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## Pre-school experience and social/behavioural development at the start of primary school

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## Pre-school experience and social/behavioural development at the start of primary school

### Abstract

This longitudinal study assesses the attainment and development of children followed between the ages of 3 and 7 years. Over 700 children were recruited to the study during 1998 and 1999 from 80 pre-school centres. Both qualitative and quantitative methods (including multilevel modelling) are used to explore the effects of pre-school experience on children's cognitive attainment and social/behavioural development at entry to school and any continuing effects on such outcomes up to 7 years of age. In addition to the effects of preschool experience, the study investigates the contribution to children's development of individual and family characteristics such as gender, family size, parental education and employment. This overview describes the research design and discusses a variety of research issues (methodological and practical) in investigating the impact of pre-school provision on children's developmental progress. A parallel study is being carried out in England (EPPE).

### Keywords

experience, social, behavioural, development, pre, start, school, primary

### Disciplines

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Edward Melhuish, Louise Quinn, Kathy Sylva, Pam Sammons, Iram Siraj-Blatchford, Brenda Taggart, and Gail Currie



# **Effective Pre-school Provision in Northern Ireland (EPPNI)**

## **Pre-school Experience and Social/Behavioural Development at the Start of Primary School.**

A Longitudinal Study funded by Department of Education (DE),  
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and Social/Behavioural Development  
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## Overview of the Project

This longitudinal study assesses the attainment and development of children followed from age 3 years until the end of Key Stage 1. Over 700 children were recruited to the study during 1998 and 1999 from 80 pre-school centres in Northern Ireland. Both qualitative and quantitative methods are used to explore the effects of pre-school experience on children's cognitive attainment and social/behavioural development at entry to school and any continuing effects up to 8 years of age. In addition to the effects of pre-school experience, the study investigates the contribution to children's development of individual and family characteristics such as gender, family size, parental education and employment. This overview describes the research design and discusses a variety of research issues (methodological and practical) in investigating the impact of pre-school provision on children's developmental progress. A parallel study is being carried out in England (EPPE).

## Previous Research on the Effects of Early Education in the UK

There has been little large-scale, systematic research on the effects of early childhood education in the UK. The 'Start Right' Enquiry (Ball 1994; Sylva 1994) reviewed the evidence of British research and concluded that small-scale studies suggested a positive impact but that large-scale research was inconclusive. The Start Right enquiry recommended more rigorous longitudinal studies with baseline measures so that the 'value added' to children's development by pre-school education could be established.

Research evidence elsewhere on the effects of different kinds of pre-school environment on children's development (Melhuish et al. 1990; Melhuish 1993; Sylva & Wiltshire 1993; Schweinhart & Weikart 1997; Borge & Melhuish, 1995; National Institute of Child Health Development 1997) suggests positive outcomes. 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 (1970) nor the National Child Development Study (1958) 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. To date no research using multilevel models (Goldstein 1987) has been used to investigate the impact of both type of provision and individual centre effects. Thus little research in the UK has explored whether some forms of provision have greater benefits than others.

In the UK there is a long tradition of variation in pre-school provision both between types (e.g. Playgroup, Local Authority or Private Nursery or Nursery Classes) and in different parts of the country reflecting funding and geographical conditions (i.e. urban/rural and local access to centres). 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 EPPNI and EPPE projects are thus the first large-scale studies in the UK on the effects of different kinds of pre-school provision relating experience in particular centres and type of centre to child development.

## Overview of Research Methods

The EPPNI and EPPE projects investigate three issues with implications for policy and practice:

- the effects on children of different types of pre-school provision,
- the ‘structural’ (e.g. adult-child ratios) and ‘process’ characteristics (e.g. interaction styles) of more effective pre-school centres, and
- the interaction between child and family characteristics and the kind of pre-school provision a child experiences.

The research design was chosen to enable investigation of 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 entry to school, through to age 8.

### **The 8 aims of the EPPNI Project**

- To produce a detailed description of the ‘career paths’ of a large sample of children and their families between entry into pre-school education and the first four years of primary school.
- To compare and contrast the developmental progress of 800+ children from a wide range of social and cultural backgrounds who have differing pre-school experiences.
- To separate out the effects of pre-school experience from the effects of education in the primary school period years 1, 2, 3 and 4.
- To establish whether some forms of pre-school experience are more effective than others in promoting children's cognitive and social/emotional development during the pre-school years (ages 3-4) and the first years of primary school (up to Key Stage 1; 8 years of age).
- To discover the individual characteristics (structural and process) of pre-school education in centres 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 age 8 in a way which will allow the possibility of longitudinal follow-up at later ages to establish long-term effects, if any.
- To relate the use of pre-school provision to parental labour market participation.

### **The sample: 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. The centres were chosen to include a selection of nursery classes and schools, playgroups, private day nurseries, reception classes and reception groups. Thus examples of all major types of pre-school centre in Northern Ireland were included in the study.

Over 700 children were recruited from 80 pre-school centres from all Education & Library Boards in Northern Ireland. Children and their families were selected randomly in each centre to participate in the EPPNI Project. All parents gave written permission for their children to participate. In order to examine the impact of no pre-school provision, an additional 150 children with no pre-school experience were recruited from Year 1 classes that EPPNI children entered.

The progress and development of pre-school children in the EPPNI sample is being followed over five years until the end of Key Stage 1 of primary school. Details about length of sessions and number of sessions normally attended per week have been collected to enable the amount of pre-school education experienced to be quantified for each child in the sample. Two complicating factors are that a substantial proportion of children have moved from one form of pre-school provision to another (e.g. from playgroup to nursery class) and some will attend more than one centre in a week. Careful records are necessary in order to examine issues of stability and continuity, and to document the range of pre-school experiences to which individual children can be exposed.

## **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 subscales of the British Ability Scales, BASII (Elliott et al 1996). These tasks were; verbal comprehension, naming vocabulary, picture similarities, and block building. The Adaptive Social Behaviour Inventory (ASBI) (Hogan et al 1992), which provides a profile of the child's social and behavioural adjustment, was completed by the member of the pre-school staff who knew the child best. If the child changed pre-school, he or she was assessed again.

### ***Child Measures at start of P1***

At school entry, a trained researcher administered a similar battery of cognitive assessments. These included pattern construction, verbal comprehension, naming vocabulary, picture similarities, 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 the Child Social Behaviour Questionnaire (CSBQ), which was an extended version of the ASBI and provided a social/behavioural profile.

### ***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, Marie Clay dictation and literacy measures. A CSBQ social/behavioural profile was again completed by the primary 1 teacher.

### ***Child Measures at the End of P2***

Further assessments are made at the end of Year 2. In addition to NFER-NELSON standardised assessments of reading and mathematics, information on school progress, attendance and special needs is collected. Goodman's Social Behaviour Inventory is completed by the P2 teacher as a measure of the child's social behaviour.

### ***Child Measures at the End of P3***

At age 7, children are invited to report themselves on their attitudes to school. The Goodman's Social Behaviour Inventory is again completed by the P3 teacher.

### ***Child Measures at the End of Key Stage 1***

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

## **Measuring child/family characteristics known to have an impact on children's development**

### ***Parental interview***

Shortly after the initial assessments of cognitive and social/behavioural development had been completed, one of the child's parents or guardians was interviewed. In the vast majority of cases the interview was with the child's mother. Parents were interviewed either in person when they were at the pre-school centre, or by telephone. The interview followed a semi-structured format with answers to most questions being coded into an established set of 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 between fifteen and forty minutes of the parent's time 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 gender, language and birth order was collected.

Family factors were also investigated. Parent interviews provided detailed information about parent education, occupation and employment history, family structure and pre-school attendance. In addition, details about the child's day care history and parental involvement in educational activities (e.g. reading to child, teaching nursery rhymes, television viewing etc) have been collected and analysed.

### **Pre-school Characteristics and Processes**

Regional researchers interviewed centre managers on: group size, child staff ratio, staff training, aims, policies, curriculum, parental involvement, etc. '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 also studied. The Early Childhood Environment Rating Scale (ECERS) which has been recently adapted (Harms, Clifford & Cryer 1998) and the Caregiver Interaction Scale (Arnett 1989) were also administered. The ECERS includes the following sub-scales:

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

In addition four additional ECERS sub-scales (ECERS-E) (Sylva et al 1998), describing educational provision in terms of: Language, Mathematics, Science and the Environment, and Diversity were also used in each pre-school centre.

The full list of variables analysed is shown on page 17.

## Case Studies

In addition to the quantitative data collected about children, their families and their pre-school centres, detailed qualitative data will be collected using case studies. The case studies were chosen retrospectively on the basis of the analyses of ECERS-R, ECERS-E and Inspection Report. This will add the fine-grained detail to how processes within centres articulate, establish and maintain good practice. There are case studies of three pre-school centres in EPPNI and these will be detailed in a separate report.

The methodology of the EPPNI project is thus mixed. These detailed case studies will use a variety of methods of data gathering, including documentary analysis, interviews and observations and the results will help to illuminate the characteristics of more successful pre-school centres and assist in generating guidance on good practice. Particular attention will be paid to parent involvement, teaching and learning processes, child-adult interaction and social factors in learning. Inevitably there are difficulties associated with the retrospective study of process characteristics of centres and it will be important to examine field notes and pre-school centre histories to establish the extent of change during the study period.

## Analytic Strategy

The EPPNI research was designed to enable the linking of three sets of data: information about children's attainment and development (at different points in time), information about children's personal, social and family characteristics (e.g. age, gender, SES etc), and information about pre-school experience (type of centre and its characteristics).

