Department for Education

Students' educational and developmental outcomes at age 16

Effective Pre-school, Primary and Secondary Education (EPPSE 3-16) Project

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The views expressed in this report are the authors' and do not necessarily reflect those of the Department for Education

Contents

Contents of Tables

Contents of Figures

Executive summary

This report focuses on a large number of teenagers poised at the start of young adulthood. Most have continued after compulsory schooling to study further academic qualifications (typically 'AS/A' levels), some were following more vocational routes, and a small number were NEET ('not in education, employment or training'). All are drawn from a national study of the developmental pathways of children and young people. The Effective Pre-school, Primary and Secondary Education (EPPSE) study has followed nearly 2600 young people from early childhood to age 16. The findings from seven technical reports on the young people at age 16 are summarised here to explore the most important influences on developmental pathways that lead to GCSE achievement, mental well-being, social behaviours and aspirations for the future, all at the end of statutory education (age 16).

The overall aim of this large-scale longitudinal study is to explore individual, family, home learning environment (HLE), pre-school, school and neighbourhood influences on the developmental and educational outcomes of young people. More specifically the EPPSE study at age 16 aims to investigate:

- the influence of family background, home and out of school learning on young people's academic results, dispositions and social-behavioural outcomes at age 16, followed by career path destinations at age 16+
- the influence of pre-school, primary and secondary school in shaping variations in outcomes
- changes in the patterns of influence across different phases in education
- how far experiences and outcomes differ for particular groups of students e.g., boys or girls, those who are disadvantaged by family background or poverty or who have additional needs
- the long term effects of pre-school and the estimated economic benefits of pre-school experience to individuals/households income and predicted subsequent contribution to the Exchequer.

Tracking the EPPSE Sample

A nationally representative sample of 141 pre-school settings (representing six types of pre-school) was drawn in 1997 from five English regions (six Local Authorities). Approximately twenty children were recruited from each setting and assessed at baseline and again on entry to reception class in primary school. They were joined in reception by just over 300 children who had little or no pre-school education (the 'home' group), bringing the sample to 3172. These children were followed up at ages 6, 7, 10 and 11 in primary school and at ages 14 and 16 in secondary school[1]. In this report GCSE outcomes and other information has been collated for students remaining (around 80%) from the original sample, although numbers vary depending on the outcome being studied.

We surveyed young people about their secondary school experiences in Year 11. Then six months after finishing Year 11 the young people were sent a postal questionnaire asking about their current studies, training and/or employment. After 13 years of data collection from all of this large sample, this report considers 'hard' academic outcomes such as GCSE performance and further study/employment destinations post 16, along with 'soft' outcomes such as mental well-being and resistance to peer pressure, aspirations, dispositions, social-behavioural development and experiences of secondary school.

Analytical strategy

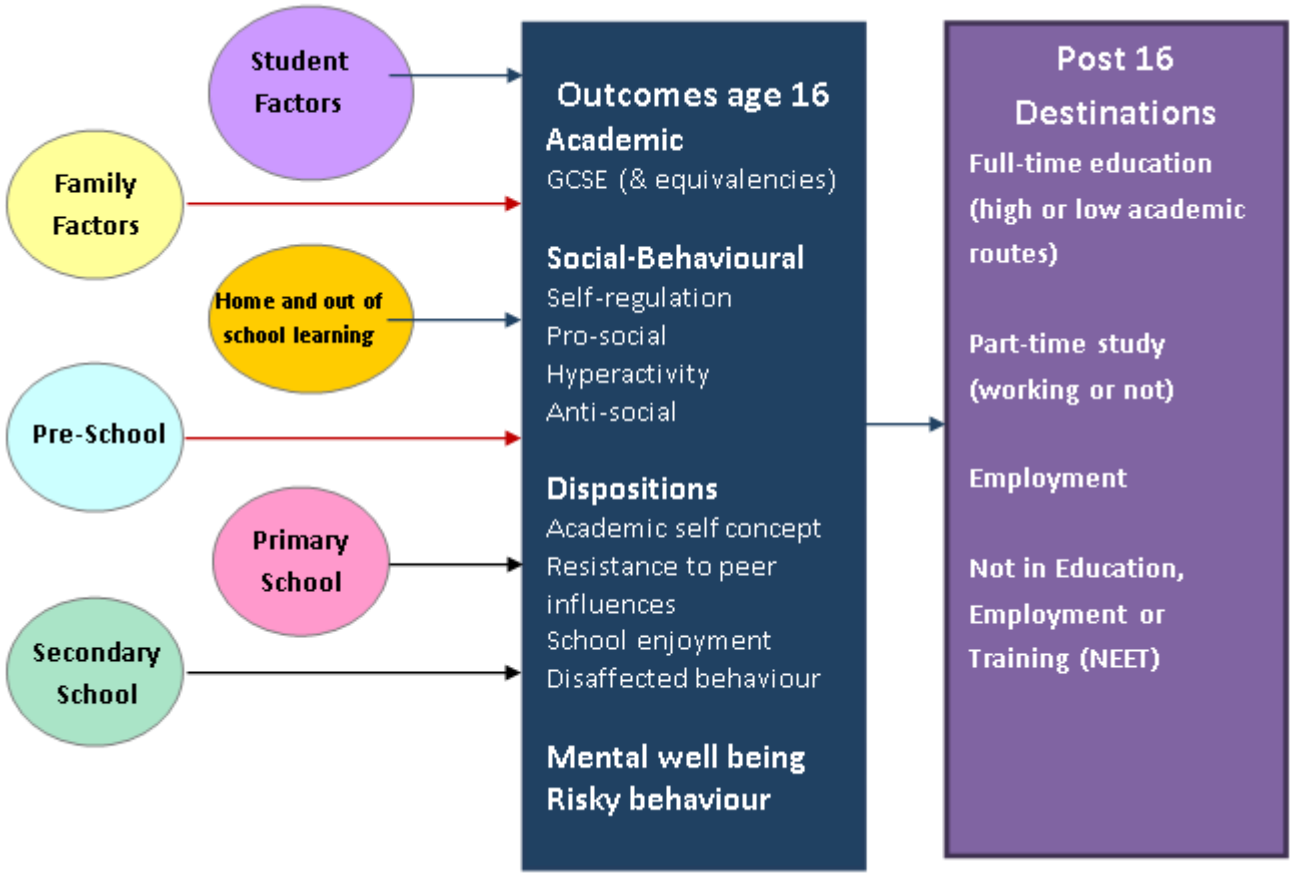
The effects associated with pre-school, primary and secondary school education can only be estimated if proper account is taken of background characteristics that also influence development (see Figure **1**).

In the statistical analyses, multilevel modelling was used as it capitalizes on the hierarchical nature of the data with students clustered within schools. The statistical techniques used by EPPSE ranged from descriptive analysis to multilevel (hierarchical) regression methods, and were all used to examine the way various individual student, family, home learning environment (HLE) and school characteristics influence (1) students' academic and social-behavioural outcomes at age 16 and (2) developmental progress between KS2 and KS4.

1 Assessment points: Key Stage 1 = Year 1 and 2; Key Stage 2 = Year 5 and 6; Key Stage 3 = Year 9; Key Stage 4 = Year 11.

When the effects of different characteristics such as gender, parents' qualifications or family poverty (to name but a few) are reported they are calculated net of other influences in the statistical models. This is important because it shows the relative strength of different sources of influence (individual, family, HLE, neighbourhood, or school experience) as predictors of different outcomes.

Figure 1: Influences on students' education and development, and their post 16 destinations



The multilevel modelling approach outlined above has been supplemented in this report by separate analyses that have estimated the future life time earnings of individuals and households on the basis of their pre-school experiences. These economic analyses (conducted by a team at the Institute for Financial Studies) estimate some future financial returns of society's investment in early education and savings to the Exchequer.

Measures

The Key Stage 4 (KS4) academic outcomes studied here are those related to both 'quantity' (total number of GCSE entries) and 'standards' (GCSE points score, English and maths grades) including important benchmark indicators that affect post 16 opportunities open to young people (achieving 5 or more GCSEs A*-C, achieving 5 more GCSE A*- C including English and maths, achieving the English Baccalaureate).

Social-behavioural outcomes were studied using an extended Pupil Profile that measured two positive behaviours, self-regulation and pro-social behaviour, and two negative behaviours, hyperactivity and anti-social behaviour.

Four student dispositions were identified from responses to the 'Life in Year 11' questionnaire. These were: 'School enjoyment', 'General academic self-concept, 'Resistance to peer influence' and 'Disaffected behaviour'. This report also introduces the use of the Warwick-Edinburgh 'Mental well-being' scale (Tennant et al., 2007) a developmental measure of positive and negative aspects of psychological adjustment, not just the absence of disorder. In addition, students' reports of their health and engagement in 'risky behaviours' have been examined and their post 16 destinations.

Key findings

1. The enduring legacy of pre-school

EPPSE began in 1997 as a study of the effects of pre-school up to age 7, with the first EPPSE plant growing with each new phase in education into a large tree of studies (see www.ioe.ac.uk/eppse). EPPSE has consistently found significant positive effects for pre-school experiences on child outcomes up to the end of primary school and into KS3 at age 14 (Sylva et al., 2004; 2008; 2012). These latest results show that effects last up to and continue beyond the end of compulsory education.

For instance, going to a pre-school or not (attendance) was a significant predictor of higher total GCSE scores and higher grades in GCSE English and maths. Pre-school attendance also predicted achieving five or more GCSEs at grade A*-C, the vital 'entry ticket' to high-value A level courses that can lead to a place in a good university at age 18.

Having established that attending any pre-school had benefits that last up to and beyond age 16, EPPSE also showed that the amount of time spent in pre-school (duration in months) continued to have positive effects in terms of predicting higher total GCSE scores and grades in English and maths. In other words, both attendance (yes or no) and the 'duration dose' (in months) of early education continue to shape academic outcomes up to the end of statutory education. The difference in total GCSE point score for attending more than 2 years (compared to none) was approximately 51 points. This represents just over 8 GCSE grades e.g. the difference between getting 8 GCSE at B grades versus 8 GCSE at 'C' grades.

Pre-school quality mattered too, although its effects are weaker than they were at the end of primary school. Quality significantly predicted total GCSE scores as well as English and maths grades. Going to a pre-school of high quality (in contrast to no pre-school or low quality) showed the most positive effects.

There were indications that pre-school quality had somewhat stronger effects for students whose parents had lower qualifications compared to those with better educated parents. These differential effects were found in GCSE English scores as well as maths and suggest that quality matters most for children whose parents have low qualification levels. Findings such as these suggest that high quality pre-school has the potential to help narrow the equity gap in achievement between those from well-educated families and those whose parents have more modest qualifications. For social-behavioural development, only the quality of the pre-school continued to influence outcomes at age 16. High quality pre-school was linked to better self-regulation, pro-social behaviour and lower levels of hyperactivity. Attendance at any pre-school (yes/no) was not related to social-behavioural outcomes.

Analysis of post 16 destinations also revealed lasting effects of pre-school in terms of predicting the likelihood of following different academic routes that lead to later adult achievement. Attending any pre-school, or attending for a longer duration in months, and attending a higher quality pre-school, all predicted a greater likelihood of entering the most demanding academic route (studying 4 or more A/AS levels) and a reduced likelihood of taking a lower academic route. This was found even after controlling for individual, family, HLE and neighbourhood influences as well as GCSE results. This shows that the benefits of pre-school in shaping long term outcomes remain across all phases of schooling and last into young adulthood.

2. The economic value of investing in pre-school education

Monetising the full impact of investment in early education is challenging. Section 8 of this report outlines economic analysis of the EPPSE data conducted by a team at the Institute for Fiscal Studies (Cattan, Crawford and Dearden, 2014). These analyses provide an estimate of some of the likely future economic returns from society's investment in early education and add further to the empirical argument in favour of pre-school attendance and high quality provision. Cattan et al., calculated the earnings benefits of 1) attending any pre-school vs. not attending and 2) attending pre-schools of different quality (high vs. low). Each of these effects was modelled for lifetime gross earnings to the individual or the household, and on specific benefits to the Exchequer.

Attending a pre-school (vs. no-pre-school) had a positive influence on educational attainment and this, in turn, can be used as the basis for predicting future lifetime gross earnings. Attending pre-school was associated with an estimated benefit of around £26,000 for an individual and around £36,000 for an average household in net present value terms. When this was calculated in terms of likely lifetime benefits to the Exchequer

it translates into an estimated benefit of around £16,000 (per household). Attending a pre-school of high vs. low quality also had financial consequences for gross lifetime earnings for individuals (around £12,000), for households (around £19,000), and benefits to the Exchequer of around £8,000 (per household). It is early within the lifetime of the EPPSE sample to make predictions about their future labour market outcomes, and therefore these results must be treated with caution.

This is the first large scale study in the UK to estimate financial returns to individuals or society of early childhood educational experiences. The economic impacts of early education are likely to be multiple (in terms of future health and employment) and Section 8 reports on one channel only. Although it is still very early to make financial predictions about the futures of the EPPSE sample and the results must be treated with caution, the findings reported here are innovative and of policy importance because they represent a first attempt to estimate whether the major investments made in expanding pre-school education in the UK are likely to be a strategic investment in the long term.

3. The effects of secondary school

The effects of the 'quality' and effectiveness of secondary schools were studied using two external measures: Ofsted inspection judgments (especially 'Overall effectiveness and pupil learning' and 'Attendance') and the Department for Education (DfE)'s Contextual Value Added (CVA[2]) scores, which provided indicators of the academic effectiveness of secondary schools. These CVA measures are based on DfE analyses of national data that link student attainment measures with background characteristics, allowing estimates of individual secondary school effects on student progress between KS2 and KS4 to be calculated. Both external indicators measured the effectiveness of secondary schools.

Ofsted data showed there were moderately strong effects for attending an 'Outstanding' compared to an 'Inadequate' school for both academic attainment and progress. Ofsted judgements on school 'quality' predicted the number of GCSE entries and subject grades in GCSE English and maths for the sample. These effects were over and above those related to the students' prior attainment, individual, family, HLE and neighbourhood influences.

The CVA indicator of secondary school academic effectiveness also predicted significantly better total GCSE scores for EPPSE students with moderately strong effects on overall academic progress, after taking into account the effects of students' prior attainment in KS2 and background influences.

[2] The EPPSE CVA indicator is based on DfE CVA results for 4 successive years, covering the 4 EPPSE cohorts, 2006-2009 for all secondary schools attended by EPPSE students. The EPPSE results have an overall CVA averaged mean of 1004, which is close to the national CVA mean of 1000. The students in the sample (based on their secondary school's average CVA score) were divided into high, medium and low CVA effectiveness groups based on the average CVA score to 1 SD above or below the mean; nationally, approximately 10% of secondary schools are 1 SD above the mean and approximately 10% of secondary schools are 1 SD below the mean

Taken together, these two external measures of school quality and effectiveness showed that going to a more academically effective secondary school gave a boost to academic outcomes over and beyond the effects of their family characteristics and neighbourhood. Although schools *do* matter for academic outcomes, these external measures of secondary schools did not predict differences in EPPSE students' social-behavioural outcomes at age 16.

Students added their own views through responding to questionnaires about their experiences of secondary school. This allowed EPPSE to study features of secondary schools from the inside (e.g., students' own views reported via questionnaires) as well as from the outside (e.g., external Ofsted judgements, CVA indicators).

Students reported on various aspects of their secondary school including:

- 'Teacher professional focus' – student perceptions that their teachers focus on teaching responsibilities such as learning and behaviour within the classroom.
- 'Positive relationships' – how well students and teachers get on, such as students feeling they are treated fairly and with respected, and teachers showing an interest in students.
- 'Monitoring students' – the extent to which teachers monitor the progress that students are making, set targets and reward hard work.
- 'Formative feedback' – students experiences of teacher support, help when students are stuck, and guidance on improving their work.

'Positive relationships' had the strongest effects on GCSE scores and the benchmark indicator of 5 GSCE A*-C. and also predicted academic progress in maths during secondary school. 'Positive relationships' was followed closely in strength of influence by 'Teacher professional focus' in class.

'Positive relationships' were also important for predicting better development in all four social-behavioural outcomes in Year 11, but the remaining three factors were unrelated to social-behavioural development. 'Positive relationships' was the main school characteristic reported by Year 11 students that predicted social behaviours. However, being in a secondary school in Year 9 that had a more positive 'Behaviour climate' was linked to reduced hyperactivity and increased self-regulation and pro-social behaviour later on in Year 11.

The survey of EPPSE students suggests that they generally have positive views of their secondary schools. Four out of five EPPSE students agreed or strongly agreed that they 'liked school and their lessons'. Interestingly research by the Organisation for Economic Co-operation and Development (OECD), using data from the Programme for International Student Assessment (PISA), has suggested that English students have more positive views of their schools and teachers than students in many other countries

(Wheater et al., 2013). The EPPSE findings are in broad accord with the positive picture painted by the OECD comparative international research.

4. Family and neighbourhood influences

Taken together family influences are the strongest predicators of exam success, just as they were at Key Stage 1 (KS1), KS2 and KS3. In particular parents' own educational success remains the strongest influence in KS4. Students whose parents had degrees earned 141 total GCSE points more than students whose parents had no qualifications at all. When a range of individual, family, HLE and neighbourhood measures was included in the statistical model predicting total GCSE scores, parental education was found to be the strongest predictor of success followed by the students' report of 'academic enrichment activities[3]' during KS3.

Poverty has consistently been shown to matter for child outcomes (Duncan and Brooks-Gunn, 1997). EPPSE also found it to be significant, with the differences in scores between students receiving free school meals (FSM) and non-FSM students amounting to a full GCSE grade in English or maths. Interestingly, socio-economic status (SES) and family income, although also important, showed weaker effects than parental education. The importance of parents' educational level is often overlooked in national statistics where only the indicator FSM is routinely collected. Raising the educational attainment of young people today is therefore likely to show positive effects on the outcomes of future generations of children.

Family factors influenced behaviour and dispositions as well as attainment. SES was one of the strongest predictors of all four social-behavioural outcomes, with children of parents in professional jobs showing higher levels of pro-social behaviour and self-regulation and lower levels of anti-social behaviour and hyperactivity (measured by teachers' ratings). SES had moderate to high effects at the end of compulsory education showing that the status of the parents' jobs was a stronger influence on behaviour than was parental education, poverty measured via FSM, or family size or structure (although all these were significant predictors too).

Neighbourhood disadvantage was measured by the Income Deprivation Affecting Children Index (IDACI) and Index of Multiple Deprivation (IMD) measures. Both measures predicted poorer GCSE scores, over and above the status of the family, confirming that 'place poverty' continues to shape educational attainment and progress. Nonetheless, these effects at age 16 were still much weaker than those of students' own family demographics, a finding that has continued to emerge throughout the length of the EPPSE study. There was some evidence that living in an area of deprivation (IDACI) predicted less developmental progress in self-regulation and pro-social behaviour (between KS2-KS4), whereas those living with a higher proportion of White British residents showed poorer pro-social behaviour over the same period.

[3] Activities such as reading for pleasure, going on family outings etc.

Indicators of school intake composition (% students in the school eligible for FSM and % students with special educational needs [SEN]) also predicted poorer academic outcomes for the sample. Taken together these findings confirm that additional ways to address the challenges of student intake (e.g., in terms of how the Pupil Premium is used) are needed to help reduce the long standing equity gap in attainment.

Six months after taking GCSEs the young people reported that their main source of information about future education and employment was their own family. Such findings clearly show that the family in England remains the most important influence on young people at 16. Family advantage or disadvantage repeats itself across the generations. However, although these statistical patterns reveal strong trends at the group level, they cannot explain all the variation in individual outcomes.

In terms of Bronfenbrenner's ecological model, EPPSE findings show that proximal factors related to family have a stronger influence than distal factors such as school and neighbourhood. However, it is likely that such factors interact, being poor increases the chance of a family living in a poorer neighbourhood (place poverty) and this also shapes the intake of local schools, thus family, neighbourhood and school characteristics may interact and reinforce disadvantage.

Learning opportunities at home and outside school

The effects of parental support for development remained strong throughout the study. In fact, the early years home learning environment (HLE) still predicted academic outcomes right up to age 16, although these effects have reduced as children moved into adolescence. By age 16 the effects of the early years HLE were not as strong as those of concurrent demographic characteristics such as family SES. However, this large sample of young people who entered school at the turn of the century show that early learning activities in the home continue to have significant and favourable long term consequences.

The age 16 findings have shown that the present does matter; the current capacity of students' families to support academic 'enrichment activities' had significant effects on total GCSE scores and on social-behavioural outcomes. Enrichment activities such as independent reading or being taken on educational visits outside the school predicted better Mental well-being and 'improvements' from KS3 to KS4 for self-regulation and pro-social behaviour, reductions in hyperactivity and anti-social behaviour, and higher academic attainment and progress. EPPSE suggested in earlier reports that outside school enrichment activities should be supported when children are young, but an argument for similar activities in secondary school still has some force.

Finally, students' reports on their engagement in doing homework on a regular basis on school nights are a very powerful predictor of GCSE results. Time spent on homework in Year 11 was a strong predictor of GCSE outcomes and social behaviours. . This was over and above individual, family, HLE and neighbourhood influences. Engagement in homework may reflect parental encouragement and support and differences between

schools in their practices of setting, marking and valuing homework. However, even when other influences are controlled, homework effects remained strong and significant. Homework is likely to increase opportunities for learning, provides opportunities for practice and also feedback when assessed, and encourages independent study skills and responsibility; all useful in promoting GCSEs, later A-levels and other qualifications.

5. The effects of gender and season of birth

EPPSE findings in relation to gender are not consistent with imbalances later in life at board level, in science and in government. Over the course of EPPE/EPPSE, girls have outperformed boys in cognitive/academic attainment and social behaviour (with the notable exception of maths scores, where girls and boys were more or less even at age 16). When translating effects into GCSE grades, the gender effect on English represented 2.8 points, roughly half a GCSE grade, whereas there were no significant gender effect for maths. The effect for gender was weaker on total GCSE score (representing 26 GCSE points) which is roughly equivalent to the difference of half a grade across 8 GCSE subjects. When comparing the strength of different predictors, it can be seen that the gender effects were slightly stronger on GCSE English than the effects of pre-school. However, the gender effects were significantly weaker than the pre-school effects for maths, and also weaker than the effect of pre-school on total GCSE points.

Girls were rated by their teachers more positively on all four social-behavioural outcomes. In terms of school-related dispositions, girls reported themselves as more resistant to peer pressure in Year 11 than boys and engaged less in ‘risky behaviours’.

Girls reported significantly lower ‘Mental well-being’ than boys at age 16 and more anxiety at age 14. As a group, boys indicate at age 14 and 16 that they felt more confident and more positive about themselves than girls. For example, boys’ academic self-concept is as high as girls’- despite their lower test performance, especially in English. Similarly, boys with low GCSE scores were more likely to aspire to higher status jobs than their female counterparts with similar exam scores. Nonetheless, girls enjoy school more than boys and consistently report spending more time on homework, a factor that strongly predicts success in secondary school. The EPPSE study shows that part of the gender gap in attainment operates through the time spent on homework, with girls more likely to spend time in study on a typical weekday evening. The ‘good citizen’ girls who do their homework and enjoy school are also keener to go to university.

Summer-born children had lower total GCSE scores when compared to autumn-born children and also lower scores in English and maths. For social-behavioural outcomes, the Summer-born children had lower pro-social behaviour and self-regulation, along with heightened levels of hyperactivity. Although effects lessened considerably over time, summer-born children are still at a disadvantage at age 16 for both intellectual and social outcomes.

6. Combating disadvantage throughout schooling

Previous EPPE/EPPSE reports document the effects of disadvantage on developmental outcomes, especially educational ones. Since its inception, the study has thrown light on factors that increase the risk of poor outcomes and those that promote resilience (Hall et al., 2009; 2013; Sammons et al., 2008a; 2013; Taggart et al, 2006. Unsurprisingly, children of highly educated parents or those with high income fared better on a wide array of outcomes at age 16. EPPSE also studied those educational experiences that acted as protective factors against the risks of multiple disadvantage. Hall et al., (2009; 2013) demonstrated that attending high quality pre-school protected against some of the risks associated with multiple disadvantage in early in childhood. In addition, the early years HLE can also act as a protective factor and parents can be supported in ways to extend children's learning at home.

At age 16 the joint effects of pre-school quality and parental qualifications showed that attendance at high quality pre-school had a stronger effect on GCSE English and maths grades for students whose parents had low qualifications compared to students whose parents had higher qualifications. This suggests that pre-school quality matters most for those whose parents had themselves not been successful at school. Moreover, the economic analyses in Section 8 reveal that 'The highest percentage gains do seem to be for relatively lower earners which provides some suggestive evidence that offering high quality pre-school may help to reduce lifetime earnings inequality'.

The findings in this report point to educational policies, especially the early years which could narrow the attainment gap (see Eisenstadt, 2011; Sammons, 2008, Taggart et al., 2008). But early years provision on its own is not enough and needs to be followed by high quality education across the board. Sammons, et al. (2008b; 2014a) and Sylva et al. (2008) showed that attending a highly effective primary school (measured by CVA) can act as a protective factor for children who entered primary school with 'at risk'. Students had higher GCSE grades in English and maths if they attended secondary schools where the quality of pupil learning and progress was judged by be outstanding by Ofsted after taking account of background influences. Improving the quality of secondary schools in disadvantaged neighbourhoods is likely to be particularly important in reducing the equity gap in attainment.

Performance in GCSE exams and social outcomes was also predicted by 'academic enrichment activities' in KS3 (such as reading for pleasure, going with the family on educational visits). It seems likely that such activities may be less common in the homes of disadvantaged students. Future initiatives might focus on ways that schools can enhance the social and cultural capital of young people through out-of-school enrichment activities such as reading for pleasure, visits to the theatre, museums and galleries and historic castles. Schools might work with families to ensure such enrichment activities are not the exclusive province of the better off or the well connected.

Many politicians and practitioners believe that it is low aspirations that underpin low achievement in school and in the workforce. The findings reported here suggest this is

not the case; career aspirations and confidence in gaining their ideal job were mostly high, with a majority of the young people aiming at professional occupations (although often in the 'second tier' of the professions). Over two thirds of FSM pupils aspired to attend university and all groups believed that getting good GCSE results was 'very important'. Non -White UK heritage young people were more confident overall in expecting to obtain their ideal job. It should be noted however, that the choices of ideal jobs still showed strong gender stereotyping, with girls aiming at jobs as teachers or social workers more than boys.

Parental aspirations for their children's education were associated with students career aspirations at age 16. Those students who said their parents 'wanted them to carry on in education post 18' were more likely to have professional career aspirations. Even amongst the small sample of young people who were NEET, two fifths aspired to a professional qualification.

The majority of young people did not think that skin colour, ethnicity, religion or sexual orientation would 'affect their chances of getting a job'. However, girls were more likely to have concerns about workplace discrimination. Despite the negative effects of family background (especially low parental qualifications, SES and income) had already played a powerful role in shaping their educational outcomes and their post 16 destinations. The challenge facing policy makers (and voters) is how best to change this for future generations? The EPPSE results reveal that better pre-school, primary and secondary school experiences can play an important part but without action to combat wider structural inequalities in society, education influences on their own cannot overturn the strong and persistent patterns identified here.

This study has shown significant and positive influences that can help to improve outcomes for all students and that may help to lessen - but not remove - the powerful effects of family disadvantage. There is no magic bullet to equalise the chances of children in society but commitment to step-by-step improvement, guided by research findings on effectiveness, is a good way forward.

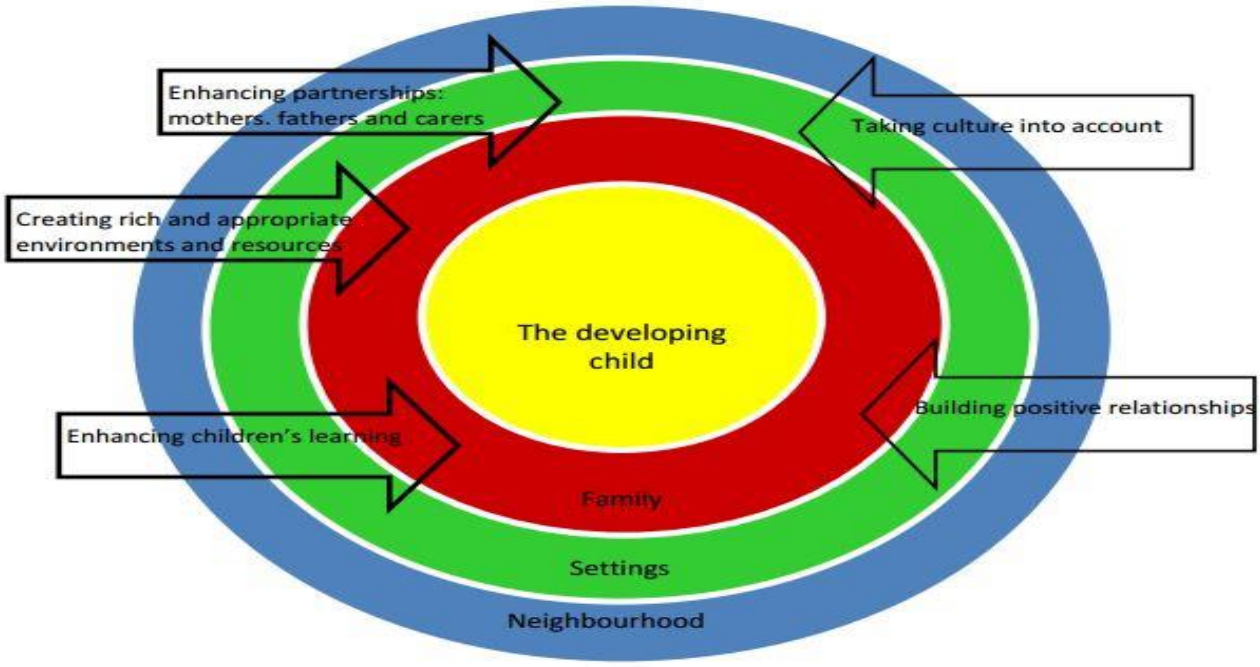
Section 1 Introduction to the EPPSE 3-16+ study

This report focuses on a large number of teenagers poised at the start of young adulthood. Most have moved from compulsory schooling to study further academic qualifications (typically A levels), some chose to follow more vocational routes, and a few were NEET ('not in education, employment or training'). All are drawn from a national study of the impact of education on the developmental trajectories of children and young people. The Effective Pre-school, Primary and Secondary Education (EPPSE study) has followed more than 2,500 young people between the ages of 3 and 16+. The findings from seven technical reports are summarised here in an attempt to document the most important influences on individual pathways that lead to GCSE achievement, mental wellbeing, social behaviours and aspirations for the future, all at the end of statutory schooling, age 16 for the EPPSE sample.

The findings are based on statistical analyses that reveal developmental pathways shaped at every turn by the family, pre-school, primary school and secondary school. Each of these 'developmental contexts' is located in a neighbourhood, which in turn may exert influence directly on the teenager and indirectly through their families or schools.

One of the key theoretical models underlying EPPSE comes from the work of Bronfenbrenner (1994). The concentric circle diagram (Figure 1.1), adapted by Evangelou et al., (2009), shows the nesting of institutional contexts that surround and influence the growing child from proximal (the family) to distal (neighbourhood). The circles represent the institutions while the arrows represent the processes by which development is influenced.

Figure 1.1: Bronfenbrenner's model of ecological influences



What is different between Bronfenbrenner's diagram (Figure 1.1) and the statistical models in this report is that EPPSE measures the strength of different influences over the course of development from pre-school to the end of secondary schooling. EPPSE also draws on educational effectiveness approaches, including the 'Dynamic' model (Creemers and Kyriakides, 2008), that study the processes of change and role of institutional effects. Thus statistical models have been used to tease apart the various influences on life pathways, tested individually and in combination, as they predict developmental outcomes. Another difference between the EPPSE statistical models and the eco-system diagram (Figure 1.1) is the temporal dimension in longitudinal research. Some contextual effects, such as those of neighbourhood, increase over time while others such as home language will be shown to decrease.

The dry statistical models are complemented in this mixed methods study with qualitative questionnaires and interviews when the teenagers were settled at secondary school or shortly after leaving; these give deeper insights into twists and turns in development. Although each person is unique and a full explanatory account of every life trajectory impossible, common patterns of influence have been found. For instance, academic pathways remain fairly stable over time, especially after age 11, but there is still evidence that educational influences related to secondary school experiences can also shape outcomes. In KS3 EPPSE identified positive and negative outliers, individuals who 'buck the trend' and who were studied more deeply through qualitative interviews.

1.1 EPPSE teenagers

The headlines surrounding UNICEF's (2007) report on child well-being told a depressing story of unhappy children and youth in England when compared to the well-being of those in other countries. However, if these results are disaggregated it can be seen that students in England have fairly positive views and experiences of school – it is in other aspects of life, including the family, that English youth appear to score low in the UNICEF report. In England students are more likely to experience family break up and worry about other problems in life. EPPSE found the vast majority of students 'like school' and 'like lessons', and report their school as 'a friendly place'. Two thirds of the students felt they had always 'done well in school subjects'. Students placed a high priority on academic success; nine out of ten thought it was 'important to gain five good GCSEs' and the majority aimed to attend university in the future.

The EPPSE research findings challenge simplistic assumptions that attribute the equity gap in achievement and problems of social mobility to the low aspirations of young people' (Baker et al., 2014; Sammons et al., 2014c; Taggart et al., 2014). Students in the EPPSE sample of 16 year olds are aiming high, especially those from the ethnic minority groups such as those of Bangladeshi, Black Caribbean, Indian and Black African heritage. Although the achievement of working class white boys is often cited as a casualty of the English educational system, nearly sixty per cent of these boys in EPPSE aspire to go to university.

Other signs of the relative health of the sample were found on the Warwick-Edinburgh Mental Well-being Scale (Tennant et al., 2007). Here most students reported 'feeling confident', 'feeling good about myself', 'feeling close to other people' or 'having energy to spare'. Although generally positive across the sample, in this scale girls registered lower well-being on ten of the fourteen items compared to boys. This relates to the finding from two years earlier when girls reported more anxiety. A dominant theme throughout this report at the age of 16 is that, as a group, girls have a significantly lower self-concept when compared to boys. For example, boys score lower in English GCSE grades, and especially in English, but their 'Academic self-concept' is not significantly different from girls. The report has ample evidence that girls do not lack ability but they appear to lack confidence. Perhaps the confidence of the boys leads to their reporting significantly less time on homework – they may think it unnecessary. The EPPSE results show that, after taking account of background influences and previous attainment, self-reported time on homework is a powerful predictor of academic progress. Toth et al., (2012) suggest one of the reasons girls are more successful in examination marks is that they study more.

There were gender differences also in anti-social and criminal behaviour, with boys reporting twice the level of anti-social behaviour of girls, twice the level of involvement with the law and more risky behaviours. Although the differences were statistically significant, luckily the overall numbers for boys are still low. On the plus side, boys reported about twice the level of participation in organised sport and games than girls. Gender differences are featured in this introductory section because they have been present in the sample since the age of 3. New however in the teenage years is the relative strengthening influence of the father's education and of family structure; children living with both parents had better outcomes across several domains that are described in the body of this report.

1.2 Aims

EPPSE 3-16+ aims to describe:

- the influence of family background, home and out of school learning on young people's academic and social outcomes at age 16, followed by career path destinations to the age of 16+
- the influence of pre-school, primary school and secondary school on young people's academic and social outcomes at age 16, followed by career path destinations to the age of 16+
- changes in the patterns of influence across different phases in education
- how far the educational experiences differ for particular groups of students e.g., boys and girls, those who are disadvantaged by poverty or have additional needs
- the long term economic benefits of pre-school experience to individuals/households and their predicted contribution to the Exchequer.

1.3 The EPPSE sample and its current status

A nationally representative sample of 141 pre-school settings (representing six types of pre-school) was drawn in 1997 from five English regions (six Local Authorities). In each setting approximately twenty children were recruited and assessed at baseline (Sylva et al., 2010). EPPSE tracked more than 2800 children from age 3+ and then studied them again when they entered their reception class in primary school. They were joined in reception by just over 300 'home' children who entered school with very little or no pre-school education (the 'home' group), bringing the sample at the end of reception to just over 3,000 (Sammons et al., 1999). These children were followed up in Years 1, 2, 5, 6 of primary and into adolescence in Years 9 and 11. In this report GCSE outcomes and other information has been collated for the 2500+ students remaining from the original sample, (approx. 80%) although numbers vary depending on the outcome being studied.

Most of the EPPSE students studied for their GCSEs in secondary schools, apart from a few exceptions who were in pupil referral units or other specialist units. Although most of the schools attended by EPPSE students were in the state sector (including some academies and selective schools), some attended independent schools and the results of these students are included as well. Because the EPPSE sample attended secondary school in the mid to late 2000s, recent changes to the school system such as the rapid increase in academies and free schools are not reflected in the sample and it is not possible to test for any influence of such changes.

Six months after finishing Year 11 the young people were sent a postal Life After Year 11 questionnaire enquiring about their current studies, training and/or employment status. Many had remained in their secondary schools, while many had moved on to college. A minority were in employment, and small numbers were studying part-time, caring for their own children or other family members, or were not in education, employment or training (NEET). This questionnaire was followed by analysis of important predictors of post-16 destinations, both before and after controlling for actual GCSE performance.

1.4 A longitudinal study of developmental outcomes and influences

The longitudinal nature of the EPPSE study enabled it to show which influences remain stable and which wax or wane. Essentially, the statistical methods used by EPPSE allow consistent factors related to the attainment and progress of more than 2500 individuals to emerge. The positive influence of pre-school education remains statistically significant at age 16 but its effect, although still significant, had weakened compared with its effect at school entry or the end of KS1. By way of contrast, the effects of neighbourhood poverty were not statistically significant during pre-school or primary school but they increased with age. However, throughout EPPSE the effects of neighbourhood were always weaker than the effects of mother's education, the home learning environment (HLE) or social class.

While social scientists, parents and the young people themselves know that GCSE achievement depends on a wide range of influences, only longitudinal research describes the magnitude of each effect, relative to others, over time.

Over 13 years of historical data on each member of this large sample includes information on ‘soft’ outcomes such as social-behaviour, dispositions and well-being alongside ‘hard’ academic outcomes. The GCSE results reported here constitute the high stakes examination which will provide the gateway to higher education, vocational qualifications or possibly increase the chance of joblessness. It is a robust outcome based on externally set examinations and independently moderated coursework (see the end of this section for information on age 16 examinations in the English educational system).

The Key Stage 4 (KS4) academic outcomes are varied, in line with options available when analysing GCSE grades that centre on ‘quantity’ (such as number of examinations taken), total GCSE points score, grades in particular subjects, or global benchmark measures of ‘academic achievement’ such as achieving 5 qualifications at grades A* - C including English and maths.

Social-behavioural outcomes include: self-regulation, pro-social behaviour, hyperactivity and anti-social behaviour. Students' dispositions are also measured and these fall into many areas including 'Enjoyment of school', 'Academic self-concept' and 'Resistance to peer influence'. Finally, new in this report is the Warwick-Edinburgh scale of 'Mental well-being', a new developmental outcome for EPPSE (Tennant et al., 2007), which focuses on positive aspects of psychological adjustment, not just the absence of disorder. Student perceptions of physical health were also tapped. Adding self-reported health and well-being to the basket of outcomes complements the picture by including students' appraisals of their own mental health – teenagers 'telling it like it is'.

When the children were very young, information about their schools was collected through staff interviews, observational rating scales of quality, and through parent interviews/questionnaires. However, as the children grew older they took a more active role through participation in surveys and interviews in which they reported on characteristics of their schools and their experiences in them as pupils. Students' reports on their experience of school via interviews and rating scales allowed EPPSE to study school characteristics from the outside (e.g., Ofsted judgements) and from the inside (e.g. pupils' own views).

The rating scales identified a number of important school factors that were used as predictors in statistical models. Although these are based on students' subjective reports, they formed robust factors that were significant in predicting students' academic and career outcomes.

School factors in Year 11 included: 'Emphasis on learning', 'Positive relationships between students and teachers' and 'Formative feedback'. School factors from Year 9 were also included, such as the 'Emphasis on learning' and 'School behavioural climate'. Sections 3 and 4 of this report show that all of these school factors are important in shaping the educational outcomes of students. However, 'Positive relationships' is the strongest predictor for both academic and social-behavioural outcomes at age 16. This one example demonstrates one of the strengths of the EPPSE methodology. It not only documents the characteristics of good schools, which have been known anecdotally for years, it also shows the relative strength of each of these important features of school experiences when compared to others.

External contextual value added (CVA) indicators produced by the Department for Education (DfE), based on national data sets for KS2-KS4, were added to the EPPSE data sets and tested in predictive models as indicators of overall secondary school academic effectiveness. In addition, selected Ofsted inspection judgements were used as further external indictors of the quality of the secondary schools attended by students in the EPPSE research. In a longitudinal study of this nature the 'effectiveness' of the pre-schools, primary schools and secondary schools attended by each individual can be investigated for their contribution (both alone and combined over time) to a range of outcomes.

The multilevel modelling approach outlined above has been supplemented in this report by separate economic analyses that project the life time earnings of individuals or families on the basis of the pre-school experiences of the sample. These economic analyses (conducted by a team at the Institute for Fiscal Studies) answer questions about the likely future financial returns of investment in early education.

In this report five major themes have been intentionally stressed: the legacy of pre-school, the drivers of the equity gap in achievement throughout schooling, the influence of secondary school, mixed methods in educational research and the financial returns of pre-school.

1.5 Overarching themes in this report

1.5.1 The enduring legacy of pre-school

EPPSE began life as a study of the effects of pre-school, with the small EPPSE plant growing with each fresh grant into a veritable tree of studies. The continuing positive effects of attendance at pre-school have been shown on all of the GCSE outcomes and in post 16 'destinations' as well as the economic analysis in Section 8 of this report, prepared by Cattan and colleagues. This shows that attendance at pre-school had an estimated benefit of around £26,800 for an individual and around £36,000 for an average household in net present value terms. When this was calculated in terms of likely life time benefits to the Exchequer it translated into an estimated benefit of around £16,000 per household. This demonstrates a sound investment in early learning and EPPSE is the first study in Europe to show the likely long term monetary benefits of early education.

1.5.2 Equity and disadvantage

Many of the EPPE/EPPSE reports detail the effects of disadvantage on developmental outcomes especially educational ones. Unsurprisingly, children of highly educated parents or those with high income fared better on milestone assessments. But EPPSE also studied those characteristics that acted as protective factors against the risks of multiple disadvantage. Hall et al., (2009; 2013) demonstrated that high quality pre-school provision protected against some of the 'risks' associated with multiple disadvantage. An important driver behind many early childhood initiatives was the concern on all sides to combat the effects of poverty and increase social equity; EPPSE suggested that early, high quality childhood education could do much to narrow the gap (Eisenstadt, 2011).

Sammons et al., (2008a; 2008b; 2013; 2014a) and Sylva et al., (2008) showed that attending a highly academically effective primary school (measured by CVA) acted as a protective factor for children who entered primary school with ‘at risk’ profiles. In addition, the early years HLE showed lasting benefits from pre-school up to age 16 in terms of better outcomes and progress. Moreover, students' performance in GCSE exams was also found to be predicted by ‘academic enrichment activities’ in KS3, including reading for pleasure and going with the family on ‘educational visits’. Future initiatives might focus on ways that schools can enhance the social and cultural capital of young people through out-of-school enrichment activities such as reading for pleasure, visits to a factory, museum, historic castle or working steam engine.

1.5.3 The effects of secondary school

The effects of secondary schools were studied using different measures, both official indicators and student reports of their views and experiences of school. Ofsted inspection judgments (especially ‘Overall effectiveness and pupil learning’ and ‘Attendance’) were collected and used as indicators of school quality. In addition, the DfE’s national CVA indicators (for 2006-2009) were used to provide measures of overall academic effectiveness for individual secondary schools. These CVA measures are based on DFE analyses of national data sets that link student attainment measures and estimate school effects on student progress over time (KS2 to KS4). To supplement the official indicators EPPSE used questionnaire data collected directly from the EPPSE students to tap into their experiences of secondary school at both KS3 and KS4. Analysis of the questionnaires led to robust measures on a range of factors including ‘Positive relationships’ and ‘Formative feedback’ in KS4 and the school’s ‘Behavioural climate’ and ‘Emphasis on learning’ in KS3.

1.5.4 Using mixed methods

EPPSE had adopted a mixed methods research design that joins together multilevel statistical modelling with qualitative case studies to exemplify and extend the quantitative findings (Sammons et al., 2005; Siraj-Blatchford et al., 2006). The qualitative element of this report focuses on students who are NEET and tells their stories in a way that is impossible through mere numbers. This mixed methods approach provides a more ‘holistic’ view of a group of young people who are of particular policy interest. The quantitative analyses draw on the ‘educational effectiveness’ research tradition which uses multilevel models to explore the effects of different kinds of predictors. This approach has allowed EPPSE to investigate the contribution of institutions across different phases of education by taking into account the clustering of children nested in pre-school and school settings (see Goldstein, 2003; Hill and Rowe, 1996; 1998; Sammons, 1996; Scheerens & Bosker, 1997; Teddlie & Reynolds, 2000).

1.5.5 The financial returns of pre-school education

The economic projections calculated for this study by Cattan, Crawford and Dearden (Section 8, Appendix 7) are the first in Europe to estimate the likely financial returns of pre-school education to individuals or society. It is early within the lifetime of the EPPSE sample to make predictions about their future labour market outcomes, and therefore these results must be treated with caution. However the analysis is innovative because it represents a first attempt to estimate the possible long term economic returns arising from investment in the expansion of pre-school education in the UK.

Many assumptions have had to be made and other data sets used in the analyses, but this part of the report is ground-breaking. While the authors provide a long list of caveats for those interpreting the findings, nonetheless their predictions can make a vital contribution to educational policy and to future research. A popular quote comes to mind ‘if you don’t start somewhere, you’re gonna go nowhere’ (Bob Marley, Macdonald, 2012).

Sylva et al., (2010) described early childhood education as the ‘Cinderella’ of educational policy and research, the ignored step daughter who finally goes to the ball. The EPPSE study, over 17 years, has done much to transform the role that early childhood education plays in the national policy landscape (Sylva and Pugh, 2005) and its findings have contributed to the development of sound practices that have enhanced the learning of thousands of young children (Siraj-Blatchford et al., 2008).

The EPPSE study documents and explains many influences on the development of children and young people. At the same time it raises important questions for the next generation of researchers. The EPPSE team wish them well.

1.6 Reporting the outcomes at age 16

This report summarises the findings from 7 technical reports that are outlined below. Readers are strongly recommended to look at each technical report for further details as this integrative report cannot provide a full account of all of the findings and methods used. The technical reports are:

- Academic - Influences on Students' GCSE Attainment and Progress at Age 16 (Sammons et al., 2014a)
- Social-behavioural - Influences on Students' social-behavioural development at age 16 (Sammons et al., 2014b)
- Dispositions - Influences on students' dispositions and well-being in Key Stage 4 age 16 (Sammons et al., 2014c)
- Views of school - Students' views of school in Key Stage 4 age 16 (Sammons et al., 2014d)
- Post 16 destinations - Post age 16 destinations (Taggart et al., 2014)
- Report on students who are not in education, employment and training (NEET) (Siraj et al., 2014)
- The economic benefits of attending pre-school - The economic effects of pre-school education and quality, undertaken by the Institute of Fiscal Studies (Cattan, Crawford and Dearden, 2014, in Section 8) - this details an economic analysis that explores future earnings and other potential wider societal benefits associated with attending pre-school.

The main outcomes and other measures used in the analyses for the reports 1-4 above are summarised below:

- **academic attainment** - a range of GCSE (and equivalent) outcomes and benchmarks (GCSE A*-C, total number of GCSEs, total GCSE point score, 5 A* to C including English and maths etc.)
- **social-behavioural outcomes** - self-regulation, pro-social and anti-social behaviour and hyperactivity
- **dispositions** - school enjoyment, disaffected behaviour, resistance to peer influences, academic self- concept, mental well-being and engagement in risky behaviours.
- **views and experiences of school** - teacher professional focus, positive relationships, monitoring students, formative feedback and academic ethos.

The fifth and sixth reports focus on **students' post 16 destinations** in terms of different post 16 pathways.

For all reports visit www.ioe.ac.uk/eppe

1.7 EPPE/EPPSE end of phase publications

Earlier phases of the research have been influential in providing research evidence for the development of national policy (Taggart at al., 2008) and practices (Siraj-Blatchford et al., 2008) in early childhood and care. The study has had considerable national (DFE, 2011; National Audit Office, 2012) and international reach (eds Pramling Samuelsson and Kaga, 2008; Australia Government Department of Education Employment and Workplace Relations, 2009; Brazil Ministerio Da Educacao, 2006).

Early phases of the study included:

Effective Provision of Pre-school Education project (EPPE: 1997–2003) focus on effects of pre-school up to age 7 (Key Stage 1) – see Sylva et al., 2004

Effective Pre-school and Primary Education 3-11 project (EPPE 3-11: 2003-2008) focus on effects of pre-school and primary school up to age 11 (Key Stage 2) – see Sylva et al., (2008).

Effective Pre-school, Primary and Secondary Education project (EPPSE 3 -14: 2008 – 2011) focus on secondary school up to age 14 (Key Stage 3) – see Sylva et al., 2012

Each end of phase report is supported by a range of technical papers – see www.ioe.ac.uk/eppse. The EPPSE study has expanded into a programme of research and details of the many sub-studies (e.g., primary pedagogical strategies, students who 'succeed against the odds') can be found at www.ioe.ac.uk/eppse. For a summary of the key findings from each of these phases see Appendix 1.

1.8 Note on education 14-16+ in England

Beyond age 14 is known as Key Stage 4 in the English education system (age 14-16). During KS4 students prepare to take their final compulsory examinations.

Beyond age 14, students must study English, maths, science and religious education but have some flexibility over which other subject they continue to study. After age 14 most students continue to study subjects they enjoy or have ability in and will discontinue others. The majority of students take a number of General Certificate of Secondary Education (GCSE) examinations at age 16 though some may take General National Vocational Qualifications (GNVQs).

Whilst most students will take their final examinations in a school, a small minority will attend a further education or work based settings and will take some vocational qualifications. Although not compulsory the vast majority of EPPSE students continued in education beyond age 16.

The EPPSE students completed compulsory education before 2013. Since then young people in England are obliged by law to remain in some form of education or training until the age of 17 (rising to 18 by 2015). Young people can remain in school, further education or sixth form college, where they will have a choice of GCSE, Advanced or a range of vocational qualifications. If they have not gained a GCSE Grade A*-C in English and maths, they will need to continue to study these subjects post-16 as part of their 16-19 study programmes. Students who enter employment will continue to add to their qualification through 'job training schemes'. Some young people may be unable to study or gain employment and fall into a category of young people referred to as NEET: Not in Education, Employment or Training.

1.9 Structure of the report

Section 1 is an introduction to the EPPSE research

Section 2 describes the research questions and how these were answered through the aims, sampling, measures, methodology and analysis strategy

Section 3 provides detailed information on academic outcomes and their predictors

Section 4 reports on social-behavioural outcomes and their predictors

Section 5 describes mental well-being and dispositions and their predictors

Section 6 describes post 16 destinations and the predictors of these pathways as well as students' aspirations

Section 7 provides a deeper understanding of the lives of students who become NEET (not in education, employment or training) through interviews with them

Section 8 summarises the results of analyses by the Institute of Fiscal Studies (Cattan, Crawford and Dearden, 2014) that explores the economic consequences of attending pre-school and the long term benefits of different indicators of high quality pre-school on returns to the Exchequer

Section 9 discusses the conclusions.

References

Glossary of terms

Appendix 1 - Summary of key findings from earlier phases of the EPPE/EPPSE programme of research

Appendix 2 - Cohort structure of the sample

Appendix 3 - Measures at earlier time points

Appendix 4 - Home Learning Environment (HLE) measures

Appendix 5 - Academic outcomes

Appendix 6 - Classification of Registrar General job coding

Appendix 7 - Economic analyses

Appendix 8: How do students view their experiences of school?

Section 2 Aims, sample, measures, methodology and analysis strategy

EPPSE is a mixed methods design (Sammons et al., 2005; Siraj-Blatchford et al., 2006) that joins together multilevel statistical modelling with qualitative case studies. For this report these methods have been extended with economic analyses that project the estimated impact and life time earnings of individuals or families on the basis of their experience of pre-school education.

2.1 Aims

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

- investigate the relative influence of family background, home learning, pre-school, primary and secondary school experiences on young people's academic and social-behavioural outcomes at the end of Key Stage 4 and in terms of early post-16 pathways.
- understand how the relative importance of these influences changes over time (from pre-school to age 16+).

The EPPSE research began, 17 years ago, with a focus on the influence of pre-school on children's academic and social-behavioural development (initially at school entry and up to age 7). This remains a key focus up to the age 16 and beyond. However, the richness of the longitudinal data has enabled a deep study of the contribution of other phases of education and of the various child and family background characteristics that shape outcomes and how these patterns remain consistent or change over time. This final phase of the study continues the 'story' of a unique group of young people and contributes to an understanding of what shapes pathways beyond the age of 16.

2.1.1 Specific aims of the 16+ study:

Demographic background characteristics

- To explore the influence of young people's individual (e.g., age, gender), family (parental SES, qualifications, home learning environment etc.) and neighbourhood characteristics on their GCSE (and equivalent vocational qualifications) attainments, social-behavioural development, dispositions and other socio-emotional outcomes and post 16 destinations.

Schooling

- To establish whether there is any evidence of a continuing influence of pre-school on student attainment, progress, attitudes and social/behavioural outcomes at the end of KS4
- To explore the contribution of primary school and secondary school on student's outcomes and how these change over time
- To explore secondary school characteristics such as Ofsted judgements, academic effectiveness (DfE's CVA analyses), school intake (% of FSM and SEN pupils) and how much these shape the development of EPPSE students.
- To identify the school factors and processes that help to narrow the attainment gap and promote better outcomes (resilience) for vulnerable groups
- To explore how demographic background characteristics are associated, and the extent that different student groups have different experiences and outcomes of secondary school
- To understand how the above characteristics and influences are associated with and predict different aspirations and post-16 destinations.

Outside of school

- To investigate variation in young people's reports of their life outside school including activities with their families, peer groups and other out-of-school activities and learning and how these relates to their individual, family and neighbourhood characteristics. This includes a particular focus on the lives and experiences of young people who were not in education, employment or training (NEET) after Year 11.

Future economic indicators

- To explore possible long term benefits of pre-school in terms of economic indicators. This includes estimates of potential life time earnings and returns to the Exchequer of attending pre-school.

2.1.2 Themes

Subsumed within these aims are a set of overlapping themes.

Theme 1 - Individual and family influences

- What are the individual characteristics of teenagers (gender etc.) that influence their academic attainment and progress, social-behavioural development, dispositions and well-being?
- Do students with different background characteristics have different views and experiences of secondary school?
- What 'risky' behaviours are undertaken by teenagers and how are these associated with different individual background characteristics?
- How does young people's health and mental well-being vary and how is this associated with different background characteristics?
- How does family background (e.g., parental income, SES, education level) contribute to children's development in the longer term and how does it increase or decrease as children grow older?
- How do the early and later 'home learning environment' (HLE) and other forms of parent support and out-of-school learning influence young people's outcomes?

Theme 2 - Pre-school and school influences

- Does the positive influence of pre-school on children's outcomes, evident at earlier phases of education, continue up to the end of KS4 and on into post-16 destinations?
- What are the contextual primary and secondary school characteristics (e.g., % of FSM and SEN pupils) and processes that differentiate effective schools?
- How do students' perceptions of school (practices and climate) relate to their achievement, attitudes and social behaviour?

Theme 3 - Neighbourhood influences

- What is the role/influence of 'neighbourhood' in shaping young people's educational and other outcomes in secondary school?
- Are neighbourhood influences stronger or weaker than individual student, family, HLE, or pre-school and school influences in shaping students' education outcomes over time?

Theme 4 - Overlapping school, family and neighbourhood levels

- To what extent can higher quality educational experiences at pre-schools, primary schools and/or secondary schools help to combat the adverse consequences of social disadvantage in shaping educational outcomes?

Theme 5 - Out of school learning and activities

- What kinds of out-of-school learning and teenage activities are reported by students at age 16 and how do these relate to educational outcomes?
- What kinds of 'risky' behaviours are teenagers engaged in and how do these relate to background characteristics?

Theme 6 – Post 16 destinations

- What are the main post-16 pathways? How far do individual, family and neighbourhood characteristics predict different academic or vocational pathways for young people at the end of compulsory education?
- What are young people's aspirations and expectations for future employment and education?
- How far do the characteristics that predict attainment and progress at GCSE also predict post-16 destinations?

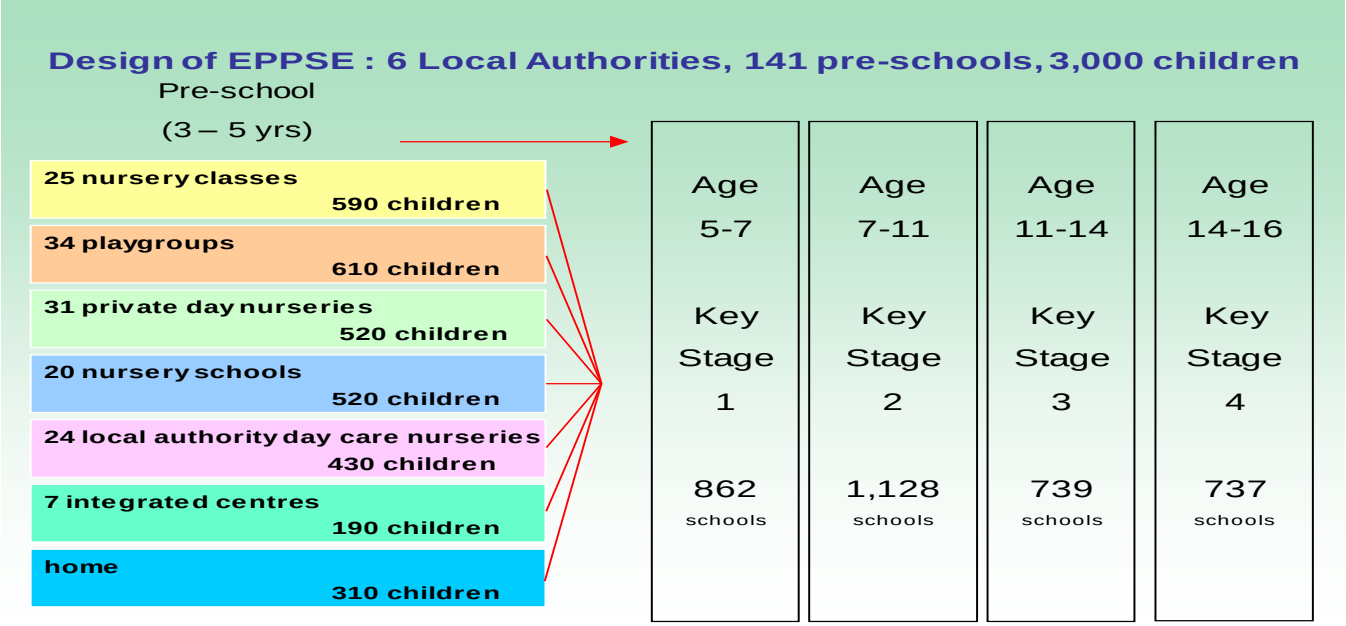
The seven technical reports that underpin this final report expand on the overlapping themes and address, with more detail than is possible in this summary report, the questions raised above.

