

Effective Pre-school Provision in Northern Ireland (EPPNI) Summary Report

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The Effective Pre-School Provision in Northern Ireland [EPPNI] Project

Summary report

1998-2004

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EXECUTIVE SUMMARY

Introduction

The Effective Pre-school Provision in Northern Ireland (EPPNI) project investigated the effects of pre-school education and care on children's development for children aged 3-8 years old. The EPPNI team collected a wide range of information on over 800 children who were studied longitudinally until the end of Key Stage 1. Data were collected on children's developmental profiles (at ages 3, 4, 5, 6, 7, and 8 years), background characteristics related to their parents, the child's home learning environment, and the pre-school settings children attended. Eighty pre-school settings were drawn from a range of providers (nursery schools/classes, playgroups, private day nurseries, reception classes and reception groups). 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 on child outcomes, EPPNI included three intensive case studies of pre-school settings. This research report summarises the empirical work published in thirteen Technical Papers (See Appendix 3). Those interested in methods or detailed findings should consult the Technical Papers because only the main findings and implications appear in this report.

Questions addressed in EPPNI

EPPNI explored five questions:

Does pre-school have an impact on children's intellectual and social/behavioural development?

Are some types of pre-school more effective in promoting children's development?

What are the characteristics of effective pre-school settings?

What is the impact of the home and childcare history on children's development?

Do the effects of pre-school continue through Key Stage 1 (up to age 8 years)?

Methodology

EPPNI is a longitudinal study and 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 from observation and interviews as well as case studies.

EPPNI studied a range of different types of pre-schools and 800+ children from differing social backgrounds across Northern Ireland, and the 'value added' by pre-school is examined after taking account of a range of child, parent and home background factors. This is critical 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.

Children were first assessed at three to four years old when they joined the study. These assessments provide a profile of each child's intellectual and social/behavioural development using standardised instruments and reports from the pre-school worker who knew the child best. Later assessments occurred at entry to school in order to compare children's progress, taking into account the background factors mentioned above. Further assessments were carried out at the end of Years 1, 2, 3, and 4 of primary school.

Key findings over the pre-school period

Impact of attending a pre-school

- Pre-school experience enhances cognitive and social development in all children.

- Full time attendance had no benefits for cognitive development at the start of primary school compared to part-time provision.
- Disadvantaged children benefit even more where they are with a mixture of children from different social backgrounds.

Does type of pre-school matter?

- There are significant differences between pre-school settings and their impact on children. Nursery schools/classes have the overall best outcomes, with good outcomes also for playgroups. Other types of pre-school produce benefits but to a lesser extent.

Effects of quality and specific 'practices' in pre-school

- High quality pre-schooling is related to better intellectual and social/behavioural development for children.
- Observed quality within pre-school settings was higher in nursery schools and classes.
- Staff training and qualifications are associated with better quality of provision.

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.

Key findings at the end of Key Stage 1

Enduring effects

- Advantageous effects of pre-school were evident throughout Key Stage 1, with some reduction in strength for some outcomes compared to school entry.

Type of pre-school

- Type of pre-school was related to longer term effects with effects most strong for nursery schools and classes, with playgroups closely following, and less long-lasting effects for other types of pre-school.

Quality of pre-school

- Pre-school quality was significantly related to children's development over the first four years of primary school.

Vulnerable children

A small group of children continued to be 'at risk' of special educational needs, with more of the 'home' children falling into this group even after taking into account background factors. There are a range of multiple disadvantages associated with children 'at risk' of learning or behavioural difficulties. These disadvantages include prematurity, low birthweight, more than 3 siblings, lower parent education and socio-economic status, and poorer home learning environment. Also such children are more likely to show developmental or behavioural difficulties in infancy. Children 'at risk' of learning or behavioural difficulties are helped by pre-school experience and the effects are greater the better the quality of the pre-school and persist until the end of Key Stage 1. Where disadvantaged children attended centres that included children from mixed social backgrounds they showed further benefit than if they attended centres containing predominantly disadvantaged children.

Summary of pre-school type impact

Table 1 below summarises the number of benefits (summed over all child outcome measures) for the first 4 years of primary school associated with attendance at various types of pre-school, as compared with no pre-school experience, having allowed for background differences.

For cognitive outcomes the children from nursery school/class show the most benefit followed by the children from playgroups, then children from private day nurseries and reception classes, with children from reception groups showing no overall cognitive benefit.

For social/behavioural outcomes, children from nursery school/classes and playgroups show equivalent benefit, with children from the other types of pre-school showing a smaller advantage over the home group.

Table 1: Overall developmental benefits associated with pre-school type for first 4 years of primary school as compared with home children

Developmental Benefit	Nursery school/class	Playgroup	Private Day Nursery	Reception Class	Reception Group
Cognitive Development	15	10	5	4	0
Social Development	9	9	2	1	2

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

Parental interviews were used to collect detailed information about childcare histories, characteristics of children, their families and home environments. This information enabled the investigation of factors that have a significant relationship with later intellectual and social/behavioural development. These factors included demographic influences, the home learning environment and patterns of childcare before entering the study.

What parents do makes a difference to young children's development. The EPPNI project used an index of the quality of the home learning environment (HLE). There is a range of activities that parents undertake with pre-school children that promotes 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 be viewed as 'protective' factors in reducing special educational needs (SEN) because children whose parents engaged regularly in home learning activities were less likely to be 'at risk' for SEN. 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. All parents, including those with low income and/or few qualifications, can improve their children's progress and give them a better start at school by engaging in activities that engage and stretch the child's mind. This EPPNI finding has implications for the work in programmes such as Sure Start that target areas of high social disadvantage.

EPPNI 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 wide range of background factors considered in the EPPNI study, especially daily activities in the home.

The influence of early childcare before entry to the EPPNI study

Parental interviews included childcare 'history' before a child entered the study. Non-parental childcare before three years of age appeared to have some effects. High levels of 'group care' in the first 3 years were associated with slightly higher levels of anti-social behaviour for a small group of children when assessed at age 3.

Lessons from Case Studies

EPPNI undertook 3 case studies in a nursery school, playgroup and private day nursery, where there had been indications of good practice. Significantly, the case studies have shown how diverse early years settings are. They show that there is no 'level playing field' in terms of the training of staff, staff salaries and conditions of service, adult-child ratios, resources or accommodation. The three EPPNI case studies identified four areas that are important when working with children aged 3 to 5 years.

1. Management and staff

The case studies revealed strong leadership and long serving staff in each of centres. In all settings the strong leadership was characterised by a strong philosophy for the setting, which was shared by everyone working in the setting. Also a high level of commitment to staff development and training was considered important and supported. Indeed staff at each of the pre-school settings held a range of vocational and academic qualifications.

2. Ethos and Emotional Climate of the Settings

Common themes related to good quality provision emerged. All the centres on the whole had a warm, caring, safe, secure and supportive approach to their children. Children were generally treated with respect and the centres were warm and inviting places. Staff appeared calm and usually engaged well with the children. Resources and available space varied between type of centre, including the outdoor environments and equipment.

3. Parental partnership

Communication with parents varied and included, open days, notice boards, prospectuses, monthly newsletters, and a booklet outlining activities for the children, the role of parents and staff and the aims of the centre. At all three centres parents were made to feel that they could talk informally to staff about problems at any time, and parents regularly received informal reports concerning their child's progress, and formal meetings were arranged if necessary. Overall, parental attitudes were positive, and parents generally expressed the opinion that staff seemed to care about the children, who were safe and happy in centres.

4. Pedagogy

Play was a central tenet of practice at all three centres, with a variety of activities being available for children. At all of the centres the quality of interactions was generally of high quality. The range of questioning to children was appropriate with both closed and open-ended questions being utilised. At all three centres opportunities to extend learning were taken, and independence was encouraged centres with children being able to choose and carry out at least some activities on their own. The role of the staff varied. However, at all three centres it was the role of the staff to provide a safe, warm, loving environment where children could play and learn. Children at all three centres generally worked at their own level and at their own pace using a wide variety of resources.

Case Studies in England from the EPPE project

The Effective Provision of Pre-school Education (EPPE) project is a linked project in England. Fourteen intensive case studies were undertaken in England but the selection of case studies differed between England and Northern Ireland. In the EPPE project, the case studies were chosen retrospectively on the basis of analyses of their child outcome data, and the most effective centres compared with less effective ones. Details of the EPPE case studies can be seen in the report by Siraj-Blatchford et al., (2003). The EPPE case studies point to several recommendations for early years practice, including the following:

- ◆ Encourage episodes of 'sustained shared thinking' with the children.
- ◆ Work towards an equal balance of child and adult initiated activity.
- ◆ Ensure staff have curriculum knowledge and understanding of child development.
- ◆ Improve the child development content of initial and continuing professional development courses.
- ◆ Aim at a good proportion of trained teachers or equivalents on the staff.
- ◆ Engage parents in their children's learning and share educational aims with them.
- ◆ Encourage behaviour policies where staff support children's behaviour management through reasoning and talk.

The EPPNI findings in the context of other research studies

The similarity of findings elsewhere as well as the EPPE results increase confidence in EPPNI findings. Areas in which the EPPNI findings are supported elsewhere include:

1. Positive effects of pre-school education have been shown conclusively in the U.S., Sweden, Norway, Germany, Canada, England and New Zealand (Melhuish, 2004a; Sylva et al., 2004).
2. The effects of greater staff training and qualifications have been shown in the U.S. (Peisner-Feinberg & Burchinal, 1997; 2001) and in England (Sylva et al., 2004).
3. 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; Sylva et al., 2004).
4. The findings on disadvantage are mirrored elsewhere (see Melhuish, 2004a) and are the basis of policy initiatives all over the world (Young, 1996).
5. EPPNI is one of few studies, EPPE in England being another, to demonstrate the role of pre-school education as an effective means of early intervention in SEN.

Lessons from research for policy and practice

The EPPNI project 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. This research indicates that pre-school can play a part in combating social exclusion for disadvantaged children by promoting a better start to primary school, and that pre-school has a positive impact on children's progress over and above family influences.

The results show that type of pre-school centre is important and indicate that better outcomes are associated with certain types of provision. Also the research points to the important separate influence of the home learning environment. These aspects (type, quality

and home learning environment) are more susceptible to change through policy and practitioner initiatives than other characteristics, such as socio-economic status (SES).

The project provides clear evidence of the benefits of pre-school education for children in Northern Ireland, and that children benefit more from nursery school, nursery class or playgroup than from other types of pre-school provision. These types of provision should be expanded in their coverage of the population rather than other types of provision. The public provision of reception classes and reception groups is associated with a low level of benefit and governmental expenditure would achieve more for the children of Northern Ireland were resources redirected to the provision of nursery school, nursery class or playgroup provision for children currently receiving pre-school provision via reception classes or groups. Private day nurseries in Northern Ireland also do not provide as much measurable benefit for children's development as do nursery school, nursery class or playgroup.

In addition to the benefits for cognitive and social development, the report also draws attention to the reduction of 'at risk' status of developing Special Educational Needs that is associated with good quality pre-school provision. This strengthens the economic case for good quality pre-school provision for all children as SEN is expensive in terms of individuals' development and public finances. Specific proposals related to vulnerable children include:

- Increasing the take-up of pre-school places by parents who would not usually send their children to pre-school (usually found in geographical clusters) would provide vulnerable groups of children with a better start to school and reduce their risk of developing SEN.
- Pre-school and school staff should be aware that boys may be at increased 'risk' of developing SEN for cognitive development and aspects of social development. Increased focus on the specific needs of boys, as learners, linked with appropriate staff development may have long-term benefits and help reduce the gender gap in SEN.
- Fostering active parental engagement with children and involvement in play activities that promote children's language, spatial skills and creativity, in particular, are likely to benefit children's subsequent cognitive and social development and attainment at school.
- The strong links between 'at risk' status and multiple disadvantage indicate that ways of effectively targeting additional resources to pre-schools and schools that serve high proportions of multiply disadvantaged families should be explored.

The linked project in England (EPPE) has become well known for its contribution to 'evidence based policy' in early years education and care, and the EPPNI findings could be used similarly. The findings of EPPNI and EPPE are robust because they are based on sound and innovative research methods. The implications for policy of the EPPNI project are substantial at national, regional and local level. EPPNI set out to contribute to the debate about the education and care of young children, and EPPNI has targeted issues that potentially 'make a difference' to young children and their families in the long term.

Chapter One: Introduction

This chapter sets the scene in terms of considering the policy and previous research context existing at the time that the Effective Pre-school Provision in Northern Ireland (EPPNI) started. EPPNI was initiated as a partner project to the Effective Provision of Pre-school Education (EPPE) project that was starting in England. Both projects share team members and use similar methods.

Policy context

EPPNI began in 1998, when early years policy and research were a ‘backwater’ compared to statutory schooling. The Rumbold Report (DES, 1990) highlighted the potential for pre-school education to give children a better start at school. This was followed by the Start Right Report (Ball, 1994), which made a strong case for the long-term effects of early education on motivational and academic outcomes. In 1997 the Effective Provision of Preschool Education (EPPE) study was commissioned in England, and EPPNI as a sister project was started in Northern Ireland in 1998. Both EPPE and EPPNI are ‘value added’ longitudinal studies of the effects of pre-school experience upon children’s development, and both were designed to produce evidence that could be used to inform policy and practice.

With the new policies introduced in 1997 the UK government has increasingly become committed to expanding early years services. This commitment involves two aspects: (a) the need to prepare all children, especially those from disadvantaged backgrounds, for the demands of entering primary school, and (b) the contribution of child care to helping workless families move into paid employment and out of poverty. These aims are consistent with the social inclusion and raising educational standards agenda. Each of the constituent countries within the UK has pursued early years policy in different ways.

This report describes the longitudinal research on Effective Pre-school Provision in Northern Ireland (EPPNI) funded by the Department of Education, the Department of Health, Social Services and Public Safety, and from an inter-departmental budget, over the period 1998-2005. Further details appear in a series of thirteen Technical Papers (see Appendix 3).

Many countries pursue policies aimed at improving educational outcomes for young children, particularly disadvantaged children. It is hoped that such policies will enable children to enter school ‘more ready’ to learn, and achieve more later in school, yet it is unclear what is effective in promoting young children’s learning and development? The EPPNI project described here may help government ensure ‘a good start’ for children through basing policy and practice on rigorous research evidence.

Previous Research

Much research on early education is American. Two studies cited often are the Abecedarian Project and the Perry Pre-school Programme (Ramey & Ramey, 1998; Schweinhart and Weikart, 1997). Both used randomised control trials to demonstrate lasting effects of high quality early intervention. These landmark studies, begun in the 1970s, were focussed on the use of pre-school as an intervention for disadvantaged children and have been followed by further randomised control trials (see the Early Head Start, Love et al., 2001) and cohort studies (See Brooks-Gunn et al., 2003; Melhuish, 2004a, for reviews). This literature points to the many positive effects of centre-based care and education. Attention has turned away from establishing simple effects of early education and towards an understanding of the familial and educational processes underlying change in development. Current research into the effects of early education must take into account aspects of the child’s home environment, as it is clear that children’s outcomes are the joint product of home and pre-school. Such a strategy was evident in the EPPNI research.

The 'Start Right' Enquiry (Ball 1994; Sylva 1994) reviewed British research and concluded that small-scale studies suggested a positive impact but that large-scale research was inconclusive, as there has been little large-scale, systematic research on the effects of early childhood education in the UK. It was clear that rigorous longitudinal studies that could measure the 'value added' to children's development by pre-school education were needed. EPPNI has responded to this with a 'value added' design for considering pre-school provision in Northern Ireland.

Research evidence on the effects of different kinds of pre-school childcare and education on children's development (Melhuish et al. 1990; Melhuish 1993; Schweinhart & Weikart 1997; Borge & Melhuish, 1995; NICHD, 1997, 2002) generally suggests positive outcomes for pre-school in the 3-5 age range, but with mixed results for the under-threes. Some researchers have examined the impact of particular characteristics, e.g. gender and attendance on children's adjustment to nursery classes (Davies & Brember 1992), or adopted cross-sectional designs to explore the impact of different types of pre-school provision (Davies & Brember 1997). Feinstein, Robertson & Symons (1998) attempted to evaluate the effects of pre-schooling on children's subsequent progress but birth cohort designs may not be appropriate for the study of the influence of pre-school education. The absence of data on children's attainments at entry to pre-school means that neither the British Cohort Study (Butler, 1970) nor the National Child Development Study (Davie, Butler & Goldstein, 1972) can be used to explore the effects of pre-school education on children's progress. These studies are also limited by the time lapse and many changes in the nature of pre-school provision that have occurred. In addition the range of data available on individual children in such general cohort studies limits the range of questions that might be addressed.

Up to the end of the twentieth century research in the UK had systematically explored neither whether some forms of pre-school provision have greater benefits than others, nor the actual differences between different forms of provision. Yet in the UK there is a long tradition of variation in pre-school provision both between types (e.g. playgroup, nursery classes) and in different parts of the country. A series of reports (House of Commons Select Committee 1989; DES Rumbold Report, 1990; Ball, 1994) have questioned whether Britain's pre-school education is as effective as it might be and have urged better co-ordination of services and research into the impact of different forms of provision (Siraj-Blatchford, 1995). The EPPE and EPPNI projects are the first large-scale British studies on the effects of different kinds of pre-school provision. Both projects studied the effects of pre-school experience and the effects of family support for children's learning at home, because to understand children's development it is necessary to take both into account.

Issues of particular relevance to policy are:

- 1 Does pre-school experience produce benefits for children?
- 2 Do early effects 'fade' over time?
- 3 Do different types of pre-school education have the same effects on children?
- 4 What are the characteristics of effective pre-school provision?

EPPNI provides rigorous research evidence relevant to these questions in Northern Ireland as the EPPE project does for England.

Chapter Two: Design and methods of the EPPNI Study

Currently two major strategies have been used to establish the effects of early education and care on children; randomised controlled trials (RCTs) such as the Perry Pre-school Project and longitudinal cohort designs such as EPPNI. Although RCTs have strong internal validity, the EPPNI and EPPE teams opted for a value added, longitudinal cohort study because of its generalisability across regions in the country, across social class, and its capacity to describe the effects of a range of Early Years provision, e.g., playgroups, private day nurseries, nursery schools/classes and reception classes and groups. Note that reception classes and groups are a form of pre-school provision where 3- and 4-year-olds are entered into a primary school where no other form of pre-school is available, usually in rural areas. A reception class is formed if there are enough pre-school children to form a class of their own (typically 10+), and there are taught separately from P1 children, whereas if there is a small number of pre-school children they form a reception group within a P1 class of older children, where P1 is the entry class for primary school.

In the case of EPPNI such questions require assessment of the development of children followed between the ages of 3 and 8 years and statistical control for background influences. Initially 80 centres from four types of provision were selected for the study. The four types were nursery school/class, playgroup, private day nursery, and reception class/group. Over 800 children and families and 80 pre-school centres were randomly selected from all of the Education and Library Board areas contributed to the EPPNI study.

The EPPNI project was designed to study four issues with important implications for policy and practice:

- the effects of sessional pre-school on children in the age range 3 – 5 years;
- the 'structural' (e.g. staffing profiles) and 'process' characteristics (e.g. interaction styles) of more effective pre-school centres; and
- the contribution of child and family characteristics to children's development;
- whether pre-school effects persist into the early primary school years.