Longitudinal research is essential to enable the impact of child characteristics (personal, social and family) to be disentangled from any influence related to the characteristics of pre-school centre attended. Given the disparate nature of children's pre-school experience it is vital to ensure that the influences of age at assessment, amount and length of pre-school experience and pre-school attendance record 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 and their relationship to parents' labour market participation. Predictor variables for attainment at entry to primary school will include prior attainment (verbal and non-verbal sub scales), social/emotional profiles, and child characteristics (personal, social and family).

The extent to which it is possible to explain (statistically) the variation in children's scores on the various measures assessed at entry to primary school will provide evidence about whether particular forms of pre-school provision have greater benefits in promoting development by the end of the pre-school period. Analyses will test out the impact of measures of pre-school process characteristics, such as the scores on various ECERS scales and pre-school centre structural characteristics such as ratios. This will provide evidence as to which measures are associated with better cognitive and social/behavioural outcomes in children.

## Identifying continuing effects of pre-school centres until the end of Key Stage 1

In the EPPNI research it is planned to explore the possible mid-term effects of pre-school provision on later progress and attainment in primary school until the end of Key Stage 1. Children's educational experiences are complex and that over time different institutions may influence cognitive and social/behavioural development for better or worse. This study will allow

the relative strength of any continuing effects of pre-school attendance to be ascertained, in comparison with the primary school influence.

### The Linked Study in England

The Effective Provision of Pre-school Education (EPPE) project is a linked project and is under the directorship of Professor Kathy Sylva, Professor Edward Melhuish, Professor Pam Sammons, and Professor Iram Siraj-Blatchford. The study explores the characteristics of different kinds of early years provision and examines children's development in pre-school, and influences on their later adjustment and progress at primary school up to age 7 years. It will help to identify the aspects of pre-school provision that have a positive impact on children's attainment, progress, and development, and so provide guidance on good practice. The research involves 141 pre-school centres randomly selected throughout 5 regions of England. The study investigates all main types of pre-school provision attended by 3 to 4 year olds in England: Playgroups, Private Day Nurseries, Nursery Classes, Nursery Schools, Local Authority Nurseries and Combined Centres. The data from England and Northern Ireland offer opportunities for potentially useful comparisons.

### Summary

The EPPNI project studies the complicated effects of amount and type of pre-school provision experienced by children and their personal, social and family characteristics on subsequent progress and development. Assessment of both cognitive and social/behavioural outcomes are made. The relationships between pre-school characteristics and children's development can be explored. The results of these analyses and the findings from the qualitative case studies of selected centres can inform both policy and practice. Comparisons with the English study (EPPE) can further illuminate the interpretation of results.

## Executive Summary

This longitudinal study assesses the attainment and development of children followed from the age of 3 until the end of Key Stage 1 in Northern Ireland. Data derives from parental interviews, child assessments, staff questionnaires, and observations and interviews undertaken in the pre-school. 837 children were rated by their class teacher on social/behavioural development in the first term of their first year in primary school. 685 of these children had been followed during their time in 80 pre-school centres throughout Northern Ireland. 152 were children from the same primary schools who had not attended a pre-school centre. The families of all, except 7, children were interviewed. This report presents the analysis of the children's social/behavioural development in terms of a range of background and pre-school factors at the start of primary school. The main results are presented below for the different kinds of factors that show associations with aspects of children's social/behavioural development, after allowing for all other background factors.

## Main Findings on 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.*

These sub-scales 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.

When all individual 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.
- Previous behaviour problems showed significant 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. Parental qualifications also affect progress on 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.

### Family & 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 Factors

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 children in 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 characteristics and processes**

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 P.1 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.

- The number of sessions attended was associated with effects for co-operation/conformity and anti-social/worried behaviour. Children attending pre-school full-time showed less co-operation/conformity and more anti-social/worried behaviour than children attending part-time.
- 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.
- 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.

The summary table on the next page indicates which of the predictor variables had significant effects for which aspect of social/behavioural development for attainment and progress at the start of primary school.

**Summary Table for social/behavioural subscales**

	Compositional variables	Adult-child interaction	ECERS-E maths	ECERS-R language	ECERS-R adult facilities	Adult: child ratio	Full time v/ part time sessions	ELB area	Pre-school type	Pre-school/home comparison	Peer play	Home Learning Environment	No. of siblings	Developmental event	Mother's employment level	Father's employment level	Father's qualifications	Mother's qualifications	Socio Economic Status	Child deprivation index	Pre-school social development	Previous beh. problems	Previous health problems	Birth weight	Gender	Age
<b>Attainment Home/pre-school</b>																										
Co-op/conformity											✓	✓		✓			✓					✓	✓		✓	✓
Sociability										✓					✓					✓		✓		✓		✓
Confidence										✓		✓	✓				✓		✓		✓	✓			✓	✓
Peer empathy										✓		✓					✓		✓		✓	✓			✓	✓
Indep/conc.										✓		✓		✓		✓	✓				✓	✓	✓		✓	✓
Anti-social/worried											✓						✓				✓	✓			✓	
<b>Progress up to Start of P1</b>																										
Co-op/conformity							✓					✓								✓	✓				✓	✓
Sociability								✓												✓	✓				✓	
Confidence												✓					✓				✓	✓			✓	✓
Peer empathy												✓					✓				✓	✓			✓	✓
Indep/conc.												✓				✓	✓				✓	✓	✓		✓	✓
Anti-social/worried											✓					✓					✓	✓			✓	✓

## **Introduction**

The Effective Pre-school Provision in Northern Ireland (EPPNI) project is a research study of children's progress and development from age three to eight years, and how progress relates to their pre-school centre experience and family background.

In the first stage of the study parents were interviewed concerning child and family characteristics. Children were also assessed on social/behavioural and cognitive development. The data provided on child and family characteristics and social/behavioural and cognitive development at the start of the study can be 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, and this is reported in Technical Paper 2, (Melhuish et al, 2001).

This paper considers the social/behavioural attainment of children at entry to Primary 1, and the progress across the pre-school period, in relation to the range of variables available in the EPPNI study that measure characteristics of the children, their parents, their family, their home and childcare history. A wide range of variables is considered and the nature of associations between family background and children's development are explored.

## **The Sample**

The focus of the EPPNI study is on the effects of pre-school experience upon children's development. The EPPNI sample was stratified by type of centre and geographical location.

The first stage of the study involved 685 children recruited from 80 pre-school centres, including 189 children from nursery classes, 157 children from playgroups, 118 children from private day nurseries and 221 children from reception groups/classes. The children were aged between 3 years and 4 years 6 months (mean 43.3 months; S.D. = 5.5 months) at the beginning of the study. For 7 families, parents were unavailable for interview. Hence this paper is based on the analysis of data from 678 parental interviews of the original sample. 152 children with no pre-school experience, for whom all parents were interviewed, were also recruited to the study at the beginning of their P1 year. These children's data are included for relevant analyses.

## Method of Data Collection

### Pre-school Assessments of Social/Behavioural Development

A pre-school centre worker who was familiar with the child was asked to complete the Adaptive Social Behaviour Inventory (ASBI) (Hogan *et al.*, 1992). The ASBI provided measures of social/behavioural development.

### The Adaptive Social Behaviour Inventory (ASBI)

The ASBI was developed by Hogan *et al.* (1992) as a general measure of the social and behavioural development of pre-school children. It was developed because there was not a measure then available that produced measures of social competence, pro-social and antisocial behaviours for pre-school children. A copy of the Adaptive Social Behaviour Inventory is included in Appendix 1. Conceptually, social competence was regarded as multi-faceted and separate from behaviour problems. Hence, a child might have varying degrees of social skills and behaviour problems simultaneously.

The inventory contains 30 items that were chosen:

- ◆ to be appropriate to pre-school children, particularly 3-year-olds
- ◆ to have wording suitable for adults of varying education
- ◆ to have content relevant to a range of home, neighbourhood and day-care settings
- ◆ to sample behaviours related to social skills
- ◆ to sample behaviours related to social knowledge
- ◆ to sample behaviours related to positive emotion
  
- ◆ to sample behaviours related to self-control
  
- ◆ to sample behaviours related to behaviour problems.

Another consideration was to choose positive and negative behaviours that had been identified as potentially related to children's experience with adults and other children.

The response choices for each of the 30 items are

'1' – rarely or never,                      '2' – sometimes and                      '3' – almost always.

Results of a factor analysis of these 30 items resulted in the extraction of 5 underlying factors:

**Co-operation and conformity**  
**Sociability**  
**Confidence**  
**Anti-social Behaviour**  
**Worried Behaviour**

## **Year 1 Primary Assessments of Social/Behavioural Development**

When the children started Year 1 of Primary school data on the children were collected in the first term. Teachers with at least 1 month's experience of working with a particular child would rate that child on the Child Social Behaviour Questionnaire (CSBQ).

### **The Child Social/Behaviour Questionnaire (CSBQ)**

This questionnaire consists of 45 items rated on a 5 point scale.

1=Rarely/never    2= not often    3=sometimes    4=usually    5=almost always

The items were derived by adding 15 items, taken from other studies of social behaviour for this age group, to the 30 items of the original ASBI. The extra 15 items were selected to sample behaviours emerging in 5-year-old children that were not covered by the original ASBI, including independence, attention related behaviours and empathy.

A factor analysis of these 45 items resulted in the extraction of these 6 underlying 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*

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

### **Parental interview**

Shortly after the initial assessments of cognitive and social/behavioural development had been completed, one of the child's parents or guardians was interviewed. In the vast majority of cases the interview was with the child's mother. Parents were interviewed either in person when they were at the pre-school centre, or by telephone. The interview followed a semi-structured format with answers to most questions being coded into an established set of 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 between fifteen and forty minutes of the parent's time 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.

### **Pre-school Environments**

685 children in the study attended one of the following types of pre-school

Playgroup	N= 15
Private Day Nurseries	N= 19
Nursery Class	N= 7
Nursery School	N= 9
Reception Class	N= 9
Reception Group	N= 21

In addition to the children in pre-school centres there were 152 children recruited to the study who had not attended a pre-school centre (home children). These children were recruited at the start of Year 1 in Primary school.

