

# THE EFFECTIVE PROVISION OF PRE-SCHOOL EDUCATION (EPPE) PROJECT: Findings from Pre-school to end of Key Stage 1.

Kathy Sylva+, Edward Melhuish#, Pam Sammons-, Iram Siraj-Blatchford\*  
and Brenda Taggart\*

\*Institute of Education, University of London, +University of Oxford,  
#Birkbeck, University of London, -University of Nottingham

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## What is EPPE?

The Effective Provision of Pre-School Education (EPPE) project is the first major European longitudinal study of a national sample of young children's development between the ages of 3 and 7 years. To investigate the effects of pre-school education, the EPPE team collected a wide range of information on 3,000 children. The study also looks at background characteristics related to parents, the child's home environment and the pre-school settings children attended. Settings (141) were drawn from a range of providers (local authority day nurseries, integrated<sup>1</sup> centres, playgroups, private day nurseries, nursery schools and nursery classes). A sample of 'home' children (who had no or minimal pre-school experience) were recruited to the study at entry to school for comparison with the pre-school group. In addition to investigating the effects of pre-school provision, EPPE explored the characteristics of effective practice (and the pedagogy which underpins it) through twelve intensive case studies of settings where children had positive outcomes. EPPE has demonstrated the beneficial effects of high quality provision on children's intellectual and social/behavioural development measured at primary school entry as well as at the end of Years 1 and 2 of primary school. This research brief describes the effects of education in the pre-school period (ages 3 and 4) as measured at primary school entry (rising 5) and in Years 1 and 2 (ages 6 and 7). The brief summarises the empirical work published in eleven Technical Papers (<http://www.ioe.ac.uk/projects/eppe>). Those interested in statistical methods or detailed findings should consult the Technical Papers.

## Key findings over the pre-school period

- *Impact of attending a pre-school*
  - Pre-school experience, compared to none, enhances all-round development in children.
  - Duration of attendance (in months) is important; an earlier start (under age 3 years) is related to better intellectual development.
  - Full time attendance led to no better gains for children than part-time provision.
  - Disadvantaged children benefit significantly from good quality pre-school experiences, especially where they are with a mixture of children from different social backgrounds.
  - Overall disadvantaged children tend to attend pre-school for shorter periods of time than those from more advantaged groups (around 4-6 months less).
- *Does type of pre-school matter?*
  - There are significant differences between individual pre-school settings and their impact on children, some settings are more effective than others in promoting positive child outcomes.
  - Good quality can be found across all types of early years settings; however quality was higher overall in settings integrating care and education and in nursery schools.
- *Effects of quality and specific 'practices' in pre-school*
  - High quality pre-schooling is related to better intellectual and social/behavioural development for children.
  - Settings that have staff with higher qualifications have higher quality scores and their children make more progress.
  - Quality indicators include warm interactive relationships with children, having a trained teacher as manager and a good proportion of trained teachers on the staff.
  - Where settings view educational and social development as complementary and equal in importance, children make better all round progress.
  - Effective pedagogy includes interaction traditionally associated with the term "teaching", the provision of instructive learning environments and 'sustained shared thinking' to extend children's learning.
- *The importance of home learning*
  - For all children, the quality of the home learning environment is more important for intellectual and social development than parental occupation, education or income. What parents do is more important than who parents are.

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<sup>1</sup> 'Integrated' settings fully combine education and care and are referred to as 'combined' centres in EPPE Technical Papers.

## **Key findings at the end of Key Stage 1**

- *Lasting effects*
  - The beneficial effects of pre-school remained evident throughout Key Stage 1, although some outcomes were not as strong as they had been at school entry.
- *Duration and quality*
  - The number of months a child attended pre-school continued to have an effect on their progress throughout Key Stage 1, although this effect was stronger for academic skills than for social behavioural development.
  - Pre-school quality was significantly related to children's scores on standardised tests of reading and mathematics at age 6. At age 7 the relationship between quality and academic attainment was somewhat weaker but still evident, and the effect of quality on social behavioural development was no longer significant. High quality pre-school provision combined with longer duration had the strongest effect on development.
- *Effective settings*
  - Individual pre-schools varied in their 'effectiveness' for influencing a child's development. The advantages for a child's development of attending a particularly 'effective' pre-school centre persists up to age 7. Of course this does not mean that contemporaneous experiences at primary school have no impact on children's lives – only that the individual pre-schools attended continued to have an influence.
- *Vulnerable children*
  - A small group of children continued to be at risk of special educational needs (2.3% of the EPPE sample had full statements), with more of the home children falling into this group even after taking into account background factors.
  - Multiple disadvantage continued to have a negative affect on intellectual and social development up to the end of Key Stage 1. However, the impact of English as an additional language (EAL) is much reduced at age 7, compared to the strength of the effect at age 3 and 5.
- *Home learning environment*
  - The effect of home learning activities during the pre-school period continues to be evident in children's developmental profiles at the end of Key Stage 1.