The study design enabled the research team to investigate the progress and development of individual children (including the impact of personal, socio-economic and family characteristics), and the effect of pre-school experience on children's outcomes at both entry to school (aged 4+) and at the end of Key Stage 1 (age 8+). In addition the EPPNI project is designed to examine the impact of type of pre-school provision for different kinds of outcomes (cognitive and social/behavioural).

The 8 aims of the EPPNI Project

- To produce a description of the 'career paths' of a large sample of children and their families between entry into pre-school education and completion of Key Stage 1.
- To compare and contrast the developmental progress of 800+ children from a wide range of social and cultural backgrounds who had differing pre-school experiences.
- To separate out the effects of pre-school experience from the effects of primary schooling.
- To establish whether some types of pre-school are more effective than others in promoting children's cognitive and social/behavioural development.
- To identify the characteristics of pre-school education found to be most effective.

- To investigate differences in the progress of different groups of children, e.g. children from disadvantaged backgrounds and both genders.
- To investigate the medium-term effects of pre-school education on educational performance at Key Stage 1 in a way which will allow the possibility of longitudinal follow-up at later ages to establish long-term effects, if any.
- To investigate the role of pre-school provision in combating social disadvantage and exclusion.

The sample: regions, centres and children

In order to maximise the likelihood of identifying the effects of various types of provision, the EPPNI sample was stratified by type of centre and geographical location.

- All 5 Northern Ireland Education and Library Board areas were included in the research, and pre-school centres were selected randomly but strategically stratified by type from these areas.
- Four main types of provision were included in the study (the most common forms of group/sessional provision) playgroups, private day nurseries, nursery schools/classes, and reception classes/groups. Centres were selected randomly within each type of provision in each Education and Library Board (ELB) area.

In order to enable comparison of type of provision effects the project recruited 685 children from 80 centres. Within each ELB area, centres of each type were selected by stratified random sampling and, due to the small size of some centres in the project (e.g. rural playgroups), more centres were recruited than originally proposed (80 rather than 60). More than 150 children with no or minimal pre-school (i.e. sessional) attendance were recruited in the same year 1 class as the EPPNI children (at school entry). These children are referred to as the 'home' children throughout this report. This brought the total sample to 837.

Children and their families were randomly selected from each centre for the research. All parents gave signed consent and participated in a detailed interview when their children were enrolled in the study. This was followed up with questionnaires/interviews once the children were in school.

Details about length of sessions, number of sessions normally attended per week and child attendance were collected to enable the amount of pre-school education experienced to be quantified for each child.

Child assessments

Child Measures at 3+ years

Around the third birthday, or up to a year later if the child entered pre-school provision after three, each child was assessed by a researcher on four cognitive tasks of the British Ability Scales, BAS II (Elliot et al 1996). These tasks were; verbal comprehension, naming vocabulary, knowledge of similarities seen in pictures, and block building. A profile of the child's social and behavioural adjustment called the Adaptive Social Behaviour Inventory (ASBI) (Hogan, Scott, and Bauer, 1992) was completed by the member of the pre-school staff who knew the child best. If the child changed pre-school before school entry, he or she was assessed again.

Child Measures at the Start of P1

At school entry, a trained researcher administered a similar battery of cognitive assessments. These included pattern construction, verbal comprehension, naming vocabulary, knowledge

of similarities seen in pictures and early number concepts. Knowledge of the alphabet, rhyme and alliteration (literacy measures) were also administered. These literacy measures were then computed to give an overall measure of pre-reading ability. The Year 1 teacher completed a social behavioural profile of the child.

Child Measures at the End of P1

Children were again assessed individually at the end of their first year of primary school. The measures included early number concepts, BAS word reading, dictation and literacy measures. A similar social behavioural profile of the child was again completed by the primary 1 teacher.

Child Measures at the End of P2

Further assessments were made at the end of Year 2. In addition to standardised assessments of reading and mathematics, information on school progress, attendance and special needs was collected. Goodman's Strengths & Difficulties Questionnaire (Goodman, 1997) and related measures were completed by the P2 teacher as measures of the child's social behaviour.

Child Measures at the End of P3

At age 7, children were invited to report themselves on their attitudes to school. The Goodman's Strengths & Difficulties Questionnaire and related measures were again completed by the P3 teacher.

Child Measures at the End of Key Stage 1

The end of Key Stage 1 results were collected from the school that each child attends.

Measuring child/family characteristics

Parental interview

Shortly after the initial child assessments had been completed, a parent or guardian was interviewed, almost always the child's mother. Parents were interviewed either in person when they were at the pre-school centre, or by telephone. The interview was semi-structured with answers to most questions being coded into set categories, and a small number of open-ended questions that were coded post hoc. The length of the interviews varied, depending on the complexity of the information to be collected, the conciseness of the parents and other factors. A typical interview might take 20-40 minutes depending upon the complexity of the information supplied by the parent.

The interview contained questions dealing with the parents, the family, the child's health, development and behaviour, the child's activities in the home, the use of pre-school provision and the childcare history.

Information on individual 'child factors' such as birth weight, gender, language, birth order, health and development problems was collected at parent interview.

Family factors were also investigated. Parent interviews provided detailed information about parent education, occupation and employment, family structure etc. In addition, details about parental attitudes and involvement in educational activities in the home (e.g. reading to child, teaching nursery rhymes, television viewing etc.) were collected and analysed in order to produce a measure of the home learning environment.

A child's care history (who looked after them, at what age & for how long) before the child entered the EPPNI study was recorded during the parent interview.

Pre-school Characteristics and Processes

Researchers contacted and maintained a cooperative relationship with each pre-school centre. They conducted extensive interviews with the centre managers that included information on child/staff ratio, staff training, aims, policies, curriculum, parental involvement, etc., as well as conducting observations of typical activity in centres.

Quality of pre-school provision can be considered in terms of process and structural characteristics. 'Process' characteristics such as the day-to-day functioning within settings (e.g. child-staff interaction, child-child interaction, and structuring of children's activities) were studied using the following measures: The Early Childhood Environment Rating Scale - revised (ECERS-R Harms, Clifford & Cryer, 1998), the Early Childhood Environment Rating Scale- extension (ECERS-E, Sylva, Siraj-Blatchford and Taggart, 2003) and the Caregiver Interaction Scale (Arnett, 1989). The ECERS-R included the following sub-scales:

- Space and furnishings
- Personal care routines
- Language reasoning
- Activities
- Interaction
- Programme structure
- Parents and staffing

The ECERS-E included additional subscales focussing on educational content:

- Language
- Mathematics
- Science and environment
- Diversity

The Caregiver Interaction Scale (CIS) assessed aspects of staff-child interaction: positive relationships, permissiveness, detachment and punitiveness of the main pre-school worker. See Appendix 1 for further details of these terms.

Data on structural characteristics including adult:child ratio, staff qualifications etc were collected from interviews with centre staff.

Case Studies

In addition to the range of quantitative data collected about children, their families and their pre-school centres, detailed qualitative data was collected using case studies of 3 centres chosen on the basis of their ratings of observed quality to represent examples of good quality provision from 3 types of provision (a fourth case study was abandoned due to difficulties in time constraints). This added the fine-grained detail about how processes within centres articulate, establish and maintain good practice (Quinn et al, 2004).

The methodology of the EPPNI project is thus mixed (combining both qualitative and quantitative data). These detailed case studies used a variety of methods of data gathering, including documentary analysis, interviews and observations to illuminate the characteristics of more successful pre-school centres and assist in the generation of guidance on good practice. Particular attention was paid to parent involvement, teaching and learning processes, child-adult interaction and social factors in learning.

Analytic Strategy

The EPPNI research was designed to enable the linking of three main sets of data: (1) information about children's attainment and development (at different points in time), (2) information about children's personal, social and family characteristics (e.g. age, gender,

socio-economic status [SES] etc), and (3) information about pre-school experience (type of centre and its characteristics).

Preschool effects at entry to school

It is necessary to disentangle the impact of child characteristics (personal, social and family) in order to establish any influence related to pre-school centre attendance. Longitudinal research enables this. Given the disparate nature of children's pre-school experience it was vital to ensure that the influences of age at assessment, amount and length of pre-school experience and pre-school attendance are accounted for when estimating the effects of pre-school education. This information is also important in its own right to provide a detailed description of the range of pre-school provision experienced by different children and any differences in the patterns of provision used by specific groups of children/parents. Predictor variables for attainment at entry to primary school included prior attainment (verbal and non-verbal sub scales), social/behavioural profiles, and child characteristics (personal, social and family). The analyses incorporated adjustment for measurement error and examined differences in the performance of different groups of children at entry to pre-school and again at entry to primary school.

In addition, the analyses tested the relationship between particular process quality characteristics of centres and children's cognitive and social/behavioural outcomes at the end of the pre-school period (entry to school). The extent to which it is possible to explain (statistically) variation in children's scores on outcome measures assessed at entry to school, provides evidence about which particular forms of provision have greater benefits for children. Analyses tested the impact of measures of pre-school processes, such as the scores on various ECERS scales and structural characteristics such as type. This provides evidence as to which family or pre-school variables are associated with better cognitive and social/behavioural outcomes in children.

The continuing effects of pre-school centres across KS1

The longitudinal follow up of the pre-school and home sample during primary school across Key Stage 1 has been used to explore any continuing pre-school influences on cognitive and social/behavioural outcomes measured in Year 1 and Year 2, social/behavioural outcomes measured in Year 3, and Key Stage 1 assessments collected at the end of Year 4. The results examined the evidence of continuing impact of pre-school process characteristics such as quality, duration, and type.

Further details on the analysis strategy including predictor variables tested are in appendix 2.

Summary

A range of methods have been used to explore the effects of individual pre-school centres on children's attainment and social/behavioural development at entry to school, and any continuing effects on such outcomes at the end of Key Stage 1 (age 8). Also the study investigates the contribution to children's development of individual and family characteristics such as gender, ethnicity, language, parental education/employment and learning activities in the home.

The EPPNI study demonstrates the complex effects of characteristics and type of pre-school provision experienced by children after taking into account their personal, social and family characteristics. Assessments of both cognitive and social/behavioural outcomes were made. The various analyses enabled the impact of pre-school experience upon cognitive and social/behavioural development up to age 8 to be investigated. Moreover, the detailed relationships between child, family, pre-school characteristics and children's development were explored. A series of 13 Technical Papers are available (see Appendix 3) and these report the findings of the EPPNI research in more depth.

Chapter Three: Children and Families at the Start of the Study

It is necessary to take account of pre-existing differences between children at the start of the pre-school period in order to understand the possible effects of pre-school experience upon children's development. Information on the characteristics of the parents, families, and children was collected by parental interview at the start of the study, including data on parents' labour market participation, socio-economic characteristics, qualifications, marital status and age as well as the family's composition, ethnicity and language, the child's health, development and behaviour, the child's activities in the home, the use of pre-school provision and childcare history.

How do the sample groups compare?

The different types of pre-school group were varied very much in relation to their differences in parental socio-economic and educational status. Socio-economic advantage of the different groups in the study can be illustrated by considering mothers' educational qualifications, which shows a similar pattern across groups as other socio-economic indicators. The classification of mother's educational qualifications by pre-school types within the EPPNI sample is shown in table 2.

Table 2: Educational qualifications of mother by pre-school type (% within each type).

Educational Qualifications	Nursery School/class	Playgroup	Private Day nursery	Reception class	Reception group	'Home' group
Degree or higher	15.5	21.0	49.5	13.9	14.1	10.6
HND, 18+ Vocational	11.2	13.4	11.1	19.8	12.3	13.9
A level	10.2	9.0	13.7	5.9	9.6	7.3
GCSE	38.0	35.0	22.2	32.7	37.7	25.8
Less than GCSE	25.1	21.6	3.5	27.7	26.3	42.4

The private day nursery group has a much higher percentage of mothers with a degree or higher qualification, reflecting their relative advantage. Similarly the relative disadvantage of the 'home' group is also clear with more mothers in this group having less than a GCSE qualification. The differences between the other four groups are not so great. Similar patterns are reflected in other educational and socio-economic variables.

Do the differences for families by type of pre-school centre reflect differences in socio-economic status or do they go beyond differences in socio-economic status? Parental characteristics of level of employment, marital status, parental age and qualifications all varied with socio-economic classification and the variation by type of pre-school centre reflected this variation. In addition to variation linked to socio-economic status, maternal levels of paid employment were also linked to type of pre-school centre and amount of previous childcare used. Both maternal employment and previous childcare use were highest for families using private day nurseries.

Differences in child health, development and behaviour for type of pre-school differences followed the same pattern expected from socio-economic differences. Recent health and potentially disruptive life events for children appeared to be related neither to social class nor type of pre-school centre.

Children's activities in the home were considered in terms of educational activities, TV and video watching, and rules concerning TV and bedtime. Home learning activities were only weakly associated with mother's educational level and family SES. Rules regarding TV and bedtime, however, did not show a consistent relationship with social background.

Parents' involvement with pre-school centres, demonstrated relationships with socio-economic differences. For example, parents from disadvantaged groups were less likely to visit centres and less likely to attend meetings with staff. Parents from middle to higher socio-economic groups were also more likely to express concern with the atmosphere and educational activities in their choice of pre-school centre. However, there were a number of differences that were related to type of pre-school centre rather than deriving from parental socio-economic differences. These included:

- the age of starting, which was lower for private day nurseries
- number of sessions attended, with a different pattern for each type of pre-school
- maternal paid employment was higher for those using private day nurseries

The childcare histories of the children revealed extensive diversity across the whole sample and for children within each type of pre-school centre. There was also a strong association between level of maternal paid employment and previous childcare use. Those mothers who were employed for longer hours had a history of using greater amounts of childcare. The socio-economic differences in childcare histories largely reflect the differential use of types of pre-school centre and differential levels of maternal paid employment by the different socio-economic groups

What background variables relate to child development at the start of the study?

The personal, social and family characteristics of a child can influence their progress and development. Thus it is essential to establish the extent to which the background characteristics of children attending different centres and types of pre-school provision vary, as this study has done. Hence EPPNI can identify any possible pre-school effects on children's later educational outcomes, separately from other factors. When the children entered the EPPNI study they were assessed on cognitive and social/behavioural development. These data, together with data from the parental interview, were used to investigate social/behavioural and cognitive development at 3-4 years in relation to a range of parental, family, child, home and childcare factors. The analysis provides information about associations between variables that may or may not be linked by causality. Possibly unmeasured factors produce the effects found. The explanation for cognitive development in the analyses is strong (i.e., it explains a large amount of variance in children's scores) whereas the explanation of social/behavioural development leaves much of the variation between children unexplained. This may be explained in part by the fact that the social-behavioural measures were completed by more than 100 practitioners using a coarse rating scale; whereas the cognitive and linguistic measures were administered 1:1 by a small team of highly trained researchers conforming to standardised testing procedures. It seems likely that variation in the sophistication and reliability of measurement available for the two aspects of development led to the cognitive analyses being stronger. The findings can be summarised as follows:

Child:

- Gender had a significant effect on co-operation/conformity and cognitive development, girls scored higher than boys on both.
- Children with previous behaviour problems were more likely to have lower cognitive development scores. Behaviour problems were also significantly associated with

cooperation/conformity, peer sociability and anti-social behaviour. This indicates that early behaviour problems observed at home continue into the pre-school setting.

Parents and socio-economic factors:

- Mother's qualifications were significantly related to peer sociability and worried/upset behaviour. Children whose mothers had attained a high qualification were rated higher on these variables.
- For cognitive development higher parental socio-economic status and higher mother's qualifications were both associated with higher cognitive scores for children.

Family:

- Children with three or more siblings scored lower on cognitive development. Larger families may result in less parent attention being available for any individual child. This decreased individual attention from parents may be the reason for the effects on cognitive development.

Home:

- Those children who had more experience of playing with friends at home showed higher co-operation/conformity and confidence.
- The variables, whether the child had a regular bedtime and rules concerning TV and video could be regarded as a marker for the degree of structure in the child's home life. These variables were associated with increased confidence. A regular bedtime was also slightly associated with worried/upset behaviour.
- Higher home learning environment was associated with higher cognitive scores. The effect on cognitive development was particularly pronounced. After age, it was one of the variables with the strongest effect on cognitive development. Its effect was stronger than either social class or parental education, which have often been found to be amongst the strongest predictors of children's cognitive development in previous studies.
- The importance of the home learning environment indicates that what parents do (i.e. with children at home) is more important than who parents are (i.e. demographic status) in regard to fostering children's cognitive development.

Early Childcare History:

- Being in group childcare (e.g. nurseries) before entering the study was slightly associated with increased antisocial and worried/upset behaviour.
- Those children who had attended the pre-school centre for longer periods before the start of the study scored higher on cognitive development. These children were primarily in private day nurseries.

Chapter Four: The Pre-School Settings: Context and Quality.

The EPPNI research was designed to enable the linking of three sets of data: (1) information about children's attainment and development (at different points in time), (2) information about parents and the home, and (3) information about pre-school experience (type of centre and its characteristics). This chapter focuses on the 80 settings and the local contexts in which they operated.

Table 3: Pre-school types

The table below shows the recruitment from different types of pre-school provision.

Type	Number	Number of children recruited
Nursery schools/classes	16	189 (22.5%)
Playgroups	15	157 (18.8%)
Private day nurseries	19	118 (14.1%)
Reception classes	9	103 (12.3%)
Reception groups	21	118 (14.1%)
Home		152 (18.2%)

Information about the pre-school centres was collected through two methods. Interviews were conducted with all centre managers, and systematic observations, supplemented by interviews were used to provide profiles of the experience and activities provided by the pre-school centres to the children in their care.

Observational Profiles of Centres

Studies in many countries have shown the relationship between the quality of pre-school provision and children's developmental outcomes (see Melhuish, 2004a,b). Loeb, Fuller, Kagan and Carroll (2004) studied the relationship between the quality of caregivers' interactions (as measured on the Arnett Scale) with children and developmental outcomes in the children they served. In a sample of disadvantaged children, they found that children had greater reading readiness and fewer social problems when the Arnett scores for staff sensitivity were higher. Similarly the Cost Quality and Outcomes Team (Peisner-Feinberg et al, 2001) found quality effects: higher quality measured on the Early Childhood Environment Rating Scale (ECERS-R, Harms et al 1998) was associated with better language attainment at the end of Year 1, after controlling for background factors. Other relevant research was undertaken by Phillips et al. (2000) on variation in quality across different states in the U.S. They found that differences in state legislation were associated with differences in quality thus demonstrating that quality is linked to legislation (Porter et al., 2002).

The EPPNI project created a 'centre profile' for each centre through systematic observation and questions to staff. The Early Childhood Environment Rating Scale: Revised (ECERS-R) was used in drawing up each centre's profile along with an extension to it: ECERS-Extension (Sylva et al., 2003). The ECERS-R rating scale consisted of seven sub-scales covering aspects of the setting from furnishings to individuality of care and the quality of social interactions. The ECERS-E describes the educational activities relevant to literacy, mathematics, science/environment and diversity. Each sub-scale is comprised of a range of items describing 'quality' of the specific type of provision. Each item was rated 1 (inadequate) to 7 (excellent). For more information on the quality rating scales see the Technical Paper 1 (Melhuish et al. 2002).