### Distribution of Children Across Pre-school Settings

Area	Nursery class/school	Playgroup	PDN	Reception class/group	Home	Total
Belfast	34	32	28	38	11	143
West	33	30	14	44	43	164
North-east	34	30	41	39	30	174
South-east	37	26	22	49	22	156
South	51	39	13	51	46	200
<b>Total</b>	<b>189</b>	<b>157</b>	<b>118</b>	<b>221</b>	<b>152</b>	<b>837</b>

### Data Collection on Pre-school Centre Characteristics

For the centres attended by the children in the study interviews were conducted with the pre-school centre manager. The topics covered in this interview included group size, child staff ratio, staff training, aims, policies, curriculum, and parental involvement. In addition to the visits to the centres to conduct interviews there were visits to collect observational data. 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. The Early Childhood Environment Rating Scale (ECERS-R) (Harms, Clifford & Cryer 1998) was administered. The ECERS-R includes the following sub-scales:

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

In addition four sub-scales (ECERS-E) (Sylva et al 1998) describing educational provision and based on Desirable Learning Outcomes were used:

- Language
- Mathematics
- Science and the Environment
- Diversity

### Analysis of Social/Behavioural Data

The relationship between the children’s scores on the factors at the pre-school level (3-4 year old) at the start of the study and their scores on the factors at the beginning of Primary school was investigated by correlations.

#### Correlations Between Pre-school Measures and Year 1 Measures.

Pre-School Measure	Year 1 measures					
	Co-op & Conform	Sociability	Confidence	Empathy	Indep. & Consent.	Anti-social /worried
Cooperation & Conformity	.36			.26	.31	
Sociability		.24				
Confidence			.26			
Anti-social					-0.23	.29
Worried						

The sub-scale of co-operation/conformity at age 3-4 is predictive of co-operation/conformity, peer empathy, and independence and concentration in primary school.

The pre-school measure of sociability is predictive of sociability in primary school.

The sub-scale of confidence at age 3-4 is predictive of confidence in primary school.

The pre-school measure of anti-social behaviour is predictive of, but inversely related to independence/ concentration, and is positively related to anti-social/worried behaviour for children in primary one.

The sub-scale measure of worried behaviour at age 3-4 predicts no primary one sub-scale measures.



## **Analysis of Relationship of Family Factors and Pre-school Experience**

The analyses presented in this report consider the children's social/behavioural development in two ways; attainment at the start of primary school, and progress over the pre-school period.

Attainment: these analyses answer the question 'What affects the child's level of 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. Attainment analyses can be done that include a comparison between the home group and the children attending different types of pre-school.

Progress over the pre-school period: These analyses answer the question 'What affects the progress the child makes 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 social/behavioural 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 child, parent, family and home factors, where their effects do not persist additively over the pre-school period.
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 for such children. Hence such children may show bigger progress effects, without necessarily showing high attainment at the start of primary school.
3. Progress analyses can only be done for the children in the pre-school groups, as the data on development at the start of the study is only available for these children. The home group of children entered the study at the start of primary school.

The social/behavioural factor scores for children were the outcome variables in a series of regression analyses. Each start of P1 social/behavioural sub-scale was analysed as a factor of

- a) Children's attainment at the start of primary school and
- b) Progress across the pre-school period

The predictor variables were entered into a regression model using the "enter" method. The variables that had statistically significant 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.

Two sorts of analysis were done. In attainment analyses the start of P1 scores are analysed without reference to social/behaviour scores at the start of the study. In progress analyses the social/behavioural scores at the start of the study are included as predictor variables.

The strategy of analysing the start of P1 social/behavioural outcomes in a regression model where the pre-school social/behavioural scores are always used as potential predictor variables is the equivalent to analysing the child's progress in social/behavioural outcomes as the initial level of social/behavioural development is taken into account.

The predictor variables considered in these analyses are listed in full below.

**Pre-school social/behavioural scores**

Co-operation/conformity  
Sociability  
Confidence  
Anti-social behaviour  
Worried behaviour

**Child characteristics**

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

**Family characteristics**

Lone parent  
Number of siblings  
Birth position  
Life events

**Home characteristics**

Home learning environment  
Rules about bedtime  
Rules about TV  
Peer play at home  
Peer play with friends elsewhere

**Childcare history**

Total relative care before entering the study  
Total individual care before entering the study  
Total group care before entering the study  
Time in target centre before entering the study

**Pre-school experience variables**

Type of pre-school  
Adult/Child Ratio  
Number of sessions

Duration of time spent in pre-school

**Area**

Education and Library Boards

**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

**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.

**Compositional variables**

Within each pre-school centre the study has a representative sample of children recruited within 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

## **Regression Analyses**

In this section we deal with two separate types of regression models for each of the six sub-scales.

The first type of model compares children with pre-school experience with children who entered the study with no pre-school experience. In this regression model we cannot include pre-school variables, as they are not available for the Home children because they did not attend any form of pre-school setting.

The second type of model looks at the children's progress across the pre-school period and includes pre-school social/behavioural scores, pre-school type and process variables, and compositional variables in the regression model.

For the development of the first model for attainment for cooperation/conformity, the progressive stages of the analyses are summarised as regression tables, leading up to the final regression model. For subsequent analyses, the presentation is abbreviated. The first stage, which contains only the significant child-related predictor variables, and the final stage, which contains all significant predictor variables, are presented. The intermediate steps are omitted for brevity.

This section deals with the analyses for each separate social/behavioural subscale in terms of attainment and progress across the pre-school period. The attainment models compare the home children with children attending different types of pre-school centres. The progress models then examine the pre-school period and the effects on social/behavioural progress.

## **Beginning of P1: Co-operation and Conformity Attainment**

At the beginning of the analyses the effects of child characteristics were considered. The child's level of co-operation/conformity at the start of primary school was analysed in terms of the effects of the following child variables:

Gender

Age at assessment

Birth weight

Perinatal problems

Health problems during the first three years

Developmental problems during the first three years

Behavioural problems during the first three years

The statistically significant variables ( $p < .05$ ) were kept in the analysis and the non-significant variables were dropped. This model was then used to test whether there were any significant differences between the home children and the pre-school groups of children in the study. The results are shown in table 1.

**Table 1: Co-operation/conformity Attainment: Child Factors**

R<sup>2</sup>=0.11

Adjusted R<sup>2</sup>=0.09

F (11,699)=7.50 p<.0001

	<b>Standardised Beta</b>	<b>Significance</b>
<b>Child variables</b>		
Gender	-.15	.000
Age	.23	.000
<i>Health problems compared with none</i>		
Low problems	-.08	.033
High problems	-.01	ns
<i>Behavioural problems compared with none</i>		
Low problems	-.08	.035
High problems	-.11	.002
<b>Type of Pre-school compared with Home Children</b>		
Nursery Class/school	.03	ns
Playgroup	.10	.029
Private Day Nursery	.08	ns
Reception Class	.00	ns
Reception Group	.02	ns

Co-operation/conformity shows significant effects for gender, age, health and behavioural problems. At this stage the children attending Playgroups attained higher co-operation/conformity scores compared with the group of Home Children. There was no difference between the home and the other pre-school groups. To test the possibility that parent, family and home differences might influence the home versus pre-school distinction, further variables reflecting these characteristics were progressively added to the analysis.

The first step in the process was to include the effects of socio-economic variables. This was done in two ways: 1. By including a measure of the level of deprivation in the area where the child was living (the variable chosen as most appropriate was the child poverty index for the child's ward) and 2. By including variables reflecting the socio-economic status of the family. The results are shown in table 2.

**Table 2: Co-operation/conformity and Socio-economic Factors**

R<sup>2</sup>=0.12

Adjusted R<sup>2</sup>=0.10

F(12,692)=7.55, p<.0001

	<b>Standardised Beta</b>	<b>Significance</b>
<b>Child variables</b>		
Gender	-.14	.000
Age	.24	.000
<i>Health problems compared with none</i>		
Low problems	-.08	.034
High problems	-.02	ns
<i>Behavioural problems compared with none</i>		
Low problems	-.08	.038
High problems	-.11	.003
<b>Type of Pre-school compared with Home Children</b>		
Nursery Class/school	.04	ns
Playgroup	.10	.032
Private Day Nursery	.06	ns
Reception Class	.02	ns
Reception Group	.03	ns
<b>Socio-economic factors</b>		ns
Deprivation/child poverty index	-.10	.014

The table shows that in addition to the previously mentioned child characteristics, the child poverty index has a significant effect on co-operation/conformity at the start of year 1. This however made no difference to the home versus pre-school distinction, which indicated that whilst children from playgroups did better than the home children, the other pre-school children were equivalent in co-operation/conformity at the start of P1.

The next step was to include variables reflecting mothers' and fathers' levels of education and employment in addition to those already considered. The results of these analyses are shown in table 3

**Table 3: Co-operation/conformity: Child, SES and Parental Factors**

R<sup>2</sup>=0.12  
 Adjusted R<sup>2</sup>=0.11  
 F(12,698)=8.25 p<.0001

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	-.15	.000
Age	.24	.000
<i>Health problems compared with none</i>		
Low problems	-.08	.022
High problems	-.01	ns
<i>Behavioural problems compared with none</i>		
Low problems	-.08	.021
High problems	-.12	.002
<b>Parental Characteristics</b>		
<i>Fathers quals compared with none</i>		
16 Vocational	.07	ns
16 Academic	.10	.028
18 Vocational	.03	ns
18 Academic	.06	ns
Degree and above	.17	.000
Father not resident	.01	ns

When fathers' qualifications are added into the regression model the difference in the co-operation/conformity scores for home children and those attending playgroups disappears.

