Department for Education

Students' educational and developmental outcomes at age 16

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

Research Brief

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Introduction

Since 1997 the Effective Pre-school, Primary and Secondary Education Project (EPPSE) has investigated academic and social-behavioural development in a national sample of approximately 3,000 children from the age of 3+ years.

This phase of the research explored how different stages of education, student characteristics, family background, and home and out of school learning, are related to students' GCSE attainment and progress, their social behaviour, dispositions, views of school, and future destinations at age 16. The research also estimates some of the economic returns from society's investment in early education.

This Research Brief outlines the main findings from a longer report by Sylva et al., 2014, which, in turn, summarises six technical papers – see Sammons et al., 2014a; 2014b; 2014c 2014d, Siraj et al., 2014, Taggart et al., 2014 and Catton, Crawford and Dearden 2014.

Key themes at age 16

There is an enduring effect of pre-school. Attendance, quality and duration at pre-school all show long term effects on students' academic outcomes

- Attending any pre-school, compared to none, predicted higher total GCSE scores, higher grades in GCSE English and maths, and the likelihood of achieving 5 or more GCSEs at grade A*-C. The more months students had spent in pre-school, the greater the impact on total GCSE scores and grades in English and maths.

- The quality of pre-school predicted both total GCSE scores and English and maths grades. High quality was also linked to better self-regulation, pro-social behaviour and lower levels of hyperactivity. The quality of pre-school was especially important for children whose parents had low qualifications.

- Pre-school attendance, effectiveness and quality also predict significantly better student progress from KS2 to KS4 in terms of promoting a higher total GCSE score after controlling for prior KS2 attainment.

- Attending pre-school, particularly for a longer period, or attending settings of higher quality, predicted a greater likelihood of following an academic pathway (4+ A/AS levels) post 16.

- Attending any pre-school, compared to none, had a positive influence on educational attainment at age 16. This, in turn, predicts future lifetime gross earnings and positive benefits to the Exchequer from life time earnings.

- High quality pre-school still influences social behaviour, but effects are weaker than in the past.

Early home learning has a long term impact, later learning opportunities outside school are important too

- Positive parenting experiences, especially a more stimulating Home Learning Environment (HLE) when children were young, helps to promote better long term outcomes. The early years HLE remained a significant predictor of better GCSE results. Home learning in adolescence is also important. Experiencing a more academically enriching HLE in KS3 predicted better GCSE attainment and progress.

- The amount of time students said they spent on homework strongly predicted better academic attainment at GCSE and also better progress across KS2 to KS4. Engagement in homework is likely to reflect student motivation, the nature of the tasks set, and the priority given to setting and marking homework by teachers. Doing homework helps to increase the opportunity to learn and can foster independence and study skills

Individual student, family and neighbourhood characteristics continue to influence student outcomes at age 16

- Taken together family influences are the strongest predicators of exam success, just as they were at Key Stage 1, Key Stage 2 and Key Stage 3.

- Students' examination attainment is strongly influenced by the education level of their parents. Although socio-economic status (SES[1]) and family income are also important, their influence on academic results was weaker than parental education. In contrast, SES was one of the strongest predictors of all four social-behavioural outcomes.

- Although weaker than the effect of parental education, poverty continues to matter for child outcomes 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. In addition, living in a disadvantaged neighbourhood (in terms of the proportion of children in families with a low income) predicted lower GCSE scores and poorer development in self-regulation and pro-social behaviour.

- Family members were the main source of advice for students making choices about post 16 destinations.

- Overall girls outperformed boys in GCSE attainment (except for maths) and in social-behavioural outcomes, but as a group had poorer mental wellbeing.

- Girls were more resistant to peer pressure, less likely to engage in 'risky behaviours', and spent more time on homework.

Secondary school quality and students' experiences of school also influence outcomes

- Most students had positive views of school, liked lessons and felt they were treated with respect. They placed great value on getting good GCSE results.

[1] Based on the Registrar General social classification of occupations

- Secondary school quality, as captured by Ofsted judgements, had a moderate positive effect on academic outcomes, but not on social-behavioural outcomes. The effects were most notable for those attending 'Outstanding' versus 'Inadequate' schools.

- Attending a secondary school where teachers were reported to have a strong focus on learning, where relationships between teachers and students were good in terms of trust, and where teachers provided more feedback on work were all significant predictors of better GCSE outcomes. Positive relationships also predicted better social development.