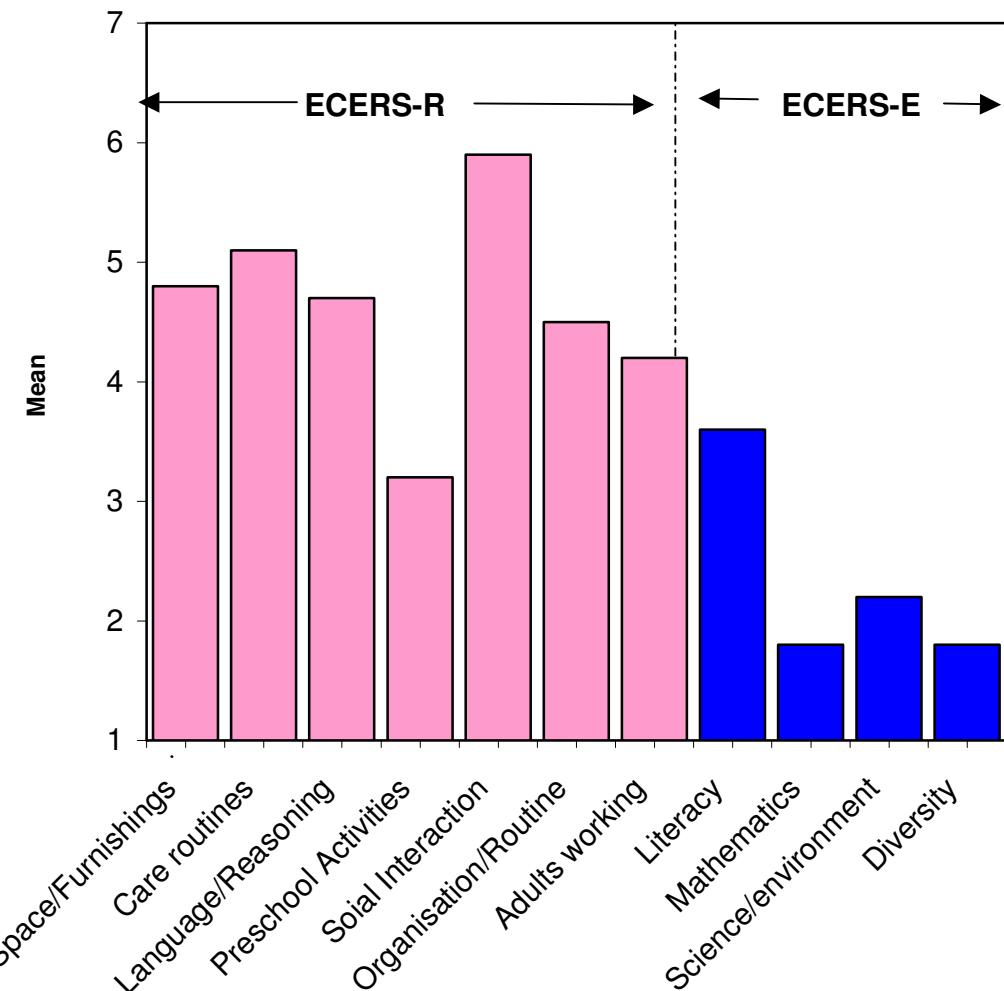
This chapter describes the characteristics of the 80 centres attended by 3 and 4 year-old children in the EPPNI sample. Averaged scores across the 80 centres in the sample approached 'good' on the ECERS-R but the ECERS-E ratings showed that the learning opportunities in maths and science were often limited and even inadequate. However,

overall scores on the ECERS-R suggest that the quality of much provision in Northern Ireland is similar to that in other industrialised countries.

These results reveal the characteristics of pre-school centres based upon observations that relate to 'expert opinion' of good practice with pre-school children. While pre-school centres in Northern Ireland are doing well overall on ECERS-R, there are big variations between individual centres, with some doing rather poorly. Most subscales of ECERS-R show fair to good scores when averaged across all types of provision. However closer inspection within types of provision reveals some differences. Many centres were found to be exciting places where children were challenged and supported in their learning and with sensitive, responsive interactions between staff and children. Unfortunately, other centres were characterised by hasty planning and poor implementation of the curriculum. The subscale 'pre-school activities' tended to show the lowest scores. This indicates that differentiated pre-school curriculum activities such as fine motor activities, art, music, movement, sand/water, nature activities, etc. have scope for improvement in pre-school centres in Northern Ireland.

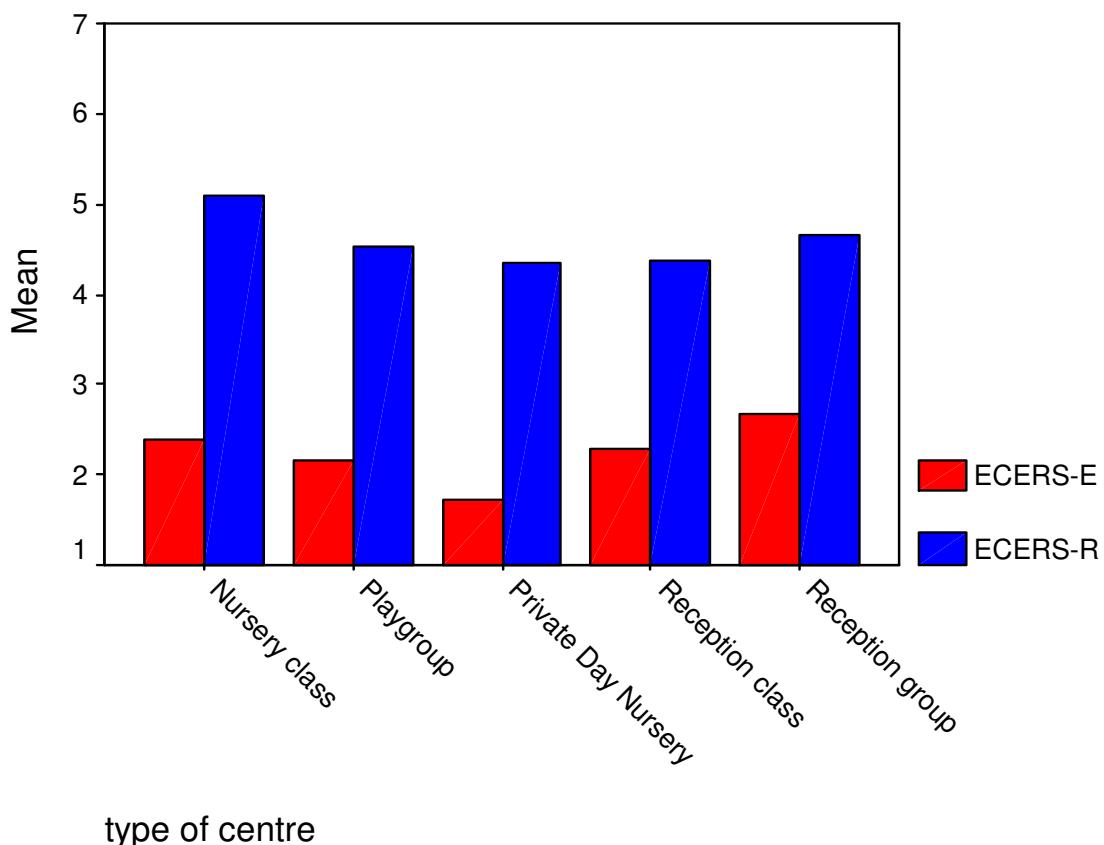
The scores for the subscales of ECERS-R and ECERS-E for the EPPNI pre-schools differ markedly as shown in Fig.1. It is clear that while EPPNI pre-schools are doing quite well on ECERS-R they are scoring poorly on ECERS-E, which may be related to ECERS-E being based on the English Desirable Learning outcomes, which are not applied in Northern Ireland.

Figure 1: Subscale scores for ECERS-R and ECERS-E for pre-schools in EPPNI



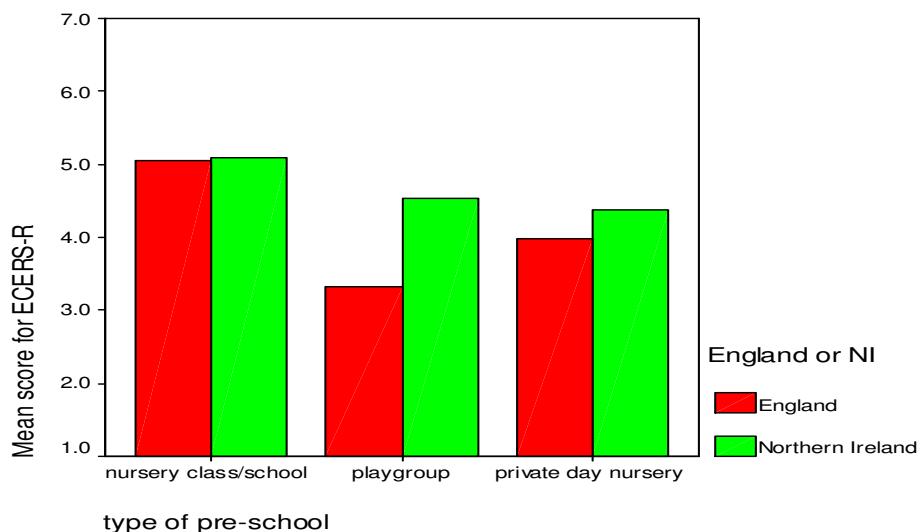
There is less variation between types of centre in Northern Ireland than in England on ECERS-R. Overall nursery schools/classes score higher than other types of pre-school provision on ECERS-R with minor differences between the other types of provision. On ECERS-E the ‘education sector’ pre-school provision score higher reflecting their educational orientation, but all types of provision in Northern Ireland score poorly on ECERS-E. Pre-school centres in Northern Ireland score slightly higher overall than comparable centres in England on ECERS-R. This is due to the playgroups and the private day nurseries, but particularly the playgroups, scoring more highly on ECERS-R than in England. In contrast to the ratings on ECERS-R, the ECERS-E ratings reveal that the Northern Ireland centres do not score as highly as those in England on mathematics, science/environment and diversity. The differences by type of pre-school and the large differences between scores for ECERS-R and ECERS-E in Northern Ireland are illustrated in Figure 2.

Figure 2: ECERS-R and ECERS-E scores by type of pre-school



A comparison can be made for ECERS-R scores for Northern Ireland and England for types of centre in common in the EPPNI and EPPE studies. The differences between the countries can be examined by the type of pre-school as in Figure 3. In looking at the separate types of pre-school, the reasons for the differences in ECERS-R total scores can be seen clearly. The overall higher scores in Northern Ireland are due to the higher scores of playgroups and private day nurseries in Northern Ireland. Whereas nursery classes/schools score almost exactly equivalently in the two countries. It is clear that on every ECERS-R subscale playgroups in Northern Ireland score higher than playgroups in England. When private day nurseries in Northern Ireland are compared with those in England, they score higher on ‘personal care routines’, ‘social interaction’ and ‘parents & staff’, but lower on ‘pre-school activities’. Nursery classes/schools in Northern Ireland score higher on ‘personal care routines’, but lower on ‘pre-school activities’ and ‘parents & staff’.

Figure 3: ECERS-R by type of centre in England and Northern Ireland



Inspection of staff training differences between Northern Ireland and England revealed that the level of staff training in playgroups in Northern Ireland was substantially higher than that for staff in playgroups in the EPPE study in England. It seems likely that the higher observed quality ratings for ECERS-R in Northern Ireland as compared with England is related to the higher levels of staff training in Northern Ireland playgroups.

Interviews with Centre managers

EPPNI staff interviewed all centre managers about their settings. The interview schedule explored the following areas:

- **general information** i.e. age of centre, opening times, major objectives etc.,
- **parental involvement** i.e. opportunities for parent/staff contact, written materials provided to parents, parent education etc.,
- **the staff** i.e. conditions and benefits, qualifications, turnover etc.,
- **the children** i.e. numbers, provision for special education needs etc.
- **perceptions of quality in child care and education**, and
- **organisational practices** i.e. planning and record-keeping etc.

Overall a good range of facilities was offered by all types of pre-school provision involved in the project. All centres met and improved on the minimum statutory staff/child ratios. Staffing within the sector as a whole was fairly stable with most children experiencing a fair degree of continuity in care and education.

Training opportunities for staff working in all types of pre-school setting were of a high standard. However, no clear pattern emerged regarding contracts and other staff benefits. Overall full-time staff working in the statutory education sector have access to better staff development opportunities than all other groups of staff. This has implications for types of pre-schools employing more part-time than full-time staff such as the playgroups and private day nurseries

As expected the senior person working with children in the statutory sector held a teaching qualification whilst in the private sector the highest qualification held in the majority of centres was a NNEB/NVQ Level 3. The most commonly held childcare qualification amongst other pre-school staff was NVQ Level 3. The centre managers with the highest qualifications e.g. Bachelor of Education (B.Ed) or Post Graduate Certificate of Education (PGCE) appeared to

be predominately in the ‘education’ rather than ‘care’ provision i.e. nursery schools and nursery classes. Nursery classes and nursery schools had very similar proportions of qualified staff who were the most highly qualified, and they also had the highest salaries.

The majority of centres held regular staff meetings with the statutory sector being more likely to fund attendance. Widespread use was made of the Pre-School Curricular Guidance (CCEA, 1997) and Northern Ireland Pre-school Playgroups Association (NIPPA) guidelines. When considering issues of quality, managers agreed about what were the most important objectives and characteristics of their centres, with the development of a positive self-concept coming out on top. Almost all centres conducted regular assessments in a wide variety of developmental areas and employed a system for identifying special needs.

Parents were surprisingly allowed to visit their centres on a daily basis more often in the educational sector than the private sector. The most commonly reported areas of parental help were fund raising and maintaining the physical environment.

Further details on the centre manager interviews can be found in Technical paper 3 (Quinn et al., 2002).

Chapter Five: Case Studies of Pre-school Practice

Three detailed case studies using a variety of methods of data gathering, including documentary analysis, interviews and observations were included in the EPPNI project. The case studies took place in a nursery school, playgroup and private day nursery. The results help to illuminate the characteristics of higher quality pre-school centres and assist in generating guidance on good practice. Particular attention was paid to parent involvement, teaching and learning processes, child-adult interaction and social factors in learning. The three pre-school centres in EPPNI were chosen for case studies retrospectively on the basis of their quality as measured by the analyses of ECERS-R, ECERS-E and Inspection Report.

In conducting the case studies a trained researcher, already familiar with the centres spent a minimum of two weeks in each centre. Case study data came from multiple sources to allow for triangulation by source and also by the method of data collection. It was only the range of documentary sources that have varied slightly between centres, for example some centres have more policy documents than others.

Key findings from EPPNI case studies

Every effort was made to collect comparable data across the case studies and to provide a framework for analysis and reporting which would allow for comparison across centres. Case studies were compared in terms of their key quality characteristics, for example the pedagogy employed, the curriculum on offer, the ethos and the management and organisational strategies.

Management and staff

The data revealed that all three pre-school settings in which case studies were conducted had strong leadership and long serving staff. Technical Paper 3 indicated (Quinn et al, 2002) that there was a high turnover of staff in the private sector, however all managers and the majority of staff in these centres had been in post for over 3 years. In all settings the strong leadership was characterised by a strong philosophy for the setting, which was shared by everyone working in the setting.

A common theme in all three centres was that staff development and training was considered important and was encouraged and supported. There also appeared to be a high level of commitment to developing professional expertise as staff attended courses in their own time.

Staff at each of the three pre-school centres held a full range of qualifications with one of the pre-schools (Nursery School) being the most highly qualified in terms of staff. The role of the leader included both administrative duties and the appointment of staff.

Within nursery schools/classes and reception groups/classes the legal minimum requirement is one adult to thirteen children, whilst a ratio of one adult to eight children is required for playgroups and private day nurseries. All three centres met and improved on the recommended adult: child staff ratios.

Ethos and Emotional Climate of the Settings

Significantly, the case studies have shown how diverse early years settings are. They show that there is no 'level playing field' in terms of the training of staff, staff salaries and conditions of service, adult-child ratios, resources or accommodation. However common themes related to good quality provision emerged. All the centres on the whole had a warm, caring, safe, secure and supportive approach to their children. Children were generally treated with respect and the centres were warm and inviting places. Staff appeared calm and usually engaged well with the children. Resources and available space varied between type of centre, including the outdoor environments and equipment.

The atmosphere of all 3 centres appeared to be busy and active with children given the opportunities to engage in various activities including singing, dancing and construction etc. All the centres had detailed 'settling in' procedures, which aimed to help children settle into the centre in such a way as to minimise stress and anxiety. In all instances, children were provided with a climate in which staff related well to one another and to the children. Children and adults seemed to enjoy their time there and this was supported by the parental comments, which described, in many cases, the happiness of the children and the openness and warmth of the staff at the various centres. Parents appeared to be happy with their children's progress at all 3 centres with parents viewing the centres generally as warm and welcoming places, where children were treated with respect.

An emphasis was placed on treating children with respect and developing a sense of self-respect within the child and a sense of respect for others. The approach of the centres was to focus on encouraging good behaviour rather than punishing bad. Children were encouraged to share, take-turns and develop manners with positive behaviour being encouraged and praised. Any techniques designed to single out and humiliate individual children were not used and if children did misbehave they were dealt with on one to one terms, with staff getting down to the child's level.

Staff co-operation and relationships appeared to be supportive and professional. Staff collegiality was good and morale at all three centres appeared to be high.

Parental partnership

The ways in which information was communicated to parents varied among the three centres and included, open days, prospectuses, monthly newsletters, and a booklet outlining activities for the children, the role of parents and staff and the aims of the centre. A parent notice board was also utilised. At all three centres parents were made to feel that they could talk informally to staff about problems at any time.

At all three centres parents received informal reports concerning their child's progress from staff. At all three centres formal meetings were arranged if necessary.

Overall, parental attitudes towards these three centres were positive. Parents of children who attended these centres generally expressed the opinion that staff seemed to care about the children and that the children were safe and happy in their respective centre. Staff were usually described as caring and committed.

Pedagogy

Play was a central tenet of practice at all three centres, with a variety of activities being available for children. Play was held both indoors and outdoors, however, there was not as much outdoor play as would be appropriate at one of the centres. At all of the centres the quality of interactions was generally of high quality. The range of questioning to children was appropriate with both closed and open-ended questions being utilised. At all three centres opportunities to extend learning were taken.

The role of the staff varied from centre to centre. However, at all three centres it was the role of the staff to provide a safe, warm, loving environment where children could play and learn. At all centres the principal/centre manager was ultimately responsible for what happened at the centre. Children at all three centres generally worked at their own level and at their own pace using a wide variety of resources.

At two of the centres continuity and progression was ensured through the assessment of children at different stages throughout the year. These assessments gave staff a clear idea of what children were able to do and what they would do next. Pre-school 21 (PG) did not formally assess children and no record of children's progress was maintained. However, if a

member of staff felt that a child was having problems with an activity, the child's name was put on a board and it was the responsibility of all staff to observe the child's progress.

Independence was encouraged at all three centres with children being able to choose and carry out at least some activities on their own. Good manners, turn taking and sharing were also encouraged. At all three centres social development appeared to take priority over intellectual development.

Findings from case studies in EPPE in England

The Effective Provision of Pre-school Education (EPPE) project is a linked project in England. Fourteen intensive case studies were undertaken in England but the selection of case studies differed between England and Northern Ireland. In the EPPE project, the case studies were chosen retrospectively on the basis of analyses of their child outcome data, and the most effective centres compared with less effective ones. Details of the EPPE case studies can be seen in the report by Siraj-Blatchford et al., (2003). The EPPE case studies identified seven areas that are 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 contribute to the thinking and it must develop 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. 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.