The table indicates that father's qualifications shows significant effects for co-operation/conformity. Children whose fathers obtained 16 academic and degree (or above) level did significantly better compared with children whose fathers had no qualifications.

Besides socio-economic status and parental education and employment, other home related factors may affect children's attainment. These factors may differ between home and pre-school groups, thus leading to differences between the home and pre-school groups in co-operation/conformity. Earlier work on the project (Melhuish, Quinn, Sylva, Sammons, Siraj-Blatchford, McSherry & McCrory 2001) has indicated the powerful effects that learning activities in the home can make to developmental progress. Another factor that may be associated with social/behavioural development is family size. It is possible that home and pre-school groups differ in these home and family related characteristics which may in turn lead to differences between them on co-operation/conformity at the beginning of year 1. To test this possibility these variables were added to the analysis, the results of which can be seen in table 4.



**Table 4: Co-operation and Conformity Attainment (Final model)**

R<sup>2</sup>=0.15  
 Adjusted R<sup>2</sup>=0.13  
 F (16,687)=7.51 p<.0001

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	-.13	.000
Age	.23	.000
<i>Health problems compared with none</i>		
Low problems	-.08	.024
High problems	-.00	ns
<i>Behavioural problems compared with none</i>		
Low problems	-.08	.037
High problems	-.11	.003
<b>Parental Characteristics</b>		
<i>Fathers quals compared with none</i>		
16 Vocational	.06	ns
16 Academic	.08	ns
18 Vocational	.03	ns
18 Academic	.04	ns
Degree and above	.16	.000
Father not resident	.03	ns
<b>Home Characteristics</b>		
<b>Developmental Event</b>	.09	.018
<b>HLE</b>	.11	.003
<i>Peer play at home compared with none</i>		
Peer play-low	.09	.029
Peer play-high	.04	ns

The results show the impact of some of the home and family related variables. HLE has a powerful effect on co-operation/conformity at the start of P1. Children who have experienced some form of family event that has affected development do significantly worse than other children. The amount of peer play a child experiences at home is also significant. After considering the whole range of possible child, parental, family and home variables there is no significant difference between the home and pre-school groups at the start of P1 on co-operation /conformity.

## Co-operation/conformity Progress at the Beginning of P1

Progress on co-operation /conformity at the start of P1 refers to the child's score on this outcome having allowed for the child's social/behavioural development at the start of the study. In the first stage of the analyses, progress was examined as a function of the individual child characteristics previously mentioned. Pre-school social/behavioural variables were entered into the analysis to act as a measure of progress over the pre-school period. After retaining the significant child variables, the variables for pre-school type were also added into the analysis. The results can be seen in table 5.

**Table 5: Co-operation/conformity: Child Factors**

$R^2=0.22$

Adjusted  $R^2=0.21$

$F(10,522)=14.70$   $p<.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	-.14	.001
Age	.21	.000
<i>Behavioural problems compared with none</i>		
Low problems	-.08	.036
High problems	-.04	ns
<b>Pre-school social development</b>		
Pre (co-operation/conformity)	.22	.000
Pre (anti-social)	-.09	.000
<b>Pre-school type compared with Reception Classes</b>		
Nursery schools/classes	-.02	ns
Playgroups	.06	ns
Private day nursery	.12	.034
Reception groups	.02	ns

After allowing for individual child characteristics and pre-school social/behavioural variables the results indicate that there is a significant difference in the amount of progress for co-operation/conformity for children attending different types of pre-school. Children attending private day nurseries during their pre-school year tend to make significantly more progress on co-operation/conformity compared with children from reception classes. Children from nursery school/classes, playgroups and reception groups appear to be equivalent in progress to children from reception classes.

The analysis of progress so far does not allow for socio-economic, parent, family or home characteristics that might explain these differences associated with type of pre-school. Therefore, the full range of background variables was progressively entered into the analyses to see if the pre-school differences persisted. Pre-school processes and characteristics were also analysed to consider their effects on co-operation/conformity progress. The results of the final analysis, retaining only significant variables can be seen in table 6.

**Table 6: Co-operation/conformity Progress at the Beginning of P1 (final model)**

R<sup>2</sup>=0.28  
 Adjusted R<sup>2</sup>=0.27  
 F(12,512)=16.71

	<b>Standardised Beta</b>	<b>Significance</b>
<b>Child variables</b>		
Gender	-.15	.000
Age	.23	.000
<i>Behavioural problems compared with none</i>		
Low problems	-.08	.026
High problems	-.02	ns
<b>Pre-school social development</b>		
Pre(co-operation/conformity)	.24	.000
Pre-(anti-social)	-.16	.001
<b>Socio-economic factors</b>		
Deprivation/child poverty index	-.13	.001
<b>Home</b>		
HLE	.13	.001
<b>Pre-school processes and characteristics</b>		
Full time compared with part time	-.09	.024
<b>ECERS-R subscales</b>		
ECERS-R/Adult Facilities	.09	.021
Child: Adult ratio	-.12	.003
<b>Caregiver Interaction Scale</b>		
Adult/child interactions:Punitiveness	.10	.016

This analysis shows that when the socio-economic, parent, family, home and pre-school variables are considered the difference in progress between pre-school types disappears. This indicates that progress on co-operation/conformity at the start of P1 is accounted for by the background and pre-school variables, and that type of pre-school has no additional effect.

As well as the individual child characteristics and pre-school progress variables previously mentioned other significant variables include full time/part time attendance, child: staff ratio and the ECERS-R subscales adult facilities and caregiver Interaction Scales sub-scale punitiveness. Considering the number of sessions attended, children attending pre-school on a full time basis show less progression on co-operation/conformity at the start of P1 in comparison with children attending part time.

In relation to child: staff ratios, when there are more children to each adult less progression is made on co-operation/conformity.

### Sociability Attainment at the Start of P1

At the beginning of the analyses the effect of child characteristics was considered. A range of child variables was entered into the regression and the statistically significant variables ( $p < .05$ ) were retained and the non significant variables were dropped. This model was then used to test whether there was any significant difference between children who had attended pre-school and children who had entered the study in year 1 with no pre-school experience. The results are shown in table 7.

**Table 7: Sociability Attainment: Child Factors**

$R^2 = 0.11$

Adjusted  $R^2 = 0.10$

$F(9,694) = 9.84, p < 0.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.22	.000
Birth weight	.09	.009
<i>Behavioural problems compared with none</i>		
Low problems	.02	ns
High problems	-.12	.001
<b>Type of Pre-school compared with Home Children</b>		
Nursery Class/school	.20	.000
Playgroup	.22	.000
Private Day Nursery	.24	.000
Reception Class	.14	.003
Reception Group	.10	.021

Older children and children with heavier birth weights were rated more highly on sociability. Children with high levels of behavioural problems in the first three years tended to be rated lower on sociability in comparison to children with no behavioural problems. At this stage there is a significant difference between the home and pre-school groups with children from all types of pre-school scoring higher on sociability compared with home children.

Because this distinction between pre-school and home children could be due to other factors relating to the child's background, variables reflecting these characteristics were progressively added into the analyses. The final model retaining only the significant variables is shown in table 8.

**Table 8: Sociability Attainment (final model)**

R<sup>2</sup>=0.13

Adjusted R<sup>2</sup>=0.12

F(12,685)=8.61, p<0.0001

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.24	.000
Birth weight	.09	.015
<i>Behavioural problems compared with none</i>		
Low problems	.02	ns
High problems	-.12	.001
<b>Type of Pre-school compared with Home Children</b>		
Nursery Class/school	.20	.000
Playgroup	.21	.000
Private Day Nursery	.19	.000
Reception Class	.14	.004
Reception Group	.08	.049
<b>Socio-economic factors</b>		
Deprivation/child poverty index	-.09	.021
<b>Parental characteristics</b>		
<i>Mother's employment level compared with full time</i>		
Part time	-.08	ns
Not employed	-.09	.050

Of the child characteristics age, birth weight and behavioural problems were statistically significant.

When the parent, family, area and socio-economic variables were added to the regression, child poverty and mothers' employment level were retained. Children with high levels of poverty, and children whose mothers were unemployed were rated lower on sociability. There appeared to be no difference for mothers who were employed either part time or full time.

After all the relevant variables have been added to the regression model the home children were doing significantly worse than the pre-school group for sociability attainment at the start of P1.

### Sociability Progress across the Pre-school Period

Progress on sociability refers to the child's score on sociability having allowed for the child's level of social behaviour at the start of the study. In the first stage of the analyses, progress was examined as a function of various individual child characteristics. After retaining the significant variables the type of pre-school was also added. The results can be seen in table 9.

**Table 9: Sociability Progress: Child Factors**

$R^2=0.08$

Adjusted  $R^2=0.07$

$F(7,568)=6.93, p<0.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.24	.000
<i>Behavioural problems compared with none</i>		
Low problems	.03	ns
High problems	-.09	.022
<b>Pre-school social development</b>		
Pre (Peer sociability)	.12	.024
Pre-(confidence)	.11	.029
<b>Pre-school type compared with Reception classes</b>		
Nursery Class/school	.03	ns
Playgroup	.08	ns
Private Day Nursery	.10	ns
Reception Group	.01	ns

Children's age had a significant effect with older children showing more progress on sociability than younger children. Children with high levels of behavioural problems showed less progress in comparison to children with no behavioural problems. Children who had been rated highly on sociability or confidence in pre-school tended to show more progress in sociability at the beginning of year 1. There was no significant difference in the levels of progress shown by children from the different pre-school types, after allowing for individual child characteristics.

However the other possible influences involving area deprivation, parent, family, home and pre-school characteristics still need to be tested for their effects. The resulting model of predictor variables is shown in table 10.