## **The Aims of EPPE - EPPE explored five questions**

1. What is the impact of pre-school on children's intellectual and social/behavioural development?
2. Are some pre-schools more effective than others in promoting children's development?
3. What are the characteristics of an effective pre-school setting?
4. What is the impact of the home and childcare history on children's development?
5. Do the effects of pre-school continue through Key Stage 1 (ages 6 and 7 years)?

## **Measuring the short and medium term impact of pre-school provision**

EPPE studied a range of different types of pre-schools and 3,000 children from differing social backgrounds. An important element in the study has been to ensure that fair comparison can be made between individual settings and types of provision. Similarly, the study has taken into account the contribution to children's development of background factors such as birth weight, gender, parental qualification/occupations and the home learning environment. The pre-school effects reported in this paper are therefore 'net' of child and family factors. Only by taking account of background influences can fair comparison be made across settings.

EPPE researchers assessed children at three to four years old when they joined the study. Assessments were undertaken to create a profile of each child's intellectual and social/behavioural development (their attainment) using standardised assessments and reports from the pre-school worker who knew the child best. Children were assessed again at entry to school and analyses were carried out to compare children's progress, taking into account the range of background factors referred to above. Further assessments were carried out at the end of Years 1 and 2.

### *Comparing pre-school children to the 'Home' children*

From analyses of children's development during pre-school, and comparisons with the 'home' children, EPPE found that pre-school attendance improves all children's development. Children with no pre-school experience (the 'home group') had poorer cognitive attainment, sociability and concentration when they started primary school.

### *Duration of pre-school and timing of entry*

A number of factors associated with attendance at pre-school were also explored. EPPE shows that a child's duration at pre-school (measured in months) was related to their intellectual gains at school entry and again at the end of Key Stage 1. An early start at pre-school (between 2 and 3 years) was also linked with better intellectual attainment and being more sociable with other children (Peer sociability). The benefits of an early start continue to be evident at the end of Key Stage 1. There was evidence that an early start in group settings, particularly before the age of 2, led to slightly increased behaviour problems for a small group of children when they were 3 and again at 5. There was no evidence that full-day attendance led to better development than half-day attendance.

### *Effect on different groups of children*

The research explored whether pre-school had an impact on the progress of different kinds of children. Pre-school was particularly beneficial to children who are more disadvantaged. EPPE shows that one in three children were 'at risk' of developing learning difficulties at the start of pre-school, however, this fell to one in five by the time they started school<sup>2</sup>. This suggests that pre-school can be an effective intervention for the reduction of special educational needs (SEN), especially for the most disadvantaged and vulnerable children.

Different groups of children have different needs. Results suggest that specialised support in pre-schools, especially for language and pre-reading skills, can benefit children from disadvantaged backgrounds and those for whom English was an additional language. Disadvantaged children are more likely to have adverse social profiles at age 3 and at school entry. The slightly increased risk of anti-social behaviour seen in a small group of children starting pre-school before age 3 can be reduced by high quality pre-school. Whilst not eliminating disadvantage, pre-school can help to ameliorate the effects of social disadvantage and can provide children with a better start to school. Therefore, investing in good quality pre-school provision can be seen as an effective means of achieving targets concerning social exclusion and breaking cycles of disadvantage.

It is also interesting to note that at entry to pre-school girls generally show better social development than boys, especially in co-operation/conformity and independence and concentration. Girls also show better cognitive outcomes than boys.

## **The effects on children of pre-school characteristics**

### *Quality*

An important question for the EPPE research was whether higher quality pre-school provision makes a difference to the intellectual and social behavioural development of young children. If so, what is essential in ensuring quality? Information from observations on the quality of each setting, using standardised rating scales, showed a significant link between higher quality and better intellectual and social/behavioural outcomes at entry to school. For example, children in high quality centres showed more independence and reduced anti-social/worried behaviour by the time they enter primary school. The quality of the interactions between children and staff were particularly important; where staff showed warmth and were responsive to the individual needs of children, children made more progress.