2. Initiation of activities

In effective settings, the balance of who initiated activities, staff or child, was about equal. Also the extent to which staff extended child-initiated interactions was important. Almost half of child-initiated episodes that contained intellectual challenge included interventions from a staff member to extend the child's thinking. Free play activities often provided the best opportunities 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.

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 as important in the early years as at later stages of education.

4. Knowledge about how young children learn

Knowledge of child development underpins sound practice but is often weak among staff. Also staff need a good grasp of appropriate pedagogy for children to develop fully. This gap could be reduced through initial training and continuous professional development. 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. In most effective centres 'play' environments were used to provide the basis of instructive learning. However, 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 aims can be academic as well as social/behavioural.

5. Adult skills to support children

Qualified staff in effective settings provided children with more curriculum-related activities (especially language and mathematics) and encouraged children to engage in challenging play. The most highly qualified staff also provided the most instruction, and 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.

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.

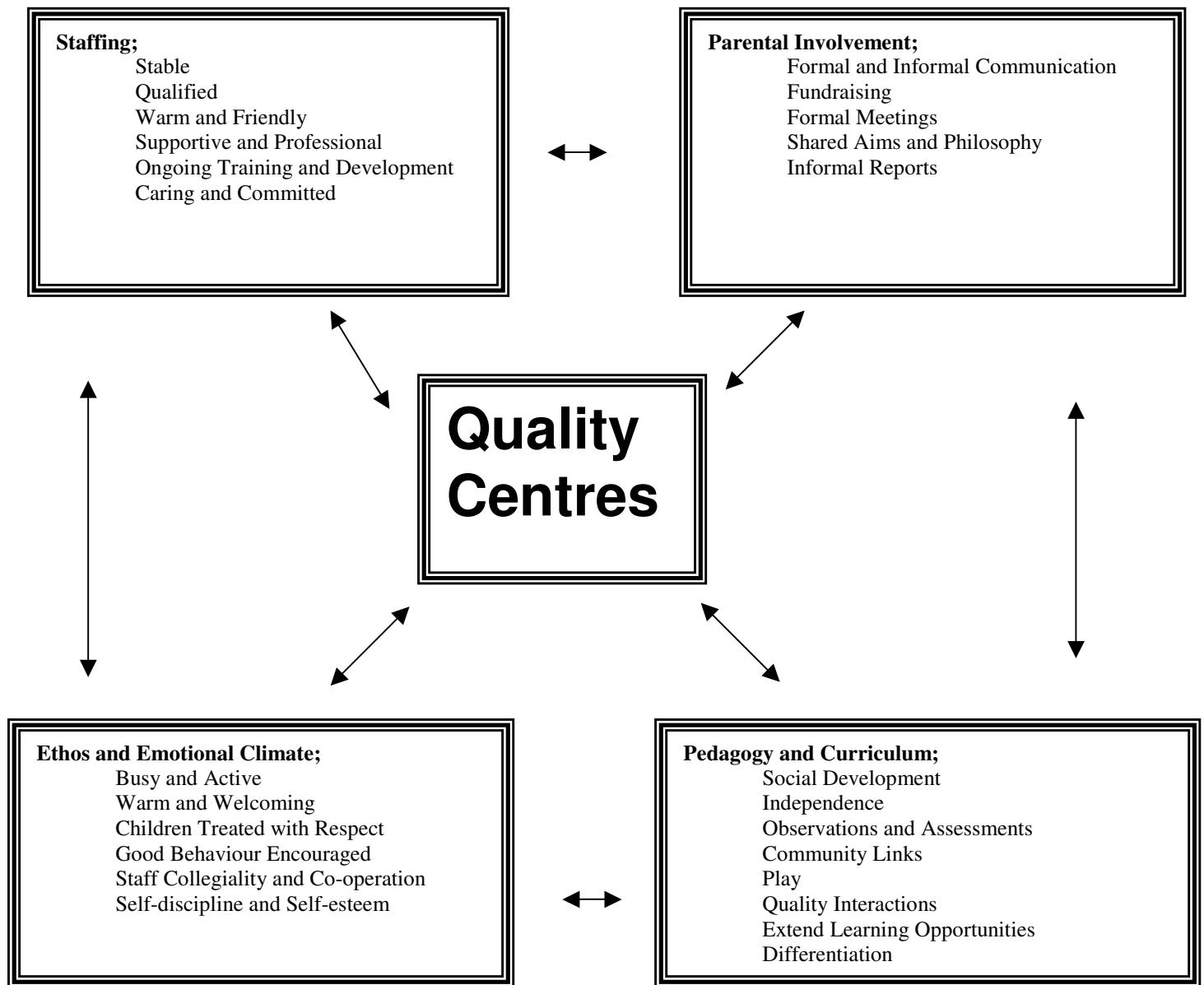
7. The most effective settings adopted discipline/behaviour policies in which staff supported children in rationalising and talking through conflicts

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.

The EPPE case studies point to several recommendations for early years practice.

- ◆ Encourage episodes of 'sustained shared thinking' with the children
- ◆ Work towards an equal balance of child and adult initiated activity.
- ◆ 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.
- ◆ Aim at a good proportion of trained teachers or equivalents on the staff.
- ◆ Engage parents in their children's learning and share educational aims with them.
- ◆ Encourage behaviour policies where staff support children's behaviour management through reasoning and talk.

Figure 4: Representation of links contributing to quality in pre-school centres



Chapter Six: Development of Children over the Pre-School Period

Background

The EPPNI project explores the impact of pre-school provision on young children's cognitive and social/behavioural development. This chapter reports on the main findings of the first phase of the longitudinal research covering the pre-school period from age 3 years plus to the start of primary school. The research seeks to establish whether different types of pre-school settings differ in their impact upon children's cognitive and social/behavioural development.

Here we describe the results of analyses of children's cognitive and social/behavioural development during their time in pre-school. Developmental gains were measured from entry to the EPPNI study until the start of primary school. Cognitive attainment assessed at entry to primary school was measured in terms of five attributes: four derived from the British Ability Scales II (Elliot et al., 1996), language attainment, two non-verbal measures, early number concepts and a fifth derived from work on early literacy skills (Bryant & Bradley, 1985) i.e. pre-reading attainment. Children's social/behavioural outcomes were assessed by a questionnaire completed by the class teacher in the first term of primary school. Measures of children's cognitive and social/behavioural development were analysed in terms of attainment and progress across the pre-school period.

Attainment analyses answer the question 'What affects the child's development at the start of primary school?' In analysing attainment the child, socio-economic (area & parent), parent, family, home childcare, and pre-school characteristics affecting the child's level of attainment at the start of primary school are considered. The child's attainment earlier is not taken into account.

Progress analyses answer the question 'What affects the child's progress over the pre-school period?' In analysing progress, all possible predictor variables used in attainment are analysed, but, in addition, the child's level of functioning at the start of the study is taken into account.

There are consequences of this strategy for progress models.

1. The child's level of functioning at the start of the study will absorb the effects of several factors. Hence an effect shown in attainment may not show in a progress analysis.
2. Where children are not showing high levels of attainment in relation to their age at the start of the study, there is more scope for progress. Hence such children may show bigger progress effects, without necessarily showing high attainment at the start of primary school.

Summary of results for cognitive development at the start of primary school

The analysis of the children's cognitive development was in terms of a range of background and pre-school factors. The main results are presented below for the different kinds of factors that show associations with aspects of children's cognitive development, after allowing for all other background factors.

Child factors

- Gender had a significant effect upon pre-reading, where girls do better than boys.
- Children with lower birth weights do significantly worse on attainment for all aspects of cognitive development except pre-reading. There are no effects for progress across the

pre-school period and this implies that the effects of birth weight are absorbed in the measures taken at the start of the study.

- Children who had developmental problems in the first three years had lower levels of cognitive ability on all of the sub-scales except non-verbal. Verbal skills were also lower for children with previous behavioural problems. These factors did not affect progress so their effects seem to have been absorbed by the start of the study.

Parent and Socio-Economic Factors

- Where children live in areas of higher deprivation, measured by the child poverty index, they score less well on verbal skills, early number concepts and general cognitive skills.
- The socio-economic status of the family has significant effects upon attainment in verbal, non-verbal and general cognitive skills. The effects persist for non-verbal skills in terms of progress over the pre-school period.
- Mothers' qualifications influence all cognitive variables for attainment and also progress in all cognitive variables, except early number concepts, over the pre-school period.
- Fathers' qualifications influence all cognitive variables, except non-verbal skills, for both attainment and progress over the pre-school period.

Family and Home Factors

- Where children lived in larger families with more than three siblings, they showed lower attainment in early number concepts.
- The home learning environment had consistently strong effects on attainment on all cognitive abilities. This variable also affected progress on pre-reading.

Pre-school Effects

Home versus pre-school

The home versus pre-school comparison had effects on attainment for the verbal, non-verbal and general cognitive skills subscales, with children who had attended these pre-school centres attaining higher scores on these subscales in comparison to Home children:

- Nursery schools showed significant effects for the subscales verbal, non-verbal and General Cognitive Skills in comparison to Home children.
- Playgroups showed effects for verbal skills.
- Private day Nurseries showed positive effects for the verbal and non-verbal subscales.
- Reception groups showed positive effects for non-verbal and General Cognitive Skills.

Pre-school type effects

The type of pre-school attended by a child had effects for progress on verbal, non-verbal and general cognitive skills over the pre-school period.

- Nursery classes/schools showed a significant effect for verbal skills with children who had attended nursery classes/schools showing more progress in comparison to children who had attended reception classes.
- Playgroups and Private Day Nurseries had significant effects for non-verbal and general cognitive progress with children who had attended these settings showing less progress in comparison to children who had attended reception classes.

Pre-school characteristics

- There were some effects for aspects of quality of pre-school as measured by the Early Childhood Environment Rating Scales (ECERS-R and ECERS-E). Children attending

centres with higher total ECERS-R/language scores showed progress over the pre-school period for non-verbal skills. There was also an effect on progress for early number concepts for the maths subscale of ECERS-E.

Pre-school group composition

The composition of the pre-school group that a child attended was found to be consistently related to all aspects of cognitive development. In particular where a child was part of a group where the other children in the group were rated as more cooperative, then the child had higher levels of development at the start of primary school. This effect may be partly due to the pre-school staff finding it easier to instruct children when there is a high level of co-operation, and partly to peer group effects whereby children learn developmentally advantageous behaviour from their peers, as greater co-operation is associated with enhanced development more generally.

Summary for Social/Behavioural Development at the Start of Primary School

Children's social/behavioural development at the start of Primary School was assessed on a range of sub-scales derived from ratings of items of behaviour by the child's teacher. These sub-scales were:

Co-operation/conformity e.g. tries to be fair in games

Sociability e.g. plays games and talks with other children

Peer Empathy e.g. is sympathetic to others distress

Confidence e.g. tends to be proud of things she/he does

Independence and Concentration e.g. thinks things out before acting

Anti-social/worried e.g. teases other children, calls them names.

When all child characteristics, socio-economic, parental, family and home variables have been considered the following effects upon social/behavioural development are significant.

Child Factors

- Age is significant for all sub-scales except anti-social/worried behaviour. Older children attain higher scores.
- Gender shows effects for all sub-scales except sociability and confidence. Boys tend to do less well than girls.
- Birth weight affects attainment on sociability, with heavier birth weight children showing more sociability.
- Previous health problems showed effects for attainment on co-operation/conformity and for attainment and progress on independence/concentration, poorer health being associated with poorer social development.
- Children with previous behaviour problems showed significantly worse effects on attainment for all the sub-scales, and for progress on all the sub-scales except empathy and independence/concentration.

Parent & Socio-economic Factors

- Children living in areas of high poverty showed lower attainment on sociability and less progress on sociability and co-operation/conformity.
- Parental qualifications show effects for attainment on all sub-scales except sociability. Generally the trend is that the higher the parents' qualifications, the better the attainment for the social/behaviour sub-scales at the start of P1. Higher parental qualifications are also associated with better progress for children's confidence, empathy and independence/concentration.
- Mother's level of employment was associated with sociability. Where mothers were employed children tended to show higher levels of attainment for sociability.
- Father's level of employment showed effects. Where fathers were employed only part-time the children tended to do less well for attainment on independence/concentration and for progress on independence/concentration and anti-social/worried behaviour. Also where fathers were unemployed children had lower attainment on empathy.

Home Factors

- The Home Learning Environment (HLE) shows powerful effects for attainment and progress on all sub-scales except sociability and anti-social behaviour. Children from homes rated higher on the HLE index, tend to attain higher scores.
- Developmental events are associated with attainment on co-operation/conformity and independence/concentration. Children who have experienced an event that may affect their development negatively tend to attain lower scores on these subscales.
- Peer play at home is associated with higher attainment on co-operation/conformity and better progress on anti-social/worried behaviour.

Pre-school Effects

Home versus pre-school

- The home versus pre-school comparison had effects on attainment on all the social/behavioural sub-scales except co-operation/conformity, after allowing for all the relevant factors.
- Nursery school/class children are more sociable and confident compared with home children. However, they also tend to have more anti-social/worried behaviour than home children
- Playgroup children are more sociable, confident and empathetic than the home group.
- Private day nursery children are more sociable and confident than the home children. However, they too have more anti-social/worried behaviour than the home group.
- Reception class children are more sociable compared with the home children.
- Reception group children are also more sociable than the home group. They also have more confidence, independence/concentration and anti-social/worried behaviour.

Pre-school type effects

The type of pre-school had some effects. After allowing for all the relevant variables the following differences were found for progress between pre-school types. Comparisons were made against the reception class children.

- Private day nursery children made more progress than Reception class children on the confidence subscale.
- Reception Groups were significant for anti-social behaviour. Children who attended reception groups were more anti-social/worried and therefore made less progress across the pre-school period than those children from reception classes.
- Nursery school/class was significant for anti-social/worried behaviour and confidence. Children who had attended Nursery schools/classes show more anti-social/worried behaviour at the beginning of P1 and therefore made less progress throughout pre-school compared with children from reception classes.
- Playgroup children made less progress on anti-social/worried behaviour compared with children from reception classes.

Pre-school characteristics

- Children who had attended pre-school part-time showed more progress in co-operation /conformity and in anti-social/worried behaviour (i.e. reduced) than children who had attended full-time. As there was no difference in overall attainment these effects represent the part-time group catching up with the full-time group.
- Adult: child ratio was associated with progress for independence/concentration, co-operation/conformity and sociability. Where there were more children per adult there was less progress on these sub-scales.
- The ECERS-R language sub-scale showed effects for confidence and independence/concentration whilst the maths sub-scale of ECERS-E was predictive of progress on confidence. The ECERS-R sub-scale, adult facilities, was associated with progress on co-operation/conformity.
- The only caregiver interaction sub-scale with significant effects was punitiveness, a measure of the amount of disciplinary control apparent in interactions, which was associated with increased progress for co-operation/conformity, independence/concentration and empathy.

Pre-school group composition

Of the compositional variables (characteristics of the peer group, see p 18) the peer group confidence in pre-school was important for sociability at the start of P1. High peer group confidence scores tended to depress sociability progress. The mothers' qualifications of the child's pre-school peer group showed effects for anti-social/worried behaviour in that the higher the qualifications the less anti-social/worried behaviour, i.e. better progress on anti-social/worried behaviour.

Chapter Seven: Development over the first year of primary school (P1 year)

This chapter considers children's development at the end of the first year of primary school. Children's development is considered in two ways, overall attainment at the end of P1 and progress over the first year of statutory schooling.

Summary of the effects for cognitive development

Significant effects of independent variables upon children's cognitive development are summarised here.

Child Variables

- Surprisingly, younger children scored better overall than older children on word reading. In addition younger children made more progress over the P1 year than older children on all 3 subscales.
- Girls scored higher than boys on word reading and pre-reading. Girls made more progress than boys on word reading across the P1 year.
- Children with heavier birth weight scored higher on early number concepts and pre-reading. Children with heavier birth weight made more progress on early number concepts.
- Children who had low levels of health problems in their first three years made more progress on pre-reading across the P1 year, than children who had no previous health problems.

Parent and Socio-Economic Status variables

In comparison to children from a professional background:

- Children from intermediate, skilled-manual, semi-skilled and unemployed backgrounds scored lower on word reading.
- Children from an unskilled background scored lower on early number concepts.
- Children from an intermediate, semi-skilled or unemployed background made less progress on word reading.
- Children who live in areas of higher child poverty made less progress on pre-reading.

Parent education was also influential.

- In comparison to children whose mothers have no qualifications, children whose mothers have age 16 or 18 vocational, age 18 academic or degree or above qualifications scored higher on word reading. Children whose mothers have age 18 academic or degree or above qualifications scored better on pre-reading and early number concepts. Children whose mothers have age 18 academic qualifications made more progress on pre-reading across P1.
- Children whose fathers have 18 academic or degree or above attained higher scores on early number concepts in comparison to children with unqualified fathers. In comparison to children whose fathers have no qualifications, children whose fathers have age 16 vocational, age 16 academic or degree or above qualifications scored higher on pre-

reading.

- Children whose mothers are employed-part time or are unemployed scored lower on early number concepts, compared with children whose mothers work full-time. Children whose mothers work full time made more progress on early number concepts than children whose mothers work part time or are unemployed.
- Children whose fathers are employed full time, made more progress on pre-reading across the P1 period compared with children whose fathers are self-employed.

Home variables

- Children who had higher levels of peer-play at home attained lower scores on word reading in comparison to children who did not have peer play at home. Children with higher levels of peer play at home made less progress on word reading than children who had no peer play at home.
- The higher the home learning environment, the better the child's attainment was on pre-reading, word reading and early number concepts. The higher the quality of the home learning environment, the more progress children made on early number concepts.

Pre-School Effects

Home versus Pre-School

In comparison with home children, children from:

- Playgroups scored higher on pre-reading and made more progress on word reading, early number concepts and pre-reading.
- Nursery classes/schools scored higher on word reading and pre-reading, and made more progress on word reading, early number concepts and pre-reading.
- Private day nurseries made more progress on word reading, early number concepts and pre-reading.

There appeared to be no significant difference between home children and children from private day nurseries, reception classes and reception groups on all subscales for attainment. There appeared to be no significant difference between home children and children from reception classes and groups in the amount of progress made on all subscales.

Pre-school type

In comparison to reception classes, children from:

- Playgroups made more progress on word reading and pre-reading over the P1 year.
- Nursery classes/schools made more progress on word reading over the P1 year.

Children from private day nurseries and reception groups appeared to make similar progress to children in reception classes.

Pre-school characteristics

- Children who had attended pre-school full time, made more progress on word reading during the P1 year than children who attended pre-school on a part time basis, but did not reach higher levels of attainment; i.e. the full-time group were catching up with the part-time group.

Quality of pre-school environment

When the children were in pre-school the quality of early care and education was assessed by observation using 3 instruments, ECERS-R focusing on care and interaction, ECERS-E focusing on educational aspects and the Caregiver-Interaction Scale (CIS) which was a rating of caregivers interactions.

- Children attending pre-school settings that scored higher on ECERS-E/math, made less progress on word reading during the P1 year.
- Where the pre-school staff had scored higher on the Caregiver Interaction Scale (CIS) subscale of Detachment, the children did better on pre-reading.

Summary for social /behavioural development over the first year of primary school.