**Table 10: Sociability Progress Across the Pre-school Period (final model)**

R<sup>2</sup>=0.17

Adjusted R<sup>2</sup>=0.14

F(17,517)=6.15, p<0.0001

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.24	.000
<i>Behavioural problems compared with none</i>		
Low problems	.01	ns
High problems	-.09	.034
<b>Pre-school social development</b>		
Pre-(Peer sociability)	.16	.002
Pre-(confidence)	.12	.020
<b>Socio-economic factors</b>		
Deprivation/child poverty index	-.09	.050
<b>ELB area compared with South</b>		
Belfast	.10	ns
Western	.13	.016
North Eastern	.11	.046
South Eastern	.09	ns
<b>Pre-school characteristics</b>		
Adult: child ratio	-.09	.029
<b>Compositional variables</b>		
Confidence	-.13	.003

Children from an area with a high child poverty index showed less progress and children from the Western and North Eastern Education and Library Boards showed more progress in comparison to children from the Southern Education and Library Board. The other Education and Library Boards appear to be equivalent to the Southern ELB.

Children who had attended pre-school centres in which the level of confidence for the rest of the group was high tended to show less progress in sociability at the beginning of year 1.

### Confidence Attainment at the Beginning of P1

Again, at the beginning of the analyses, the effect of child characteristics was considered. The statistically significant variables were retained and the non-significant variables dropped. This model was then used to test whether there was any significant difference between the home and pre-school groups of children. The results of the analysis are shown in table 11.

**Table 11: Confidence Attainment: Child Factors**

$R^2=0.10$

Adjusted  $R^2=0.09$

$F(8,702)=9.88, p<0.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.20	.000
<i>Behavioural problems compared with none</i>		
Low problems	-.03	ns
High problems	-.12	.001
<b>Type of Pre-school compared with Home Children</b>		
Nursery Class/school	.19	.000
Playgroup	.16	.001
Private Day Nursery	.29	.000
Reception Class	.08	ns
Reception Group	.15	.000

Older children exhibited more confidence than younger children and children with high levels of behavioural problems were less confident in comparison to children with no behavioural problems. Children who had attended all pre-school centres, except reception classes, were more confident than children who had no pre-school experience (home children).

The distinction between home and pre-school children, at this stage, could be due to other factors. To test for this possibility variables reflecting background characteristics such as parents, home, area and socio-economic status were progressively entered into the regression. A final model retaining only the significant variables is shown in table 12.



**Table 12: Confidence Attainment (final model)**

R<sup>2</sup>=0.14  
 Adjusted R<sup>2</sup>=0 .12  
 F(14,689)=8.15, p<0.0001

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.21	.000
<i>Behavioural problems compared with none</i>		
Low problems	-.03	ns
High problems	-.11	.001
<b>Type of Pre-school compared with Home Children</b>		
Nursery Class/school	.17	.000
Playgroup	.12	.014
Private Day Nursery	.18	.000
Reception Class	.06	ns
Reception Group	.12	.004
<b>Parental characteristics</b>		
<i>Mother's quals. compared with none</i>		
16 vocational	-.01	ns
16 academic	.07	ns
18 vocational	.11	.011
18 academic	.07	ns
Degree or above	.20	.000
<b>Home</b>		
HLE	.09	.015

Mothers' qualifications and HLE are now shown to have significant effects on children's levels of confidence. Children with mothers who had gained vocational qualifications at age 18 years or had attained a degree or above were rated as showing more confidence in comparison to children whose mothers had no qualifications. Children who came from a home that had been rated higher on the HLE index tended to exhibit more confidence.

There was no difference in the confidence of children in reception classes and in the home group (no pre-school experience), whilst children from other pre-schools settings were rated significantly higher on this scale, even after allowing for all background factors.

### Confidence Progress across the Pre-school Period

Progress on confidence refers to the child's score on confidence having allowed for the child's level of confidence at the start of the study. In the first stage of the analyses, progress was examined as a function of various child characteristics. After retaining the significant variables, the pre-school type was added. The results are shown in table 13.

**Table 13: Confidence Progress: Child Factors**

$R^2=0.13$

Adjusted  $R^2=0.11$

$F(8,526)=9.46$   $p<.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.23	.000
<i>Behavioural problems compared with none</i>		
Low problems	-.03	ns
High problems	-.09	.029
<b>Pre-school social development</b>		
Pre(confidence)	.21	.000
<b>Pre-school type compared with Reception Classes</b>		
Nursery schools/classes	.11	ns
Playgroups	.07	ns
Private day nursery	.18	.002
Reception groups	.11	.025

Older children showed more progress in confidence while children with high levels of behavioural problems showed less progress in comparison to children with no behavioural problems. Children who had been rated highly on confidence in pre-school showed more progress at the beginning of year 1.

Pre-school type also had a significant effect with children who had attended private day nurseries and reception groups showing more progress in confidence in comparison to children who had attended reception classes. Children who had attended nursery classes/schools or playgroups appear to be equivalent to children who had attended reception classes.

**Table 14: Confidence Progress across the Pre-school Period (final model)**

$R^2=0.20$

Adjusted  $R^2=0.17$

$F(19,510)=6.77$   $p<.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.23	.000
<i>Behavioural problems compared with none</i>		
Low problems	-.04	ns
High problems	-.08	.041
<b>Pre-school social development</b>		
Pre(confidence)	.19	.000
<b>Pre-school type compared with Reception Classes</b>		
Nursery schools/classes	.20	.003
Playgroups	.11	ns
Private day nursery	.14	.038
Reception groups	.09	ns
<b>Parental characteristics</b>		
<i>Mother's quals compared with none</i>		
16 Vocational	.02	ns
16 Academic	.06	ns
18 Vocational	.10	.050
18 Academic	.08	ns
Degree and above	.21	.000
<b>Home</b>		
<i>Number of siblings compared with none</i>		
1 sibling	-.12	.037
2 siblings	-.10	ns
3+ siblings	-.10	ns
HLE	.10	.018
<b>ECERS sub-scales</b>		
ECERS-E/Maths	.17	.001
ECERS-R/Language	-.13	.009

When a range of background variables had been progressively added into the regression and the significant variables retained, age, behavioural problems and pre-school level of confidence all still had significant effects. Pre-school type was also still significant, however, now children who had attended nursery school/classes or private day nurseries showed more progress in confidence in comparison to children who had attended reception classes.

Mother's qualifications had a significant effect with children whose mothers had gained a vocational qualification at age 18 years or had attained a degree or above qualification showing more progress than children whose mothers had no qualifications. Family size also had a significant effect with children who had one sibling showing less progress in comparison to only children. Children who came from homes that had been rated highly on the HLE index tended to show high levels of progress in confidence. Children who had attended pre-school centres which had been rated highly in

the ECERS-E maths subscale tended to show high levels of progress in confidence, while children who had attended pre-school centres which had been rated highly in the language subscale tended to show less confidence.

### Peer Empathy Attainment at the Beginning of P1

The child's level of empathy across pre-school was analysed in terms of effects of the child variables, as previously listed. This was then used to test whether there was any significant difference between home and pre-school children. The results are shown in table 15.

**Table 15: Peer Empathy Attainment: Child Factors**

$R^2=0.11$

Adjusted  $R^2=0.10$

$F(9,701)=9.55, p<0.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.18	.000
Gender	-.19	.000
<i>Behavioural problems compared with none</i>		
Low problems	-.05	ns
High problems	-.11	.004
<b>Type of Pre-school compared with Home Children</b>		
Nursery Class/school	.13	.005
Playgroup	.16	.000
Private Day Nursery	.11	.020
Reception Class	.09	.043
Reception Group	.09	.029

The results show significant effects for gender, age and behavioural problems. Boys show less empathy than girls, and older children appear to be more empathetic than younger children in pre-school. Children with low behavioural problems showed less empathy at the start of P1 than those children with no behavioural problems.

The results showed there was a significant difference between the home and pre-school groups of children with the pre-school groups showing higher levels of empathy at the start of P1.

However this difference could be due to a wide range of background characteristics as previously listed. So to test this possibility these characteristics were gradually added to the analysis to see if the difference between home and pre-school children persisted.

The results are shown in table 16.

**Table 16: Peer Empathy Attainment at the Beginning of P1 (final model)**

$R^2=0.17$

Adjusted  $R^2=0.15$

$F(22,681)=6.49, p<0.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.19	.000
Gender	-.19	.000
<i>Behavioural problems compared with none</i>		
Low problems	-.05	ns
High problems	-.09	.009
<b>Type of Pre-school compared with Home Children</b>		
Nursery Class/school	.08	ns
Playgroup	.11	.017
Private Day Nursery	.02	ns
Reception Class	.06	ns
Reception Group	.06	ns
<b>Socio-economic factors</b>		
<i>SES compared with professional</i>		
Intermediate	.01	ns
Skilled non-manual	-.04	ns
Skilled manual	.04	ns
Semi-skilled	-.08	ns
Unskilled	-.02	ns
Unemployed	-.11	.019
<b>Parental Characteristics</b>		
<i>Father's quals. compared with none</i>		
16 vocational	.06	ns
16 academic	.04	ns
18 vocational	.11	.006
18 academic	.03	ns
Degree or above	.15	.002
Father not resident	.04	ns
<b>Home</b>		
HLE	.11	.003

These results show that some home versus pre-school difference persists when all other variables are taken into consideration in that children attending playgroups had more empathy than the group of home children. The previously found differences between the home children and those from other pre-school settings have been accounted for in the background characteristics.

Those children from unemployed families demonstrated lower levels of empathy compared with children from professional families. Children whose fathers achieved an 18 vocational level qualification or degree/above showed greater empathy in pre-school than those children whose fathers had no qualifications.

Another significant predictor variable was home learning environment with children from homes rated higher on home learning environment showing higher levels of empathy.