### *Quality and staff qualifications*

Quality makes a difference to children's development. There was a significant relationship between the quality of a pre-school centre and improved child outcomes. There was also a positive relationship between the qualifications of staff and ratings of quality. Children made more progress in pre-school centres where staff had higher qualifications, particularly if the manager was highly qualified. Having trained teachers working with children in pre-school settings (for a substantial proportion of time, and most importantly as the curriculum leader) had the greatest impact on quality, and was linked specifically with better outcomes in pre-reading and social development at age 5.

### *Balance in the curriculum*

One of the rating scales used to assess quality measured four of the developmental domains in the Foundation Stage Curriculum. Centres which put particular emphasis on literacy, maths, science/environment and children's 'diversity' (catering to children of different genders, cultural backgrounds and abilities or interests) promoted better outcomes for children in their subsequent academic attainment, especially in reading and mathematics at age 6. EPPE found that settings strong on the intellectual aspects of the curriculum tended to be strong on the social/behavioural side as well.

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<sup>2</sup> See the Early Transition and Special Education Needs (EYTSSEN) Institute of Education, for more detail on SEN in the early years.

### *Type of pre-school*

Even after taking account of a child's background and prior intellectual skills, the type of pre-school a child attends has an important effect on their developmental progress. Integrated centres that fully combine education with care and have a high proportion of trained teachers, along with nursery schools, tend to promote better intellectual outcomes for children. Similarly, fully integrated settings and nursery classes tend to promote better social development even after taking account of children's backgrounds and prior social behaviour.

Good quality pre-school education can be found in all kinds of settings, however the EPPE data indicates that integrated centres and nursery school provision have the highest scores on pre-school quality, while playgroups, private day nurseries and local authority day nurseries centers have lower scores. The integrated centres in the EPPE sample were all registered as nursery schools but had extended their provision to include flexible hours for childcare along with substantial health and family support services.

### *Social mix*

Disadvantaged children do better in settings with a mixture of children from different social backgrounds rather than in settings catering mostly for children from disadvantaged families. This has implications for the siting of centres in areas of social disadvantage.

### **The impact of the home learning environment on children's development**

In addition to the child assessments and pre-school centre information, interviews were conducted with parents when their child entered the study (with follow-up questionnaires when the children were in school). These were used to collect detailed information about childcare histories, characteristics of children, their families and home environments. This wealth of information has enabled the research study to investigate some of the influences affecting young children that have a significant relationship with their later intellectual and social/behavioural development. These factors clustered around demographic influences, the home learning environment and patterns of childcare before entering the study.

What parents and carers do makes a real difference to young children's development. The EPPE project developed an index to measure the quality of the home learning environment (HLE). There are a range of activities that parents undertake with pre-school children which have a positive effect on their development. For example, reading with the child, teaching songs and nursery rhymes, painting and drawing, playing with letters and numbers, visiting the library, teaching the alphabet and numbers, taking children on visits and creating regular opportunities for them to play with their friends at home, were all associated with higher intellectual and social/behavioural scores. These activities could also be viewed as 'protective' factors in reducing the incidence of SEN because children whose parents engaged regularly in home learning activities were less likely to be at risk for special educational needs. The home learning environment was only moderately associated with parents' educational or occupational level and was more strongly associated with children's intellectual and social development than either parental education or occupation. In other words what parents do with their children is more important than who parents are. Poor mothers with few qualifications can improve their children's progress and give them a better start at school by engaging in activities at home that engage and stretch the child's mind. This EPPE finding underpins the work in programmes such as Local Sure Start and Children's Centres that target areas of high social disadvantage.

EPPE demonstrated a strong relationship between children's outcomes and parental factors but this was somewhat weaker for child social/behavioural development than for cognitive development. Research has consistently indicated that there are strong associations between certain factors related to disadvantage (such as low socio-economic status or SES, low income, mother's educational levels etc.) and children's poor intellectual attainment at school. However, few large-scale research studies have been able to explore the very wide range of background factors considered in the EPPE study, especially daily activities in the home.

The parent, family and home characteristics of children are inter-related and causal attributions cannot be made. For instance the higher incidence of lower attainment amongst children with young mothers is also likely to reflect other factors, including lower qualification levels and reduced employment levels for this group. Bearing this in mind, our findings indicate that there is a strong relationship between a child and family background characteristics at entry to pre-school but this reduces (though is still strong) by the time a child enters primary school. This indicates that pre-school, whilst not eliminating differences in social backgrounds, can help to reduce the disadvantage children experience from some social groups and can help to reduce social exclusion.