Children's social/behavioural development was measured through a questionnaire completed by their class teacher. This questionnaire produced measures of the following factors:

Co-operation/Conformity e.g. *tries to be fair in games*

Sociability e.g. *plays games and talks with other children*

Peer Empathy e.g. *is sympathetic to others' distress*

Confidence e.g. *tends to be proud of things she/he does*

Independence and Concentration e.g. *thinks things out before acting*

Conduct Problems e.g. *teases other children, calls them names.*

The analyses have considered both the child's level of development at the end of P1 and the developmental gain (progress) over the first year of primary school having allowed for previous attainment measured at entry to primary school. The effects of child, family, home environment and child care variables on children's social behaviour measured at the end of P1, and on developmental gains or change over the P1 year are summarised below. In all cases the relationships are statistically significant, when the influence of other measures is controlled. The findings identify general tendencies for different groups of children, but do not necessarily apply to every individual in a specific group.

Child variables

- Older children scored higher on all subscales except conduct problems. Older children made more progress on sociability and independence/concentration at the end of P1.
- Girls showed less conduct problems than boys, and attained higher scores than boys on independence/concentration, co-operation/conformity, and empathy. Girls made more progress on empathy. Boys and girls made similar progress on the remaining subscales.
- Children with heavier birth weights attained higher scores on independence / concentration and confidence.
- Previous behaviour problems had significant effects for confidence, conduct problems, co-operation/conformity and sociability. Children who had no previous behaviour problems attained higher scores than children with previous behaviour problems. Children who had previous high levels of behaviour problems made less progress on sociability over P1 compared with children with no previous behaviour problems.
- Previous health problems had significant effects for sociability and co-operation/conformity with children who had no previous health problems scoring better than children who had previous health problems. Children who had previous low levels of health problems made less progress on sociability.

Parent Variables

Parental education was important, compared to children whose mothers were unqualified:

- Children with mothers with a degree or better scored higher on independence. Children whose mothers obtained age 16 academic, age 18 vocational or degree or above made more progress on independence/concentration across the P1 period. Children whose mothers had obtained a degree or above made more progress on confidence.
- Children whose fathers had obtained 'A' levels and above had more sociability, confidence and empathetic behaviour, than children whose fathers had no qualifications. Children whose fathers obtained age 16 academic or above had higher co-operation/conformity. Where fathers had obtained 'A' levels children made more progress over the P1 period in sociability.

Parental employment also was influential.

- Children whose fathers work part-time did less well on co-operation/conformity and empathy, and had more conduct problems than children whose fathers work full-time. Children whose fathers work full-time made more progress on empathy in comparison to children whose fathers work part-time or are unemployed.
- Children whose mothers work full-time generally scored higher on confidence, sociability, empathy and independence/concentration. Children whose mothers work full-time, made more progress on sociability and independence/concentration.

Home Variables

- The Home Learning Environment is an index of the level of activities in the home offering learning opportunities to the child. The higher the score on the Home Learning Environment (HLE) Index, the higher the score attained on confidence and independence/concentration.
- Where children experienced a potentially disruptive life event they attained lower scores on co-operation/conformity and independence/concentration.
- Children who experienced peer play at home, in comparison to children who had no peer play, scored higher on co-operation/conformity, empathy, sociability and independence/concentration. They also showed less anti-social behaviour and made more progress over the P1 year on empathy.
- Where there were rules about watching T.V. in the home, children were more sociable.
- Children with 3 or more siblings scored lower on confidence than children with no siblings.

Family Characteristics

- Children from a one-parent family made more progress on empathy in comparison with children belonging to a two-parent family. As there were no differences in attainment this indicates that these children were catching up.

Childcare factors

- Children with more group care in the first 3 years of life showed less empathy and more conduct problems. In addition children who had experienced more early group care, made less progress on conduct problems, cooperation/conformity, empathy and independence/concentration.
- Children with more relative care in the first 3 years were more confident and made more progress on empathy and independence/concentration.

Pre-school Effects

Home versus Pre-school Attainment

In comparison to home children, children from;

- Nursery Schools/Classes had more confidence and sociability, and less co-operation/conformity.
- Playgroups had better confidence, empathy and sociability.
- Private Day Nurseries were more sociable and confident, had more conduct problems and less co-operation/conformity.
- Reception Classes showed less co-operation/conformity, but were more sociable.
- Reception Groups had more conduct problems and showed less co-operation/conformity.

Home versus Pre-school Progress

In comparison with home children, children from

- Playgroups made more progress on empathy and sociability.
- Reception Classes and Reception Groups made more progress on empathy over P1.
- Private Day Nurseries and Nursery Classes/Schools appeared to be equivalent with home children on all of the sub-scales.

Pre-school Type

In comparison to children from Reception Classes, children from;

- Nursery Classes/Schools made less progress on empathy at the end of P1.
- Private Day Nurseries made less progress on empathy.
- Playgroups made less progress on conduct problems across the P1 period.

There appeared to be no difference between children from Reception Classes and children from Reception Groups on any of the subscales.

Pre-school characteristics

- Children who attended pre-school full time made more progress over the first year of school on sociability than children who attended part-time, but not higher attainment. The full-time group were catching up with the part-time group.
- The more months that children had attended pre-school, the less conduct problems they displayed at the end of P1.
- Children who attended a pre-school where the leader had a degree qualification, decreased in their conduct problems in comparison with children who attended a pre-school where the leader had no qualifications.

Quality of Pre-school

When the children were in pre-school the quality of early care and education was assessed by observation using 3 instruments, ECERS-R focussing on care and interaction, ECERS-E focusing on educational aspects and the Caregiver-Interaction Scale (CIS) which was a rating of caregivers interactions. Only one subscale showed a significant effect after allowing for all the other predictor variables.

- Children who attended a pre-school centre rated higher on the ECERS-R subscale for Care, made more progress on cooperation/conformity over the P1 period, but made less progress on confidence.

Home Learning Environment

The results clearly indicate the importance of different aspects of parental activities that contribute to the quality of the children's 'Home Learning Environment'. While other family factors such as mother's education and family SES are also important, the 'Home Learning Environment' exerts a significant and independent influence on attainment at both age 3 years plus and later at the start of primary school, and at the end of the first year of primary, and on progress over this period. Aspects of self-reported parental involvement in activities (such as reading to their child, teaching songs and nursery rhymes, playing with letters and numbers, visiting the library, painting and drawing, emphasising the alphabet, etc) remain positive influences which account for differences in attainment and also influence young children's cognitive progress over the pre-school period. The study also shows that the home learning environment index (measuring the extent of different activities involving the child at home) is only modestly associated with family SES or mother's education, and hence a high home learning environment can occur when parental SES or qualifications are low, and vice versa.

These results suggest that policies for parents in disadvantaged communities that encourage active parenting strategies can help to promote young children's cognitive progress as well as positive social/behavioural outcomes. Many pre-school settings already encourage parental participation, and some have developed programmes that feature parent education. The EPPE results indicate that programmes which directly promote activities for parents and children to engage in together are likely to be most beneficial for young children.

Chapter Eight: Pre-School Effects up to the end of Year Two (P2 year).

This chapter summarises the findings on cognitive and social/behavioural development from entry to primary school (age rising 5 years) through to the end of Year 2 (age 6+ years) in primary school. EPPNI explores the impact of different child, family, and home learning environment factors on a range of child outcomes. Also the research explores whether pre-school influences found to be important in accounting for variations in children's progress and development up to the time they start primary school continue to show relationships with outcomes in the early years of primary school. The analyses explore whether 'home' children (those who had very little or no pre-school centre experience) continue to lag behind other children, and whether duration, quality and type of pre-school attended still show significant effects on attainment and social behaviour over the early primary school years.

When the children were at the end of Year 2 (6 years old) we administered assessments of reading and mathematics. Also social/behavioural development was assessed by teachers using an extended version of the Goodman (1997) Strengths and Difficulties Questionnaire.

Previous analyses over the pre-school period showed that variations in quality and type of pre-school had an impact on children's cognitive and social/behavioural gains. This chapter builds on these earlier findings to explore whether the positive impacts of pre-school are still evident in child outcomes measured at the end of Year 2 of primary school.

Findings concerning a sample of 'home' children, who had no pre-school centre experience before starting primary school, are reported for comparison with the pre-school sample. Analyses explore whether 'home' children are still at a disadvantage for cognitive development (reflecting differences evident when they started primary school) and the extent to which any attainment gap can be attributed to the absence of pre-school experience, rather than differences in background characteristics. In addition other analyses focus on the children who attended pre-school to explore any continuing pre-school impact.

Summary of the effects for cognitive development

Significant effects of independent variables upon children's literacy and numeracy development are summarised here, after allowing for other child, parent and home characteristics. In considering these results it is clear that some variables influence attainment, some influence progress and some influence both attainment and progress. Where an analysis of children's attainment indicates that some factor influences children's development, but the analysis of progress does not reveal a significant effect for that factor, this indicates that the significant effect for that variable has occurred prior to school entry and that during the time in primary school no further effect has occurred.

When a variable shows a significant effect on progress but not on attainment, this indicates that the effect occurs over the first two years of primary school, but that the effect has been a 'catching up' effect whereby some children have reached a similar level as other children but from a lower starting point at the beginning of primary school.

Where both attainment and progress analyses reveal significant effects this indicates that the variable has had an effect over the first two years of school, and that the overall attainment at the end of P2 is affected either because

- a. the effect over the school period is more than a 'catching up' effect or
- b. the variable exerted an influence in the pre-school period that affected the start of school performance and that the effect continues into the first two years of primary school.

Child Variables

- Gender affected children's scores on literacy, with girls attaining better scores than boys at the end of the first two years of primary school.
- Heavier birth weight children attained higher scores on literacy and numeracy compared with lower birth weight children. Also heavier birth weight children made more progress on numeracy over the first two years of primary school.

Parental and Socio-Economic Status (SES) Variables

While the specific details varied between analyses involving socio-economic status effects, the overall pattern below emerged.

Compared with children with parents with Professional socio-economic status, children from;

- All other SES backgrounds either attained lower scores or made less progress on literacy, and usually both applied, over the first two years of primary school.
- The children with parents in unskilled occupations also attained lower scores and made less progress in numeracy over the first two years of primary school.
- Children who live in more deprived areas attained lower scores and made less progress in literacy than children from relatively more affluent areas over the first two years of primary school.

Parental qualifications were important for literacy and numeracy attainment.

- Mothers' qualifications were significant for both literacy and numeracy. Compared with children whose mothers do not have any qualifications; children whose mothers had any type of qualification attained higher scores on numeracy; and children whose mothers have degree or above also scored better on literacy.
- In addition children whose mother's had age 16 academic, age 18 academic or Degree plus qualifications showed more progress in numeracy over the first two years of primary school.
- Fathers' qualifications were related to children's attainment on both literacy and numeracy. Compared with children whose fathers do not have any qualifications, children whose fathers have age 16 vocational, age 18 academic or degree and above qualifications scored better on literacy and numeracy.
- Fathers' employment was associated with literacy attainment. Compared with children whose fathers are employed full time, children whose fathers are self employed attained lower scores on literacy and made less progress in literacy over the first two years of primary school. As with all findings summarised here this effect emerged after allowing for all the other differences between children and families measured in the study. Possibly self-employed parents have less time to spend with children in activities such as reading that foster literacy development.

Home Variables

- Play with friends was significant for numeracy, as compared with children who did not experience any play with friends outside of their own home, children who had a moderate level of such play attained better scores on numeracy.
- Children with a regular bedtime attained higher scores on numeracy than children without a bedtime routine, and also made more progress in numeracy over the first two years of primary school, possibly indicating the influence of a structured home environment.

- The biggest effect for home background was for the home learning environment where the higher the rating on the home learning index, the better children's scores were on both literacy and numeracy. The effects occur primarily in the pre-school period in that while the home learning environment exerts powerful effects upon overall attainment, there is little effect for progress over the first two years of primary school.

Pre-school Effects

Home versus Pre-school

Compared with children who did not attend pre-school, children who attended;

- Nursery Class/School or Playgroup scored higher scores on literacy, and made more progress in literacy and numeracy over the first two years of primary school.
- Reception Class showed more progress in numeracy over the first two years of primary school.

Type of Pre-school

Considering differences amongst those children who attended some type of pre-school and making comparisons against those who attended Reception Groups, children who attended;

- Nursery Class/School provision scored higher on literacy and numeracy, and also made more progress in literacy and numeracy over the first two years of primary school.
- Playgroups scored higher on literacy, and made more progress in literacy over the first two years of primary school.
- Private Day Nurseries attained better scores on numeracy, and made more progress in literacy and numeracy over the first two years of primary school.
- Reception Class attained higher scores on numeracy and made more progress in numeracy over the first two years of primary school.

These results indicate the continuing positive effects of pre-school experience even during the first two years of primary school.

Pre-school staff qualifications

Pre-school leaders' qualifications were significant for literacy.

- Compared with children who attended pre-school where the leader did not have any qualifications, children who attended pre-school where the leader has a Bachelor of Education qualification scored higher on literacy.

Pre-school Characteristics

The pre-schools were rated on measures of observed quality called the ECERS-R and ECERS-E scales. Both of these instruments are made up of subscales reflecting different aspects of observed quality in pre-schools. Some subscales of ECERS-R and ECERS-E for the pre-schools that children attended were related to literacy and numeracy scores of children at the end of year 2.

- Children who attended pre-schools that were rated higher on the ECERS-R subscale, Care scored lower and made less progress in literacy.
- Children who attended pre-schools that were rated higher on the ECERS-R subscale, Parent and staff facilities, scored lower and made less progress in numeracy.

- Children who attended pre-schools that scored higher on the ECERS-R subscale, Programme structure, scored higher and made more progress in literacy.
- Children who attended pre-schools that were rated higher in their provision of Science attained better scores and made more progress in numeracy.
- Children who attended pre-schools that scored higher on the ECERS-R subscale, Activities, made more progress in literacy.

These results indicate that there are effects of pre-school quality that persist after 2 years of primary school. The different effects for different aspects of the ECERS ratings suggest that pre-schools would be better putting more effort into programme structure, science provision and range of activities rather than concentrating resources on routine care activities or parent & staff needs. It is likely given the restricted resources within pre-school centres that focusing on maintaining good provision in one or two areas may detract from the quality of other aspects of provision.

Pre-school peer group composition

- When children had attended a pre-school group where mothers were better qualified, they attained higher scores on numeracy and made more progress in literacy by the end of P2. This result indicates the continued effects of peer group influences.

Summary of results for social/behavioural development

Children's social/behavioural development was measured through a questionnaire completed by their class teacher. This questionnaire produced measures of the following factors:

Self-Regulation e.g. can independently select and return equipment as appropriate
 This factor relates to children's capacity to regulate their behaviour in a purposeful, responsible manner, without being easily distracted.

Pro-social Behaviour e.g. is sympathetic to other children when they are upset
 This factor refers to children's capacity to engage in behaviours that foster good relationships, help other children, share and show empathy.

Conduct Problems e.g. teases other children, calls them names
 This factor refers to a child's antisocial behaviour or conduct problems.

Anxious Behaviour e.g. often unhappy, downhearted or tearful
 This factor refers to worried or anxious behaviour.

Social Isolation e.g. rather solitary, tends to play alone
 This factor refers to a behaviour shown by a small subset of children who do not 'fit in' in their peer group and can be seen as awkward outsiders.

Social Competence e.g. generally liked by other children
 This factor refers to child's success in engaging in good peer relationships.

The analyses have considered both the child's level of development at the end of P2 and the developmental gain (progress) over the first two years of primary school having allowed for previous attainment measured at entry to primary school. The effects of child, family, home environment and child care variables on children's social behaviour are measured at the end of P2, and on developmental gains or change over the P1 and P2 years are summarised below. In all cases the relationships are statistically significant, when the influence of other

measures is controlled. The findings identify general tendencies for different groups of children, but do not apply to every individual in a specific group.

Child Variables

- Age: Older children did better on self-regulation, pro-social behaviour and social competence, and were less likely to show social isolation, than younger children.
- Gender: Gender affected children's scores on self-regulation, pro-social behaviour, conduct problems and social isolation subscales. Girls attained higher scores and made more progress on both self-regulation and pro-social behaviour than boys. Boys attained higher scores and showed an increase on conduct problems and social isolation at the end of P2 compared with girls.
- Birth Weight: Heavier birth weight children attained better scores and made more progress on self-regulation than lower birth weight children.
- Behavioural Problems in the first 3 years: Compared with children who did not have any behavioural problems in their first three years, children who had early behavioural problems without treatment displayed more anxious behaviour, attained lower scores and made less progress on self-regulation, pro-social behaviour and social competence, and attained higher scores and showed an increase on conduct problems and social isolation. Children who had behavioural problems and did receive treatment were more socially isolated than children who did not have any previous behavioural problems.

Parental and Socio-Economic Status Variables

Parental socio-economic status was an important predictor of children's social/behavioural development, having varying effects on all subscales.

Compared with children from a professional socio-economic status, children from:

- All other backgrounds, with the exception of children from a skilled manual background for attainment, attained lower scores and made less progress on social competence.
- All other socio-economic groups made less progress on self-regulation.
- All other socio-economic groups, with the exception of unskilled for progress, attained higher scores and showed an increase on social isolation.

In addition there were some more limited effects;

- Children from an intermediate background attained lower scores on pro-social behaviour.
- Children from a skilled non-manual background attained lower scores on pro-social behaviour, and attained higher scores and showed an increase on conduct problems.
- Children from a skilled manual group showed an increase on anxious behaviour.
- Children from a semi-skilled background attained lower scores on self-regulation and pro-social behaviour.
- Children from an unskilled background showed an increase on anxious behaviour.
- Children from an unemployed background attained lower scores on self-regulation and pro-social behaviour, made less progress on pro-social behaviour, and attained higher scores and showed an increase on conduct problems.

Area Deprivation had additional effects to family socio-economic status.

- Children from areas where there is greater child poverty attained lower scores and made less progress on pro-social behaviour during P1 and P2.

Parental qualifications were important for children's attainment and progress on pro-social behaviour, self-regulation, social competence, conduct problems and social isolation.

- Mothers' Education/Qualifications: Compared with children whose mothers do not have any qualifications, children whose mothers have any type of qualifications, with the exception of age 16 vocational, attained higher scores and made more progress on social competence. In addition, children whose mothers have age 18 vocational or degree and above qualifications scored higher on self-regulation and showed a decrease on conduct problems, compared with children whose mothers do not have any qualifications.
- Fathers' Education/Qualifications: Compared with children with unqualified fathers, children whose fathers have age 16 academic qualifications made more progress on self-regulation and pro-social behaviour across the P1 and P2 period; children whose fathers have age 18 vocational qualifications also made more progress on pro-social behaviour. Children whose fathers have age 18 academic qualifications attained higher and made more progress on self-regulation and pro-social behaviour and attained lower scores and showed a decrease on conduct problems and social isolation. Children whose fathers have degree or above attained higher scores and made more progress on self-regulation, displayed fewer conduct problems, and attained lower scores and showed a decrease on social isolation compared with children whose fathers do not have any qualifications.
- Fathers' Employment: Compared with children whose fathers are full time employed, children whose fathers are part time employed showed more conduct problems and social isolation in terms of attainment and progress across the P1 and P2 period.

Family Variables

- Developmental Event: Children who experienced an event in their first three years that could affect normal development scored lower and made less progress on self-regulation, and showed more conduct problems at the end of P2 compared with other children.