- The behavioural climate of the school (disobeying rules, fights, bullying etc) as rated by students, influenced long-term outcomes. Students GCSE attainment and progress were boosted if they attended a secondary school with a more favourable overall school 'behaviour climate' in KS3. The effects were most notable for maths and English grades and the number of full GCSE entries.

Most students have high career aspirations

- Regardless of background, most students had high career aspirations, aiming at professional occupations and most wanted to attend university. There remains strong gender stereotyping in career choices. When students were asked about their parents' aspirations for them, these reports were a strong predictor of the students' own aspirations for education or training.

- The majority of young people did not think that skin colour, ethnicity, religion or sexual orientation would 'affect their chances of getting a job'.

Background and Aims

Previous phases of the EPPSE project have reported extensively on the sample at different ages. For full details visit www.ioe.ac.uk/eppse. The aim of the KS4 phase was to explore influences on outcomes at age 16. The full report shows how current and past experiences shape the achievements and pathways of young people at 16.

This phase of the EPPSE study sought to identify:

- the influence of family background, home and out of school learning, pre-school, primary and secondary school on academic results, dispositions and social behavioural outcomes at age 16, followed by career path destinations at age 16+

- changes in the patterns of influence across different phases in education and students' post 16 destinations

- how far educational experiences differ for particular groups of students e.g., gender, those with disadvantaged family background;

- the likely future financial returns of pre-school experience in term of future earnings and to the Exchequer.

Methodology

EPPSE used an educational effectiveness design that employs mixed methods (Sammons et al., 2005; Siraj-Blatchford et al., 2006) and has gathered information on children's development from age 3 to 16.

A nationally representative sample of 141 pre-school settings was drawn in 1997 from five English regions (six Local Authorities). These children were followed up at ages 6, 7, 10 and 11 in primary school and at ages 14 and 16 in secondary school. 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.

External indicators of secondary school quality were obtained from Ofsted and the DfE. The latter included CVA[2] (Contextualised Value Added) measures on individual schools. Measures of social behaviour were derived from teacher ratings. Secondary school experience was collected from the students by survey in Year 11. Six months after finishing Year 11 the young people were also asked about their current studies, training and/or employment.

The statistical analyses include exploratory and confirmatory factor analyses along with multilevel modelling. The sample size varies according to outcome and ranges from 1727 for the destinations to approximately 2582 students for the academic analyses (over 94% of the tracked KS4 sample and 81% of the original sample). For further details see Sylva et al., 2014a.

The main outcomes and other measures used in the analyses are:

- **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'* (problem-solving, motivation, self-confidence, assertiveness etc.), '*pro-social behaviour*' (peer empathy, co-operation, altruism etc.), *'hyperactivity'* (reduced self-control, impulsiveness etc.) and *'anti-social behaviour'* (verbal abuse, aggression etc.).

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[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.

- **well-being and dispositions** - mental well-being, school enjoyment, disaffected behaviour, resistance to peer influences, academic self- concept, and engagement in risky behaviours.

- **views and experiences of school** - teacher professional focus, positive relationships, monitoring students, formative feedback and academic ethos.

Findings for each outcome

Most of the results for GCSE outcomes are reported as 'effect sizes' (ES) which allow a comparison of the relative strength of different influences. All the presented ES are statistically significant; however they vary in their strength, for instance anything below 0.2 would be regarded as relatively 'weak', 0.5 moderate and above ES 0.8 would be 'strong. The benchmark indicators are reported as odds ratios (OR).

All the findings on the effects of the predictors are shown net of the effects of other influences (e.g., the effect of gender is shown net of the effects of age, family SES, FSM status, parents' qualifications etc.). For further details see Sammons et al., 2014a.

Outcome 1: Academic attainment and progress

Student and family characteristics

After taking into account other influences girls and Autumn-born children generally scored higher at GCSE (higher total GCSE scores for girls, ES = 0.19 and English scores ES = 0.38; higher total GCSE for older students, ES=0.14)

After taking into account other influences parents' highest qualification level (compared to no qualifications) was the strongest predictor of better attainment in GCSE English - ES=0.69 (degree); ES=0.80 (higher degree) and GCSE maths - ES=0.65 (degree); ES=0.74 (higher degree) and achieving 5 A*-C including English and maths - OR=2.86 (higher degree) OR=3.92 (degree). Family income, measured in KS1, showed large effects on the likelihood of achieving 5 A*-C.