### Peer Empathy Progress across the Pre-school Period

In this first stage of the analysis progress was looked at in terms of individual child characteristics, having allowed for the pre-school social behaviour progress variables. After retaining the significant individual child variables, the variables for pre-school were added.

The results can be seen in table 17.

**Table 17: Peer Empathy across the Pre-school Period: Child Factors**

R<sup>2</sup>=0.13

Adjusted R<sup>2</sup>=0.12

F(9,525)=8.78 p<.0001

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	-.14	.001
Age	.19	.000
<b>Pre-school social development</b>		
Pre-(co-operation/conformity)	.19	.000
<b>Pre-school type compared with Reception Classes</b>		
Nursery schools/classes	.04	ns
Playgroups	.08	ns
Private day nursery	.03	ns
Reception groups	.05	ns

The table show that boys show less progress than girls in empathy, and also that older children showed progressively more empathy across pre-school than younger children. Another significant predictor was the pre-school progress variable ‘pre-(co-operation and conformity), with children who are rated higher in co-operation and conformity showing greater progress in empathy across the pre-school period.

When considering the effect of type of pre-school this analysis shows that there is no significant difference between children in nursery schools, playgroups, private day nurseries or reception groups when compared with reception classes.

However the analysis so far doesn’t account for the many background characteristics, which might explain the non-significant effect of pre-school type. Therefore the background characteristic variables were progressively added to see if they were predictors of progress.

The final regression model can be seen in table 18.

**Table 18: Peer Empathy Progress (final model)**

R<sup>2</sup>=0.20  
 Adjusted R<sup>2</sup>=0.17  
 F(15,512)=8.25

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	-.15	.000
Age	.21	.000
<b>Pre-school social development</b>		
Pre (co-operation/conformity)	.19	.000
<b>Type of pre-school compared with Reception Class</b>		
Nursery school/class	.06	ns
Playgroup	.10	ns
Private day nursery	.03	ns
Reception group	.10	.050
<b>Parental characteristics</b>		
<i>Father's quals compared with none</i>		
16 Vocational	.07	ns
16 Academic	-.01	ns
18 Vocational	.14	.003
18 Academic	.04	ns
Degree and above	.12	.021
Father not resident	-.00	ns
<b>Home</b>		
HLE	.16	.000
<b>Caregiver Interaction Scale</b>		
Adult/child interactions:Punitiveness	.11	.009

This analysis shows that the significance of pre-school type has increased creating a significant difference between reception groups and reception classes. Children in reception groups show more progress in empathy than those children in reception classes, allowing for other factors.

Aside from child characteristics other significant variables include fathers qualifications, with children whose fathers achieved 18 vocational or degree/above showing progressively more empathy across the pre-school period than those children whose fathers have no qualifications. Other significant predictors of progress included home learning environment and the pre-school characteristic 'punitiveness'. Those children from homes rated higher on the Home Learning Environment index showed more progress in empathy across pre-school. Children from centres showing higher levels of punitiveness, also showed more progress during the same period.



### Independence/Concentration Attainment

Children's attainment in independence/concentration at the beginning of primary school was considered in terms of individual child characteristics. A model was produced retaining only significant variables and used to test whether there was any difference between the home and pre-school groups. The results are shown in table 19.

**Table 19: Independence/concentration: Child Factors**

$R^2 = 0.15$

Adjusted  $R^2 = 0.14$

$F(12,691) = 11.37, p < 0.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.29	.000
Gender	-.16	.000
<i>Health problems compared with none</i>		
Low problems	-.10	.006
High problems	.01	ns
<i>Behavioural problems compared with none</i>		
Low problems	-.01	ns
High problems	-.09	.012
Birth weight	.08	.032
<b>Type of Pre-school compared with Home Children</b>		
Nursery school/class	.12	.008
Playgroup	.11	.011
Private day nursery	.18	.000
Reception Class	.07	ns
Reception group	.13	.001

The results indicate that girls and older children do significantly better on independence/concentration at the start of P1. Previous health and behaviour problems, and birth weight also show significant effects. The home children tend to do worse than the pre-school groups on independence/concentration at the beginning of primary 1 with the exception of children from reception classes.

This difference however, could be accounted for by the background variables previously listed. Again to test this possibility socio-economic, family, parent and home variables were progressively analysed to see if the difference between the home and pre-school groups persisted. The final analysis, retaining only statistically significant variables is shown in table 20.

**Table 20: Independence/concentration Attainment (final model)**

$R^2 = 0.23$

Adjusted  $R^2 = 0.20$

$F(25,678) = 8.08; p < .0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Age	.29	.000
Gender	-.14	.000
<i>Health problems compared with none</i>		
Low problems	-.12	.001
High problems	.02	ns
<i>Behavioural problems compared with none</i>		
Low problems	-.00	ns
High problems	-.08	.029
<b>Type of Pre-school compared with Home Children</b>		
Nursery school/class	.08	ns
Playgroup	.07	ns
Private day nursery	.09	ns
Reception Class	.04	ns
Reception group	.10	.015
<b>Parental characteristics</b>		
<i>Mother's quals. compared with none</i>		
16 vocational	-.04	ns
16 academic	-.02	ns
18 vocational	.03	ns
18 academic	.00	ns
Degree or above	.12	.022
<i>Father's qual. Compared with none</i>		
16 vocational	.03	ns
16 academic	.04	ns
18 vocational	-.02	ns
18 academic	.01	ns
Degree or above	.10	.038
Father not resident	-.02	ns
<i>Fathers level of employment compared to other groups</i>		
Father's working part time	-.08	.017
<b>Home</b>		
HLE	.16	.000
Developmental event	.09	.013

The results show the impact of parental qualifications and Home Learning Environment on independence/concentration at the beginning of P1. There is a trend for children of mothers and fathers who obtained a degree or above to show greater independence/concentration attainment in comparison to those whose parents had no qualifications.

Fathers level of employment and the occurrence of a developmental event also show significant effects.

Some difference between home and pre-school groups, whilst being markedly less, is still statistically significant. This means that after allowing for a wide range of socio-economic, parent, family, home and area effects, children from the reception groups attain higher on independence/concentration at the start of P1 than the home children, whilst the previously seen difference in the other types of centres has been accounted for by background factors.

## Independence/concentration Progress at the Beginning of P1

To test the possibility that children from different types of centre made different progress on Independence/Concentration across the pre-school period, a series of regressions were progressively made allowing for all previously mentioned variables. The first step was to see if there was a difference in progression after allowing for individual child characteristics, and pre-school social/behavioural measures. The results are shown in table 21.

**Table 21: Independence/concentration: Child Factors**

$R^2=0.23$

Adjusted  $R^2=0.21$

$F(10,522)=15.39$   $p<.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	-.12	.003
Age	.31	.000
<i>Health problems compared with none</i>		
Low problems	-.10	.013
High problems	.03	ns
<b>Pre-school social development</b>		
Pre-(co-operation/conformity)	.19	.000
Pre-(anti-social)	-.13	.006
<b>Pre-school type compared with Reception Classes</b>		
Nursery schools/classes	.00	ns
Playgroups	.01	ns
Private day nursery	.15	.009
Reception groups	.09	ns

The results indicate that age, gender and previous health problems show significant effects for independence/concentration progress across the pre-school period. Children rated high on co-operation/conformity in pre-school showed more progress on independence/concentration, whilst children with more anti-social behaviour in pre-school showed less progress on independence/concentration at the start of P1. After allowing for these variables children from private day nurseries show significantly more progress compared with children from reception classes. All other types of pre-schools appear to be equivalent in terms of progress across the pre-school period.

Once again however, the analysis for progress doesn't allow for the many other predictor variables. Hence to see if this difference persists after including all relevant variables, each set was progressively entered into the regression model with only statistically significant variables retained. The final model is shown in table 22.

**Table 22: Independence/concentration Progress (final model)**

R<sup>2</sup>=0.33  
 Adjusted R<sup>2</sup>=0.30  
 F(23,502)=10.75

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	-.12	.002
Age	.33	.000
<i>Health problems compared with none</i>		
Low problems	-.12	.002
High problems	.03	ns
<b>Pre-school social development</b>		
Pre-(co-operation/conformity)	.17	.000
Pre-(anti-social)	-.14	.003
<b>Type of pre-school compared with Reception Classes</b>		
Nursery school/class	.04	ns
Playgroup	-.04	ns
Private day nursery	-.02	ns
Reception group	.11	.016
<b>Parental characteristics</b>		
<i>Mother's quals compared with none</i>		
16 Vocational	-.03	ns
16 Academic	-.07	ns
18 Vocational	-.02	ns
18 Academic	.01	ns
Degree and above	.12	.048
<i>Father's level of employment compared with FT</i>		
Part time	-.09	.013
Self employed	.02	ns
Unemployed	-.07	ns
Not resident	-.09	.021
<b>Home</b>		
HLE	.18	.000
<b>Pre-school processes</b>		
Child: Adult ratio	-.14	.006
<b>Caregiver Interaction Scale</b>		
Adult/child interactions:Punitiveness	.08	.041
<b>ECERS sub-scales</b>		
ECERS-R/Language	-.11	.019

The results indicate that children from different pre-school types make different progress. However, after allowing for the full range of variables, now children from reception groups make significantly more progress compared with reception classes, whilst all other groups appear equal in progression on independence/concentration across the pre-school period.

The table also indicated that in addition to individual child characteristics and pre-school social/behavioural measures there are strong effects for mother's qualification, father's level of employment and pre-school processes and characteristics.

### Anti-social/worried attainment at the Start of Primary School

The child's level of anti-social/worried behaviour at the beginning of primary school was analysed in terms of child variables. After disregarding the non-significant child variables the model was then used to predict whether there was any significant difference between the home children and pre-school children within the study. The results of the analysis are shown in table 23.