Home Variables

- Home Play with Friends: Peer play at home affected all social/behavioural subscales, except anxious behaviour. Compared with children who did not have any home play with friends, children who experienced a low amount scored higher on self-regulation; children who had a high amount of peer play at home attained, and progressed more on pro-social behaviour and social competence, did better in terms of attainment and progress on conduct problems and social isolation and made more progress on self-regulation.
- Regular bedtime: Children who had a regular bedtime in their first three years displayed less anxious behaviour, attained higher scores on social competence across the P1 and P2 period than children who did not have a bedtime routine, possibly reflecting the effects of a structured home environment.
- Home Learning Environment: Children from homes rated higher on the home learning index attained higher scores on self-regulation, displayed less conduct problems and showed a decrease on anxious behaviour during P1 and P2.

Early Childcare Characteristics

- Relative Care: Children who experienced more relative care in the first 3 years displayed less anxious behaviour at the end of P2.

- Group care: Children who had more group care in the first 3 years attained lower scores and made less progress on pro-social behaviour and showed more conduct problems at the end of P2.

Pre-school Effects

Home versus Pre-school

Compared with children who did not attend pre-school, children who attended;

- Nursery Class/School scored higher on social competence, and were less anxious.
- Playgroups and Private Day Nurseries did less well in terms of both attainment and progress on conduct problems and displayed less anxious behaviour.
- Reception Classes did less well for attainment and progress on conduct problems.
- There were no significant differences between home children and children who attended reception groups on any of the social/behavioural scales.

Pre-school Type Comparison

Compared with children who attended reception groups, children who attended;

- Playgroups made less progress on pro-social behaviour and showed an increase on conduct problems.
- Private Day Nurseries and Reception Classes attained higher scores and showed an increase on conduct problems.
- Private Day Nurseries also attained lower scores on self-regulation, and made less progress on pro-social behaviour.

Pre-school Characteristics

- Duration of Pre-school: Children who spent a longer duration of time at pre-school scored higher on self-regulation at the end of P2.
- Full time versus Part time Sessions: Children who attended pre-school full time attained lower scores on pro-social behaviour at the end of P2. There appeared to be no difference between children who attended pre-school full time or part time in relation to all other measures of social behaviour.
- Pre-school staff qualifications: Compared with children who attended pre-school where the leader did not have any qualifications, children who attended pre-school where the leader had BTEC/NNEB qualifications scored higher and made an increase on social isolation during P1 and P2.

Chapter Nine: Pre-School Effects on Children's Social / behavioural development up to the end of Year Three (P3 year).

This chapter considers children's social/behavioural development at the end of the third year of primary school. Aspects of social/behavioural development are considered in two ways, attainment at the end of P3 and progress over the first three years of primary school.

As in the previous year of primary school, children's social/behavioural development was measured through a questionnaire completed by their teacher. The same questionnaire as used for the previous year and, as indicated in the previous chapter, this produced measures of the following factors:

Self-Regulation e.g. *can independently select and return equipment as appropriate*

This factor relates to children's capacity to regulate their behaviour in a purposeful, responsible manner, without being easily distracted.

Pro-social Behaviour e.g. *is sympathetic to other children when they are upset*

This factor refers to children's capacity to engage in behaviours that foster good relationships, help other children, share and show empathy.

Conduct Problems e.g. *teases other children, calls them names*

This factor refers to a child's antisocial behaviour or conduct problems.

Anxious Behaviour e.g. *often unhappy, downhearted or tearful*

This factor refers to worried or anxious behaviour.

Social Isolation e.g. *rather solitary, tends to play alone*

This factor refers to behaviours shown by a small subset of children who do not 'fit in' in their peer group and can be seen as awkward outsiders.

Social Competence e.g. *generally liked by other children*

This factor refers to child's success in engaging in good peer relationships.

In line with the general analysis strategy applied throughout this project, the analyses have considered both the child's level of development at the end of P3 and the developmental gain (progress) over the first three years of primary school having allowed for previous attainment measured at entry to primary school. The effects of child, family, home environment and childcare variables on children's social behaviour as measured at the end of P3, and on developmental gains or change over the first three years of primary school are summarised below. In all cases the relationships are statistically significant, when the influence of other measures is controlled. The findings identify general tendencies for different groups of children, but do not apply to every individual in a specific group.

Summary of the effects of independent variables

Significant effects of independent variables upon children's social/behavioural development are summarised here, after allowing for other child, parent and home characteristics. The summary deals with the overall pattern of results across all attainment and progress analyses. In considering these results it is clear that some variables influence attainment, some influence progress and some influence both attainment and progress.

Child Variables

- Age: Older children attained higher scores on self-regulation, pro-social behaviour and social competence and scored lower on social isolation than younger children.

- Gender: Girls scored higher and made more progress on self-regulation and pro-social behaviour, and had fewer conduct problems and were less socially isolated, than boys.
- Birth weight: Heavier birth weight children attained higher scores on social competence, attained higher scores and made more progress on self-regulation, and attained lower scores and showed a decrease on anxious behaviour, compared with lower birth weight children at the end of P3.
- Behavioural Problems in the first 3 years: Compared with children who did not have behavioural problems in their first three years, children who had behavioural problems without treatment displayed more conduct problems; children who had behavioural problems and received treatment attained lower scores on self-regulation, pro-social behaviour and social competence and were more socially isolated at the end of P3.

Parental and Socio-Economic Variables

Parental socio-economic status affected children's scores on self-regulation, pro-social behaviour, conduct problems and social isolation.

Compared with children from a professional background, children from a;

- Skilled manual, semi-skilled, unskilled or unemployed background had more conduct problems and showed an increase on conduct problems during the first three years of primary school.
- Skilled manual background attained higher scores and showed an increase on social isolation during the P1, P2 and P3 period.
- Semi-skilled background attained lower scores on both self-regulation and pro-social behaviour at the end of P3.

Generally children with parents in manual jobs were not doing as well on social development as children with professional parents and children with parents in other non-manual jobs were similar to children with parents in professional jobs.

Area Deprivation - Child Poverty Index: In addition to the above differences related to parental occupational status there were additional influences related to the area lived in. Children from areas where there is more poverty attained lower scores and made less progress on pro-social behaviour and social competence, attained higher scores and made an increase on social isolation, and also showed an increase on anxious behaviour during the first three primary school years, compared with children from relatively more affluent areas, i.e. poor areas are associated with worse social development.

Mothers' Education/ Qualifications: Compared with children whose mothers do not have any qualifications, children whose mothers have;

- Age 16 vocational, age 16 academic or age 18 vocational qualifications made more progress on self-regulation.
- Age 18 academic qualifications scored higher on self-regulation.
- Degree and above attained higher scores and made more progress on self-regulation and also attained higher scores on social competence.

Fathers' Education/Qualifications: Compared with children whose fathers do not have any qualifications, children whose fathers have;

- Age 16 vocational qualifications made more progress on social competence, scored lower and showed a decrease on anxious behaviour.
- Age 16 academic qualifications attained higher scores and made more progress on self-regulation.
- Age 18 academic qualifications scored lower and made a decrease on social isolation.

Generally the higher the parents' education the better the child's social development appeared on the assessments used in this project.

Mothers' Employment: Compared with children whose mothers are employed full time, children whose mothers are unemployed scored higher and showed an increase on anxious behaviour during P1, P2 and P3.

Fathers' Employment: Compared with children whose fathers are employed full time; children whose fathers are self-employed scored lower on self-regulation, scored higher and showed an increase on social isolation; children whose fathers are unemployed scored lower on self-regulation and scored higher on social isolation.

Family Variables

Developmental Event: Compared with children who experienced a developmental event likely to disrupt normal development, children who did not experience any event attained higher scores on self-regulation and social competence, and attained lower scores on social isolation.

Lone Parent: Children whose fathers are not resident at the family home scored lower on self-regulation, and were more likely to show anxious behaviour.

Home Variables

Home Learning Environment: Children with a higher home learning environment attained higher scores on self-regulation and scored lower on social isolation at the end of P3.

Early Childcare Characteristics

Group Care: Children with more group care in their first three years scored higher and increased in conduct problems, and made less progress on pro-social behaviour.

Pre-school Effects

Home versus Pre-school

Compared with Home children, children who attended;

- Nursery Classes/Schools scored higher on pro-social behaviour and social competence and made more progress on social competence, and scored lower and showed a decrease on anxious behaviour.
- Playgroups scored higher on pro-social behaviour, attained higher scores and made more progress on social competence, and attained lower scores on anxious behaviour.
- Private Day Nurseries and Reception Classes attained lower scores and made a decrease on anxious behaviour.
- Reception Groups attained lower scores on anxious behaviour and attained higher scores on social competence.

Pre-school Type Comparison

Compared with children who attended Reception Groups, children who attended;

- Private Day Nurseries attained lower scores on self-regulation, attained lower scores and made less progress on pro-social behaviour and social competence, and attained higher scores on conduct problems and social isolation.

Pre-school Characteristics

- ECERS-R Language: Children who attended pre-schools rated higher on the ECERS-R subscale language, attained lower scores and showed a decrease on anxious behaviour.
- Observed Ratio of Staff to Children: Children who attended pre-schools with a greater number of children to staff members, scored lower and made less progress on social competence and pro-social behaviour, scored lower on self-regulation and scored higher on social isolation.
- Pre-school Peer Group Composition: Children whose pre-school peer group attained higher scores on cognitive measures made more progress on self-regulation and showed a decrease on social isolation. Children whose pre-school peer group had higher qualified mothers scored lower on social isolation at the end of P3.

Chapter Ten: Enduring Effects of Pre-School Experience at the end of Key Stage 1 (KS1), at age 8 years?

This chapter presents the findings on children's literacy and numeracy development at the end of Key Stage 1, that is, the fourth year of statutory schooling (P4, age 8 years). After allowing for a range of other factors including child, parent and home characteristics, significant effects of independent variables upon children's literacy and numeracy development are summarised here. The summary deals with the overall pattern of results across all attainment and progress analyses. In considering these results it is clear that some variables influence attainment, some influence progress and some influence both attainment and progress.

Where an analysis of children's attainment indicates that some factor influences children's development, but the analysis of progress does not reveal a significant effect for that factor, this indicates that the significant effect for that variable has occurred prior to school entry and that during the time in primary school no further effect has occurred.

When a variable shows a significant effect on progress but not on attainment, this indicates that the effect occurs over the first few years of primary school, but that the effect has been a 'catching up' effect whereby some children have reached a similar level as other children but from a lower starting point at the beginning of primary school. It may also indicate that a child attained higher and continued to make more progress.

Where both attainment and progress analyses reveal significant effects this indicates that the variable has had an effect over the first few years of school, and that the overall attainment at the end of P4 is affected either because

1. The effect over the school period is more than a 'catching up' effect or
2. The variable exerted an influence in the pre-school period that affected the start of school performance and that the effect continues into the first four years of primary school.

Child Variables

- Age affected literacy, with older children attaining better scores. It is not surprising that age has been a consistent predictor of cognitive development throughout the period of the EPPNI project. It is possible that in any school year there is as much as twelve months between the oldest and youngest child.
- Children with developmental problems, either low or high, that emerged before the age of three years, attained lower scores on literacy and numeracy.
- Girls did better at literacy.
- The results show that children's early abilities continued to affect them at the end of KS1, e.g., ability in early number concepts at the start of primary school partly predicts numeracy at KS1.

Parent and Socio-Economic Status (SES) Variables

While the specific details varied between analyses involving socio-economic status effects, the overall pattern below emerged. Compared with children with parents from a Professional socio-economic status, children from;

- Unemployed backgrounds attained lower scores and made less progress on literacy over the first four years of primary school.

- The children with parents from all other SES groups (except intermediate) attained lower scores and made less progress in numeracy over the first four years of primary school.
- Children who live in more deprived areas attained lower scores in literacy and numeracy and made less progress than children from relatively more affluent areas over the first four years of primary school.

Parental qualifications were important for literacy and numeracy attainment.

- Mothers' qualifications were significant for both literacy and numeracy. Compared with children whose mothers do not have any qualifications; children whose mothers had age 16 academic or above qualification attained higher and made more progress on numeracy. Children whose mothers have age 18 academic or above also attained higher scores on literacy.
- Mothers' pattern of employment had a small effect on children's numeracy with those employed part-time making less progress.

Home Variables

- Children who experienced an event that could be deemed to affect development attained lower on literacy and numeracy and made less progress on numeracy.
- The higher the rating on the Home Learning Environment (HLE) index, the better children's scores were on both literacy and numeracy. The effects occur primarily in the pre-school period in that while the Home Learning Environment exerts powerful effects upon overall attainment, there are no additional significant effects for progress over the school period.

Pre-school Effects

Home versus Pre-school

Compared with children who did not attend pre-school, children who attended;

- Nursery Class/School attained higher scores and made more progress in literacy and numeracy over the first four years of primary school.
- Playgroups attained and made more progress in numeracy over the first four years of primary school.
- Reception Class made more progress on numeracy.

There appeared to be no difference in attainment or progress for either literacy or numeracy in home children and children who attended Reception Groups and Private Day Nurseries.

Pre-school Type

Compared with children who attended Reception Groups, children who attended;

- Nursery Class/School provision appeared to attain higher scores, and make more progress in literacy and numeracy over the first four years of primary school.
- Playgroups attained better scores and made more progress in numeracy over the first four years of primary school.

These results indicate the continuing positive effects of certain types of pre-school experience, with the best overall pattern of results shown by children who attended Nursery Schools/Classes.

Pre-school Characteristics

- Children who attended pre-schools that were rated higher on the ECERS-R subscale, Parent and staff facilities, scored higher and made more progress in numeracy.

Pre-school peer group composition

- When children had attended a pre-school group with children whose mothers were better qualified, they attained higher scores on numeracy and made more progress in literacy by the end of P4. This result indicates the association with peer group characteristics in pre-school. However such peer group differences may well be maintained in primary school. Nonetheless it is clear peer group matters.

Chapter Eleven: Children 'At Risk' of Special Educational Needs.

Special Educational Needs (SEN)

The project funders requested that the EPPNI team conduct an investigation into children who might be 'at risk' of special educational needs (SEN). In undertaking such an investigation the researchers were very aware that definitions and criteria for SEN are contested concepts, particularly for very young children. Very few children in pre-school have been formally assessed as having SEN, yet many may exhibit behaviours that give cause for concern. Note that children whose disability or medical condition require specialist assistance are likely to attend a specialised centre and were therefore unlikely to be in pre-school provision studied in the EPPNI project.

People's experience of children in differing contexts will affect their perception of children, and hence children may be perceived differently by parents, pre-school workers and teachers. Particular children may be identified as giving cause for concern at some stages of development but not at others. Similarly different adults' concepts of 'special needs' can vary. Also children develop differently, so changes in status in terms 'special needs' may be expected to take place between the ages of 3 and 6 years (for further discussion of the issues surrounding the identification of special educational needs of young children see Scott and Carran, 1989; Roffey, 1999). Given that SEN is such a contentious issue the project chose to adopt a means of identifying 'risk of developing SEN status' from their characteristics during pre-school. The use of this 'at risk' status is a more appropriate for young children than diagnosed SEN, which rarely occurs for pre-school children.

Hence in addition to investigating the effects of pre-school experience, individual and family characteristics on children's attainment and progress on cognitive and social/behavioural development at entry to school and up to 8 years of age, the EPPNI study has explored ways of identifying children who may be 'at risk' in terms of showing later SEN using a wide range of data for a large sample of children drawn from 80 pre-school centres, including a range of different pre-school providers. The criteria adopted for 'at risk' status was one standard deviation below the mean for measures of cognitive ability and sociability, and one standard deviation above the mean for antisocial behaviour measures, as a higher score on antisocial subscales indicates a higher incidence of antisocial behaviours. Possibly future research on this topic will be able to arrive at a better alternative for defining 'at risk' status, but in the absence of other measures appropriate for pre-school and primary school children, such a measure does allow a systematic investigation of factors associated with 'at risk' status.

This enquiry has explored attainment and progress in cognitive and social behavioural development over the pre-school period from entry to the study (age 3-4 years) to start of primary school (age rising 4 years), and then to the end of primary 3 (age 7 years). Information from parent interviews, child assessments, pre-school staff and teacher ratings of social behaviour, and teacher reports of Special Educational Needs have been used. These analyses may be useful for informing policy and practice related to SEN.

A number of findings relevant to understanding SEN in young children aged 3-7 years have been identified. In particular, a method of defining children who may be most 'at risk' of SEN is reported and the characteristics (child, parent, family, home and pre-school attendance) of 'at risk' children described at four distinct time points, and across two time periods. Significant differences in the distribution of 'at risk' children across different types of pre-school settings were identified.

Significant Findings

This summary highlights important findings regarding child, parent, family, home and pre-school type characteristics which show a significant association with young children's cognitive or social/behavioural 'at risk' status at distinct points in development (age 3-4 years, age rising 4 years, age 6 years and age 7 years). Additionally, the significant relationships between children's background variables and children's change in 'at risk' status on cognitive and social/behavioural outcomes from entry to pre-school to entry to P1, and entry to pre-school to end of P3, are discussed.

Due to the use of 'cut-off' points used to define children 'at risk', it must be noted that some children may show only small changes and move from above to just below the 'cut-off' point, and vice versa. In view of this, any change in an individual child's 'at risk' status must be interpreted cautiously. However, where change in 'at risk' status forms a pattern for particular groups, one may be more confident in interpreting the data.

Percentages of children 'at risk' at each stage

At entry to pre-school, the percentages refer to the pre-school sample only. At entry to primary school and thereafter, the percentages relate to the whole sample (home group included).

Identification of 'at risk' status at entry to Pre-school:

Overall, 16.9% of children (114 children) were 1 standard deviation below the sample average on the General Cognitive Ability (GCA) scale, and hence 'at risk' in terms of cognitive ability. 18.5% of children (118 children) were identified 'at risk' on the Peer Sociability scale, and for the Antisocial factor, 20.2%, of children (128 children) were 'at risk'.

Identification of 'at risk' status at entry to Primary school:

Approximately 17.5% of children (145 children) were one standard deviation below the sample average on the GCA scale and were considered to be 'at risk' in terms of their cognitive ability.

13.6% of children (96 children) were identified as 'at risk' on Sociability, and for the Antisocial/Worried factor), 17.2% of children (121 children) were 'at risk'.

Identification of 'at risk' status at end of Primary 2:

19% of the children (158 children) were 1 standard deviation below the sample average on Literacy, and 14.1% of children (117 children) were 'at risk' based on Numeracy scores.

Identification of 'at risk' status at end of Primary 3:

10.4% of children (75 children) were 'at risk' based on Learning Difficulty. 5.7% of children (44 children) were 'at risk' based on Behavioural Disability. Using the criteria of 1 standard deviation above the mean for the sample as a cut off for both measures, 18.1% of children (136 children) were identified 'at risk' on Peer Problems, and for Conduct Problems, 12.6% (95 children) were 'at risk'.

Gender

Gender was significantly associated with children's 'at risk' status at entry to primary 1 and end of primary 3 for learning and social/behavioural difficulties, with boys being more 'at risk' than girls on antisocial/worried at entry to primary 1, on learning difficulty, behavioural disability and conduct problems at the end of primary 3. Similar patterns have been reported in other studies.

Socio-Economic Status

Parental socio-economic status was consistently associated with children's 'at risk' status at each age, particularly on cognitive measures, and less often on social/behavioural measures. Generally, at each age, children from higher socio-economic groups were less 'at risk' on cognitive and social/behavioural measures than children from lower socio-economic groups.