For grades in GCSE English both FSM (ES=-0.31) and lower family SES (ES=-0.49 – unskilled vs. professional non-manual) had moderate negative effects. Family SES also had stronger effects for grades in GCSE maths (ES=-0.66 - unskilled vs. professional). The SES effects for grades in GCSE English were also important and similar in size to the effects of the early years HLE (ES=0.51 - for high vs. low) and the KS3 enrichment HLE measure showed stronger effects for English (ES=0.48 - for high vs. low). Interestingly, the early years HLE had a stronger impact on all measures of students' GCSE results than FSM.

Ethnicity was a relatively strong predictor of total GCSE score and maths grades. After controlling for background factors, students of Indian, Black Caribbean, Pakistani[3] and Bangladeshi[4] heritage obtained higher total GCSE scores, better grades in GCSE maths and were entered for more full GCSEs than students of White UK heritage.

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[3] This shows that for Pakistani students, their low raw scores are accounted for by background influences such as maternal education.
[4] There is only a small number of EPPSE students who are of Bangladeshi heritage.

Neighbourhood influences

Neighbourhood measures are based on the neighbourhood the child lived in during pre-school/primary school and may not reflect later home moves. Higher neighbourhood disadvantage predicted 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 (OR ranges between 0.32-0.39). A higher percentage of White British living in the neighbourhood predicted poorer grades in GCSE English (ES=-0.20) and in maths (ES=-0.15) and the three benchmark indicators. Although significant, neighbourhood effects are weaker than those related to the student's family background.

Pre-school influences

Attending a pre-school, compared to none, predicted higher total GCSE score (ES=0.31), more full GCSE entries (ES=0.21), better grades in GCSE English (ES=0.23) and maths (ES=0.21) and a higher probability of achieving 5 A*-C including English and maths (OR=1.48) when compared to the no pre-school group. The benefit of attending any pre-school, compared to none, is equivalent to 41 points at GCSE. This represents the difference between getting 7 GCSE at 'B grades versus 7 GCSE at 'C' grades, or 7 'C' grades versus 7 'D' grades etc.

The number of months (**duration** of attendance) spent in pre-school predicted Year 11 outcomes. Students who had attended pre-school between 2 and 3 years (whether part-time or full-time) obtained higher total GCSE scores (ES=0.38), better grades in GCSE English (ES=0.28) and in maths (ES=0.30), and were entered for more GCSE exams (ES=0.24).

The **quality** of pre-school also predicted better GCSE results (total GCSE score – ES=0.37; GCSE English – ES=0.31; maths – ES=0.36). Those who had attended high quality settings (compared to no pre-school) were more likely to achieve 5 A*-C including English and maths (OR=1.69). Analyses of the 'joint effects' of pre-school quality and gender showed that boys who attended a medium (ES= 0.33) or a high quality (ES= 0.41) pre-school obtained significantly higher grades in GCSE maths than those in lower quality or not attending pre-school.

The importance of attending a high quality pre-school as a predictor has changed as the young people progressed through school. A high quality pre-school is important when starting school and throughout primary and remains important to the end of Key Stage 2. It influences both attainment and progress in early school careers. However, whilst the influence of attending pre-school or not is still evident at age 16, the quality of pre-school is weaker although still significant in predicting GCSE outcomes.

Other 'joint' effects showed that students of low qualified parents who attended high quality pre-school had better grades in GCSE English (ES= 0.35) and in maths (ES= 0.25) compared to similar students who had attended pre-school of low quality. How **effective** a pre-school was in promoting pre-reading skills predicted later attainment.

Higher pre-school effectiveness predicted more GCSE entries (ES=0.25), better grades in English (ES=0.31), and a higher probability of achieving 5 A*-C including English and maths (OR=1.73). Similarly the effectiveness of the pre-school in promoting early number concepts showed positive and significant effects for later grades in maths (ES=0.35) and total GCSE score (ES=0.48).

Primary school influences

Students who had attended a more academically effective primary school for maths went on to gain better GCSE maths grades (ES=0.25). Students who had attended a medium or highly academically effective primary school were almost twice as likely to achieve the EBacc as students from a low academically effective primary school (OR=1.94).

Secondary school influences

Attending a more **academically effective** secondary school (using DfE Contextual Value Added data[5]) predicted total GCSE score (ES=0.42) but not GCSE English or GCSE maths. It also predicted greater 'Enjoyment of school' and reduced 'Disaffected behaviour' although these effects were relatively weak.