**Table 23: Anti-social/worried Behaviour: Child Factors**

$$R^2 = 0.04$$

$$\text{Adjusted } R^2 = 0.03$$

$$F(9,701) = 3.35, p < 0.0001$$

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	.12	.001
<i>Behavioural problems compared with none</i>		
Low problems	.08	.027
High problems	.05	ns
<b>Type of Pre-school compared with Home Children</b>		
Nursery school/class	.07	ns
Playgroup	.03	ns
Private day nursery	.05	ns
Reception Class	.01	ns
Reception group	.11	.009

Anti-social/worried behaviour shows significant effects for gender and behavioural problems. Children with low behavioural problems show more anti-social/worried behaviour than those children with no behavioural problems. Boys also showed more anti-social/worried behaviour across the pre-school period, compared with girls.

The only pre-school/ home children difference noticed at this stage is that children from reception groups had significantly more anti-social/worried behaviour than children with no pre-school experience.

To assess the potential difference between home children and pre-school children further variables were added progressively to the analysis to see if there was any possible difference between the home and pre-school children in the study. The results are shown in table 24.

**Table 24: Anti-social/worried Attainment (final model)**

$R^2 = 0.06$

Adjusted  $R^2 = 0.04$

$F(14,696) = 3.01, p < 0.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	.12	.002
<i>Behavioural problems compared with none</i>		
Low problems	.09	.015
High problems	.05	ns
<b>Type of Pre-school compared with Home Children</b>		
Nursery school/class	.10	.035
Playgroup	.05	ns
Private day nursery	.11	.023
Reception Class	-.02	ns
Reception group	.11	.012
<b>Parental characteristics</b>		
<i>Father's quals. compared with none</i>		
16 vocational	-.04	ns
16 academic	-.06	ns
18 vocational	.00	ns
18 academic	-.08	.040
Degree and above	-.15	.001
Father not resident	-.02	ns

The table shows that in addition to the previously mentioned child characteristic variables, there are strong effects for fathers qualifications. Children whose fathers achieved 18 academic or degree/above qualifications show less antisocial behaviour.

The results indicate a change in the home versus pre-school distinction. Children previously attending nursery school/classes, private day nurseries and reception groups show more anti-social/worried behaviour than the home children after allowing for all the background characteristics. The children from playgroups and reception classes appear to be equal to the home group.



### Anti-social/worried Progress Across the Pre-school Period

Progress for anti social/worried behaviour was looked at in terms of individual child characteristics, having allowed for the pre-school social behaviour progress variables. After retaining the significant individual child variables, the variables for pre-school were added. The results can be seen in table 25.

**Table 25: Anti-social/worried Progress: Child Factors**

$R^2=0.17$   
Adjusted  $R^2=0.15$   
 $F(12,520)=8.64$   $p<.0001$

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	.11	.007
<i>Health problems compared with none</i>		
Low problems	.01	ns
High problems	-.09	.026
<i>Behavioural problems compared with none</i>		
Low problems	.09	.034
High problems	.04	ns
<b>Pre-school social development</b>		
Pre-(co-operation/conformity)	-.20	.001
Pre-(confidence)	.13	.005
Pre-(anti-social)	.18	.001
<b>Pre-school type compared with Reception Classes</b>		
Nursery schools/classes	.19	.001
Playgroups	.11	.050
Private day nursery	.07	ns
Reception groups	.16	.001

In this analysis there were a great number of child variables included as significant predictors for anti-social/worried behaviour. Considering gender boys increased anti-social/worried behaviour more than girls. This means that girls are showing more improvement than boys in terms of antisocial/worried behaviour.

Other significant predictor variables included both health and behaviour problems, with those children with high health problems showing less anti-social/worried behaviours and therefore making more progress in comparison to children with no health problems, across the pre-school period. Children with low behaviour problems showed more anti-social/worried behaviour and therefore less progress than those children with no behaviour problems.

When considering the pre-school social behaviour variables, this analysis shows there are significant effects from earlier levels of co-operation/conformity, confidence and anti-social/worried variables. Children who were rated highly on co-operation and conformity showed less anti-social worried behaviour and therefore more progress throughout the pre-school period. However those children who were rated as high in confidence in pre-school showed more antisocial/worried behaviour at the

beginning of P1. Also those children who showed high levels of antisocial behaviour in pre-school were rated as showing more antisocial behaviour at the beginning of P1.

When looking at the effect of type of pre-school this analysis shows there are significant differences and that children from nursery classes, playgroups, and reception groups all show more anti-social/worried behaviour and therefore less progress throughout the pre-school period than those children from reception classes.

However this analysis so far does not allow for the many background characteristics, which might explain these differences, associated with the type of pre-school. Hence in the next analyses, the variables reflecting the large number of background characteristics were included as predictors of progress.

**Table 26: Anti-social/worried Progress Across the Pre-school Period (final model)**

R<sup>2</sup>=0.23

Adjusted R<sup>2</sup>=0.19

F(22,504)=6.70 p<.0001

	Standardised Beta	Significance
<b>Child variables</b>		
Gender	.12	.006
<i>Behavioural problems compared with none</i>		
Low problems	.09	.027
High problems	.03	ns
<b>Pre-school social development</b>		
Pre-(co-operation/conformity)	-.19	.001
Pre-(confidence)	.13	.005
Pre-(anti-social)	.16	.002
<b>Pre-school type compared with Reception Classes</b>		
Nursery schools/classes	.18	.002
Playgroups	.15	.010
Private day nursery	.13	ns
Reception groups	.17	.000
<b>Parental Characteristics</b>		
<i>Father's level of employment compared with full time</i>		
Part time	.13	.001
Self employed	.01	ns
Unemployed	.08	ns
Not resident	.02	ns
<b>Home</b>		
<i>Peer play at home compared with none</i>		
Peer play-low	-.10	.038
Peer play-high	-.06	ns
<b>ELB area compared with South</b>		
Belfast	-.11	.049
Western	-.07	ns
North Eastern	.03	ns
South Eastern	.02	ns
<b>Pre-school characteristics</b>		
Full time sessions compared with Part time	.12	.022
<b>Compositional variables</b>		
Compositional mother's quals	-.14	.009

This analysis shows that the effects of type of pre-school persist when the full contribution of variables is considered. Children from nursery classes, playgroups, and reception groups all show more anti-social worried behaviour and therefore less progress throughout the pre-school period than those children from reception classes.

The other significant variables include fathers' level of employment, peer play, area and some preschool characteristics. Children whose fathers are employed part-time show higher levels of anti-social/worried behaviour and therefore less progress, than those children whose fathers are employed fulltime. Also those children who experienced some peer play at home showed lower levels of anti-social worried behaviour and therefore more progress across the pre-school period. Those children who are from BELB show less anti-social worried behaviour and therefore more progress across the pre-school period when compared to SELB.

Considering pre-school characteristics, children who attended pre-school full-time showed more anti social/worried behaviour at the beginning of P1 compared with children who attended part-time. Those children who mixed with others whose mothers' qualifications were high, showed less anti-social worried behaviour and therefore showed more progress across the pre-school period.

## **Summary**

### **Social/behavioural Attainment**

#### **Child Variables**

Age showed significant effects for all of the social/behavioural subscales except anti-social, with older children scoring better than younger children on all relevant subscales. Gender showed significant effects for all the subscales except Sociability and Confidence with girls exhibiting better social behaviour than boys.

Health was significant for co-operation/conformity and independence/concentration with children who had experienced some health problems in their first three years performing worse on these subscales in comparison to children who had experienced no health problems.

Previous behaviour problems were significant for all of the social/behavioural subscales. Children with high levels of behavioural problems showed less attainment on sociability, empathy, independence/concentration and confidence in comparison to children with no behavioural problems. Children with low levels of behavioural problems showed more anti-social behaviour in comparison to children who had no behavioural problems while children who had experienced any behavioural problems, low or high, showed less co-operation/conformity than children with no previous behavioural problems.

Birth weight showed effects for sociability with children with heavier birth weights scoring higher than children with lower birth weights on sociability.

#### **Parent & Socio-economic Variables**

Child poverty is predictive of sociability with children who come from wards experiencing higher amounts of poverty scoring lower on sociability. Socio-economic status is significant for empathy with children from an unemployed background scoring lower in comparison to children from a professional background. All other SES backgrounds were equivalent to professional.

When compared with children whose parents had no formal qualifications, parental qualifications show effects for several of the social/behavioural subscales. For co-operation/conformity children whose fathers had obtained a degree or above scored higher. For independence/concentration children whose mothers or fathers had obtained a degree or above also scored higher. Confidence was affected by mothers who had obtained 18 or above qualifications, and fathers that had obtained qualifications at age 18 or above affected empathy. Children scored higher on these subscales. Anti-social/worried behaviour also showed significant effects for parents' qualifications with children whose fathers obtained qualifications at age 18 or above showing less anti-social/worried behaviour than those children whose fathers had no qualifications.

Parental level of employment affects sociability with children whose mothers are not employed showing less sociable behaviour in comparison to children whose mothers are employed full time. Parental level of employment also affects independence/concentration. Children whose fathers work part time show less independence/concentration in comparison to children whose fathers have any other employment level.

#### **Family & Home Variables**

The Home Learning Environment (HLE) shows powerful effects for co-operation/conformity, independence/concentration, confidence and empathy with children who came from homes that had been rated higher on the HLE index scoring higher on these social/behavioural subscales. Peer play

at home affects co-operation/conformity with children who experience low amounts of peer play at home exhibiting more co-operation/conformity than children who experience no peer play at home.

Developmental events are important for co-operation/conformity and independence/concentration with children who had experienced an event that could be deemed as impeding developmental progress scoring lower on these subscales.

### **Home versus Pre-school Distinction**

After allowing for all the relevant factors the home group do significantly worse on all social/behavioural subscales except co-operation/conformity for which there were no significant differences between the home and pre-school groups.