2.2 The sample

The EPPSE longitudinal study of the influences that shape children's development as they progress through pre-school, primary school and secondary school involved an original sample of 3,172 children made up of 2,857 children recruited around the age of 3/4 from 141 pre-schools plus over 315 children with no pre-school experience (the 'home' group) who were recruited to the study at age 5 when they entered school (Sylva et al., 1999a). The children's pre-schools were located in six Local Authorities (five regions) in England, which were chosen to provide a sample of urban, rural, inner city and other social demographic populations. The first children were recruited to the project in early 1997 (see Appendix 2 for the cohort structure of the sample).

Once out of pre-school, the children were enrolled in over 800 primary schools across the country. Figure 2.1 shows how the sample dispersed across school phases.

Figure 2.1: Design of the EPPSE study



Sample attrition

The original EPPE study began in 1997 with over 3,000 children. In 17 years, inevitably, as in all longitudinal studies, there has been some attrition from the sample. In order to keep the sample engaged, the young people were sent regular birthday cards, questionnaires, newsletters and opportunities to enter competitions with other participants. Analyses of the demographics of the post 16 sample, on a number of key indicators (ethnicity, poverty at home as measured by eligibility for free school meals [FSM], special educational needs [SEN] status), suggests that the respondents are broadly representative of a national sample of young people and their families (see Table 2.1).

The sample ('n') included in different EPPSE analyses varies reflecting; sample attrition, the outcome being studied, the means of data collection and response rate to various questionnaires. For instance the GCSE academic outcome at age 16 had valid data for 2582 students (94% of the 2744 active sample tracked and 81% of the original 3172 sample at age 5 (Sammons et al., 2014a). The social-behavioural outcomes (Sammons et al., 2014b) are derived from an analyses of approximately 2,400 students who had Pupil Profiles (88% of the active tracked sample) returned from teachers in 904 secondary schools. Other outcomes at age 16 are based on the responses to a student 'Life in Year 11' questionnaire completed and returned by 1,670 students (61% of the active tracked sample). Extensive 'tracking' over time means that some students 'lost' at earlier time points and excluded from some analyses have been included in later analyses using their unique pupil identifier in national data sets. The data for the analyses of post 16 destinations is derived from 1,737 (63% of the active tracked sample) responses to a Life After Year 11 questionnaire, sent out six months after the EPPSE students completed Year 11.

Table 2.1 Selected background characteristics and questionnaire returns

Background characteristic	Returned Post 16 questionnaire		England[4]	
	N	%	N	%
White British ethnic heritage	1343	77.3	10,000,330	77.9
Eligible for FSM in Year 11	237	14.0	298110	13.2
On SEN register in Year 11	290	17.4	2,652,535	20.1

The EPPSE data matches the national figures from DfE data very closely on these characteristics, with EPPSE having slightly more young people eligible for FSM and slightly less students on the SEN register in Year 11.

One of the challenges of the post-16 phase of this study has been obtaining questionnaire data from teenagers. This mode of data collections was not without its challenges. The questionnaires were initially sent out in hard copy. After a month researchers undertook 'follow-up' but efforts to increase the response rate were, unlike previous phases of the research, made difficult because of behaviours specifically associated with teenagers: their disengagement in anything 'official' or outside of their immediate day-to-day culture, their lack of availability and erratic timekeeping. However, persistence and a range of options for completing the questionnaires, including resending hard copy, face-to-face meetings, telephone interviews and an on-line version, pushed the initial forty per cent response rate up to sixty-three per cent. This is a high response rate for a survey of this type that asks for sensitive information regarding family circumstances, aspirations and emotions. The response rate is a testament to the team of research assistants led by Anne Hall and Linda Burton who dealt sensitively with the students and families they encountered who were in distressing circumstances, in need of guidance and suffering bereavement.

4 This is a combined figure for the 2008/09-2012/2013, corresponding to the years EPPSE students were in Year 11.

2.3 Measures at age 16

2.3.1 Academic

There are a range of Key Stage 4 academic outcomes with some relating to 'quantity' (such as number of examinations passed) and some relating to 'quality' such as achieving 5 qualifications at grades A* - C. The analyses for academic outcomes reported in detail in Sammons et al., (2014a) are based on the students' GCSE results at the end of Year 11:

- the total GCSE and equivalents point score
- grade achieved in full GCSE English
- grade achieved in full GCSE maths
- total number of full GCSE entries.

Use is also made of some important benchmark indicators:

- achieving 5 or more GCSE/GNVQs at grades A*-C
- 5 or more GCSE and equivalents at grades A*-C including GCSE English and maths
- whether students meet the requirements of the English Baccalaureate (EBacc).

2.3.2 Social-behavioural

A 'Pupil Profile', sent to Year 11 teachers, was used to collect information on students' social-behavioural development. This profile builds on similar ratings sent at earlier time points to pre-school and primary school staff. The profile was based on the Goodman (1997) Strengths and Difficulties Questionnaire, with additional items to extend the range of social behaviours measured. Four underlying dimensions of social-behavioural development were identified: self-regulation, pro-social behaviour (positive) and hyperactivity, anti-social behaviour (negative). Scores on these factors provide a social-behavioural development profile for each student at age 16. As the profile used was similar to those administered at earlier time points the analyses could not only investigate contemporaneous behaviours but also how these may have changed over time.

2.3.3 Dispositions and views of school

During Year 11 students were sent a ‘Life in year 11’ questionnaire. Three dispositions were identified from answers to a range of questions: Mental well-being, General academic self-concept and Resistance to peer influence. Answers from this questionnaire were also linked to other sources of data to produce two additional disposition factors: school enjoyment and disaffected behaviour. The Year 11 survey also explored students' views and experiences of school resulting in the following factors: teacher professional focus, positive relationships, monitoring, formative feedback and academic ethos. See Appendix 3 for all measures at earlier time points.

2.4 Methodology and analytical strategy

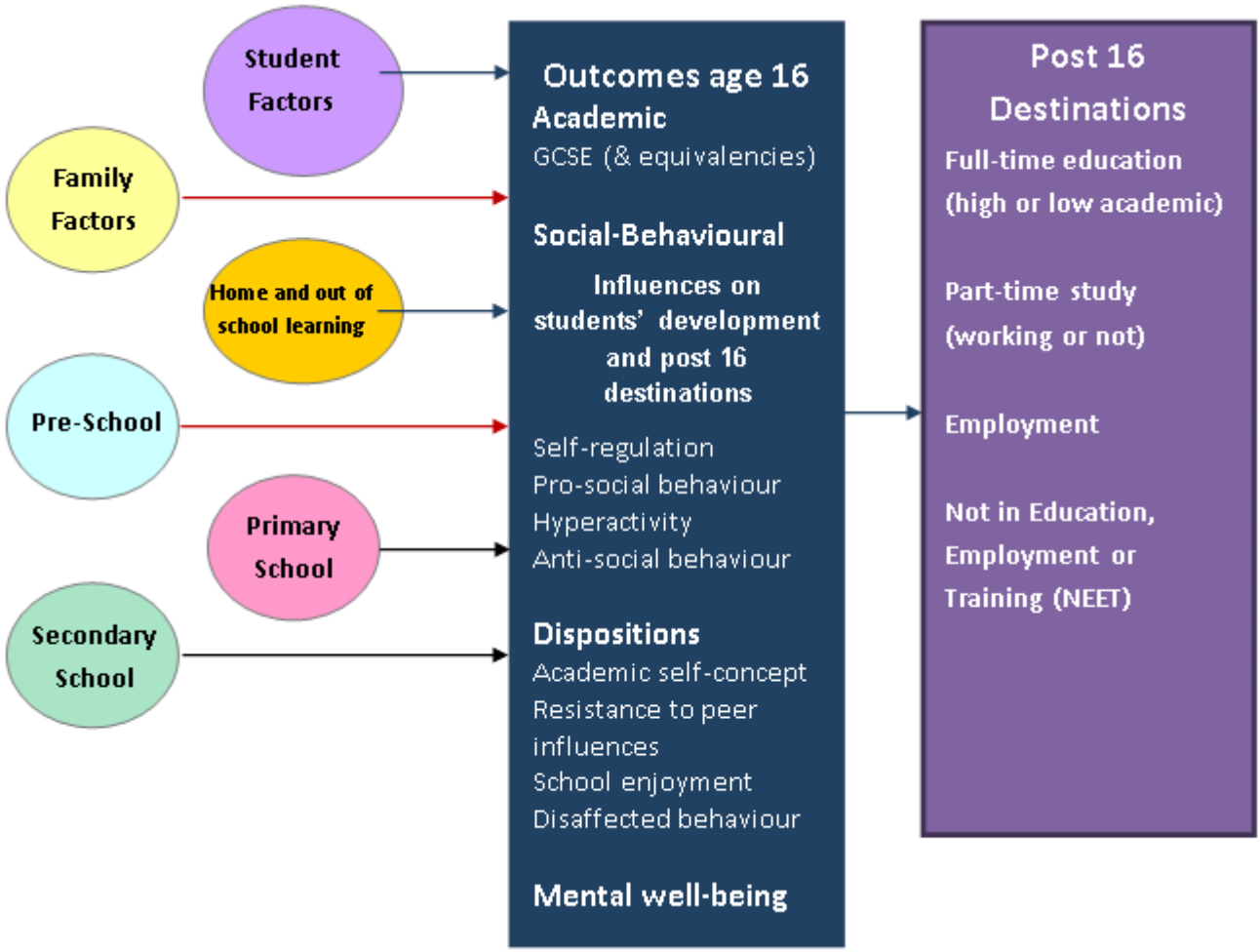
A number of statistical techniques from descriptive and correlation analysis to multilevel (hierarchical) regression methods were used to examine the way various individual student, family and home learning environment (HLE) characteristics influence students’ academic and social-behavioural outcomes, progress up to the end of KS4 and into post-16 destinations.

When the effects of different characteristics such as gender, family or poverty (to name but a few) are reported they are calculated net of other influences in the statistical models. The multilevel regression techniques can apportion the relative contributions of various ‘explanatory’ predictors within the same model. For example, parental qualifications and household salary are themselves significantly correlated but the statistical modelling reveals the independent contribution of each in predicting variations between students in their total GCSE scores while other influences (e.g., number of siblings, duration of pre-school) are also taken into account.

The effects associated with pre-school, primary school and secondary school characteristics can only be adequately achieved if proper account is taken of a range of background characteristics that can influence development as shown in Fig Figure 2.2. 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; 2003), and therefore produces more accurate estimates of the net effects of different predictors and their statistical significance.

EPPSE 3-16+ employed a range of simple descriptive techniques as well as more complex multivariate analyses including exploratory and confirmatory factor analyses, which are used to identify underlying dimensions or latent factors (e.g., of social behaviour or affective outcomes such as ‘academic self-concept’ or ‘enjoyment of school’).

Figure 2.2: Influences on students' development and post 16 destinations



Multilevel (hierarchical) regression was used to model the influences of various individual student, family, home learning environment (HLE)[5] and neighbourhood characteristics as predictors of variation in students' Year 11 GCSE and other social-behavioural or disposition outcomes. In addition, value added analyses of students' developmental progress are conducted to explore change over time in various outcomes from Year 6 (end of KS2, age 11) to Year 11 (end of KS4, age 16). Here the equivalent Year 6 measure is used as a baseline to study progress or change across five years in secondary schooling. 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., 2008b; 2008c; 2008d; 2008e, Sammons et al., 2011a, 2011b, 2011c, 2011d).

5 For details of the home learning environment (HLE) at different time points see Appendix 4

After exploring individual student, family and HLE characteristics as predictors of outcomes at age 16, multilevel analyses also went on to investigate:

- the continued influence of attending pre-school (using measures of duration, quality and effectiveness)
- the continued influence of academic effectiveness of the primary school attended by an EPPSE student (CVA measures)
- the influence of secondary school's quality (based on Ofsted inspection ratings of school quality)
- the influence of secondary school's academic effectiveness (from DfE CVA analyses of national data sets).

Various additional measures were collected from the Year 9 'All About Me in School' questionnaire e.g., on the amount of time students reported spending on homework and several indicators of school and teaching processes. These have been developed using Exploratory factor analysis (EFA) and Confirmatory factor analysis (CFA) and tested as predictors of academic and social-behavioural outcomes as well as of student attitudes in the various multilevel models for Year 11.

Section 3 Academic attainment and progress

Attainment

- Girls (compared to boys) obtained better results in GCSE English, had higher total GCSEs and were entered for more full GCSEs.
- Students with more highly qualified parents and from higher SES groups had higher attainment. Parents' highest qualification level (when child was age 3/5) was the strongest net predictor of better grades in GCSE English and maths and achieving 5 A*-C including English and maths.
- Students eligible for FSM had lower average attainment.
- A more stimulating early years HLE was a predictor of better GCSE results.
- Ethnicity differences were strongly positive for students of Bangladeshi, Indian & Pakistani heritage as predictors of better GCSE outcomes.
- Family income (in KS1), showed large effects for the likelihood of achieving 5 A*-C (at or above £67000 compared to no earned salary).
- Neighbourhood disadvantage was a weak predictor of lower GCSE English and maths grades and a lower likelihood of attaining the benchmark indicators.
- A higher % of FSM students in a school predicted lower GCSE English grades, fewer full GCSE entries and a lower probability of achieving 5 A*-C.
- Pre-school attendance was a predictor of higher total GCSE score, more GCSE entries, better grades in GCSE English and maths and, of a higher probability of achieving 5 A*-C including English and maths.
- Longer pre-school duration predicted higher total GCSE score, better grades in GCSE English and maths and a higher number of total GCSE entries.
- Pre-school quality predicted better total GCSEs, GCSE English and maths scores and a higher likelihood of achieving 5 A*-C including English and maths.
- Higher pre-school effectiveness predicted more GCSE entries, better grades in GCSE English and a higher probability of achieving 5 A*-C including English and maths.
- Joint effects: Boys who attended a high quality pre-school had higher grades in GCSE maths. Attending a high quality pre-school predicted better grades in GCSE English and maths for students with low qualified parents.
- Attending a more academically effective primary school for maths predicted better GCSE maths grades. Students from high/medium effective primary schools were almost twice as likely to achieve the EBacc.

- Secondary schools' overall academic effectiveness predicted better total GCSE scores and increased the probabilities of achieving 5 A*-C and 5 A*-C including English and maths. Students who attended a secondary school rated as 'outstanding' by Ofsted for 'quality of pupils' learning' had better results in GCSE English and GCSE maths, and were more likely to achieve 5 A*-C, 5 A*-C including English and maths, as well as the EBacc.

Progress

- Students with the following characteristics made greater progress between KS2 and KS4 in a range of outcomes: older for their year group (Autumn-born), female, of Bangladeshi heritage, from families with higher qualifications/SES/incomes and who provided a more academically enriching KS3 HLE.
- The % of White British residents in a neighbourhood was the only significant neighbourhood predictor of poorer student progress in English. Higher rates of crime predicted poorer progress in maths. Perceived neighbourhood safety also predicted progress in maths, with poorer progress linked to living in a neighbourhood perceived as less safe.
- Pre-school attendance, quality and effectiveness significantly predicted better academic progress in terms of promoting a higher total GCSE score.
- Secondary school academic effectiveness was a moderately strong predictor of better progress in total GCSE score. Ofsted ratings of secondary school quality predicted greater progress in GCSE English and maths but not progress in other GCSE outcomes.

For full details of the findings and analyses see Sammons et al., 2014a.

This section of the report presents the results of analyses of students' academic attainment at the end of Year 11, when they took their General Certificate of Secondary Education (GCSE) examinations. It also studies academic progress from the age of 11 to 16 across five years of secondary schooling (KS2 to KS4). The results extend the findings about these students' educational outcomes at younger ages (Sylva et al., 2010; Sammons et al., 2002a; Sammons et al., 2004a; Sammons et al., 2011a), and are summaries drawn from an extensive technical paper (Sammons et al., 2014a). Companion reports on students' social-behavioural development, dispositions and views of schools over the same period are reported in separate technical papers (Sammons et al., 2014b; 2014c; 2014d).

Throughout the research, the EPPSE project has gathered a wide range of data on children's development, and individual, family, home learning environment (HLE), neighbourhood, pre-school, primary school and secondary school characteristics. Measures such as secondary schools' academic effectiveness[6] and Ofsted inspection judgements were used to provide indicators of the quality of the secondary schools attended by EPPSE students. These complement the measures of quality[7] and effectiveness[8] for pre-school settings and the measures of primary school academic effectiveness[9]. It was therefore possible to explore pre-school, primary school and secondary school influences on EPPSE students' academic attainment in Year 11 as expressed through various outcome measures based on GCSE results.

The sample size for analyses varies on different outcomes, but includes a minimum of 2582 students, representing over ninety-four per cent of the sample tracked to the end of KS4 (n= 2744) and eighty-one per cent of the original sample of children (n= 3172).

The aims of the academic analyses in KS4 (age 16) are to investigate:

- the relationships between students' academic attainment and individual student, family and home learning environment (HLE) characteristics;
- students' progress between KS2 and KS4 (Year 6 to Year 11) and its predictors;
- the continuing influence of pre-school experience, particularly attendance, quality and academic effectiveness on academic outcomes;
- the combined influence of gender, parental qualification levels, HLE and pre-school experiences on later academic attainment;
- the influence of primary school academic effectiveness on later academic attainment and progress;
- the influence of secondary school academic effectiveness and quality on students' academic attainment and progress;
- the influences of student reported experiences about characteristics of their secondary schools on their academic attainment and progress.

6 Secondary school academic effectiveness (DfE's CVA) is a measure of progress between KS2 and KS4 taken over 4 years (2006-2009). Quality measures were from various Ofsted inspection judgments over the same period.

7 Pre-school quality was measured by the ECERS-R (Harms, Clifford & Cryer, 1998) and ECERS-E (Sylva et al., 2003).

8 The effectiveness of pre-school measure was from value added (VA) models of progress during pre-school, controlling for prior attainment and background characteristics.

9 The academic effectiveness measure of the EPPE 3-11 children's primary schools was from analyses of National Assessment data (2002-2004) for all primary schools in England (Melhuish et al., 2006a; 2006b).

Previously, EPPSE has shown that characteristics related to child, family and the HLE are important predictors of both early cognitive and later academic attainment and progress up to age 14 (Sammons et al., 2002; Sammons et al., 2008b, Sammons et al., 2011a). The influences of these can be detected from a young age and can also predict later educational attainment. Analyses of variations in achievement point to the negative effects of socio-economic disadvantage and the importance of early years experiences. The results have contributed to policy developments in England associated with issues of equity and social inclusion (Taggart et al., 2008; The EPPE 3-11 Team, 2007; The Equalities Review, 2007; Sylva et al., 2007, Allen, 2011; Field, 2010).

The analyses presented here are based on the students' GCSE results as follows:

- the total GCSE and equivalents point score
- the grade achieved in full GCSE English
- the grade achieved in full GCSE maths
- the total number of full GCSE entries.

The analyses also used some important Department for Education (DfE) benchmark indicators that are used to judge school performance:

- achieving 5 or more GCSEs/GNVQs at grades A*-C
- achieving 5 or more GCSEs and equivalents at grades A*-C including GCSE English and GCSE maths
- achieving the English Baccalaureate (EBacc).

These analyses identify which child, family and HLE characteristics predict EPPSE students' KS4 academic attainment and show similarities to earlier findings during KS3 (Sammons et al., 2011a). While many findings are in line with other educational research, EPPSE shows the continued importance of the early years HLE. EPPSE is unique in exploring the early years HLE across different phases of education. It shows that the early years HLE continues to predict attainment up to age 16. This section shows that various individual and family background characteristics continue to shape students' academic progress between KS2 and KS4 (especially ethnicity, parents' highest qualification levels and the KS3 HLE measure of academic enrichment).

As well as investigating the impact of child, family and the HLE, EPPSE explored the continued influences of pre, and primary school as predictors of attainment at age 16. It also tested measures related to secondary schools based on students' reports of their views of school in KS3 and KS4. The results, therefore, provide new evidence on the way different educational settings affect GCSE attainment and progress across five years in secondary education. This section focuses on statistical trends and quantitative analyses of characteristics that predict attainment and progress in KS4 based on results using multilevel statistical models.

3.1 Summary of findings[10]

For detailed tables illustrating these findings see Appendix 5.

3.1.1 Raw differences in attainment for different student groups

Gender

In Year 11, on average females continue to obtain better results in GCSE English than males (with a difference of about half a grade). However, there were no significant gender differences in GCSE maths. Females also obtained higher total GCSE scores (Mean=472.3; Standard Deviation =165) and were entered for more full GCSEs (Mean=7.6; Standard Deviation=2.7) than males, and were more likely to achieve all three DfE benchmark indicators of performance - 5 A*-C, 5 A*-C including English and maths and the EBacc. At younger ages, girls had been found to have higher attainment in reading and English. They also had higher maths and science outcomes in primary school, but by age 14 and later at age 16, these gender differences are no longer statistically significant.

Ethnicity

There was some evidence of ethnic differences in attainment, but due to low numbers for most ethnic origin sub-groups the results should be interpreted with caution. The differences found in average results by ethnic group are in line with those evident in other studies indicating higher attainment for some groups (e.g., students of Bangladeshi, Indian or Pakistani heritage) compared with students of White UK heritage.

Family characteristics

There were marked differences in GCSE attainment related to parents' qualification levels (originally measured when children were age 3/5). As might be anticipated, students with highly qualified parents (degree level) had much higher attainment on average than those students whose parents had no qualifications. The differences were equivalent to 141 points for total GCSE score, 10 points in GCSE English, 13 points in GCSE maths (equal to two grades higher e.g., the difference between achieving a grade B instead of a grade D), and 4 extra full GCSE exam entries.

There were also large differences related to family socio-economic status (SES) between those students whose parents were from the professional non-manual category and those from lower SES categories. Moreover, students eligible for Free School Meals (FSM) had lower average attainment than students who were not eligible for FSM. The differences for FSM versus no FSM were around a full GCSE grade in size in GCSE English and GCSE maths.

The quality of the early years home learning environment (HLE) showed a clear association with later differences in average GCSE results. The differences for GCSE

[10] Only statistically significant differences are presented.

English and maths were approximately 10 grade points, and for total GCSE score the difference was 125 points for those who had experienced a high versus low quality early years HLE. This again confirms earlier findings about the likely importance of parents providing a stimulating HLE in the early years.

3.1.2 The net impact of child, family and HLE characteristics on GCSE attainment in Year 11

The average group differences described above do not take into account the relative influence of other characteristics. Multilevel modelling provided more detailed results of the 'net' contribution of individual characteristics, whilst controlling for other predictors and so enabled the identification of the 'strongest' net predictors. For instance, effects can distinguish differences in attainment for students with mothers who have degrees compared with those with no qualifications, net of the influence of other associated family and individual student level characteristics (e.g., family SES, income, HLE, age or gender). Results are reported in effect sizes (ES), a statistical measure of the relative strength of different predictors, or in odds ratios (OR), representing the odds of achieving certain benchmark performance indicators given certain characteristics relative to the odds of the reference group.

The strongest background predictors

Parents' highest qualification level, when children were age 3/5, was the strongest net predictor of better attainment in terms of grades in GCSE English (ES=0.69 - for degree versus no qualification; ES=0.80 - for higher degree versus no qualification) and GCSE maths (ES=0.65 - for degree versus no qualification; ES=0.74 - for higher degree versus no qualification) and achieving 5 A*-C including English and maths (OR=2.86 - for higher degree, OR=3.92 - for degree). All these comparisons are to parents with no qualifications (see Table 3.1 and Table 3.2).

Differences related to ethnicity were strong predictors of total GCSE score (ES=0.76 for students of Bangladeshi heritage). Family income, measured in KS1, showed larger effects in terms of the likelihood of achieving 5 A*-C (OR=3.94 - for an income larger than £67000 when compared to no earned salary) and the EBacc (OR=4.04 - for an income larger than £67000 when compared to no earned salary).

Table 3.1: Summary findings from contextualised models: academic outcomes[11]

Background characteristics	Total GCSE score	Total GCSE entries	GCSE English	GCSE maths
Individual student measures	**ES**	**ES**	**ES**	**ES**
Age	0.14		0.13	0.14
Gender	0.19	0.11	0.38	
Ethnicity	0.76 (B)†	0.58 (B)	0.55 (B)	0.53 (I)ǂ
Birth weight		-0.39		
Early behavioural problems	-0.29	-0.30	-0.17	-0.27
Early health problems	-0.12	-0.12	-0.14	-0.16
Number of siblings	-0.17	-0.33	-0.28	-0.17
Family measures				
Mother's age (age 3/5)			0.15	0.10
FSM (Year 11)	-0.32	-0.23	-0.31	-0.37
Family salary (KS1)	0.29	0.52	0.41	0.28
Parents' highest SES (age 3/5)	-0.31	-0.58	-0.53	-0.66
Mothers' highest qualifications level (age 3/5)[12]	0.47	0.31	0.70	0.57
Fathers' highest qualifications level (age 3/5)[13]		0.25	0.33	0.40
Parents' highest qualifications level (age 3/5)	0.59	0.36	0.80	0.74
HLE measures				
Early years HLE	0.36	0.51	0.51	0.45
KS1 HLE enrichment outings (medium)				0.11
KS1 HLE educational computing (medium)	0.11	0.13		
KS2 HLE educational computing (medium)		0.13	0.10	0.15
KS3 HLE computer (high)		0.15		
KS3 HLE academic enrichment (high)	0.47	0.43	0.48	0.47

†B=Bangladeshi heritage; ǂI=Indian heritage

11 ES are based on the models that included the combined measure of parental qualification levels. When multiple categories are significant, the highest ES is presented.

12 This measure was tested in different models than the models that included the combined parental qualification measure.

13 This measure was tested in different models than the models that included the combined parental qualification measure.

Table 3.2: Contextualised models: benchmark indicators[14]

Background Characteristics	Achieved 5 A*-C	Achieved 5 A*-C English and maths	EBacc
Individual student measures	**OR**	**OR**	**OR**
Age		1.04	
Gender	1.45	1.24	1.74
Ethnicity		2.28(I)[≠]	
Developmental problems	0.68	0.67	
Behavioural problems	0.65	0.63	
Health problems	0.63		
Number of siblings	0.62	0.69	
Family measures			
Mother's age (age 3/5)	1.33		1.39
FSM (Year 11)	0.61	0.51	
Family salary (KS1)	3.94	1.95	4.04
Parents' highest SES (age 3/5)	0.50	0.59	0.41
Mothers' highest qualifications level (age 3/5)[15]	3.14	4.11	
Fathers' highest qualifications level (age 3/5)[16]	2.48	2.07	3.16
Parents' highest qualifications level (age 3/5)	3.58	3.92	2.83
HLE measures			
Early years HLE	3.61	2.90	
KS1 HLE enrichment outings (medium)		1.39	
KS1 HLE educational computing (medium)	1.36		0.51 (high)
KS3 HLE academic enrichment (high)	2.80	2.60	3.89
KS3 HLE parental interest (high)		1.34	

[≠]I=Indian heritage

[14] ORs are based on the models that included the combined measure of parental qualification levels.

[15] This measure was tested in different models than the models that included the combined parental qualifications measure.

[16] This measure was tested in different models than the models that included the combined parental qualifications measure.

Strong/moderate background predictors

There were also a number of additional strong/moderately strong effects for various family influences that are noted in Table 3.3.

Table 3.3: Background predictors of academic attainment

Predictor characteristics	Academic outcome						
Child Characteristics	**Total GCSE score**	**GCSE grade in English**	**GCSE grade in maths**	**Total number of full GCSE entries**	**Achieving 5 A*-C**	**Achieving 5 A*-C including English & maths**	**EBacc**
Gender					X		X
Ethnicity		X	X	X		X	
FSM (Year 11)			X				
Family Characteristics							
Parents' highest qualification level	X				X		X
Family SES		X	X	X			
Family salary (KS1)		X		X		X	
Home learning environment (HLE)							
Early years HLE	X	X	X	X	X	X	
KS3 HLE academic enrichment	X	X	X	X	X	X	X

Ethnicity was not a significant predictor of the overall benchmark indicators (i.e. achieving 5 A*-C or the EBacc), but it was for the other GCSE outcomes like the total GCSE score and subject grades. Students of Pakistani[17] and Bangladeshi[18] heritage obtained statistically significant and higher total GCSE scores, better grades in GCSE maths and were entered for more full GCSEs than students of White UK heritage when account was taken of the effects of all other significant predictors e.g., SES, income. Students of Indian heritage had significantly better results in both GCSE English and GCSE maths, and were twice as likely to achieve 5A*-C including English and maths than White students.

[17] This shows that for Pakistani students, their low raw scores are accounted for by background influences.

[18] There is only a small sample size of EPPSE students who are of Bangladeshi heritage.

Both FSM (a low income indicator; ES=-0.31) and family SES (ES=-0.49 – for unskilled versus professional non-manual) had moderate effects on grades in GCSE English, but the family SES effect was stronger for grades in GCSE maths (ES=-0.66 - for unskilled versus professional). The SES effects for grades in GCSE English were similar in size to the effects of the early years HLE (ES=0.51 - for high versus low) and KS3 enrichment HLE measure for English (ES=0.48 - for high versus low). Interestingly, the early years HLE had a stronger impact on all measures of students' GCSE results than the low income indicator, FSM.

Older students (for their age group e.g., Autumn-born) showed significantly better results although the effect was not strong. There were also small positive effects related to the age of the mother at the child's birth. The older the mother the better the child's grades in GCSE English and GCSE maths, and the higher the likelihood of achieving overall benchmark indicators (5 A*-C and the EBacc), when compared with students who had younger mothers.

These results broadly confirm patterns identified for the EPPSE sample at younger ages indicating that differences in attainment related to individual student and family background influences emerge early (age 3/5) and remain fairly stable as students' progress through primary and secondary school. Evidence for this conclusion has been well established in previous research (Mortimore et al., 1988; Nuttall, 1990; Rutter & Madge, 1976; Tizard et al., 1988; Sammons, 1995) but EPPSE shows the important effects of the HLE that have been little studied elsewhere.

3.1.3 Other predictors

Neighbourhood influences

A number of neighbourhood measures were tested as potential predictors of GCSE results. These measures reflected the neighbourhood in which the child lived while in pre-school and primary school and may not reflect later neighbourhood environments resulting from the EPPSE students' families moving house.

Previous research has suggested that contextual influences outside the family (such as 'place poverty' linked to living in a disadvantaged neighbourhood and school intake composition) can also influence student attainment. Living in a disadvantaged area while in pre-school or primary school and attending a school with a higher representation of disadvantaged students may affect student and family aspirations and attitudes towards education, as well as teacher expectations, classroom processes and school climate (Chowdry, Crawford and Goodman, 2011; Goodman and Gregg, 2010; Leckie, 2009; 2012; Sammons, Thomas and Mortimore, 1997; Sampson, 2012;).

Levels of neighbourhood disadvantage measured by the national indicators the Index of Multiple Deprivation (IMD - Noble et al., 2004), and the Income Deprivation Affecting Children Index (IDACI - Noble et al., 2008) were used to predict GCSE results.

The IDACI was found to be a significant negative predictor of lower grades in GCSE English (ES=-0.15) and in GCSE maths (ES=-0.16), and also of lower likelihood of attaining the benchmark performance indicators (ORs ranged between 0.32-0.39). This had not been found to be the case during the primary school years, possibly because neighbourhood influences increase as adolescents interact more with their peer group outside the home. Students who lived in more disadvantaged neighbourhoods in their early years went on to show poorer attainment in GCSE outcomes, over and above their own and their family characteristics, although these neighbourhood effects are relatively small compared with those of the family.

Other neighbourhood measures were also studied. These included the level of unemployment, level of crime, percentage of White British residents and the percentage of residents with limiting long term illnesses. Except for the last measure, all these other indicators were significant negative predictors of different GCSE outcomes in Year 11, although the effects were fairly weak. For example, a higher percentage of White British residents in a neighbourhood was a statistically significant predictor with small negative effects for grades in GCSE English (ES=-0.20) and in GCSE maths (ES=-0.15) and the three benchmark indicators. The level of crime and unemployment recorded in a neighbourhood were both found to have small negative effects on attainment in maths and slightly stronger negative effects on the number of full GCSE entries. Similarly, parents' perceptions of higher levels of safety in their neighbourhood (measured by a parental questionnaire during KS1) also showed small but positive effects on grades in GCSE maths, total GCSE score and achieving 5 A*-C.

School composition

There is some evidence that the 'social composition' of the school intake, as measured by the percentage of students entitled to free school meals (FSM), predicts individual students' outcomes over and above their own FSM status. A higher percentage of FSM students measured at school level predicted significantly lower grades in GCSE English (ES=-0.18), fewer full GCSE entries (ES=-0.55) and a lower probability of achieving 5 A*-C (OR=0.98).

These findings are in line with research conducted by the DfE that examined broader contextual influences when calculating the national Contextual Value Added (CVA) measure. The DfE's national CVA analyses of school performance have demonstrated that the school intake measure (% of FSM students) and neighbourhood measures such as the IMD and IDACI score predict poorer progress for students, even when individual student background measures are controlled.

Taken together the results indicate that attainment was lower for students who lived in more disadvantaged neighbourhoods compared with those living in more advantaged neighbourhoods, over and above their own and their family characteristics. The neighbourhood and school composition influences though relatively small have become stronger as the EPPSE sample move through adolescence. The findings show the challenges faced in raising attainment in certain social contexts as recognised by research on schools in challenging circumstances (Muijs et al., 2004).

Pre-school

The EPPSE research was designed to follow up children recruited at pre-school as they moved into primary school and later secondary school in order to identify the contribution of different educational influences on their later progress and development during various phases of education, and whether effects shown when children were younger continued to remain evident thirteen years later. Four measures of pre-school were tested:

- Attendance at any pre-school or not (in comparison with the no pre-school group)
- Duration of attendance (in months)
- Quality (measured by the ECERS-R and ECERS-E)
- Effectiveness of the pre-school attended in promoting better child outcomes at entry to primary school.

Attendance

Attending any pre-school was found to be a statistically significant predictor of higher total GCSE score (ES=0.31), more full GCSE entries (ES=0.21), better grades in GCSE English (ES=0.23) and GCSE maths (ES=0.21), and of a higher probability of achieving 5 A*-C including English and maths (OR=1.48), when compared with students from the no pre-school group. Although relatively modest, these effects are still stronger than those found for students' age (i.e., being Autumn rather than Summer-born) or the effects of some home learning measures (i.e., KS1 and KS2 HLE) or family composition. They indicate that attending a pre-school (versus not) still shapes academic outcomes in the longer term (see Table 3.4).

Duration

The amount of time in months (duration of attendance) that a student had spent in pre-school also showed continued effects on Year 11 academic outcomes. Students who had attended between 2 and 3 years (whether part-time or full-time) in pre-school obtained higher total GCSE scores (ES=0.38), better grades in GCSE English (ES=0.28) and in GCSE maths (ES=0.30), and were entered for more GCSE exams (ES=0.24) than those who had not attended any pre-school. This represented the advantages of a fairly early start to pre-school when children were between two to three years old.

Table 3.4: Summary for Year 11 academic outcomes[19]

	Total GCSE score	Total GCSE entries	GCSE English	GCSE maths
Individual student measures	**ES**	**ES**	**ES**	**ES**
Age	0.14		0.13	0.14
Gender	0.19	0.11	0.38	
Ethnicity	0.76 (B)†	0.58 (B)	0.55 (B)	0.53 (I)≠
Birth weight		-0.39		
Early behavioural problems	-0.29	-0.30	-0.17	-0.27
Early health problems	-0.12	-0.12	-0.14	-0.16
Number of siblings	-0.17	-0.33	-0.28	-0.17
Family measures				
Mother's age at age 3/5			0.15	0.10
Year 11 FSM	-0.32	-0.23	-0.31	-0.37
KS1 family salary	0.29	0.52	0.41	0.28
Parents' highest SES at age 3/5	-0.31	-0.58	-0.53	-0.66
Mothers' highest qualifications level at age 3/5	0.47	0.31	0.70	0.57
Fathers' highest qualifications level at age 3/5		0.25	0.33	0.40
Parents' highest qualifications level at age 3/5	0.59	0.36	0.80	0.74
HLE measures				
Early years HLE	0.36	0.51	0.51	0.45
KS1 HLE outing (medium)				0.11
KS1 HLE educational computing (medium)	0.11	0.13		
KS2 HLE educational computing (medium)		0.13	0.10	0.15
KS3 HLE computer (high)		0.15		
KS3 HLE academic enrichment (high)	0.47	0.43	0.48	0.47
Pre-school measures				
Pre-school attendance	0.31	0.21	0.23	0.21
Pre-school duration	0.38	0.24	0.28	0.30
Pre-school quality	0.37	0.20	0.31	0.26
Pre-school effectiveness pre-reading	0.27	0.25	0.31	
Pre-school effectiveness early number concepts	0.48	0.23		0.35
Primary school measures				
Primary school academic effectiveness - maths				0.25
Secondary school measures				
Secondary school academic effectiveness	0.42			
Secondary school quality – the quality of pupils' learning		0.93	0.47	0.47
Secondary school quality – attendance of learners		0.78	0.50	0.62

B†=Bangladeshi heritage; I≠=Indian heritage

[19] ES are based on the models that included the combined measure of parental qualification levels. When multiple categories are significant, the highest ES is presented.

Quality

There was some evidence that the quality of pre-school also continued to predict better GCSE results. The pattern of findings for the effects of pre-school quality was very similar regardless of whether the quality measurement was the ECERS-E or ECERS-R (see Table 3.5, Table 3.6, Table 3.7 and Table 3.8). Students who had attended high quality pre-schools showed the most consistent pattern (High quality pre-school compared to no pre-school: total GCSE score – ES=0.37; GCSE English – ES=0.31; GCSE maths – ES=0.26). Those who had attended a high quality setting were also more likely to achieve 5 A*-C including English and maths (OR=1.69) than students who had not attended pre-school (see Table 3.6). These quality effects were mostly fairly small although still statistically significant. This pattern shows broadly similar effects to those found at younger ages, but they are weaker than those found when students were in KS2 in primary school.

Table 3.5: Contextualised models: Pre-school quality ECERS-E

Fixed effects	**Total GCSE score**		**Total GCSE entries**		**GCSE English**		**GCSE maths**	
Pre-school quality (compared with no pre-school)	**ES**	**Sig**	**ES**	**Sig**	**ES**	**Sig**	**ES**	**Sig**
Low quality	0.36	***	0.24	*	0.22	*	0.20	*
Medium quality	0.27	**	0.20	*	0.19	*	0.20	*
High quality	0.37	***	0.20		0.31	**	0.26	**
Number of students	2497		2510		2343		2535	
Number of schools	610		614		573		675	
Intra-school correlation (ICC)	0.3029		0.3020		0.0618		0.0409	
% Reduction student variance	15.6		11.3		20.7		18.7	
% Reduction school variance	28.4		62.4		86.1		86.1	
% Reduction total variance	19.9		37.1		38.6		32.2	

* p<0.05, ** p<0.01, *** p<0.001

Table 3.6: Contextualised models - Pre-school quality ECERS-E

Fixed effects	**Achieved 5 A*-C English and maths**	
Pre-school quality (compared with no pre-school)	**OR**	**Sig**
Low quality	1.48	
Medium quality	1.40	
High quality	1.69	*
Number of students		2753
Number of schools		735
% Reduction school variance		45.8

* p<0.05, ** p<0.01, *** p<0.001

Table 3.7: Contextualised models - Pre-school quality ECERS-R

Fixed effects	Total GCSE score		Total GCSE entries		GCSE English		GCSE maths	
Pre-school quality (compared with no pre-school)	**ES**	**Sig**	**ES**	**Sig**	**ES**	**Sig**	**ES**	**Sig**
Low quality	0.30	**	0.18		0.20		0.17	
Medium quality	0.29	**	0.25	**	0.22	*	0.24	**
High quality	0.35	***	0.13		0.25	*	0.20	*
Number of students	2497		2510		2343		2535	
Number of schools	610		614		573		675	
Intra-school correlation (ICC)	0.3005		0.3008		0.0631		0.0436	
% Reduction student variance	15.4		11.4		20.6		18.9	
% Reduction school variance	29.1		62.6		85.8		85.2	
% Reduction total variance	20.0		37.3		38.4		32.1	

* p<0.05, ** p<0.01, *** p<0.001

Table 3.8: Contextualised models benchmark indicators - Pre-school quality ECERS-R

Fixed effects	Achieved 5 A*-C English and maths		EBacc	
Pre-school quality (compared with no pre-school)	**OR**	**Sig**	**OR**	**Sig**
Low quality	1.36		1.81	
Medium quality	1.42		2.55	*
High quality	1.69	*	1.75	
Number of students	2753		2255	
Number of schools	735		584	
% Reduction school variance	47.3		77.9	

* p<0.05, ** p<0.01, *** p<0.001

Duration and quality

EPPSE is able to show how Effect Sizes for duration and quality translate into 'real life' metrics expressed in GCSE grades and point scores (see Appendix 9 for GCSE grades, point scores and distribution). Each difference in grade at GCSE in English or maths (and other subjects) is the equivalent of 6 points

EPPSE found an overall effect of going to pre-school or not going (attendance) with positive patterns also relating to the duration of attendance (in months) and the quality of pre-school. Table 3.9 shows the pattern for duration for total GCSE point score and Table 3.10 shows the pattern for pre-school quality for GCSE English grade (N.B. similar patterns were found for maths results).

Table 3.9: Pre-school duration and total GCSE scores

Pre-school duration (compared to no pre-school)	Estimate	SE	ES	Sig
0-12 months	23.20	13.44	0.18	
12-24 months	32.78	12.75	0.25	*
24-36 months	50.95	13.47	0.38	***
>36 months	50.92	15.99	0.38	**

The difference in GCSE point score for over 2 years or more duration was approximately 51 points. This is roughly twice the size of the gender effect (26 points) for total GCSE point score. This represent just over 8 GCSE grades e.g. the difference between getting 8 GCSE at ‘B’ grades versus 8 GCSE at 'C' grades, or 8 'C' grades versus 8 'D' grades.

Table 3.10: Pre-school quality (ECERS-E) and GCSE English

Pre-school quality-ECERS-E (compared to no pre-school)	Estimate	SE	ES	Sig
Low quality	1.62	0.80	0.22	*
Medium quality	1.45	0.70	0.19	*
High quality	2.32	0.76	0.31	**

The quality of pre-school also predicted GCSE English grade and the difference for high quality versus no pre-school is 2.32 points, which represents around a third of a grade with a similar pattern for maths.

Comparing effects

When comparing effects translated into GCSE grades and points scores, EPPSE found that the gender effect (ES=0.38) on English represented 2.8 points, roughly half a GCSE grade, whereas there were no significant gender effect for maths. The effect for gender was weaker (ES=0.19) on total GCSE score representing 26 GCSE points, which is roughly equivalent to the difference of half a grade in 8 GCSE subjects, or 4 full grades in 4 subjects. For comparison, the ES for pre-school duration (longer) was 0.28 for GCSE English, 0.30 for GCSE maths and 0.38 for total GCSE score. The effects for high quality versus no pre-school were 0.31 on GCSE English, 0.26 on GCSE maths and 0.37 on total GCSE score. This identifies that the pre-school effects were slightly weaker on GCSE English than the effects of gender, but were significantly stronger than gender for maths and somewhat stronger than the effects of gender on total GCSE points score.

Effectiveness

Pre-school effectiveness in promoting pre-reading skills continued to predict academic attainment at the end of Year 11. Higher levels of pre-school effectiveness predicted more GCSE entries (ES=0.25), better grades in GCSE English (ES=0.31), and having a higher probability of achieving 5 A*-C including English and maths (OR=1.73), taking account of other influences (see Table 3.11 and Table 3.12).

Table 3.11: Contextualised models for Year 11 academic outcomes – Pre-school effectiveness (Pre-reading)

Fixed effects	Total GCSE score		Total GCSE entries		GCSE English	
Pre-school effectiveness - pre-reading (compared with no pre-school)	**ES**	**Sig**	**ES**	**Sig**	**ES**	**Sig**
Low effectiveness	0.32	**	0.19		0.18	
Medium effectiveness	0.32	***	0.20	*	0.22	*
High effectiveness	0.27	**	0.25	*	0.31	**
Number of students	2497		2510		2343	
Number of schools	610		614		573	
Intra-school correlation (ICC)	0.3016		0.3006		0.0628	
% Reduction student variance	15.4		11.3		20.7	
% Reduction school variance	28.8		62.6		85.9	
% Reduction total variance	19.9		37.2		38.5	

* p<0.05, ** p<0.01, *** p<0.001

Table 3.12: Contextualised models for benchmark indicators - Pre-school effectiveness (Pre-reading)

Fixed effects	Achieved 5 A*-C English and maths		EBacc	
Pre-school effectiveness - pre-reading (compared with no pre-school)	**OR**	**Sig**	**OR**	**Sig**
Low effectiveness	1.32		2.81	*
Medium effectiveness	1.48	*	1.83	
High effectiveness	1.73	*	2.20	
Number of students	2753		2255	
Number of schools	735		584	
% Reduction school variance	44.2		76.1	

* p<0.05, ** p<0.01, *** p<0.001

The patterns of relationships between pre-school effectiveness (in terms of early number concepts) and students' later Year 11 academic outcomes also indicated positive and significant effects for grades in GCSE maths (ES=0.35) and total GCSE score (ES=0.48). However, no clear patterns for these predictors emerged for the various GCSE benchmark indicators (see Table 3.13 and Table 3.14).

Table 3.13: Contextualised models for Year 11 academic outcomes –

Pre-school effectiveness (Early number concepts)

Fixed effects	Total GCSE score		Total GCSE entries		GCSE maths	
Pre-school effectiveness - early number concepts (compared with no pre-school)	**ES**	**Sig**	**ES**	**Sig**	**ES**	**Sig**
Low effectiveness	0.30	**	0.29	**	0.22	*
Medium effectiveness	0.25	**	0.17		0.16	
High effectiveness	0.48	***	0.23	*	0.35	***
Number of students	2497		2510		2535	
Number of schools	610		614		675	
Intra-school correlation (ICC)	0.2979		0.3024		0.0389	
% Reduction student variance	15.6		11.5		18.9	
% Reduction school variance	30.2		62.4		86.8	
% Reduction total variance	20.6		37.2		32.5	

* p<0.05, ** p<0.01, *** p<0.001

Table 3.14: Contextualised models for benchmark indicators –

Pre-school effectiveness (Early number concepts)

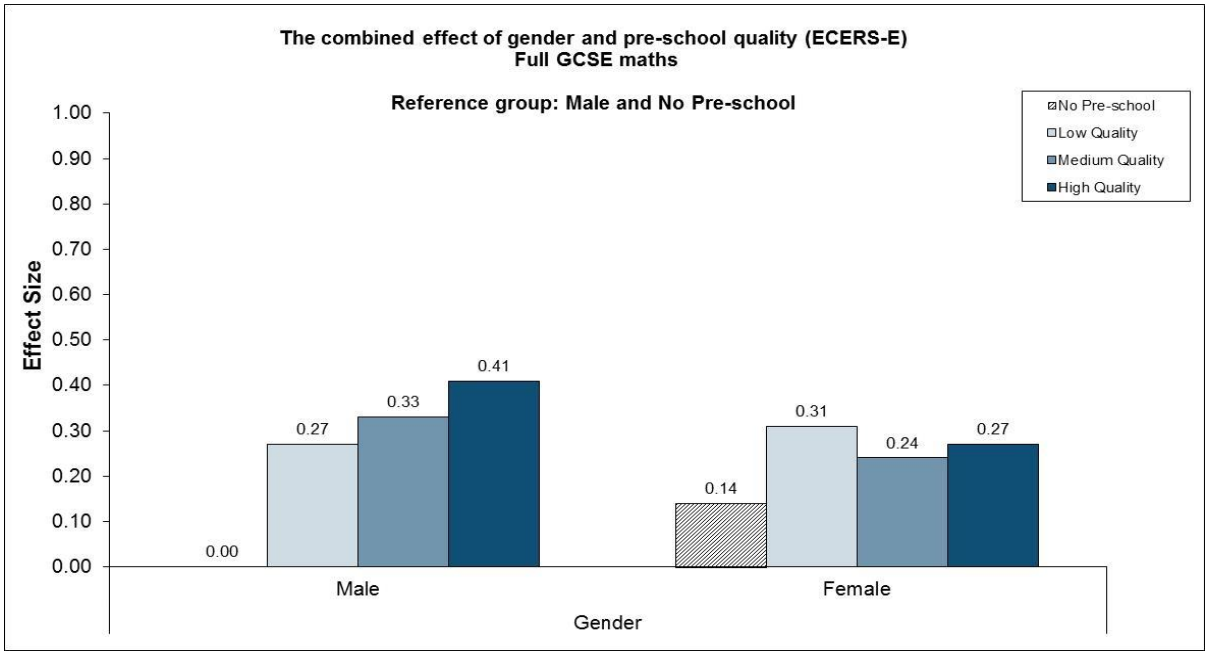
Fixed effects	EBacc	
Pre-school effectiveness - early number concepts (compared with no pre-school)	**OR**	**Sig**
Low effectiveness	2.77	*
Medium effectiveness	2.05	
High effectiveness	1.80	
Number of students	2255	
Number of schools	584	
% Reduction school variance	77.6	

* p<0.05, ** p<0.01, *** p<0.001

Combined effects

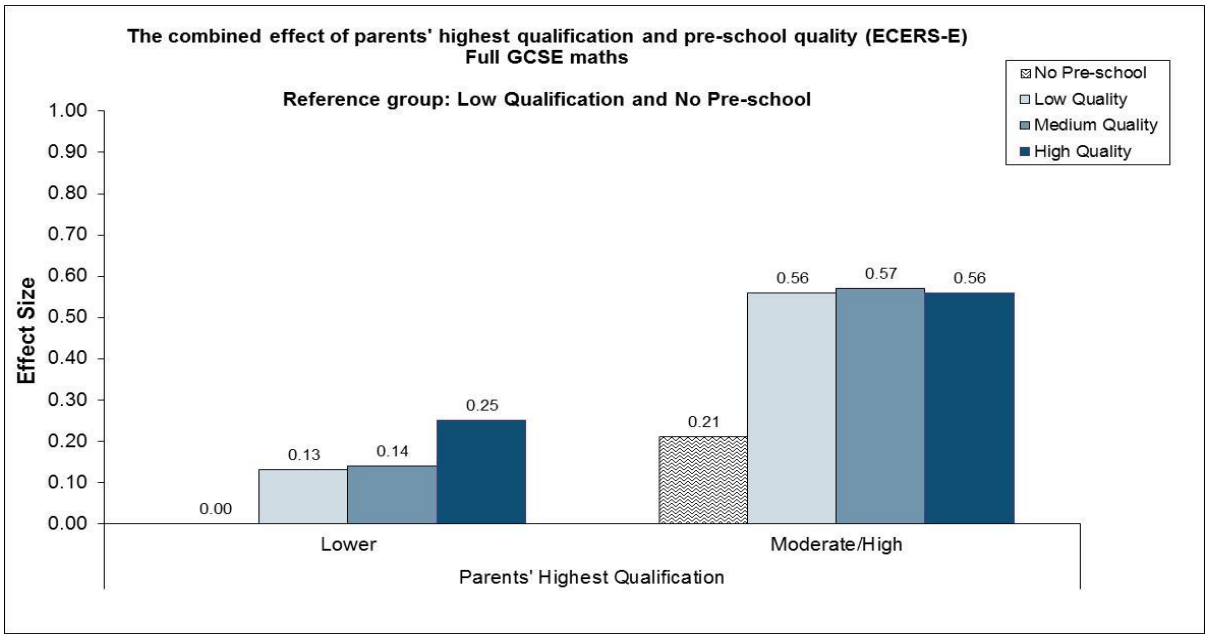
Analyses explored the joint effects of pre-school quality and gender. Results show boys who attended a medium (ES= 0.33) or a high quality (ES= 0.41) pre-school had higher GCSE maths grades than boys with no pre-school (see Figure 3.1).

Figure 3.1: The combined impact of gender and pre-school quality on GCSE maths



The joint effects of pre-school quality and parental qualification levels showed that high quality pre-school predicted better grades in GCSE English (ES= 0.35) and maths (ES= 0.25) for students of low qualified parents compared to similar students who had not attended any pre-school (Figure 3.2).

Figure 3.2: The combined impact of parents' highest qualification and pre-school quality on GCSE maths



Primary school influence

Previous EPPSE research has shown that the academic effectiveness of a child's primary school was a statistically significant predictor of better attainment and progress across KS2 for English and more strongly for maths (Sammons et al., 2008b). Value added effectiveness measures for primary schools were calculated using National Assessment data linking KS1 and KS2 results (Melhuish et al., 2006a; 2006b). Other educational effectiveness research has shown that primary schools can continue to influence students' longer term academic outcomes at secondary school (Goldstein & Sammons, 1997; Leckie, 2009). Indeed, earlier EPPSE results from KS3 (in Year 9) show that measures of the primary school academic effectiveness significantly predicted students' later academic attainment in maths and science three years after transferring to secondary school (Sammons et al., 2011a).

The GCSE analyses show that primary school academic effectiveness continues to influence EPPSE students' later academic attainment up to age 16. Students who had attended a primary school that was more academically effective for maths had significantly better grades in GCSE maths (ES=0.25) than students who had attended a low academically effective primary school. Similarly, students who had previously attended a medium or highly academically effective primary school were almost twice as likely to achieve the EBacc as students who had attended a low academically effective primary school (OR=1.94), after controlling for student, family, HLE and neighbourhood influences (see Table 3.18).

Secondary school influences

Contextual Value Added (CVA[20]) measures of the overall academic effectiveness of secondary schools attended by EPPSE students were obtained from the DfE, derived from the DfE's National Pupil Database (NPD). These CVA measures show the relative progress made by successive student intakes measured from KS2 to KS4 (across a period of 5 years). In contrast to our primary school academic effectiveness measure that examined results in English, maths and science separately (Melhuish et al., 2006a; 2006b), we did not have subject specific results for the secondary school CVA indicators. The secondary school CVA measure of overall academic effectiveness (averaged over 5 years) significantly predicted EPPSE students' academic attainment in terms of total GCSE score (ES=0.42), but not the specific subject grades or the benchmark indicators. It is likely that the total GCSE score is more susceptible to overall school level influences as also shown by the larger intra-school correlation for this outcome (see Table 3.15). By contrast, subject grades are likely to be more shaped by departmental effectiveness (Sammons, Thomas & Mortimore, 1997).

[20] The EPPSE CVA indicator is based on DfE CVA results for 4 successive years, covering the 4 EPPSE cohorts, 2006-2009 for all secondary schools attended by EPPSE students. The EPPSE results have an overall CVA averaged mean of 1004, which is close to the national CVA mean of 1000. The students in the sample (based on their secondary school's average CVA score) were divided into high, medium and low CVA effectiveness groups based on the average CVA score to 1 SD above or below the mean; nationally, approximately 10% of secondary schools are 1 SD above the mean and approximately 10% of secondary schools are 1 SD below the mean

Table 3.15: Contextualised models for Year 11 academic outcomes

- Secondary school academic effectiveness

Fixed effects	**Total GCSE score**			
Secondary school academic effectiveness (compared with low)	**Coefficient**	**SE**	**ES**	**Sig**
Medium effectiveness	11.53	13.41	0.09	
High effectiveness	55.51	18.59	0.42	**
Number of students				2497
Number of schools				610
Intra-school correlation (ICC)				0.2967
% Reduction student variance				15.2
% Reduction school variance				30.2
% Reduction total variance				20.3

* p<0.05, ** p<0.01, *** p<0.001

Ofsted[21] inspection ratings were used to provide additional external measures of secondary school quality. EPPSE students who attended secondary schools classified as 'outstanding' based on the 'quality of pupils' learning and their progress' had significantly better results in GCSE English (ES=0.47) and GCSE maths (ES=0.47), were more likely to achieve 5 A*-C, 5 A*-C including English and maths, as well as the EBacc than students from secondary schools characterised as 'inadequate' in their learning quality (see Table 3.16 and Table 3.17). Again, these analyses controlled for students' individual, family, HLE and neighbourhood characteristics.

Ofsted inspectors also rated secondary schools based on the level of attendance of their students. 'learners' attendance' as rated by Ofsted inspectors was a statistically significant predictor of EPPSE students' academic attainment.

Students from secondary schools rated as 'outstanding' on the 'learners' attendance' got higher grades in GCSE English (ES=0.50) and GCSE maths (ES=0.62) than students from secondary schools characterised as 'inadequate' while controlling for other influences (see Table 3.16 and Table 3.17).

Students from 'outstanding' schools rated on 'learners' attendance' were also entered for more full GCSEs than students from schools where attendance was assessed as 'inadequate' (ES=0.78) (see Table 3.16).

21 It should be noted that the inspector data are related to the time EPPSE students were in KS3 and were measured by the inspection frameworks in use between 2005 and 2010.

Table 3.16: Contextualised models for Year 11 academic outcomes - Quality of pupils' learning and Attendance of learners

Fixed effects	Total GCSE entries		GCSE English		GCSE maths	
The quality of pupils' learning (compared with inadequate)	**ES**	**Sig**	**ES**	**Sig**	**ES**	**Sig**
Outstanding	0.93	***	0.47	***	0.47	***
Good	0.54	***	0.13		0.15	
Satisfactory	0.42	***	0.09		0.12	
Missing	0.42	*	0.04		0.25	*
Attendance of learners (compared with inadequate)	**OR**	**Sig**	**OR**	**OR**	**Sig**	**OR**
Outstanding	0.78	***	0.50	***	0.62	***
Good	0.70	***	0.31	*	0.51	***
Satisfactory	0.53	***	0.19		0.43	***
Missing	0.49	**	0.16		0.52	***

* p<0.05, ** p<0.01, *** p<0.001

Table 3.17: Contextualised models for benchmark indicators - Quality of pupils' learning and Attendance of learners

Fixed effects	Achieved 5 A*-C		Achieved 5 A*-C English and maths		EBacc	
The quality of pupils' learning (compared with inadequate)	**OR**	**Sig**	**OR**	**Sig**	**OR**	**Sig**
Outstanding	3.04	***	2.74	***	5.44	***
Good	1.40		1.06		2.64	*
Satisfactory	1.29		1.10		1.88	
Missing	1.84	*	0.93		1.74	
Attendance of learners (compared with inadequate)	**OR**		**Sig**		**OR**	
Outstanding	2.89		***		2.74	
Good	2.17		**		1.97	
Satisfactory	1.87		*		1.78	
Missing	2.56		**		1.49	

* p<0.05, ** p<0.01, *** p<0.001

The probabilities of achieving 5 A*-C and 5 A*-C including English and maths were significantly higher for students attending secondary schools rated as 'outstanding' for 'learners' attendance' (see Table 3.17).There was less evidence of differences for schools rated as 'good' on Ofsted's 'learners' attendance' measure.

These results indicate that secondary school quality was important in shaping students' academic attainment over and above the impact of their own background and neighbourhood characteristics.