Secondary school quality, as captured by Ofsted judgements, had a moderate positive effect on academic outcomes. Attending a **higher quality** secondary school (judged 'outstanding' compared to 'inadequate') in terms of the inspectors' judgment of 'quality of pupils' learning and their progress' predicted better GCSE English (ES=0.47) and maths (ES=0.47) results and a higher likelihood of gaining 5 A*-C, 5 A*-C including English and maths, and of the EBacc. Similarly, Ofsted ratings of 'learners attendance' ('outstanding' compared to 'inadequate') predicted higher grades in GCSE English (ES=0.50) and maths (ES=0.62) and more GCSE entries (ES=0.78). The probability of achieving 5 A*-C and 5 A*-C including English and maths was significantly higher for students that had the benefit of having attended a secondary school judged to have 'outstanding' attendance.

Attending a secondary school that placed a greater 'emphasis on learning' in KS3 predicted significantly better GCSE attainment in Year 11 and more progress across the five years in secondary school. The strongest effects were on total GCSE score (ES=0.36).

Students' attainment was boosted if they attended a secondary school with a more favourable school '**behaviour climate**' in KS3. The difference was particularly noticeable for GCSE maths (ES= 0.41) English (ES=0.34) and the number of entries (ES=0.41).

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[5] 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.

Other factors from students' reports on their secondary schools in Year 11 were also important. In particular, 'Positive relationships' between teachers and students (trust, respect and fairness) were associated with GCSE outcomes (ES=0.38 for total GCSE score, ES= 0.33 for English and ES=0.28 for maths). Teacher professional focus and provision of 'formative feedback' were also significant but weaker predictors of better results.

The composition of the school's student intake also had an impact on GCSE results, particularly on number of GCSE entries. Attending a school with a higher percentage of FSM students predicted lower grades in English (ES=-0.18), fewer entries (ES=-0.55) and a lower probability of achieving 5 A*-C.

Students' progress between KS2 and KS4

Students with the following characteristics made more progress on a range of GCSE outcomes: older for their year group (Autumn-born), girls, those of certain ethnic minority backgrounds (including Bangladeshi, and Pakistani, heritage), higher family income or qualifications and a richer KS3 HLE for academic enrichment. The percentage of White British residents in a neighbourhood predicted poorer student progress in English whereas reported crime, level of unemployment and perceived neighbour safety all predicted poorer progress for maths.

Pre-school attendance, quality and effectiveness were moderately strong predictors of academic progress for total GCSE score whilst secondary school academic effectiveness predicted academic progress for total GCSE score (ES=0.53). Ofsted ratings of secondary school quality also predicted progress in specific GCSE subject grades in English and maths but not students' overall academic progress.

Homework

The amount of time students said they spent on homework predicted better academic attainment and progress (strongest effects for 2-3 hours on a typical weekday evening). Students who spent more time on homework during Year 9 were almost 10 times more likely to achieve 5 A*-C (OR=9.97) than those who did less homework. A similar result was found for the time spent on homework during Year 11 (OR=9.61) with positive effects evident for total GCSE score, specific GCSE grades and the benchmark indicators as well as overall academic progress in specific subjects.

Outcome 2: Social-behavioural development

Student characteristics

Individual and family characteristics were associated with teachers' ratings of social behaviour. Girls showed significantly better social-behavioural profiles than boys for: self-

regulation (ES=0.43), pro-social behaviour (ES=0.59), hyperactivity (ES=-0.47) and anti-social behaviour (ES=-0.39).

A student's age within their year group was a weak predictor, with the youngest (summer born) showing poorer outcomes for self-regulation (ES=-0.17), pro-social behaviour (ES=-0.12) and hyperactivity (ES=0.17).

Students eligible for FSM had poorer outcomes for self-regulation (ES=-0.33), pro-social behaviour (ES=-0.30), hyperactivity (ES=0.39) and anti-social behaviour (ES=0.44).

Students with SEN in secondary school showed significantly poorer behavioural outcomes and those who had behaviour problems during their early years were more likely to display poorer social behaviour in Year 11 for self-regulation (ES=-0.44), pro-social behaviour (ES=-0.33) and hyperactivity (ES=0.38).

Family characteristics

Parents' highest qualification level was a moderately strong predictor (a degree vs. no qualifications) for: self-regulation (ES=0.44), pro-social behaviour (ES=0.35), hyperactivity (ES=-0.33) and anti-social behaviour (ES=-0.32).