Specifically;

- Nursery school/class children are more sociable and confident compared with home children. However, they also have more anti-social/worried behaviour.
- Playgroup children are more sociable, confident and empathetic than the children in the home group.
- Private day nursery children are more sociable and confident than the home children. However, they also have more anti-social/worried behaviour.
- 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.

### **Social/behavioural Progress Across the Pre-school Period**

#### **Child Variables**

Age showed significant effects for all of the social/behavioural sub-scales except anti-social behaviour, with older children showing more progress across the pre-school period than younger children on all the relevant subscales. Gender was not significant for confidence or sociability, with girls demonstrating greater progress on empathy, anti-social/worried behaviour, independence/concentration and co-operation/conformity than boys

Previous health problems showed effects for independence/concentration whilst previous behaviour problems were significant for all except empathy and independence/concentration. Children who had experienced low health problems showed less progress in independence/concentration than those children with no health problems. In relation to behaviour problems, children who have low behavioural problems showing more antisocial worried behaviour at the beginning of P.1 and therefore less progress across the pre-school period. Children who were rated as having high behavioural problems tended to show less progress on the subscales sociability and confidence. Children who had high behavioural problems showed less progress on co-operation/conformity across the pre-school period.

#### **Pre-school Social development**

Pre-school social/behaviour measures were predictive of several social/behaviour measures at the start of P1. Pre-school levels of co-operation/conformity showed effects for empathy, independence/concentration, co-operation/conformity and anti-social/worried behaviour. Children who were rated highly co-operation/conformity in pre-school showing more progress on independence/concentration, peer empathy and co-operation/conformity. Children who were rated high in co-operation/conformity showed less anti-social/worried behaviour at the beginning of P.1 and therefore showed more progress across the pre-school period.

Pre-school levels of anti-social behaviour affected independence/concentration, co-operation/conformity and anti-social/worried behaviour. Those children showing more anti-social/worried behaviour in pre-school showing less progress on primary 1 on independence/concentration and co-operation/conformity. Children who showed high levels of antisocial/worried behaviour at the start of P.1 made less progress across the pre-school period.

Pre-school levels of confidence were predictive of sociability, confidence and anti-social behaviour. Children who had been rated highly on confidence in pre-school tended to show more progress in sociability and confidence at the beginning of P.1. Also, children who were rated as high in confidence in pre-school showed more anti-social/ worried behaviour at the beginning of P.1 and therefore less progress across the pre-school period.

### **Pre-school Type**

The effects of pre-school type on social/behaviour were varied:

- Private day nurseries showed effects for confidence with children who attended private day nurseries showing more progress on this subscale.
- Reception groups were significant for anti-social/worried behaviour with children who attended reception groups showing more anti-social/worried behaviour and therefore less progress across the pre-school period than those children from reception classes.
- Nursery school/class were significant for anti-social/worried behaviour and confidence with those children who had attended Nursery schools/classes showing more anti-social/worried behaviour and therefore less progress throughout pre-school compared with children from reception classes. Nursery school/class children made more progress on confidence during this period.
- Playgroup children made less progress on anti-social/worried behaviour compared with children from reception classes.

### **Parental Factors**

Parental qualifications were significant for confidence, empathy and independence/concentration. Children whose fathers had gained a qualification at age 18 years or above showed more progress on empathy in comparison to children whose fathers had no qualifications. Children whose mothers had gained qualifications at age 18 years or above showed more progress in confidence, whilst children whose mothers had obtained a degree or above showed more progress on independence/concentration in comparison to children whose mothers had no qualifications.

Father's level of employment showed effects in independence/concentration with children whose fathers were employed part time or not resident exhibiting less progress than children whose fathers were employed full time. Father's level of employment also showed significant effects for anti-social behaviour with children whose fathers were employed part time showing less progress in anti-social/worried behaviour than children whose fathers were employed full time.

### **Home Variables**

The Home Learning Environment (HLE) was predictive for all subscales except sociability and anti-social/worried behaviour with children who came from homes that had been rated higher on the HLE index showing more progress on the significant subscales.

### **Pre-school Variables**

Of the pre-school characteristics and processes:

The number of sessions attended was important for co-operation/conformity and anti-social/worried behaviour with children who had attended session's full time showing less progress on co-operation/conformity and anti-social/worried behaviour. Adult: child ratio was important for independence/concentration and co-operation/conformity with children showing less progress on these subscales when there was a high ratio of children to adults.

The ECERS-R subscale language showed effects for confidence and independence/concentration with children who had attended pre-school centres that had been rated higher on language showing less progress on confidence and independence/concentration. The ECERS-E maths subscale was predictive of confidence with children who had attended pre-school centres that had been rated higher on the maths subscale exhibiting more progress on confidence. The only Adult-child Interaction subscale that showed any effects was punitiveness for co-operation/conformity, empathy and independence/concentration with children who had attended pre-school centres that had been rated highly on the punitiveness subscale showing greater progress on these subscales.

Of the compositional variables the peer group confidence in pre-school was important for sociability at the beginning of P1 with children who had attended pre-school centres in which the average confidence score for the peer group was high showing less progress on sociability. The mothers' qualifications of the child's pre-school peer group showed significant effects for anti-social/worried behaviour with children who had attended pre-school centres where the level of mother's qualifications for the peer group was high showing more progress on anti-social/worried behaviour.

### **ELB Area**

The Education and Library Board in which the pre-school was located was important for sociability in that children from the Western Education and Library Board showed more progress on sociability than children from the Belfast Education and Library Board. All other ELBs were equivalent to the BELB. ELB area was also significant for anti-social/worried behaviour with children from BELB showing less anti-social/worried behaviour, and hence more progress in comparison to children from the Southern Education and Library Board.



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**APPENDIX 1**  
**ADAPTIVE SOCIAL BEHAVIOUR INVENTORY**

Name of child .....	Name of Centre .....		
Date of Birth .....	Name of administrator.....		
Date of administration .....	<b>R or N</b>	<b>S</b>	<b>AA</b>
1. Understands others' feelings, like when they are happy, sad or mad	1	2	3
2. Is helpful to other children	1	2	3
3. Is obedient and compliant	1	2	3
4. When you give him/her an idea for playing, he/she frowns, shrugs shoulders, pouts or stamps foot	1	2	3
5. Follows rules in games	1	2	3
6. Gets upset when you don't pay enough attention	1	2	3
7. Is sympathetic toward other children's distress, tries to comfort others when they are upset	1	2	3
8. Waits his/her turn in games or other activities	1	2	3
9. Is open and direct about what he/she wants	1	2	3
10. Cooperates with your requests	1	2	3
11. Can easily get other children to pay attention to him/her	1	2	3
12. Says nice or friendly things to others, or is friendly towards others	1	2	3
13. Will join a group of children playing	1	2	3
14. In social activities, tends to just watch other	1	2	3
15. Follows household or pre-school centre rules	1	2	3
16. Says 'please' and 'thank you' when reminded	1	2	3
17. Asks or wants to go play with other children	1	2	3
18. Is calm and easy-going	1	2	3
19. Plays games and talks with other children	1	2	3
20. Shares toys or possessions	1	2	3
21. Teases other children, calls them names	1	2	3
22. Is confident with other people	1	2	3
23. Prevents other children from carrying out routines	1	2	3
24. Tends to be proud of things she/he does	1	2	3
25. Accepts changes without fighting against them or becoming upset	1	2	3
26. Bullies other children	1	2	3
27. Is interested in many and different things	1	2	3
28. Is worried about not getting enough (where enough might include attention, access to toys, food/drink etc.)	1	2	3
29. Is bossy, needs to have his/her way	1	2	3
30. Enjoys talking with you	1	2	3

**Appendix 2**  
**EPPNI Project**

**Child Social Behaviour Questionnaire-Year 1**

Name \_\_\_\_\_ Date of Birth \_\_\_\_\_  
Name of Centre \_\_\_\_\_ Date of Administration \_\_\_\_\_

	Rarely/ Never	Not Often	Sometimes	Usually	Almost Always
Understands others feelings. Like when they are happy, sad or mad	1	2	3	4	5
Thinks things out before acting					
Is helpful to other children					
Tries to be fair in games					
Is obedient and compliant					
When you give him/her an idea for playing, he/she frowns, shrugs shoulders, pouts or stamps foot					
Follows rules in games					
Gets upset when you don't pay enough attention					
Is sympathetic to other children's distress, tries to comfort others when they are upset					
Can behave appropriately during less structured sessions, with no more than one reminder					
Waits his/her turn in games or other activities					
Is open and direct about what he/she wants					
Co-operates with your requests					
Easily distracted, concentration wanders					
Can easily get other children to pay attention to him/her					
Says nice or friendly things to others, or is friendly towards others					
Can move to a new activity on completion of a task					
Will join a group of children playing					
Can independently select and return equipment as appropriate					
In social activities, tends to just watch others					
Follows school rules					
Says please and thank you when reminded					
Constantly fidgeting or squirming					
Asks or wants to go and play with other children					
Is calm and easy-going					
Can work easily in a small peer group					
Plays games and talks with other children					
Shares toys or possessions					
Teases other children, call them names					
Is confident with other children					
Will invite others to join in a game					
Prevents other children from carrying out routines					
Preservers in the face of difficult or challenging tasks					
Tends to be proud of things he/she does					
Accepts changes without fighting against them or becoming upset					
Likes to work things out for self/can work independently					
Bullies other children					
Is interested in many and different things					
Apologises spontaneously after a misdemeanour					
Is worried about not getting enough					
Is bossy, needs to have his/her way					
Restless, overactive, cannot stay still for long					
Enjoys talking with you					
Offer to help other children who are having difficulty in the classroom					
Sees tasks through to the end, good attention span					