Table 3.18: Summary for Year 11 benchmark indicators

	Achieved 5 A*-C	Achieved 5 A*-C English & maths	EBacc
Individual student measures	**OR[22]**	**OR**	**OR**
Age		1.04	
Gender	1.45	1.24	1.74
Ethnicity		2.28(I)♯	
Developmental problems	0.68	0.67	
Behavioural problems	0.65	0.63	
Health problems	0.63		
Number of siblings	0.62	0.69	
Family measures			
Mother's age at age 3/5	1.33		1.39
Year 11 FSM	0.61	0.51	
KS1 family salary	3.94	1.95	4.04
Parents' highest SES at age 3/5	0.50	0.59	0.41
Mothers' highest qualifications level at age 3/5	3.14	4.11	
Fathers' highest qualifications level at age 3/5	2.48	2.07	3.16
Parents' highest qualifications level at age 3/5	3.58	3.92	2.83
School level FSM	0.98		0.96
HLE measures			
Early years HLE	3.61	2.90	
KS1 HLE outing (medium)		1.39	
KS1 HLE educational computing (medium)	1.36		0.51 (high)
KS3 HLE academic enrichment (high)	2.80	2.60	3.89
KS3 HLE parental interest (high)		1.34	
Pre-school measures			
Pre-school attendance		1.48	
Pre-school quality		1.69	
Pre-school effectiveness pre-reading		1.73	
Primary school measures			
Primary school academic effectiveness - maths			1.94
Secondary school measures			
Secondary school quality of pupils' learning	3.04	2.74	5.44
Secondary school attendance of learners	2.89	2.74	

I♯=Indian heritage

[22] Odds Ratios represent the odds of achieving certain benchmark performance indicators given certain characteristics relative to the odds of the reference group.

Students' academic progress between KS2 and KS4

Progress was studied by controlling for students' prior attainment in KS2 national assessments as a baseline. Students made better progress between KS2 and KS4 where they were: older for their year, female, of Bangladeshi heritage, had parents who were more highly qualified, had higher family incomes and experienced more enrichment activities in KS3 HLE (see Table 3.19).

Table 3.19: Selected characteristics of students' and academic outcomes

Fixed effects	Total GCSE entries		GCSE English		GCSE maths	
Characteristics	**ES**	**Sig**	**ES**	**Sig**	**ES**	**Sig**
Older for their year group (Autumn-born)	0.16	***	0.18	***	0.20	***
Females	0.25	***	0.27	***	0.13	**
Bangladeshi heritage[23]	0.83	***	0.66	**	0.88	***
Higher family incomes	0.26	**	0.34	*	0.21	*
Higher qualified parents	0.39	**	0.59	***	0.42	**
Higher KS3 HLE academic enrichment	0.36	***	0.37	***	0.45	***

There were also small negative effects on progress related to early behavioural problems, early health problems and for eligibility for FSM. Again, this is in accord with patterns found by EPPSE in KS2 and KS3.

Of the neighbourhood measures tested, only the percentage of White British residents was a significant predictor of poorer student progress in English. For progress in maths however, reported crime, level of unemployment, perceived neighbour safety, and the IMD and IDACI were all statistically significant predictors. These findings indicate that the disadvantage of the students' neighbourhood characteristics had small negative effects predicting both poorer progress and attainment in some GCSE outcomes.

Similar to findings in Year 9, the pre-school measures and the primary school academic effectiveness measures did not predict academic progress in specific subjects (English and maths) between KS2 and KS4. These may be more sensitive to subject department effects. However, pre-school attendance, quality and effectiveness were still significant predictors of EPPSE students' overall academic progress in terms of promoting a higher total GCSE score.

Overall GCSE performance is likely to be a broader measure of school effects for all students in contrast to subject results that are more likely to reflect the role of different subject departments (Harris, Jamieson and Russ, 1995; Sammons, Thomas and Mortimore, 1997).

[23] N.B the number of Bangladeshi heritage students is small.

Similarly, the CVA measure of secondary school academic effectiveness was a moderately strong predictor of overall academic progress in terms of total GCSE score (ES=0.53). Moreover, measures of secondary school quality (Ofsted ratings) were also significant predictors of progress in specific GCSE subject grades in English and maths but not students' overall academic progress.

Students' experiences and views of secondary school

EPPSE students' questionnaire data provided factors on students' views about their teaching and school environments (Sammons et al., 2011d). These factors were derived from students in Year 9 (KS3) and Year 11 (KS4). Further details are shown in Appendix 8.

The factors derived from students' views of school in Year 9 were:

- 'Emphasis on learning'
- 'Behaviour climate of the school'
- 'Headteacher qualities'
- 'School environment'
- 'Valuing pupils'- students' perceptions of how they felt teachers valued and respected them
- 'School/learning resources'- whether students felt the school was well equipped with computers and technology
- 'Teacher discipline and care'
- 'Teacher support'.

The factors derived from students' views of school in Year 11 were:

- 'Teacher professional focus'- relates to perceptions of teachers' focus on teaching responsibilities such as learning and behaviour within the classroom
- 'Positive relationships' - covers how well students and teachers get on, such as students feeling they are treated fairly and respected, and teachers showing an interest in students
- 'Monitoring students' - relates to the extent to which teachers monitor the progress students are making, set targets and reward hard work
- 'Formative feedback'- relates to students' experiences of teacher support, help when students are stuck and guidance on improving their work
- 'Academic ethos' - measures the extent to which students feel that other students within the school are interested in learning, doing well and continuing their education past compulsory schooling age.

These factors were tested to explore if they predicted variations in students' KS4 academic attainment and progress after control for individual, family, HLE characteristics and the percentage of students on FSM in the school (see related reports Sammons et al., 2014d).

Views in Year 9

The results indicate that students who perceived their school to place higher 'Emphasis on learning' in Year 9 had significantly higher GCSE attainment and made more progress across the five years in secondary school. Table 3.20 shows the strongest effect was on total GCSE score (ES=0.36). The effect on the overall academic progress was similar (ES=0.33).

Table 3.20: Summary of the effects of Year 9 views of schools on Year 11 academic outcomes

Year 9 views of schools	Year 11 Total GCSE score		Year 11 Total GCSE entries		Year 11 GCSE English		Year 11 GCSE maths	
Fixed effects (continuous)	**ES**	**Sig**	**ES**	**Sig**	**ES**	**Sig**	**ES**	**Sig**
Emphasis on learning	0.36	***	0.26	***	0.32	***	0.23	***
Behaviour climate	0.34	***	0.41	***	0.34	***	0.41	***
Headteacher qualities	0.14	*		ns	0.12	*		ns
School environment	0.15	*	0.19	**	0.12	*	0.13	*
Valuing pupils	0.22	***	0.20	***	0.15	*		ns
School/Learning resources	0.20	***	0.20	***	0.14	*	0.17	**
Teacher discipline and care	0.14	*		ns		ns		ns
Teacher support	0.15	*	0.12	*		ns		ns

* p<0.05, ** p<0.01, *** p<0.001

EPPSE students' attainment (in all measures of GCSE results) was also found to be higher when students perceived a more positive 'Behaviour climate' in their secondary school, which was particularly noticeable for grades in GCSE maths and the number of full GCSE entries (ES=0.41).

For overall progress and progress in specific subjects the effects were similar. Students' perceived quality of their 'School environment'[24] was also a predictor of better attainment (in total GCSE score and subject grades), although the effects were smaller. Similarly, small but positive effects were identified for the factor related to students' perceptions of how much they felt teachers 'Valued and respected pupils'.

The factor 'School/learning resources' (was the school well equipped with computers and technology) also predicted better attainment in all continuous measures of GCSE results (see Table 3.20). All Year 9 factors related to students' perceptions of school characteristics and these processes significantly predicted overall academic progress measured by total GCSE score and progress in English and maths, controlling for Year 6 prior attainment and other background characteristics (see Table 3.21).

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

After testing these factors separately as predictors of attainment, we also tested them together to investigate which ones were the most important in predicting academic outcomes in Year 11 while controlling for student, familial and HLE characteristics. It was found that the two factors 'Emphasis on learning' and 'Positive behaviour climate' together significantly predicted the majority of Year 11 academic attainment and progress measures.

Table 3.21: Summary table of the effects of Year 9 views of schools on Year 11 benchmark indicators

Year 9 views of schools	Year 11 Achieved 5 A*-C		Year 11 Achieved 5 A*-C English and maths		Year 11 EBacc	
Fixed effects (continuous)	**OR**	**Sig**	**OR**	**Sig**	**OR**	**Sig**
Emphasis on learning	5.95	***	2.51	*	3.00	*
Behaviour climate	3.12	***	2.32	***	1.94	*
Headteacher qualities		ns		ns		ns
School environment		ns		ns		ns
Valuing pupils	2.44	***	1.67	*		ns
School/Learning resources		ns		ns		ns
Teacher discipline and care	2.27	*		ns		ns
Teacher support	1.69	*		ns		ns

* p<0.05, ** p<0.01, *** p<0.001

Views in Year 11

When testing the factors related to students' views of school in Year 11, significantly higher total GCSE scores and better grades in GCSE English were obtained by students who reported that:

- teachers had a strong focus on learning
- relationships between students and teachers were good in terms of trust, respect and fairness
- there was a high level of monitoring by their teachers
- teachers provided more feedback.

The same factors were significant predictors of overall academic progress and progress in English. 'Positive relationships' and 'Formative feedback' were both significant predictors of better GCSE grades in maths and also of academic progress in maths during secondary school.

These results point to the importance of school and teaching experiences in both KS3 and KS4 in shaping academic attainment at GCSE level. It is interesting to note that the latest report on PISA 2012 results shows that students in England generally have more favourable views of their schools (in terms of positive climate for learning) and teachers (and their relationships with teachers) than the students from other OECD countries (Wheater et al., 2013). The EPPSE analyses point to the importance of students' perspectives and their experiences of education as influences on their academic outcomes.

3.1.4 Homework

After controlling for individual, family, home learning environment (HLE) and neighbourhood influences, the daily time spent on homework, as reported by students in Year 9 and again in Year 11, was an important and strong predictor of better academic attainment and progress in both KS3 and KS4. The strongest effects were noted for those who reported spending 2-3 hours doing homework on a typical school night. For example, students who reported in Year 9 spending between 2 and 3 hours on homework on an average weeknight were almost 10 times more likely to achieve 5 A*-C (OR=9.97) than students who did not spend any time on homework. A similarly strong result was found for the time spent on homework reported in Year 11 (OR=9.61). Moderate to strong positive effects of time spent on homework were found for total GCSE score, specific GCSE grades and the benchmark indicators, but also on overall academic progress and progress in specific subjects.

Spending more time on homework is likely to increase students' study skills and opportunities to learn. It may also be influenced by and provide an indicator of self-regulation. Homework is likely to reflect secondary schools' policies, teachers' expectations and the academic emphasis in the school as well as encouragement from parents to take school work seriously. These results show that independent study and effort by students are important contributors to academic success at GCSE over and above the important role of all the other background influences and prior attainment in KS2.

3.2 Conclusions

The KS4 findings reported here are generally in line with those found in the previous EPPSE analyses of Year 9 outcomes at the end of KS3, age 14.

The GCSE outcomes have very important consequences for students' subsequent further higher education and employment opportunities. These analyses highlight a number of features of school experience that can be addressed in school improvement policies intended to promote better outcomes for secondary school students. They also point to the potential role of using survey data and other ways to tap into the student 'voice' in assessing the quality of their educational experiences.

The aspects about secondary school experience identified here show the importance to school leaders and teaching staff of focusing on enhancing the quality of teaching and learning, student support, positive relationships, improving the behavioural climate of the school, ensuring students feel valued, and promoting a high quality physical environment and learning resources. These aspects should be viewed as key features for school self-evaluation and planning for improvement as well as for external evaluation.

Policy makers are increasingly interested in student progression in judging school performance. Indeed, schools are now required to publish information on progression in their school, not just on academic attainment.

Overall, these results confirm and extend earlier EPPSE findings (Melhuish et al., 2008a; Sylva et al., 2010). The life chances of some children are shaped by important individual, family, home and school experiences from an early age. There is no level playing field at the start of school or in later phases. These early effects of disadvantage emerge at a young age and their influences continue to shape students' later educational outcomes through subsequent phases of their educational careers.

It is widely recognised that England has a very large equity gap in achievement in international comparisons and that life chances and social mobility are highly stratified. However, some influences can help to ameliorate the effects of disadvantage. Positive pre-school and primary school effects remain evident, while secondary school experiences are also relevant. There are important and probably reciprocal associations between students' academic and social-behavioural development.

Disadvantage remains a complex and multi-faceted concept. The longitudinal EPPSE research indicates that disadvantage is by no means captured by one simple indicator such as the FSM status of a student. This has important implications for funding to tackle disadvantage. Poverty, in terms of FSM status, does not embrace the full range of characteristics that are shown in this report to shape students' academic outcomes.

The concept of multiple disadvantage is important and the challenges facing schools, parents and communities, in promoting better outcomes for students from disadvantaged homes and contexts remain strongly evident (related to neighbourhood and school composition influences).

Educational influences (including pre-school) have an important part to play in supporting those ‘at risk’ and can promote better outcomes by ameliorating the adverse effects of disadvantage. But the EPPSE data shows that equity gaps emerge early for all outcomes (cognitive/academic and social-behavioural) and remain strongly evident across different phases of education.

Taken together, the EPPSE research indicates that no single educational influence acts as a ‘magic bullet’ that can overcome disadvantage. However, parental actions that provide a better home learning environment (HLE) and also supportive educational environments (pre-school, primary school and secondary school) may well make a difference to children’s and young people’s academic and other important educational outcomes and so can help to improve life chances.

These findings confirm that pre-school effects last and have particular relevance for policy making. The academic effectiveness of the primary school, and later of the secondary school, attended also predicted students’ attainment and progress. Those fortunate to attend more academically effective or higher quality schools receive a significant boost in terms of GCSE outcomes at age 16. There are also clear implications for practitioners about the role of students’ secondary school experiences that can support school improvement strategies in KS3 and KS4.

Section 4 Social-behavioural development

- Background characteristics continue to influence students' social-behavioural outcomes.
- Socio-economic status (SES), family poverty and parents' education were predictors of social-behavioural outcomes, and progress across secondary school.
- Girls show better social behaviour and progress than boys.
- There are weak effects linking single parenthood to poorer social behaviour at age 16 and progress across secondary school.
- Coming from a large family (3 or more siblings in early years) was predictive of poorer social behaviour and progress across secondary school.
- Students with a more positive early years HLE showed better social-behavioural outcomes in Year 11. However, there were no early years HLE effects for progress. Higher levels of KS3 HLE 'academic enrichment' predicted better social-behavioural outcomes and progress across secondary school.
- SEN students showed significantly poorer behavioural outcomes.
- Students younger for their year (Summer-born) showed poorer social-behavioural outcomes and progress compared to those older for their year group (Autumn-born) but effects were weak.
- Living in a neighbourhood with higher deprivation or a higher proportion of White British residents predicted poorer social-behavioural outcomes and less progress.
- Experiencing higher quality pre-school weakly predicted better social-behavioural outcomes.
- School academic effectiveness (primary and secondary) and Ofsted ratings of secondary school were all unrelated to social-behavioural outcomes.
- Secondary school composition (e.g., higher % of SEN or % FSM students) had a weak but negative impact on social-behavioural outcomes.
- Aspects of students' views and experiences of school, e.g., 'negative behavioural climate', 'valuing pupils', 'teacher support', 'teacher professional focus', 'formative feedback' and 'positive relationships' were linked to social-behavioural outcomes and progress in those outcomes across secondary school.

For full details of the findings and analyses see Sammons et al., (2014b).

This section provides a summary of the characteristics that shape students' social-behavioural outcomes at age 16 and examines how these are linked with the same students' academic attainment and dispositions. Academic attainment is measured by GCSE results whereas students' dispositions are based on self-report questionnaires in Year 11. Accompanying reports describe the findings on students' academic attainment and dispositions (Sammons et al., 2014a; 2014c) and the full findings for social-behaviours are contained in a technical report (Sammons et al., 2014b). This summary outlines findings on four dimensions of social behaviour at age 16: two positive social behaviours (self-regulation and pro-social behaviour) and two negative behaviours (hyperactivity and anti-social behaviour). Exploratory and confirmatory factor analyses were used to construct these measures from teachers' individual ratings of 2424 students (see Figure 4.1).

As with other research (Eisenberg et al., 1995; Kerr and Michalski, 2007; Schmitz, 2003) the results show that most students are rated favourably by their teachers, and only a small minority are identified as showing problem behaviours (see Figure 4.2). Compared with results from the primary school, while Year 11 students were rated fairly positively in social-behavioural outcomes, the proportion identified as showing negative behaviours has increased.

There were a number of child and family characteristics and measures of the home learning environment (HLE) that showed a significant influence in predicting social-behavioural outcomes. These effects occurred from an early age, and also remained statistically significant predictors of the EPPSE sample's academic attainment and progress up to the end of primary school (Sammons et al., 2008b; 2008c). Some characteristics, in particular being male, parents' qualification levels, the early years HLE and socio-economic disadvantage remain significant predictors of poorer outcomes through to age 16.

Earlier EPPSE research findings, from pre-school onwards, have highlighted certain characteristics and influences that can promote resilience and also those that can increase the risk of poor social-behavioural and academic outcomes (Hall et al., 2009; 2013). The EPPSE study has informed policy development in England across successive governments (Taggart et al., 2008; HM Treasury, 2004; The Equalities Review, 2007; Siraj-Blatchford et al., 2008; Allen, 2011; Field, 2010) and this section adds to the knowledge base about what fosters better social-behavioural outcomes and development, and what increases the risk of poor outcomes in adolescence.

This analysis of the EPPSE sample up to age 16 provides new evidence (as well as extending previous findings) about the continuing influence of individual, family and HLE characteristics. This section indicates that teacher ratings of Year 11 students' behaviour in secondary school are strongly associated with students' own reports of their experiences of secondary school.

As with previous analyses multilevel statistical models were used to ascertain which factors are the best predictors of social-behavioural outcomes at age 16. Although these findings are based on quantitative analyses of large data-sets elsewhere EPPSE has reported findings from qualitative case studies of individual children and families that are more educationally successful in overcoming disadvantage (Siraj-Blatchford et al., 2011a). These qualitative findings provide a broader understanding of the way social disadvantage can shape children's educational outcomes and experiences as they move through different phases of education and into adolescence. These case studies show that certain behavioural traits can be important in supporting better educational outcomes for vulnerable groups of disadvantaged students, and indicate that self-regulation and a positive early years home learning environment (HLE) in particular can help to protect students from the adverse impacts of social disadvantage across different phases of education.

The section also explores the role of neighbourhood, pre-schools, primary schools and secondary schools in predicting Year 11 students' social-behavioural outcomes after controlling for the impact of individual student, family, HLE and neighbourhood characteristics. It details any continued influence of pre-school, primary school and secondary school as predictors of students' social-behavioural outcomes and tests measures related to students' secondary school experiences.

4.1 Aims

The main aims were to:

- investigate the variation in students' social-behavioural outcomes at the end of KS4
- identify which student background characteristics, including individual, family, home learning environment (HLE) and neighbourhood, predict social-behavioural outcomes at age 16
- explore the influence of pre-schools, primary schools and secondary schools on Year 11 social-behavioural outcomes
- explore the role of secondary school experiences and processes on students' social-behavioural outcomes using self-report measures of such processes derived from student questionnaires.

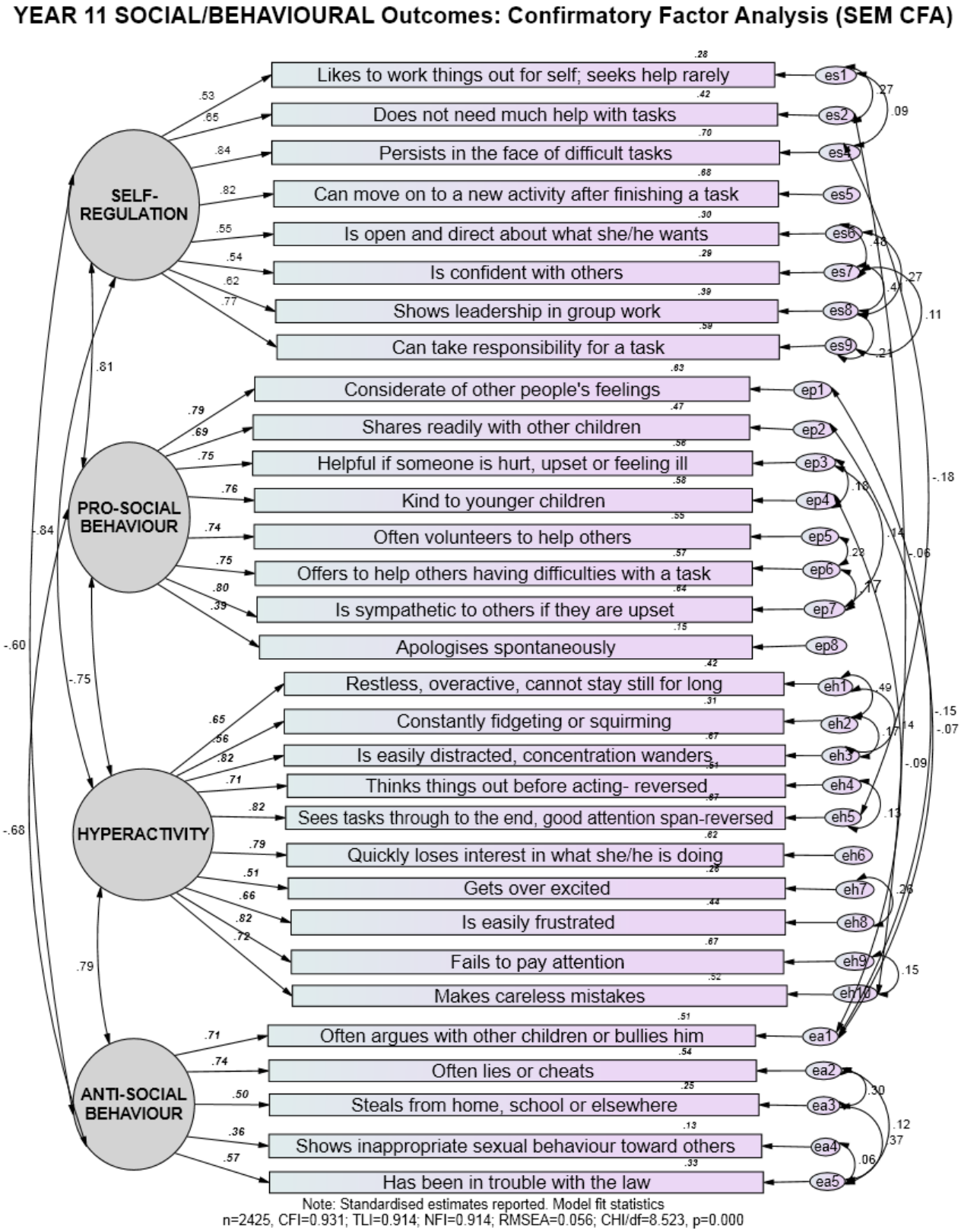
4.2 Summary of findings

4.2.1 Social-behavioural measures in the Year 11 profile

Measuring adolescent behaviours is complex (Gaoni, Couper and Baldwin, 1998). The measures of social behaviour used by EPPSE were derived from teacher ratings of individual students. Teachers completed a profile which included 25 items from the Strengths and Difficulties Questionnaire (Goodman, 1997) with additional items to extend the range of social behaviours. Using both exploratory and confirmatory factor analyses, four underlying dimensions of social behaviour were identified: two positive social behaviours (self-regulation and pro-social behaviour) and two negative behaviours (hyperactivity and anti-social behaviour). These provide a social-behavioural profile for each student at age 16. Earlier analyses had identified these dimensions of behaviour for this sample at younger ages. In order to investigate social-behavioural development/change over the five years of secondary education, baseline measures of these four behaviours, based on teacher ratings collected at the end of primary school in Year 6, were also created and included in the analyses. The results of the factor analyses that show the relationship between the four dimensions of social behaviour and the questionnaire items are shown in Figure 4.1.

Using these four social behaviour dimensions as outcomes, EPPSE investigated the influence of numerous demographic and socio-economic measures derived from earlier parental interviews and questionnaires as predictors of students' social-behaviour at age 16. These include individual characteristics, such as gender, age, ethnicity, early childhood behavioural history, and family characteristics including family size (number of siblings), parents' marital status, earned income, family highest socio-economic status (SES), as well as the highest level of parents' qualifications. EPPSE also investigated characteristics specific to the education system in England, such as special educational needs (SEN) status, and free school meal (FSM) eligibility. The following summarises the key findings, after allowing for the influence of other background factors.

Figure 4.1: Results of factor analysis producing 4 social-behavioural outcomes



Note: Standardised estimates reported. Model fit statistics
n=2425, CFI=0.931; TLI=0.914; NFI=0.914; RMSEA=0.056; CHI/df=8.523, p=0.000

4.2.2 Variations in social-behavioural outcomes in Year 11 for different student groups

The distributions of scores for the four social-behavioural dimensions of self-regulation, pro-social behaviour, hyperactivity, and anti-social behaviour can be seen in Figure 4.2.

Figure 4.2: Distributions of the four social-behavioural outcomes

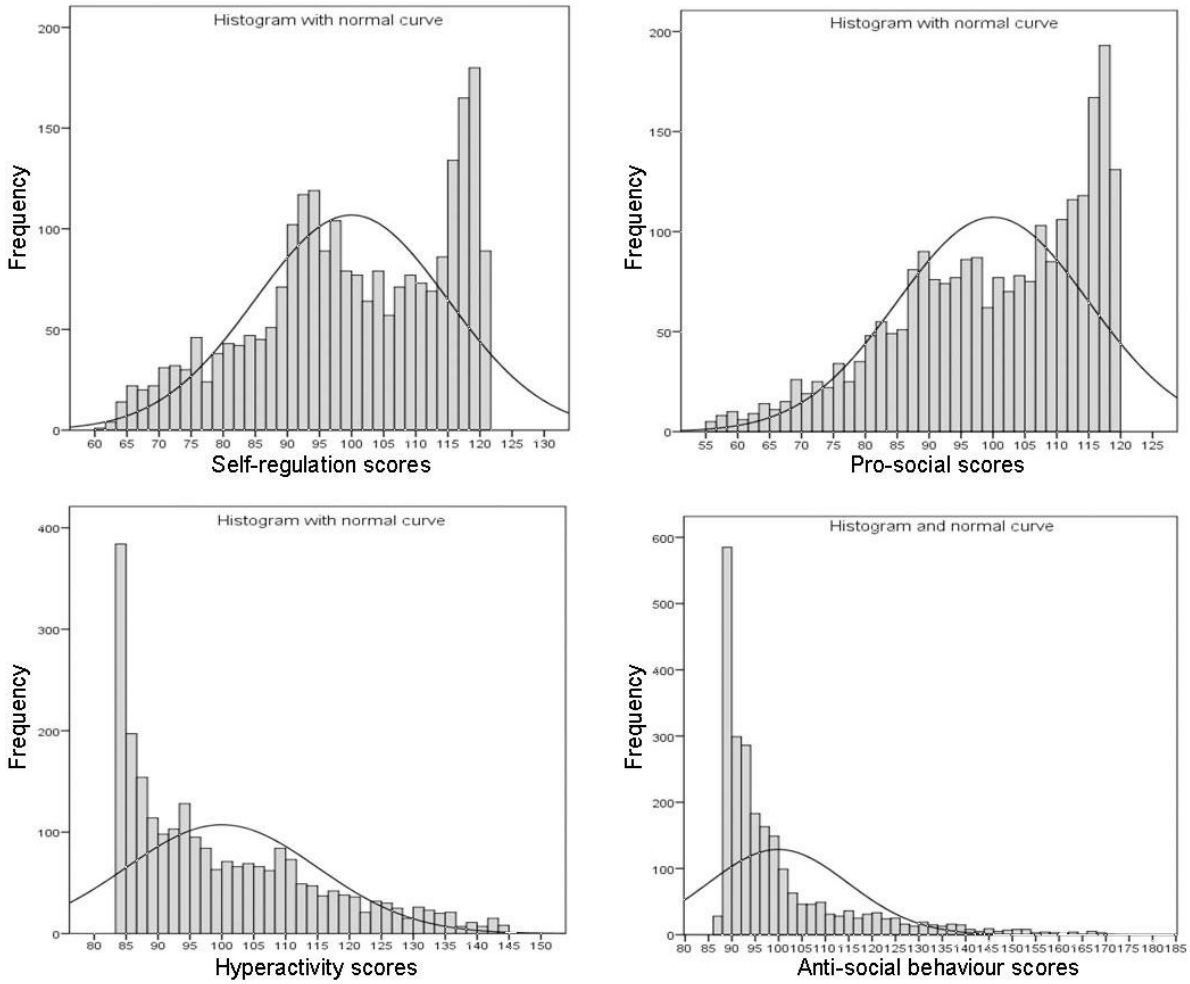


Figure 4.2 illustrates how most students are rated favourably by their teachers, and only a small minority are identified as showing problem behaviours in Year 11. However these aspects of social development are clearly influenced by other characteristics of the students and their background.

As seen in Table 4.1, girls showed significantly better social-behavioural profiles than boys at age 16 in all four outcomes (e.g., ES=0.43 - for self-regulation; ES=0.59 - for pro-social behaviour; ES=-0.47 - for hyperactivity; ES=-0.39 - for anti-social behaviour). Parents' highest qualification level was also a moderately strong predictor (e.g., for mothers having a degree or equivalent versus no educational qualifications, ES=0.44 - for self-regulation; ES=0.35 - for pro-social behaviour; ES=-0.33 - for hyperactivity; ES=-0.32 - for anti-social behaviour).

Socio-economic status (SES) and family poverty also proved to be important predictors of social-behavioural outcomes in Year 11 (see Table 4.1). For example, compared to the highest SES group (professional non-manual), students with unskilled parents had poorer social-behavioural ratings (ES=-0.61 - for self-regulation; ES=-0.51 - for pro-social behaviour; ES=0.56 - for hyperactivity; ES=0.54 - for anti-social behaviour). Students eligible for FSM also displayed poorer outcomes in Year 11 (ES=-0.33 - for self-regulation; ES=-0.30 - for pro-social behaviour; ES=0.39 - for hyperactivity; ES=0.44 - for anti-social behaviour, compared to those children not eligible for FSM).

There are weaker effects linked to parents' marital status, although there is a significant tendency for poorer self-regulation and pro-social behaviour and increased hyperactivity and anti-social behaviour for those from single parent families (ES=-0.25 - for self-regulation; ES=-0.28 - for pro-social behaviour; ES=0.24 - for hyperactivity; ES=0.21 - for anti-social behaviour, for students with single parents versus those with married parents).

Coming from a large family (3 or more siblings in the early years, compared to being an only child) was predictive of lower scores for self-regulation (ES=-0.22) and higher scores for hyperactivity (ES=0.18).

The early years home learning environment (HLE) and later HLE measures, such as, Academic enrichment (in KS3) continue to predict students' social-behavioural outcomes up to age 16, taking into account of other influences (see Table 4.1). Those students who had experienced a more positive HLE in the early years were rated more favourably by teachers in terms of various social-behavioural outcomes (ES=0.29 - for the very high versus lowest HLE groups - for self-regulation; ES=0.21 - for pro-social behaviour; ES=-0.23 - for hyperactivity). Higher levels of 'Academic enrichment' activities (educational related activities such as reading for pleasure, educational outings) reported by students and their parents in KS3 also predicted better social-behavioural outcomes (ES=0.28 - for the high versus low enrichment groups - for self-regulation; ES=0.17 - for pro-social behaviour; ES=-0.25 - for hyperactivity; ES=-0.18 - for anti-social behaviour).

Students with a record of SEN in secondary school showed significantly poorer behavioural outcomes as would be anticipated given the known link with behaviour and SEN, the two probably reflecting a reciprocal relationship (see Sammons et al., 2014b). The strength of relationships are in line with the SEN research literature and findings for this group at younger ages (Anders et al., 2010; Taggart et al., 2006; Sammons et al., 2003; Sammons et al., 2004c; Sammons et al., c). Similarly, those who had been identified by their parents as having behaviour problems (two or more) in the early years were also more likely to continue to display poorer social-behavioural outcomes in Year 11 (ES=-0.44 - for self-regulation; ES=-0.33 – for pro-social behaviour; ES=0.38 - for hyperactivity) than those with no problems reported.

The student's age within the year group remained a significant predictor though effects were fairly weak (see Table 4.1). Even in Year 11 summer-born (youngest) compared to autumn-born students (oldest) showed poorer outcomes: (ES=-0.17 - for self-regulation; ES=-0.12 - for pro-social behaviour; ES=0.17 - for hyperactivity). These effects, though statistically significant, were smaller than those found for term of birth effects in pre-school or primary school.

Neighbourhood influences

Various measures of neighbourhood disadvantage were also tested to see if they predicted students' social-behavioural outcomes at age 16, while controlling for the effects of individual, family, HLE and other school composition measures (see Table 4.1). There was evidence that the level of overall disadvantage in the child's neighbourhood measured (when the children were in pre-school) by the Income Deprivation Affecting Children Index (IDACI) scores predicted poorer social-behavioural outcomes, taking into account the influences of other significant predictors described above (see Table 4.1). Low levels of neighbourhood deprivation compared to high deprivation predicted higher scores for self-regulation (ES=0.22) and pro-social behaviour (ES=0.25) and lower scores for hyperactivity (ES=-0.19).

Living in a neighbourhood with a higher proportion of White British residents was also weakly predictive of lower pro-social behaviour (ES=-0.20), higher hyperactivity (ES=0.15) and greater anti-social behaviour (ES=0.18).

These results indicate that 'place' poverty as well as that related to the individual and their family can also shape social-behavioural outcomes for adolescents. In primary school the neighbourhood effects were not statistically significant, but they became significant by KS3 and their influence is also evident in KS4. These findings are in line with those found for EPPSE students' academic outcomes described in the last section, indicating that neighbourhood effects increase in secondary schooling.

Table 4.1: Summary of background influences on social behaviours[25]

Background characteristics	Self-regulation	Pro-social behaviour	Hyperactivity	Anti-social behaviour
Student characteristics				
Gender (boys)	0.43	0.59	-0.47	-0.39
Age (autumn)				
Spring	ns	ns	0.10	ns
Summer	-0.17	-0.12	0.17	ns
Number of siblings (none)				
1-2 siblings	ns	ns	ns	ns
3 siblings	-0.22	ns	0.18	ns
Ethnicity (White UK heritage)				
White European heritage	ns	ns	ns	ns
Black Caribbean heritage	ns	ns	ns	ns
Black African heritage	0.33	ns	ns	ns
Any other ethnic minority heritage	ns	ns	ns	ns
Indian heritage	0.33	ns	ns	ns
Pakistani heritage	ns	ns	ns	ns
Bangladeshi heritage	ns	ns	ns	ns
Mixed race heritage	ns	ns	ns	ns
Early behavioural problems (none)				
1 Behavioural Problem	-0.14	-0.20	0.15	ns
2+ Behavioural Problems	-0.44	-0.33	0.38	ns
Family characteristics				
Parents' Highest SES at age 3/5 (professional non-manual)				
Other Professional, non-Manual	-0.25	-0.26	ns	ns
Skilled, non-Manual	-0.28	-0.29	ns	ns
Skilled, manual	-0.43	-0.37	0.29	0.40
Semi-skilled	-0.37	-0.27	ns	ns
Unskilled	-0.61	-0.51	0.56	0.54
Not working/never worked	ns	ns	ns	ns
Parent's Highest Qualification Level at age 3/5 (no qualifications)				
Other Professional/Miscellaneous	ns	ns	ns	ns
Vocational	ns	ns	ns	ns
16 academic	0.17	0.21	-0.17	-0.23
18 academic	ns	ns	ns	ns
Degree or equivalent	0.44	0.35	-0.33	-0.32
Higher degree	0.43	0.37	-0.33	-0.36
Marital Status of Parent/Guardian/Carer (married)				
Single	-0.25	-0.28	0.24	0.21
Separated/Divorced	ns	Ns	ns	ns
Living with partner	-0.20	-0.19	0.19	0.14
Widow/Widower	~	~	~	~
Free School Meals (FSM) eligibility (No)				
Yes	-0.33	-0.30	0.39	0.44

[25] N.B. Table displays significant effects at p<0.05; results with small student numbers not shown.

Background characteristics	Self-regulation	Pro-social behaviour	Hyperactivity	Anti-social behaviour
Home Learning Environment (HLE)				
Early Years Home Learning Environment Index (Grouped) (Very low)				
Low (Index values: 14-19)	ns	ns	ns	ns
Average (Index values: 20-24)	ns	ns	ns	ns
High (Index values: 25-32)	0.19	0.23	ns	ns
Very high (Index values: 33-45)	0.29	0.21	-0.23	ns
KS3 Academic enrichment (Grouped) (Low)				
Medium	0.18	0.13	-0.14	ns
High	0.28	0.17	-0.25	-0.18
Neighbourhood				
IDACI (High deprivation)				
Low deprivation	0.22	0.25	-0.19	ns
Average deprivation	ns	0.12	ns	ns
% White British	ns	-0.20	0.15	0.18
School composition				
% SEN	-0.16	-0.15	ns	-0.12
% FSM	0.14	ns	ns	ns

NS Not significant, #p<0.10, *p<0.05, **p<0.01, ***p<0.001

4.2.3 Summary of background influences on progress

The results of the analyses investigating the influences associated with the range of background characteristics are shown in Table 4.1 in terms of the effect sizes in standard deviation units associated with each predictor for each of the four social-behavioural outcomes. The effect sizes are derived from multi-level models that include all background characteristics in the model. Hence the effect sizes are indicative of the net effect of a predictor once allowance has been made for all the other background characteristics.

4.2.4 Educational experiences from pre-school to secondary school

EPPSE investigated the influences of educational environments across different phases of education in shaping students' social-behavioural outcomes at age 16.

Pre-school influences

In order to assess whether the impact of early educational settings on social behaviour continued through to the end of KS4 various measures related to pre-school were tested: attendance (i.e., attended pre-school or not), quality and pre-school effectiveness.

The results indicate that just attending any pre-school centre did not predict social-behavioural outcomes in Year 11, which is in contrast to findings for Year 11 GCSE academic outcomes for the EPPSE sample where positive effects remain (Sammons et al 2014a). In addition, the influence of pre-school effectiveness measures on social-behavioural development was no longer visible at age 16, in line with findings when the students were 14. There was some evidence that these measures and pre-school effectiveness were important when the EPPSE sample were in primary school, but these effects disappear by Year 11. In contrast, the quality of the pre-school setting, as measured by the Early Childhood Environment (ECERS) observational scales, continued to be a statistically significant predictor for self-regulation, pro-social behaviour and hyperactivity at the end of KS4, although the effects were weak.

Overall, students who had attended higher quality pre-schools still showed significantly better social-behavioural outcomes (for self-regulation, pro-social behaviour and hyperactivity) at age 16 than those who had experienced only low quality pre-school controlling for other influences. These relatively small effects were consistent in predicting better outcomes, for self-regulation (ES=-0.14, high versus low quality), pro-social behaviour (ES=0.16, high versus low quality) and hyperactivity (ES=-0.20 high versus low quality).

Primary school influence

There were no statistically significant trends in the effects of the academic effectiveness of the primary school an EPPSE student had attended in terms of predicting better later social-behavioural outcomes at the end of KS3, and this was largely mirrored in KS4. Again, this is in contrast to findings for academic attainment where longer term positive benefits from attending a more academically effective primary school remain statistically significant in predicting academic results in Year 9 and for overall GCSE outcomes in Year 11 (see Sammons et al., 2011a; Sammons et al., 2014a).

Secondary school influences

Two administrative indicators of secondary school academic effectiveness and quality were available:

- the DfE's Contextual Value Added (CVA) measures, calculated to measure secondary school effectiveness in promoting students' academic progress from KS2 to KS4
- the Office for Standards in Education (Ofsted) inspection grades for schools.

EPPSE tested whether students who attended more academically effective or higher quality secondary schools (as defined by these indicators) showed better social-behavioural outcomes.

The four year average CVA score for secondary schools did not predict significant differences in students' social-behavioural outcomes in KS3 or in KS4, when account was taken of the influence of individual student, family, HLE, school composition and neighbourhood characteristics. However, there was some suggestion of weak positive effects for pro-social behaviour that verged on being significant.

Similarly, the overall Ofsted inspection judgments of the secondary school did not predict social-behavioural outcomes for EPPSE students. Again these results are in contrast to findings for the academic attainments of the EPPSE students in Year 11, measured by GCSE results, where these official indicators predicted better academic outcomes and progress.

The social composition of secondary school intakes was measured by the percentage of students eligible for free school meals (FSM) and the percentage of students with special educational needs (SEN). Both of these aggregate measures of school intake were found to be significant predictors of social-behavioural outcomes in KS4.

Attending a secondary school with a higher proportion of SEN students had a weak but negative impact on EPPSE students' own social-behavioural outcomes for self-regulation, pro-social behaviour and anti-social behaviour. Attending a secondary school with a more disadvantaged student intake (% FSM) also had a weak but positive effect on EPPSE students' own social-behavioural outcomes for self-regulation, once other characteristics had been accounted for.

The later finding is in contrast to those for GCSE outcomes, where a disadvantaged school context predicted poorer attainment. It may be that high disadvantage schools place a greater emphasis on promoting positive social behaviour to support learning.

Teaching and school processes in KS3 and KS4

Another perspective on secondary school characteristics was provided by data on students' views and experiences of their secondary school education in KS3 and KS4. These were obtained from self-report questionnaires in Year 9 and again in Year 11. Various factors were derived that related to features of students' school experiences (Sammons et al., 2011d; Sammons et al., 2014d). Further details are in Appendix 8. Those that showed the strongest associations with social-behavioural outcomes were related to how well staff and students 'get along' and how valued students felt (positive relationships in Year 11; Valuing pupils in Year 9), the behavioural climate of the school and the emphasis given to learning within the classroom (Year 9).

Where students reported that their schools laid a greater 'Emphasis on learning' in KS3, this predicted better self-regulation, pro-social behaviour and reduced negative behaviour (hyperactivity and anti-social behaviour) in KS4.

A negative ‘Behavioural climate’ in the secondary school in KS3, also predicted poorer later social-behavioural outcomes at age 16. A more negative climate predicted poorer self-regulation and pro-social behaviour and increased levels of hyperactivity and anti-social behaviour.

Similarly, the factor ‘Valuing pupils’ was found to predict better outcomes for all four social-behavioural measures, as was the similar factor based on data collected in Year 11 that identified positive relationships. These factors capture aspects of the emotional climate of the school, such as relationships with teachers in terms of friendliness and the extent to which students feel valued and involved.

The levels of ‘teacher support’, ‘teacher professional focus’ and use of ‘formative feedback’ reported were also positive predictors of better social-behavioural outcomes, but to a lesser extent. Similarly the factors ‘head teacher qualities’ and ‘teacher discipline’ showed weak, but significant positive effects in predicting most social-behavioural outcomes in Year 11.

The physical ‘Environment of the secondary school’ (attractive buildings, classroom decorations, and standards of cleanliness) and the ‘School/learning resources’ showed only very weak or non-significant associations with social-behavioural measures. This was also the case for the factor measuring the ‘Academic ethos’ of the secondary school.

As these aspects of student experience are to some extent inter-related they were also tested in combination. The KS4 measure ‘Positive relationships’ was found to be the strongest predictor for all four social-behavioural outcomes in Year 11 (ES=0.42 - for self-regulation; ES=0.42 - for pro-social behaviour; ES=-0.49- for hyperactivity; ES=-0.43 - for anti-social behaviour, high versus low – see Table 4.2). However, the KS3 poor ‘behaviour climate’ was still important as an additional predictor for later self-regulation (ES=-0.36), pro-social behaviour (ES=-0.21) and levels of hyperactivity (ES=0.20, high versus low – see Table 4.2).

The KS3 measure of ‘Emphasis on learning’ also predicted better pro-social behaviour (ES=0.30, high versus low), lower levels of hyperactivity (ES=-0.30, high versus low) and lower levels of anti-social behaviour (ES=-0.38, high versus low) in Year 11 (see Table 4.2).

Lastly, ‘Formative feedback’ was an additional predictor of better pro-social behaviour outcomes (ES=0.29, high versus low), when tested in combination.

Table 4.2: Summary of the combined influence of students' views of school on Year 11 social-behavioural outcomes (high vs. low scores)

	Self-regulation	Pro-social behaviour	Hyperactivity	Anti-social behaviour
Students' views of school in KS3				
Emphasis on learning		0.30	-0.30**	-0.38
Poor behaviour climate	-0.36	-0.21	0.20	
Students' views of school in KS4				
Positive relationships	0.42***	0.42***	-0.49***	-0.43***
Formative feedback		0.29**		

* p<0.05, ** p<0.01, *** p<0.001

N.B. views of school were tested in combination

4.2.5 Developmental progress between KS2-KS4

In these analyses the student's prior social behaviour, measured in Year 6 of primary school, was included as a baseline to model developmental change across the five years of secondary education, while testing whether the student, family, home learning environment (HLE) and neighbourhood influences discussed above also predicted developmental change.

Individual and family characteristics

A significant gender gap was identified, with girls showing more change/progress in the positive social-behavioural outcomes (ES=0.30 – for self-regulation; ES=0.40 – for pro-social behaviour) and also greater reductions in the negative outcomes (ES=-0.24 - for both hyperactivity and anti-social behaviour – see Table 4.3). Thus the gender gap in behaviour widened in secondary school in favour of girls. The occurrence of multiple behavioural problems in early childhood was also a significant predictor of students' developmental progress in self-regulation between KS2 and KS4 (ES=-0.44). Similarly, the student's age (relative age position within their academic cohort) predicted social-behavioural changes for students during KS3 and KS4. Younger students born later in the year (summer-born) showed less developmental progress than older students (autumn-born) although the size of the effects were small (ES=-0.11 – for self-regulation; ES=-0.14 – for pro-social behaviour). This shows that students' young for their year do not typically catch up in terms of positive social-behavioural outcomes across five years of secondary schooling but fall a little further behind.

Coming from a large family (three or more siblings) also predicted less developmental progress in self-regulation (ES=-0.24 compared to singletons) and increases in hyperactivity (ES=0.22) between KS2 and KS4.

A small equity gap associated with family poverty (eligibility for FSM) was found for changes in self-regulation (ES=-0.17), pro-social behaviour (ES=-0.20), hyperactivity (ES=0.28) and a somewhat stronger effect for anti-social behaviour (ES=0.33) placing students not living in poverty at an advantage (see Table 4.3). The gaps were larger for the measure of family socio-economic status. A moderately strong equity gap associated with SES was found for changes in self-regulation (ES=-0.44), pro-social behaviour (ES=-0.43), and increased hyperactivity (ES=0.57) and anti-social behaviour (ES=0.52) for students with 'unskilled' parents compared to those with 'professional non-manual' parents.

A consistent pattern of differences in developmental progress related to the level of parent's educational qualifications emerged for self-regulation (ES=0.28 for degree versus no qualifications), pro-social behaviour (ES=0.37), and anti-social behaviour (ES=-0.23), with students whose mothers held a degree or equivalent, showing significant improvements in the two positive social-behavioural outcomes, and significant reductions in anti-social behaviour. Smaller reductions in hyperactivity were also found, but those just failed to reach statistical significance (ES=-0.19 for degree compared to students of parents with no qualifications).

The marital status of parents in the early years, when children were first recruited to the study, was also a significant predictor of changes in self-regulation (ES=-0.25 - single parent compared to married) and pro-social behaviour (ES=-0.19 - single parent compared to married) during secondary education. Single parent status also predicted increases in hyperactivity in adolescence (ES=0.24 - single parent versus married) and anti-social behaviour (ES=0.15). Students in lone parent families showed small but statistically significant increases in both negative behaviours and decreases in both positive behaviours. In addition, students of parents who were living with their partner but unmarried in the early years were found to show small decreases in self-regulation (ES=-0.18) and pro-social behaviour (ES=-0.14) and an increase in hyperactivity (ES=0.15).

Home Learning Environment (HLE)

The quality of the early years HLE was not found to predict better developmental progress between KS2 and KS4, once later HLE activities were taken into account. This is in contrast to findings for Year 11 GCSE outcomes for the EPPSE sample. However, academic enrichment activities in KS3 predicted better developmental progress in social-behavioural outcomes between KS2 and KS4 (see Table 4.3). Students who experienced more learning opportunities (in terms of KS3 HLE academic enrichment) showed a significant positive change in self-regulation (ES=0.29 high versus low) and pro-social behaviour (ES=0.21 high versus low) from Year 6 to Year 11, and significant reductions in hyperactivity (ES=-0.33 high versus low) and anti-social behaviour (ES=-0.22 high versus low).

Neighbourhood

There was some evidence that living in an area of lower deprivation (IDACI) predicted more favourable developmental progress in self-regulation (ES=0.17 compared to high deprivation areas) and pro-social behaviour (ES=0.21) between KS2-KS4 (see Table 4.3). Students from areas with higher proportions of White British residents showed less favourable developmental progress in pro-social behaviour between KS2 and KS4 (ES=-0.18).

Summary of background influences on progress (or change KS2 to KS4)

The analyses reported above consider the effect of background characteristics upon the changes in social-behavioural outcomes from KS2 (age 11) to KS4 (age 16). This is done by including the relevant KS2 score as the first predictor and adding the background characteristics as further additional predictors. The results of these analyses investigating the influences associated with the range of background characteristics on progress KS2 to KS4 are shown in Table 4.3 in terms of the effect sizes in standard deviation units associated with each predictor for each of the four social-behavioural outcomes.

The ES are derived from multi-level models that include all background characteristics (and KS2 scores) in the model. Hence, the effect sizes are indicative of the net effect on progress KS2 to KS4 of a predictor once allowance has been made for all the other background characteristics. The ES show how far the gaps increased over five years in secondary school for the four social-behavioural dimensions.

Table 4.3: Summary of background influences on social-behavioural progress KS2 to KS4

Background characteristics	Self-regulation	Pro-social behaviour	Hyperactivity	Anti-social behaviour
Student Factors				
Gender (boys)	0.30	0.40	-0.24	-0.24
Age (autumn)				
Spring	ns	ns	ns	ns
Summer	-0.11	-0.14	ns	ns
Number of siblings (none)				
1-2 siblings	ns	ns	ns	ns
3 siblings	-0.24	ns	0.22	ns
Ethnicity (White UK heritage)				
White European heritage	ns	ns	ns	ns
Black Caribbean heritage	ns	ns	-0.31	ns
Black African heritage	0.37	ns	ns	ns
Any other ethnic minority heritage	ns	ns	ns	ns
Indian heritage	ns	ns	ns	ns
Pakistani heritage	ns	ns	-0.25	ns
Bangladeshi heritage	ns	ns	ns	ns
Mixed race heritage	ns	ns	ns	ns

N.B. Table displays significant effects at p<0.05; results with small student numbers not shown

Background characteristics	Self-regulation	Pro-social behaviour	Hyperactivity	Anti-social behaviour
Early behavioural problems (none)				
1 Behavioural Problem	ns	-0.16	ns	ns
2+ Behavioural Problems	-0.44	ns	ns	ns
Family characteristics				
Parents' Highest SES at age 3/5 (professional non-manual)				
Other Professional, non-manual	ns	ns	ns	ns
Skilled, non-manual	ns	ns	ns	ns
Skilled, manual	-0.27	ns	0.29	0.24
Semi-skilled	ns	ns	ns	ns
Unskilled	-0.44	-0.43	0.57	0.52
Not working/never worked	ns	ns	ns	ns
Parent's Highest Qualification Level at age 3/5 (no qualifications)				
Other Professional/Miscellaneous	ns	ns	ns	ns
Vocational	ns	ns	ns	ns
16 academic	ns	0.19	ns	-0.19
18 academic	ns	ns	ns	ns
Degree or equivalent	0.28	0.37	ns	-0.23
Higher degree	ns	0.33	ns	ns
Marital Status of Parent/Guardian/Carer (married)				
Single	-0.25	-0.19	0.24	0.15
Separated/Divorced	ns	ns	ns	ns
Living with partner	-0.18	-0.14	0.15	ns
Widow/Widower				
Free School Meals (FSM) eligibility (No)				
Yes	-0.17	-0.20	0.28	0.33
Home Learning Environment (HLE)				
KS3 Academic enrichment (Grouped) (Low)				
Medium	0.15	0.15	-0.17	ns
High	0.29	0.21	-0.33	-0.22
Neighbourhood				
IDACI (High deprivation)	0.17	0.21	ns	ns
Low deprivation	ns	ns	ns	ns
Average deprivation	ns	-0.18	ns	ns

N.B. Table displays significant effects at p<0.05; results with small student numbers not shown

Secondary school influences on progress (or change KS2 to KS4)

Several features of teaching and school processes in secondary schools were found to influence students' social-behavioural developmental progress between KS2 and KS4, over and above the effects of background noted above. Although the academic effectiveness and quality of the secondary school were not found to predict developmental progress for any of the four social-behavioural outcomes, student's own reports of their experiences of school were significant predictors of their own developmental progress between KS2 and KS4.

Individually, many of the experience of school factors predicted better developmental progress, in particular attending a secondary school rated more favourably for the factors ‘Positive relationships’, ‘Monitoring students’, ‘Formative feedback’, ‘Emphasis on learning’ and ‘Valuing pupils’.

The most important feature in predicting progress in all four social-behavioural measures, when tested in combination was the factor ‘positive relationships’ (ES=0.38 - for self-regulation, high versus low; ES=0.40 - for pro-social behaviour; ES=-0.46 - for hyperactivity; ES=-0.37 - for anti-social behaviour). ‘Positive relationships’ is concerned with the culture of valuing students, typified by the extent to which students feel that teachers and the students get on well, teachers offer them friendly and respectful treatment, and the extent that teachers show an interest in students.

In addition, attending a secondary school rated more favourably for ‘Formative feedback’ was associated with more favourable developmental progress in terms of students’ pro-social behaviour (ES=0.26 high versus low). Moreover, attending a secondary school rated more favourably in terms of ‘Emphasis on learning’ predicted decreases in hyperactivity between KS2 and KS4 (ES=-0.25).

4.3 Conclusions

This phase of the research adds to the body of evidence provided by earlier analyses conducted for the EPPSE sample at younger ages (school entry, KS1, KS2 and KS3). The age 16 results support and extend previous findings that investigated the role of different sources of influence (proximal to distal) that shape social behaviour over time. The approach has been influence by the ecological model of human development proposed by Bronfenbrenner (1994), shown in Section 1 of this report. EPPSE research has explored the way individual, family, home learning environment (HLE), neighbourhood, pre-school, primary school and secondary school influences shaped children’s development from early childhood to adolescence.

There is clear evidence that various individual, family and HLE characteristics continued to shape students’ social behaviour in secondary school up to the end of KS4. As at younger ages, we have identified significant differences in outcomes for different groups of students. Although most students are rated fairly favourably in terms of their social behaviour in Year 11, for a minority of students poor behaviour is evident. Certain influences increase the risk of poor behavioural outcomes. Just as an equity gap related to disadvantage can be identified in terms of influences that promote or hinder learning and academic attainment, similar influences shape social-behavioural adjustment. Some influences reduce the likelihood of positive social-behavioural outcomes, others promote this. The same is found for the two measures of negative behaviour.

There are strong gender effects, as at younger ages. Girls show better social behaviour in terms of all four outcomes as rated by teachers compared to boys. This gap widens over time in the analyses of developmental progress from age 11 to 16. However, it is important to note that elsewhere (Sammons et al., 2014c) it is shown that girls in the EPPSE project had poorer mental health (measured on the Warwick-Edinburgh Mental Health Scale) than boys, but this does not seem to be reflected in teacher assessments of their behaviours in school. This possibly reflects the greater sensitivity of teachers to the more easily observable aspects of student behaviour than the more internalising behaviours such as anxiety that are more prevalent for girls.

The experience of various indicators of disadvantage from the early years increases the risk of poorer social-behavioural development up to age 16 years, as well as predicting poorer attainment. The two are likely to be mutually reinforcing. Thus low family SES, eligibility for FSM, single parent status and larger family size all predicted poorer outcomes. Although smaller in size, both neighbourhood disadvantage measures and school context are significant predictors of outcomes. Contextual effects linked to 'place poverty' and school composition also seem to shape social behaviour in adolescence.

By contrast higher parental qualification levels and positive parenting experiences in the early years, measured by the early years HLE, as well as HLE measured at later ages (especially enrichment learning experiences in KS3) predicted better longer term outcomes.

Attending any pre-school (compared with none) did not show any continued effects on social behaviour up to age 16. However, there were some indications of small positive effects for those students who had attended high quality pre-school provision.

The measure of primary school academic effectiveness predicted better academic attainment in primary school and later in Year 9 and Year 11 but not better (or worse) social behaviour. Similar results are found for the academic effectiveness of the secondary school (CVA) which, while important for academic attainment and progress, was not a predictor of social-behavioural outcomes for the EPPSE sample.

In KS3, attending a poor quality secondary school, as measured by Ofsted judgements, predicted poorer social-behavioural outcomes for those unfortunate enough to attend a school rated as inadequate, even after controlling for the influence of individual, family and HLE characteristics. However, by age 16 this effect was no longer statistically significant. This may reflect changes in schools judged to be inadequate or satisfactory over the time of the research, given the strong pressure to improve inherent in the accountability system for schools in England.

The EPPSE research incorporated measures reflecting ‘student voice’. Self-report surveys provided measures of students’ experiences and views of school in Year 9 and Year 11. The various factors derived from these provided measures of the variation in students’ experiences. These measures were moderate to strong predictors of both academic outcomes at GCSE and also social behaviour as rated by teachers.

Student reports on the quality of teaching , their school’s ‘Behavioural climate’, the ‘Emphasis on learning’, ‘Positive relationships’ with staff, and feeling ‘Valued’ were found to be consistent predictors of better social-behavioural as well as academic outcomes.

The findings in KS4 are in broad accord with those found in KS3. They highlight areas that could be addressed in school improvement policies intended to promote better outcomes for secondary school students. They also point to the potential role of using survey data and other ways to tap into the student ‘voice’ in assessing the quality of their educational experiences. The aspects about secondary school experience identified here show the importance to school leaders and teaching staff of focusing on enhancing the quality of teaching and learning, student support, improving the behavioural climate of the school, ensuring students feel valued, and promoting a high quality physical environment and learning resources. These aspects should be viewed as key features for school self-evaluation and planning for improvement as well as for external evaluation.

Overall, these results for social-behavioural outcomes confirm and extend earlier findings. The life chances of some children are shaped by important individual, family, home and learning experiences. These early effects emerge at a young age and their influences continue to shape students’ educational outcomes later in their educational careers. However, some influences can help to ameliorate the effects of disadvantage. The effects of high quality pre-school experience remain evident, while secondary school experiences are also relevant. There are important and probably reciprocal associations between academic outcomes and social-behavioural development (see accompanying reports - Sammons et al 2014a; 2014b; 2014c).

Disadvantage remains a complex and multifaceted concept. The longitudinal EPPSE research indicates that it is by no means captured by one simple indicator such as the free school meal (FSM) status of a pupil. The concept of multiple disadvantage is important and the challenges facing schools in promoting better outcomes for students from disadvantaged homes and contexts remain strongly evident. Educational influences (including pre-school) have an important part to play in supporting those ‘at risk’ and can promote better outcomes. But the EPPSE data shows that equity gaps emerge early for all outcomes (cognitive/academic and social-behavioural) and remain strongly evident across different phases of education.