Family poverty and SES and were important predictors of social behaviours. Compared to the highest SES group (professionals), students with unskilled parents had poorer social-behavioural outcomes for: self-regulation (ES=-0.61), pro-social behaviour (ES=-0.51), hyperactivity (ES=0.56) and anti-social behaviour (ES=0.54).

Being in a single parent household was associated with less favourable self-regulation (ES=-0.25), pro-social behaviour (ES=-0.28), hyperactivity (ES=0.24) and anti-social behaviour (ES=0.21) and being in a large family predicted lower scores for self-regulation (ES=-0.22) and higher scores for hyperactivity (ES=0.18).

Students with a more positive early years HLE had better[6] social behaviours in Year 11 for self-regulation (ES=0.29), pro-social behaviour (ES=0.21) and hyperactivity (ES=-0.23). Higher levels of KS3 'academic enrichment activities'[7] predicted better self-regulation (ES=0.28), pro-social behaviour (ES=0.17), hyperactivity (ES=-0.25) and anti-social behaviour (ES=-0.18).

Neighbourhood influences

Low levels of neighbourhood disadvantage 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

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[6] Highest vs. lowest HLE groups

[7] 'enrichment' – activities such as reading for pleasure, educational outings as reported by students and parents

predicted poorer outcomes for pro-social behaviour (ES=-0.20), increased hyperactivity (ES=0.15) and anti-social behaviour (ES=0.18).

Pre-school influences

There was no statistically significant pre-school effect in terms of whether a student had attended or had not attended a pre-school in predicting differences in social behaviour in Year 11. Nor was the duration in months of pre-school attended significant (in contrast to findings for GCSE attainment).

However, pre-school quality, continued to predict social behaviours, although the effects were small and weaker than at earlier time points. Overall, students at 16, who had attended high (compared to low) quality pre-schools, had better scores for 'self-regulation (ES=0.14) and pro-social behaviour (ES=0.16) and lower scores for hyperactivity (ES=-0.20). Similar findings emerged for the measure of pre-school effectiveness in reducing anti-social behaviour. Attending a pre-school that was more effective in reducing anti-social behaviour predicted better outcomes for later self-regulation in Year 11.

Secondary school influences

Attending a secondary school with a higher proportion of SEN students had a negative impact on self-regulation, pro-social behaviour and anti-social behaviour. Students' reports about their secondary school experiences also predicted outcomes. Attending a secondary school reported more favourably for 'positive relationships' predicted better self-regulation (ES=0.42); pro-social behaviour[8] (ES=0.42); and reduced hyperactivity (ES=-0.49) and anti-social behaviour (ES=-0.43). 'Formative feedback' from teachers to students also predicted better pro-social behaviour (ES=0.29).

External indicators of school academic effectiveness (based on DfE CVA indicators) and of school quality from Ofsted inspection grades did not predict differences in social behavioural outcomes. This is in contrast to findings for GCSE attainment where these external indicators were found to be significant. This is also a change from earlier KS3 findings where better school quality measured by Ofsted grades did predict more favourable social behavioural outcomes for students in Year 9.

Outcome 3: Students' wellbeing

School life and aspirations

The majority of students in Year 11 liked school and lessons. Fewer than 10% felt out of place or thought school was a waste of time. However a significant minority (36%) said they were bored in lessons in Year 11.

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[8] All the views and experiences of school comparisons are for high vs. low

Most students were positive about their academic ability and nearly two thirds said they had always done well in school. Only 5% felt 'hopeless' in school subjects. Approximately 90% considered it very important to gain five good GCSEs, nearly 60% spent at least an hour on homework each day, and 72% thought A-levels were important. Nearly two thirds expected to go to university (the proportion was higher for girls).

Girls spend more time on homework with21% of girls and 12% of boys spending more than two hours on homework per day.

Influences on Mental well-being

Girls had lower scores for mental well-being (ES=-0.45), consistent with their higher anxiety recorded in Year 9. In Year 11, boys were more positive and more likely to 'feel good about themselves' (67% compared to 43% of girls) and to feel more 'relaxed' (53% compared to 32% of girls).

Family discord (ES=-0.27) and regular quarrelling with parents predicted poorer Mental well-being (ES=-0.22). Students who rarely ate an evening meal with their family reported lower levels of Mental well-being (ES=-0.13). Students with stricter boundaries (e.g. set times to return home on an evening) had more favourable Mental well-being (ES=0.30).

Friendship groups were important for Mental well-being with lower Mental wellbeing found for students who spent most of their time alone (ES=-0.27), or were excluded from friendship groups in Year 9 (ES=-32).

