

Technical Paper 1

Special Education Needs across the Pre-school Period

*EYTSEN is a linked study drawing on the DfES funded Effective
Provision of Pre School Education (EPPE) Project 1997-2003*

EYTSEN Technical Paper 1

SPECIAL EDUCATIONAL NEEDS ACROSS THE PRE-SCHOOL PERIOD

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SUMMARY AND KEY FINDINGS

INTRODUCTION

The Early Years Transitions and Special Educational Needs (EYTSSEN) project builds on the work of the Effective Provision of Pre-School Education (EPPE) project, a major longitudinal study of a national sample of young children's progress and development through pre-school and into primary school until the end of Key Stage 1 (age 3+ to 7 years) (Sylva et al., 1999).¹ Both the EPPE and EYTSSEN research studies are funded by the DfES. The EYTSSEN study explores evidence of possible special educational needs (SEN) amongst pre-school children. It uses a range of information to identify children who may be 'at risk' in terms of either cognitive or social behavioural development and investigates links with a variety of child, parent and family characteristics. It also describes variations in the policies and provision offered by different pre-school centres designed to support children with special needs.

Information for over 2800 children attending 141 pre-school centres selected from five regions across England has been analysed. Centres have been drawn from a range of types of providers (local authority day nursery, combined centres, playgroups, private day nurseries, nursery schools and nursery classes). The research was designed to study the six main types of institutional provision, not other forms of pre-school care such as relatives, childminders or nannies. One-to-one assessments of different aspects of young children's cognitive development were conducted by trained researchers at entry to the study (age 3+) and later at entry to primary school. In addition, ratings of individual children's social and behavioural development have been collected from pre-school workers at entry to pre-school, and from teachers when children enter primary school. We thus have several sources of information that can be used to explore young children's cognitive attainment and progress and their social behavioural development.

In addition to child assessments, parental interviews conducted when children entered the study have been used to collect detailed information about childcare history and health, and characteristics of children, their families and home environments.

Interviews with centre managers of the pre-school settings attended by children have been used to provide details about pre-school settings including provision for SEN. Observations concerning aspects of centre 'quality', and measures of the environment experienced by children were made by trained researchers. The distribution of children in the sample identified as 'at risk' of SEN between different types of pre-school settings has been examined. In addition, the extent of variation in provision made for SEN between different centres and type of pre-school setting has been investigated.

The EYTSSEN study analysed these different sources of information and the linkages amongst them with a view to informing policy and practice related to the characteristics of young children 'at risk' of SEN and pre-school centre practices associated with changes in risk status.

Aims of the EYTSSEN project

The EYTSSEN study investigates possible indicators of SEN recognising that such needs can be viewed as social constructs, and that some aspects of need may be seen as particular points along a developmental continuum. Children may be perceived differently by parents, pre-school workers and teachers (Hay et al., 1999; Heiser et al., 2000). At some stages children may be identified as giving cause for concern or be seen to show particular 'needs' but not at others. Likewise different adults may have different understandings or perceptions of SEN. Young children develop differently, so changes in status in terms of 'showing' some form of 'need' may be expected to take place during the ages of 3 to 5 years, the pre-school period covered in this

¹ Full details about the sample and results in the main EPPE study are given in a series of EPPE Technical Papers (listed in Appendix 1).

research (for further discussion of the issues surrounding the identification of special needs of young children see Scott and Carran, 1989; Roffey, 1999). Change over time, in children's status, cannot be attributed directly to pre-school or other interventions unless an experimental randomised controlled trial (RCT) is conducted. The children in the EYTSEN project were not involved in an experimental RCT but rather represent naturally occurring variation in a national sample of children in different types of pre-school provision. In contrast to an experimental design, the EYTSEN analysis provides a more accurate picture of the pre-school experience and variation in young children's cognition and social/behavioural development.

It is recognised that both *definitions of* and *criteria for the identification* of special need are contested concepts. The EYTSEN study pays particular attention to exploration of evidence of possible special educational needs using a variety of definitions and attempts to identify different categories of possible 'risk'. It seeks to address three main research objectives:

- 1 To examine the impact of different pre-school settings on the progress and development of children who may be seen as vulnerable or 'at risk' of developing 'special needs' over the pre-school period and in transition to school until the end of Key Stage 1 (KS1), including:
 - The identification and description of the characteristics of those children who fall into potential 'at risk' categories, using a range of information, including cognitive assessments, pre-school staff assessments of social behaviour, and parental interviews.
 - An analysis of the distribution of the 'at risk' groups of children across different types of pre-school provider.
 - A description of patterns of progress and changes in cognitive and social/behavioural development of the various 'at risk' groups across the pre-school period and to the end of KS1.
- 2 To identify pre-school centres' policies and practice in relation to the early identification of SEN as reported by centre managers.
- 3 To examine the relationship between pre-school centre quality characteristics and the subsequent progress and development of different 'at risk' groups.

This report focuses on the pre-school period. Subsequent reports will follow up the progress and development of the sample of children during KS1 and explore the characteristics of children identified as showing some form of SEN at school.

The SEN Code of Practice (DfES 2001) provides the following definition of Special Educational Needs:

"Children have special educational needs if they have a learning difficulty which calls for special educational provision to be made for them.

Children have a learning difficulty if they:

- a) *have more significant delay in learning than children of the same age*
- b) *have a disability which prevents or hinders them from making use of educational facilities generally provided for children of the same age in schools within the area of the local education authority*
- c) *are under compulsory school age and fall within the definitions a) or b) above, or would do so if special educational provision was not made for them.*

Children must not be regarded as having a learning difficulty solely because the language or form of language of their home is different from the language in which they will be taught." (Code of Practice 2001, p. 6)

The Code of Practice, whilst laying emphasis on cognitive attainment, also considers the child's social and behavioural development. A child may receive a statement of SEN if their behaviour is such that it affects their attainment potential. The Code of Practice (2001) stresses the benefits of early identification of needs.