Section 5 Mental well-being and dispositions towards learning

- Four out of five students agreed or strongly agreed that they liked school and their lessons
- Compared to responses from Year 9 students, when students were in Year 11 they were more likely to think their school was a 'friendly place' and less likely to feel school was a 'waste of time'
- Almost three quarters of EPPSE students expected to go to university, with more girls than boys reporting this
- Girls had significantly lower scores for mental well-being but higher scores for 'Resistance to peer influence'
- 'Mental well-being' was unrelated to most other demographic characteristics, and its intra-school correlation was low, suggesting that well-being does not vary much between individual secondary schools and is also little affected by socio-demographics
- By way of contrast, dispositions related to learning were predicted by family characteristics ('Enjoyment of school' scores were consistently predicted by higher parental qualifications and by students living with both parents)
- School characteristics predicted 'Mental well-being', although only weakly. These included: 'Positive relationships' between teachers and students, 'Monitoring students' and 'Teacher professional focus'
- School characteristics were stronger predicators of 'Enjoyment of school' than of 'Mental well-being', with students who rated their schools higher on 'Positive relationships' and 'Teacher professional focus' reporting greater 'Enjoyment of school'
- Lower levels of 'Disaffected Behaviour' were also predicted by students' experiences of their school in terms of 'Teacher professional focus' and 'Positive relationships'
- Overall, two school factors consistently predicted 'Mental well-being', these were 'Positive relationships' and 'Teacher professional focus' rather than 'Academic ethos' or 'Formative feedback'.

For full details of the findings and analyses see Sammons et al., (2014a; 2014b; 2014c; 2014d).

This section describes students' 'Mental well-being' and learning dispositions in Year 11 before exploring some of the characteristics that predict them. 'Mental well' being was measured via the Warwick-Edinburgh Scale (Tennant et al., 2007) and the learning dispositions measured by students' responses to questions in the EPPSE survey; these include the factors: 'School enjoyment', 'Disaffected behaviour', 'General academic self-concept' and 'Resistance to peer influence'. All of these are treated as outcomes and the same statistical modelling that was applied to the academic and social-behavioural outcomes was used in analysing these factors.

The section goes on to summarise aspects of students' lives related to their health, involvement in 'risky' behaviours (such as drug taking, alcohol, smoking, crime), educational and employment aspirations and out of school activities. A separate report, Sammons et al., (2014d) investigates the EPPSE sample's views and experiences of their secondary schooling.

5.1 Aims

The overall aim of this section is to describe students' well-being and dispositions in Year 11, and in particular to:

- explore the influence of student (e.g., gender, ethnicity), family (e.g., parental qualification, family SES), home learning environment (HLE) and neighbourhood characteristics as predictors of students' well-being and dispositions
- identify any continuing impact of educational influences on well-being and dispositions especially the influence of the quality and effectiveness of pre-schools, primary schools and secondary schools
- explore the impact of secondary school characteristics such as those derived from students' questionnaire responses ('Teacher professional focus', 'Formative feedback'), and other features of school such as school composition of intake, and students' school experiences
- investigate the additional impact of student experiences such as family relationships, peer group and out of school activities (e.g., engagement in sports, organised groups) as influences on student well-being and dispositions.

5.2 School life, aspirations and views on examinations

Students in Year 11 were still very positive about secondary school: four out of five liked school and their lessons (agree or strongly agree) and fewer than one in ten students reported that they felt ‘out of place at school’ or that ‘school was a waste of time’.

The vast majority of students reported they liked being in school (82%). Moreover, compared to their own accounts in Year 9, they were more likely to think their school was a friendly place, and less likely to feel out of place or feel school was a waste of time. There was slightly less reported bad behaviour in class compared to when they were in Year 9, and students were significantly less likely to say they were bored in class in Year 11 (36% reported being bored in class in Year 11 compared to 41% in Year 9). However, it still remains a concern that over a third of students in the sample felt bored by some lessons in Year 11.

As a whole, students felt very safe in school in Year 11, with only a tiny minority (less than 5%) reporting feeling unsafe in either lessons or during break times.

Students were generally positive about their academic ability, and two thirds of students felt they had always done well in school subjects. Only a very small proportion (5%) felt ‘hopeless’ in school subjects. School attainment was viewed as ‘extremely important’ for the majority of students. Nine out of ten students thought it was very important to gain five good GCSEs (90% believed it was very important and 9% believed it was fairly important). This is a much higher proportion than actual success rates, where nationally less than sixty percent of students obtain 5 good GCSEs. Around one out of five students (21%) predicted wrongly that they would achieve 5 A*C GCSEs. Of those who incorrectly predicted their results (either way) more were over-optimistic than under-optimistic.

Seven out of ten (72%) EPPSE students thought A-levels were very important, with another one in ten (13%) indicating these were fairly important. Just over half of EPPSE students felt it was very important to get a degree in the future, while another quarter thought this fairly important. These findings reflect the high proportion of students (72%) who expected to go to university. The EPPSE research findings challenge simplistic assumptions that attribute the equity gap in attainment and problems of social mobility to ‘low aspirations’ of young people (for further discussion of this issue see Baker et al., 2014).

Although there were no significant gender differences in how important students felt qualifications were, girls were slightly more likely than boys to expect to go to university and this may reflect their higher attainment in GCSEs. Students’ views about whether they would apply to university were relatively stable over time, and only a small minority responded that they didn’t know in both Year 9 and Year 11. This suggests that students have already begun to make these important career plans as earlier as KS3, if not before.

Not only was school work considered important, it was often done outside of school hours. Nearly six out of ten (59%) reported doing at least one hour of homework on an average school day. Girls reported spending significantly more time on homework than boys (e.g., 21% of girls reported more than two hours on a typical school day but only 12% of boys). Elsewhere it has been shown that over and above students' own background (income, SES, parent's qualifications etc.) important behaviours such as spending time on homework predict better attainment at Years 9 and 11, as well as progress over the secondary period (Sammons et al., 2011a; 2014a; Toth et al., 2012). One of the reasons girls have higher attainment may relate to the extra time they put into study at home.

5.3 Student health and well-being

5.3.1 Mental well-being

Well-being is increasingly viewed by educators, parents and students as an important aim of education. EPPSE used a valid and reliable 'mental well-being' rating scale that measured positive attributes such as being interested in new things, feeling close to other people, having 'energy to spare'. Overall scores on the Warwick-Edinburgh Mental Well-being scale were lower for girls than boys in Year 11, in line with higher 'Anxiety' scores for girls found in Year 9. Boys were significantly more positive than girls in their responses to most items in the scale, with larger gender differences for feeling good about themselves, feeling confident and feeling relaxed. EPPSE is not the only research to highlight the consequences of emotional well-being (Vordach, 2002).

5.3.2 Resistance to peer influence

Most students indicated on questionnaire items that they would be influenced by their peers in certain circumstances. Only five per cent of students thought it 'sort of true' or 'very true' that they would break the law if their friends said they should, but two thirds (64%) thought they would take more risks when with their friends. Girls were more likely to report they would resist peer influence than boys.

5.3.3 Physical Health

The vast majority of students (93%) reported that their health was 'very' or 'fairly' good. However, only four in ten (39%) of girls rated their health as very good compared to over half (54%) of boys. Having a longstanding (over the last year) illnesses, disability or infirmity was reported by over one in ten (13%) of EPPSE students. Of these students, half of them felt that it limited their daily activities (52%) and a slightly smaller proportion thought it made it harder to go to school or college (41%).

5.3.4 Out of school activities

Computer use (surfing the net, social network sites) was high (over 95% of students reported using a computer in the last month), and three quarters of students reported playing computer/console games in the last month. There were strong gender differences, with boys significantly more likely to report computer gaming than girls (58% of boys reporting gaming 6 or more times in the previous month compared to only 29% of girls). In contrast, girls were slightly more likely to say that they browsed the internet or used social network sites.

Nearly two thirds of EPPSE students reported reading for pleasure, but this figure was somewhat lower for boys (approximately half of boys indicated they rarely read for pleasure). Just one in five students had visited a library in the last month.

Approximately four out of five students had gone to a party or attended at least one cultural event in the previous month (cinema, theatre or concert). In total, a third of EPPSE students reported going to a pub or club in the last month, and one in ten (9%) reported going at least 3 times a month. Religious activity was less common, with less than one in five students (18%) reporting having gone to a religious activity in the last month.

5.3.5 Peer group and family closeness

Peer group links were clearly important, with two thirds of EPPSE students spending their spare time mainly with friends (65%) and over ninety per cent having spent time with friends in the last month. Three quarters of EPPSE students at this age report having a best friend, which other research has shown contributes to children's all round development (Ellis and Zarbatany, 2007). However, a minority of students seemed isolated (12% reported spending most of their spare time alone).

Many Year 11 students reported spending time with their family. Two thirds had been on at least one family outing in the previous month and a quarter still chose to spend most of their spare time with their family.

5.3.6 Risky behaviours in Year 11

Students were asked about activities considered as risky to health or risky anti-social behaviours. These items were then combined to form an overall measure of negative 'risky' behaviours.

One in ten students reported daily smoking, and girls were more likely to be regular smokers than boys (11% of girls compared to 8% of boys smoked daily), and were more likely to have ever tried a cigarette (41% of girls compared to 34% of boys).

Approximately one in five students reported having tried Cannabis/other Class B or legal drugs, and a very small minority (3%) reported having tried Class A drugs such as Cocaine, Ecstasy or Amphetamines. Very few (less than ten students for each) reported taking solvents, LSD, Magic mushrooms, Steroids, Crack or Heroin. The most commonly reported drug used by 16 year olds was Cannabis, with one per cent of EPPSE students reporting using Cannabis every day.

No gender differences in drug usage were found but students with more highly educated parents were much more likely to report having tried any drug. For example, approximately one in seven (14%) of EPPSE students whose parents had no qualifications reported taking any drugs. In contrast, over a quarter (26%) of EPPSE students whose parents have a degree or higher degree level qualification reported taking any drugs.

In total, approximately four out of five students reported that they had drunk alcohol at some point (80%), and approximately one in ten (9%) reported drinking at least once a week. Boys were more likely to say they were regular drinkers than girls.

Lack of exercise can also be considered a potential risk indicator for health, although it was not included in the 'risk index' (discussed below) because it was so common it would have overwhelmed other items. Instead this lack of exercise is reported separately. Nearly half (42%) of students had not taken part in any sports activity in their spare time in the previous month. Girls were much less likely than boys to report having taken part in sport in their free time in the previous month. Disadvantaged students (FSM) and students with parents with lower qualifications were more likely to have taken part in some form of sport outside of school.

A sizeable minority (1 in 5) of EPPSE students said they had truanted at some time during Year 11. The main reasons given by students for truanting were school-related and reasons included not liking particular lessons (40%), not liking particular teachers (26%), or being bored (26%). Other reasons involved personal issues such as being upset over a personal matter (25%) or not liking school (23%). Students from more disadvantaged and less qualified families (FSM, parental qualifications) were more likely to report having truanted in Year 11 (e.g., 30% of FSM entitled students compared to 18% of non-FSM students).

Combining risky behaviours into an index

An EPPSE 'risky' behaviour index was constructed from six behaviours that could be considered to put students at risk of poorer educational and health outcomes including anti-social behaviours (truanting, anti-social behaviour, having been in trouble with the police/law) and health risk behaviours (smoking, drinking, substance use). Although many of these behaviours did co-occur, the number of risks engaged in ranged from zero (59% of students) to six risky behaviours (<1%). One in five students (19%) engaged in two or more risky behaviours and one in ten engaged in three or more (11%).

When investigated on this aggregated scale, boys were more likely to engage in multiple risky behaviours than girls, as were older students in the year group.

Family characteristics that predicted higher scores on the 'risky behaviour index' included membership in a single parent or reconstructed family (step parent in house) or experiencing lower levels of academic supervision. Students for whom English was an Additional Language (EAL) showed lower levels of multiple risky behaviours compared to White UK students. High levels of computer use were associated with higher scores on the 'risky' behaviour index.

Higher levels on the 'risky' behaviour index were also associated with poorer (self-reported) health, lower attainment at school, poorer social-behavioural development and less favourable dispositions towards learning. Young people, drawn to risky behaviour, jeopardise much more than their own safety. These findings confirm connections between academic and socio-emotional development and the need to support the well-being of children and young people from the earliest years to the end of KS4.

5.4 Factors that predict mental well-being and learning dispositions in Year 11

All five 'soft outcomes' were tested in predictive multilevel models in the same way as the academic social-behavioural outcomes. These included 'mental well-being' and a 'basket' of factors grouped together and called 'learning dispositions' (see Table 5.1).

5.4.1 The impact of student, family and HLE influences on well-being and learning dispositions – the five 'soft skill' outcomes

Personal and social background

Boys reported higher levels of 'Mental well-being' (ES=-0.45), similar to findings elsewhere (Morrison-Gutman and Feinstein, 2008; Currie et al., 2008) whereas girls were likely to report lower levels of 'Disaffected behaviour' (ES=-0.23), and higher 'Resistance to peer influence' than boys (ES=0.34). This is in keeping with the analysis of social-behavioural outcomes in Year 11 where boys showed higher levels of hyperactivity, and anti-social behaviour and lower levels of pro-social behaviour and self-regulation (Sammons et al., 2014b).

In Year 11 boys and girls reported similar 'General academic self-concept'. At first sight this is surprising as girls score significantly higher than boys in terms of overall GCSE performance[26]. Once GCSE attainment was taken into account in the models, boys reported significantly more favourable beliefs in their general academic ability. In other words boys have more positive views of their academic ability ('General academic self-concept' - ES=0.20) even after controlling for actual performance. This result fits with earlier findings in Year 9 on subject specific academic self-concept, where boys were found to have higher 'Maths Academic self-concept' (Sammons et al., 2011a) even though their actual maths attainment was no better than girls. Similarly in Year 9, girls did not report higher views of their own ability in English ('Academic self-concept' in subject) compared to boys although they significantly outperformed boys in terms of their attainment. Although boys lagged behind this did not seem to shape 'Academic self-concept' for either sex.

Because of low numbers in some sub-groups, students with different ethnic backgrounds were compared to the majority ethnic group, White UK. In line with findings in Year 9, some ethnic differences were found for students of:

- Black African heritage who had more positive scores for 'Mental well-being' (ES=0.52) than the White UK group.
- Pakistani heritage who tended to report more favourable 'School enjoyment' (ES=0.59), higher 'General academic self-concept' (ES=0.35) and lower levels of 'Disaffected behaviour' (ES=-0.56).
- Indian heritage who also reported more favourable 'School enjoyment' than White UK students (ES=0.60).
- Mixed race heritage who reported lower scores for 'Mental well-being' (ES=-0.27) and lower 'School enjoyment' (ES=-0.29) than White UK students.

Due to small numbers in some groups, these results should be treated with caution. However, the findings suggest, in line with earlier time points, that ethnic group heritage is associated with some differences in dispositions (see Table 5.1). In particular, Pakistani students generally reported more favourable dispositions and mixed race students somewhat lower scores on some dispositions.

26 Girls were found to outperform boys in four of the five academic attainment measures collected in Year 11 for EPPSE students: overall GCSE score, % A*-C GCSEs (yes/no), English Baccalaureate (Yes/no), and English GCSE. There was no significant gender difference in GCSE Mathematics performance (See Sammons et al., 2014a).

In line with reports from the EPPSE students in Year 9, older students in the year group (autumn-born versus younger summer-born) reported higher 'General academic self-concept' than younger students (ES=0.17). This may be in part a function of continuing small but significant attainment differences that remain at this time (interestingly the effect of age was no longer significant once prior attainment in Year 9 was taken into account). It shows that students who were young for their year remain educationally disadvantaged across a range of outcomes through their schooling up to Year 11. They are more likely to be identified as having SEN at earlier time points, have lower attainment, poorer social-behavioural outcomes and less favourable self-concepts than their older (autumn-born) classmates.

Family background

A small number of family demographics predicted students' dispositions (see Table 5.1). Free School Meals (FSM) entitlement was not significantly related to dispositions once the effects of other background variables were taken into account in the models. However, higher parental qualifications predicted higher 'General Academic self-concept' (the mother's qualification level e.g., Degree ES=0.42), greater 'School enjoyment' (father's qualification level e.g., Degree ES=0.31) but lower 'Resistance to peer influence' (highest parental qualification e.g., Degree ES=-0.20). Students with relatively young mothers (22 or younger at birth) had lower 'General academic self-concept' than students whose mothers were older when they were born (22-33 years old - ES=0.19; 33+ years old - ES=0.20).

Students from single parent families (at entry to pre-school) showed poorer 'Mental well-being' in Year 11 compared to those from married households (ES=-0.33). Family structure in Year 11 was also collected from students and found to be associated with some dispositions. Students from households that contained a step-parent reported lower 'School enjoyment' (ES=-0.17), lower 'General Academic self-concept' (ES=-0.18) and higher levels of 'Disaffected behaviour' (ES=0.17).

Home Learning environment (HLE)

Students' past experiences measured by the early years HLE index predicted later 'School enjoyment' in both primary and lower secondary school (Sammons et al., 2011a; 2011b; 2011c). At the end of Year 11, students who had received a very good early HLE were still found to have greater 'School enjoyment' and also more favourable 'General academic self-concept' (ES=0.26 for both). Higher levels of parent-child interaction in primary school also predicted lower levels of 'Disaffected behaviour' (Medium ES=-0.23, High ES=-0.33).

The HLE in secondary school also predicted EPPSE students' dispositions (see Table 5.1). Higher levels of 'Parental academic supervision', as measured in KS3, were associated with greater 'Mental well-being' in KS4 (e.g., High supervision - ES=0.43), predicted increased 'School enjoyment' (e.g., High - ES=0.59), and 'General academic self-concept' (e.g., High - ES=0.22), increased 'Resistance to peer influence' (e.g., High ES=0.48), and lower levels of 'Disaffected behaviour' (e.g., High - ES=-0.47). Higher levels of 'Enrichment activities' (measured in KS3 HLE) also predicted more favourable 'School enjoyment' (e.g., High ES=0.37), and 'General academic self-concept' (e.g., High ES=0.39), as well as lower levels of 'Disaffected behaviour' (e.g., High ES=-0.40). These HLE measures also predicted better academic outcomes in Year 9 and Year 11, making them an enduring feature in EPPSE findings across school phases.

Neighbourhood

While administrative data on neighbourhood deprivation showed very little association with dispositions, in line with findings from previous analysis of Year 9 data. However, in Year 11 students' own perceptions of neighbourhood safety appeared to be important. Compared to students who always felt safe in their neighbourhood, students who felt their home neighbourhood was unsafe (rarely/never feeling safe) had lower 'Mental well-being' (ES=-0.60) and lower 'School enjoyment' (ES=-0.53).

Special Educational Needs (SENs)

Students classified with a SEN had significantly less favourable dispositions in Year 9 than other students without SEN. By Year 11, the impact of SEN was less pronounced but students on the SEN register (particularly School Action or School Action Plus) still showed significantly lower 'School enjoyment' (e.g., School Action Plus - ES=-0.66), lower 'General academic self-concept' (e.g., School Action Plus - ES=-0.68), and higher levels of 'Disaffected behaviour' (e.g., School Action Plus - ES=0.54), after controlling for the effects of the other individual, family, HLE and neighbourhood influences. These effects are relatively strong.

Table 5.1: Summary of background influences on dispositions in Year 11

Characteristics	Mental well-being	School enjoyment	Disaffected behaviour	Resistance to peer influence	General academic self-concept
Student Characteristics					
Gender (boys)	-0.45	ns	-0.23	0.34	ns
Age (within the years group)	ns	ns	ns	ns	0.17
Ethnicity (White UK heritage)					
White European heritage	ns	ns	ns	ns	ns
Black Caribbean heritage	ns	ns	ns	0.44	ns
Black African heritage	0.52	ns	ns	ns	ns
Any other ethnic minority	ns	ns	ns	ns	ns
Indian heritage	ns	0.60	ns	ns	ns
Pakistani heritage	ns	0.59	-0.56	ns	0.35
Bangladeshi heritage	ns	ns	ns	ns	ns
Mixed race	-0.27	-0.29	ns	ns	ns

N.B. Table displays significant effects at the p<0.05 level or above

Characteristics Family Characteristics	Mental well-being	School enjoyment	Disaffected behaviour	Resistance to peer influence	General academic self-concept
Parent's Highest SES at age3/5 (professional non-manual)					
Other Professional, Non-Manual	ns	ns	ns	ns	ns
Skilled; Manual or Non-manual	ns	ns	ns	ns	-0.17
Semi-skilled	ns	ns	ns	ns	ns
Unskilled	ns	ns	ns	ns	-0.41
Not working/never worked	ns	ns	ns	ns	ns
Mother's employment in the early years (not working)					
Working full-time	ns	0.19	ns	ns	ns
Working part-time	ns	ns	ns	ns	ns
Father's employment in the early years (working full-time)					
Working part-time	ns	ns	ns	ns	ns
Not working	ns	ns	0.21	ns	ns
Father absent	ns	ns	ns	ns	ns
Mother's age (Grouped) (16-25)					
26-35 years old	ns	ns	ns	ns	0.19
36+ years old	ns	ns	ns	ns	0.20
Mother's /Father's/Parent's Highest Qualification Level (no qualifications)[27]					
Other Professional/Misc.	ns	ns	ns	ns	ns
Vocational	ns	0.27	ns	ns	ns
16 academic	ns	0.28	ns	ns	ns
18 academic	ns	0.22	ns	ns	ns
Degree or equivalent	ns	0.31	ns	-0.20	0.42
Higher degree	ns	0.33	ns	-0.30	0.44
Family structure in Year 11 (living with both natural parents)					
Living in reconstituted family	ns	-0.17	0.17	ns	-0.18
Living with single parent	ns	ns	ns	ns	ns
Other arrangement	ns	ns	0.57	ns	ns
Marital Status of Parent/Guardian/Carer (married)					
Single	-0.33	ns	ns	ns	ns
Separated/Divorced	ns	ns	ns	ns	ns
Living with partner	ns	ns	ns	ns	ns
Widow/Widower	ns	ns	ns	ns	ns
Free School Meals (No)	ns	ns	ns	ns	ns
Early Years Home Learning Environment Index (Grouped) (Very low)					
Low (Index values: 14-19)	ns	ns	ns	ns	ns
Average (Index values: 20-24)	ns	ns	ns	ns	ns
High (Index values: 25-32)	ns	ns	ns	ns	ns
Very high (Index values: 33-45)	ns	0.26	ns	ns	0.26
KS2 Parent-child interaction (grouped) (low)					
Medium	ns	ns	-0.23	ns	ns
High	ns	ns	-0.33	ns	ns
KS3 Academic supervision (Grouped) (Low)					
Medium	ns	0.23	-0.15	0.33	ns
High	0.43	0.59	-0.47	0.48	0.22
KS3 Academic enrichment (Grouped) (Low)					
Medium	ns	0.18	-0.17	ns	0.16
High	ns	0.37	-0.40	ns	0.39

N.B. Table displays significant effects at the p<0.05 level or above

27 Father's highest qualification level predicted School enjoyment; Mother's highest qualification level predicted General academic self-concept; and Parent's highest qualification level predicted Resistance to peer influence.

5.4.2 Additional characteristics associated with well-being and dispositions in Year 11

Gender was strongly associated with 'Mental well-being', with girls reporting lower levels. The contextualised multilevel analyses of well-being showed demographic background characteristics accounted for only a small proportion of its variance. However, living in a single parent family predicted low scores for 'Mental well-being', and family 'supervision' of the student activity predicted higher 'Mental well-being'. Of the dispositional outcomes, 'General academic self-concept' was predicted by low family education and low socio-economic status (SES).

Health status and Year 11 dispositions

Further (contextualised) analyses explored the association between additional variables such as physical health, and the dispositional outcomes.

The majority of students described their health as good (46% - very good; 47% - fairly good). However, students who reported their health more negatively had significantly lower reported 'Mental well-being' and the effects were strong (e.g., not very good/not good at all - ES=-1.37), 'General academic self-concept' (e.g., not very good/not good at all - ES=-0.54), and 'School enjoyment' (e.g., not very good/not good at all - ES=-0.50). Students with poorer reported health also reported increased 'Disaffected behaviour' (e.g., not very good/not good at all - ES=0.34).

Peer relationship and family dynamics for 'Mental well-being'

Questionnaires completed by EPPSE students and their parents contained key indicators about peer and family relationships. These indicators were investigated to see if they predicted students' 'Mental well-being'. Family discord (ES=-0.27) and regular quarrelling with parents (ES=-0.22) predicted poorer 'Mental well-being' although it must be noted that this relationship is likely to be reciprocal. Students who rarely ate an evening meal with their family also reported lower levels of 'Mental well-being' (ES=-0.13). There was some evidence that students with stricter boundaries (in terms of supervision by parents such as set times to return home in the evening) had more favourable 'Mental well-being' (ES=0.30).

Friendship groups were also found to be important for 'Mental well-being'. Students had significantly lower 'Mental well-being' if they reported spending most of their time alone in Year 9 (ES=-0.27) or being excluded from a friendship group in Year 9 (ES=-0.32).

While family and demographic characteristics generally have relatively weak to moderate effects on the softer skills, there was consistency in the pattern of significant effects. Out-of-school enrichment activities were linked to higher 'General academic self-concept', more 'School enjoyment' and less 'Disaffected behaviour'.

Supervision and academic monitoring by the family was linked to higher 'Mental well-being', 'School enjoyment' and 'General academic self-concept', lower 'Disaffected behaviour' and higher 'Resistance to peer influence'. Structured family support in a harmonious home environment has been described more fully by Siraj et al., (2014) and the concept of 'active cultivation' of the young person's future success highlighted. The horizons of the young people can be broadened by enrichment activities and their academic focus promoted by parental monitoring.

5.4.3 Educational influences

The net influence of pre-school

Pre-school experience rarely predicted dispositional outcomes. However students who had attended pre-schools that were more effective at promoting 'independence and concentration' in the pre-school period were found to have higher 'resistance to peer influence' in Year 11. This, combined with evidence on academic and social-behavioural outcomes, suggests that good pre-school experiences can have a lasting legacy.

The net influence of primary school

Attending an academically effective primary school predicted a better 'General Academic self-concept' in Year 11, after controlling for other influences. This may be because of improved attainment. Attending an academically effective primary school was shown to predict better attainment and progress in KS2 (Sammons et al, 2008b), and was also found to shape later attainment in secondary school in both KS3 and KS4. It also predicted better progress in secondary school over KS3 and KS4 (as noted earlier in this report).

The net influence of secondary school

Attending a more effective secondary school, measured by national contextualised value-added (CVA) indicators published by the Department for Education (DfE), predicted greater 'School enjoyment' and decreased 'Disaffected behaviour', after controlling for other background influences.

Ofsted judgements of secondary school quality also predicted greater 'School enjoyment', particularly the judgement related to attainment and standards. A similar pattern was found for predicting better 'Mental well-being', although to a lesser extent.

5.5 Students' experiences and views of secondary school

5.5.1 Teaching and school processes in KS3 and KS4

The study collected data from EPPSE students about their views and experiences of school in Year 9 and in Year 11. Further details are in Appendix 8. Several factors representing students' views of school (from Year 9 and Year 11) predicted EPPSE students' 'Mental well-being' and dispositions. The factors 'Positive relationships' with students had the largest effect on 'Mental well-being' (ES=0.32) followed by 'Monitoring students' (ES=0.26). 'School enjoyment' was predicted by 'Positive relationships' with students (ES=0.88), higher 'Teacher professional focus' (ES=0.48) and 'Formative feedback' (ES=0.44).

Table 5.2 summarises the effects associated with students' views of secondary school on EPPSE students' 'Mental well-being' and dispositions with the most consistent school predictors being 'Positive relationships' and 'Teacher professional focus', followed by 'Monitoring students'.

Table 5.2: Students' views of school as predictors of well-being and dispositions

Fixed Effects	Mental Well-being							
	Tested individually				Tested together			
	Coef	SE	ES	Sig	Coef	SE	ES	Sig
Teacher professional focus	0.38	0.04	0.48	***	0.13	0.05	0.16	*
Positive relationships	0.38	0.04	0.53	***	0.23	0.05	0.32	***
Monitoring students	0.34	0.04	0.48	***	0.18	0.04	0.26	***
Formative feedback	0.28	0.03	0.45	***	ns	Ns	ns	ns
Academic ethos	0.23	0.04	0.31	***	ns	Ns	ns	ns
School enjoyment								
Teacher professional focus	0.59	0.03	1.19	***	0.21	0.03	0.48	***
Positive relationships	0.59	0.02	1.27	***	0.36	0.03	0.88	***
Monitoring students	0.39	0.02	0.84	***	ns	ns	ns	ns
Formative feedback	0.42	0.02	1.04	***	0.15	0.02	0.44	***
Academic ethos	0.33	0.03	0.66	***	0.06	0.02	0.14	*
Disaffected behaviour								
Teacher professional focus	-0.42	0.03	-0.72	***	-0.27	0.04	-0.46	***
Positive relationships	-0.33	0.03	-0.60	***	-0.11	0.04	-0.21	***
Monitoring students	-0.24	0.03	-0.44	***	ns	ns	ns	ns
Formative feedback	-0.27	0.02	-0.58	***	-0.11	0.03	-0.24	***
Academic ethos	-0.18	0.03	-0.32	***	ns	Ns	ns	ns

5.6 Associations with attainment

Students' overall GCSE attainment predicted better 'Mental well-being' and higher 'Resistance to peer influence', although the size of the effects were small (Effect sizes<0.20). Again, it must be recognised that these relationships may well be reciprocal.

5.7 Conclusions

It can be seen that background influences (especially demographics) were typically relatively weak predictors of dispositions and of mental health and risky behaviours. Nonetheless, some student groups do show significantly better or poorer socio-emotional and health outcomes. Girls reported lower 'Mental well-being' than boys but also lower scores for 'Disaffected behaviour'; thus they seemed to be better citizens than boys but don't feel so positive about their lives or their abilities. This is in contrast to girls' significantly better attainment and social-behavioural outcomes in Year 11. Boys by contrast show poorer behaviour and attainment outcomes that receive more attention from schools and perhaps parents. This might be regarded as a worrying finding that indicates the possible need for further exploration of gender differences.

Another significant demographic influence was family structure, with students coming from step-parent families reporting lower 'School enjoyment' and 'Academic self-concept', and higher levels of 'Disaffected Behaviour'. Family routines inside the family such as eating meals together also predicted more favourable dispositions.

The findings reveal that features of secondary school experience also predict better 'Mental well-being' and disposition outcomes at age 16. Taken together with findings on GCSE results and teachers' ratings of social behaviour in Year 11, EPPSE has identified characteristics of schools that predict educational and social success, particularly where students' report school staff display 'Positive relationships' with students and have a more 'professional focus'.

The analyses presented in this section show that 'Mental well-being' is only weakly related to social background, and learning dispositions only slightly more so. 'Positive relationships' between teachers and students in Year 11 have effects on 'Mental well-being' and especially on 'School enjoyment'. The EPPSE young people were generally positive about their lives in schools and rather optimistic about their chances of success in GCSE exams. Section 6 will continue the story using reports from the young people themselves in the year following their GCSE exams. What happens next?

Section 6 Post 16 destinations and aspirations

- Parents were the most likely group to give advice on post 16 plans. Only around a half of students sought advice from Connexions or found them helpful. Family, friends and other networks were particularly important in helping NEETs move into EET status.
- Most young people thought they would go to university with the majority not being put off by financial concerns, although this was a concern for a large minority (40%). The scrapping of the EMA did not seem to influence most students' plans for staying in 16-19 education.
- The majority of young people did not think their skin colour, ethnicity, religion or sexual orientation would affect their chances of getting a job although girls were more likely to have concerns about workplace discrimination.
- Students in full-time education stayed on to improve their job prospects, whilst those studying part-time did so because only a part-time course was available to them.
- Young people in work mostly left full-time education because they wanted to earn money, with over half wanting to learn a trade. Less than one in10 left because they could not afford to say in full-time education.
- The sample was overwhelmingly happy in general, at home and with those of their own age. However, the NEET group was consistently the least happy in all three circumstances.
- Both mothers' and fathers' (to a lesser extent) highest qualification levels strongly predicted post-16 destinations, especially following a higher academic route.
- Students from higher income families were more likely to choose a higher academic route with those whose parents were in lower SES groups being four times more likely to follow a lower academic route.
- High levels of 'academic enrichment' in KS3 significantly predicted a higher probability of following a higher academic route.
- Pre-school attendance, duration, quality and effectiveness significantly predicted positive probabilities of a higher academic route and negative probabilities of a lower academic/vocational route.
- Primary school academic effectiveness predicted higher academic/vocational routes.
- Students attending an 'outstanding' secondary school (quality of learning) were more likely to follow a higher academic route.

- Good GCSE results in English and maths were significant predictors of post-16 destinations and when taking into account GCSE results, age, ethnicity, number of siblings and KS3 HLE were significant predictors of different post-16 destinations.
- Although a small sample, the NEET group was less likely to live with their natural mother/father and more likely to be carers, teenage parents, or college 'drop outs'. Their background often included multiple risk factors (poor physical and mental health) including low educational attainment at GCSE, especially in English and maths.
- The NEET group needed better information/advice on post 16 options. Lack of this resulted in them undertaking one short, low level course after another.
- The NEET group suffered from low attainment, difficult labour market conditions (lack of apprenticeships etc.) being in the benefits trap, in areas with transport difficulties and unable to find fees for courses once they were over 18.

Aspirations

- Career aspirations and confidence in achieving an ideal job were generally high, with most aspiring to professional occupations. Non-white ethnic heritage students were more confident overall in expecting to obtain their ideal job.
- The relationship between gender and aspirations was not straight forward; lower achieving girls were more likely to choose lower skilled careers than their male counterparts. Ideal job choices showed strong signs of gender stereotyping.
- Family background influenced career aspirations with these family characteristics being associated with more ambitious students' aspirations: higher parents' aspirations for their children's education, higher parental qualifications, higher SES, and levels of KS3 enrichment activities in the home.
- Parental aspirations for their children's education were the strongest family predictor of career aspirations at age 16/17. Young people whose parents wanted them to carry on in education post 18 were much more likely to have professional career aspirations.
- Not all NEET young people lacked high aspirations, as two fifths aspired to a professional qualification. NEET young people, however, had higher levels of career uncertainty than other young people.

For full details of the findings and analyses see Taggart et al., (2014).

For the young people who are the subject of this report, the end of school is not the end of their 'story'. What happens to these teenagers is of interest as it helps us to better understand how early experiences may shape post 16 destinations and possible later life trajectories. Although a young person's trajectory is not set for life, poor GCSE results and less favourable social behaviour and dispositions developed at school and home up to age 16, can all affect post 16 destinations and decrease the chances of later success in employment and further/higher education. This may shape a pathway that is difficult to deviate from later on. This section of the report summarises the findings from a longer technical paper (see Taggart et al., 2014) on the post 16 destinations and aspirations of the EPPSE sample.

6.1 Aims

The main aim of the EPPSE 3-16+ phase was to investigate the relative influence of child and family background characteristics, out of school learning, and pre-school, primary and secondary school experiences on young people's initial post-16 pathways. The investigation sought to:

- identify students on vocational, employment or NEET pathways
- explore the background characteristics and views of students on different pathways
- identify the predictors of academic post 16 pathways and how these are influenced by individual and family background characteristics
- describe the aspirations of the EPPSE students and how these differ by background characteristics.

6.2 Methodology and data collection

Six months after leaving school all students were sent four questionnaires which explored their current circumstances. The data for this section was obtained from 1,727 students who responded to the survey. This represented nearly two-thirds (63%) of the active EPPSE sample at age 16. An analyses of the returned data revealed that young people who returned questionnaires, were largely representative of a national sample of 16 year olds on a number of key demographic characteristics and were slightly more advantaged than students in the EPPSE sample who did not return a questionnaire.

Members of the EPPSE sample were asked to choose and complete the one questionnaire that best matched their post 16 destination choice.

The four Life After Year 11 questionnaires were:

Questionnaire 1 - Students in full-time education (6th Form or College). There were 1503 young people on this route (87% of the sample)

Questionnaire 2 - For those working (not studying at all) / working and doing job related training (Apprenticeships etc.). There were 124 young people on this route (7% of the sample)

Questionnaire 3 - For those doing part-time study (not related to their current job), whether working or not. There were 24 young people on this route (1% of the sample)

Questionnaire 4 – For those not working, studying or training (NEETs). There were 86 young people on this route (5% of the sample).

6.3 Summary of findings

6.3.1 Family background

The majority of young people (94%) lived with their natural mother but a relatively smaller proportion lived with their natural father (62%), however, there were marked differences when comparing the students in full-time education with the NEET group. Most (95%) of students in full-time education lived with their natural mother and nearly two-thirds (64%) lived with their natural father. In comparison, nearly eight out of ten (78%) NEETs lived with their natural mother and only 4 out of ten (38%) NEETs lived with their natural father. Less than 10 per cent of all young people were ‘carers’ to others, but this represented a fifth (20%) of the NEET group. They were also more likely to be teenage parents. It should be borne in mind that numbers in the NEET group were quite small (86 in total).

6.3.2 Advice and plans

Parents were the most ‘go to’ and useful group for providing advice on post 16 plans, followed by friends and teachers (see Table 6.1). Foskett and Helmesley-Brown (2001) and White (2007) similarly found that parents were influential in giving advice to students, with the former suggesting that parents act as background advisers but that final decisions are made by the students themselves. Taylor (1992) and Foskett and Hesketh (1997) asserted that careers teachers and advisers play a marginal role, but that classroom teachers were more influential due to the fact that they are with the young people for longer stretches of time.

Batterham and Levesley (2011), in an on-line survey of 1,620 young people aged between 15 and 18, also highlighted the importance and usefulness of parents as a source of information and advice. However, parents were less confident about providing advice for those on vocational routes and those parents with lower qualification levels were seen by young people as less knowledgeable. In this study, schools careers advisers were considered almost as important a source of advice as parents and marginally more important than teachers or tutors. Around half of the EPPSE students sought advice from Connexions advisers or found them helpful (see Table 6.1).

Table 6.1: Who did the EPPSE young people talk to, in Year 11, for advice on future plans?

Advice in Year 11	Post 16 destination routes									
	Q1		Q2		Q3		Q4		Total	
	N	%	N	%	N	%	N	%	N	%
Parents										
Yes	1348	90.8	110	89.4	18	78.3	67	78.8	1543	90.0
No	136	9.2	13	10.6	5	21.7	18	21.2	172	10.0
Total	1484	100	123	100	23	100	85	100	1715	100
Friends										
Yes	1017	68.5	66	53.7	8	34.8	46	54.1	1137	66.3
No	468	31.5	57	46.3	15	65.2	39	45.9	579	33.7
Total	1485	100	123	100	23	100	85	100	1716	100
Form tutor										
Yes	991	66.9	67	54.5	11	47.8	45	52.9	1114	65.0
No	491	33.1	56	45.5	12	52.2	40	47.1	599	35.0
Total	1482	100	123	100	23	100	85	100	1713	100
Form Career Adviser										
Yes	845	57.0	71	57.7	10	43.5	53	62.4	979	57.2
No	637	43.0	52	42.3	13	56.5	32	37.6	734	42.8
Total	1482	100	123	100	23	100	85	100	1713	100
Any other teacher										
Yes	776	52.4	42	34.1	8	34.8	38	44.7	864	50.4
No	706	47.6	81	65.9	15	65.2	47	55.3	849	49.6
Total	1482	100	123	100	23	100	85	100	1713	100
Connexions Personal Adviser										
Yes	622	41.9	67	54.5	12	52.2	46	54.1	747	43.6
No	862	58.1	56	45.5	11	47.8	39	45.9	968	56.4
Total	1484	100	123	100	23	100	85	100	1715	100

Nearly two thirds of young people thought it very/fairly likely they would go to university but there were differences across groups with those continuing in full-time education (Q1)being the most confident and the working group (Q2) the least confident (see Table 6.2). This finding is very similar to that of Connor et al., (1999) who found, in a study of 1894 young people in Year 11, that six out of ten (62%) young people thought it likely they would go to university This study also found that more girls (69%) than boys (56%) felt they were likely or fairly likely to go on to higher education. Similar results were obtained from a study undertaken by May (2013) who found that nearly two-thirds (64%) of 14-19 thought that they would probably go to university, with the 16-17 year old age group most certain.

Table 6.2: The likelihood of EPPSE young people attending university?

Likelihood of university	Post 16 destination routes									
	Q1		Q2		Q3		Q4		Total	
	N	%	N	%	N	%	N	%	N	%
Very	621	41.5	3	2.4	2	8.7	4	4.7	630	36.5
Fairly	435	29.1	11	8.9	4	17.4	8	9.3	458	26.5
Not very	181	12.1	31	25.0	6	26.1	22	25.6	240	13.9
Not at all	137	9.2	69	55.6	8	34.8	39	45.3	253	14.6
Don't know	121	8.1	10	8.1	3	13.0	13	15.1	147	8.5
Total	1495	100	124	100	23	100	86	100	1728	100

When asked about the financial consideration of higher education, forty per cent of students said they would be put off going to University ‘a lot/completely’ due to money worries, whereas this was of no concern for twenty per cent of young people. Students said they mostly wanted to go to University to study a subject that interested them linked to a qualification for a specific career.

The most important attribute cited by young people when choosing a job was that it had to be interesting and provide opportunities to use their skills. Interestingly, only just over a third of the sample thought getting good money was ‘very important’ to their job selection. The vast majority of young people did not think skin colour, ethnicity, religion or sexual orientation would affect their chances of getting a job. However, a fifth thought gender to be the most likely aspect of discrimination to affect them in the workplace, with this view being expressed overwhelmingly by females.

6.3.3 Happiness

Young people were asked to describe their overall level of happiness in terms of being very happy, happy, not very happy or very unhappy. Over nine out of ten members of the EPPSE sample were happy in general, at home and with those of their own age. However, the NEET group were consistently the least happy in all three circumstances.

6.3.4 Young people in full time education

Over 85 per cent of students stayed on in education because they thought that getting better qualifications would improve their job prospects. Around eighty per cent of students reported wanting to study certain subjects (79%) or wanting to go onto higher/further education (80%). Around forty per cent were undecided about their future careers (42%) or were mindful of family expectations (39%), only around twenty per cent stayed on because of their friends (23%). Less than twenty per cent cited reasons to do with lack of employment opportunities (19%) or apprenticeships (10%).

Baird et al's., (2010) national study of 14-19 year olds' perceptions of the 2008 reforms indicated that Year 11 students were well aware of the need to stay on in education and training. In this study, when asked about their broad aspirations for the future, 59 per cent of Year 11 students gave educational and career-related ones, with the majority seeing staying on in education and getting good grades as the main means of gaining a place in higher education or/and a well-paid, professional job. Half of all Year 11 students in the Baird study wanted a professional job.

Financial support for continuing in full-time education

The Education Maintenance Allowance (EMA) was introduced after the 1997 elections as part of a raft of initiatives to 'close the achievement gap' by enabling students from poorer backgrounds to participate in further education. The scheme offered £10 per week for students in households with an income under £25,522 per annum rising to £30 per week for students in household with an income under £20,000. The funds were paid directly to students. Two reviews of the scheme by the Department for Education and Skills (DfES, Middleton et al., 2005) and the Institute of Fiscal Studies (IFS, Chowdry, Dearden and Emmerson, 2007) suggested that following the introduction of the scheme staying on rates amongst students eligible for the grant increased by 5.9 percentage points. The biggest increase was amongst boys from disadvantaged backgrounds. The scheme was not without its critics and was referred to by Chris Grayling, a Tory party spokesperson, as 'bribing young people to sign up for courses they may not complete' (BBC News, 2005).

Over time the EMA evolved into the Learners Support Fund (LSF) and by 2010 it had become the 16-19 Bursary. By 2010, £180 million was invested in the bursary which, unlike the EMA was given to educational establishments such as schools and further education and sixth form colleges to administer, rather than being paid directly to students.

As the EPPSE sample ran over 4 academic cohorts (see the cohort grid in Appendix 2) students were able to apply for different financial support at different times. The EPPSE post 16 survey contained questions that related to these financial support schemes and as policy shifted the questions in the Life After Year 11 questionnaire adjusted accordingly. In order to explore these schemes the 4 cohorts are reported separately below.

Cohort 1 - These young people completed their compulsory schooling at the end of the academic year 2008/09 and were the first cohort to be tracked beyond Year 11 to their post 16 destinations. Those remaining in education completed A-levels or equivalent qualifications during 2010/11. Of the 132 student in this cohort who stayed on in full time education, 59 (45%) reported receiving an EMA.

Cohort 2 - These young people completed their compulsory schooling at the end of the academic year 2009/10. At the time they finished their GCSEs (or equivalents) the EMA had been changed to the Learners Support Fund. Of the 599 students who returned their Life After Year 11 questionnaire, 201 (40%) were receiving the EMA allowance and a further 79 has applied for funding from the Learners Support Fund (LSF).

Cohort 3 - These young people completed their compulsory schooling at the end of the academic year 2010/11 and only 22 from a total of 746 (2.9%) were still claiming an EMA.

Cohort 4 – These young people completed their compulsory schooling at the end of the academic year 2011/12 and from a total of 55 students, only 2 (3.6%) reported receiving EMA.

Both Cohort 3 and 4 were able to apply for the 16-19 Bursary Fund. A total of 117 out of 833 students (14%) reported receiving support through this fund. This was a massive reduction on the proportions receiving help compared with Cohorts 1 and 2.

All students in Cohorts 2, 3 and 4 were asked if the scrapping of the EMA scheme had made a difference to their plans for staying on in education. Whilst many students were able to access ‘staying on support/incentives’ the vast majority (90%) reported the scrapping of the EMA made no difference to their plans for staying on in education.

6.3.5 Young people undertaking part-time study

Many young people who were studying part-time (70%) were doing so because it provided an opportunity to improve their job prospects and because there were certain courses they wanted to do (57%). Around half reported there were no jobs available that they wanted to do or they wanted to extend their qualifications to go on to further/higher education (52%). Just over a fifth (22%) said they didn’t get the grades at GCSE that they needed to stay on in full-time education. There were a variety of reasons for part-time working (see Table 6.3).

Why study part-time?

Table 6.3: Why students were studying part-time

Why are you studying part-time?	Yes out of 23	%
I thought that by getting better qualifications I'd improve my job prospects	16	69.6
There were certain courses or subjects I wanted to do	13	56.5
There were no jobs around that I wanted	12	52.2
I wanted qualifications for going on to further or higher education	12	52.2
I hadn't decided on my future education or career	8	34.8
I enjoyed school life	5	21.7
I was able to claim Education Maintenance Allowance (EMA)	5	21.7
I felt too young to leave education	5	21.7
I liked teachers in my school/college	5	21.7
I didn't get the grades I needed to stay on in full-time	5	21.7
Because my friends were studying part-time	5	21.7
It was what my family expected me to do	5	21.7
I found full time study too difficult	5	21.7
The idea of leaving school at 16 never crossed my mind	3	13.0
I have poor health or a disability	3	13.0
There were no Modern Apprenticeships available that I wanted	3	13.0
I am too young to enter the job or training I'd chosen	2	8.7
I could not afford to stay in full-time education	2	8.7
I didn't get on the full-time course I wanted to study	2	8.7
I find school/college work easy	1	4.3
I have family problems	1	4.3
Independence	1	4.3
Training to be a professional tennis player	1	4.3

NB Responses exceed the total number of respondents due to multiple choice options

Of the 23 young people who were studying part-time only 6 were working and they were all undertaking part-time work over a range of hours. Three were working as shop assistants (3, 6 and 12 hours per average week); one as a care assistant (12 hours per week); one was child minding (3 hours per week) and one was working alongside a plumber (12 hours per week).

6.3.6 Employment

EPPSE participants who were working were asked about why they had left full time education. Table 6.4 shows that around seven out of ten (73) wanted to earn money and around a half (57.5%) wanted to do an apprenticeship/learn a trade, or were doing the sort of work they wanted to do in the future (46.7%), or thought the work they were doing might lead to better employment (46.7%). Less than 10 per cent left because they could not afford to stay in full-time education (8.3%) or because they couldn't get onto a course they wanted to study (4.2%). Interestingly, nearly a third (29%) had always planned to leave school at 16 and a quarter (25%) had lined up their job before leaving school.

Table 6.4: Why those working left full time education

Main reasons for leaving full time education?	Yes out of 120	%
Wanted to start earning money	87	72.5
Wanted to get a job/start working	84	70.0
The job is teaching me useful skills	72	60.0
Wanted to do an Apprenticeship/learn a trade	69	57.5
This is the kind of work I want to do in the future	56	46.7
This should help me to move on to something better	56	46.7
Did not like/enjoy school/found school boring	52	43.3
I felt I was old enough to enter the job or training Id chosen	47	39.2
I was old enough to leave school	45	37.5
I always planned to leave school at age 16	35	29.2
I had this job/placement lined up before I left school	30	25.0
Found school difficult	27	22.5
I hadn't decided on my future education or career	27	22.5
Getting better qualifications will not improve my job prospects	16	13.3
I didn't get the grades I needed	16	13.3
There were no courses offered that I wanted to study	13	10.8
I am currently having a break from study	10	8.3
I could not afford to stay in full-time education	10	8.3
College/School drop out	9	7.5
I have family problems	5	4.2
I didn't get on the course I wanted to study	5	4.2
Because my friends have left full-time education	3	2.5
Because my family didn't expect me to continue in education	3	2.5
I have poor health or a disability	3	2.5
Parental influence	2	1.7

NB Responses exceed the total number of respondents due to multiple choice options

6.3.7 Not in Education, Employment or Training (NEET)

Not being able to find work was the main reason given by young people for their NEET status, with nearly a third (28%) having dropped out of school/college (see Table 6.5).

Table 6.5: Main reasons for being NEET

What is the main reason for being NEET?	Yes out of 86	%
Can't find work	38	44.2
College drop-out	24	27.9
Job/course pending	22	25.6
Unable to work/study due to physical/mental health problems	10	11.6
Temporarily unemployed	10	11.6
Pregnant/Parent	10	11.6
Lack of qualifications/experience	8	9.3
Family Problems	7	8.1
Young Offender	2	2.3
Taking a break/gap year	2	2.3
Don't know what they want to do	5	0.2

Obtaining poor GCSE results made a quarter of these young people change their Year 11 plans. This reflects findings from other studies on NEETs which suggest that while this group of young people is heterogeneous, low educational attainment is a major factor in a young person becoming and remaining NEET (Spielhofer et al., 2009).

Despite this less than one in ten thought being NEET was an enduring status (beyond one year). They wanted to be in work or studying full time within a year.

The majority of NEETs who had left work did so because their temporary contract came to an end (46.7%). Youth labour market conditions have been highlighted in other studies of this group of young people as being instrumental in the proportion of them becoming or remaining NEET (Spielhofer et al., 2009). Over a fifth of EPPSE NEETs had left work because their work didn't provide them with enough money or they didn't like their work colleagues. Just over 10 per cent of the EPPSE NEETs had left work because they found it boring.

The NEET group had strong views about school with over half (59%) finding school boring, half finding it difficult, and just under half (44%) expressing a dislike for teachers. This issue has been echoed in a number of studies of young people identified as NEET (e.g., Hayward and Williams, 2011; Finlay et al., 2010; Spielhofer et al., 2009; Steer, 2000). Just under a half (46%) of the EPPSE NEETs group said they always wanted to leave school at 16, and just slightly less (42%) were in a friendship group of young people who had also left fulltime education. Over a third of NEETS reported feeling worried and many had poor health, a disability or family problems.

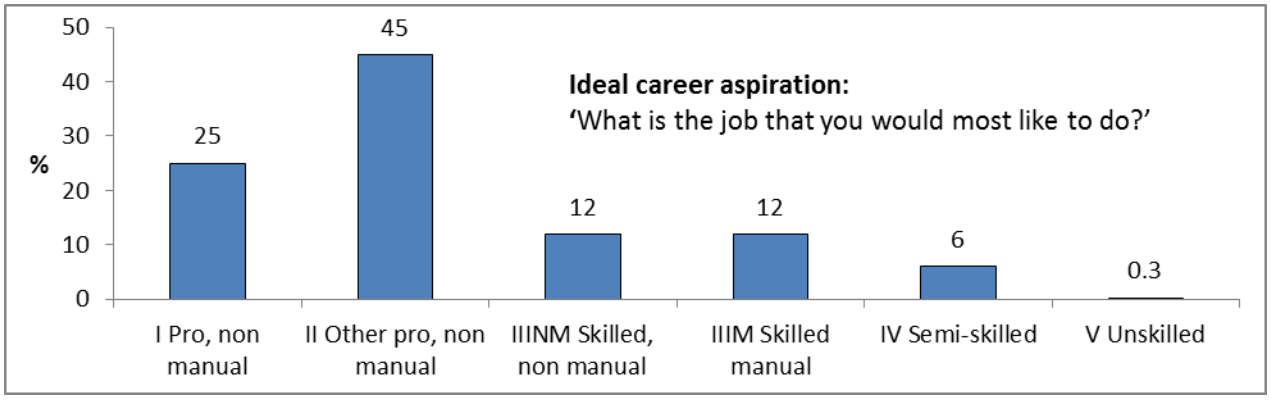
6.3.8 Findings on students' career aspirations

As part of the survey young people on all destination routes were asked questions about their aspirations for employment and plans for the future. For full details of these analyses see Taggart et al., (2014).

Career aspirations

In line with other research (Croll, 2008; Mann et al., 2013; Kinrea et al., 2011) students generally had high aspirations in their choice of occupation (see Figure 6.1).

Figure 6.1: SES of occupation young people would most like to do



Seven out of ten (70%) young people chose a professional occupation (either a professional I or II career – for classification see Appendix 6) as the job they would most like to do. The most popular occupation level was a 'professional II' career. Just under half of the young people in our sample (45%) chose an ideal job from this SES which included major public sector occupations such as teaching and nursing. Only a small minority (6%) chose semi-skilled or unskilled occupations for their ideal job.

Career uncertainty

Confidence was generally high, as the majority of young people (77%) felt it was likely (23% very likely, 54% fairly likely) they would go on to achieve a job in line with their career aspiration. However, those choosing higher skilled careers (professional non-manual I /II) felt it was less likely they would achieve them than those choosing lower skilled employment.

Table 6.6: Career aspirations and post-16 route

How likely it is that you will do that job?	Post 16 route											
	Full-time education - Higher academic		Full-time education - Lower academic		Full-time education - Vocational		Working Full-time		Studying part-time		NEET	
	N	%	N	%	N	%	N	%	N	%	N	%
Very likely	103	16.9	46	18.6	140	30.3	48	41.7	4	20.0	12	17.1
Fairly likely	363	59.6	141	57.1	237	51.3	53	46.1	9	45.0	24	34.3
Not very likely	69	11.3	34	13.8	36	7.8	6	5.2	4	20.0	21	30.0
Not at all likely	21	3.4	4	1.6	3	0.6	4	3.5	0	0.0	4	5.7
Don't know	53	8.7	22	8.9	46	10.0	4	3.5	3	15.0	9	12.9
Total	609	100	247	100	462	100	115	100	20	100	70	100

The particular route young people had chosen was related to their confidence. The young people who were most confident in obtaining the job they most wanted to do were the 'Working full-time' group (88% very/fairly likely). This group were, in the 6 months after leaving Year 11, already working so it is likely they have more realism and experience in the job market. In addition, they may have already committed to a job which may or may not be the job of their choice. Those undertaking full time vocational study were also confident (82% very/fairly likely) of getting the job they most wanted to do in the future. The group least confident of getting the job of their choice was the NEET group (52%).

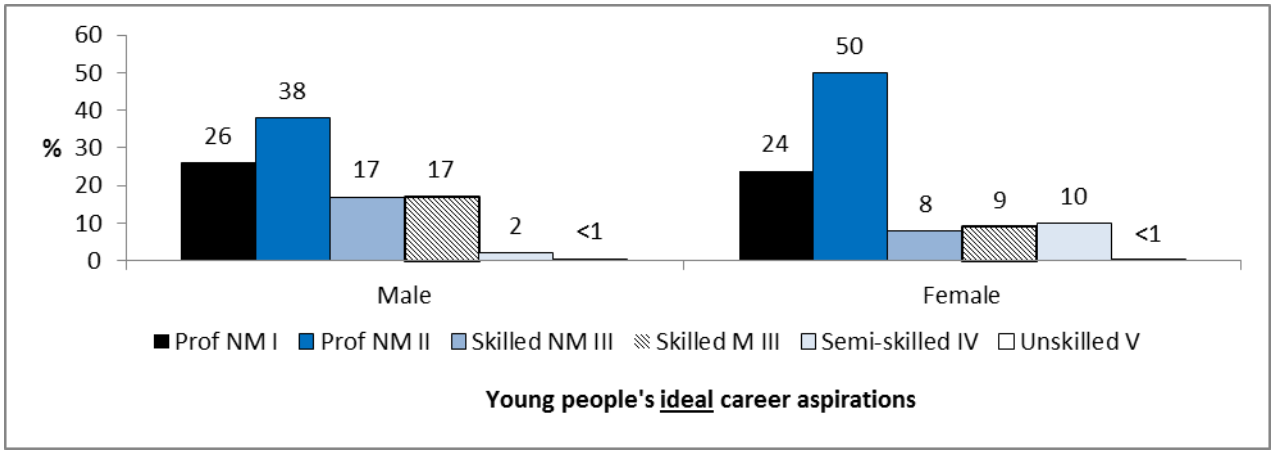
6.3.9 What predicts career aspirations?

There were commonalities in the characteristics of the young people who had more ambitious career aspirations. The more ambitious were: from Non-white UK ethnic heritage backgrounds, had higher GCSE attainment and higher academic self-concept and more qualified parents.

Gender

The EPPSE's analyses, as found in other research (Schoon et al., 2007), shows that girls had relatively higher aspirations than boys in Year 11 (Sammons et al., 2014c). Figure 6.2 shows young women were significantly more likely to choose a professional occupation than the young men in the EPPSE sample (74% of females choose a professional occupation compared to 64% of males). However, a minority of young women are also more likely to choose a semi-skilled or unskilled occupation than young men (10% compared to 2% of males). Proportionately more males aimed more at skilled manual work. Females were more likely to have chosen caring professions such as education, healthcare and social work. Males were more likely to choose trade and industry related occupations such as building and construction, engineering, security and the Armed Forces. However, the relationship with gender and aspirations was not straightforward, as lower achieving girls were also more likely to choose lower skilled careers than their male counterparts.