Peer influence and spare time

Most students said they might be influenced by their peers in some circumstances. Two thirds (64% thought they would take more risks when with their friends. Girls were more resistant to peer pressure than boys.

Two thirds of students spent most of their spare time with friends (65%) but family time was also important for most students and two thirds still attended family outings, with a quarter spending most of their time with family. Only a minority of students (12%) spent most of their spare time alone and three quarters said they had a best friend.

Outcome 4: Post-16 destinations

Career aspirations and confidence in achieving an ideal job were generally high, with most aspiring to professional occupations. There were gender differences in career aspirations amongst low achieving students; low-achieving girls were more likely to choose a lower skilled job than their male peers with similar low achievement.

Nearly two thirds of the sample thought they would go to university, although students from higher income families were more likely to follow a higher academic route that could

lead to more prestigious universities. Both mothers' and fathers' (to a lesser extent) qualifications predicted post-16 destinations, especially following a more academic route. Students from higher SES families were four times more likely than those from low SES to follow a higher academic route post-16. Good GCSE results in English and maths were significant predictors of post-16 destinations. After taking account of age, ethnicity, number of siblings and KS3 HLE, the GCSE results continued to make a strong and significant contribution to destinations

Pre-school attendance (OR = 2.79), duration (OR = 4.38 for > 36 month compared to no pre-school), quality (OR = 2.79 for high compared to no pre-school) and effectiveness (OR = 3.06 for high effectiveness for pre-reading compared to no pre-school) predicted greater likelihood of following a higher academic route after GCSEs, rather than a vocational one.

Overall the sample was generally happy, at home and with those their own age. However, the NEET group was consistently the least happy and although a small sample, the NEET group were less likely to live with their natural mother/father and more likely to be carers, teenage parents, or college 'drop outs'.

Finally and positively the majority of young people did not think their skin colour, ethnicity, religion or sexual orientation would affect their chances of getting a job. They turned to their families for advice on education and employment.

Outcome 5: Predicted economic returns to individuals, households and society

Monetising the full impact of investment in early education is challenging. Economic analysis of the EPPSE data was conducted by a team from Institute for Fiscal Studies (Cattan, Crawford and Dearden, 2014). These analyses provide estimates of some of the likely future economic returns from society's investment in early education. The economic findings 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. Each of these effects was modelled for lifetime gross earnings to the individual or the household, and on specific returns 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 £26,800 for an individual and around £36,000 for an average household. 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 of

around £12,000, for households (around £19,000), and benefits to the Exchequer of around £8,000 (per household).

Conclusions

The EPPSE research was designed to answer questions relevant to policy. It aimed to identify the influences on the educational histories of several thousand children, drawn from around the country and representing diverse social and cultural backgrounds. Most prospered, some faltered, and all were influenced the **most** between 3 and 16 years by their families. But schools mattered too, EPPSE identified the positive role of pre-school education and the continuing contribution of pre-school quality to sound development, particularly for children whose parents had low qualifications. The benefits of good teaching and good schools were found in each key stage. The KS4 analyses provide useful pointers for educational improvement that were found in the reports from students themselves; they thrived most in schools where there were 'positive relationships' and teachers had strong 'professional focus'. A key finding in this newest EPPSE report is the likely return to society of investment in early education.

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Table 1: Summary table for Year 11 academic outcomes[9]

	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

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[9] 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.

Table 2:Summary table for Year 11 benchmark indicators

	Achieved 5 A*-C	Achieved 5 A*-C English & maths	EBacc
Individual student measures	OR[10]	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 – the quality of pupils' learning	3.04	2.74	5.44
Secondary school quality – attendance of learners	2.89	2.74	

I[‡]=Indian heritage

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

Table 3:Summary of the effects of background characteristics as predictors of social behaviour in Year 11

Background characteristics	Self-regulation	Pro-social behaviour	Hyperactivity	Anti-social
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 (No)	-0.33	-0.30	0.39	0.44
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

Background characteristics	Self-regulation	Pro-social behaviour	Hyperactivity	Anti-social
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

N.B. Table displays significant effects at the p<0.05 level or above~ small student numbers so not shown

Background characteristics	Self-regulation	Pro-social behaviour	Hyperactivity	Anti-social
Neighbourhood				
IDACI (High deprivation)				
Low deprivation			0.22	0.25	-0.19	ns
Average deprivation			ns	ns	ns

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