## Revealing practice through case studies

Through analysing the progress of children during the pre-school period, researchers identified individual settings that promoted children's developmental outcomes beyond what would be expected given the child's developmental profile at age 3 and their social background. EPPE conducted intensive case studies in 12 centres identified in the middle and upper range of 'effectiveness'. 'Effectiveness' was based on the amount of progress children made at each centre, after controlling for pre-test and social background. The purpose of the case studies was to explore the practices that might explain why children fared so well in some of them. This has important implications for all those working directly with young children as it describes practices linked to children's developmental gains (see EPPE Technical Paper 10, Siraj-Blatchford et al, 2003).

The case studies identified six areas that are particularly important when working with children aged 3 to 5 years.

1. *The quality of adult-child verbal interactions.* More 'sustained shared thinking' was observed in settings where children made the most progress. 'Sustained shared thinking' occurs when two or more individuals 'work together' in an intellectual way to solve a problem, clarify a concept, evaluate an activity, extend a narrative etc. Both parties must contribute to the thinking and it must develop and extend the understanding. It was more likely to occur when children were interacting 1:1 with an adult or with a single peer partner and during focussed group work. In addition to sustained shared thinking, staff engaged in open-ended questioning in the settings where children made the most progress and provided formative feedback to children during activities. Adult 'modelling' skills or appropriate behaviour was often combined with sustained periods of shared thinking; open-ended questioning and modelling were also associated with better cognitive achievement.

RECOMMENDATION: Encourage episodes of 'sustained shared thinking' with the children

2. *Initiation of activities.* In effective settings, the balance of who initiated the activities, staff or child, was about equal. Similarly in effective settings the extent to which staff members extended child-initiated interactions was important. Almost half the child-initiated episodes that contained intellectual challenge included interventions from a staff member to extend the child's thinking. Freely chosen play activities often provided the best opportunities for adults to extend children's thinking. It may be that extending child-initiated play, coupled with the provision of teacher-initiated group work, are the most effective vehicles for learning. Children's cognitive outcomes appear to be directly related to the quantity and quality of the teacher/adult planned and initiated focused group work.

RECOMMENDATION: Work towards an equal balance of child and adult initiated activity.

3. *Knowledge and understanding of the curriculum.* Pre-school workers' knowledge of the particular curriculum area that is being addressed is vital. Curriculum knowledge is just as important in the early years as it is at any later stage of education

4. *Knowledge about how young children learn.* The knowledge of child development underpins sound practice but is often weak among early years staff. This gap could be reduced through initial training and continuous professional development. Staff need a good grasp of the appropriate pedagogy for child's understanding and interests to develop fully. There has been a long debate about the extent to which pre-school education should be formal or informal, often summarised by the extent to which the curriculum is 'play' based. EPPE concludes that in most effective centres 'play' environments were used to provide the basis of instructive learning. However, the most effective pedagogy combines both 'teaching' and providing freely chosen yet potentially instructive play activities. Effective pedagogy for young children is less formal than for primary school but its curricular aims can be both academic as well as social and emotional.

RECOMMENDATION for 3 and 4: Ensure staff have both **curriculum knowledge** as well as knowledge and understanding of **child development**. Improve the child development content of both initial and continuing professional development courses.

5. *Adult skills to support children.* Qualified staff in the most effective settings provided children with more curriculum-related activities (especially language and mathematics) and they encouraged children to engage in challenging play. The most highly qualified staff also provided the most instruction, and were the most effective in their interactions with the children, using the most sustained shared thinking. Less qualified staff were significantly better at supporting learning when they worked with qualified teachers.

RECOMMENDATION: Aim at a good proportion of trained teachers on the staff.

6. *There were more intellectual gains for children in centres that encouraged high levels of parent engagement in their children's learning.* The most effective settings shared child-related information between parents and staff, and parents were often involved in decision making about their child's learning programme. More particularly, children did better where the centre shared its *educational* aims with parents. This enabled parents to support children at home with activities or materials that complemented those experiences in the Foundation Stage.

RECOMMENDATION: Engage parents in their children's learning and share educational aims with them.

7. *The most effective settings adopted discipline/behaviour policies in which staff supported children in rationalising and talking through their conflicts.* In settings that were less effective in this respect, our observations showed that there was often no follow up on children's misbehaviour and, on many occasions, children were 'distracted' or simply told to stop.

RECOMMENDATION: Encourage behaviour policies in which staff support children's behaviour management through reasoning and talk.