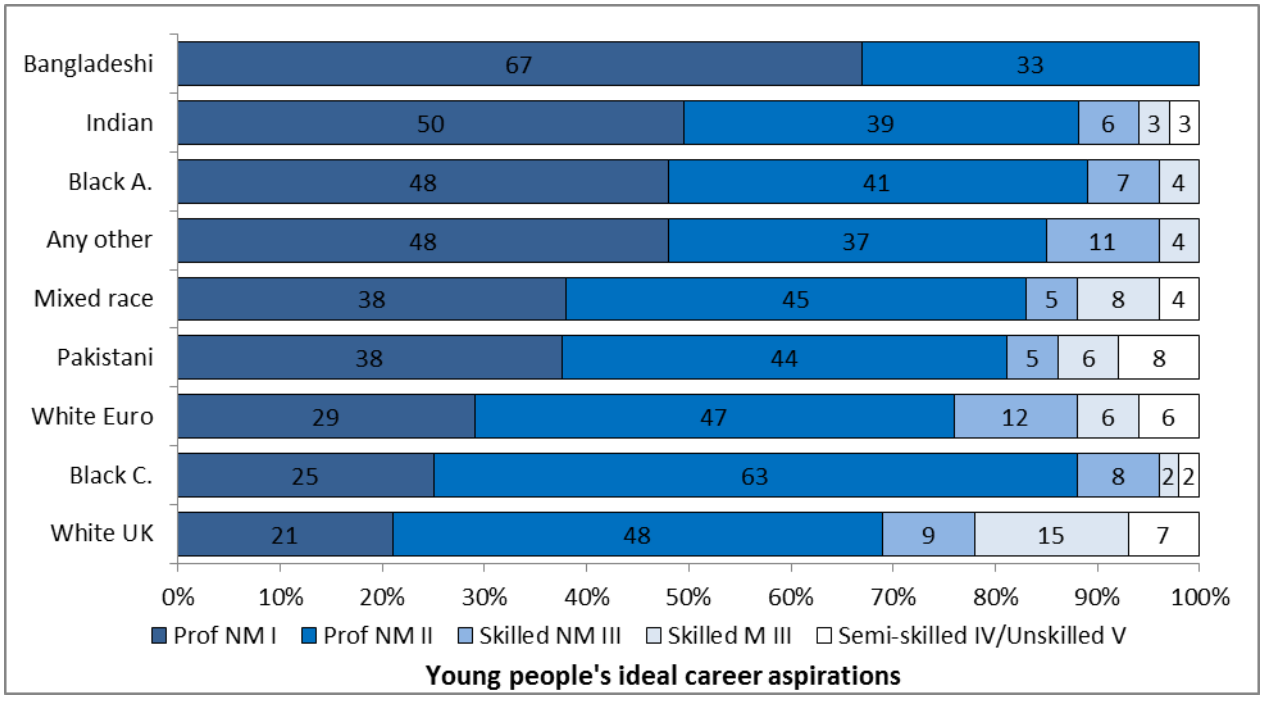
Figure 6.2: Distribution of young people's ideal post-16 career aspirations by gender



Ethnicity

There was some indication that young people of White UK heritage had lower aspirations than other groups. In line with research elsewhere (Strand, 2007a; 2007b) the White UK group had the lowest career aspirations of any of the ethnic heritage groups, although 66% of these students still aspired to a professional occupation (this compares to 82% from non-White UK heritage combined). Figure 6.3 compares the aspirations of the White UK ethnic heritage group with the non-White UK ethnic heritage groups. Non-White heritage young people were more likely to aspire to top professional careers[28].

Figure 6.3: Distribution of young people's ideal career aspirations at age 16/17 by ethnic heritage

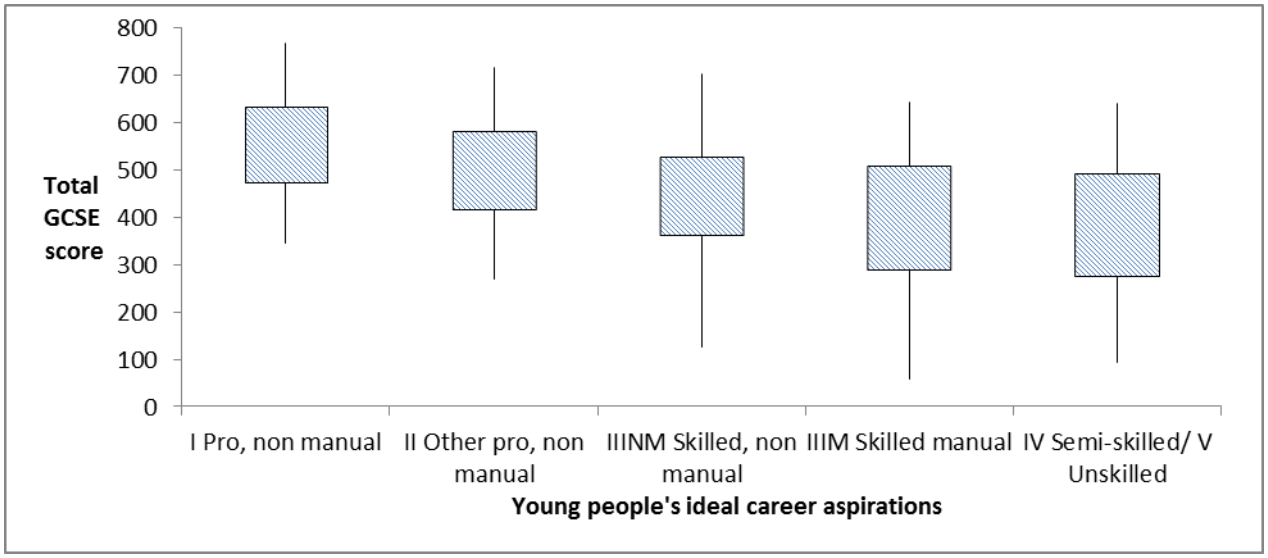


28 The ethnic heritage groups were also analysed separately, and all except the White European heritage group had higher aspirations than the White UK group. However, due to small numbers in many of the ethnic groups, figures should be treated with caution.

GCSE Attainment

There was a significant relationship between career aspirations and GCSE attainment. As shown in Figure 6.4, young people with higher attainment at the end of Year 11 were more likely to have higher aspirations. However, as can also be seen, there is a great deal of variation within each group in attainment, and overlap between groups. The range of attainment for young people aspiring to skilled manual and semi/unskilled occupations was particularly large, suggesting that attainment at the end of Year 11 is not the sole driver of career aspirations although it should be noted that the qualification requirements for these occupations varied widely. The association between GCSE scores and career aspiration (positively scaled[29]) was found to be significant but fairly modest (r=0.35, p<0.001).

Figure 6.4: GCSE attainment and career aspirations



N.B. The vertical lines represent the 5th and 95th percentile for each SES group, and the boxes represent the inter-quartile range (75% of GCSE scores lie within this range).

Family characteristics

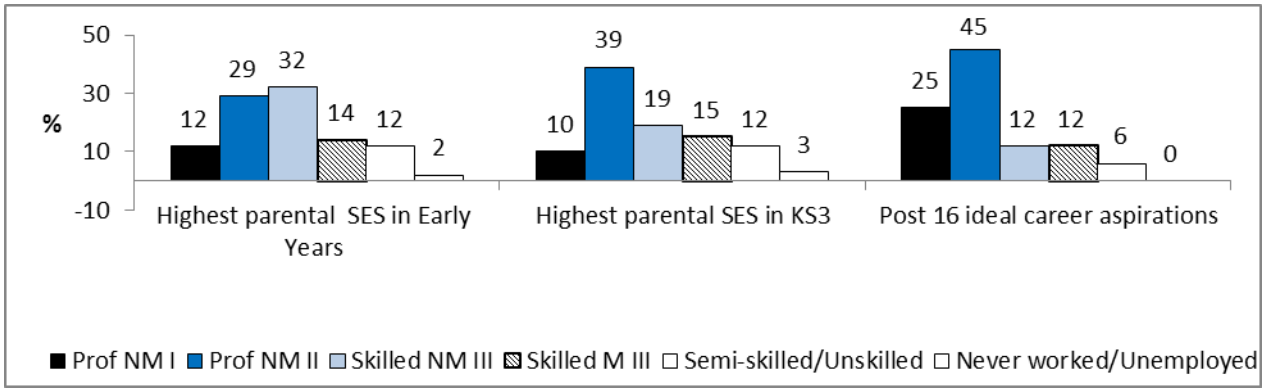
Family background had an influence on career aspirations. Young people with more ambitious career aspirations had parents with greater aspirations for their education, higher qualifications and higher socio-economic status (SES) and provided more enrichment activities in the home during KS3.

[29] A career aspiration scale was created by coding career aspirations from 1-5: 1=Semi or unskilled; 2=Skilled manual; 3=Skilled Non-manual; 4=Professional Non-manual II: 5=Professional Non-manual I.

Parental socio-economic status (SES)

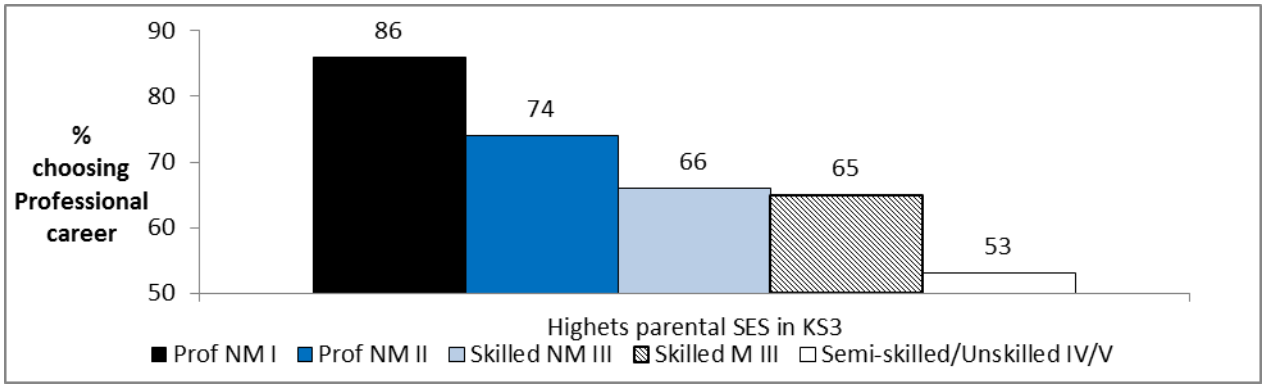
The relationship between parental SES (highest SES of either the mother or father) and career aspirations was investigated[30]. Figure 6.5 shows the distribution for parents SES at two time points (based on their occupation at the time) and for young people's ideal career aspirations at age 16/17. The proportion of the sample that have at least one parent in a professional occupation has increased from when they entered the study to when they were in KS3, as shown in Figure 6.5.

Figure 6.5: Comparison of SES for EPPSE parents and EPPSE young people[31]



Using the most recent SES classification a clear relationship between parental SES group and students' career aspirations was found (Figure 6.6). Young people from higher SES groups were, on the whole, more likely to aspire to higher skilled careers. Nearly nine out of ten (86%) young people whose parents had the highest SES (professional I) aspired to professional occupations, compared to just over half (53%) from semi-skilled or unskilled family backgrounds.

Figure 6.6: Proportion of young people aspiring to professional careers by parental SES



30 Due to higher levels of missing data for the KS3 social class measure a combined measure was created first by replacing missing data in KS3 with the next available SES measure (taken in KS2, KS1 or entry to the study).

31 Only those that reported their career aspirations were represented in the family SES statistics. There was some degree of social mobility in parental social class between the early years and KS3.

However, as so many young people across SES backgrounds aspire to professional occupations it is no surprise that there was a fair degree of mismatch between parents' SES and their children's SES aspirations. For example, just one third of young people chose an occupation in the same occupational category as their parents (32%). A larger proportion (45%) chose an occupation above their parents' SES and just under a quarter (23%) below. The most popular career choice for young people from all SES backgrounds was a professional II non-manual career. For example, 41 per cent of young people from the lowest SES groups (semi or unskilled) aspired to professional II careers. This compares to around 45 per cent from skilled non-manual and skilled manual backgrounds and just over half (53%) from lower professional backgrounds (professional II).

Young people from higher SES families appear to be protected from the potentially detrimental effects of lower attainment on their career aspirations. They are also less likely to lower their aspirations when asked for a 'realistic' job choice.

The combined influence of individual, family and HLE on career aspirations

The ideal career aspirations of young people were used as an outcome in a multiple linear regression model, investigating the impact of individual, family and home learning environment (HLE) variables in combination. The SES variable was reverse coded so that the highest score represented the highest SES and higher career aspirations (1-5 scale, reverse coded so 5=top SES group). The semi-skilled and unskilled were combined in this analysis due to very few unskilled cases. Table 6.7 shows the final model with effect sizes.

Career aspirations were predicted by a number of different individual, family and HLE characteristics. No one variable was found to influence aspirations significantly more than others when tested in combination. Individual influences found to be predictors of career aspirations were:

- GCSE attainment in Year 11: Higher GCSE attainment was associated with higher career aspirations (ES[32]=0.43)
- General academic self-concept in Year 11: More favourable General academic self-concept was associated with higher career aspirations (ES=0.36)
- Ethnicity: All ethnic minority heritage groups had higher career aspirations than the White UK group. In particular, the Asian (Indian ES=0.55; Bangladeshi ES=1.17; and Pakistani ES=0.51) and African ethnic groups (Black Caribbean ES=0.41 and Black African ES=0.61) had some of the highest aspirations.

[32] ES = Effect size, which provides a measure of the strength of the relationship between different predictors and the outcomes under study. For further information see Elliot & Sammons (2004).

Table 6.7: Contextualised multiple regression model for Year 11 Career aspiration scale[33]

Career aspirations scale	Coef.	Sig.	Std. Error	Effect size
Total GCSE score	0.001	***	0.000	0.43
Academic self-concept score	0.012	***	0.002	0.36
Ethnicity (compared to White UK)				
White European	0.17		0.17	0.17
Black Caribbean	0.41	*	0.18	0.41
Black African	0.61	*	0.27	0.61
Any other ethnic group	0.64	**	0.24	0.64
Indian	0.55	**	0.20	0.55
Pakistani	0.51	**	0.17	0.51
Bangladeshi	1.17	***	0.31	1.17
Mixed Race	0.32	*	0.15	0.32
Highest parental qualifications (compared to no qualifications)				
Missing	-0.34		0.26	-0.34
Vocational	0.28	**	0.11	0.28
16 Academic	0.01		0.12	0.01
18 Academic	0.28	#	0.14	0.28
Degree or higher degree	0.34	*	0.14	0.34
Other professional	0.20		0.29	0.20
Highest SES (compared professional non-manual)				
Missing	0.22		0.53	0.22
Other professional non-manual	-0.16		0.10	-0.16
Skilled non-manual	-0.22	*	0.12	-0.22
Skilled manual	-0.31	**	0.13	-0.31
Semi-skilled/unskilled	-0.36	**	0.14	-0.36
Unemployed/never worked	-0.49	*	0.23	-0.49
Parental educational aspirations for child (stay on post 18)				
Missing	-0.13		0.11	-0.13
Leave school at 16	-0.44	**	0.17	-0.44
Leave school at 17/18	-0.33	**	0.11	-0.33
Unsure	0.01		0.03	
Key stage 3 HLE: Enrichment (compared to low)				
Missing	0.11		0.13	0.11
High	0.33	**	0.11	0.33
Medium	0.16	#	0.09	0.16
Intercept	3.57	***	0.17	
Residual, Mean square	0.996			
Number of students	1117			
R square	0.266			
Adjusted R square	0.247			
Std. Error of the Estimate	0.998			
F	13.626	***		

#p<0.10, *p<0.05, **p<0.01, ***p<0.001 Reduction in total variance=25.5%

33 Also tested but not significant (NS): no. of siblings, birth order, free school meals (FSM), Family structure in Year 11 (step parent was significant in some models); Parent thinks degree is important (significant in earlier models without parental aspirations); Family income in KS1 or KS2; early years HLE; all the other KS3 HLE measures. In addition, special educational needs (SEN) status in Year 11 was also tested but became NS when Academic self-concept was added. Mental well-being was NS and term of birth. Gender was only significant once Total GCSE score was added. N.B. many of these variables showed a significant relationship with career aspirations when tested individually. Neighbourhood measures were also tested and all NS.

Family and the home learning environment (HLE) variables that were found to predict career aspirations in combination were:

- Parental educational aspirations for their children: Young people with parents who wanted them to continue in education post 18 had higher career aspirations than those who wanted them to leave education at 16 (Leave at 16 - ES=-0.44; Leave at - 17/18 ES=-0.33)
- Parental SES: Young people with higher SES backgrounds had higher career aspirations (e.g., semi/unskilled - ES=-0.36 compared to the professional non-manual SES group)
- Parental qualifications: Young people with parents who had higher level qualifications had higher career aspirations (e.g., degree or higher - ES=0.34, compared to those with parents who had no qualifications)
- Young people who engaged in higher levels of academic enrichment activities[34] in KS3 had higher career aspirations (Medium - ES=0.16; High - ES=0.33, compared to low enrichment activities).

Educational influences

There was no evidence of significant differences between different secondary schools in students' career aspirations. Hierarchical linear regression models showed significant variation between schools before the effects of student background were accounted for (null model, ICC=0.068). However, this was no longer significant once individual, family and HLE characteristics were taken into account.

The following aspects of secondary school effectiveness and quality were investigated as potential influences on career aspirations:

- Contextualised Value Added (CVA): Secondary school academic effectiveness scores created by the DfE represent the relative progress of students within the school from the end of KS2 to KS4
- Ofsted quality judgements: Two judgements were tested - The 'Overall effectiveness of the school' and 'How well learners develop workplace and other skills that will contribute to their future economic well-being'.
- Students' views of school: in both Year 9 ('Emphasis on learning', 'Behaviour climate of school', 'Headteacher qualities', 'School environment', 'Valuing students', 'School/learning resources', 'Teacher discipline and care' and 'Teacher support') and Year 11 ('Teacher professional focus', 'Positive relationships', 'Monitoring students', 'Formative feedback' and 'Academic ethos').

None of the aspects of secondary school above were found to predict higher or lower ideal career aspirations, once background influences had been accounted for. This is in

[34] The KS3 'Academic enrichment' measure included three items: Read on your own for pleasure, Go with family on educational visits; Go to the library (not school library).

contrast to findings for GCSE attainment, social behaviour and some dispositions. This suggests aspirations for occupations are shaped more by out of school influences related to the family and possibly local neighbourhood opportunities.

6.3.10 What predicts different full time education routes?

Just as the NEET group are of particular interest, so too are those students who remained in education post 16. Not all those remaining in education followed the same pathways and this group is not homogenous. Having completed compulsory education, students who stayed in school/college beyond Year 11 made choices of particular curriculum subjects or courses that determine their later entry into Higher Education or employment. Having information on post GCSE examination routes, from the Life After Year 11 questionnaire, the EPPSE study explored those individual, background and institutional characteristics that predicted these routes.

Three dichotomous outcome measures were constructed:

- Higher academic route - those who took 4 or more AS/A levels (versus all who had returned any of the four Life After Year 11 questionnaires)
- Lower academic route - those who took 3 or fewer AS/A levels (versus those who are on a higher academic route)
- Vocational route - those who did not take any AS/A levels, but returned a Life After Year 11-Q1- Full-Time Education questionnaire (versus all the others who were either on higher or lower academic routes).

Table 6.8: EPPSE students taking a higher academic route

Higher academic route	N	% of returned Q1-Q4 (n=1737)	% of tracked sample (n=2744)
Yes	718	41.3	26.2
No	1019	58.7	37.1
Total	1737	100.0	63.3

More than 40 per cent of the students who returned a Life After Year 11 questionnaire (n=1737) reported that they were taking four or more AS/A levels (see Table 6.8. This represents about 26 per cent of the EPPSE sample tracked up to the end of KS4 (n=2744).

Table 6.9: EPPSE students taking a lower academic route

Lower academic route	N	% of those taking AS/A levels (n=993)	% of tracked sample (n=2744)
Yes	275	27.7	10.0
No	718	72.3	26.2
Total	993	100.0	36.2

Almost 28 per cent (Table 6.9) of students were taking three or fewer AS/A levels and another 40 per cent (Table 6.10) reported taking a vocational route (19% of the tracked sample).

Table 6.10: EPPSE students taking a vocational route

Vocational route	N	% of returned Q1 (n=1503)	% of tracked sample (n=2744)
Yes	510	33.9	18.6
No	993	66.1	36.2
Total	1503	100.0	54.8

6.3.11 Individual and family background characteristics as predictors of full time education routes

For these analyses using multilevel logistic modelling, the results are presented in terms of odds ratios[35]

Individual characteristics

When compared with White UK students and controlling for the influences of other characteristics, students of Bangladeshi, Black African, Pakistani and Indian heritage were more likely to follow a higher academic route (i.e., taking 4 or more A-levels) and less likely to follow a vocational route. Students whose parents reported early behavioural problems at the entry to the study were less likely to follow a higher academic route (OR=0.61) than students whose parents did not report these problems. Students from larger families with 3 siblings or more were also less likely to be on a higher academic route than students from smaller families (OR=0.45).

[35] Odds Ratios represent the odds of achieving certain benchmark performance indicators given certain characteristics relative to the odds of the reference group.

Family characteristics

The following family characteristics had statistically significant net effects as predictors of taking a higher academic route:

- parents' qualification levels
- family SES
- family salary.

Parent's highest qualification level

Parents' qualification level, collected when their child was age 3/5, was tested in two ways:

- as individual measures of mother's and father's qualification levels
- as a combined measure of parents' highest qualification level.

When tested individually, the mother's highest qualification level was a significant and positive predictor of post-16 destinations. Students whose mothers were more qualified (degree/higher degree) were also significantly more likely to follow a higher academic route (OR=3.57) and less likely to be on lower academic (OR=0.28) or vocational (OR=0.41) routes than students whose mothers did not have any qualifications (Table 6.11). Students whose fathers had a degree/higher degree were significantly less likely to follow a vocational route (OR=0.33) than students whose fathers did not have any qualifications.

Analyses using the combined measure showed that students whose parents have a higher degree were almost five times more likely to follow a higher academic route than students whose parents did not have any qualifications (OR=4.86, see Table 6.11). The same group of students had the lowest probability of following a vocational route (OR=0.09, see Table 6.11).

Family SES

In previous analyses, the measure of family SES collected at age 3/5 has proved to be the best and most robust SES predictor[36] of later academic attainment and this was the measure used for SES in these analyses. The results showed that compared with the 'professional, non-manual' category (representing the highest possible SES category), lower SES (for example, 'skilled-manual') categories predicted smaller probabilities of taking a higher academic route (OR=0.37) but significantly higher probabilities of taking a lower academic route (OR=3.92). Family SES was not a significant predictor of taking a vocational route (see Table 6.11).

36 This does not mean SES was the strongest predictor, parents' qualifications were stronger.

Family salary

Analyses of household salary (collected in KS1) showed that students in households with higher incomes (more than £67,500) were much more likely to be on a higher academic route (OR=2.58) and less likely to be on a vocational route (OR=0.33) than students from families with no earned income (see Table 6.11).

Table 6.11: Predicting the probabilities of following different post-16 destinations

Background characteristics	Higher academic route	Lower academic route	Vocational route
Individual student measures	**OR[37]**	**OR**	**OR**
Ethnicity	7.63(B)	ns	0.21(P,B)
Early behavioural problems	0.61	ns	ns
Number of siblings	0.45	ns	ns
Family measures			
KS1 family salary	2.58	0.40	0.33
Parents' highest SES at age 3/5	0.37	3.92	ns
Parents' highest qualifications level at age 3/5	4.86	0.38	0.09
Mothers' highest qualifications level at age 3/5[38]	3.57	0.28	0.41
Fathers' highest qualifications level at age 3/5[39]	1.96	ns	0.33
HLE measures			
Early years HLE	ns	ns	0.34
KS1 HLE outing (medium)	1.68	ns	0.61
KS3 HLE academic enrichment (high)	3.73	0.36	0.32
KS3 HLE parental interest (medium)	ns	ns	1.59

B=Bangladeshi P=Pakistani

Home learning environment at different time points

Both EPPSE and other research have drawn attention to the importance of learning within the home (Hess et al., 1982; Melhuish et al., 2008b). Measures of the child's home learning environment (HLE) were obtained from parents' responses at four time points: at entry to study, KS1, KS2 and KS3 (see Appendix 4 for further details).

37 Odds Ratios represent the odds of achieving certain benchmark performance indicators given certain characteristics relative to the odds of the reference group.

38 This measure was tested in different models than the models that included the combined parental qualification measure.

39 This measure was tested in different models than the models that included the combined parental qualification measure.

Early years home learning environment (early years HLE)

The early years HLE is a measure of learning activities undertaken at home such as teaching the child the alphabet, reading to the child (see Sylva et al., 2010). The overall index of the early years HLE significantly predicted only the vocational route after controlling for parents' SES, income and educational level (see Table 6.11). Students in the top early years HLE category were the least likely to follow a vocational route when compared to students in the lowest early years HLE group (OR=0.34).

KS1 HLE

Parents were surveyed during KS1 (when children were aged 6-7 years) about their interactions with their child at home including activities such as frequency of reading to/with the child, taking the child out on educational visits, computing activities etc. The individual KS1 HLE activities formed four factors:

- Home computing
- One-to-one interaction
- Expressive play
- Enrichment outings (see Sammons et al., 2008b; 2008c for further information)[40].

All four factors were tested in models that controlled for the individual student and family characteristics, but also for early years HLE. The latter remained the stronger predictor even when KS1 HLE measures were included. Only moderate level of the 'Enrichment outings' factor was found to be a statistically significant predictor of an increased probability of taking a higher academic route (OR=1.68, see Table 6.11). The same factor significantly predicted a decreased probability of being on a vocational route (OR=0.61).

KS3 HLE

In KS3 'out of school' learning measures incorporate information from both parents and students which takes account of the increased independence of adolescents at age 14 and the young person's own influence over their home learning environment (HLE). The individual items formed five factors:

- Learning support and resources
- Computer use
- Parental interest in school
- Academic enrichment
- Parental academic supervision.

40 Based on exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to identify latent factors.

These factors were tested with respect to their influence on academic attainment at the end of Year 11. The models controlled for early years HLE and the statistically significant KS1 and KS2 HLE specific factors.

Medium and high levels of 'Academic enrichment' in KS3 significantly predicted increased probabilities of being on a higher academic route (Medium - OR=2.09; High – OR=3.73) and smaller probabilities of following a vocational route (Medium - OR=0.41; High – OR=0.32, see Table 6.11). High levels of 'Academic enrichment' also significantly predicted smaller probabilities of following a lower academic route (OR=0.36).

Medium levels of 'parental interest' in KS3 significantly predicted higher probabilities of following a vocational route when compared with low levels of 'parental interest' (OR=1.59, see Table 6.11).

Neighbourhood characteristics

When analysing the broader social context like the neighbourhood environment in which the child lived while in pre-school and primary school, only the percentage of White British citizens in the neighbourhood was a significant predictor of post 16 routes (see Table 6.12). An increased percentage of White British residents in the neighbourhood predicted significantly lower probabilities of following a higher academic route (OR=0.99) and higher probabilities of following a lower academic route (OR=1.03)[41].

Table 6.12: Neighbourhood measures predicting post-16 destinations

Fixed effects (continuous)	Higher academic route		Lower academic route		Vocational route	
	OR	Sig	OR	Sig	OR	Sig
IMD		ns		ns		ns
IDACI		ns		ns		ns
% White British	0.99	*	1.03	***		ns
Crime		ns		ns		ns
Unemployment		ns		ns		ns

* p<0.05, ** p<0.01, *** p<0.001
ns=not statistically significant

Influence of pre-school, primary and secondary school

Pre-school

As well as the family, institutional experiences also predicted a higher or lower full-time education route. For instance pre-school attendance, duration and effectiveness significantly predicted positive probabilities of a higher academic route and negative probabilities of a lower academic/vocational route (Taggart et al., 2014).

The duration of pre-school (in months) showed strong and significant effects on post-16 destination routes (see Table 6.13). The results for duration of time in pre-school (over 36

[41] Meaning that for one-unit increase in % White British, we expect to see 1% decrease in the odds of being on a higher academic route or a 3% increase in the odds of being on a lower academic route.

months) were particularly striking in increasing the chances of entering the higher academic route more than fourfold. Students who had attended a pre-school for more than 3 years had the highest probability of following a higher academic route (OR=4.38, see Table 6.13). Moreover, students who had attended between 2 and 3 years were three times more likely to take a higher academic route than students who had not attended a pre-school (OR=3.04). Attending a pre-school for a longer time also reduced the likelihood of following a lower academic or vocational route by half.

Table 6.13: Pre-school duration predicting post-16 destinations

Fixed effects	**Higher academic route**		**Lower academic route**		**Vocational route**	
Pre-school duration (compared with no pre-school)	**OR**	**Sig**	**OR**	**OR**	**Sig**	**OR**
0-12 months	2.44	*	0.16	**	0.61	
12-24 months	2.79	**	0.18	**	0.56	
24-36 months	3.04	**	0.17	**	0.49	*
>36 months	4.38	***	0.07	***	0.52	
Number of students	1422		774		1211	
Number of schools	435		306		399	
% Reduction school variance	65.0		-6.6		75.0	

* p<0.05, ** p<0.01, *** p<0.001

Pre-school quality was also important. Table 6.14 shows that students who had attended high quality pre-schools (measured by ECERS-E: Sylva et al., 2003) were three times more likely to pursue a higher academic route than students who had not attended pre-school (OR=3.33). The same group of students were significantly less likely to follow a lower academic (OR=0.21) or vocational (OR=0.36) routes.

Table 6.14: Pre-school quality (ECERS-E) predicting post-16 destinations

Fixed effects	**Higher academic route**		**Lower academic route**		**Vocational route**	
Pre-school quality (compared with no pre-school)	**OR**	**Sig**	**OR**	**Sig**	**OR**	**Sig**
Low quality	2.17		0.26	*	0.68	
Medium quality	2.66	**	0.16	***	0.67	
High quality	3.33	**	0.21	**	0.36	**
Number of students	1437		785		1224	
Number of schools	439		311		404	
% Reduction school variance	63.2		7.4		79.8	

* p<0.05, ** p<0.01, *** p<0.001

Primary school

Value added effectiveness measures for primary schools were calculated using National Assessment data linking KS1 and KS2 results (Melhuish et al., 2006a; 2006b). The primary schools academic effectiveness in English was a significant predictor of post-16 routes. Students who had previously attended a highly academic effective primary school were twice as likely to follow a higher academic route as students who had attended a low academically effective primary school (OR=2.15). The same group of students were much less likely to follow a vocational route (OR=0.36).

The measure of primary school academic effectiveness for maths was not a significant predictor of destinations. These findings are in line with those on academic attainment and progress, and on overall GCSE results. The effects of primary schools on attainment are longer lasting, as they seem to give a lasting boost to attainment that in turn shapes post 16 pathways.

Secondary school

The quality of the secondary school students attended was obtained from Ofsted inspection judgements. Attending an outstanding secondary school in terms of the 'Quality of pupils' learning' predicted a higher chance of students later following the higher academic route (see Table 6.15). Also being in a secondary school that had a positive 'Behavioural climate' and 'Positive relationships' between teachers and students also predicted an increased likelihood of moving on to the higher academic route rather than a vocational route.

Table 6.15: Secondary school quality predicting post-16 destinations: quality of pupils' learning

Fixed effects	**Higher academic route**		**Lower academic route**		**Vocational route**	
The quality of pupils' learning (compared with inadequate)	**OR**	**Sig**	**OR**	**Sig**	**OR**	**Sig**
Outstanding	2.25	*		ns	0.51	
Good	0.80				1.56	
Satisfactory	0.76				1.92	*
Missing	0.52				1.73	
Number of students		1437				1224
Number of schools		439				404
% Reduction school variance		71.0				86.5

* p<0.05, ** p<0.01, *** p<0.001
ns=not statistically significant

6.3.12 The influence of GCSE outcomes on post-16 destinations

The GCSE results students gained were also extremely important in predicting which full time education route they followed beyond Year 11. Unsurprisingly, GCSE results in English and maths were significant predictors of post-16 destinations being positive predictors of higher academic route and negative predictors of lower academic and vocational routes (see Table 6.16). Hodgson and Spours (2012a; 2013) found similar results when examining the retention and attainment of 16-19 year olds in London.

Table 6.16: GCSE outcomes predicting post-16 destinations

Fixed effects	**Higher academic route**		**Lower academic route**		**Vocational route**	
KS4 Prior attainment	**OR**	**Sig**	**OR**	**Sig**	**OR**	**Sig**
GCSE Maths	1.13	***	0.92	***	0.89	***
GCSE English	1.15	***	0.88	***	0.88	***
Number of students		1537		893		1335
Number of schools		503		376		471
% Reduction school variance		53.16		11.35		93.39

* p<0.05, ** p<0.01, *** p<0.001

However, when taking into account GCSE results, other background characteristic such as age (older in year group), ethnicity, number of siblings and KS3 HLE still remained significant predictors of different post-16 education routes.

The amount of time in months spent in pre-school also had a positive effect on students' progression with the highest probabilities being found for more than 3 years in pre-school (Table 6.17). Students who had attended pre-school this long were almost six times more likely to continue on a higher academic route (OR=5.85), but significantly less likely to follow a lower academic route (OR=0.07) than students who had not attended a pre-school at all.

Table 6.17: Pre-school duration predicting Post-16 destinations (controlling for GCSEs)

Fixed effects	**Higher academic route**		**Lower academic route**		**Vocational Route**	
Pre-school duration (compared with no pre-school)	**OR**	**Sig**	**OR**	**OR**	**Sig**	**OR**
0-12 months	2.63	*	0.18	**		ns
12-24 months	2.79	*	0.21	**		
24-36 months	3.16	*	0.20	**		
>36 months	5.85	***	0.07	***		
Number of students		1391		773		
Number of schools		425		305		
% Reduction school variance		52.32		-20.61		

* p<0.05, ** p<0.01, *** p<0.001; ns=not statistically significant

Quality also continued to predict a higher academic route. Students who had attended a high quality pre-school (measured by ECERS-E and ECERS-R) were more likely to progress on to a higher academic route (ECERS-E - OR=3.37; ECERS-R - OR=2.87) and less likely to progress on a lower academic route when compared to the 'home' group (ECERS-E - OR=0.23; ECERS-R - OR=0.24, see Table 6.18 and Table 6.19).

Table 6.18: Pre-school quality (ECERS-E) predicting post-16 destinations (controlling for GCSEs)

Fixed effects	**Higher academic route**		**Lower academic route**		**Vocational route**	
Pre-school quality (compared with no pre-school)	**OR**	**Sig**	**OR**	**Sig**	**OR**	**Sig**
Low quality	1.81		0.36			ns
Medium quality	2.79	*	0.18	**		
High quality	3.37	**	0.23	*		
Number of students		1406		784		
Number of schools		429		310		
% Reduction school variance		51.04		-8.21		

* p<0.05, ** p<0.01, *** p<0.001; ns=not statistically significant

Table 6.19: Pre-school quality (ECERS-R) predicting post-16 destinations (controlling for GCSEs)

Fixed effects	**Higher academic route**		**Lower academic route**		**Vocational route**	
Pre-school quality (compared with no pre-school)	**OR**	**Sig**	**OR**	**Sig**	**OR**	**Sig**
Low quality	2.43		0.31			ns
Medium quality	2.88	*	0.17	**		
High quality	2.87	*	0.24	*		
Number of students		1406		784		
Number of schools		429		310		
% Reduction school variance		51.50		-13.77		

* p<0.05, ** p<0.01, *** p<0.001; ns=not statistically significant

After controlling for GCSE results, pre-school attendance, duration and quality also remained significant predictors of following higher academic routes as did quality of pre-school (Taggart et al., 2014). The effects of these were moderately strong.

6.4 Conclusions

This section draws together information provided by the EPPSE young people 6 months after they left compulsory education. These young people had just embarked on an exciting new stage in their lives having moved out of compulsory education and becoming young adults. Whilst the majority had remained in education other pathways have emerged and the once homogenous EPPSE sample has split into distinct groups.

Nevertheless taking the group as a whole some important findings emerge. Overall these young people are happy and positive about their situations. They have high aspirations and are looking to improve their future prospects. Many are planning to attend university or are in further study. Whilst they remain aware of gender discrimination the majority do not feel they will experience discrimination in their future workplaces. In many cases they turn to their parents for advice on their futures and do not seem to have been deterred from further study by worries over funding (but it is important to note that these young people filled in their surveys before the tripling of student university fees in 2011).

However, this positive picture for many contrasts with some disturbing findings when the full sample is divided into sub-groups. There is currently great concern nationally about the 'equity gap' and this has been an enduring interest in the EPPSE research. The present findings show clearly that the odds of different post 16 pathways are strongly shaped by background characteristics and also by pre-school, primary school and secondary school experiences.

Most young people aspire to university but the majority of young people (over 50%) nationally do not go to university. In the same way students had high aspirations, with more aspiring to professional non manual I and II jobs. However, this is a greater proportion than the numbers of such jobs in the market place. Indeed, evidence suggests such jobs are being squeezed out in the hour glass effect. The popularity of jobs in health and education (traditionally public sector and more secure fields of work) may contrast with the opportunities available. The young people in the EPPSE sample will have gone on to experience the severe economic recession from 2007 onwards, higher youth unemployment and public sector cuts from 2010. This context may well affect their later education, employment and life chances.

There is currently a great debate regarding the 16 – 19 qualifications framework and pathways into work for those young people outside of an academic route. Increasing the number of apprenticeships available should be a top policy priority for these young people, as should the provision of high quality vocational qualifications in a variety of settings. But in addition, as Hodgson and Spours (2012b) have argued, it is important to ensure that the 14-19 curriculum is both more inclusive and is based on a progression rather than selection logic so that fewer young people find themselves outside the mainstream or on a trajectory that jeopardises their future life chances. This is particularly important with Raising the Participation Age which *de facto* suggests that England is moving to a universal upper secondary education phase by 2015.

EPPSE reports, at the end of each phase of education, have monitored the outcomes for different groups of students and Siraj-Blatchford (2010) and Siraj-Blatchford and Mayo (2012) have drawn attention to disadvantaged students who ‘succeed against the odds’. What emerges in this section is the particular background characteristics that have an impact on the minority of young people who leave school and become NEET. They tell a tale of social inequality and cycles that are very difficult to beak. However, the young people themselves identify areas in which further support could be given to help them ‘narrow the gap’. This points to the need for better career guidance, more targeted ‘catch-up programmes and financial support for returning to education post 18.

Section 7 Focus on students not in education, employment or training (NEET)

Background characteristics

- NEETs often had multiple risk factors present from their early years although sometimes emerging only during compulsory schooling
- Educational risk factors
- Most significant was low educational attainment at GCSE, especially in English and maths.

Other risk factors

- Having physical and mental health problems that required quicker access to professional support services
- Being in Local Authority care, physical health and mental health problems and a lack of aspirations
- Difficulties in transitioning from school to FE, often 'dropping-out' of courses.

Structural risk factors

- Difficult labour market conditions, lack of training and apprenticeships, being in the 'benefits trap', transport difficulties and course fees for over 18s.
- Importance of information and advice on options and pathways post 16
- Needed much better information/advice on post 16 options including education/vocational qualifications, apprenticeships and training.
- The variable quality of post 16 courses
- Most courses did little to improve employability resulting in a cycle of one short, low level course after another
- Lack of long term employment and apprenticeship or training opportunities
- Difficulties were compounded by cuts to Connexions services, Jobcentre budgets and the removal of the EMA
- Personal motivation and determination in resolving NEET status
- Employment/training opportunities often found through personal perseverance rather than the Job Centre or agencies
- Social capital facilitating entry to EET
- Family, friends and other networks were important in helping achieve EET status.

For full details of the findings and analyses see Siraj et al., 2014.

7.1 Introduction

NEET status has been reported to be a major predictor of later unemployment, low income, teenage motherhood, depression and poor physical health (DCSF, 2007). The DCSF (2007) report identified certain characteristics of these young people. Those in the NEET category nationally tended to have the following background characteristics:

- a disability and/or learning difficulties (young people with learning difficulties and disabilities are twice as likely to be NEET)
- poor health status
- more likely to be male (16 year old boys are twice as likely to be NEET as 16 year old girls)
- receiving Free School Meals (FSM) in Year 11
- low academic outcomes (39% of those with no GCSEs are NEET at 16, compared to 2% of 16 year olds who attained 5 or more A* - C GCSEs)
- low behavioural outcomes.

Having identified these characteristic the DCSF (2007) report goes on to explain that the NEET group were not homogenous (DfES, 2007) but could be identified within 4 different classification groups as follows:

- young people who are doing some activity which is not formally counted as education, employment or training. It will include those in custody and those taking part in personal development opportunities not leading to qualifications. This will also include gap year students and those undertaking voluntary work
- young people who have an identifiable barrier to participation, as they have a child or are experiencing serious illness or disability
- those for whom we do not know their current activity
- others for whom activity is known, but they do not fall into any types mentioned above.

In the light of this, the EPPSE research extended their focus of study to the NEET group. Initial quantitative analyses were conducted to identify some of the characteristics associated with NEET status for the 86 young people who returned a Life After Year 11 questionnaire (Q4). The characteristics displayed in Table 7.1 were found to be associated with the 86 EPPSE NEET young people when tested individually[42].

42 Other variables tested that were not related to NEET status: gender, birth weight, ethnicity, health problems in the early years, developmental problems in the early years, father's age, KS1 HLE Parent-child one-to-one interactions at

Table 7.1: Significant characteristics related to NEET status

Background characteristics	NEETS more likely to:
Individual	
Behavioural problems (early years*)	have behavioural problems
SEN status in Year 11	have an SEN
Family	
FSM status in Year 11	be FSM
Mother's age	have younger mums
Parental qualifications	have lower qualified parents
Marital status in the early years	be from single parent families
Family structure in Year 11	be with single/step parents/other arrangement
Mother's employment in the early years	have not working mothers
Father's employment in the early years	have not working fathers
Combined parent employment (early yrs)	have non-working mothers & fathers
Family salary	be from lower income families
Family SES in the early years	be from lower SES families
Home Learning Environment (HLE)	
Early years HLE*	have low HLE
KS1 computer use	have low & high HLE
KS1 Parent-child outings	have low HLE
KS1 Creative play	have high HLE
KS2 Educational computing	have low HLE
KS3 academic enrichment	have low HLE
KS3 Parental interest*	have low HLE

* Significant at the p<0.08 level

During the data collection for the Life After Year 11 there was an opportunity to supplement the questionnaire with richer, qualitative information on the lives of this group of young people adopting a more focussed 'case study' approach. The EPPSE study has a long tradition of offering 'mixed-methods' (Sammons et al., 2005; Siraj-Blatchford et al., 2006) where the quantitative data can be limited in its explanatory power as to what shapes certain outcomes.

This section of the report details this in-depth focus. This research on young people who are NEET became a sub-study of the main EPPSE programme that examined some of the factors that might have contributed to NEET status as well as the barriers and facilitators to these young people getting into education, employment or training (EET). This section summarises the findings of a longer report (see Siraj et al., 2014). As the case studies follow different methodology and data collection these are described in more detail below to differentiate this section from the quantitative analyses reported in other sections of this report.

home, KS2 HLE Parent-child interactive learning process, KS2 HLE Individual child activities, KS2 HLE Computer games, KS3 HLE Computer use, KS3 HLE Learning resources, KS3 HLE Academic supervision.

7.2 Methodology and sample

Qualitative, semi-structured telephone interviews were carried out with a stratified, random sample of 20 of the 86 young people who indicated in their EPPSE 'Life After Year 11' questionnaire they were NEET six months after finishing compulsory schooling. In total these 20 NEETs, aged between 18 and 20 when interviewed, were asked about their experiences of taking their GCSEs, what they had been doing since leaving school and their hopes and plans for the future.

Prior to the interviews a range of background data was collated on each of the 20 young people including information from the EPPSE quantitative data files, the 'Life After Year 11' questionnaire, GCSE results, relevant information concerning health, family or behaviour issues and anticipated plans post 16. This information was collated to produce a 'profile' for each participant and this helped to inform the development, structure and customisation of the interview schedule.

The NEET status of 13 of the 20 young people had changed between completion of their Life After Year 11 questionnaire and the interview, this change in status provided an excellent opportunity to explore some of the issues related to entering and transition from NEET to education, employment or training (EET).

The interviewed sample consisted of 12 females and 8 males which closely mirrored the gender split of the EPPSE NEET group. The majority of the NEETs interviewed (85%) came from families with a White UK background, a similar percentage to that found in the EPPSE NEET population of 86 (79%).

Interviews were transcribed and anonymised and analysed using NVIVO. Analysis combined a bottom up and top down approach, bottom up to code and analyse the perceptions of young people as to why they had been NEET, their views of school and undertaking their GCSEs and their plans for the future, and top down using the established literature on NEETs (Spielhofer et al., 2009; Gartshore, Hadyn and Lane, 2009; York Consulting, 2005) and the theory related to risk and protective factors found in the research literature (Siraj and Mayo, 2014).

7.3 Summary of findings

7.3.1 Background characteristics of NEETs

The study highlights a number of background characteristics associated with a risk of becoming NEET. Previous research has identified social class as a major factor in NEET status with rates of NEETs increasing as social class declines (Thompson, 2009).

Sixty-five per cent of the interviewed NEETs came from families that had a socio-economic status (SES) in the lower half of the SES scale (4-7[43]) during the time the EPPSE child was at pre-school. Only five per cent of interviewed NEETs were from families with professional or non-manual SES groups compared with a third of the whole EPPSE sample.

Table 7.2 provides detailed information on the background characteristics of the NEET young people comparing those interviewed to those returning a Life After Year 11 and the full EPPSE sample.

There was a general trend of low qualifications amongst the parents of NEET young people, only ten per cent of the mothers and fathers of these young people had educational qualifications at 18 Academic or higher compared with approximately a quarter of the EPPSE sample. A higher percentage of interviewed NEETs were in the lowest early years Home Learning Environment (HLE) group (40%) than was the case amongst the full EPPSE sample (31%).

Multiple risk factors were often at play in the lives of NEET young people many of which were present from their early years or emerged during the course of compulsory schooling. In many cases these had a hugely detrimental impact upon educational achievement and the pathways and opportunities available to these young people post 16.

43 Groups 4 – 7 = Skilled manual, Semi-skilled, Unskilled and Unemployed not working.

Table 7.2: Background characteristics of students returning post 16 questionnaire compared to the full EPPSE sample

	Interviewed NEETs		NEETs returning a Life After Year 11 questionnaire		Whole EPPSE sample	
	N	%	N	%	N	%
Gender						
Male	8	40.0	39	45.3	1646	51.9
Female	12	60.0	47	54.7	1526	48.1
Ethnicity						
White UK	17	85.0	68	79.1	2295	72.4
White European	0	0	5	5.8	122	3.9
Black African	0	0	1	1.2	66	2.1
Black Caribbean	0	0	0	0	116	3.7
Black other	0	0	2	2.3	22	0.7
Pakistani	1	5.0	4	4.7	177	5.6
Indian	0	0	0	0	67	2.1
Bangladeshi	0	0	0	0	40	1.3
Mixed race	2	10.0	1	1.2	192	6.1
Other ethnic minority	0	0	5	5.8	71	2.2
Family socio-economic status (SES) at pre-school – age 3						
1. Professional non-manual	0	0	2	2.3	281	8.9
2. Other professional non-manual	1	5.0	9	10.5	776	24.5
3. Skilled non-manual	6	30.0	24	27.9	974	30.7
4. Skilled-manual	7	35.0	21	24.4	452	14.2
5. Semi-skilled	4	20.0	21	24.4	406	12.8
6. Unskilled	0	0	1	1.2	79	2.5
7. Unemployed not working	1	5.0	5	5.8	88	2.8
Missing	1	5.0	3	3.5	116	3.7
Family socio-economic status (SES) at KS3 – age 14						
1. Professional non-manual	1	5.0	1	1.2	200	6.3
2. Other professional non-manual	5	25.0	12.0	14.0	638	20.1
3. Skilled non-manual	2	10.0	10.0	11.6	258	8.1
4. Skilled-manual	4	20.0	7	8.1	213	6.7
5. Semi-skilled	1	5.0	4	4.7	117	3.7
6. Unskilled	0	0	0	0	28	0.9
7. Unemployed not working	3	15.0	16.0	18.6	211	6.7
Missing	4	20.0	36.0	41.9	1507	47.5
Marital status (at child age 3 yrs)						
Never married, single parent	1	5.0	18	20.9	417	13.1
Never married, living with partner	4	20.0	14	16.3	444	14.0
Married, living with spouse	13	65.0	43	50.0	1849	58.3
Separated/divorced	0	0	7	8.1	327	10.3
Widow/widower	1	5.0	1	1.2	8	0.3
Other	0	0	0	0	21.0	0.7
Missing	1	5.0	3	3.5	106.0	3.3

	Interviewed NEETs		NEETs returning a Life After Year 11 questionnaire		Whole EPPSE sample	
	N	%	N	%	N	%
Mothers' highest qualification						
Vocational	1	5.0	10	11.6	442	13.9
16 Academic	9	45.0	34	39.5	1118	35.2
18 Academic	2	10.0	4	4.7	257	8.1
Degree or equiv	0	0	2	2.3	381	12.0
Higher Degree	0	0	1	1.2	131	4.1
None	7	35.0	29	33.7	46	1.5
Missing	1	5.0	6	7.0	647	20.4
Father's highest qualification						
Vocational	3	15.0	8	9.3	346	10.9
16 Academic	4	20.0	18	20.9	676	21.3
18 Academic	0	0	1	1.2	223	7.0
Degree or equiv	1	5.0	3	3.5	378	11.9
Higher Degree	1	5.0	2	2.3	165	5.2
Other professional/misc	0	0	1	1.2	32	1.0
None	7	35.0	24	27.9	484	15.3
Father absent	3	15.0	25	29.1	757	23.9
Missing	1	5.0	4	4.7	111	3.5
Early years home learning environment (HLE) group						
Low HLE	8	40.0	29	33.7	973	30.7
Medium HLE	4	20.0	23	26.7	727	22.9
High HLE	6	30.0	29	33.7	1306	41.8
Missing	2	10.0	5	5.8	166	5.2

7.3.2 Educational risk factors

There were a number of educational risk factors contributing to young people's NEET status but the most significant was that of low educational attainment at GCSE (see Table 7.3). Only three of the 20 interviewees (15%) achieved 5 or more GCSEs grades A*-C. This was even lower (2 respondents = 10%) for those gaining 5 GCSEs A*-C including the key subjects of English and maths. Poor attainment significantly restricted the options available to these young people post 16 and was a major barrier to trying to get into EET.

Reasons cited by young people for low attainment included their own lack of motivation, poor health (physical and mental) and having special educational needs (SEN).

Table 7.3: Academic achievement of NEETs

	Interviewed NEETs		NEETs returning a LA Y11 questionnaire		Whole EPPSE sample	
	N	%	N	%	N	%
Achieved 5 or more GCSEs A*-C						
Yes	3	15.0	11	12.8	1570	49.5
No	17	85.0	69	80.2	1193	37.6
Missing	0	0	6	7.0	409	12.9
Achieved 5 or more GCSEs A*-C including GCSE and equivalents in English and Maths						
Yes	2	10.0	13	15.1	1555	49.0
No	18	90.0	67	77.9	1208	38.1
Missing	0	0	6	7.0	409	12.9

Students' dispositions at age 16 were explored through quantitative analyses for the whole EPPSE sample (Section 6). The report on dispositions (Sammons et al., 2014c) investigated students' health and mental well-being as well as 4 specific dispositions; General Academic self-concept, Resistance to peer pressure, School enjoyment and Disaffected behaviour.

Having undertaken this analyses the results were compared for the NEET and non NEET groups. A quantitative analyses that compared the NEET group with all those on other post 16 routes showed that the NEETs experienced poorer health, lower enjoyment of school, poorer behaviour and mental well-being and unsurprisingly had lower academic self-concepts (these are statistically significant differences but given the NEET group is small, statistical significance is more difficult to achieve).

The whole NEET sample showed marked differences from the full sample and some slight variation when compared to the smaller sample of NEETs who were interviewed (see Table 7.4):

- 'General academic self-concept' - lower than only the academic routes: interviewed NEETs slightly higher than not interviewed
- 'Mental well-being' - lower than higher academic only: interviewed NEETs and not interviewed very similar
- 'School enjoyment' - lower than only the academic routes: interviewed NEETs and not interviewed very similar
- 'Disaffected behaviour' - higher than only the academic routes: interviewed NEETs slightly higher than not interviewed
- Perceived health status - lowest perceived good health: interviewed NEETs slightly poorer perceived health than not interviewed.

Table 7.4: Disposition differences when comparing NEETs and non-NEETSs

Disposition	Status	N	Mean	Standard Deviation
General Academic self-concept	Not NEET	1320	101.09	14.86
	NEET	51	92.43	14.89
Disaffected behaviour	Not NEET	1323	99.19	14.834
	NEET	51	107.75	16.78
School enjoyment	Not NEET	1324	100.98	14.70
	NEET	51	93.49	14.58
Mental well-being	Not NEET	1319	99.91	14.85
	NEET	50	94.92	16.69

It can be seen that the NEET group have significantly poorer perceived health (see Table 7.5).

Table 7.5: Perceived health status by post-16 route

Perceived Health in Year 11	Very good		Fairly good		Not very good/ not good at all		Totals	
	N	%	N	%	N	%	N	%
Q1: Higher academic	335	53.6	265	42.4	25	4.0	625	100
Q1: Lower academic	82	39.6	110	53.1	15	7.2	207	100
Q1: Vocational	158	42.5	174	46.8	40	10.8	372	100
Q2: Working	34	37.4	45	49.5	12	13.2	91	100
Q3: Studying & working	5	35.7	7	50.0	2	14.3	14	100
Q4: NEET	13	25.5	26	51.0	12	23.5	51	100
Total	627	46.1	627	46.1	106	7.8	1360	100

N.B. Whole cohort response was: Very good - n=756 (45.8%); Fairly good - n=771 (46.7%); Not very good/not good at all - n=125 (7.6%); Total n=1652

The 2011 Wolf Report (Wolf, 2011) for the Department for Education (DfE) on vocational education states that English and maths GCSEs (at grades A*-C) are fundamental to young people's employment and education prospects. Yet national figures show that fewer than half of NEET students have both at the end of Key Stage 4 (age 15/16) and at age 18. The lack of educational qualifications achieved by the EPPSE interviewed NEETs had in their view significantly restricted options available to them post 16 and in several cases were attributed as one of the main reasons for becoming NEET.

Many NEETs believed that their poor educational qualifications, and in particular not having a pass grade in English and maths, was a key reason for the difficulties they experienced in trying to get into further education, training or employment. During the interviews several spoke about how poor grades had significantly affected their prospects:

“No one wants to employ me because I don't have maths.” (Annie)

“How do you feel about what has happened to you since you left school? Useless cos I ain’t got no qualifications and no shot at work.” (Shannon)

As identified in other research (Furlong & Cartmel, 1997) many NEETs attributed their poor grades to their own immaturity during secondary schooling, not working hard enough and having a general lack of motivation. A number of NEETs stated they had not fully appreciated the importance of achieving good grades and the consequences of poor educational attainment on their future pathways and prospects until it was too late:

“**How did you feel about what you got in your GCSEs?** Oh I could have done better yeah, I didn’t really bother… **And how was the last year of school for you?** It was a bit crap to be honest, I turned into a little bugger at school to be honest, I wasn’t very good at school at the end.” (Archie)

There was a common theme of regret amongst these young people around not having worked harder at school and getting better grades and with hindsight they could see the impact of their poor qualifications on their pathways. Some felt very strongly that they had the ability to achieve better grades if only they had applied themselves at the time:

“I regret it now but at the time that’s how I was, I didn’t enjoy it at the end.” (Archie)

“What did you think about the grades you got at GCSE? I thought I could have done a bit better if I’d have stuck in a bit more…**And when you say that you think you could have done better, what makes you feel that way?** I think if I’d have just stuck in a bit more, did a bit more revising I could have come out with better grades.” (Becky)

This highlights the importance of early identification of these risk factors and the important role of schools in supporting the educational achievement of this group. This might take the form of targeted support for pupils with SEN, those struggling to get GCSE passes in English and maths or the use of more innovative teaching methods for those struggling to engage with education. These students may need more regular advice on their potential as life-long learners and what further opportunities exist to retake GCSEs.

7.3.3 Personal risk factors

A range of personal risk factors were associated with being NEET including a lack of direction or aspirations after finishing school, health problems, caring responsibilities, difficult family circumstances (being in Local Authority care) or a breakdown in relationships with parents. The influence of physical and particularly mental health problems on NEET status cannot be overstated; the need for quicker access to professional support services was evident in the case of several young people.

Two young people had long term physical health problems and three had long term mental health problems. These physical and mental health conditions started during the final years of compulsory education and resulted in them missing periods of schooling and struggling to keep up with their studies. They reported receiving little or no additional support from schools, teachers or referrals to other professional or third sector sources or help.

These young people struggled to manage their physical and mental health problems and felt these were the main reason they became NEET. Only one of these young people had managed to change their NEET status; Crixus's depression and Asperger's had seriously affected his schooling and led to a disappointing 3Cs and 2D grades at GCSE. He attempted to enrol on Further Education (FE) courses but dropped out because of his mental health problems which deteriorated after he was put on medication which did not suit him. Crixus spent over a year being NEET before receiving professional psychiatric support. In his interview he reported that he had recently started studying full-time for a Level 2 BTEC which he was enjoying very much. The effect of mental health problems on both educational attainment and later NEET status was an experience shared by Shannon:

"I dropped out of school at 15 because of my panic attacks and depression and, but I still done my GCSEs and got results for them but since then I haven't done anything because of my panic attacks and depression." (Shannon)

Marie had been a motivated high achiever at school and gained relatively good grades at GCSE despite becoming ill with a limiting, long term physical condition which affected her attendance. She received no additional support from school during this time and had been rather disappointed with her GCSE grades which were lower than predicted. Marie had aspirations to do A-levels and go on to university but became NEET due to her health problems:

"I was off a lot and in the second year I had to catch up by myself and I just had to do it all by myself…then I went back to do my A levels and I couldn't do them at all, I was extremely ill so I had to stop then…it's still bad, I'm pretty much housebound for the majority of the time." (Marie)

Malik also struggled with ill health at school that left him unable to engage with education, training or employment. He had not received support outside of his family and was still waiting for some professional help:

"I have a condition which causes me to repeat movements over and over, it's a physical condition…I've had it for the last two years. **Are you getting any help for it or support?** Well we're still waiting for an appointment with a specialist" (Malik).

This highlights the importance of having greater flexibility in post 16 educational options particularly for those with physical/mental health or SEN. For instance, it would be hugely beneficial for some students to have the option to take just one or two 'A levels' at a time or being allowed to complete courses over a longer period of time or be provided with additional tuition or work to be undertaken at home. However, this has now become more difficult as funding for those at 18+ who are still studying in a school, college or Sixth Form College are funded less generously than their 16 and 17 year olds counterparts.

7.3.4 Structural risk factors

Although interviewed NEETs were all keen to engage in some form of education, training or employment, there were a range of external and structural barriers that contributed to their NEET status. This constrained the level of agency they were able to exert. The tension between structure and agency as described by Bourdieu (1986) was evident in the experiences of the NEET young people. Structural risk factors included the difficult labour market conditions, a lack of training and apprenticeship opportunities, being caught in the benefits trap where young people were better off on welfare support than they would be in EET.

Cathy who had been in Local Authority care said she was better off on benefits than if she was in education or an apprenticeship. She hadn't been able to find full-time employment that paid more than the minimum wage and although she had looked into doing apprenticeships she said that it wouldn't pay her enough to support her family:

"I tried to do an apprenticeship but with it being a joint tenancy with my boyfriend it would have affected our benefits, the money we would get through an apprenticeship it wouldn't be enough for what we need, my boyfriend's got two kids as well so we got to, me and me boyfriend are supposed to be looking for full-time jobs cos if one of us gets a part-time job we're gonna be financially really badly off so it's worked out that I've got to work at least 40 hours a week minimum pay which is quite a lot so an apprenticeship wouldn't be beneficial to me." (Cathy)

This was another issue raised in the 2013 Institute for Public Policy Research (IPPR) report (Cook, 2013) which highlighted how training of 16 hours or more a week is not permitted for those on Job Seekers Allowance (JSA).