In relation to transitions in 'at risk' status, children from higher socio-economic groups were less likely to 'always' be 'at risk' on General Cognitive Ability at entry to pre-school and entry to primary 1, and were more likely to 'never' be 'at risk' at entry to pre-school and end of primary 3 on antisocial behaviour.

Mothers' Qualifications

Generally, children whose mothers had higher qualifications were less likely to be 'at risk' on cognitive ability at each age. Children whose mothers had degree and above qualifications were significantly less likely to be 'at risk' on peer sociability at entry to pre-school.

Regarding transitions in 'at risk' status, children whose mothers did not have any qualifications were significantly more likely to 'always' be 'at risk' on General Cognitive Ability at entry to pre-school and entry to primary 1.

Mothers' Employment

Mothers' level of employment during the pre-school period was consistently associated with children's 'at risk' status on cognitive ability at each age, with full time employment found to be most favourable, and unemployment least favourable, for children's development.

Children whose mothers were unemployed were significantly more likely to be 'at risk' at entry to pre-school and at entry to primary school on General Cognitive Ability.

Fathers' Employment

Fathers' level of employment was significantly associated with children's 'at risk' status on cognitive ability at each age, until the end of primary 2, antisocial/worried at entry to primary 1 and conduct problems at the end of Primary 3, with fathers' full time employment being more favourable than part time employment or unemployment for children's development.

Similarly, in relation to children's transitions in 'at risk' status between entry to pre-school and entry to primary 1 and end of primary 3, on cognitive and antisocial measures, fathers' full time employment was more favourable for children's changes in 'at risk' status, compared with fathers' part time employment, unemployment or non-residency.

Lone Parent

Children from a two-parent family were less 'at risk' on General Cognitive Ability at entry to pre-school and entry to primary 1. Sociability at the beginning of primary 1 and numeracy at the end of primary 2.

In relation to transitions in 'at risk' status, children from lone parent families were significantly more likely to 'always' be 'at risk' at entry to pre-school and entry to primary 1 on General Cognitive Ability.

Home Learning Environment

Generally, as the quality of the home learning environment increased, the percentage of children 'at risk' on sociability at entry to primary 1, and on cognitive ability at each age decreased within each year group. Further discussion of the home learning environment is at the end of this chapter.

Regarding transitions across the pre-school period, children from homes that scored lower on the home learning environment were significantly more likely to ‘always’ be ‘at risk’ on General Cognitive Ability.

Peer Play

Generally, results indicated that having no peer play or having a lot of such play, either at home or elsewhere, was not beneficial for children’s ‘at risk’ status on cognitive ability and peer sociability at entry to pre-school or peer problems at the end of year 3. It was more beneficial for children to have peer play occasionally.

Children who never played with friends at home were significantly more likely to ‘always’ be ‘at risk’ on antisocial behaviour at entry to pre-school and the end of primary 3.

Multiple Disadvantage

Indicators in the multiple disadvantage index

Child Variables	Disadvantage Indicator
• Premature	Premature at birth
• Birth weight (very low)	Birth weight <=2000 grams
• Birth weight (low)	Birth weight <=2500 grams
Parent Variables	
• Family Socio-Economic Status	Semi-skilled, unskilled, unemployed
• Mothers’ Qualification Level	No Qualifications
• Mothers’ Employment Level	Unemployed
• Fathers’ Employment Level	Unemployed
Family Variables	
• Family Size	3 or more siblings
• Lone Parent	Single parent
Home Variables	
• Home Learning Environment	Bottom Quartile (score 0 – 13)

For the children in the EPPNI study the distribution of children showing various levels of multiple disadvantage is shown in the table 4 below.

Table 4: Children showing different levels of multiple disadvantage.

Level of multiple disadvantage	N	%
none	238	28.7
1-2 indicators	380	45.8
3-4 indicators	169	20.4
5+ indicators	43	5.2
Total	830	100.0

Table 4 shows that, in all, just over a quarter (28.7%) of the EPPNI sample experienced none of the indicators of disadvantage explored, while 25.6% of children experienced three or more indicators of disadvantage. Only a small proportion (5.2% or 43 children) experienced 5 or more.

Multiple disadvantage was consistently associated with children’s increased risk on nearly all subscales measured at each age. Generally, the percentage of children ‘at risk’ on cognitive

ability and social/behavioural measures at all ages, increased significantly within each year group as the number of factors experienced associated with disadvantage increased.

Where multiple disadvantage was associated with children's transitions in 'at risk' status on cognitive and social/behavioural measures, children were most likely to be 'always at risk' if they had experienced more factors of disadvantage. Over all categories of disadvantage, higher percentages of children appeared to 'move out' of 'at risk' status on cognitive and social/behavioural measures across the pre-school period, compared to the percentages of children who 'moved into at risk' status, showing positive benefits for pre-school attendance. The only exception was for children with 5 or more indicators of disadvantage, where higher percentages appeared to 'move in' to 'at risk' status on peer sociability and antisocial behaviour, over the pre-school period than those who 'moved out of 'at risk' status for SEN. A similar pattern was observed for change in 'at risk' status at start of pre-school and end of primary 3. This extremely disadvantaged group shows consistently high risk for SEN.

Pre-school Effects

Pre-school type was significantly associated with children's 'at risk' status on most cognitive and social/behavioural subscales at each age and across both transition periods.

Nursery Class/School

At entry to primary 1, a significantly smaller proportion of children who attended nursery classes/schools were 'at risk' on General Cognitive Ability, compared with any other type of pre-school. On literacy and numeracy at the end of primary 2, the proportion of children 'at risk' who attended nursery classes/schools was low compared with other types of provision.

Playgroup

A significantly smaller proportion of children who attended playgroups were 'at risk' on antisocial behaviour, compared with any other type of provision, at entry to pre-school.

Private Day Nursery

A significantly smaller proportion of children who attended private day nurseries were 'at risk' on General Cognitive Ability, at entry to pre-school, compared with any other type of pre-school. In contrast, a larger percentage of children who attended private day nurseries were 'at risk' on antisocial behaviour, at entry to pre-school, compared with other types of pre-school. At entry to primary 1, quite a small proportion of children who attended private day nurseries were 'at risk' on General Cognitive Ability, which was similar to the figure observed for nursery classes/schools at entry to primary 1. Significantly smaller percentages of children who attended private day nurseries were 'at risk' on literacy and numeracy at the end of primary 2, compared with any other type of pre-school.

In relation to children's transitions in 'at risk' status, the highest percentages of children 'always at risk' on Antisocial at entry to pre-school and entry to primary 1, attended private day nurseries or reception groups. The highest percentage of children 'always at risk' on antisocial behaviour, at entry to pre-school and end of primary 3, also attended private day nurseries.

Reception Class

The largest percentage of children 'at risk' on General Cognitive Ability, within pre-school type, was observed for children entering reception classes, where approximately one quarter appeared to be 'at risk' of SEN at entry to pre-school. Children who attended reception classes were least likely to be 'at risk' on Peer Sociability at entry to pre-school and sociability at the end of primary 1. Over one quarter of children who attended reception classes were 'at risk' on General Cognitive Ability at the start of primary 1, a similar figure being observed for home children.

Reception Group

A greater proportion of children who entered reception groups were 'at risk' on peer sociability at entry to pre-school than any other type of provision.

In relation to children's transitions in 'at risk' status, significantly higher numbers of children who attended reception classes or reception groups appeared to be 'always at risk', based on General Cognitive Ability, at entry to pre-school and entry to primary 1, compared with children who attended any other type of pre-school provision. As previously stated, the highest percentages of children 'always at risk' at entry to pre-school and entry to primary on antisocial behaviour attended reception groups or private day nurseries. Reception classes and groups do not appear to be the most beneficial types of pre-school experience. The relative lack of benefit for children of these types of pre-school compared to particularly nursery schools/classes or playgroups is discussed further in the last chapter.

Home children

A significantly larger proportion of home children were 'at risk' on General Cognitive Ability and sociability at entry to primary 1 compared with any other type of pre-school provision. A significantly larger proportion of home children were 'at risk' on literacy at the end of primary 2 and learning difficulty at the end of primary 3 compared with children from any other type of pre-school. These findings highlight the importance of pre-school attendance.

Home Learning Environment: further discussion

Parental education and socio-economic status are associated with poorer developmental progress for children including increased risk of developing SEN. The Home Learning Environment was only modestly associated with mother's educational level or family SES, indicating that this measure is relatively independent of other indicators of disadvantage. The HLE index was strongly associated with 'at risk' status in all assessments, at pre-school entry and at start of primary school. Those who scored poorly on the HLE scale (i.e. those who reported low levels of home learning activities) were over-represented among those identified as 'at cognitive risk' at entry to primary school. The results suggest that policies that improve parent education and encourage active parental involvement in their child's learning at home could play a positive role in combating the impact of disadvantage and reduce the risk of SEN for children in vulnerable groups. The 'home' sample tended to have significantly lower scores on the HLE index, and as such, 'home' children may be especially vulnerable to SEN due to missing out on pre-school experience and having fewer learning opportunities at home. Again this has important implications for policy, increasing the availability and quality of pre-school provision and the uptake by vulnerable groups is likely to improve development and thus reduce incidence of SEN. In addition, for children who do not use pre-school, initiatives such as Sure Start may help improve the home learning environment and thus benefit children most 'at risk' of developing SEN and facilitate a better start to school.

Overall, child and parental factors were more strongly associated with children's cognitive outcomes than with social/behavioural development. Multiple disadvantage is strongly associated with low cognitive scores amongst young children, at age 3 years plus. Children scoring highly in terms of multiple disadvantage were much more likely to be identified in the 'cognitive risk' category than others.

Summary and policy implications

There are a range of multiple disadvantages associated with children 'at risk' of learning or behavioural difficulties. These disadvantages include prematurity, low birthweight, more than 3 siblings, lower parent education and socio-economic status, and poorer home learning

environment. Also such children are more likely to show developmental or behavioural difficulties in infancy. Children 'at risk' of learning or behavioural difficulties are helped by pre-school experience and the effects are greater the better the quality of the pre-school. Where disadvantaged children attended centres that included children from mixed social backgrounds they showed further benefit than if they attended centres containing predominantly disadvantaged children.

For cognitive outcomes, children with multiple disadvantage (in terms of child, family and home environment characteristics) were much more likely to be identified as 'at risk', while such background characteristics showed weaker links with social/behavioural development. The quality of the home learning environment (related to parents' reported activities with their pre-school child) showed a strong relationship with 'at risk' status. A more stimulating home learning environment benefits both cognitive and social/behavioural development. The home learning environment was only modestly related to parents' education and SES.

Children with no pre-school experience were more likely to be 'at risk' of SEN for cognitive development, even after taking into account this group's higher levels of multiple disadvantage. Thus pre-school may be an effective intervention for the reduction of SEN, especially for the most disadvantaged and vulnerable groups of young children.

Particular types of pre-school provision were of greater benefit to children who are 'at risk' of SEN. For those 'at risk' of SEN, nursery schools/classes were seen to be particularly beneficial. Generally those centres with better quality provision produced the most benefit. High quality pre-school centres may be seen as an effective intervention that can help improve cognitive development and thus provide more vulnerable children with a better start at primary school, particularly if children spend more months in pre-school.

There was wide variation in methods for identifying children with SEN across different types of pre-school, and hence some children 'at risk' of SEN may go unidentified and, therefore, miss the opportunity for early interventions. Despite this variation, the majority of parents were satisfied with the support their children were given for SEN, and if they were dissatisfied, they generally wanted more learning support on an individual basis.

Chapter Twelve: Summary and messages for policy and practice

Between 1998 and 2004 the EPPNI project had recruited its sample of 800+ families, constructed developmental trajectories for children between the years of 3+ and 8, and described the pre-school characteristics associated with children making a better start to primary school. This large-scale longitudinal study required the contribution of 80 pre-school centres and involved a large research team who collected and analysed very large amounts of data using diverse methodologies. A summary of findings follows.

Major findings at entry to school

1. Impact of attending any form of pre-school setting

Pre-school experience, compared to none, enhances children's development.

Having allowed for any differences in background factors that might affect development, 'home' children (those who had little or no pre-school experience) show poorer cognitive and social/behavioural outcomes at entry to school and at the end of Year 1 than those who attended pre-school. Also they are more likely to be identified as having some form of SEN.

2. Type of pre-school provision

The EPPNI project has compared children from each of the types of pre-school provision with children with very little or no pre-school centre experience (home group). In these comparisons a wide range of child, parent, socio-economic, home, family and early childcare variables have been included in analyses so that comparisons take place on a fair basis, i.e. "a level playing field". At the start of primary school children from nursery school/classes showed the most benefit for cognitive development and children from reception groups showed no cognitive advantage over the home group. For social development children from playgroups showed the most advantage with all pre-school groups showing some advantage. A summary of overall benefits for the different pre-school groups compared with the home group is shown for cognitive and social development outcomes in Table 4.

Table 4: Overall developmental benefits associated with pre-school type at the start of primary school as compared with children with no pre-school experience

Developmental Benefit	Nursery school/class	Playgroup	Private Day Nursery	Reception Class	Reception Group
Cognitive Development	3	1	2	2	0
Social Development	1	3	1	1	2

3. Full-time versus part-time pre-school

At every stage of the study the possibility that there would be differences associated with full-time versus part-time attendance at preschool was examined. At the start of primary school there were no differences between children who had full-time or part-time pre-school in terms of cognitive development. There were slight differences for progress in social development, which appeared to be the effects of one group catching up with the other as there were no differences in attainment.

4. Duration

The duration of attendance at pre-school was consistently found to be associated with better outcomes in the EPPE study in England, with every month of pre-school experience after age 2 years linked to better intellectual development and improved independence, concentration and sociability. However similar effects for duration were not found in the EPPNI study and this is likely to be because a lower level of variation in duration of pre-school was found in Northern Ireland than in England.

5. Quality of provision

The observed quality of pre-school centres is related to better intellectual/cognitive and social/behavioural development in children at the start of primary school.

While good quality can be found across all types of early years settings, the evidence revealed that quality was higher overall in nursery schools and nursery classes.

The quality of provision is likely to be affected by staff qualifications and training. The comparison of observed quality in playgroups between Northern Ireland and England strongly suggests that improved staff training can improve quality of pre-school provision. Also the higher levels of observed quality and better child outcomes for nursery schools/classes is likely to be related to higher staff qualifications in these centres.

6. Peer group influences

The EPPNI study investigated the consequences of pre-school peer group influences upon children's development by testing for effects related to the composition of the peer group in terms of mother's qualifications (proxy for social class), cognitive ability and social characteristics. These aspects are correlated so that the peer group with the high average mother's qualifications will also likely be advantaged for children's cognitive and social development. At the start of primary school such peer group influences were present for cognitive and social development.

7. Vulnerable children

Where disadvantaged children attended centres that included children from mixed social backgrounds they showed further benefit than if they attended centres containing predominantly disadvantaged children. Children 'at risk' of learning or behavioural difficulties are helped by pre-school.

Major findings at end of Key Stage 1

1. Enduring effects: Home versus pre-school groups

Advantageous effects of pre-school remained evident throughout Key Stage 1, although some outcomes were not as strong as they had been at school entry. The most likely explanation for the diminishing 'pre-school effect' is the powerful influence of the primary school on children's development. By the end of Key stage 1 (age 8 years) the attainment gap is still evident for reading and mathematics, and was still evident at 7 years of age (last age social development measured) for some aspects of social development (e.g. the pre-school group were consistently less anxious).

2. Type of pre-school

The effects present at the end of Key Stage 1 are present most strongly for children from nursery schools and classes, slightly less so for children from playgroups, less again for children from reception classes, but have largely disappeared for children from private day nurseries and reception groups.

The EPPNI project has compared children from each of the types of pre-school provision with children with very little or no pre-school centre experience (home group). In these comparisons a wide range of child, parent, socio-economic, home, family and early childcare variables have been included in analyses so that comparisons take place on a fair basis, i.e. "a level playing field". At every stage from the start of primary school up until the end of Key Stage 1, children who have been at nursery school or nursery class consistently show better cognitive social/behavioural outcomes, they are followed by children from playgroups, then the least benefits of pre-school appear for children from private day nurseries, reception classes and reception groups. The effects vary for different outcomes and for different periods in primary school. However it is possible to produce an index of overall benefit for cognitive and for social behavioural outcomes by summing all the positive effects and subtracting any negative effects separately for cognitive and social outcomes over the first 4 years of primary school. Table 5 shows the result of this aggregation.

For cognitive outcomes the children from nursery school/class show the most benefit followed by the children from playgroups, then children from private day nurseries and reception classes, with children from reception groups showing no overall cognitive benefit.

For social/behavioural outcomes, children from nursery school/classes and playgroups show equivalent benefit, with children from the other types of pre-school showing a minimal advantage over the home group.

Table 5: Overall developmental benefits associated with pre-school type for first 4 years of primary school as compared with children with no pre-school experience

Developmental Benefit	Nursery school/class	Playgroup	Private Day Nursery	Reception Class	Reception Group
Cognitive Development	15	10	5	4	0
Social Development	9	9	2	1	2

3. Full-time versus part-time pre-school

At every stage of the study the possibility that there would be differences associated with full-time versus part-time attendance at preschool was examined. For most comparisons there were no differences between children who had full-time or part-time pre-school. This result mirrors results in the EPPE study in England. There were a few differences for progress in aspects of social development, but these effects appeared to represent one group catching up with the other as there were no differences in attainment.

4. Duration

There were small benefits for social development found at the end of P1 and P2 for higher duration of pre-school attendance in EPPNI.

5. Quality of preschool

The observed quality of pre-school centres is related to better intellectual/cognitive and social/behavioural development in children throughout the first 4 years of primary school. The effects diminish with time in primary school but there are still some residual effects at the end of Key Stage 1 (age 8 years).

Good quality can be found across all types of early years settings. However quality was higher overall in nursery schools and nursery classes. The quality of provision is related to staff qualifications and training. The comparison of observed quality in playgroups between

Northern Ireland and England and also the relatively better child outcomes for playgroups in Northern Ireland strongly suggests that improved staff training can improve quality of pre-school provision, as these relatively better results for playgroups in Northern Ireland may reflect the higher levels of staff training in Northern Ireland playgroups. Also the higher levels of observed quality and better child outcomes for nursery schools/classes is likely to be related to the higher staff qualifications in these pre-school centres.

6. Peer group influences

The EPPNI study investigated the consequences of pre-school peer group influences upon children's development by testing for effects related to the composition of the peer group in terms of mother's qualifications (proxy for social class), cognitive ability and social characteristics. These aspects are correlated so that the peer group with the high average mother's qualifications will also likely be advantaged for children's cognitive and social development. Several findings showed that the children in more advantaged pre-school peer groups had a developmental benefit. Similar findings occurred in the EPPE project. This suggests that disadvantaged children will make better progress in pre-school centres with children from a mix of social backgrounds rather than in a centre uniformly disadvantaged. This has consequences for the siting of pre-school centres and their catchment areas.

7. Vulnerable children

Many children continued to be 'at risk' of special educational needs at the end of Key Stage 1, with more of the 'home' children falling into this group even after taking into account background factors. There are a range of multiple disadvantages associated with children 'at risk' of learning or behavioural difficulties. These disadvantages include prematurity, low birthweight, more than 3 siblings, lower parent education and socio-economic status, and poorer home learning environment. Also such children are more likely to have shown developmental or behavioural difficulties in infancy. Children 'at risk' of learning or behavioural difficulties are helped by pre-school experience and the effects are greater the better the quality of the pre-school. Where disadvantaged children attended centres that included children from mixed social backgrounds they showed further benefit than if they attended centres containing predominantly disadvantaged children.