### **The influence of early childcare before entry to the EPPE study**

Our parental interviews discussed childcare 'history' before their child entered the study. This revealed that non-parental childcare before three years of age had several effects:

High levels of 'group care' before the age of three (and particularly before the age of two) were associated with slightly higher levels of anti-social behaviour for a small group of children when assessed at age 3. This effect was largely restricted to children attending Local Authority and Private Day nurseries where substantial numbers of children attended from infancy onwards. If children with higher anti-social behaviour attended a high-quality setting between 3 and 5 years, then their anti-social behaviour decreased.

Although moderate levels of childminder care were not associated with increased anti-social behaviour, extremely high levels were. Where there was substantial care from a relative (usually grandmothers) there was less anti-social behaviour and more co-operative behaviour in children.

### **Methodology**

EPPE used the following sources of information: standardised child assessments taken over time, child social/behavioural profiles completed by pre-school and primary staff, parental interviews, interviews with pre-school centre staff, quality rating scales and case study observations and interviews. The case studies included detailed documentation of naturalistic observations of staff pedagogy, and systematic structured target child observations of children's learning. Information was also gathered and analysed using interviews with parents, staff and managers and through intensive and wide ranging documentary analysis and a literature review of pedagogy in the early years.

Many sources of data have been used in statistical analyses to explore the contribution to children's development by pre-school settings after taking account of a range of child, parent and home background factors. EPPE has produced rigorous and persuasive data for policy makers and provided practical guidance on quality for practitioners.

### **Relationship of EPPE findings to other research**

The EPPE findings are similar to other research studies and this increases confidence in its conclusions.

Related studies have shown:

- Short-term, positive effects of pre-school education have been shown conclusively in the U.S., Sweden, Norway, Germany, Canada, Northern Ireland and New Zealand (See Melhuish, 2004a).
- The effects of greater staff training and qualifications have been shown in the U.S. (Peisner-Feinberg and Burchinal, 1997) and in Northern Ireland (Melhuish et al., 2000).
- The contribution of quality to children's developmental progress has been shown in many studies, often using the ECERS observational scale (Melhuish, 2004a and b).
- The US National Institute of Child Health and Development Study (NICHD) found that family characteristics have a greater impact on outcomes for children than pre-school factors. However, the effect of attending pre-school (versus not) on developmental progress is greater than the effect of social disadvantage. In addition, for children attending pre-school, the effect of attending a specific centre is about half that of all social background factors (NICHD, 2002).
- Early day care was found in EPPE to relate to increased cognitive outcomes better Independence and Peer Sociability at 5 years but also to increased anti-social behaviour. These findings are similar to those in the US and Northern Ireland (NICHD, 2002; Melhuish et al., 2001, 2002).
- The findings on disadvantage are mirrored elsewhere (see Melhuish, 2004a) and are the basis of

policy initiatives all over the world (Young, 1996).

- EPPE is one of few studies (the only in the UK) to demonstrate the role of pre-school education as an effective means of early intervention in SEN (Sammons et al., 2002).
- EPPE is the first large-scale multi-level modelling study to show convincingly that individual pre-school centres have lasting effects on children's development.

### Summary

This study has demonstrated the positive effects of high quality pre-school provision on children's intellectual and social behavioural development up to the end of Key Stage 1 in primary school. The EPPE research indicates that pre-school can play an important part in combating social exclusion and promoting inclusion by offering disadvantaged children, in particular, a better start to primary school. The findings indicate pre-school has a positive impact on children's progress over and above important family influences. The quality of the pre-school setting experience as well as the quantity (more months but not necessarily more hours/day) are both influential.

The results show that individual pre-school centres vary in their effectiveness in promoting intellectual progress over the pre-school period, and indicate that better outcomes are associated with certain forms of provision. Likewise, the research points to the separate and significant influence of the home learning environment. These aspects (quality and quantity of pre-school and home learning environment) can be seen as more susceptible to change through policy and practitioner initiatives than other child or family characteristics, such as SES.

The EPPE project has become well known for its contribution to 'evidence based policy' in early years education and care. Its findings are robust because they are based on sound and innovative research methods. The implications for policy of the EPPE project have been spelled out clearly and are being discussed – and acted upon – at national and local level. EPPE set out to contribute to the debate about the education and care of young children; the EPPE mixed-method research design targeted issues that could 'make a difference' to the lives of young children and their families. The research is now extended in the continuation study, EPPE 3-11 also funded by the DfES, to find out if the effects of early education that were so evident at ages 5 and 7 continue through to the age 11. Moreover, the team are investigating the way in which educational experiences in Key Stage 2 interact with the earlier pre-school experiences in the shaping of cognitive and social/behavioural outcomes for children at the transition to secondary school.

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