Access and transport, especially for those living in rural areas, was a structural concern. Living in a rural area limited the employment and training opportunities not only in terms of the jobs that were available within travelling distance on public transport but the employment hours that they could work e.g., getting to/from a job that starts early or finishes late or involves night shifts. Maguire et al., (2009) identified this as a key barrier and risk factor for becoming NEET.

Natasha who had been NEET ever since leaving school said that living in a rural location was a key reason why she hadn't tried to get into FE or been able to find employment:

"**Have you tried contacting a college to find out what they do and talking to somebody there?** I could do, I haven't tried. It's just they're so far out though so." (Natasha)

Other young people also spoke about how the rural locality of where they lived restricted the opportunities available to them:

"What do you see as the main difficulties to finding a job? I'd say experience and distance." (Harry)

"Where I live the college I was going to was an hour away and the bus was like at half seven so I had to get up quite early and I just couldn't be bothered. **So do you live in quite a rural area?** Yeah, in [name of town], it's very rural here. Plus the college I was at it was like awful." (Bane)

The imposition of course fees for those 18 and over was another significant structural barrier. Re-engaging with education later on was problematic because once over 18 education fees had to be paid and most could not afford to do these:

"I must have been like 18 maybe and I was signing on. Then afterwards I couldn't find a job, I was unemployed for about a year, I couldn't find a job and so I thought you know what I'm gonna go back and study but then I think it was along the lines of I'd have to pay for a course or something but then obviously I couldn't afford to pay and I thought I don't want to get into that." (Sahla)

The 2013 IPPR report 'No more NEETs' (Cook, 2013) highlighted this as a major structural issue facing NEETs reporting that, "there is currently no provision of financial support for young people aged 18-24 to participate in education or vocational training unlike for those in higher education'. This means that opportunities are restricted to those who have financial support from parents or independent sources of income" (Cook, 2013, p.2). These financial difficulties have further intensified since the removal of the Educational Maintenance Allowance (EMA).

7.3.5 Characteristics of those who were still NEET at time of interview

Seven young people were still NEET when interviewed (see Table 7.6). Two had been NEET since leaving school, a further two had spent a very short period of time in education but due to health problems had left education and had been NEET since that time. The remaining three had mixed pathways of short periods of time in education, training or employment interspersed with periods of inactivity. Several of the risk factors already referred to had contributed to their continuing NEET status, including being in Local Authority care, long term physical health problems, long term mental health problems and a lack of any plans or aspirations about what they wanted to do after finishing school and poor GCSE grades with only one of the seven gaining 5 A-C grades at GCSE.

Table 7.6: NEET young people status at time of interview

Gender	Name	Age	Ethnic heritage	Activity at time of interview
Females	Laila	19	White UK	Full-time employment
	Natasha	18	White UK	NEET
	Annie	18	White UK	Full-time employment
	Shannon	18	White UK	NEET
	Sahla	20	Pakistani	Full-time employment
	Jackie	19	White UK	Full-time employment
	Jasmine	19	Mixed heritage	Full-time education & part-time employment
	Marie	19	White UK	NEET
	Becky	19	White UK	Full-time education & part-time employment
	Cathy	18	White UK	NEET
	Katie	18	White UK	Full-time employment & part-time education
	Bane*	18	White UK	Full-time education & part-time employment
Males	Crixus	20	White UK	Full-time education
	Michael	19	White UK	Full-time employment
	David	20	White UK	NEET
	Archie	19	White UK	Full-time employment
	Malik	19	Mixed heritage	NEET
	Harry	19	White UK	NEET
	Tim	19	White UK	Full-time apprenticeship
	Will	18	White UK	Full-time education

*Bane is female

7.3.6 ‘Dropping out’ and delay in post 16 pathways

There was a high incidence amongst NEETs of not knowing what they wanted to do after leaving school that often persisted for some considerable time. This resulted in non-linear, ‘yo-yo’ transitions, where young people started and stopped in either education or various forms of work. Particularly in relation to education, these often resulted in young people trying out courses with little overall direction or idea of what they might do afterwards. This is a finding which corresponds with earlier literature on NEETs (see Spielhofer et al., 2009).

David initially went to college after he finished school but dropped out after 6 months and had been NEET ever since apart from a brief period of temporary employment. He said that he struggled with the different style of learning and expectations at college:

“I didn’t like the style of learning, cos it was more, I’m more the type of person who needs to learn by being shown and by repeating the process and people haven’t the patience for me cos I find it difficult to process information. I’ve obviously got a lot better with age but no, I didn’t like the style of learning and the tutors weren’t very helpful, it was more like, ‘here’s what you need to do, get on with it.’” (David)

Other young ‘dropped outs’ felt forced to remain in education after finishing school. There were several reasons given for this:

- because they weren’t sure what they wanted to do
- feeling that their employment prospects were poor
- there was a strong expectation from family or teachers that they should carry on in education
- because they had received very little or poor quality advice on the options available to them after leaving school.

“I was in two minds about whether, cos I wasn’t really told much about the progression that I could have took, I felt really forced into doing A levels, I didn’t really know about the other side, vocational courses, they didn’t really explain everything fully. Teachers at school mainly pushed you down the A level route.” (Becky)

There were a few cases where young people had ‘dropped out’ because they wanted to do a different course but they had to wait for the start of the next academic year and in the interim period were NEET.

Many NEETs found making the transition from compulsory schooling to further education extremely difficult leading to a high drop-out rate from courses. Nine of the twenty young people had started a post 16 course but had dropped out because they didn’t enjoy it, it wasn’t what they expected or because they struggled to make the transition to further education.

Some young people reported that they had not been ready at age 16 to make key decisions about their future careers. Trying to re-engage with education later on was sometimes problematic for these young people because once they were over 18 they had to pay fees for their education which most could not afford to do. It could be suggested that more needs to be done in the way of preparing young people in the final years at school for making the transition to college and in providing greater financial support for young people over 18 who want to return to education to help them become more employable.

7.3.7 Importance of information and advice on options and pathways post 16

Many NEETs felt there was a need for much better information and advice on the range of options available, not just in education but also on quality vocational qualifications, apprenticeships and training opportunities and the types of employment that this would qualify them for. Better information has been shown to improve staying on rates (Englund, Collins and Egeland, 2008).

Becky dropped out of her A-levels after only a few months and spent almost a year NEET before re-enrolling in education on a different course. She felt forced into taking A-levels because there was little information about alternative options:

“Did anyone try to help you or give you any advice? My parents did but not really the college or anyone else no, they didn’t really do much.” (Becky)

This dearth of information and support around educational options was something that Sahla also experienced:

“Like you have to go back to college and you have to have like a C in English and Maths or something and that’s what’s putting me off, I don’t know enough information about it or where to go.” (Sahla)

Structural barriers not only exist in relation to educational options, a number of young people spoke about the difficulties they had in finding employment and how little support was available from professional services:

“I only got this job because of my mum, she told me about it. When I wasn’t doing anything like education or employment I didn’t really have any help or advice about that from anyone.” (Laila)

There was particular dissatisfaction with official services such as the Job Centre. Sahla (NEET for over a year) said about help and support to find work:

“...the Jobcentre, but to be honest with you they weren’t that great, they would just leave you to it.” (Sahla).

There were other negative experiences of trying to find work through the Job Centre:

“I’ve looked [for employment]. It would be nice to have some help to try and get a job…..Jobcentre aren’t helping very much.” (Natasha)

“I went on Jobseekers, I didn’t want to, my mum wanted me to, I didn’t feel comfortable doing it but I was like ok, I’ll just do it. My advisor she tried to help me but she was always sending me to job interviews and stuff like that like totally outside the area where I live but because I don’t drive I would have had to rely on public transport and there was no way where the jobs were based that I could have been able to get to them so she didn’t really help as much as I wanted her to.” (Jackie)

Tim encountered little help to find an apprenticeship and said that he had received no real careers advice either:

“They put us on like a, it was like another place they sent me where I could like try and find a job but they didn’t really help us, they just wanted to get us into any sort of work, stuff that I didn’t need qualifications to do. I was trying to tell them that like I wanted to do an apprenticeship but they didn’t have like an apprenticeship sector, programme. So they just made us apply for like working in shops, cleaning, stuff like that.” (Tim)

Tim spoke more generally about what he saw as the lack of specific services and support for young people aged 18-25 around finding employment, training and apprenticeships. He thought the Connexions in his area had closed and was unaware of anything else in its place for young people.

This gap in services for NEET young people was also raised by David. He managed to get a temporary job through an agency after dropping out of his college course but when this employment ended he hadn’t been able to find other work via this agency because he was over 18. At the time of his interview David had been NEET for over a year:

“The agency I first used was for under 18s so now I’m 20 I can’t use them again.” (David)

It was felt that advice should be available to young people much earlier on in their compulsory education, before they have to make their KS4 subject choices so that young people have the information they need to make clearer and more informed choices about their future pathways through education, training and employment.

7.3.8 The variable quality of post 16 courses

A key issue emerging from these young people was that of the variable and often poor quality of further education courses and qualifications such as entry level vocational skills courses and short 'multi-skills' courses. The generally poor GCSE grades of this group restricted the types of courses and institutions they could get into with many finding they could only access relatively low level courses at what some considered less favourable educational establishments. In most cases these courses did little to improve their employability and resulted in a return to NEET status or a cycle of taking up one short, low level course after another. There is a need for greater quality control of vocational courses and training to ensure that what is offered is of high quality and recognised by employers.

7.3.9 Lack of long term employment and apprenticeship or training opportunities

The NEET group reported enormous problems in gaining apprenticeships or securing long-term employment. Some were critical of services such as Jobcentres however such organisations may face huge difficulties in identifying employment or training for young people, whose lack of qualifications and other personal issues such as health problems make it very hard to place them at a time of high youth unemployment. These difficulties are compounded by a context of significant cuts to Connexions services, Jobcentre budgets and the removal of the EMA. More routes and support into employment or training for those young people who are motivated to work but whose low educational qualifications prevent access to the job market is needed as well as a greater range and availability of non-academic post 16 options for young people.

7.4 Personal motivation and determination in resolving NEET status

A very important protective factor that helped some back into EET was that of young people being proactive and determined despite the difficult circumstances they faced. Examples of this include young people handing out CVs, signing up with job agencies, doing voluntary work to boost chances of employment and spending large amounts of time searching for courses or jobs on-line. Several NEETs said that they found employment or training opportunities through their own perseverance and ingenuity rather than via the Job Centre or agencies.

7.4.1 Social capital facilitating entry to EET

Young people's social capital in the form of family, friends and other networks was exceptionally important in helping them out of their inactivity and into EET. Support and encouragement from family and teachers was important in fostering a more positive disposition towards returning to education. Parents paying course fees enabled some young people to return to education and there were examples of families supporting young people financially during extended periods of unemployment or training.

For instance, when Jasmine decided on a course she really wanted to do her parents paid the fees (liable as an over 18 year old). Her parents and friends had also encouraged and supported her when she was thinking about what course to do and in researching what was available:

"They've been helpful, they helped me find out, work out what I wanted to do and stuff, my friends and my parents. They've helped me to find courses especially when I dropped out of the ones I started**… So you're studying for a Diploma, is that full time?** Yes, it's full time. I'm loving it. **And how is it funded, who pays for it?** Oh, my parents (Jasmine).

Social capital in the form of family contacts has been shown to be important (Feinstein, Duckworth and Sabates, 2004) and this proved to be true for Will as they provided him with a source of casual employment whilst trying to get into an apprenticeship:

"I've never been in full-time employment but friends of my mums and people I know who needed jobs doing I've been doing stuff for them cash in hand over the past year whilst I was trying to get an apprenticeship." (Will)

A number of NEETS received useful advice on educational options from those known to them which helped to galvanise their thinking and direct them into action whilst many others were able to find employment or access training opportunities through their friends, family members or teachers.

7.5 Conclusions

Young people who are NEET constitute a small but heterogeneous group with varied experiences and pathways but this research, as with previous studies before it, has identified a range of common risk factors associated with becoming NEET at both proximal and distal levels. Bronfenbrenner's ecological model (1979) described at the beginning of this report has proven to be a helpful theoretical framework for understanding the complexity of both proximal and distal factors at play in the lives of these young people.

This section of the report has identified the background characteristics of this group and has reported, in their own words, some of the challenges they face in their NEET status and the barrier to joining the EET sector.

In spite of this difficult economic context, the problems that NEETs experienced in trying to get into EET highlights a number areas that could be addressed to try and ameliorate some of the problems that they encountered:

- greater flexibility and support in post 16 educational options particularly for those with SEN and physical/mental health difficulties e.g., having the option to take just one or two 'A levels' at a time or being allowed to complete courses over a longer period of time
- early identification and support for those at risk of becoming NEET, including appropriate health and mental health support where these concerns are evident
- greater financial support for young people over 18 who want to return to education
- more routes into employment or training for those motivated to work but whose low educational qualifications prevent access to the job market
- greater range and availability of non-academic post 16 options
- greater quality control of vocational courses and training currently available to ensure that what is offered is of high quality and is recognised by employers.

For the full report which provides further detail on this group see Siraj et al., (2014).

Section 8 The economic effects of pre-school education and quality

This section of the report summarises economic analyses undertaken by Lorraine Dearden, Sarah Cattan and Claire Crawford for the Institute of Fiscal Studies.

The EPPSE design enables researchers to investigate the impact of earlier phases of education on later educational achievement, after taking into account the effects of gender, family background, out of school learning and neighbourhood, to name but a few of the co-variates used in estimating the effects of education. With age 16 GCSE exam results available, however, a new type of analysis became possible because experiences of early education (attendance/lack of attendance at pre-school, quality of pre-school provision) can be used as predictors of future labour market outcomes. The EPPSE sample is particularly useful for this enquiry as its members were among the last children in England who did not have an entitlement to universal free early years education and therefore predictions can be made for those who did and did not attend pre-school. It is these long term economic consequences that are the focus of this section.

8.1 Research questions

- What are the long term economic consequences effects of pre-school education (attendance and quality) on educational outcomes at age 16? These results were then used to explore the second and third questions:
- What are the likely differences in future employment and earnings outcomes that arise from pre-school education?
- What are the likely overall costs and benefits to the Exchequer of pre-school education?

8.2 Methodology

The methodology involved a two stage process. Firstly the effect of different pre-school experiences (attendance and quality) on GCSE outcomes (e.g., total GCSE scores, 5 A* - C) were estimated using different statistical models from the ones reported in Section 5 of this report. Unfortunately, there is currently no information about these individuals' labour market participation since the last data collection took place when they were aged 16+ years old. This means that it is impossible to directly estimate the effect of pre-school provision on lifetime earnings and employment. However, *predictions* can be made about the estimated effect of different pre-school experiences on lifetime gross and net earnings in order to estimate the likely exchequer benefits of different pre-school experiences in the long term. This involves complex modelling and a substantial number of strong assumptions about which qualifications lead towards different economic pathways. Some of these will be touched upon at the end of the section, along with caveats about the interpretation of the economic results.

Five analytic steps are excerpted below from the full version of the report by Cattan, Crawford and Dearden (2014)

Step A: Uses the EPPSE data to estimate the effect of pre-school quality on:

- the probability of obtaining more than 5 GCSEs A*-C
- the number of GCSEs passed with grades A*-C were estimated and explored separately for boys and girls.

Step B: The highest educational level these individuals will go on to attain on the basis of their KS4 outcomes was predicted. This assumes that anyone achieving fewer than 5 GCSEs at grades A*-C at age 16 does not go on to further study. Amongst those achieving at least this benchmark level, data was used from the Longitudinal Study of Young People in England (LSYPE) to predict whether they will stop there, or go on to A-levels and/or a university degree. This was on the basis of the number of GCSEs they achieved at grades A*-C, plus a variety of demographic and family background characteristics, calculated separately for boys and girls.

Table 8.1 below reports the marginal effect of the number of GCSEs achieved at grades A*–C (along with other selected background characteristics) on the probability that an individual's highest educational qualification is five or more GCSEs at A*–C (first column), one or more A-level passes (second column) and a university degree (last column).

Table 8.1: Marginal effects of observable characteristics on educational attainment[44]

Marginal effect of observable characteristics on the probability that each following category is the highest educational level attained by labour market entry						
	5+ GCSEs A*–C	**SE**	**A levels**	**SE**	**University**	**SE**
Number of GCSE qualifications A*–C	–0.006***	(-0.002)	–0.027***	(-0.003)	0.033***	(-0.004)
Number of GCSE qualifications A*–C interacted with Female	–0.003	(-0.003)	0.002	(-0.004)	0.002	(-0.005)
Female	0.035	(-0.025)	0.007	(-0.041)	–0.042	(-0.047)
White	0.090***	(-0.007)	0.140***	(-0.013)	–0.230***	(-0.014)
Low birth weight	0.006	(-0.014)	–0.022	(-0.022)	0.016	(-0.025)
Number of younger siblings	0.004	(-0.004)	0.006	(-0.007)	–0.010	(-0.008)
Number of older siblings	0.007	(-0.004)	0.006	(-0.007)	–0.013	(-0.008)
Parents were married	–0.011	(-0.010)	–0.030*	(-0.018)	0.041**	(-0.020)
IDACI deprivation index: 2nd quintile	0.013	(-0.017)	–0.027	(-0.025)	0.014	(-0.029)
3rd quintile	0.003	(-0.016)	–0.009	(-0.027)	0.007	(-0.031)
4th quintile	–0.019	(-0.015)	–0.047*	(-0.028)	0.066*	(-0.031)
5th quintile	–0.053***	(-0.016)	–0.075**	(-0.030)	0.127***	(-0.034)
Father's qualification level: Age-16 academic qualification	0.026	(-0.018)	–0.008	(-0.026)	–0.018	(-0.031)
Vocational qualification	0.023*	(-0.013)	0.022	(-0.021)	–0.045*	(-0.023)
Age-18 academic qualification	0.017	(-0.013)	0.009	(-0.022)	–0.026	(-0.025)
University degree	–0.023	(-0.014)	–0.046*	(-0.024)	0.069**	(-0.027)
Mother's qualification level: Age-16 academic qualification	0.03	(-0.018)	0.041	(-0.030)	–0.071**	(-0.033)
Vocational qualification	0.003	(-0.013)	0.042*	(-0.023)	–0.045*	(-0.026)
Age-18 academic qualification	–0.003	(-0.013)	0.043*	(-0.024)	–0.041	(-0.026)
University degree	–0.011	(-0.016)	0.007	(-0.029)	0.004	(-0.032)

* p<0.10, ** p<0.05, *** p<0.001

The results show that the number of GCSEs achieved at grades A*–C has a positive effect on the highest level of education attained by labour market entry. In particular, an additional GCSE (above five) increases the probability of going to university by over 3 percentage points and decreases the probability of attaining only A levels by nearly 3 percentage points. Because pre-school quality can potentially affect both the probability of achieving at least five GCSEs and the number of GCSEs achieved at grades A*–C, these results indicate that pre-school quality can possibly affect final educational attainment. Besides GCSE results, the child's geographical deprivation level, ethnicity, parents' marital status and qualification levels are other significant predictors of educational attainment (see Table 8.1).

[44] The marginal effects reported in this table are based on the estimates of a multinomial logit model of educational attainment, where the outcome can take one of three, mutually exclusive values (1 = at least five GCSEs at A*–C; 2 = A levels; and 3 = university). It is estimated among the sample of LSYPE respondents who report having at least five A*–C GCSEs at age 19–20 (Wave 7 of the LSYPE), which we assume remains constant until labour market entry at age 22. Standard errors (SE) are shown in parentheses. Reference category is having at least five A*–C GCSEs as highest educational level by labour market entry.

Step C: Lifetime (gross) earnings and employment profiles of individuals were simulated in each of the four possible educational levels (less than 5 GCSEs A*-C, 5 or more GCSEs A*-C, A-levels, and university degree) again separately for boys and girls.

For each educational group and gender, a rich statistical model of earnings and employment dynamics that takes into account the likely persistence of earnings and employment shocks (for example, a recession) was estimated. The model is estimated using two large data sets that contain survey information on British individuals' labour market outcomes – the Labour Force Survey (LFS) and the British Household Panel Survey (BHPS). The statistical model generates cross-sectional earnings distributions that are consistent with the high-quality cross-sectional data from the LFS. Transitions between employment and non-employment, and year-on-year earnings fluctuations, are consistent with the dynamics observed in the BHPS.

For each educational category, they used the corresponding estimates from the earnings and employment model to simulate artificial earnings and employment paths for a cohort of 10,000 individuals, and compute the discounted present value of gross lifetime earnings. The EPPSE children attended pre-school up to the age of 4 years 9 months on average. Following the Treasury Green Book (HM Treasury, 2011), they need to start discounting from the time of the investment (when the children were aged 4) until the fruition of the investment (which they assume is at age 60). They use a discount rate of 3.5% for the first 30 years and of 3.0% for the following 25 years (as specified in Table 6.1 of the Green Book - HM Treasury, 2011). The estimates will therefore be slightly conservative, if pre-school provision has longer effects than this, or indeed intergenerational effects, but we feel a 55-year time horizon is reasonable. To test the sensitivity of the estimates to using different discount rates, they also used discount rates 0.5 percentage points higher and lower than this central scenario.

Table 8.2 presents the results of this exercise, showing that the average discounted gross lifetime earnings (including periods of non-employment) increases with educational level for both men and women, as one would expect. For example, men achieving fewer than five GCSEs at grades A*–C earn around £365,000 over their lifetimes in discounted present-value terms, while men with a degree earn approximately double this amount, at just under £740,000. Women who achieved fewer than five GCSEs at grades A*–C have lifetime earnings that are around 45% of those of men in the same category, whereas in the middle two educational groups the fraction is around 50%. For university graduates, women's lifetime earnings are, on average, around 60% of men's. It is also clear that there is much more variation in outcomes (compared with the mean) for those in the lowest educational group than for those in higher educational groups. Of course, these estimates are much lower than those typically reported in other types of analysis, because they have discounted future earnings from the age of 4 (as the initial investment in pre-school provision was at this age). The gap, before the earnings fruition of this investment can be realised, explains the discounted present value of lifetime earnings being lower than that typically used when considering initiatives aimed at adults.

Table 8.2: Average discounted present values of simulated lifetime earnings, by qualification level, as predicted by the earnings and employment model[45]

Qualification level	Males	SE	Females	SE
Fewer than 5 GCSEs A*–C	£364,435	(159,296)	£163,915	(112,269)
At least 5 GCSEs A*–C	£477,563	(158,208)	£243,238	(123,498)
A levels	£525,512	(172,983)	£259,400	(129,191)
University graduates	£736,366	(252,790)	£446,823	(191,236)

Step D: The simulated lifetime profiles of gross earnings were run through the Institute for Fiscal Studies' tax and benefit model to compute the implied lifetime profiles of net earnings.

Step E: The results from Steps A and B were used to predict the probability that each individual in the EPPSE study will achieve each educational level in counterfactual situation A (low-quality pre-school) and counterfactual situation B (high-quality pre-school). Combining this with results from Steps C and D, a weighted average of the discounted present value (DPV) of lifetime gross and net earnings each individual in EPPSE is predicted to have under each counterfactual situation was computed. Finally the average effect of attending high-quality versus low-quality pre-school on lifetime gross and net earnings as the average difference in predicted DPV between both situations across the whole sample was measured. This process was repeated for comparing no pre-school education (or only a minimal amount) versus receiving pre-school education in order to measure the average effect of attending pre-school.

8.3 Summary of findings

8.3.1 Attendance

The analyses first investigated the effects of receiving pre-school education versus none (or only a minimal amount) on a variety of Key Stage 4 outcomes (see Table 8.3). Attending any pre-school increased the probability of achieving 5 or more GCSEs by 8.4 percentage points, on average, while it increased the average number of GCSEs achieved at grades A*-C by 0.8 GCSEs. The effect of attending pre-school was more than twice as large for those whose mothers had low educational qualification levels compared to those whose mothers had high qualification levels.

[45] Standard errors (SE) of the means are shown in parentheses. The average discounted present values of earnings are calculated based on simulations of 10,000 profiles for each educational category and gender.

Table 8.3: The average effect of some pre-school education (versus none) on KS4 scores[46]

Type of pre-school provision evaluated	Key Stage 4 Outcomes			
Full sample	**Achieved 5 or more GCSE & equivalents at grades A*-C**	**SE**	**Number of GCSE and equivalents achieved at grades A*-C**	**SE**
Pre-school education vs. none	0.084**	(0.038)	0.848*	(0.499)
Boys				
Pre-school education vs. none	0.10	(0.065)	0.913	(0.756)
Girls				
Pre-school education vs. none	0.069	(0.042)	0.787	(0.595)
Low maternal qualification levels				
Pre-school education vs. none	0.197**	(0.068)	1.646***	(0.34)
High maternal qualification levels				
Pre-school education vs. none	0.026	(0.057)	0.46	(0.612)

* p<0.10, ** p<0.05, *** p<0.001

This finding about attendance suggests that pre-school education may play an especially important role in supporting educational attainment in children of mothers with low educational qualifications. These individuals are likely to be particularly disadvantaged in the education system as mother's educational qualification level has been found to be the strongest predictor of educational attainment across different phases of education. These results are very similar for boys and girls. Nonetheless, the magnitude of these results needs to be treated with some caution as the study has no baseline data on cognitive ability (at age 3) for those who did not attend pre-school, which could lead to over-estimates of the effects.

8.3.2 Quality

The next part of the analysis investigated the effects of attending high versus low-quality pre-school on a variety of KS4 outcomes. Unlike pre-school attendance, the long-term effect of pre-school quality was found to be either small or non-significant. For example, a significant effect was found for attending a pre-school of high-quality compared to low quality (defined using the ECERS-R scale) on the number of GCSE and equivalents qualifications achieved at grades A*-C, even after accounting for differences in early development, family background and parental characteristics. However, these effects are not significant if quality is measured on the ECERS-E scale, nor do they significantly

46 The results presented in this table show the average treatment effects for the whole sample and various sub-groups calculated based on the estimates of the fully interacted linear model, where we also control for parental characteristics (parents' qualification levels and employment), deprivation index, family structure (number of younger and older siblings), demographic characteristics (gender and ethnicity). Low maternal qualification levels identify children whose mothers have no qualifications, some vocational qualifications and/or age 16 academic qualifications and high maternal qualification levels identify those children whose mothers have A-level or equivalent qualifications and/or degree level qualifications. Standard errors (SE) are shown in parentheses.

affect the likelihood of achieving the simpler benchmark indicator of 5 GCSEs and equivalents at grades A*-C.

Where quality is statistically significant, it is only very low-quality pre-schools (in the bottom twenty per cent of the distribution) that have a significantly negative effect on GCSE outcomes at age 16 when compared to higher quality pre-schools. For example, attending a pre-school that scores in the top twenty per cent on the ECERS-R quality measure (compared to a pre-school that scores in the bottom twenty per cent on the same scale) is found to increase the number of GCSEs and equivalents achieved at grades A*-C by just over one GCSE, which represents an increase of just under twenty per cent relative to the sample mean (5.41). Similarly, it increases the probability of a young person achieving 5 or more GCSEs and equivalents at grades A*-C by about 7 percentage points or thirteen per cent (relative to the sample mean of 55%). Table 8.4 shows the effects of pre-school quality measured by the ECERS-R on 'good' GCSE grades of A*-C.

Table 8.4: Average effect of pre-school quality on GCSEs achieved with grades A*-C[47]

Type of pre-school provision evaluated		Key Stage 4 Outcomes			
		Achieved 5 or more GCSE & equivalents at grades A*-C	SE	Number of GCSE and equivalents achieved at grades A*-C	SE
ECERS-E	High vs. Low	0.054	(0.035)	0.448	(0.435)
	Medium vs. Low	-0.01	(0.019)	-0.122	(0.268)
	High vs. Medium/Low	0.046*	(0.024)	0.525*	(0.269)
	Above 50% vs. Below 50%	0.003	(0.015)	0.137	(0.232)
ECERS-R	High vs. Low	0.07**	(0.025)	1.032***	(0.307)
	Medium vs. Low	0.028	(0.024)	0.474*	(0.287)
	High vs. Medium/Low	0.035**	(0.015)	0.526***	(0.159)
	Above 50% vs. Below 50%	0.054***	(0.013)	0.648***	(0.162)

* p<0.10, ** p<0.05, *** p<0.001

47 The results presented in this table show the results of the fully interacted linear model, controlling for baseline (at age of 3) cognitive ability, behavioural and development problem (except for pre-school experience), parental characteristics (parents' qualifications and employment), deprivation index, family structure (number of young and old siblings), demographic characteristics (gender and ethnicity) and duration of pre-school experience. High-quality refers to the top 20%, medium quality refers to the middle 60% and low-quality refers to the bottom 20%. Standard errors (SE) are shown in parentheses.

Table 8.5 shows the effects of quality separately for mothers of high or low qualification levels. In line with the results for pre-school attendance, pre-school quality seems to be more beneficial for children with lower educated mothers than children with higher educated mothers. Again, results are very similar for boys and girls.

Table 8.5: Average effects of pre-school quality on KS4 outcomes by maternal qualification[48]

Type of pre-school provision evaluated		Key Stage 4 Outcomes							
		Achieved 5 or more GCSE & equivalents at grades A*-C				Number of GCSE & equivalents achieved at grades A*-C			
		Low maternal qualification levels	SE	High maternal qualification levels	SE	Low maternal qualification levels	SE	High maternal qualification levels	SE
ECERS-E	High vs. Low	0.079**	(0.037)	0.047	(0.053)	0.035	(0.035)	0.562	(0.507)
	Medium vs. Low	0.004	(0.024)	0.004	(0.04)	-0.014	(0.027)	-0.094	(0.29)
	High vs. Medium/Low	0.035	(0.023)	0.071**	(0.034)	0.059*	(0.032)	0.778*	(0.466)
	Above 50% vs. Below 50%	0.018	(0.017)	0.046*	(0.024)	-0.008	(0.021)	-.009	(.295)
ECERS-R	High vs. Low	0.078**	(0.025)	0.049	(0.057)	0.054	(0.034)	.671	(.442)
	Medium vs. Low	0.051**	(0.025)	0.014	(0.053)	0.008	(0.032)	.156	(0.377)
	High v. Medium/Low	0.041**	(0.018)	0.004	(0.022)	0.034	(0.027)	0.403	(0.289)
	Above 50% vs. Below 50%	0.042**	(0.021)	0.053**	(0.025)	0.061***	(0.018)	0.662**	(0.218)

* p<0.10, ** p<0.05, *** p<0.001

[48] The results presented in Table 8.5 show the average treatment effects for students whose mothers had low or high education, calculated using the estimates of the fully interacted model, where we also controlled for baseline cognitive ability at age 3, behavioural and development problems (except for pre-school experience), parental characteristics (father's qualifications and employment), deprivation index, family structure (number of younger and older siblings), demographic characteristics (ethnicity) and duration of pre-school experience. We use a probit model for the first outcome and a linear model for the second one. Low maternal qualification level includes no qualifications, vocational qualifications and age 16 academic qualifications. High maternal qualification level includes anything above age 18 academic qualifications. Standard errors (SE) are shown in parentheses.

8.3.3 Individual economic benefits

Having identified evidence on whether either pre-school attendance (going or not going to a pre-school) and/or pre-school quality show benefits in terms of increased academic outcomes at the end of Key Stage 4, the next phase of this economic research estimates how such gains might translate into long term economic benefits for the individual (in terms of the net present value of lifetime gross earnings).

Estimates were made for the average effect of pre-school attendance and pre-school quality on gross lifetime earnings (that is, earnings before taxes have been deducted or benefits added). Results are presented for both individuals (who remain single and have no dependent children) and households (which attempts to account for family formation and labour supply decisions in our modelling). These differences are particularly pertinent when it comes to understanding the impact of pre-school quality on net lifetime earnings (i.e., after paying taxes and receiving benefits) and the benefit to the Exchequer.

Table 8.6: The impact of receiving some pre-school education on educational attainment and lifetime gross earnings (at the individual and household level)

	(A) No pre-school experience	(B) Some pre-school experience	(C) Difference between (A) and (B)
Probability of males attaining each educational level			
Less than 5 GCSEs	0.31	0.21	-0.10
At least 5 GCSEs	0.11	0.12	0.01
A-levels	0.20	0.22	0.01
University degree	0.37	0.45	0.08
Probability of females attaining each educational level			
Less than 5 GCSEs	0.21	0.14	-0.07
At least 5 GCSEs	0.17	0.17	0.01
A-levels	0.22	0.21	-0.01
University degree	0.40	0.47	0.07
Discounted present value of lifetime gross earnings at the individual level			
Average individual gains in £	**£432,150** (135,151)	**£458,938** (136,055)	**£26,788** (058,787)
Average of individual gains in percentage points			**7.9%** (16.1)
Gain in percentage points based on average gains			**6.2%**
Discounted present value of lifetime gross earnings at the household level			
Average household gains in £	**£838,353** (087,566)	**£874,346** (071,578)	**£35,993** (082,352)
Average of individual gains in percentage points			**5.1%** (10.9)
Gain in percentage points based on average gains			**4.3%**

It can be seen that children who had received the average pre-school experience amongst the EPPSE sample will go on to earn, on average, around £27,000 more over their working lives in discounted present value terms than children who had received little or no pre-school experience, and around £36,000 more if we take into account the earnings of other members of their household. These figures have been discounted from when the child is aged 4 (at the time of the pre-school investment). These figures translate into average percentage gains per individual of around eight per cent in net earnings and five per cent of gross earnings (see Table 8.6).

These figures above need to be considered with caution because of caveats such as the difficulty in predicting future earnings of the cohort, especially when extrapolating them from another sample from different decades, which had to be done since no A-level results were available for the EPPSE sample and A-level performance was the basis for economic predictions.

Table 8.7: The impact of attending a high-quality pre-school versus a low-quality pre-school on educational attainment and in gross lifetime earnings in discounted present value terms

	(A) Attending a pre-school in bottom 20% on ECERS-R scale	**(B) Attending a pre-school in top 20% on ECERS-R scale**	**(C) Difference between (A) and (B)**
Probability of males to attain each educational level			
Less than 5 GCSEs	0.23	0.20	-0.03
At least 5 GCSEs	0.12	0.13	0.01
A-levels	0.22	0.23	0.01
University degree	0.44	0.45	0.01
Probability of females to attain each educational level			
Less than 5 GCSEs	0.21	0.13	-0.09
At least 5 GCSEs	0.17	0.18	0.02
A-levels	0.21	0.22	0.01
University degree	0.42	0.47	0.05
Discounted present value of lifetime gross earnings at the individual level			
Average of individual gains in £	**£449,236** (144,405)	**£461,571** (138,582)	**£12,335** (048,024)
Average of individual gains in percentage points			**4.3%** (12.2)
Gain in percentage points based on average gains			**2.7%**
Discounted present value of lifetime gross earnings at the household level			
Average of household gains in £	**£857,495** (087,373)	**£876,315** (081,582)	**£18,820** (067,450)
Average of household gains in percentage points			**2.6%** (8.5)
Gain in percentage points based on average gains			**2.2%**

These calculations predicted that gross lifetime earnings would increase by about £12,500 per individual and £19,000 per household on average for an EPPSE child who attended a high-quality pre-school in the top twenty per cent of the ECERS-R scale compared to a child who had attended a poor quality pre-school rated in the bottom twenty per cent on the ECERS-R scale. This represents an average percentage increase of four per cent per individual and nearly three per cent per household in gross lifetime earnings comparing those who had attended a setting rated as high-quality compared to one of low-quality (see Table 8.7).

Interestingly, it is those predicted to be relatively low earners who have the highest percentage gains from both pre-school and pre-school quality in terms of gross lifetime earnings, which suggests that pre-school could help reduce lifetime earnings inequality.

Further analyses show those who attended a pre-school scoring in the middle sixty per cent of the ECERS-R scale, compared to a pre-school scoring in the bottom twenty per cent of the ECERS-R scale, have figures that are very similar to those who attended high-quality pre-schools. These calculations predict that gross lifetime earnings would increase by about £11,000 per individual and £16,000 per household (in discounted present value terms) on average if the EPPSE sample had experienced a pre-school in the middle sixty per cent of the ECERS-R scale instead of a low-quality pre-school in the bottom twenty per cent of the ECERS-R scale. This represents an average percentage increase per individual of four per cent and two per cent per household of in lifetime gross earnings compared to if they had attended a pre-school of low-quality.

8.3.4 Benefits to the Exchequer

Earlier in this section the implications of attending pre-school versus not attending and high versus low-quality pre-school provision on gross lifetime earnings were considered. However, in order to look at the potential savings to the Exchequer and to work out what the individual gains are likely to be in terms of net earnings (take home pay) it is necessary to work out the taxes the EPPSE sample, as adults are likely to pay and the benefits they are likely to receive over their lifetime. This extremely difficult exercise requires substantial strong assumptions, which may or may not be borne out.

The differences in gross lifetime earnings from attending pre-school translate into estimated benefits to the exchequer of around £11,000 per individual pre-school attendee if we only account for individual earnings and of around £16,000 per household if we account for both the pre-school attendee's own earnings and those of their future partner (see Table 8.8). These figures are likely to be upper bounds unless the benefits of pre-school attendance extend beyond retirement age (assumed to be 60), have intergenerational effects or affect other important outcomes such as improved health or pensions or reduced criminal behaviour.

Table 8.8: The impact of receiving some pre-school education on lifetime net individual earnings and savings to the Exchequer per individual and per household

Earnings gains and savings to the Exchequer at the individual level	(A) No pre-school experience	(B) Some pre-school experience	(C) Difference between (A) and (B)
Discounted present value of lifetime gross earnings			
Average of individual gains in £	**£432,150** (135,151)	**£458,938** (136,055)	**£26,788** (058,787)
Average of individual gains in percentage points			**7.9%** (16.1)
Gains in percentage points based on average gains			**6.2%**
Discounted present value of lifetime net earnings			
Average of individual gains in £	**£294,207** (084,297)	**£309,984** (084,836)	**£15,777** (034,851)
Average of individual gains in percentage points			**6.6%** (13.4)
Gains in percentage points based on average gains			**5.4%**
Savings to the Exchequer per individual			**£11,011**
Earnings gains and savings to the Exchequer at the household level			
Discounted present value of lifetime gross earnings			
Average of household gains in £	**£838,353** (087,566)	**£874,346** (071,578)	**£35,993** (082,352)
Average of household gains in percentage points			**5.1%** (10.9)
Gains in percentage points based on average gains			**4.3%**
Discounted present value of lifetime net earnings			
Average of household gains in £	**£518,811** (055,766)	**£538,889** (049,231)	**£20,079** (046,490)
Average of household gains in percentage points			**4.5%** (9.8)
Gains in percentage points based on average gains			**3.9%**
Savings to the Exchequer per household			**£15,914**

More modest effects are found for attending high versus low-quality pre-school provision. For example, it is estimated that the difference in gross lifetime earnings of £12,500 between individuals attending a pre-school scoring in the bottom twenty per cent of the ECERS-R scale and a pre-school scoring in the top twenty per cent of the ECERS-R scale (see Table 8.9).

This translates into a difference in net lifetime earnings of around £7,500 in discounted present value terms once we strip out the estimated taxes paid and benefits received (see Table 8.9). This generates a saving to the Exchequer of around £5,000 per individual, suggesting that those who had attended a high-quality pre-school will pay around £5,000 more in tax (or receive £5,000 less in benefits, or some combination of the two) than those who had attended low-quality pre-schools. The equivalent figure at the household level is around £8,000.

Table 8.9: The impact of attending a high-quality pre-school versus a low-quality pre-school on lifetime net earnings and savings to the Exchequer per individual and household

Earnings gains and savings to the Exchequer at the individual level	**(A) Attending a pre-school in bottom 20% on ECERS-R scale**	**(B) Attending a pre-school in top 20% on ECERS-R scale**	**(C) Difference between (A) and (B)**
Discounted present value of lifetime gross earnings			
Average of individual gains in £	**£449,236** (144,405)	**£461,571** (138,582)	**£12,335** (048,024)
Average of individual gains in percentage points			**4.3%** (12.2)
Gains in percentage points based on average gains			**2.7%**
Discounted present value of lifetime net earnings			
Average of individual gains in £	**£304,031** (089,668)	**£311,563** (086,362)	**£7,532** (028,715)
Average of individual gains in percentage points			**3.6%** (10.5)
Gains in percentage points based on average gains			**2.5%**
Savings to the Exchequer per individual			**£4,803**
Earnings gains and savings to the Exchequer at the household level			
Discounted present value of lifetime gross earnings			
Average of household gains in £	**£857,495** (087,373)	**£876,315** (081,582)	**£18,820** (067,450)
Average of household gains in percentage points			**2.6%** (8.5)
Gains in percentage points based on average gains			**2.2%**
Discounted present value of lifetime net earnings			
Average of household gains in £	**£529,592** (057,562)	**£540,322** (053,955)	**£10,730** (038,494)
Average of household gains in percentage points			**2.4%** (7.7)
Gains in percentage points based on average gains			**2.0%**
Savings to the Exchequer per household			**£8,090**

8.4 Conclusions

In summary, work by Cattan, Crawford and Dearden has investigated the implications of attending pre-school versus no pre-school and then explored the implications of experiencing high versus low-quality pre-school provision from an economic perspective. The latter analysis focuses on dimensions of pre-school quality exclusively based on the ECERS-R measure where the largest impacts were found.

It was found that children who received the average pre-school experience amongst the EPPSE sample earn, on average, around £27,000 more over their working lives in discounted present value terms than children who receive little or no pre-school experience, and around £36,000 more if we take into account the earnings of other members of their household. These figures translate into average percentage gains per individual of around eight per cent and five per cent of gross earnings respectively.

It appears that the key margin for finding a positive impact of pre-school quality involves comparing those in the top eighty per cent of the ECERS-R scale (high or medium quality) versus those in the bottom twenty per cent of the ECERS-R scale. Attending a high or medium quality pre-school has only a modest effect on the estimated discounted present value of gross lifetime earnings at both the individual level and household level. The highest percentage gains do seem to be for relatively lower earners, however, which provides some suggestive evidence that offering high quality pre-school may help to reduce lifetime earnings inequality. Given the uncertainty associated with these calculations, however, these results should only be interpreted as possible indications of the potential magnitude of the long-term individual economic benefits of pre-school quality.

In line with previous analyses, pre-school quality seems to benefit children with lowly educated mothers more than children with more highly educated mothers. In contrast with previous analyses, the differences in effects between boys and girls are not clear enough to make any firm conclusions about differential effects.

While it would be tempting to conclude from these results that the government should invest in high-quality pre-school provision for all children, it must be remembered that these estimates are liable to contain a lot of measurement error, such that one cannot be sure that they accurately estimate the size of effects, or whether they are significantly different from zero (or even positive).

It should also be noted that these estimates represent the gross benefit to the Exchequer, which abstracts from any costs associated with increasing pre-school quality. There are currently very few well developed estimates of how much it would cost the government to increase the quality of low-quality pre-schools. This will depend on the number of such pre-schools and on whether the focus is on all low-quality pre-schools or those with more disadvantaged intakes (e.g., pre-schools whose children have a high proportion of mother's with relatively low qualifications, where the benefits of increasing quality seem to be highest). This is a question for future research.

8.5 Warrant

The findings summarised above alter very little when rigorous sensitivity checks are applied. Overall, these checks suggested that changing either the method of analysis or the real earnings growth rate chosen would not substantially alter the picture presented by these findings. As highlighted throughout the rest of the report (Cattan, Crawford and Dearden, 2014), however, of greater concern is the substantial uncertainty inherent in any attempt to forecast future earnings, and (particularly in the case of the estimated effects of receiving any pre-school experience versus none) the potential bias arising from the selection of children into pre-school on the basis of characteristics that we do not observe and hence cannot account for in our data.

And finally – the analyses reported here should not be viewed as a comprehensive analysis of the possible economic returns to attending pre-school education. The analysis is not able to detect other potential benefits such as the 'knock on' benefit of better qualifications of future parents shaping better outcomes for their children, or better health outcomes and educations in crime that have been linked to educational and employment trajectories (See Belfield et al., 2006).

See Appendix 7 for full details of the economic analysis.

Section 9 Conclusions and discussion

When the 3,000 EPPSE children were recruited shortly before the turn of the century no one could have predicted their career paths at the age of 16+. We were able to track the vast majority (over 80%) of EPPSE's young people up to age 16 and beyond, finding that many are still in full-time education, studying with high aspirations for entrance to university, or for vocational qualifications that they hope will lead to employment, with a small number already working, studying part-time or not in education, employment or training (NEET). Through surveys and interviews they told us how important it was to get 'good results' in their GCSE exams and nearly three quarters thought getting A levels was important. In fact, close to half (43.7%) the sample achieved the more demanding benchmark 5A*-C including English and maths. This benchmark was a strong predictor of the 'higher academic route' (studying 4 or more A/AS levels) discussed in the section on post-16 destinations.

Section 3 of this report describes the variation in GCSE results, showing the familiar equity gaps in attainment for key groups of students. Multilevel analyses revealed the contribution of individual, social and neighbourhood influences in shaping students' GCSE exam performance. Once background characteristics had been taken into account, influences related to pre-school, primary school or secondary schooling were used as predictors to test the effects of educational influences (net of background) on a range of GCSE outcomes. The same modelling was applied in subsequent sections to other educational outcomes of importance including measures of social-behavioural development, mental well-being, dispositions and post-16 destinations (including NEET). By studying outcomes across successive phases of education and modelling progress across five years in secondary school (from Year 6 to Year 11) it was possible to identify the influences, either past or present, that contributed to results on the high stakes examinations, 'staying on' in education, anti-social behaviour, mental well-being and dispositions towards learning. This is the first report since the children were 5 that shows how individuals in the post 16 sample have such different daily experiences. Most spend their days in college or school but a small number travel to jobs each day and an even smaller number attend education part-time or were NEET.

9.1 Family influences

Taken together family influences are the strongest predicators of exam success, as they were at Key Stage 1 (KS1), KS2 and KS3. In particular parents' own educational success remains the strongest influence in KS4. Students whose parents had degrees obtained 141 total GCSE points more than students whose parents had no qualifications at all. When a range of individual, family, home learning environment (HLE) and neighbourhood measures were included in the statistical models predicting total GCSE scores, parental education was found to be the strongest predictor of success followed by the students' experience of 'academic enrichment activities' during KS3.

Interestingly parents' socio-economic status (SES) and family income, although also important, showed weaker effects than parental education. When surveying the young people six months after GCSE they reported their main source of information about future education and employment was from their own family.

The findings show clearly that in England the family remains the most important source of influence on young people at 16. Family advantage or disadvantage repeats itself across the generations. However, though these statistical patterns reveal strong trends at the group level, they cannot explain all the variation in individual students' outcomes. This study has identified significant educational influences that can also shape outcomes, although they do not overturn the powerful group differences that EPPSE has documented across successive phases of education.

As found in other studies (Bradley, 2002; Bradley et al., 2001), EPPSE found that family characteristics influenced behaviour and dispositions as well as attainment. SES was one of the strongest predictors of all four social-behavioural outcomes, with children of parents in professional jobs showing higher levels of pro-social behaviour and self-regulation and lower levels of anti-social behaviour and hyperactivity. The effect sizes for SES were moderate to high showing that at the end of compulsory schooling the status of the parents' jobs was a stronger influence on behaviour than was parental education, poverty measured via eligibility for free school meal (FSM), or family size. It is tempting to conclude that children of parents who themselves were characterised by educational success and job achievement develop confidence in their own talents and can articulate detailed pathways to success that depend on soft skills as well as top marks.

In Year 11 the EPPSE students were sent a survey about their lives at home. They replied to questions about family activities, relationships and support for learning at home. Family relationships appeared to shape behaviour as well as dispositions. Family discord predicted poorer dispositional factors, including less enjoyment of school, and poorer mental well-being. Students who reported higher levels of quarrelling with parents had lower mental well-being, although it is likely there may be reciprocal relationships at work here. Family break up and re-constituted families (with a step parent) were also predictors of poorer outcomes in line with other research (Dunn et al., 1998; Dunn, 2002). Finally, enrichment activities such as independent reading or educational visits outside the school predicted higher mental well-being too.

The ‘Post 16 Destinations’ section contains many examples of the importance of the family and support and experiences at home. Parents were a main source of advice for young people when considering career possibilities, more frequently noted than professionals at school or in the community. EPPSE found that family support for teenagers’ career planning was mixed, perhaps because some families do not possess strategic knowledge about access to the professional careers which the majority of the EPPSE sample told us they aspired to.

9.2 Learning opportunities outside school

The early years home learning environment (HLE) still predicted students’ later academic outcomes at age 16, but these effects were weaker than the strong ones found in pre-school and primary school. By age 16 the effects were not as strong as those of concurrent demographic influences such as family SES, or parents’ qualification level. The follow up to KS4 of young people shows that early learning activities in the home have long term consequences. However, the present matters too: the qualifications of parents, the current capacity of the family to support academic enrichment activities and living in poverty (FSM status) also have significant effects on total GCSE scores. So, the past continues to have an influence but so does the present, especially concerning parents’ education and the family’s socio-economic status. For example, the difference between an FSM and non-FSM student amounted to a full GCSE grade in English or in maths.

Which influences are less important in predicating success? A large longitudinal study such as EPPSE allows the relative contribution of different background characteristics to be identified when tested in combination. For instance family size (3+ siblings) or early health problems both show sustained but relatively weaker effects in the secondary phase in comparison to enrichment activities outside the school in KS3.

9.3 Gender and outcomes

EPPSE findings in relation to gender are puzzling when considered in light of gender imbalances later in life in income, employment at board level, and involvement in science, technology, engineering and mathematics (STEM) related occupations. Over the course of EPPE/EPPSE, girls outperformed boys in cognitive/academic attainment and social behaviour (with the notable exception of maths scores, where girls and boys were more or less even at 16). Girls were also rated by their teachers more positively on all four social-behavioural outcomes. In terms of school-related dispositions, girls reported themselves as more resistant to peer pressure in Year 11 than boys, engaging less in ‘risky behaviours’ and they also had higher citizenship values in Year 9.

Nonetheless, girls reported significantly lower mental well-being than boys at age 16 and more anxiety at age 14. Boys indicate at age 14 and 16 that they are more confident and feel more positive about themselves than girls. For example, boys' academic self-concept is no lower than girls' - despite their lower test performance, especially in English. However, girls reported enjoying school more than boys and consistently reported spending more time on homework, an influence that strongly predicts success in secondary school. The 'good citizen' girls who do their homework and enjoy school are also keener to go to university.

9.4 'Young for school year'

Previous research has shown an age effect with younger students within their age group being disadvantaged (Crawford, Dearden and Meghir, 2007; 2010). EPPSE has shown that being younger in the year group (Summer versus Autumn-born) was strongly associated with most outcomes in pre-school and primary school, although in this report, it is not surprising that being one of the youngest in class became less important in secondary school. Nonetheless, it is still a significant and negative predictor of exam performance, although the effect sizes are small.

9.5 Secondary school influences

EPPSE tested several external indicators of secondary school effectiveness (based on the DfE Contextual Value Added scores) and quality (Ofsted). The CVA predicted better total GCSE scores but not subject grades, which may be more likely to reflect departmental effectiveness. There were moderately strong effects on overall academic progress (KS2 – KS4), after taking into account prior attainment. Ofsted judgements of secondary school quality predicted the total number of GCSE entries and subject grades in GCSE English and maths. Ofsted data showed that there were moderately strong effects for attending an Outstanding compared to an Inadequate school for both attainment and progress.

Taken together, the external indicators of academic effectiveness and school quality showed that going to a 'better' school gave a significant boost to EPPSE students over and beyond the effects of their own individual, family and neighbourhood background characteristics. Schools do matter: going to a 'better' school as measured by these indicators can enhance the likelihood of academic success at GCSE.

In addition to the global indicators from official sources students reported on their views and experiences of the secondary school they attended. Questionnaire items grouped quite well into coherent school measures. Of these, the school's score for the factor 'Positive relationships' had the strongest effect on GCSE scores, and also on the benchmark indicator of 5 GSCE A*-C (with and without English and maths) when compared to the other four school measures.

‘Positive relationships’ was followed closely in terms of effect size by the school’s score for ‘Teacher professional focus’. School characteristics reported by students were also found to be significant predictors of their social-behavioural outcomes. Students attending secondary schools rated more favourably in terms of the factor ‘Positive relationships’ showed improvements in the ‘softer’ outcomes such as self-regulation and also pro-social behaviour.

It is interesting that seventeen per cent of the variance in behaviour climate scores at age 14 was accounted at school level, showing considerable variation between secondary schools in their behavioural climate. Other international research across OECD countries (Wheater et al., 2013) has suggested that students in England have more favourable views of their schools and teachers than students in many other countries. The EPPSE findings chime with the OECD findings since EPPSE students generally expressed fairly positive views of their secondary school experiences overall.

9.6 The importance of homework

Moderate to strong effects were found for the amount of time students reported they spent on homework on a typical school night during the week. The value of homework has been much debated and the EPPSE study has examined its effects in both KS3 and KS4. Those who reported they spent 2-3 hours a night on homework in Year 9 were about 10 times more likely to achieve 5 or more A*- C grades than those who did no homework at all, controlling for the important effects of individual, family and neighbourhood. But any time on homework showed a positive effect, with a clear gradient indicating that the extra effort paid dividends. Homework can increase the opportunity to learn and master curriculum and promote study skills as well as independent learning. If homework is set and assessed the likelihood of feedback on learning is increased. The EPPSE analyses have also demonstrated the significant and strong contribution of homework after controlling for prior academic attainment (at the end of KS2) and prior self-regulation in promoting progress in secondary school. EPPSE also shows that part of the explanation for girls’ better GCSE results is predicted by their putting in more time on homework. It is never possible to establish cause in the matter of homework in a longitudinal study of young people’s typical experiences and behaviours such as EPPSE but the findings strongly suggest that spending time on homework in secondary school is strongly linked to better academic progress. Future experimental research could throw more light on the way homework may be best used to support learning.

9.7 Pre-school and primary school influences

Other studies have recognised the enduring impact of pre-school (Berlinski et al., 2008; 2009) and similarly EPPSE has consistently found moderate and significant positive effects for pre-school experiences on children's outcomes in primary school. The latest results show that effects last up to the end of compulsory schooling. Attendance at pre-school, compared to none, was a significant predictor of higher total GCSE scores and grades in English and maths. It also predicted achieving five or more GCSEs at grade A*-C, the vital 'entry ticket' to undertaking AS or A levels that enable application to a good university at age 18. Having established that attending pre-school had effects that still show up in academic results at age 16, EPPSE findings also reveal that the duration of pre-school (in months) continued to benefit students in terms of total GCSE scores and grades in GCSE English and maths. In other words, both attendance and also 'dose' of early education has had lasting effects to the end of statutory education.

Pre-school quality mattered too, although its effects are weaker than at the end of primary school. Attending a higher quality pre-school significantly predicted total GCSE score as well as grades in GCSE English and maths. Attending a high quality setting, in contrast to no pre-school or only a low quality setting, unsurprisingly showed positive effects. There were some indications that pre-school quality had stronger effects on students whose parents had lower qualifications compared to those with better educated parents. These differential effects were found for grades in GCSE English as well as maths and suggest that quality matters most for those with parents who have low qualification levels. This finding is relevant to narrowing the gap between those from well-educated families and those whose parents have lower qualifications, as education of parents is such an important determinant of the equity gap.

Analysis of post 16 destinations also revealed lasting effects of pre-school in terms of predicting the likelihood of different routes. Attending any pre-school, longer duration in months and higher quality all predicted a greater likelihood of choosing the higher academic route (which we defined as studying 4 or more A/AS levels) and a reduced likelihood of the vocational route. This remained evident after control for individual, family, HLE and neighbourhood influences. This shows that the benefits of pre-school in shaping long term outcomes remain across all phases of schooling and into young adulthood.

The academic effectiveness of the primary school a student had attended also predicted exam success and boosted the progress made during KS2 and KS3 (Sammons et al, 2008a; 2008b; 2013). The effects remained significant for maths to the end of Year 11. This is the subject that tends to show more evidence of school effects compared to English.

9.8 Economic Analysis

Economic analyses carried out by Cattan, Crawford and Dearden (see Section 8; Appendix 7) add further to the empirical argument in favour of pre-school attendance and high quality early years provision. These economists calculated the likely income benefit of attending any pre-school vs. not attending to individuals of around £27,000 over the lifetime and to households of around as £36,000. This study also estimated the likely savings to the Exchequer of children attending pre-school, or of attending a higher quality pre-school, although it must be acknowledged that they estimated only one channel of return to society (Belfield et al., 2006). The findings suggest that attendance in a pre-school setting will go on to 'save' the Exchequer around £16,000 (for a household). This is the first large scale study in the UK to estimate some of the potential financial returns of early childhood education to individuals or society on income. It is early within the lifetime of the EPPSE sample to make predictions about their future labour market outcomes, and therefore these results must be treated with caution. However the analysis is innovative because it represents a first attempt to estimate the possible long term economic returns arising from investment in the expansion of pre-school education in the UK.

Moreover, these analyses are not able to detect other potential benefits such as the 'knock on' benefit of higher qualifications of future parents shaping better outcomes for their children, or better health outcomes and reductions in crime that are linked to educational and employment trajectories.

9.9 EPPSE methods in light of other research

EPPSE is interdisciplinary in using constructs and methods drawn from a range of disciplines, but especially education and psychology. Many of the EPPSE findings confirm or support the conclusions of other studies. For example the adverse impact of social disadvantage on children's development is widely known (McCulloch and Joshi, 2001; Mercy and Steelman, 1982; Muijs et al., 2004; Reynolds et al., 2001; Vandell et al., 2010; Younger et al., 2005). The equity gap in attainment is recognised to be a particularly strong feature of the English education system in international comparative studies such as PISA (OECD, 2004; Wheater et al., 2013).

School effectiveness research in many countries has demonstrated that schools vary in their impact on outcomes and that school effects matter most for disadvantaged groups of students. EPPSE has added new knowledge in the way it has been able to tease out the net contributions of a wide range of influences on both attainment and progress in both 'hard' and 'soft' skills and to establish how far patterns remain consistent, what the strongest predictors are, and how some influences wax while others wane.

The EPPSE research has thrown particular light on the role of pre-school and how its effects last, along with their potential economic consequences in line with other research (Bauchmuller et al., 2011; Belsky et al., 2007). The findings also reveal that primary schools and secondary schools, especially in the KS4 outcomes, can help to ameliorate, (although not overcome) the adverse impacts of early experiences or continuing disadvantage. All phases of education are important but an early start to pre-school and the experience of higher quality continue to promote good development.

As well as official indicators, the findings on secondary school influences have many implications for school improvement and raising standards (Stringfield et al., 2008; Teddlie and Stringfield, 1993). The students' reports on their own experiences of secondary school reveal the importance of positive relationships, along with academic/professional focus and formative feedback for raising achievement.

Although the young people in our study (especially those from ethnic minorities) enjoyed school and aspired to higher status jobs, a large minority (40%) had financial concerns about funding future university study. These young people were entering post compulsory destinations at a time of economic recession and public sector cuts. They were 'worried' about finances but they were still aiming high. It is not possible to say how far the EPPSE students' aspirations will be fulfilled at this stage. What has been shown is how different influences taken together shaped their post 16 destinations and likelihood of entering the higher academic route.

