levels for English and maths (see Figure A5.8).

Figure A5.8: Percentage Awarded Levels for KS3 Teacher Assessments by Early Years HLE
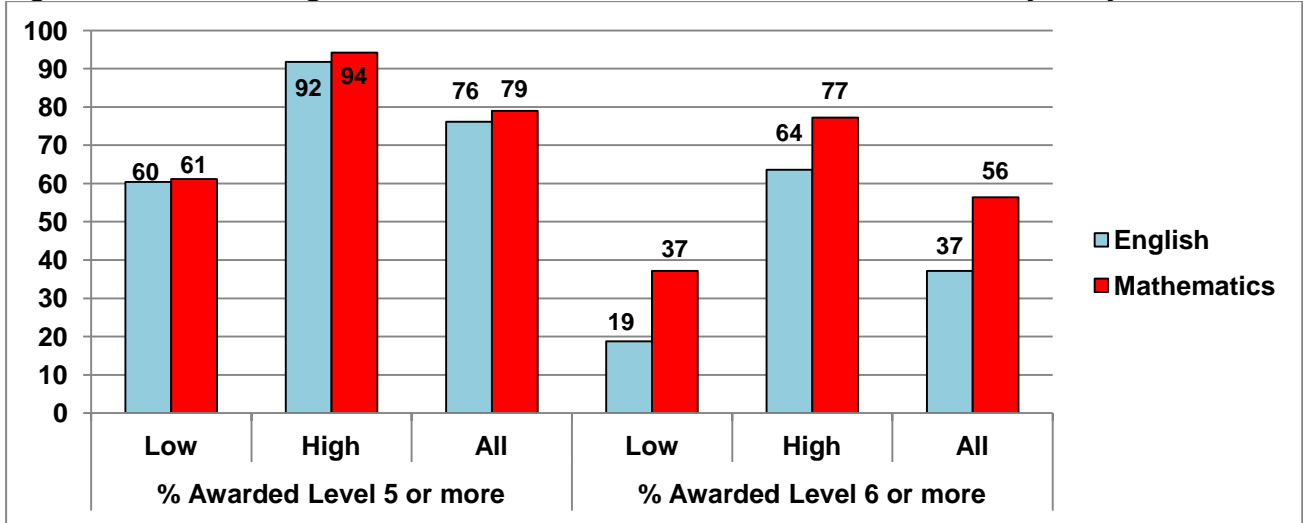
English: N=2644; maths: N=2642

In summary, pupils who were from High SES families, whose mothers had a High qualification level (degree or higher), whose families had a High income (£37,500+), who had not been in receipt of FSM, who had a Low score on the multiple disadvantage index, and who had a High scoring Early years HLE were awarded higher mean average TA levels for English and maths at KS1, KS2 and KS3 than pupils who were from Low SES families, whose mothers had a Low qualification level (None), whose families had a Low income (No earned income), who had been in receipt of FSM, who had a High score on the multiple disadvantage index, and who had a Low scoring Early years HLE (see Table A5.2).

EPPSE has previously explored characteristics associated with pupils having SEN (see Taggart et al., 2006; Anders et al., 2010). Class teachers completed a social-behavioural profile for each EPPSE child in Year 2, at the end of KS1. This profile included a question that asked whether the child had, 'ever been recognised as having special educational needs?' According to their class teachers, nearly three out of ten EPPSE pupils had been recognised as having special educational needs (SEN) by the end of KS1. Differences in this measure were explored in relation to various child, family and home learning environment (HLE) characteristics: gender, family SES, mother's qualification level, early years HLE, family income, FSM, multiple disadvantage index and term of birth (please see the Glossary for further information about some of these measures).

By the end of KS3, boys, children who were born in the summer, who were from Low SES families, whose mothers had a Low qualification level (None), whose parents had a Low income (None), who had been in receipt of FSM, who had a High score on the multiple disadvantage index, and whose families had a Low scoring early years HLE, were more likely to 'have ever been recognised as having special educational needs' (SEN), than girls, children who were born in the autumn, who were from High SES families, whose mothers had a High qualification level (degree or higher), whose parents had a High income (£37,500+), who had not been not in receipt of FSM, who had a Low score on the multiple disadvantage index, and whose families had a High scoring Early years HLE.

Summary and Implications

These analyses highlight in absolute terms the key child, family, and home learning environment (HLE), characteristics that appear to be linked to children's vulnerability for lower attainment and greater likelihood of being recognised as having special educational needs (SEN) by the end of KS1. These analyses also illustrate that the gaps are significantly larger in relation to some characteristics than others (e.g. mother's qualification level and early years HLE), and the way they change across students' educational careers. For example, gender differences are modest but increase for English to KS3, whereas the pattern for maths is different. Term of birth age effects lessen by KS3; the 'gap' remains stable for early years HLE and mother's qualification level.

Additional EPPSE analyses (Sammons et al., 2011a) have explored the same relationships between these key child, family and home learning environment (HLE) characteristics and KS3 cognitive outcomes but in terms of net differences rather than absolute differences. Similar analyses have previously been conducted using outcomes from the end of KS1 and KS2 (Sammons et al., 2004a; 2008a; 2008b).

The size of the absolute attainment gap has important implications for students' longer term educational and employment prospects. Successive UK governments have paid attention to this important topic during the time the EPPSE students were in school. However, other research (Sammons, 2008) has shown that there has been greater success in raising standards of attainment for all groups, and reducing the number of poorly performing schools during the period 1996 to 2008, than in narrowing the equity gap related to social disadvantage.

Appendix 6: Characteristics in the multiple 'at risk' index

Child Characteristics	Disadvantage Indicator
First language	English not first language
Large family	3 or more siblings
Pre-mature/Low birth weight	Premature or below 2500 grams
Parent Characteristic	
Mother's highest qualification	No qualifications
Social class of father's occupation	Semi-skilled, unskilled, never worked, absent father
Father's employment status	Not employed
Young mother	Age 13-17 at birth of EPPE child
Lone parent	Single parent
Mother's employment status	Unemployed
Home learning environment	
Home learning environment index score	Bottom quartile

March 2012