8. The importance of the home learning environment

The quality of the learning environment at home (where parents are actively engaged in activities with children) promoted intellectual and social development in all children. Although parent's social class and levels of education were related to child outcomes the quality of the home learning environment was more important and only moderately associated with social class or mothers qualification levels. What parents do is more important than who they are. Hence pre-school settings that do not include parent support/education are missing an important element in enhancing social and behavioural development.

Relationship to other research

In many ways the EPPNI findings are not new; for example the adverse impact of social disadvantage on children's development has been established wherever it has been studied. Other areas in which the EPPNI findings are supported elsewhere include:

1. Positive effects of pre-school education have been shown in the U.S., Sweden, Norway, Germany, Canada, England and New Zealand (Melhuish, 2004a).
2. Developmental benefits are associated with greater staff training/qualifications in the U.S. (Peisner-Feinberg & Burchinal, 1997; 2001) and in England (Sylva et al., 2004).
3. 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).

4. The findings on disadvantage are mirrored elsewhere (see Melhuish, 2004a) and are the basis of policy initiatives all over the world (Young, 1996).
5. EPPNI is one of few studies, EPPE in England being another, to demonstrate the role of pre-school education as an effective means of early intervention in SEN.

Conclusions

The EPPNI project has provided clear evidence of the benefits of pre-school education for children in Northern Ireland. The project also demonstrates that children benefit more from nursery school, nursery class or playgroup than from other types of pre-school provision. These types of provision should be expanded in their coverage of the population rather than other types of provision. The public provision of reception classes and reception groups is associated with a low level of benefit and governmental expenditure would achieve more for the children of Northern Ireland were resources redirected to the provision of nursery school, nursery class or playgroup provision for children currently receiving pre-school provision via reception classes or groups. Private day nurseries in Northern Ireland also do not provide as much measurable benefit for children's development as do nursery school, nursery class or playgroup.

In addition to the benefits to cognitive and social development, the report also draws attention to the reduction of 'at risk' status of developing Special Educational Needs that is associated with good quality pre-school provision. This strengthens the economic case for good quality pre-school provision for all children as SEN is expensive in terms of individuals' development and public finances. Specific proposals related to vulnerable children include

- Efforts should be made to increase the take-up of pre-school places by parents who would not usually send their children to pre-school (usually found in geographical clusters or specific minority ethnic groups). This would provide vulnerable groups of children with a better start to school and reduce their risk of developing SEN.
- All pre-school and school staff should be aware that boys have increased 'risk' of developing SEN for cognitive development and aspects of social development. Increased focus on the specific needs of boys, as learners, linked with appropriate staff development may have long-term benefits and help reduce the gender gap in SEN.
- Increasing active parental engagement with children and involvement in play activities that promote children's language, spatial skills and creativity, in particular, are likely to benefit children's subsequent cognitive and social development and attainment at school.
- The strong links between 'at risk' status and multiple disadvantage, indicates that ways of effectively targeting additional resources to pre-school and school settings that serve high proportions of young children from multiply disadvantaged families should be explored.

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Appendix 1: Glossary of terms

'Anti-social / Worried' At primary school entry, teachers rated the social behaviour of EPPE children using the CSBQ. A factor analysis of the 45 items resulted in the extraction of 6 underlying factors. Primary school entry factor 4 measures the child's tendency to show behaviour that is disruptive to others or that is aggressive or destructive. Often, but not always, such behaviour occurs together with indications of worry or upset by the child. This scale is termed 'Anti-social / Worried'. Similarly, a factor analysis of the ASBI (rated by a pre-school worker at entry to the study) resulted in the extraction of 5 underlying factors with entry to study factor 4 and 5 measuring 'Anti-social' and 'Worried / Upset' behaviour.

ASBI The Adaptive Social Behaviour Inventory (ASBI) (Hogan et al, 1992) is a rating scale consisting of 30 items completed by a caregiver of a child. The items can be combined to produce factors that are measures of different aspects of the child's social behaviour.

'at risk' The term 'at risk' is a complex one which will differ depending on the particular criteria used. In this study 'cognitive risk' is defined as 1 sd below national average. 'Social/behavioural risk' is defined as 1 sd below sample average. These provide definitions of children who may be seen to be 'at risk' on the basis of their cognitive attainment or Social/behavioural development at entry to pre-school. Specifically the criteria adopted for 'at risk' status was one standard deviation below the mean for measures of cognitive ability and sociability, and one standard deviation above the mean for antisocial behaviour measures, as a higher score on Antisocial subscales indicates a higher incidence of antisocial behaviours.

Attendance The number of sessions attended at the target centre by an EPPNI child from entry to study (BAS assessment) until exit from target pre-school centre (from attendance records of pre-school centre). This measure provides a crude indicator of amount of pre-school experience.

Baseline measures Social/behavioural ratings given by the pre-school worker at entry to the study. These social/behavioural scores are subsequently employed as prior social/behavioural measures in a value added analysis of pupils' social/behavioural outcomes.

Birth weight Babies born weighing 2500 grams (5lbs 8oz) or less are defined as below normal birth weight, fetal infant classification is below 1000 grams, very low birth weight is classified as 1001-1005 grams and low birth weight is classified as 1501-2500 grams (Scott and Caren, 1989).

Caregiver Interaction Scale (CIS) A rating scale consisting of 26 items completed by an observer of the interactions between caregivers and children. The items are grouped to produce 4 subscales: positive relationships, punitiveness, permissiveness and detachment. The CIS was developed by Arnett (1989).

- Positive relationships is a subscale made up of 10 items indicating warmth and enthusiastic interaction with children by the caregiver.
- Punitiveness is a subscale made up of 8 items indicating harsh or over-controlling behaviour in interaction with children by the caregiver.
- Permissiveness is a subscale made up of 4 items indicating avoidance of discipline and control of children by the caregiver.
- Detachment is a subscale made up of 4 items indicating lack of involvement in interaction with children by the caregiver.

Child background factors Child background characteristics such as age, gender, or ethnicity.

Compositional effects The impact of peer group measures on a child's individual outcomes. For example, when the characteristics of children in a centre (measured as a centre level aggregated variable) show a significant relationship with outcomes at the individual child level, after controlling for the same variable at the individual level. For further details see Harker (2001).

'Confidence' At entry to the study, pre-school workers rated the social behaviour of EPPE children using the ASBI. A factor analysis of the 30 items resulted in the extraction of 5 underlying factors. Entry to study factor 3 measures the child's apparent confidence in his/her own ability and is termed 'Confidence'.

Confidence intervals at the 95% level A range of values which can be expected to include the 'true' value in 95 out of 100 samples (i.e. if the calculation was repeated using 100 random samples).

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.

'Co-operation & Conformity' At primary school entry, teachers rated the social behaviour of EPPE children using the CSBQ. A factor analysis of the 45 items resulted in the extraction of 6 underlying factors. Primary school entry factor 2 measures the child's co-operative behaviour and conformity to group norm and is termed 'Co-operation & Conformity'. Similarly, a factor analysis of the ASBI (rated by a pre-school worker at entry to the study) resulted in the extraction of 5 underlying factors with entry to study factor 1 measuring 'Co-operation & Conformity'.

CSBQ The Child Social Behaviour Questionnaire (CSBQ) is an extension of the ASBI and has 45 items concerning a child's social behaviour rated by teachers at entry to school. The items can be combined to produce factors that are measures of different aspects of the child's social behaviour.

ECERS-R and ECERS-E The American Early Childhood Environment Rating Scale (ECERS-R) (Harms et al, 1998) is based on child centred pedagogy and also assesses resources for indoor and outdoor play. The English rating scale (ECERS-E) (Sylva, Siraj-Blatchford & Taggart, 2003) was intended as a supplement to the ECERS-R and was developed specially to reflect the Desirable Learning Outcomes (which have since been replaced by the Early Learning Goals), and more importantly the Curriculum Guidance for the Foundation Stage which at the time was in trial stage.

'Empathy & Pro-social' At primary school entry, teachers rated the social behaviour of EPPE children using the CSBQ. A factor analysis of the 45 items resulted in the extraction of 6 underlying factors. Primary school entry factor 5 measures the child's ability to show empathy or understanding for another child's feelings and is termed 'Empathy & Pro-social'.

Family factors Examples of family factors are mother's qualifications, father's employment and family SES.

Factor scores Factor scores for each child were calculated by averaging the ratings given by the teacher / pre-school centre worker for the questions that form each factor.

Home learning environment An index derived from reports from parents (at interview) about what children do at home, for example, reading, painting, playing with numbers and letters, singing songs and nursery rhymes.

'Independence & Concentration' At primary school entry, teachers rated the social behaviour of EPPE children using the CSBQ. A factor analysis of the 45 items resulted in the extraction of 6 underlying factors. Primary school entry factor 1 measures the child's ability to play or work independently showing a certain level of concentration and is termed 'Independence & Concentration'.

Intervention study A study in which researchers 'intervene' in the sample to control variables i.e. control by setting, the adult / child ratios in order to compare different specific ratios in different settings. EPPNI is not an intervention study in that it investigates naturally occurring variation in pre-school settings.

Language attainment Composite formed by adding together the scores for two of the BAS assessments (naming vocabulary and verbal comprehension).

Multiple Disadvantage Based on three child variables, six parent variables, and one related to the home learning environment, which were considered 'risk' indicators when looked at in isolation. A child's 'multiple disadvantage' was calculated by summing the number of indicators the child was 'at risk' on.

Multilevel modelling A methodology that allows data to be examined simultaneously at different levels within a system (e.g. young children, pre-school centres, LEAs), essentially a generalisation of multiple regression.

Multiple regression A method of predicting outcome scores on the basis of the statistical relationship between observed outcome scores and one or more predictor variables.

Net effect The unique contribution of a particular variable upon an outcome while other variables are controlled.

Pedagogical strategies Strategies used by the educator to support learning. These include the face-to-face interactions with children, the organisation of the resources and the assessment practices and procedures.

'Peer Sociability' At primary school entry, teachers rated the social behaviour of EPPE children using the CSBQ. A factor analysis of the 45 items resulted in the extraction of 6 underlying factors. Primary school entry factor 3 measures the child's ability to play or work well with peers and in groups and is termed 'Peer Sociability'. Similarly, a factor analysis of the ASBI (rated by a pre-school worker at entry to the study) resulted in the extraction of 5 underlying factors with entry to study factor 2 measuring 'Peer Sociability'.

Pre-reading attainment Composite formed by adding together the scores for phonological awareness (rhyme and alliteration) and letter recognition.

Prior attainment factors Measures that describe pupils' achievement at the beginning of the phase or period under investigation (e.g. taken on entry to primary or secondary school or, in this case, on entry to the EPPNI study).

Quality Measures of pre-school centre quality collected through observational assessments (ECERS-R, ECERS-E and CIS) made by trained researchers.

Significance level Criteria for judging whether differences in scores between groups of children or centres 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 child’s ability to ‘socialise’ with other adults and children and their general behaviour to others.

Socio-Economic Status (SES) Occupational information was collected by means of a parental interview when children were recruited to the study. 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 non-manual, intermediate non-manual, skilled non-manual, skilled manual, semi-skilled manual, unskilled manual, never worked and no response. Family SES was obtained by assigning the SES classification based on the parent with the highest occupational status.

Standard deviation (sd) A measure of the spread around the mean in a distribution of numerical scores. In a normal distribution, 68 percent of cases fall within one standard deviation of the mean and 95 percent of cases fall within two standard deviations.

Target centre A total of 80 p-school centres were recruited to the EPPNI research covering 5 types of provision. The sample of children was drawn from these target centres.

Value added models Longitudinal multilevel models exploring children’s social/behavioural developmental gains over the pre-school period, controlling for prior social behaviour and significant child, parent and home learning environment characteristics.

Appendix 2: Analysis strategy

Analysis of relationship of family factors and pre-school experience

The analyses presented in this report consider the children's development in two ways, in terms of attainment, and in terms of progress.

Attainment: these analyses answer the question 'What affects the child's level of development at a point in time?'

In analysing attainment the child, socio-economic (area & parent), parent, family, home and childcare characteristics affecting the child's level of attainment are considered. The child's earlier level of functioning is not taken into account. Attainment analyses include a comparison between the home group and the different pre-school groups as well as comparing the different pre-school types.

Next progress is considered. These analyses answer the question 'What affects the progress the child makes over a particular period, e.g. from start of study to start of primary school?'

In analysing progress, all possible predictor variables used in attainment are analysed, but, in addition, the child's level of functioning at the start of the relevant period is taken into account.

The strategy of analysing the outcome at the end of a period in a regression model where the level of functioning on the outcome at the start of the period is a predictor, is the equivalent to analysing the child's progress in the outcome as the initial level of functioning is taken into account.

There are consequences of this strategy for progress models.

1. The child's level of functioning at the start of a period will absorb the effects of several child, parent, family and home factors, where their effects do not persist additively later.
2. Where children are not showing high levels of attainment in relation to their age at the start of a period, there is more scope for progress for such children. Hence such children may show bigger progress effects, without necessarily showing high attainment at the end of the period.

In analysing for a particular outcome, the predictor variables were entered into a regression model using the "enter" method. The variables that had statistically significant ($p < .05$) effects were retained in the model. The other factors were removed one at a time to ensure all variables with statistically significant effects were retained. The final regression models for each outcome variable retained only the predictor variables found to have statistically significant effects on the outcome variable. The chosen significance level (conventional cut-off point) of $p < .05$ means that there is a less than 5% chance that the observed result is due to chance.

The predictor variables considered in analyses are listed in full below

Child characteristics

Age
Gender
Birth weight
Perinatal health difficulties
Previous developmental problems
Previous behaviour problems

Parental characteristics

Socio-economic status
Mother's level of employment
Father's level of employment
Mother's qualifications
Father's qualifications
Mother's age
Father's age
Age mother left education
Age father left education
Marital status

Index of Area Deprivation

Child poverty mean
Various measures of deprivation were considered. They were all highly correlated.
Therefore it was sensible to choose one and the child poverty index seemed most appropriate.

Family characteristics

Lone parent
Number of siblings
Birth position
Life events

Home characteristics

Home learning environment (HLE)
Rules about bedtime
Rules about TV
Play with friends at home
Play with friends elsewhere

Childcare history entering the study

Total childcare by a relative e.g. grandmother before entering the study
Total childcare by an individual nonrelative carer, e.g. a childminder, before entering the study
Total group childcare before entering the study
Time in target pre-school centre before entering the study

Pre-school experience variables

Type of pre-school
Adult/Child Ratio
Number of sessions per week
Duration of time spent in pre-school in months
Pre-school leader qualifications

Area

Education and Library Board (ELB) area where the child lives

ECERS-R

ECERS-R total score
ECERS-R sub-scales scores
Space and furnishings
Personal care routines
Language reasoning
Activities
Interaction
Programme structure
Parents and staff facilities

ECERS-E

ECERS-E total score
ECERS-E sub-scales scores
Maths
Literacy
Science/environment
Diversity

Caregiver Interaction Scale (CIS)

Positive Relations
Punitiveness
Permissiveness
Detachment

Compositional variables

Within each pre-school centre the study has a representative sample of children recruited during the setting up phase of the project. Hence an average of the children's scores on a characteristic, leaving out the target child's score, gives a measure of the rest of the pre-school group's composition in terms of that characteristic. Such a composition variable is a useful way to incorporate analysis of peer group effects during the pre-school period.

Composition variables were computed for:

Child cognitive ability
Child co-operation
Child peer sociability
Child confidence
Child anti-social behaviour
Child worried behaviour
Mother's education

APPENDIX 3: EPPNI Technical Papers

Technical Paper 1

Melhuish, E., Quinn, L., McSherry, K., Sylva, K., Sammons, P., Siraj-Blatchford, I., Taggart, B. & Guimares, S. (2002) *Characteristics of Pre-school Environments in Northern Ireland: An Analysis of Observational Data*. N.I.: Stranmillis University Press.

Technical Paper 2

Melhuish, E., Quinn, L., Sylva, K., Sammons, P., Siraj-Blatchford, I., Taggart, B., McSherry, K. & McCrory, M. (2001) *Cognitive and Social/behavioural Development at 3-4 years in Relation to Family Background*. N.I.: Stranmillis University Press.

Technical Paper 3

Quinn, L., Colhoun, J., Taggart, B., Melhuish, E., Siraj-Blatchford, I., Sylva, K., Sammons, P. & McSherry, K. (2002) *Pre-school Centre Characteristics: An Analysis of Centre Manager Interviews*. N.I.: Stranmillis University Press.

Technical Paper 4

Melhuish, E., Quinn, L., Sylva, K., Sammons, P., Siraj-Blatchford, I., Taggart, B. & Currie, G. (2002) *Pre-school Experience and Social/behavioural Development at the Start of Primary School*. N.I.: Stranmillis University Press.

Technical Paper 5

Melhuish, E., Quinn, L., Sylva, K., Sammons, P., Siraj-Blatchford, I., Taggart, B. & Shields, C. (2002) *Pre-school Experience and Cognitive Development at the Start of Primary School*. N.I.: Stranmillis University Press.

Technical Paper 6

Quinn, L., Melhuish, E., Sylva, K., Sammons, P., Siraj-Blatchford, I., Taggart, B., Hanna, K. & Sweeney, G. (2003) *Cognitive Development and Progress at the End of Year 1*. N.I.: Stranmillis University Press.

Technical Paper 7

Quinn, L., Melhuish, E., Hanna, K., Sylva, K., Sammons, P., Siraj-Blatchford, I., & Taggart, B. (2004) *Pre-school Experience and Social/Behavioural Development At the End of Year 1 of Primary School*. N.I.: Stranmillis University Press.

Technical Paper 8

Quinn, L., Hanna, K., Melhuish, E., Siraj-Blatchford, I., Sylva, K., Sammons, P. & Taggart, B. (2004) *EPPNI Case Studies*. N.I.: Stranmillis University Press.

Technical Paper 9

Melhuish, E., Quinn, L., Hanna, K., Sylva, K., Siraj-Blatchford, I., Sammons, P. & Taggart, B. (2004) *Pre-school Experience and Social/Behavioural Development At the End of Year 2 of Primary School*. N.I.: Stranmillis University Press.

Technical Paper 10

Melhuish, E., Quinn, L., Hanna, K., Sylva, K., Siraj-Blatchford, I., Sammons, P. & Taggart, B. (2004) *Pre-school Experience and Literacy and Numeracy Development At the End of Year 2 of Primary School*. N.I.: Stranmillis University Press.

Technical Paper 11

Melhuish, E., Hanna, K., Quinn, L., Sylva, K., Siraj-Blatchford, I., Sammons, P. & Taggart, B. (2004) *Pre-school Experience and Social/Behavioural Development At the End of Year 3 of Primary School*. N.I.: Stranmillis University Press.

Technical Paper 12

Quinn, L., Melhuish, E., Hanna, K., Sylva, K., Siraj-Blatchford, I., Sammons, P., Taggart, B. & Doyle A. (2005) *Pre-school Experience and Literacy and Numeracy Development At the End of Key Stage 1* N.I.: Stranmillis University Press.

Technical Paper 13

Hanna, K., Melhuish, E., Quinn, L., Sylva, K., Siraj-Blatchford, I., Sammons, P. & Taggart, B. (2005) *Identifying and Monitoring Changes in Special Educational Needs in the Early Years* N.I.: Stranmillis University Press.



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