The UK was experiencing economic problems of recession at the time EPPSE students moved into post-compulsory destinations (2009-2012). Indeed some of the highest rates recorded for youth unemployment in the UK in the last twenty years (around 20% for 16-24 age group and higher for those aged 16-17) were reported during this time. The wider outlook for employment was uncertain and this is likely to have affected young people's decisions; staying in education may have seemed the safest option.

To summarise, EPPSE uses an educational effectiveness approach combined with a longitudinal design across different phases of education to investigate the combined influences of pre-school, primary school and secondary school experiences upon students' development up to age 16. In addition to its quantitative strand, EPPSE's mixed methods design used qualitative data to investigate the 'lived experiences' of young people and so extend the quantitative findings by shedding light on a sample of those who were NEET.

This mixed methods approach (Sammons, et al, 2005; Siraj-Blatchford et al., 2006) has been used to throw light on pre-school experiences, pedagogy in primary school and children and families who 'succeeded against the odds'. In KS4 the focus turned to the NEET group to seek to enhance our understanding of processes in homes and schools which may explain why some young people struggle through school and entering employment. Overall, EPPSE has sought to show how individual, family, HLE and neighbourhood, as well as educational, characteristics and experiences influence

children’s and adolescents’ educational outcomes in the broadest sense. Equity gaps emerge early and remain strongly evident, but despite this most young people in our study value their educational experiences and enjoy school. The majority are continuing in education and show relatively high aspirations for their futures.

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Glossary of terms

A-level (include Applied A-level): the GCE Advanced Level qualifications are the main pre-university qualification taken by students in England. For further information see http://ofqual.gov.uk/qualifications-and-assessments/qualification-types/a-levels/

A/S-level: The AS is a stand-alone qualification, usually made up of two units, and is worth half the value of a full A-level. For further information see http://ofqual.gov.uk/qualifications-and-assessments/qualification-types/a-levels/

Academic self-concept: EPPSE derived two measures of Academic self-concept from Year 9 student questionnaire data: 'Academic self-concept for English' & 'Academic self-concept for maths'. Both measures are based on items taken from existing well established 'academic self-concept' scales (Marsh, 1990a; 1990b; Marsh & Hau, 2003; Marsh & Craven, 2006). In addition a General academic self-concept measure, based on similar items (and based on Marsh's scale) was derived from the Year 11 questionnaire.

Academic ethos – Year 11 Factor: A factor derived from Year 11 student questionnaire items that relates to the extent to which students feel that other students within the school are interested in learning, doing well and continuing their education past compulsory education age.

Age standardised scores: Assessment scores adjusted to take account of the pupil's age at testing, enabling comparisons between the cognitive/academic outcome of an individual pupil, and the achievement of a nationally representative sample of pupils in the same age group or, in this case, the achievement of the EPPSE sample.

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.

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.

Aspiration: Aspirations refer to students intentions for future educational destinations and achievements, such as gaining qualifications, carrying on in education (e.g., going to university) and career choices.

‘At risk’: The term ‘at risk’ is complex and differs depending on the criteria used. The definition of possible cognitive/academic ‘at risk’ used in the ETYSEN study (Taggart et al., 2006), was based on children’s cognitive/academic attainment age 3; a score of one standard deviation (sd) below the mean (in standardised assessments) in relation to national norms (at risk). In the EPPSE case studies, there are various definitions of risk and resilience (Siraj-Blatchford et al., 2011a).

Basic Skills: qualifications in literacy and numeracy for adults and other skills for everyday life (http://ofqual.gov.uk/files/2010-11-26-statistics-glossary.pdf [Last accessed 14 March 2014]).

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 1001-1500 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.

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.

BTEC: This is a type of vocational work-related qualification offered by the Business and Technology Education Council (BTEC) in three levels: Award, Certificate and Diploma.

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 the 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.

City & Guilds: This is a type of vocational work-related qualification, offered by City & Guilds qualifications, which can be completed in the workplace, in the classroom or workshop. For further information, see http://www.cityandguilds.com/courses-and-qualifications/qualifications-explained/ [Last accessed 14 March 2014]).

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).

Continuous measures: Numerical/Scale variables. In this report, continuous measures include total GCSE and equivalents point score, grade achieved in full GCSE English, grade achieved in full GCSE maths, and the total number of full GCSE entries

Contextualised models: Cross-sectional multilevel models exploring individuals' outcomes, while controlling for individual, family and home learning environment (HLE) 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 ranging 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.

Dichotomous measures: categorical variable with only two possible values (1 defining the existence of a characteristic and 0 defining the inexistence). In this report, dichotomous measures include achieved 5 or more GCSE/GNVQs at grades A*-C, achieved 5 or more GCSE and equivalents at grades A*-C including GCSE English and maths and achieved the English Baccalaureate.

The Diploma: The Diploma is composite qualification for 14 to 19 year-olds, made up of individual free-standing qualifications combined in a specific way, mixing practical and theoretical learning, with an emphasis on 'applied learning'. Three of the components of the Diploma (Principal Learning, Project and Functional Skills) can also be studied as qualifications in their own right. (http://webarchive.nationalarchives.gov.uk/+/http://www.ofqual.gov.uk/popups/explaining-qualifications/ [Last accessed 14 March 2014]).

Disaffected behaviour (from Year 11 Dispositions report): Disaffected behaviour is the term EPPSE has used to reflect negative and positive behaviours/attitudes that indicate the extent of school engagement (behaviour within class and a more general item covering perceptions of the worth of schooling).

Dispositions: An overarching term used to refer to factors such as 'Mental well-being', 'School Enjoyment', 'Disaffected behaviour', 'Resistance to Peer Influence' and 'general academic self-concept'. The EPPSE study derived these factors from the Life in Year 11 questionnaire. EPPSE had previously derived other disposition factors such as 'enjoyment of school', 'academic self-concept (English and maths)', 'popularity', 'citizenship values' and 'anxiety' from the 'All about Me' and 'All about Me in school' questionnaires completed by EPPSE students in Year 9 .

E2E: Entry to employment is a learning programme which is part of the work-based learning route and funded by the Learning and Skills Council (LSC). It is designed to provide opportunities for young people aged 16 and over who are not yet ready or able to take up a Modern Apprenticeship or further education or to move directly into employment. http://www.nfer.ac.uk/publications/EET01/EET01_home.cfm

English Baccalaureate (EBacc): The EBacc is not a qualification but a performance measure that indicates where a student has secured a C grade or above across a core of KS4 academic subjects (https://www.gov.uk/government/publications/english-baccalaureate-eligible-qualifications/ [Last accessed 14 March 2014]).

ECERS-R and ECERS-E: The American Early Childhood Environment Rating Scale (ECERS-R) is an observational instrument based on child centred pedagogy that assesses interactions and resources for indoor and outdoor learning (Harms et al., 1998). The English ECERS-E rating scale (Sylva et al., 2003) is an extension to the ECERS-R that was developed specially for the Effective Provision of Pre-school Education (EPPE) study to reflect developmentally appropriate practices in early years Literacy, Numeracy, Science & the Environment and Diversity (gender, race, individual needs). 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 size (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 make 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.

EPPE: The Effective Provision of Pre-school Education (EPPE) project was designed to explore the impact of pre-school on children's cognitive/academic and social-behavioural outcomes as well as other important background influences (including family characteristics and the home learning environment). EPPE was the original phase of the EPPSE study, funded by the Department for Education and Employment and ran from 1997-2003.

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). Procedures used by EPPSE include:

- Exploratory Factor Analysis (EFA) – a type of analysis 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 Factor Analysis (CFA) – a type of factor analysis 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).

Formative feedback – Year 11 Factor: A factor derived from Year 11 student questionnaire items that relate to students' experiences of practical support from teachers, helping students when they are stuck and guiding them on how to improve their work.

Free school meals (FSM): In order to be eligible for a free meal at school students' parents must have a low income or be eligible for some other form of income/welfare support. A Free School Meal is therefore an indicator of family poverty with the Government funding this household benefit.

Functional Skills: These qualifications, available in England to those aged 14 and older, are available as stand-alone qualifications at a number of different levels, and may also contribute towards the Diploma qualification. Functional Skills qualifications lead to the development of practical skills that allow learners to use English, maths and ICT in real life contexts (http://ofqual.gov.uk/files/2010-11-26-statistics-glossary.pdf [Last accessed 14 March 2014]).

GCSE: General Certificate of Secondary Education (GCSE) exams are usually sat during Year 11 at age 16 but can be taken by 15 to 18 year olds in schools or colleges. They can also be taken by those wanting to gain an exit school level qualification see http://ofqual.gov.uk/qualifications-and-assessments/qualification-types/gcses/ [Last accessed 14 March 2014]).

GCSE Benchmark Indicators: DfE benchmark indicators of GCSE performance include:

- achieved 5 or more GCSE/GNVQs at grades A*-C
- achieved 5 or more GCSE and equivalents at grades A*-C including GCSE English and maths
- achieved the English Baccalaureate.

Head teacher 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 predefined sub-groups or levels within a system (i.e., students, schools, local authorities).

Higher academic route: dichotomous measure based on students' responses on the Life After Year 11-Questionnaire 1- Full-Time Education. It takes the value 1 for those who took 4 or more AS/A levels and 0 for all others returning a Life After Year 11 questionnaires.

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, KS3 HLE (please see Appendix 4 for further details).

Homework: Tasks students are given by their teachers to be completed outside the lesson. In EPPSE students' self-reported time spent on homework on an average school night predicted outcomes at age 16.

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 Super Output Area (SOA) that live in families that are income deprived. For further details see Noble et al., (2008).

Independent School - Category: An independent school is any school or establishment, which is not maintained by a local authority or a non-maintained special school, that provides full time education for 5 or more pupils of compulsory school age (http://www.education.gov.uk/edubase/glossary.xhtml?letter=I [Last accessed 14 March 2014]).

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).

International Baccalaureate: The International Baccalaureate Diploma Programme is a programme of education with final examinations that prepares students, aged 16 to 19, for success at university and life beyond - see http://www.ibo.org/diploma/ [Last accessed 14 March 2014]).

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 Skills: These qualifications can be studied in 6 subject areas (communication, application of number, information and communication technology (ICT), working with others, improving own learning and performance, and problem solving) that provide the necessary skills for learning, working and life in general (http://ofqual.gov.uk/files/2010-11-26-statistics-glossary.pdf [Last accessed 14 March 2014]).

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).

Lower academic route: dichotomous measure based on students' responses on the Life After Year 11-Questionnaire 1- Full-Time Education. It takes the value 1 for those who took 3 or less As/A levels and 0 for those who are on a higher academic route.

Matriculation: refers to the qualification (in any country) that describes the transfer from secondary to tertiary education.

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).

Mental well-being (from Year Dispositions report): In order to asses mental well-being EPPSE included items from the Warwick-Edinburgh Mental Well-Being scale (Tennant et al., 2007) in the Life in Year 11 questionnaire. The Warwick-Edinburgh Mental Well-being scale was used to measure students' positive mental well-being in Year 11 allowing investigation of specific aspects of mental well-being as well as providing an overall scale.

Monitoring students – Year 11 Factor: A factor derived from Year 11 student questionnaire items that relate to the extent to which teachers monitor the progress students are making, set targets and reward hard work.

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 focused 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., (2002b).

Multiple regression: 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 or which can be awarded to a student by 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 1	Level 1
	Level 2 – Expected Level	Level 2	Level 2
	Level 3	Level 3	Level 3
	Level 4	Level 4 – Expected Level	Level 4
		Level 5	Level 5 – Expected Level
		Level 6	Level 6
			Level 7
			Level 8
Maths Levels	Working towards level 1		
	Level 1	Level 1	Level 1
	Level 2 – Expected Level	Level 2	Level 2
	Level 3	Level 3	Level 3
	Level 4	Level 4 – Expected Level	Level 4
		Level 5	Level 5 – Expected Level
		Level 6	Level 6
			Level 7
			Level 8
Science Levels	Working towards level 1		
	Level 1	Level 1	Level 1
	Level 2 – Expected Level	Level 2	Level 2
	Level 3	Level 3	Level 3
	Level 4	Level 4 – Expected Level	Level 4
		Level 5	Level 5 – Expected Level
		Level 6	Level 6
			Level 7
			Level 8

Net effect: The unique contribution of a particular variable upon an outcome while other variables are controlled.

NEET: The term NEET (Not in Education, Employment or Training) is used to describe young people (aged 16 to 25) who are not studying, working or involved in formal training programmes.

Non-Maintained Special School - Category: Type of Establishment. Non-Maintained Special schools are special schools approved by the Secretary of State for Education and Skills, and are run on a not-for-profit basis by charitable trusts and normally cater for children with severe and/or low incidence special educational needs. Non-Maintained Special schools get the majority of their funding from local authorities placing children with special educational needs statements at the schools and paying the fees (http://www.education.gov.uk/edubase/glossary.xhtml?letter=N) [Last accessed 14 March 2014]).

Null model: Multilevel model with no predictors.

NVQ: National Vocational Qualifications (NVQ)s are 'outcome based' and are delivered in a workplace setting. NVQs are work-related, competence-based qualifications that cover a broad range of industry sectors and occupations. (http://webarchive.nationalarchives.gov.uk/+/http://www.ofqual.gov.uk/popups/explaining-qualifications/ [Last accessed 14 March 2014]).

Odds Ratio (OR): Odds Ratios represent the odds of achieving certain benchmark performance indicators given certain characteristics relative to the odds of the reference group.

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/) for further details.

Out of school activities (from Year 11 Dispositions report): Out of school activities include activities students were involved in outside of school during Year 11 (during the month previous to completing the Life in Year 11 questionnaire). They include activities such as reading, going to the library, going to parties, going to church, music groups etc.

Pedagogical strategies: Strategies used by an educator to support learning. These include face to face interactions with students, the organisation of resources and the assessment practices.

Peer group (and Peer group affiliation) (from Year 11 Dispositions report): The peer group refers to other students in their immediate social circle, primarily other students sharing similarities such as age and background. Peer affiliation refers to being affiliated, or associated, with a specific friendship group.

Physical Health (from Year 11 Dispositions report): Physical health refers to students' health status, including any illness, disability or infirmity experienced in the 12 months previous to completing the Life in Year 11 questionnaire.

(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.

Positive relationships – Year 11 Factor: A factor derived from Year 11 student questionnaire items that relate to how well students and teachers get on, such as students feeling they are treated fairly and respected and teachers showing an interest in students.

Pre-reading attainment: Composite formed by adding together the scores for assessments of 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., 2004b).

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 and Year 11 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.

Resistance to peer influence (from Year 11 Dispositions report): The Resistance to Peer Influence scale (RPI) examines a students' ability to resist the influence of their peers in more than just anti-social scenarios, ranging from wanting to fit in with the crowd to being willing to break the law to fit in with friends. Items included 'I think it's more important to be who I am than to fit in with the crowd'.

'Risky' behaviours (from Year 11 Dispositions report): Students were asked about activities considered as 'risky' to health or as 'risky' anti-social behaviours and responses to these items were then combined to form an overall measure of 'risky' behaviours. EPPSE asked about the following 'risky' behaviours in the Life in Year 11 questionnaire: Truanting - Smoking prevalence - Drinking prevalence - Drug usage - Anti-social criminal behaviours and legal intervention.

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.

Root Mean Square Error of Approximation (RMSEA): The RMSEA is an index measure of statistical models; 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 England, but being representative of urban, rural and 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) were randomly selected across the regions.

School engagement (from Year 11 Dispositions report): Fredericks et al., (2004) view School engagement as multi-dimensional covering 'behavioural engagement', 'emotional engagement' and 'cognitive engagement'.

School enjoyment (from Year 11 Dispositions report): The EPPSE definition of School Enjoyment is an aspect of what Fredricks et al., (2004) would describe as the 'emotional' dimension of 'school engagement'. The EPPSE factor 'School Enjoyment' includes items such as 'On the whole I like being at school'.

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 16, 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.

Special Educational Needs (SEN): Children with an SEN have been assessed as having a specific need which demands additional attention/resources. Children with an SEN can be placed on the Code of Practice at various levels, depending on their conditions see https://www.gov.uk/government/publications/special-educational-needs-sen-code-of-practice

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

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 professional focus – Year 11 Factor: A factor derived from Year 11 student questionnaire items that relate to perceptions of teachers' focus on day to day teaching responsibilities such as learning and behaviour within the classroom.

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 GCSE and equivalents point score: This is a mechanism for comparing equivalencies of different types of KS4 exams, based on the student's total point score and not the average points scores per subject. For example in School A, if pupils take 10 full GCSEs and in each obtain grade C, which has a points score of 40, their total points score will be 10 x 40, which is 400. If all pupils in the school had the same results, the school's average total points score would be 400. In School B all pupils might take only 8 GCSEs but in each attain grade B, which has a points score of 46. The school's average total points score would be 368. So School A has a higher average total points score than School B. In EPPSE total points score is a continuous measure.

Total number of full GCSE entries: The total number of GCSE's students were entered for regardless of the results.

Trajectory: used to describe a pathway or route a person might follow through time. It is used in the report in the descriptive sense rather than the statistical sense of a Trajectory Analyses.

Truanting (from Year 11 Dispositions report): Truanting refers to whether the student had taken unauthorised time off school during Year 11 (the students were asked if they had bunked/skived off in Year 11).

Value added models: Longitudinal multilevel models exploring individuals' progress over time, controlling for prior attainment as well as significant individual, family and HLE 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 pupils: A factor derived from Year 9 student questionnaire items that relate to whether the school values students' views, teachers listen to student's 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 pupils', 'headteacher qualities', 'poor behaviour climate', 'emphasis on learning', 'teacher discipline', and 'school/learning resources'. The EPPSE study derived these factors from the 'All about me in school' questionnaire completed by students in Year 9 and the 'Life in Year 11 questionnaire', completed in Year 11.

Vocational qualifications: work-related qualifications that are examined through practical assessment as opposed to formal academic assessment. Types of vocational qualification include NVQ, VRQ, and the Diploma.

Vocational route: dichotomous measure based on students' responses on the Life After Year 11-Questionnaire 1- Full-Time Education. It takes the value 1 for those who did not take any As/A levels, but returned a Life After Year 11-Questionnaire 1- Full-Time Education questionnaire.

Z score (from Year 11 Dispositions report): A Z score is a statistical method for standardising data so that the mean equals zero and the standard deviation equals one.

VRQ: Vocationally Related Qualifications (VRQs) are related to employment but, unlike NVQs, do not necessarily require a work placement. VRQs are work-related, competence-based qualifications designed to provide learners with the skills and knowledge needed to do a job (http://ofqual.gov.uk/files/2010-11-26-statistics-glossary.pdf [Last accessed 14 March 2014]).

Well-being: Well-being here refers to aspects of young people's life such as physical health, peer and family relationships, and engagement (or not) in 'risky' behaviours.

The Edinburgh Mental Well-being scale: The Warwick-Edinburgh Mental Well-being scale is a 14 item scale (Tennant et al., 2007) that covers aspects of hedonic and eudaemonic well-being. Hedonic well-being is more emotional in nature, such as feelings of optimism, cheerfulness and feeling good about oneself. Eudaemonic well-being relates to mental capacities such as dealing with problems, thinking clearly and decision making.

Appendix 1 - Summary of key findings from earlier phases of the EPPE/EPPSE programme of research

Key findings from the pre-school phase (age 3-5)

Full details of the analyses and findings of the pre-school phase are contained in 11 Technical Reports and an end of project report with summary research brief – see www.ioe.ac.uk/eppse

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. Children made better progress in fully integrated centres and nursery schools. The duration of attendance is important: longer duration was 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). 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 (HLE), 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 (REPEY) 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 involved 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 (age 5 – 11)

Full details of the analyses and findings of this phase are contained in a number of Technical Reports and an end of project report with summary research brief - see www.ioe.ac.uk/eppse

Effects of pre-school

The positive benefits of pre-school education persisted to the end of Key Stage 2 (age 11) with significant benefits for English, maths and 'pro-social' behaviour. (Sylva et al., 2008). These effects were largely carried by pre-school settings of medium or high quality where quality was an important predictor of all children's academic and social-behavioural outcomes. This was especially important for boys, children with SEN and those from disadvantaged backgrounds or who had 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.) remained 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 at 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 (KS1) and KS2 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., 2006a; 2006b). 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., 2008, Sammons et al., 2008b, Sammons et al., 2008c).

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. Pupil and teachers behaviours were explored through both quantitative and qualitative lines of enquiry.

The quantitative analyses showed 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’. A sub-study in 125 schools showed that there were moderately strong relationships between inspection measures and pupils’ outcomes, particularly for maths and a number of social-behavioural (Sammons et al., 2007a; Sammons et al., 2007b).

As well as classroom observations Year 5 teachers returned questionnaires which included questions about their school context and processes. These showed that teachers’ self reports of their school context and processes (particularly the five factors concerning ‘school standards’, ‘pupils’ agency and voice’, ‘anti-academic ethoses, ‘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’.

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 used a qualitative analytical framework. This showed significant differences in the strategies used by teachers in excellent, good and poor schools. There appeared to be a ‘bundle’ of strategies that make a difference to children’s development and progress. Eleven strategies differentiated schools with different levels of effectiveness and quality of pedagogy:

- organisational skills
- sharing learning objectives
- the use of homework
- positive classroom climate
- behaviour management
- collaborative learning
- personalised teaching and learning
- making learning links explicit
- dialogical teaching and learning
- assessment for learning practices
- the use of the plenary.

Pre-school and primary school interactions

The combination of attending a higher quality pre-school and then an academically effective primary school had benefits for pupils' academic outcomes at age 11, especially for maths. High quality pre-school provided 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., 2008d; 2008e). These pupils' self-perceptions (also termed students' dispositions) and views of school showed relationships with learning and social-behavioural development. 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 higher for pupils who were eligible for FSM and for those who had previously attended high quality pre-school vs. 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 reductions 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).

Key findings from the early secondary school phase (age 11 – 14)

The effects of pre-school

The quality of the pre-school attended predicted better outcomes in maths and science in KS3 with medium and high quality being better than low quality. In science, only medium or high quality pre-school continued to be significant for better attainment. Pre-school quality positively predicted all four social behaviours in KS3. Students who attended higher quality pre-schools showed significantly better social-behavioural outcomes than those in low quality or the non-pre-school group.

The effectiveness of the pre-school attended (in promoting pre-reading skills) continued to predict better outcomes in English when comparing those in highly effective settings with the non-pre-school group. For maths, all pre-school effectiveness groups (high; medium and low) had better KS3 results than the non-pre-school group. For science, attending a high/medium effective pre-school predicted better outcomes compared to the non-preschool group.

The individual, family, Home Learning Environment (HLE) and neighbourhood influences

Girls had higher attainment than boys in English but there were no significant gender differences in maths or science. Girls were rated by teachers as showing significantly better social-behavioural profiles than boys at age 14 in all four outcomes.

Autumn-born (oldest in year group) made more progress in English, maths and science over KS3 than younger students, however age in year group did not predict social-behavioural development.

Experiencing ‘multiple disadvantage’ during the early years was a strong predictor of poorer outcomes later for all social behaviours. For academic outcomes, of those students who were the most disadvantaged (4+ disadvantages) only fifty-eight per cent achieved Level 5 (+) in English and sixty-two per cent in maths. This compares with results for those students who were least disadvantaged where eight-seven per cent achieved Level 5+ in English and eighty-nine per cent in maths.

Mother’s qualification level was the strongest background predictor of better attainment. Students with highly qualified parents (degree level) had much higher attainment on average than those students whose parents had no qualifications. Similar patterns were evident for social-behavioural outcomes.

The quality of the early years HLE was also strongly associated with attainment. Those who had experienced a high compared to low early years HLE had better outcomes in all three cores subjects. The early years HLE also predict better social-behavioural outcomes for 'self-regulation', 'pro-social behaviour' and 'hyperactivity'.

Attainment in English and science was weakly predicted by neighbourhood disadvantage (measured by the Index of Multiple Disadvantage). The higher the IMD the lower student's results were in these subjects. The level of neighbourhood disadvantage weakly predicted social-behavioural development, with higher levels of criminality in neighbourhoods predicting poorer outcomes in all four social-behavioural domains.

The academic effectiveness of the primary school

Students who had attended a highly academically effective primary school compared with a low effective one showed positive benefits for attainment in maths and science but not English attainment or any social-behavioural outcomes at age 14.

Transition from primary to secondary schools

Students who quickly became accustomed to secondary school routines and who experienced continuity in the curriculum from primary to secondary school had moderately better attainment and made more progress in all three cores subjects (Evangelou et al., 2008). The strongest effects were for maths.

Secondary school quality as captured in Ofsted judgements

Students who attended a school judged by Ofsted as 'outstanding' for 'quality of pupil's learning' had better attainment and progress in all 3 core subjects compared to students in 'inadequate' schools. This was similar for Ofsted judgments of 'attendance of learners' for attainment but for progress students in 'outstanding', 'good' or even 'satisfactory', schools made significantly more progress in English and maths only. Attending a secondary school judged to be better at promoting the 'behaviour of learners' predicted better 'self-regulation' and 'pro-social behaviour' whereas students attending a secondary school judged as 'outstanding' showed significantly better 'self-regulation' and 'pro-social behaviour'.

Attending a 'good' or an 'outstanding' school offered the greatest benefits in promoting better social-behavioural outcomes for more advantaged students. Students from schools with higher proportion of Free School Meal (FSM) made less progress in English and science during KS3.

Students' dispositions and views of school

Most students liked school, lessons and teachers and those who reported enjoying school had better attainment. There were strong positive links between students' 'academic self-concept' in English and maths and their attainment in these subjects.

Time spent on homework strongly predicted better attainment and progress in all three core academic subjects as well as influencing better social-behavioural outcomes. Students had better attainment and progress across KS3 in school where there they reported a strong ‘emphasis on learning’ and a positive ‘behaviour climate’ in their school. Students made more academic progress where they reported having positive ‘teacher support’, and felt they valued and respected by teachers. These factors also predicted improvements in social-behavioural outcomes but the effects were smaller than for academic outcomes.

The level of disadvantage of the school’s intake of students had a weak negative effect on both progress and attainment.

Appendix 2 - Cohort structure of the sample

EPPSE sample cohort information and assessment time points for the academic year (2013/14)

Cohort	DOB	Pre-school	Primary School					Secondary School		Post 16 Compulsory Education (KS5)		H.E.= 1st Year Uni (age 19)	H.E.= 2nd Year Uni (age 20)	H.E.= 3rd Year Uni (age 21)
			KS1			KS2		KS3	KS4					
		Entry to study (age 3+)	Entry to Reception (age 5)	Year 1 (age 6)	Year 2 (age 7)	Year 5 (age10)	Year 6 (age 11)	Year 9 (age 14)	Year 11 GCSE (age 16)	Year 12 A/S = (age 17)	Year 13 A = (age 18)			
1	Sept 92 – Aug 93	Sept 95– Aug 96	Sept 96– Aug 97	Sept 97– Aug 98	Sept 98 – Aug 99	Sept 02 – Aug 03	Sept 03 – Aug 04	Sept 06 – Aug 07	Sept 08 – Aug 09	Sept 09– Aug 10	Sept 10 – Aug 11	**Sept 11 – Aug 12**	Sept 12 – Aug 13	Sept 13 – Aug 14
2	Sept 93 – Aug 94	Sept 96– Aug 97	Sept 97– Aug 98	Sept 98– Aug 99	Sept 99 – Aug 00	Sept 03 – Aug 04	Sept 04 – Aug 05	Sept 07 – Aug 08	Sept 09 – Aug 10	Sept 10 – Aug 11	**Sept 11 – Aug 12**	Sept 12 – Aug 13	Sept 13 – Aug 14	Sept 14 – Aug 15
3	Sept 94 – Aug 95	Sept 97– Aug 98	Sept 98– Aug 99	Sept 99 – Aug 00	Sept 00 – Aug 01	Sept 04 – Aug 05	Sept 05 – Aug 06	Sept 08 – Aug 09	Sept 10 – Aug 11	**Sept 11 – Aug 12**	Sept 12 – Aug 13	Sept 13 – Aug 14	Sept 14 – Aug 15	Sept 15 – Aug 16
4	Sept 95 – Aug 96	Sept 98– Aug 99	Sept 99– Aug 00	Sept 00 – Aug 01	Sept 01 – Aug 02	Sept 05 – Aug 06	Sept 06 – Aug 07	Sept 09 – Aug 10	**Sept 11 – Aug 12**	Sept 12 – Aug 13	Sept 13 – Aug 14	Sept 14 – Aug 15	Sept 15 – Aug 16	Sept 16 – Aug 17

Key Stage (KS) Assessment time points

KS1 National Assessments (Year 2)

KS2 National Assessments (Year 6)

KS3 National Assessments (Year 9)

KS4 GCSEs (Year 11)

Appendix 3 - Measures at earlier 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 and 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 teacher assessments (TA) for science
- Year 5*:* NFER-Nelson Primary Reading Level 2 and Mathematics age 10 tests
- Year 6: Key Stage 2 National Assessments Tests: English (a combined measure of Writing, Spelling and Reading -via comprehension) and maths
- Year 9 Key Stage 3 National Assessments reported via TA[49]: 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 at Year 6

Test levels were collected at the end of Year 6, using categories that ranged from: working towards Level 1 to Level 6. 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 (see Sylva, 2008).

[49] See National Assessment at age 14.

National Assessments at age 14

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 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 National Assessment levels for the two oldest EPPSE year groups, raw test scores were also collected.

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 without raw results for 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 for the two oldest cohort groups. The analyses for KS3 (Sammons et al., 2011a) reported on TA levels of attainment. It should be noted that 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.

Social-behavioural outcomes

At each time point, adults in educational establishments were sent a 'Pupil Profile' to complete detailing information about the children's social-behavioural development, attendance and any special needs. This information, collected at ages 3, 5, 10, 14 and 16, was used to look at social development. The Profile asked for responses to a range of questions that included, over time, the Adaptive Social Behavioural Items (Hogan, Scott and Baurer, 1992) and the Child Social Behavioural Questionnaire[50]and the Goodman (1997) Strengths and Difficulties Questionnaire. These were supplemented with additional items to measure different features of children's social-behavioural development. The information has been analysed into broad factors that identify both positive and negative behaviours as follows:

- Early years: independence & concentration, co-operation & conformity, anti-social/worried, peer sociability, peer empathy and confidence
- End of reception: independence & concentration, co-operation & conformity, peer sociability, anti-social/worried, empathy & pro-social and openness
- Key Stage 1: independence & concentration, co-operation & conformity, peer sociability, anti-social/worried
- Key Stage 2: self-regulation, pro-social behaviour, hyperactivity, anti-social behaviour
- Key Stage 3: self-regulation, pro-social behaviour, hyperactivity, anti-social behaviour
- Key Stage 4: self-regulation, pro-social behaviour, hyperactivity, anti-social behaviour

Dispositions

- Key Stage 1: enjoyment of school, behaviour self-image, unhappy victim, alienation and academic self-image
- Key Stage 2: enjoyment of school, anxiety & isolation, academic self-image and behavioural self-image
- Key Stage 3: enjoyment of school, English & maths academic self-concept, citizenship values, popularity, and anxiety
- Key Stage 4: mental well-being, general academic self-concept, resistance to peer influence plus school enjoyment and disaffected behaviour.

[50] An instrument developed by the EPPE team from the Adaptive Social Behaviour Inventory by Hogan et al., 1992

Views of school

- Key Stage 2: teachers' support for pupils' learning, headteacher qualities and positive social environment
- Key Stage 3: teacher support, school environment, valuing students, headteacher qualities, poor behaviour climate, emphasis on learning, teacher discipline and school/learning resources
- Key Stage 4: teacher professional focus, positive relationships, monitoring, feedback, academic ethos.

Measures of 'other' influences at different ages

Individual students and their families

Parental interviews and questionnaires were used when the children were age 3, 6/7, 11 and 14 to inform the research about individual students and family characteristics that may influence students' academic attainment, development and progress. Over the years the parents have been asked to supply information on their qualification levels, employment and composition of their household. At each time point the questionnaires/interviews have been customised reflecting the age of the child for instance during the pre-school period parents were asked about their child's early care history, birth weight and developmental problems. During Key Stage 1 and 2 they were asked, amongst other things, about their neighbourhood and during KS3 about their attitudes to teenagers.

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. see Appendix 4), 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 and KS3. This included computer access and use at home, homework and 'enrichment' activities.

Pre-school Quality and effectiveness

During pre-school the research established the quality of early years settings through 3 measures: The Early Childhood Environment Rating Scales (Harms et al., 1998) and the Adult/Child Interaction Scale (Arnett, 1989). These measures provided a 'quality' profile for each setting (Sylva et al., 1999b; 1999c). The effectiveness of each early years setting was calculated separately for Literacy and maths.

During KS2 the quality of primary school was determined by inspection judgements made by the Office for Standards in Education (Ofsted). The academic effectiveness was measured separately for English, maths and science based on an EPPE 3-11 value added analyses of pupil progress for three successive national cohorts (2002-2004) using National Assessment data matched between Key Stage 1 (KS1) and KS2 (Melhuish et al., 2006a; 2006b).

Secondary school academic effectiveness was measured by the DfE's contextual value added (CVA) scores at the school level. This measure[51] was calculated for all state secondary schools in England and a mean CVA score was calculated for the EPPSE schools based on KS2 to KS4 (KS2-4) CVA scores for four years from 2006 to 2009. The quality of secondary education was determined by Ofsted's framework assessments on key aspects of secondary schooling (range 1 to 4) for pupils' attendance and the quality of pupils' learning.

Neighbourhood measures

The EPPSE 3-16 study has, at the end of each phase of the 17 year study, explored the influence of neighbourhood and 'place poverty' on a range of students' outcomes. Multiple measures of the neighbourhood environment have been explored from census statistics or the National Pupil Data (NPD). In addition the study has used the Index of Multiple Deprivation (IMD- Noble et al., 2004), 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, and the Income Deprivation Affecting Children Index (IDACI - Noble et al., 2008).

51 At the time of these analyses the DfE's CVA 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 KS2. 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

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, 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 and Taggart, 2008).

The specific items associated with the early years (HLE) measure

- 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 them self
- 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)

The Key Stage 3 (KS3) home learning environment (HLE)

KS3 HLE Factors and the items (from the KS3 Parent and All about me Questionnaires) loading on these factors:

Learning Support & Resources

- (Parent) Bought/downloaded educational computer software
- (Parent) Helped with using the internet
- (Parent) Gave help with difficult homework
- (Parent) Bought a book to help with school work.

Computer Use

- (EPPSE Child) Computer use - MSN
- (EPPSE Child) Computer use - E mail
- (EPPSE Child) Computer use - Listening to music
- (EPPSE Child) Computer use - Browsing/downloading from the net.

Parental Interest in School

- (Parent) Talked to EPPSE Child about their school work
- (Parent) Talked to EPPSE Child about their experiences at school
- (Parent) Talked to EPPSE Child about subjects for GCSE.

Academic Enrichment

- (EPPSE Child) Reads on own for pleasure
- (EPPSE Child) With family - Go on educational visits
- (EPPSE Child) Go to the library (not school library).

Parental Academic Supervision

- (EPPSE Child) My parents make sure I do my homework
- (EPPSE Child) My parents know about how I'm getting on in school.

Appendix 5 - Academic outcomes

Table A9.1: Selected characteristics of sample with valid academic continuous data

Background characteristics	Total GCSE score N=2746		GCSE English N=2630		GCSE maths N=2620		No. of GCSE entries N=2682	
	N	%	N	%	N	%	N	%
Gender								
Male	1405	51.2	1326	50.4	1329	50.7	1366	50.9
Female	1341	48.8	1304	49.6	1291	49.3	1316	49.1
Total	2746	100.0	2630	100.0	2620	100.0	2682	100.0
Ethnicity								
White European heritage	94	3.4	87	3.3	87	3.3	88	3.3
Black Caribbean heritage	108	3.9	102	3.9	102	3.9	103	3.8
Black African heritage	47	1.7	45	1.7	44	1.7	46	1.7
Any other ethnic minority heritage	65	2.4	63	2.4	63	2.4	64	2.4
Indian heritage	59	2.2	57	2.2	56	2.1	58	2.2
Pakistani heritage	144	5.2	139	5.3	139	5.3	140	5.2
Bangladeshi heritage	29	1.1	28	1.1	28	1.1	29	1.1
Mixed heritage	153	5.6	138	5.3	138	5.3	141	5.3
White UK heritage	2045	74.5	1969	74.9	1961	74.9	2011	75.0
Total	2744	100.0	2628	100.0	2618	100.0	2680	100.0
Number of siblings in the house (age 3/5)								
No siblings	537	19.6	513	19.5	511	19.5	522	19.5
1 sibling	986	35.9	953	36.2	942	36.0	969	36.1
2 siblings	727	26.5	705	26.8	703	26.8	716	26.7
3+ siblings	409	14.9	381	14.5	386	14.7	395	14.7
Missing	87	3.2	78	3.0	78	3.0	80	3.0
Total	2746	100.0	2630	100.0	2620	100.0	2682	100.0
Early Years HLE Index								
<13	251	9.6	228	9.1	231	9.3	239	9.4
14-19	583	22.3	553	22.1	554	22.2	569	22.3
20-24	641	24.5	613	24.5	614	24.6	626	24.5
25-32	834	31.9	812	32.4	807	32.3	821	32.1
>33	303	11.6	300	12.0	291	11.7	301	11.8
Total	2612	100.0	2506	100.0	2497	100.0	2556	100.0
Type of pre-school								
Nursery class	524	19.1	501	19.0	496	18.9	514	19.2
Playgroup	545	19.8	530	20.2	533	20.3	538	20.1
Private day nursery	433	15.8	428	16.3	418	16.0	432	16.1
Local authority day nursery	348	12.7	322	12.2	318	12.1	331	12.3
Nursery schools	473	17.2	457	17.4	461	17.6	465	17.3
Integrated (combined) centres	161	5.9	153	5.8	153	5.8	154	5.7
Home	262	9.5	239	9.1	241	9.2	248	9.2
Total	2746	100.0	2630	100.0	2620	100.0	2682	100.0

Background characteristics	Total GCSE score N=2746		GCSE English N=2630		GCSE maths N=2620		No. of GCSE entries N=2682	
	N	%	N	%	N	%	N	%
Mother's qualification level								
None	562	21.4	515	20.4	522	20.8	536	20.9
Vocational	392	14.9	374	14.8	378	15.1	384	14.9
16 Academic	1007	38.4	979	38.8	975	38.8	990	38.5
18 Academic	214	8.2	212	8.4	213	8.5	214	8.3
Degree or higher degree	411	15.7	405	16.1	389	15.5	409	15.9
Other professional	38	1.4	36	1.4	34	1.4	36	1.4
Total	2624	100.0	2521	100.0	2511	100.0	2569	100.0
Father's qualification level								
None	424	16.0	401	15.7	405	15.9	411	15.8
Vocational	302	11.4	296	11.6	297	11.7	300	11.5
16 academic	629	23.7	617	24.2	617	24.3	626	24.1
18 academic	189	7.1	182	7.1	182	7.2	186	7.2
Degree or higher degree	436	16.4	429	16.8	415	16.3	434	16.7
Other professional	28	1.1	25	1.0	24	0.9	25	1.0
Absent father	649	24.4	601	23.6	601	23.7	619	23.8
Total	2657	100.0	2551	100.0	2541	100.0	2601	100.0
Family highest SES (age 3/5)								
Professional non-manual	223	8.4	221	8.7	210	8.3	222	8.5
Other professional non-manual	658	24.8	647	25.4	637	25.1	651	25.0
Skilled non-manual	880	33.1	850	33.3	856	33.7	865	33.3
Skilled manual	403	15.2	379	14.9	384	15.1	391	15.0
Semi-skilled	352	13.3	327	12.8	324	12.8	338	13.0
Unskilled	65	2.4	59	2.3	59	2.3	62	2.4
Unemployed/not working	75	2.8	69	2.7	70	2.8	71	2.7
Total	2656	100.0	2552	100.0	2540	100.0	2600	100.0
FSM (Year 11)								
No Free School Meals (FSM)	2200	81.3	2130	82.1	2116	81.9	2159	81.6
Free School Meals (FSM)	507	18.7	463	17.9	467	18.1	486	18.4
Total	2707	100.0	2593	100.0	2583	100.0	2645	100.0
Family earned income (KS1)								
No earned salary	502	23.5	459	22.3	463	22.6	479	22.8
£ 2,500 – 17,499	449	21.0	435	21.1	437	21.3	444	21.2
£ 17,500 – 29,999	378	17.7	369	17.9	371	18.1	373	17.8
£ 30,000 – 37,499	253	11.8	248	12.0	249	12.1	250	11.9
£ 37,500 – 67,499	411	19.2	406	19.7	399	19.5	409	19.5
£ 67,500 – 132,000+	144	6.7	143	6.9	132	6.4	144	6.9
Total	2137	100.0	2060	100.0	2051	100.0	2099	100.0
SEN status (Year 11)								
No special provision	2048	78.3	2037	80.4	2025	79.9	2041	79.3
School action	296	11.3	287	11.3	287	11.3	294	11.4
School action plus	179	6.8	158	6.2	158	6.2	167	6.5
Statement of SEN	92	3.5	52	2.1	63	2.5	73	2.8
Total	2615	100.0	2534	100.0	2533	100.0	2575	100.0

Table A1.2: Selected characteristics of sample with valid academic dichotomous data

Background characteristics	Achieved 5 or more GCSE/GNVQs at grades A*-C N=2763					
	No		Yes		Total	
	N	%	N	%	N	%
Gender						
Male	682	48.2	733	51.8	1415	100.0
Female	511	37.9	837	62.1	1348	100.0
Total	1193	43.2	1570	56.8	2763	100.0
Ethnicity						
White European heritage	43	45.3	52	54.7	95	100.0
Black Caribbean heritage	55	50.5	54	49.5	109	100.0
Black African heritage	20	42.6	27	57.4	47	100.0
Any other ethnic minority heritage	29	43.9	37	56.1	66	100.0
Indian heritage	17	28.8	42	71.2	59	100.0
Pakistani heritage	81	55.9	64	44.1	145	100.0
Bangladeshi heritage	11	37.9	18	62.1	29	100.0
Mixed heritage	73	47.1	82	52.9	155	100.0
White UK heritage	862	41.9	1194	58.1	2056	100.0
Total	1191	43.1	1570	56.9	2761	100.0
Number of siblings in the house (age 3/5)						
No siblings	220	40.9	318	59.1	538	100.0
1 sibling	358	36.1	633	63.9	991	100.0
2 siblings	312	42.6	420	57.4	732	100.0
3 or more siblings	241	58.2	173	41.8	414	100.0
Missing	62	70.5	26	29.5	88	100.0
Total	1193	43.2	1570	56.8	2763	100.0
Early Years HLE Index						
0-13	175	68.4	81	31.6	256	100.0
14-19	309	52.9	275	47.1	584	100.0
20-24	291	45.0	355	55.0	646	100.0
25-32	283	33.8	555	66.2	838	100.0
33-45	46	15.1	258	84.9	304	100.0
Total	1104	42.0	1524	58.0	2628	100.0
Type of pre-school						
Nursery class	235	44.8	290	55.2	525	100.0
Playgroup	244	44.4	305	55.6	549	100.0
Private day nursery	86	19.8	348	80.2	434	100.0
Local authority day nursery	188	53.3	165	46.7	353	100.0
Nursery schools	192	40.6	281	59.4	473	100.0
Integrated (combined) centres	77	47.8	84	52.2	161	100.0
Home	171	63.8	97	36.2	268	100.0
Total	1193	43.2	1570	56.8	2763	100.0
Pre-school attendance						
Pre-school	1022	41.0	1473	59.0	2495	100.0
No pre-school	171	63.8	97	36.2	268	100.0
Total	1193	43.2	1570	56.8	2763	100.0

Background characteristics	Achieved 5 or more GCSE/GNVQs at grades A*-C N=2763					
	No		Yes		Total	
	N	%	N	%	N	%
Mother's qualification level						
None	393	68.7	179	31.3	572	100.0
Vocational	179	45.4	215	54.6	394	100.0
16 Academic	441	43.7	569	56.3	1010	100.0
18 Academic	59	27.6	155	72.4	214	100.0
Degree or higher degree	30	7.3	382	92.7	412	100.0
Other professional	6	15.8	32	84.2	38	100.0
Total	1108	42.0	1532	58.0	2640	100.0
Father's qualification level						
None	277	65.0	149	35.0	426	100.0
Vocational	105	34.7	198	65.3	303	100.0
16 academic	255	40.3	377	59.7	632	100.0
18 academic	50	26.5	139	73.5	189	100.0
Degree or higher degree	42	9.6	396	90.4	438	100.0
Other professional	8	28.6	20	71.4	28	100.0
Absent father	392	59.7	265	40.3	657	100.0
Total	1129	42.2	1544	57.8	2673	100.0
Family highest SES (age 3/5)						
Professional non manual	18	8.0	206	92.0	224	100.0
Other professional non manual	146	22.2	512	77.8	658	100.0
Skilled non manual	372	42.0	513	58.0	885	100.0
Skilled manual	256	63.2	149	36.8	405	100.0
Semi-skilled	239	66.9	118	33.1	357	100.0
Unskilled	51	75.0	17	25.0	68	100.0
Unemployed /not working	44	58.7	31	41.3	75	100.0
Total	1126	42.1	1546	57.9	2672	100.0
FSM at Year 11						
No Free School Meals (FSM)	815	36.9	1395	63.1	2210	100.0
Free School Meals (FSM)	360	70.0	154	30.0	514	100.0
Total	1175	43.1	1549	56.9	2724	100.0
Family earned income at KS1						
No earned salary	314	61.6	196	38.4	510	100.0
£ 2,500 – 17,499	232	51.4	219	48.6	451	100.0
£ 17,500 – 29,999	136	35.9	243	64.1	379	100.0
£ 30,000 – 37,499	77	30.4	176	69.6	253	100.0
£ 37,500 – 67,499	78	19.0	333	81.0	411	100.0
£ 67,500 – 132,000+	7	4.9	137	95.1	144	100.0
Total	844	39.3	1304	60.7	2148	100.0
SEN status at Year 11						
No special provision	641	31.3	1408	68.7	2049	100.0
School action	231	77.0	69	23.0	300	100.0
School action plus	157	87.2	23	12.8	180	100.0
Statement of SEN	87	91.6	8	8.4	95	100.0
Total	1116	42.5	1508	57.5	2624	100.0

Appendix 6 - Classification of Registrar General job coding

Responses were classified into an occupational socio-economic status (SES) based on the Registrar general classification (Office of Population Census and Surveys, 1995). The Registrar General's social classification scheme was used as a way of categorising SES for most of the twentieth century and was originally based on a hierarchical grading system, whereby an occupation was judged on its standing within the community. More recently this was modified to reflect levels of occupational skill or competence required. This classification system (see Table A1.3) has been used throughout the EPPE/ EPPSE project to classify the occupation of parents when children entered the study (aged 3/5) and again during KS1, KS2 and KS3. Table A1.3 gives some examples of occupations from each group.

Table A1.3: Registrar General's Social classification (1995)

SES Group	Example occupations
I Professional Non-manual	Surgeon, Lawyer, Architect, Doctor, MP, Accountant, Scientist
II Other professional Non-manual	Teacher, Nurse, Manager, Artist, Graphic designer, Journalist
III Skilled Non-manual	Shop assistant, Secretary, Policeman, Fireman, Administrator
III Skilled Manual	Car mechanic, Plumber, Painter and decorator, Hairdresser
IV Semi-skilled	Carer, Beauty therapist , Bartender, Waitress
V Unskilled	Labourer, cleaner

Appendix 7 - Economic analyses

Data

The data used in these analyses derive from 3 separate studies.

Effective Pre-School, Primary and Secondary Education (EPPSE) project

The analysis focuses on the first (age 3 +) and last round of data (age 16). The only age 16 variables used in the analysis are Key Stage 4 outcomes listed in the text. Below we describe how we constructed the baseline variables included in the analysis:

- An indicator of whether the child is female
- An indicator of whether the child is white
- An indicator for low birth weight
- Four cohort indicators, based on the raw variable **cohort**
- Mother/father's education qualification levels in 5 categories, i.e. 0 for no qualification, 1 for vocational qualifications, 2 for academic qualifications up to 16, 3 for academic qualifications up to 18, and 4 for degree
- Indicators for whether the mother/father is employed
- An index of socio-economic deprivation based on the Key Stage 4 IDACI index. We constructed indicators for five quintiles (lowest quintile is the reference category)
- Developmental problems indicator
- Behavioural problems indicator
- Baseline verbal test scores
- Baseline non-verbal test scores
- Number of younger siblings and number of older siblings
- Pre-school experience (both attendance and quality).

Longitudinal Study of Young People in England (LSYPE)

The Longitudinal Study of Young People in England (LSYPE) is a panel study of young people which brings together data from several sources, including annual interviews with young people and their parents, and administrative sources. LSYPE respondents were first interviewed in the spring of 2004 (at age 13) and were interviewed annually until 2010, resulting in a total of seven 'waves'. We make use of data from all Waves in order to construct background variables as well as highest educational qualification completed (if the individual is no longer studying) or being studied (if the individual is currently studying).

Our main outcome is the highest educational level attained by age 19-20 (Wage 7). We define it as being one of the following four categories:

- Less than 5 GCSEs A*-C
- More than 5 GCSEs A*-C
- Any A-levels A*-C
- University degree.

We assume that any individual reporting being in university as her/his main activity in Wave 7 is a university graduate (category 4). If the respondent does not report being in university in Wave 7, we then classify her/him in category 3 (A-levels) if s/he has received any A-levels with grades A*-C. If s/he hasn't and is not in university at Wave 4, we classify her in category 2 or 1 depending on the number of GCSEs passed with grades A*-C.

Our explanatory variables are defined as follows:

- A female indicator
- A non-white indicator
- Mother and father's highest qualification, defined according to the same 5 categories as we defined parental qualifications in the EPPSE dataset
- Number of younger siblings and number of older siblings (at entry to the study)
- An indicator for whether the respondent's parents were married/partnered (at entry to the study)
- An index of social deprivation based on the SEP index. As with the IDACI index in the EPPSE dataset, we construct indicators for each quintile of this index and treat the lowest quintile as the reference category.

British Household Panel Survey

Sample selection

We define each individual's education level as the highest attained level by age 22. Education level can be one of the following four categories:

- Having less than 5 GCSEs A*-C
- Having at least 5 GCSEs A*-C
- Having A-levels
- Having a university degree.

We create four samples, including all individuals who attained one of these four categories by age 22. For all by university graduates, we include their observations from ages 19 to 60. For university graduates, we include their observations from ages 22 to 60. Our data are from the first 18 waves of the BHPS, covering the years 1991 to 2008.

Definition of earnings

Annual earnings are defined as annual labour income in the reference year, from September in the year prior to the interview until September in the year in which interviewing begins. All earnings are expressed in 2011 pounds with uprating according to the retail price index (all items). We treat observations with annual earnings below £1,000 as zero annual earnings.

Labour Force Survey

Sample selection

We define each individual's education level as the highest attained level by age 22. We include all individuals in the sample from ages 19 to 60 if their highest attained level is not university and from ages 22 to 60 if it is. Our data are quarterly, from 1993Q1 to 2012Q4.

Definition of earnings

Annual earnings are defined as gross weekly pay in main job, multiplied by 52. All earnings are expressed in 2011 pounds with uprating according to the retail price index (all items). We treat observations with annual earnings below £1,000 as zero annual earnings.

Econometric methodology

Educational attainment model

Given that an individual has achieved at least 5 GCSEs with grades A*-C, the probability of attaining one of the other three educational categories by age 22 (more than 5 GCSEs A*-C, A-levels and university degree) is modelled using a multinomial model. In this type of model, the explanatory variables do not vary over the alternatives, but their effect on the probability of attaining each educational level is allowed to vary across alternatives. In particular the model specifies that the probability of reaching educational level j by age 22 can be written as:

$$p_{ij} = \frac{\exp(x_i'\beta_j)}{\sum_{l=1}^{m} \exp(x_i'\beta_l)}$$

Where x_i is a vector of explanatory variables and β_j the vector of associated coefficients. Note that the coefficients are indexed by j since they are alternative-specific. This model is based on the behavioural model where an alternative is chosen if the underlying utility derived from choosing this alternative is greater than the underlying utility derived from all other alternatives and the random component of this utility is distributed following an Extreme Value Type I distribution.

Earnings and employment dynamics model

Earnings

The current model for log earnings for individual *i* at age *a* in year *t* is:

$$y_{iat} = \beta X_{iat} + \hat{y}_{iat}$$

$$\hat{y}_{iat} = \alpha_i + \gamma_i a + u_{iat} + z_{iat}$$

$$u_{iat} = \epsilon_{iat} + \theta \epsilon_{i,a-1,t-1}$$

$$z_{iat} = \rho z_{i,a-1,t-1} + \eta_{iat}$$

$$z_{i0t} = 0$$

$$\epsilon_{i0t} = 0$$

X_{iat} is a vector of observable characteristics for individual *i* that include a quartic polynomial in age, a full set of year dummies, and dummies for region and ethnicity. α_i is an individual-specific fixed effect and

$\gamma_i$is an individual-specific deterministic linear trend in age.

Together, α_i and $\gamma_i$allow for cross-sectional heterogeneity in both the level and age-profile of the deterministic component of earnings. The idiosyncratic stochastic component comprises two parts: z_{iat} is a first-order autoregressive persistent shock and u_{iat} is a first-order moving-average transitory shock. We allow the variances of both shocks, ϵ_{iat} and η_{iat}, to be quadratic functions of age, and the auto-regressive parameter, ρ, to be a cubic function of age. The moving average parameter, θ, is assumed to be fixed across ages.

The model parameters are estimated separately for male and for female graduates using the BHPS sample described above. Estimation takes place in three stages:

- Regress log earnings on the observed characteristics X_{iat} and store the residuals as $\hat{y}_{iat}$
- Calculate the sample auto-covariance function of the residuals $\hat{y}_{iat}$ at each age for up to 10 lags. This generates a set of estimated auto-covariances, $Cov(y_a, y_{a-d})$for d = 0, ..., 10.
- Choose the parameters of the earnings model to minimise the distance between the sample auto-covariance function and the theoretical auto-covariance function implied by the model. Each element of the auto-covariance function is weighted by $n_{a,d}^{0.5}$, where $n_{a,d}$ is the number of observations that were used in the construction of the sample auto-covariance at age a and lag d.

In total, 374 moments were used in the estimation for university graduates and 407 moments were used in the estimation for non university graduates.

Models for annual employment

We define an individual to be non-employed in year t if they are observed to have annual earnings less than £1,000 in that year. We estimate three models for employment dynamics: the probability of moving from employment to non-employment, the probability of moving from non-employment to employment, and the annual earnings of re-employed workers.

Entry to employment

The probability of a previously non-employed worker becoming employed is assumed to be a probit model with age and duration of non-employment as independent variables. Age enters as a quartic polynomial. Duration enters as dummy variables for one year, two years and more than two years.

Exit to non-employment

The probability of a currently employed worker becoming non-employed is assumed to be a probit model with age and log earnings as independent variables. Age enters as a quartic polynomial. Log earnings enter as a quadratic polynomial.

Re-entry earnings

Log earnings of a previously non-employed worker are assumed to be a function of age, duration non-employed and last log annual earnings before becoming non-employed. Age enters as a quartic polynomial, duration enters as dummy variables for one year and more than one year, and last log annual earnings enter linearly.

Simulating the BHPS model for earnings and employment

The estimated earnings and employment models are simulated alongside each other, using the simulated earnings as inputs to determine the probability of becoming non-employed and the re-entry earnings upon re-employment. The only thing that remains to be specified is how the stochastic component of earnings upon re-employment is divided between the persistent and transitory components. This is done differently for males and females. For males, it is assumed that the transitory component is equal to the stochastic component of the re-entry earnings equation; the persistent component is equal to the remainder. For females, it is assumed that the persistent component is a weighted average of the persistent component as just described for males, and a random draw from the unconditional distribution of the persistent component (assuming full employment) at the relevant age; the weights used are 0.35 on the former and 0.65 on the latter. These specifications were chosen because they were found to generate employment patterns and re-entry earnings distributions that match the BHPS well at each age.

To generate a simulated series for raw earnings from the simulated series for logs, we first add back the estimated quartic age profile from the first-stage regression. Next we randomly assign each simulated individual to a region / ethnicity group, according to the observed region / ethnicity distribution. We then add back the relevant region / ethnicity constants. Finally, we add back the intercept term that corresponds to the year effect for the most recent year (2006) and exponentiate log earnings to obtain raw earnings.

Adjusting for consistency with the LFS

The final step is to adjust the cross-sectional distributions of non-zero earnings to be consistent with the observed cross-sectional distributions of non-zero earnings in the LFS. To do this, we calculate the following percentiles of the log-earnings distribution in the LFS at each age: 1 2 3 4 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 99. Each percentile is smoothed across ages using a five-point moving average.

For each simulated log-earnings realisation, we calculate its rank in the simulated distribution at that age. We then re-assign it the corresponding log earnings from the smoothed percentiles in the LFS, using linear interpolation to evaluate ranks that lie between the percentiles listed above. Two things should be noted. First, non-employed simulations (i.e. those with zero earnings) are not affected by this transformation; hence, the fraction of people employed at each age is left unchanged. Second, since annual earnings in the LFS are calculated as weekly earnings multiplied by 52, it is likely that the LFS overstates earnings in the bottom parts of the distribution, due to the presence of part-year workers.

Goodness-of-fit of the earnings and employment model

It is very important that the model delivers a good fit of the data since we heavily rely on its predictions to compute the effect of pre-school quality on lifetime earnings. Figure A7.1 and Figure A7.2 compare the data with the predictions of the models on several dimensions of earnings and employment. In the interest of space, we only report such goodness-of-fit exercises for male and female university graduates, but the patterns are similar for the other educational categories.

Figure A7.1: Goodness-of-fit of the earnings and employment model for male university graduates

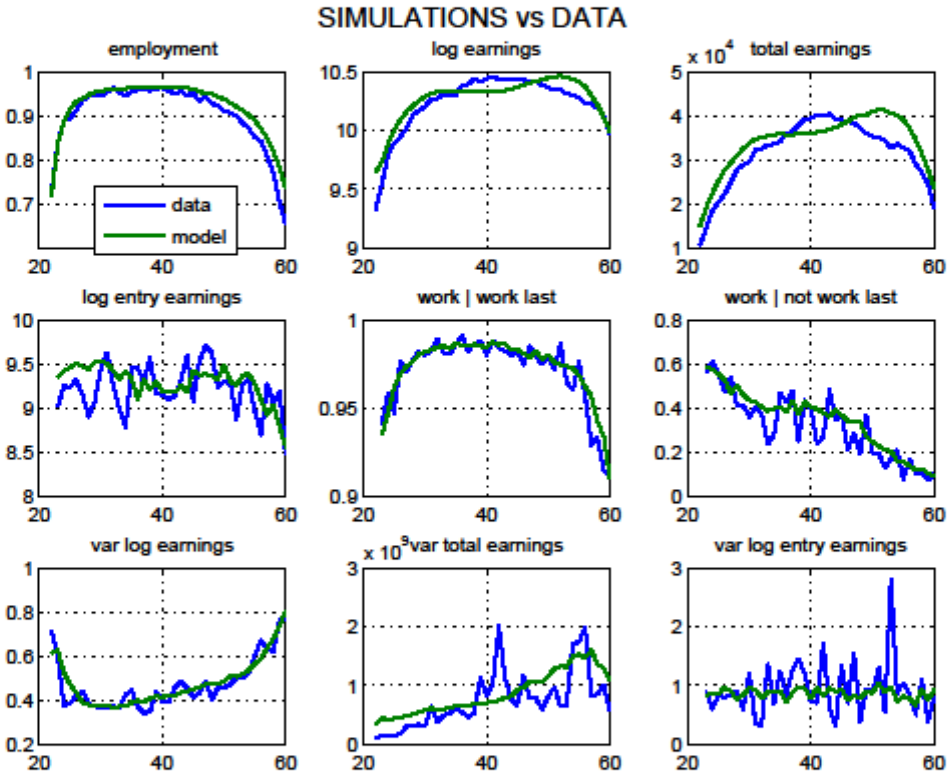
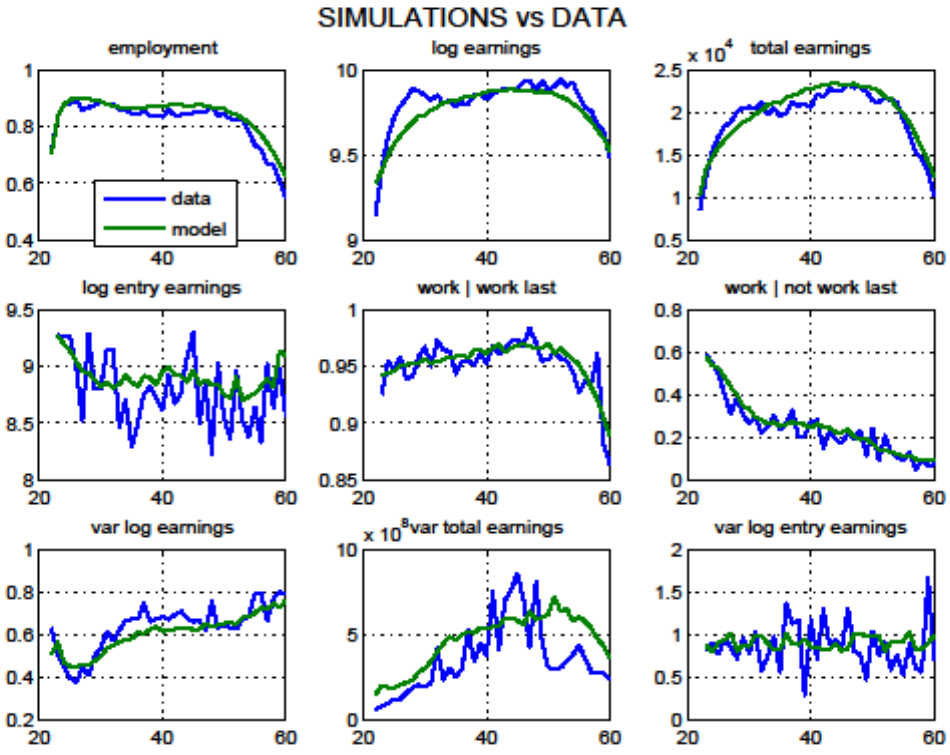


Figure A7.2: Goodness-of-fit of the earnings and employment model for female university graduates



Predicting characteristics to estimate net earnings profiles

As explained earlier, one step of our methodology (Step 4) consists of computing, for each lifetime profile of gross earnings simulated in Step 3, the corresponding profile of net earnings, along with the amount of tax paid and benefit received. To do so, we use The Institute for Fiscal Studies' tax and benefit model to calculate the amount of tax paid and benefits received by each individual in the EPPSE sample if s/he attended a low-quality pre-school and if s/he attended high-quality pre-school. This creates an additional difficulty because the tax and benefit system in the UK is intrinsically dependent on a number of characteristics, which we do not observe for individuals in the EPPSE datasets. In particular, it depends on the individuals' family structure (marital status, partner's age, number and age of his/her dependent children), his/her number of hours worked, his/her partner's number of hours worked and earnings, his/her region and housing situation (whether he/she is a renter, the value of the rent, and council tax band). We therefore need to predict all these characteristics for each period the individuals in the EPPSE dataset will spend in the labour market.

To do so, we estimate the empirical distribution of these characteristics in the BHPS for each gender, education, age groups (we use weights so as to approximate a nationally representative distribution). We use these estimates to predict these characteristics for each period the individuals in the EPPSE dataset spend in the labour market. Table A1.4 through Table A1.7 report the means of the characteristics we predict in this exercise against their means as estimated in the BHPS. We report these means by gender and educational group below (we do not condition on age below for the sake of space).

Table A1.4: Mean of the characteristics predicted to estimate net earnings profiles against means in the BHPS among males and females with less than 5GCSEs A*-C

Education group:	Males		Females	
Less than 5 GCSEs A*- C	BHPS	Predicted	BHPS	Predicted
In couple	0.63	0.60	0.64	0.60
Married	0.52	0.47	0.57	0.49
Partner's age	41.60	37.50	44.96	41.59
Weekly hours of work	30.05	30.71	13.47	13.39
Partner's weekly hours of work	18.09	18.32	32.33	34.74
Partner's weekly earnings	438.98	431.22	714.11	641.64
Weekly rent	53.71	54.91	55.54	56.02
Number of kids	0.69	0.93	0.81	1.02
Region of residence:				
Inner London	2.32	2.42	2.17	2.11
Outer London	4.83	4.12	6.84	6.79
South East	14.88	15.06	17.95	17.06
South West	8.06	8.27	9.15	8.7
East Anglia	4.05	4.03	3.77	3.69
East Midlands	10.47	11.06	9.79	10.4
Midlands Conurbation	5.75	5.48	4.58	4.96
West Midlands	5.82	5.93	4.55	4.41
Greater Manchester	3.89	4.1	3.62	3.32
Merseyside	2.32	2.3	2.35	2.16
North West	4.99	4.79	3.8	4.09
South Yorkshire	2.47	2.38	3.08	2.89
West Yorkshire	4.38	4.85	4.48	5.54
Yorks and Humbershire	3.56	3.57	2.8	3.21
Tyne and West	3.17	3.46	2.2	2.06
North West	4.38	4	3.58	3.58
Wales	5.76	5.72	5.46	5.52
Scotland	6.96	6.6	7.63	7.48
Northern Ireland	1.95	1.85	2.21	2.03
Council band:				
Band A	31.93	33.89	28.13	30.97
Band B	23.48	22.99	24.69	25.14
Band C	17.37	17.5	18.88	17.76
Band D	15.37	14.3	17.83	17.62
Band E	6.91	6.57	6.17	5.21
Band F	2.04	2.22	2.28	1.73
Band G	2.41	2.11	1.47	1.11
Band H	0.48	0.43	0.55	0.46

Table A1.5: Mean of the characteristics predicted to estimate net earnings profiles against their means in the BHPS among males and females with at least 5GCSEs A*-C

Education group: At least 5 GCSEs A*- C	Males		Females	
	BHPS	Predicted	BHPS	Predicted
In couple	0.65	0.66	0.66	0.65
Married	0.50	0.52	0.54	0.53
Partner's age	38.19	37.79	41.25	41.54
Weekly hours of work	35.56	35.15	20.48	20.81
Partner's weekly hours of work	21.31	22.82	36.76	37.25
Partner's weekly earnings	456.27	464.80	744.14	654.88
Weekly rent	62.25	64.01	60.47	61.06
Number of kids	0.72	0.75	0.92	0.81
Region of residence:				
Inner London	2.33	2.31	2.57	2.79
Outer London	7.02	7.28	6.33	6.26
South East	16.52	16.56	20.02	19.96
South West	11.44	11.28	9.65	10.11
East Anglia	5.75	5.8	5.11	5.2
East Midlands	7.52	7.38	7.79	7.88
Midlands Conurbation	3.4	3.74	3.15	2.87
West Midlands	5.56	5.38	3.21	3.17
Greater Manchester	4.03	3.74	4.34	4.32
Merseyside	2.89	3.05	2.69	2.73
North West	3.98	3.89	5.4	5.56
South Yorkshire	1.81	1.78	2.97	2.9
West Yorkshire	3.05	2.84	3.61	3.61
Yorks and Humbershire	3.07	2.96	3.37	3.37
Tyne and West	1.57	1.4	2.71	2.61
North West	4.45	4.5	3.34	3.15
Wales	4.59	4.85	4.42	4.4
Scotland	8.99	9.25	7.45	7.35
Northern Ireland	2.02	2.01	1.85	1.77
Council band:				
Band A	20.44	19.68	20.48	20.71
Band B	24.8	23.65	19.72	19.58
Band C	20.56	20.71	21.01	20.25
Band D	18.69	18.9	20.3	20.21
Band E	8.69	9.76	9.42	9.77
Band F	5.07	5.22	4.3	4.41
Band G	1.18	1.32	3.87	4.12
Band H	0.58	0.77	0.88	0.94

Table A1.6: Mean of the characteristics predicted to estimate net earnings profiles against their means in the BHPS among males and females with A-levels

Education group: A-levels	Males		Females	
	BHPS	Predicted	BHPS	Predicted
In couple	0.58	0.64	0.58	0.63
Married	0.46	0.52	0.43	0.49
Partner's age	38.01	37.67	39.08	41.74
Weekly hours of work	32.11	33.30	21.19	22.27
Partner's weekly hours of work	22.09	23.55	38.80	41.10
Partner's weekly earnings	507.96	487.65	803.28	658.68
Weekly rent	71.07	68.92	76.86	77.40
Number of kids	0.59	0.73	0.77	0.69
Region of residence:				
Inner London	3.75	3.85	2.46	1.99
Outer London	5.26	5.23	6.35	6.6
South East	22.14	23.1	19.62	20.07
South West	9.01	8.88	7.5	7.42
East Anglia	3.76	3.79	4.26	4.12
East Midlands	8.35	8.34	8.48	7.72
Midlands Conurbation	1.46	1.27	1.71	1.79
West Midlands	4.09	4.08	6.57	5.87
Greater Manchester	4.49	4.41	1.78	1.63
Merseyside	2.32	1.85	2.22	1.84
North West	4.35	4.59	5.03	5.15
South Yorkshire	2.04	1.83	4.05	4.15
West Yorkshire	4.07	4.08	3.14	3.1
Yorks and Humbershire	4.35	4.18	2.87	3.42
Tyne and West	2.08	2.24	1.16	0.98
North West	3.9	3.8	2.86	2.87
Wales	4.07	4.03	5.77	5.99
Scotland	9.17	9.09	12.39	13.57
Northern Ireland	1.33	1.35	1.78	1.72
Council band:				
Band A	15.92	15.48	15.91	14.42
Band B	17.87	18.35	20.92	21.11
Band C	18.12	17.98	17.67	16.96
Band D	23.44	23.24	20.66	20.04
Band E	11.65	11.24	13.24	14.93
Band F	6.96	7.59	4.93	5.32
Band G	4.2	4.33	4.84	5.26
Band H	1.84	1.8	1.84	1.97

Table A1.7: Mean of the characteristics predicted to estimate net earnings profiles against their means in the BHPS among males and females with a university degree

Education group: University degree	Males		Females	
	BHPS	Predicted	BHPS	Predicted
In couple	0.65	0.65	0.63	0.63
Married	0.53	0.53	0.49	0.51
Partner's age	39.38	39.12	41.66	42.65
Weekly hours of work	35.51	35.66	24.83	25.17
Partner's weekly hours of work	22.03	23.94	37.37	38.60
Partner's weekly earnings	512.54	542.07	808.02	767.58
Weekly rent	78.82	80.73	82.63	82.79
Number of kids	0.67	0.68	0.77	0.69
Region of residence:				
Inner London	5.52	5.38	5.73	5.79
Outer London	7.17	7.23	6.98	7.27
South East	21.23	21.38	20.05	19.94
South West	7.55	7.48	8.23	8.22
East Anglia	3.76	4.02	3.4	3.24
East Midlands	8.22	8.28	7.24	7.04
Midlands Conurbation	3.05	3.04	2.91	3.07
West Midlands	4.91	4.78	5.82	5.69
Greater Manchester	4.17	4	4.09	4.05
Merseyside	1.81	1.89	1.87	1.89
North West	5.48	5.51	4.34	4.55
South Yorkshire	2.5	2.4	2.34	2.32
West Yorkshire	2.33	2.4	3.43	3.49
Yorks and Humbershire	3.02	2.9	3.28	3.32
Tyne and West	1.95	1.85	2.13	2.05
North West	3.48	3.43	2.92	2.87
Wales	4.58	4.65	4.68	4.73
Scotland	8.02	8.15	9.2	9.07
Northern Ireland	1.25	1.24	1.36	1.39
Council band:				
Band A	13.53	13.1	13.23	13.19
Band B	17.2	17	16.87	16.65
Band C	18.07	17.4	19.57	19.15
Band D	23.67	23.78	23.29	23.43
Band E	12.52	12.88	12.64	12.72
Band F	6.93	7.16	6.85	6.93
Band G	6.67	7.15	6.26	6.56
Band H	1.41	1.53	1.29	1.36

Estimates of the average effect of pre-school attendance and quality on additional KS4 outcomes

We report additional results related to the analysis on the effects of pre-school attendance and quality on Key Stage 4 outcomes.

Table A1.8: Average effects of different pre-school quality measures on Key Stage 4 outcomes

Type of pre-school provision evaluated		Achieved 5 or more GCSE or equivalents at grades A*-C, including English and Math	Achieved 5 or more GCSE/GNVQs at grades A*-C	Total number of GCSE/GNVQ qualifications at grades A*-C, including English and Math	Total GCSE/GNVQ new style point score	Grade achieved in full GCSE Math	Grade achieved in full GCSE English
Some pre-school education (versus none or minimal)		0.106	0.144***	1.153	0.328**	0.188	0.267**
		(0.104)	(0.055)	(0.826)	(0.145)	(0.153)	(0.101)
ECERS-E	High versus Low	0.035	0.022	0.344	0.135	0.047	0.017
		(0.04)	(0.063)	(0.532)	(0.100)	(0.096)	(0.084)
	Medium versus Low	0.012	-0.001	-0.056	0.094	0.088	0.01
		(0.033)	(0.032)	(0.397)	(0.059)	(0.063)	(0.058)
	High versus Medium/Low	0.038*	0.029	0.44*	0.010	-0.027	0.026
		(0.021)	(0.031)	(0.266)	(0.059)	(0.046)	(0.051)
	Above 50% vs. Below 50%	0.029	0.022	0.340	0.003	-0.008	0.045
		(0.018)	(0.022)	(0.277)	(0.034)	(0.044)	(0.028)
ECERS-R	High versus Low	0.064	0.049	1.057**	0.063	-0.118	0.091
		(0.041)	(0.056)	(0.473)	(0.068)	(0.085)	(0.08)
	Medium versus Low	0.013	0.052	0.428	0.119*	0.003	0.012
		(0.036)	(0.045)	(0.461)	(0.070)	(0.065)	(0.062)
	High versus Medium/Low	0.028	-0.010	0.455**	-0.088***	-0.113**	0.018
		(0.018)	(0.019)	(0.228)	(0.026)	(0.05)	(0.034)
	Above 50% vs. Below 50%	0.047**	0.029	0.669**	0.016	-0.021	0.023
		(0.019)	(0.022)	(0.253)	(0.037)	(0.048)	(0.033)

Table A1.9: Average effects of different pre-school quality measures on Key Stage 4 outcomes for boys

Type of pre-school provision evaluated		*Achieved 5 or more GCSE or equivalents at grades A*-C, including English and Math*	*Achieved 5 or more GCSE/GNVQs at grades A*-C*	*Total number of GCSE/GNVQ qualifications at grades A*-C, including English and Math*	*Total GCSE/GNVQ new style point score*	*Grade achieved in full GCSE Math*	*Grade achieved in full GCSE English*
Some pre-school education		0.067	0.142	1.051	0.266	0.164	0.281*
(versus none or minimal)		(0.046)	(0.102)	(1.315)	(0.203)	(0.255)	(0.161)
ECERS-E	High versus Low	0.067	0.041	0.690	0.084	0.045	0.043
		(0.046)	(0.057)	(0.590)	(0.091)	(0.099)	(0.081)
	Medium versus Low	0.028	-0.006	0.413	0.064	0.086	0.066
		(0.033)	(0.031)	(0.396)	(0.089)	(0.066)	(0.057)
	High versus Medium/Low	0.067*	0.055	0.656	0.036	0.008	0.055
		(0.035)	(0.034)	(0.467)	(0.058)	(0.059)	(0.059)
	Above 50% vs. Below 50%	0.017	0.024	0.320	0.004	-0.008	0.062
		(0.025)	(0.024)	(0.375)	(0.048)	(0.046)	(0.045)
ECERS-R	High versus Low	0.069*	0.032	0.986**	-0.051	-0.199**	-0.006
		(0.039)	(0.049)	(0.484)	(0.083)	(0.085)	(0.117)
	Medium versus Low	-0.016	0.002	0.074	-0.001	-0.060	-0.068
		(0.043)	(0.039)	(0.423)	(0.086)	(0.078)	(0.069)
	High versus Medium/Low	0.058*	0.020	0.839**	-0.082*	-0.150**	0.013
		(0.030)	(0.022)	(0.380)	(0.042)	(0.046)	(0.066)
	Above 50% vs. Below 50%	0.059**	0.023	1.010**	0.0250	-0.010	0.054
		(0.025)	(0.021)	(0.391)	(0.051)	(0.051)	(0.054)

Table A1.10: Average effects of different pre-school quality measures on Key Stage 4 outcomes for girls

Type of pre-school provision evaluated		*Achieved 5 or more GCSE or equivalents at grades A*-C, including English and Math*	*Achieved 5 or more GCSE/GNVQs at grades A*-C*	*Total number of GCSE/GNVQ qualifications at grades A*-C, including English and Math*	*Total GCSE/GNVQ new style point score*	*Grade achieved in full GCSE Math*	*Grade achieved in full GCSE English*
Some pre-school education		0.104**	0.147***	1.25**	0.385***	0.210**	0.253***
(versus none or minimal)		(0.052)	(0.024)	(0.522)	(0.096)	(0.090)	(0.067)
ECERS-E	High versus Low	0	0.002	-0.034	0.190	0.050	-0.011
		(0.052)	(0.100)	(0.654)	(0.168)	(0.153)	(0.122)
	Medium versus Low	-0.005	0.005	-0.559	0.126	0.091	-0.048
		(0.068)	(0.052)	(0.819)	(0.108)	(0.145)	(0.102)
	High versus Medium/Low	0.007	0.002	0.213	-0.017	-0.063	-0.003
		(0.024)	(0.050)	(0.314)	(0.084)	(0.059)	(0.074)
	Above 50% vs. Below 50%	0.041*	0.020	0.362	0.002	-0.008	0.026
		(0.021)	(0.033)	(0.263)	(0.042)	(0.057)	(0.035)
ECERS-R	High versus Low	0.059	0.069	1.14*	0.199*	-0.020	0.203*
		(0.059)	(0.078)	(0.616)	(0.105)	(0.118)	(0.106)
	Medium versus Low	0.044	0.106*	0.806	0.247**	0.069	0.094
		(0.060)	(0.063)	(0.735)	(0.102)	(0.117)	(0.109)
	High versus Medium/Low	-0.004	-0.042	0.053	-0.094*	-0.074	0.023
		(0.024)	(0.029)	(0.272)	(0.049)	(0.092)	(0.047)
	Above 50% vs. Below 50%	0.035	0.035	0.308	0.007	-0.033	-0.009
		(0.024)	(0.036)	(0.273)	(0.045)	(0.066)	(0.037)

Table A1.11: Average effects of different pre-school quality measure on Key Stage 4 outcomes, not controlling for baseline characteristics in cognitive, behavioural and development differences between children

Type of pre-school provision evaluated		*Achieved 5 or more GCSE and equivalents at grades A*-C, including English and Math*	*Number of GCSE and equivalents achieved at grades A*-C, including English and Math*	*Achieved 5 or more GCSE or equivalents at grades A*-C*	*Achieved 5 or more GCSE/GNVQs at grades A*-C*	*Total number of GCSE/ GNVQ qualifications at grades A*-C*	*Total GCSE/ GNVQ new style point score*	*Grade achieved in full GCSE Math*	*Grade achieved in full GCSE English*
Some pre-school education (versus none or minimal)		0.116*	1.397*	0.107**	0.153**	1.494**	0.401**	0.262*	0.338***
		(0.065)	(0.749)	(0.043)	(0.058)	(0.504)	(0.131)	(0.134)	(0.096)
ECERS-E	High versus Low	0.060*	0.825*	0.066**	0.055	0.633*	0.111	0.082	0.138**
		(0.036)	(0.422)	(0.031)	(0.049)	(0.357)	(0.090)	(0.095)	(0.064)
	Medium versus Low	0.029	0.246	0.006	0.034	0.414*	0.097	0.094	0.086*
		(0.035)	(0.355)	(0.025)	(0.032)	(0.236)	(0.064)	(0.063)	(0.047)
	High versus Medium/Low	0.041**	0.602**	0.050**	0.021	0.205	0.007	0.012	0.071**
		(0.018)	(0.233)	(0.022)	(0.026)	(0.204)	(0.052)	(0.051)	(0.034)
	Above 50% vs. Below 50%	0.045***	0.593**	0.019	0.035	0.337*	0.048	0.050	0.108***
		(0.013)	(0.192)	(0.018)	(0.023)	(0.174)	(0.049)	(0.044)	(0.027)
ECERS-R	High versus Low	0.060	1.023**	0.066**	0.054	0.607**	0.077	-0.082	0.104
		(0.037)	(0.382)	(0.022)	(0.039)	(0.241)	(0.061)	(0.087)	(0.066)
	Medium versus Low	0.042	0.696**	0.033	0.086**	0.871***	0.183***	0.047	0.066
		(0.034)	(0.350)	(0.025)	(0.032)	(0.213)	(0.053)	(0.053)	(0.048)
	High versus Medium/Low	0.032*	0.519**	0.035**	-0.020	-0.174	-0.092**	-0.086*	0.051
		(0.017)	(0.203)	(0.017)	(0.019)	(0.126)	(0.032)	(0.050)	(0.034)
	Above 50% vs. Below 50%	0.061***	0.868***	0.060***	0.041*	0.380**	0.061	0.030	0.100**
		(0.017)	(0.228)	(0.015)	(0.024)	(0.171)	(0.042)	(0.041)	(0.031)

Table A1.12: Average effects of different pre-school quality measure on Key Stage 4 outcomes, not controlling for baseline characteristics in cognitive, behavioural and development differences between children for boys

Type of pre-school provision evaluated		*Achieved 5 or more GCSE and equivalents at grades A*-C, including English and Math*	*Number of GCSE and equivalents achieved at grades A*-C, including English and Math*	*Achieved 5 or more GCSE or equivalents at grades A*-C*	*Achieved 5 or more GCSE/ GNVQs at grades A*-C.*	*Total number of GCSE/ GNVQ qualifications at grades A*-C*	*Total GCSE/ GNVQ new style point score*	*Grade achieved in full GCSE Math*	*Grade achieved in full GCSE English*
Some pre-school education		0.123	1.389	0.134*	0.152	1.334*	0.356*	0.265	0.376**
(versus none or minimal)		(0.096)	(1.153)	(0.070)	(0.102)	(0.775)	(0.185)	(0.224)	(0.158)
ECERS-E	High versus Low	0.114**	1.364**	0.075**	0.078*	0.810**	0.103	0.095	0.219**
		(0.042)	(.495)	(0.037)	(0.045)	(0.362)	(0.106)	(0.107)	(0.087)
	Medium versus Low	0.062*	0.845**	0.015	0.046	0.588*	0.099	0.103	0.186**
		(0.035)	(0.360)	(0.032)	(0.039)	(0.321)	(0.098)	(0.071)	(0.063)
	High versus Medium/Low	0.070**	0.782*	0.055**	0.037	0.313	0.013	0.033	0.081
		(0.031)	(0.411)	(0.026)	(0.028)	(0.255)	(0.062)	(0.067)	(0.056)
	Above 50% vs. Below 50%	0.040*	0.615**	0.013	0.030	0.323*	0.027	0.046	0.127**
		(0.024)	(0.256)	(0.027)	(0.021)	(0.196)	(0.056)	(0.048)	(0.044)
ECERS-R	High versus Low	0.076*	1.120**	0.049*	0.038	0.398	-0.011	-0.148*	0.056
		(0.039)	(0.403)	(0.029)	(0.040)	(0.267)	(0.095)	(0.086)	(0.109)
	Medium versus Low	0.022	0.363	0.009	0.041	0.482	0.064	-0.007	0.013
		(0.045)	(0.407)	(0.032)	(0.038)	(0.298)	(0.088)	(0.076)	(0.071)
	High versus Medium/Low	0.071**	1.025**	0.052**	0.013	0.029	-0.067	-0.098**	0.060
		(0.028)	(0.365)	(0.025)	(0.020)	(0.203)	(0.053)	(0.041)	(0.064)
	Above 50% vs. Below 50%	0.077***	1.203**	0.050**	0.029	0.399*	0.059	0.040	0.110**
		(0.023)	(0.376)	(0.024)	(0.020)	(0.220)	(0.060)	(0.058)	(0.055)

Table A1.13: Average effects of different pre-school quality measure on Key Stage 4 outcomes, not controlling for baseline characteristics in cognitive, behavioural and development differences between children for girls

Type of pre-school provision evaluated		*Achieved 5 or more GCSE and equivalents at grades A*-C, including English and Math*	*Number of GCSE and equivalents achieved at grades A*-C, including English and Math*	*Achieved 5 or more GCSE or equivalents at grades A*-C*	*Achieved 5 or more GCSE/GNVQs at grades A*-C.*	*Total number of GCSE/GNVQ qualifications at grades A*-C*	*Total GCSE/GNVQ new style point score*	*Grade achieved in full GCSE Math*	*Grade achieved in full GCSE English*
Some pre-school education		0.109*	1.404**	0.081*	0.154***	1.644***	0.442***	0.259**	0.302***
(versus none or minimal)		(0.056)	(0.556)	(0.044)	(0.029)	(0.327)	(0.086)	(0.081)	(0.069)
ECERS-E	High versus Low	-0.001	0.217	0.057	0.030	0.433	0.120	0.069	0.048
		(0.050)	(0.566)	(0.043)	(0.091)	(0.588)	(0.136)	(0.124)	(0.088)
	Medium versus Low	-0.005	-0.398	-0.005	0.020	0.228	0.094	0.085	-0.017
		(0.063)	(0.690)	(0.030)	(0.051)	(0.416)	(0.091)	(0.112)	(0.086)
	High versus Medium/Low	0.010	0.411	0.045	0.005	0.090	-0.001	-0.011	0.060
		(0.025)	(0.297)	(0.034)	(0.050)	(0.307)	(0.079)	(0.054)	(0.057)
	Above 50% vs. Below 50%	0.049**	0.570**	0.026	0.041	0.351	0.070	0.055	0.089**
		(0.018)	(0.225)	(0.023)	(0.036)	(0.231)	(0.061)	(0.060)	(0.034)
ECERS-R	High versus Low	0.041	0.908	0.085**	0.074	0.853**	0.181**	-0.001	0.160*
		(0.056)	(0.611)	(0.037)	(0.066)	(0.369)	(0.082)	(0.125)	(0.090)
	Medium versus Low	0.064	1.062*	0.059**	0.136**	1.299***	0.314***	0.104	0.122
		(0.059)	(0.610)	(0.028)	(0.055)	(0.328)	(0.079)	(0.104)	(0.098)
	High versus Medium/Low	-0.009	-0.018	0.016	-0.054*	-0.390**	-0.120**	-0.074	0.041
		(0.025)	(0.286)	(0.028)	(0.030)	(0.173)	(0.047)	(0.094)	(0.045)
	Above 50% vs. Below 50%	0.045**	0.520**	0.070***	0.052	0.360*	0.064	0.020	0.090**
		(0.020)	(0.222)	(0.021)	(0.036)	(0.197)	(0.050)	(0.058)	(0.036)

Estimates of the effect of pre-school attendance and quality on gross and net lifetime earnings, by gender

Table A1.14: Effect of receiving some pre-school education (versus none or a minimal amount) on lifetime earnings for men

Earnings gains and savings to the Exchequer at the individual level	(A) No pre-school experience	(B) Some pre-school experience	(C) Difference between (A) and (B)
Discounted present value of lifetime gross earnings			
Average of individual gains in £	**£548,692**	**£581,285**	**£32,593**
	(074,807)	(063,476)	(069,705)
Average of individual gains in percentage points			**7.2%**
			(14.5)
Gains in percentage points based on average gains			**5.9%**
Discounted present value of lifetime net earnings			
Average of individual gains in £	**£365,970**	**£384,860**	**£18,889**
	(043,301)	(036,493)	(040,544)
Average of individual gains in percentage points			**6.1%**
			(12.4)
Gains in percentage points based on average gains			**5.2%**
Savings to the Exchequer per individual			**£13,703**
Earnings gains and savings to the Exchequer at the household level			
Discounted present value of lifetime gross earnings			
Average of household gains in £	**£846,403**	**£888,319**	**£41,917**
	(095,369)	**(078,735)**	**(090,915)**
Average of household gains in percentage points			**5.9%**
			(12.0)
Gains in percentage points based on average gains			**5.0%**
Discounted present value of lifetime net earnings			
Average of household gains in £	**£538,474**	**£561,839**	**£23,365**
	(053,260)	**(043,399)**	**(051,022)**
Average of household gains in percentage points			**5.0%**
			(10.4)
Gains in percentage points based on average gains			**4.3%**
Savings to the Exchequer per household			**£18,551**

Table A1.15: Effect of receiving some pre-school (versus none or a minimal amount) on lifetime earnings for women

Earnings gains and savings to the Exchequer at the individual level	(A) No pre-school experience	(B) Some pre-school experience	(C) Difference between (A) and (B)
Discounted present value of lifetime gross earnings			
Average of individual gains in £	**£311,499**	**£332,278**	**£20,779**
	(052,456)	**(044,133)**	**(044,010)**
Average of individual gains in percentage points			**8.6%**
			(17.5)
Gains in percentage points based on average gains			**6.7%**
Discounted present value of lifetime net earnings			
Average of individual gains in £	**£219,721**	**£232,267**	**£12,547**
	(040,461)	**(037,688)**	**(027,389)**
Average of individual gains in percentage points			**7.0%**
			(14.3)
Gains in percentage points based on average gains			**5.7%**
Savings to the Exchequer per individual			**£8,233**
Earnings gains and savings to the Exchequer at the household level			
Discounted present value of lifetime gross earnings			
Average of household gains in £	**£830,019**	**£859,879**	**£29,860**
	(077,866)	**(060,038)**	**(071,977)**
Average of household gains in percentage points			**4.2%**
			(9.7)
Gains in percentage points based on average gains			**3.6%**
Discounted present value of lifetime net earnings			
Average of household gains in £	**£498,401**	**£515,069**	**£16,667**
	(050,780)	(043,266)	(041,019)
Average of household gains in percentage points			**3.9%**
			(9.1)
Gains in percentage points based on average gains			**3.3%**
Savings to the Exchequer per household			**£13,193**

Table A1.16: Effect of attending a high-quality pre-school versus a low-quality preschool on lifetime earnings for men

Earnings gains and savings to the Exchequer at the individual level	(A) Attending a pre-school in the bottom 20% on the ECERS-R scale	(B) Attending a pre-school in the top 20% on the ECERS-R scale	(C) Difference between (A) and (B)
Discounted present value of lifetime gross earnings			
Average of individual gains in £	**£574,300**	**£581,261**	**£6,961**
	(072,668)	**(072,546)**	**(057,511)**
Average of individual gains in percentage points			**1.8%**
			(11.0)
Gains in percentage points based on average gains			**1.2%**
Discounted present value of lifetime net earnings			
Average of individual gains in £	**£380,795**	**£384,902**	**£4,107**
	(041,896)	**(041,805)**	**(033,490)**
Average of individual gains in percentage points			**1.5%**
			(9.5)
Gains in percentage points based on average gains			**1.1%**
Savings to the Exchequer per individual			**£2,854**
Earnings gains and savings to the Exchequer at the household level			
Discounted present value of lifetime gross earnings			
Average of household gains in £	**£879,379**	**£888,784**	**£9,405**
	(090,962)	**(091,002)**	**(075,428)**
Average of household gains in percentage points			**1.5%**
			(9.3)
Gains in percentage points based on average gains			**1.1%**
Discounted present value of lifetime net earnings			
Average of household gains in £	**£556,834**	**£562,250**	**£5,416**
	(050,322)	(050,380)	(042,529)
Average of household gains in percentage points			**1.3%**
			(8.2)
Gains in percentage points based on average gains			**1.0%**
Savings to the Exchequer per household			**£3,989**

Table A1.17: Effect of attending a high-quality pre-school versus a low-quality preschool on lifetime earnings for women

Earnings gains and savings to the Exchequer at the individual level	(A) Attending a pre-school in the bottom 20% on the ECERS-R scale	(B) Attending a pre-school in the top 20% on the ECERS-R scale	(C) Difference between (A) and (B)
Discounted present value of lifetime gross earnings			
Average of individual gains in £	**£315,331**	**£333,420**	**£18,089**
	(053,195)	(048,520)	(034,256)
Average of individual gains in percentage points			**6.9%**
			(12.9)
Gains in percentage points based on average gains			**5.7%**
Discounted present value of lifetime net earnings			
Average of individual gains in £	**£221,598**	**£232,808**	**£11,210**
	(040,742)	(040,082)	(021,923)
Average of individual gains in percentage points			**5.8%**
			(11.1)
Gains in percentage points based on average gains			**5.1%**
Savings to the Exchequer per individual			**£6,879**
Earnings gains and savings to the Exchequer at the household level			
Discounted present value of lifetime gross earnings			
Average of household gains in £	**£834,064**	**£862,963**	**£28,899**
	(076,789)	(067,670)	(056,025)
Average of household gains in percentage points			**3.8%**
			(7.4)
Gains in percentage points based on average gains			**3.5%**
Discounted present value of lifetime net earnings			
Average of household gains in £	**£500,339**	**£516,774**	**£16,436**
	(050,020)	(047,368)	(032,708)
Average of household gains in percentage points			**3.6%**
			(7.0)
Gains in percentage points based on average gains			**3.3%**
Savings to the Exchequer per household			**£12,463**

Table A1.18: Effect of attending a medium quality pre-school versus a low-quality preschool on lifetime earnings for men

Earnings gains and savings to the Exchequer at the individual level	(A) Attending a pre-school in the bottom 20% on the ECERS-R scale	(B) Attending a pre-school in the middle 60% on the ECERS-R scale	(C) Difference between (A) and (B)
Discounted present value of lifetime gross earnings			
Average of individual gains in £	**£577,755**	**£581,342**	**£3,587**
	(069,984)	**(076,716)**	**(061,301)**
Average of individual gains in percentage points			**1.1%**
			(11.3)
Gains in percentage points based on average gains			**0.6%**
Discounted present value of lifetime net earnings			
Average of individual gains in £	**£382,818**	**£384,862**	**£2,044**
	(040,303)	**(044,247)**	**(035,630)**
Average of individual gains in percentage points			**0.9%**
			(9.8)
Gains in percentage points based on average gains			**0.5%**
Savings to the Exchequer per individual			**£1,542**
Earnings gains and savings to the Exchequer at the household level			
Discounted present value of lifetime gross earnings			
Average of household gains in £	**£884,005**	**£888,150**	**£4,145**
	(087,371)	**(096,650)**	**(080,006)**
Average of household gains in percentage points			**0.8%**
			(9.5)
Gains in percentage points based on average gains			**0.5%**
Discounted present value of lifetime net earnings			
Average of household gains in £	**£559,465**	**£561,711**	**£2,246**
	(048,240)	(053,644)	(044,951)
Average of household gains in percentage points			**0.7%**
			(8.4)
Gains in percentage points based on average gains			**0.4%**
Savings to the Exchequer per household			**£1,899**

Table A1.19: Effect of attending a medium quality pre-school versus a low-quality preschool on lifetime earnings for women

Earnings gains and savings to the Exchequer at the individual level	(A) Attending a pre-school in the bottom 20% on the ECERS-R scale	(B) Attending a pre-school in the middle 60% on the ECERS-R scale	(C) Difference between (A) and (B)
Discounted present value of lifetime gross earnings			
Average of individual gains in £	**£315,909**	**£334,884**	**£18,975**
	(053,020)	(050,562)	(041,089)
Average of individual gains in percentage points			**7.3%**
			(15.6)
Gains in percentage points based on average gains			**6.0%**
Discounted present value of lifetime net earnings			
Average of individual gains in £	**£221,925**	**£233,609**	**£11,684**
	(040,632)	**(041,358)**	**(026,475)**
Average of individual gains in percentage points			**6.2%**
			(13.3)
Gains in percentage points based on average gains			**5.3%**
Savings to the Exchequer per individual			**£7,291**
Earnings gains and savings to the Exchequer at the household level			
Discounted present value of lifetime gross earnings			
Average of household gains in £	**£834,937**	**£863,544**	**£28,607**
	(076,856)	**(072,577)**	**(066,463)**
Average of household gains in percentage points			**3.9%**
			(8.7)
Gains in percentage points based on average gains			**3.4%**
Discounted present value of lifetime net earnings			
Average of household gains in £	**£500,790**	**£516,782**	**£15,992**
	(049,988)	(049,717)	(039,018)
Average of household gains in percentage points			**3.6%**
			(8.3)
Gains in percentage points based on average gains			**3.2%**
Savings to the Exchequer per household			**£12,615**

Table A1.20: Effect of attending a pre-school above median quality versus a preschool below median quality on lifetime earnings for men

Earnings gains and savings to the Exchequer at the individual level	(A) Attending a pre-school below the median on the ECERS-R scale	(B) Attending a pre-school above the median on the ECERS-R scale	(C) Difference between (A) and (B)
Discounted present value of lifetime gross earnings			
Average of individual gains in £	**£582,841**	**£592,452**	**£9,610**
	(071,715)	**(065,770)**	**(033,109)**
Average of individual gains in percentage points			**2.0%**
			(6.4)
Gains in percentage points based on average gains			**1.6%**
Discounted present value of lifetime net earnings			
Average of individual gains in £	**£385,758**	**£391,359**	**£5,601**
	(041,307)	**(037,816)**	**(019,293)**
Average of individual gains in percentage points			**1.7%**
			(5.5)
Gains in percentage points based on average gains			**1.5%**
Savings to the Exchequer per individual			**£4,010**
Earnings gains and savings to the Exchequer at the household level			
Discounted present value of lifetime gross earnings			
Average of household gains in £	**£890,334**	**£902,988**	**£12,654**
	(089,629)	**(081,598)**	**(043,386)**
Average of household gains in percentage points			**1.7%**
			(5.4)
Gains in percentage points based on average gains			**1.4%**
Discounted present value of lifetime net earnings			
Average of household gains in £	**£562,985**	**£570,131**	**£7,146**
	(049,589)	(045,035)	(024,458)
Average of household gains in percentage points			**1.5%**
			(4.7)
Gains in percentage points based on average gains			**1.3%**
Savings to the Exchequer per household			**£5,508**

Table A1.21: Effect of attending a pre-school above median quality versus a preschool below median quality on lifetime earnings for women

Earnings gains and savings to the Exchequer at the individual level	(A) Attending a pre-school in the bottom 20% on the ECERS-R scale	(B) Attending a pre-school in the top 20% on the ECERS-R scale	(C) Difference between (A) and (B)
Discounted present value of lifetime gross earnings			
Average of individual gains in £	**£329,171**	**£339,512**	**£10,341**
	(050,963)	(043,794)	(019,964)
Average of individual gains in percentage points			**3.8%**
			(7.5)
Gains in percentage points based on average gains			**3.1%**
Discounted present value of lifetime net earnings			
Average of individual gains in £	**£230,038**	**£236,445**	**£6,407**
	(041,011)	(038,258)	(012,451)
Average of individual gains in percentage points			**3.2%**
			(6.3)
Gains in percentage points based on average gains			**2.8%**
Savings to the Exchequer per individual			**£3,935**
Earnings gains and savings to the Exchequer at the household level			
Discounted present value of lifetime gross earnings			
Average of household gains in £	**£854,244**	**£872,834**	**£18,590**
	(072,780)	**(059,097)**	**(032,596)**
Average of household gains in percentage points			**2.4%**
			(4.3)
Gains in percentage points based on average gains			**2.2%**
Discounted present value of lifetime net earnings			
Average of household gains in £	**£511,463**	**£522,202**	**£10,739**
	(049,205)	(043,599)	(018,592)
Average of household gains in percentage points			**2.3%**
			(4.0)
Gains in percentage points based on average gains			**2.1%**
Savings to the Exchequer per household			**£7,851**

Appendix 8 - How do students view their experiences of school?

Student questionnaire data provided factors on students' views about their teaching and school environments (Sammons et al., 2011d; Sammons et al., 2014d). These factors were derived from data collected from students in Year 9 (KS3) and Year 11 (KS4). The factors derived on students' views of school in Year 9 were:

- Emphasis on learning
- Behaviour climate
- Headteacher qualities
- School environment
- Valuing pupils
- School/Learning resources
- Teacher discipline and care
- Teacher support.

See Sammons et al., 2011d for full descriptions of each factor.

The factors derived from students' views of school in year 11 were:

- Teacher professional focus
- Positive relationships
- Monitoring students
- Formative feedback
- Academic ethos.

These factors were tested to see whether they predicted variations in students' KS4 academic attainment and progress after control for individual, family, HLE characteristics and the percentage of students on FSM in the school (see related reports Sammons et al., 2014a; 2014d). This appendix describes the development of measures of students' views of their secondary school experience at age 16. It also investigates how views of school vary for different groups of students. The most recent findings about students' academic and social-behavioural outcomes and their dispositions in Year 11 are presented in companion reports (Sammons et al 2014a; 2014b; 2014c).

Aims

To explore:

- underlying dimensions (factors) related to students' experiences and views of school at the end of Key Stage 4 (KS4)
- differences between student groups (gender, SES etc.) in their experiences and views
- relationships between individual, family and home learning environment (HLE) characteristics and students' experiences of school at the end of KS4
- relationships between school composition, school effectiveness and school quality and variations in student' views of school at the end of KS4, as well as the effects of earlier educational influences.

Evidence on these measures in terms of correlations and 'effect sizes', statistical measures of association for student outcomes at KS4 are described. This evidence includes some differences between various student groups for individual survey questions. While many of the differences in views are not large the report highlights only those that are statistically significant for this sample.

Key findings

Previously analyses at the end of Year 9 found large differences between individual secondary schools in students' reports of their experiences in terms of several factors including School environment, Headteacher qualities and Poor behaviour climate. Some of these measures were predicted by aspects of student, family and home learning environment (HLE) background. For example, students whose parents were more highly qualified typically had more positive views of the behaviour climate of their secondary school in KS3, but this did not account for all the differences between schools and seventeen per cent of variance was found at the school level after the influence of students' own individual, family and HLE characteristics had been controlled. This pointed to the existence of important differences between secondary schools in these features of students' school experiences in KS3.

Summary of findings for students' views of school in Year 11

School life, academic self-concept and aspirations

Analyses of the student Life in Year 11 questionnaire identified five underlying factors that related to students' experiences of secondary schooling in KS4. These are:

- 'Teacher professional' focus relates to perceptions of teachers' focus on day to day teaching responsibilities such as learning and behaviour within the classroom
- 'Positive relationships' covers how well students and teachers get on, for example, students feeling they are treated fairly and respected and teachers showing an interest in students
- 'Monitoring students' relates to the extent to which teachers monitor the progress students are making, set targets and reward hard work
- 'Formative feedback' relates to students' experiences of practical support from teachers, helping students when they are stuck and guiding them on how to improve their work
- 'Academic ethos' measures the extent to which students feel that other students within the school are interested in learning, doing well and continuing their education past compulsory schooling age.

Students' overall experiences of school in Year 11

On the whole students were very positive about their secondary school experiences in KS4, in line with findings from Year 9 (Sammons et al 2011d). The majority showed particularly favourable views for the factors Positive relationships, Formative feedback and the Academic ethos of their schools. However, the items related to behaviour and discipline were rated rather less favourably than other aspects. For example, approximately a third of students did not think teachers in their school applied rules for behaviour consistently (33%), and a similarly large minority did not think that their teachers marked and returned homework promptly (32%). Similarly, a quarter of students did not agree that 'teachers make sure that it is quiet and orderly during lessons' (25% disagreed/disagreed strongly with this statement).

By contrast, approximately nine out of ten students felt they were treated fairly by teachers and that teachers treated them with respect (71% agreed, 18% agreed strongly). Eight out of ten felt that teachers were interested in them as a person and that teachers and students generally got on well in their secondary school (68% agreed, 16% agreed strongly).

In total, over 95% of students agreed with the statement 'Teachers in this school believe that learning is important', which relates to the factor Teachers' professional focus (55% agreed, and 43% agreed strongly).

In addition, approximately nine out of ten students reported that teachers supported them in terms of providing help when they were stuck, helpful comments and ways to improve their work (e.g., 32% strongly agreed, 63% agreed that teachers helped them when they were stuck). These items relate to the factor Formative feedback.

Nearly all students believed that fellow students in their school thought it was important to do well in exams (66% agreed, 30% agreed strongly) and wanted to carry on with their education after GCSEs (67% agreed, 28% agreed strongly). In all, less than one in five thought students in their school weren't really interested in learning (15%).

Students' views were less favourable when asked about student behaviour and order and structure in the classroom. Also, rather worryingly, a quarter of students did not feel that their teachers would be approachable if they were being bullied (24%).

Differences between student groups in their views of school

The analyses investigated differences between various student groups in their responses to individual questionnaire items and their scores on the five underlying factors. Responses were compared for the following groups: gender, Free School Meals (FSM), parental qualification level, Special Educational Needs (SEN) and the home learning environment (HLE).

Gender differences were generally fairly small but boys were more positive than girls for a number of questionnaire items related to teacher-student relationships (items from the Positive relationships and Teacher professional focus factors). Specifically, boys were more likely to report their teachers arrived on time to lesson, marked and returned homework promptly and treated students fairly. Boys were significantly more positive than girls about the three factors: Teacher professional focus, Positive relationships and Formative feedback.

However, girls were slightly more likely to think students in their school wanted to carry on their education after GCSEs (30% strongly agree compared to 25% of boys). This may relate to differences in boys and girls own plans as nationally more girls enter higher education.

As found in Year 9, SEN was associated with views of school, but not consistently across the stages of the Code of Practice. Students who were on the School Action plus stage had less favourable views of school, but those at the other stages (School Action, Full statement) held similar views to students not on the SEN register.

There were only a few differences related to FSM eligibility in students' views of school (and no significant difference in the five factor scores). However, there were some large differences for a few individual items. For example, nearly a quarter of FSM students strongly agreed that Teachers have the same rules about behaviour compared to only thirteen per cent of non-FSM students.

Students from households where parents had no qualifications showed more positive views for a few individual questionnaire items (the approachability of teachers if they were bullied and the consistency between teachers of behaviour rules). Nonetheless, in general students whose parents were more highly qualified had more positive views of school than others, especially for the two factors Positive relationships and Academic ethos.

The HLE measures capture education related activities that the student has experienced at home and outside of school. They have been collected at regular intervals from the early years up to the end of Year 9 and were investigated to assess any association with views of school. There was no evidence that the early years HLE still predicted differences in secondary students' views of school in Year 11. In contrast, the KS3 HLE measures of Academic supervision and Academic enrichment activities at home were strong predictors of views of school at age 16. Students whose parents provided higher levels of Academic supervision and Academic enrichment activities in KS3 showed consistently more positive views up to age 16. In particular, students with higher levels of Academic supervision reported more favourable views of their secondary schools in terms of Teacher professional focus, Monitoring students, and Formative feedback. Home learning environment may be an additional indicator of cultural capital that could be associated with parents' more active pursuit of good educational opportunities for their children. The findings point to the continued importance of parents in supporting their children's education not only in the early years but through adolescence and the way school and parenting support for education may be mutually reinforcing.

The combined impact of student, family and home learning environment (HLE)

The differences in student responses described above do not take into account the inter-relationship between individual, family and HLE characteristics, so that the strongest predictors of views cannot be identified easily. However, multilevel models (hierarchical linear regression) allow variables to be tested in combination, and provide estimates of the net influence of one predictor, once other variables are controlled. Thus the net effect of say gender can be identified and compared to that of other predictors (e.g., SEN or FSM status). EPPSE used this statistical approach in further analyses and results show that gender still significantly predicted differences in student reports on the factors Teacher professional focus, Positive relationships and Formative feedback, with boys reporting more favourable views than girls.

Students who had shown behavioural problems in their early years were less positive about the Teacher professional focus at age 16. Some ethnic group differences remain evident, with Indian and Pakistani heritage students being more positive in their reports than white students for many or all of the views of school outcomes. However, students from single parent or reconstituted families had less positive views of school (except for the factor Teacher professional focus) than students from families with both natural parents in the house. The effect sizes for student and family variables were generally fairly small however (below 0.2), but taken together they suggest that background characteristics continue to shape students' experiences as well as their outcomes.

Those students with higher HLE scores in KS3 in terms of Academic Enrichment (students were engaged in academic related activities outside school) and Academic Supervision (where parents were more involved in monitoring their academic work) also had more positive views of school, even after other student and family variables had been accounted for. The size of the effect sizes for home learning were moderate in size, and interestingly by far the strongest predictors of more favourable views of school. Elsewhere in companion reports we show how HLE predicts GCSE attainment and progress from KS2 to KS4 (see Sammons et al., 2014a).

There were no significant differences associated with the type of neighbourhood[52] the student had been brought up in the early years and their views of school, again in contrast to results for academic and social-behavioural outcomes.

Academic achievement and views of school

Separate analyses investigated the relationship between current GCSE achievement and students' views of school. Higher attainers in Year 11 reported better relationships with teachers (Positive relationships). They also expressed more positive views of Teacher professional focus, Monitoring students and Formative feedback, although the size of the effect was small. In contrast, prior achievement (in Year 6 and Year 9) only weakly predicted differences in later views in Year 11 for Positive relationships. Interestingly, higher attainers in Year 11 also reported better experiences of schooling but did not rate the academic ethos of others in their school more favourably than other students.

School context and views of school

School ethnic composition was associated with some of the factors related to views of school, once other influences (individual, family and HLE) were taken into account. Students in schools with a higher proportion of White British heritage students reported significantly less favourable views of their school in terms of Academic ethos and Positive relationships. Other school context measures (the percentage of students' that were eligible for FSM, or on the SEN register) were not associated with views after controlling for other influences.

52 Overall IMD, IDACI, Crime and Employment measures were tested as well as census level data on the proportion of White British ethnic heritage group and the proportion of adults with limiting long term illness in the neighbourhood.

Educational influences on views of school

Earlier education phases (pre-school and primary school)

Pre-school attendance (whether children attended pre-school or not), pre-school quality and pre-school effectiveness did not predict any differences in EPPSE students' views of secondary school at age 16. This is in contrast to findings for academic results at GCSE for the EPPSE sample (see Sammons et al 2014a). However, students who had attended a pre-school centre that combined education and care did show more favourable views in Year 11 (compared to the group with no pre-school experience) for Positive relationships, Monitoring students and Formative feedback. This was the case even after accounting for secondary school quality, academic effectiveness and student background influences[53].

There was little evidence of a relationship between the academic effectiveness of the primary school a student had attended and later views of school in Year 11. Students from academically more effective primary schools (for English) reported more favourable views of their secondary school experiences in terms of Academic ethos and Teacher professional focus. Attending an academically effective primary school has been shown to have boosted EPPSE students' attainment at entry to secondary school at age 11 and also predicted their attainment in Year 9 and their progress (from age 11-14). This better attainment at entry to secondary school may have shaped such students' later secondary school experience in KS3 and KS4 in ways that reinforced more positive experiences and views. Elsewhere, we show that the academic effectiveness of the primary school attended continues to predict GCSE outcomes in Year 11 and progress from Year 6 to Year 11 (Sammons et al., 2014a).

Secondary school quality and effectiveness

It was anticipated that EPPSE students' views of their own secondary school might be associated with external measures of school quality and effectiveness. This proved to be the case. Students from more academically effective secondary schools (measured by the DfE Contextualised Value Added indicators) reported significantly more positive views of their secondary school in terms of Academic ethos, Teacher professional focus and Positive relationships than those from less effective secondary schools. There was also evidence, collected when the students were in Year 9, that highly academically effective secondary schools were rated as having a better behaviour climate (more favourable scores for the factor Poor behaviour climate measure), a more pleasant School environment, valued students more and had higher levels of reported Teacher discipline.

[53] Students in the EPPSE sample from different types of secondary school had different trajectories in terms of the quality, effectiveness and type of secondary school they were likely to attend later on. For example, 27% of students who attended a Private Day Nursery went on to attend a selective or independent secondary school. This compares to approximately 4-7% of students from each of the other types of pre-school settings (and the 'home' group).

EPPSE students attending more academically effective secondary schools also reported slightly higher scores for School enjoyment and slightly lower scores for Disaffected behaviour, as reported elsewhere (Sammons et al 2014c). These findings show that the DfE CVA indicators provided valuable measures of differences in school performance that shaped EPPSE students' experiences and outcomes (elsewhere we show that EPPSE students who attended a more academically effective secondary school as measured by the DfE CVA indicator, also had a boost to their GCSE outcomes and made more progress over Year 6 to Year 11; see Sammons et al., 2014a).

EPPSE students' views of school were also more positive in secondary schools that had received more favourable Ofsted quality judgements. Students' views of Academic ethos showed the strongest association with Ofsted quality ratings, followed by Teacher professional focus and Positive relationships. Reports of Academic ethos were more favourable in secondary schools where 'the standards reached by learners' were judged by inspectors to be higher, and where attendance was judged as better. Inspection judgements of achievement and standards showed the most consistent association with EPPSE students' views of school for Teacher professional focus, Positive relationships and Academic ethos.

By contrast, students' reports of two other factors Monitoring students and Formative feedback showed no statistically significant association with Ofsted quality and CVA effectiveness Indicators.

School type

Once student, family and out of school HLE influences were accounted for, students from independent schools[54] had significantly more positive views of their secondary school than students from other schools, classed as 'comprehensive' by the DfE, for all factors except Monitoring students, where no significant differences were found. Students from other maintained schools (mainly special schools) also had significantly more positive views of Teacher professional focus and reported higher levels of Formative feedback than students from comprehensive schools. In addition, students from selective schools gave more favourable ratings for Academic ethos than students from comprehensive schools. These differences are likely to reflect academic selection processes and the extra support provided for students with SEN in special schools.

[54] Schools were classified by the DfE as: Comprehensive, Selective, Other maintained or Independent.

Variation between schools

As was found in previous analyses of EPPSE students' views in Year 9 (Sammons et al 2011d), most factors related to students' views of school in Year 11 varied significantly between schools. This is in contrast to variation in dispositions (Sammons et al., 2014c), which showed little if no school level variation. Once intake differences (student, family and HLE characteristics) were controlled for, Academic ethos showed the greatest variation between schools. A substantial fifteen per cent of variance was found at the school level. School level variation was smaller but still significant for Teacher professional focus, Positive relationships, and Monitoring students at between four and six per cent. These areas of secondary school processes have been identified as important features of educational effectiveness in past research (see Sammons Thomas and Mortimore, 1997).

Conclusion

We find EPPSE students' views about their secondary school experiences continue to be largely favourable towards the end of compulsory schooling, and yet there are some statistically significant differences between schools in terms of the quality of students' experiences. In Year 9, the analyses found substantial variation in measures related specifically to the school structure, ethos and management (Head teacher qualities, Poor behaviour climate and the School environment). In Year 11 it was Academic ethos that showed the largest variation between secondary schools (although all measures showed significant variation). In addition, EPPSE students who were attending more academically effective secondary schools (as measured independently by DfE CVA indicators) had significantly more favourable views.

Significant associations were found between external measure of quality (Ofsted judgements and students' experiences) and effectiveness (DfE, CVA), indicating triangulation. This implies that students are picking up on particular aspects of the quality of education in their secondary schools. In particular, highly effective schools were ones in which academic success was perceived to be highly valued by students (Academic ethos), behaviour and discipline was better (Poor behaviour climate, Teacher discipline) and students and teachers got on well (Positive relationships, Valuing students). Teacher professional focus and the School environment also appeared to be better in more effective schools. This emphasises once more the importance of students' opinions and experiences in the evaluation of school performance. There was no evidence, in terms of their students' scores for Mental well-being, that more academically effective secondary schools were putting undue pressure on their students (see accompanying report Sammons et al, 2014c). In contrast, students from these schools had more favourable reports for School enjoyment (although the size of the effect was small, Sammons et al 2014a3).

As in Year 9, student and family background characteristics accounted for only a small amount of variance in student views. The Home learning environment (HLE) was an exception. A more stimulating KS3 HLE (Academic supervision and Academic enrichment) predicted more positive views of school in Year 11. The relationship between Academic supervision and more favourable views is complex and causation should not be inferred. Students whose parents spend more time monitoring their children's schoolwork report more favourable school experiences in terms of Teacher professional focus, Monitoring students, Formative feedback and Positive relationships[55]. The HLE for the EPPSE sample has been found to predict attainment and social-behavioural outcomes across the educational phases of this longitudinal study and it is possible that students with this kind of home support may also be receiving more support from teachers.

There may be a complex interplay between school processes and the HLE. Students attending more effective and higher quality secondary schools had significantly higher scoring HLEs at the end of primary school and engaged in more educational enrichment activities in Year 9. This suggests that parents who provide a more stimulating HLE may have chosen more effective and higher quality secondary schools for their children. However, schools with a greater focus on Teacher professional focus, Monitoring students, Formative feedback and Positive relationships may well also have an influence on both student and parental behaviour. For example, through practices such as setting and marking homework, and expectations. It is not possible to tease out such potentially reciprocal relationships in this research. However, by controlling for the influence of parental qualifications and support (as measured by the HLE indicators), it is possible to identify the net role of other school influences in shaping differences in students' academic, social-behaviour and other outcomes and their views and experiences of school (as we show in the companion reports on GCSE and social-behavioural outcomes). We conclude that controlling for prior attainment or social behaviour, and other student and family characteristics including HLE differences, secondary school experiences still shape students' outcomes and progress up to the end of Year 11.

55 This relationship was also found for views of school in Year 9. When tested without controlling for other factors, students with higher scores for Academic supervision at home also had more favourable views of school. This was particularly marked for views related to their experiences in the classroom and their relationship with teachers (Emphasis on learning, Valuing students, Teacher discipline, Teacher support). Higher levels of academic enrichment were associated more with a more positive behaviour climate (Poor behaviour climate measure) and a better School environment.

Appendix 9 - GCSE grades, point scores and distribution

Table A1.22: GCSE grades and points scores

Grade (Points value)	Grade achieved in full GCSE English		Grade achieved in full GCSE maths	
	N	%	N	%
A*(58)	162	6.2	199	7.6
A (52)	338	12.8	361	13.8
B (46)	568	21.6	461	17.6
C (40)	770	29.3	730	27.9
D (34)	423	16.1	335	12.8
E (28)	227	8.6	261	10.0
F (22)	89	3.4	164	6.3
G (16)	35	1.3	81	3.1
Ungraded (0)	18	0.7	28	1.1
Total	2630	100	2620	100

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