The EYTSEN project examines the concept of special needs within a framework of potential risk, rather than attempting to identify a fixed cognitive or social/behavioural problem. We focus on both cognitive and social/behavioural measures of young children's development, to enable us to explore the relationships between the two and to acknowledge the need to look at multiple outcomes within the education and care system and their association with different child, parent and family characteristics.

The definition of 'at risk' status

Developing a robust definition of children who may be considered to be most 'at risk' of showing some form of SEN is an important component of the EYTSEN study. Information was analysed to explore the range in young children's cognitive attainment and social behavioural development at two different time points:

- Entry to a pre-school in the sample (a target centre), age 3+
- Entry to primary school, age rising 5 years (in the majority of cases children enter reception classes, but in some cases they are placed into year 1 classes at entry to primary school).

Several measures were used because it is recognised that individual children's attainments can vary in different areas of learning and that, particularly at school, low attainment in specific areas of the curriculum may require additional forms of learning support and may be used in the identification of SEN. Aspects of both cognitive and social behavioural development were addressed.

Measures of children's General Cognitive Ability (GCA) covering both verbal and non-verbal components were collected at entry to pre-school and also at entry to primary school. In addition, measures of children's attainments in Pre-reading and Early Number Concepts were collected at entry to primary school.

Social behavioural development is also highly relevant to the identification of possible SEN. Pre-school staff completed the Adaptive Social Behavioural Inventory (ASBI), a 30-item checklist for each child in our sample (Hogan et al., 1992). At entry to school, an expanded version of the ASBI (Child Social Behavioural Questionnaire) was completed by the child's class teacher.

The definition of possible 'at risk' status used was children whose score was one standard deviation or more below the mean. At each time point this was investigated in comparison to national norms and also to EPPE sample assessment scores.

For the GCA it is possible to make comparisons with the national mean. The results indicated that a substantial proportion of EPPE children were significantly below the national average, a much higher proportion than would be expected, a reflection of the weighting of the sample towards disadvantaged groups. This feature of the sample increases the chances of identifying children 'at risk' of possible SEN in national terms, because of known links between social disadvantage and the incidence of SEN. In addition, a more stringent definition (1 sd below sample mean) was also studied to provide an additional indicator of those at 'strong' cognitive risk.

For social behavioural development the EYTSEN study focussed on two important areas – Peer sociability and Anti-social/worried/upset behaviour derived from ASBI ratings (see EPPE Technical Paper 7 for details of these dimensions of behaviour). The relationships between the identification of children who may be seen as 'at risk' on cognitive measures and those 'at risk'

for social behaviour were explored. In addition, the characteristics of 'at risk' children in terms of key child, parent and home environment variables were compared with the whole sample. An index of multiple disadvantage was created (based on factors showing a link with low attainment) and the characteristics of those 'at risk' contrasted to those of children not identified as at risk.

KEY FINDINGS

In the following sections a summary of the key findings from the EYTSEN study is provided in relation to the main research objectives. Further details are included in the main body of the Technical Report.

Research Objective 1

To examine the impact of different types of pre-school centres on the progress and development of children who may be seen as vulnerable or 'at risk' of developing 'special needs' over the pre-school period.

The impact of pre-school

Data from the EPPE sample allow us to explore three potential indicators. Whether an earlier start at pre-school is related to higher cognitive scores or better social behavioural outcomes, taking other factors into account. Whether 'dose' of pre-school (months over which a child attended target centre) is related to greater cognitive progress or better social behavioural development over the pre-school period. Whether children who have not experienced pre-school (a 'home sample') show poorer cognitive development and social behavioural outcomes at entry to primary school (see EPPE Technical Papers 8a and 8b). For the EYTSEN study we are particularly interested in whether children identified as 'at risk' status have had less time in pre-school.

- One-third of children showed low cognitive attainment (GCA 1 sd below national mean) at entry to the target pre-school and can be considered 'at risk' in terms of national comparisons. This is almost double the expected proportion of 16.7%. By the start of primary school the proportion of children with low cognitive attainment (GCA1 sd below national mean) identified as 'at risk' in national comparisons had reduced to one in five (21%). This provides an indication of substantial improvement for low attainers and suggests a positive impact of pre-school on young children's cognitive development.
- Value added analyses of progress for the whole sample indicate that the experience of pre-school over a longer period of time (in months) has a positive impact on cognitive attainment (see EPPE Technical Paper 8a).
- The EYTSEN analyses indicate that children who made an earlier start (below 3 years) at pre-school had higher cognitive attainments than other children at age 3+. This cognitive advantage remains at entry to primary school. On average children identified as 'at risk' in the cognitive assessments at entry to pre-school were likely to have started pre-school at a later age. However, a very early start (i.e. below 2 years) at pre-school was weakly associated with increased risk for Anti-social/worried/upset behaviour. Early start across the pre-school period (2+ years) was not associated with increased risk for Peer sociability.

Overlap between different definitions of 'at risk' status

The EYTSEN study tested a **strong cognitive** risk definition as well as making comparisons with national norms. This definition identified young children whose attainment was 1 standard deviation below the mean for the sample. It can be seen to pick up children who have particularly low attainment and was used for all cognitive assessments.

- There is an overlap between the identification of children in terms of 'strong cognitive risk' on GCA at entry to primary school and 'at risk' status for Pre-reading. These children have particular difficulties with early reading activities. Just under half of those identified at strong cognitive risk were also identified for Pre-reading risk. This represents just under 8% of the sample.
- For Early Number Concepts the overlap is greater, (69%) identified as 'at strong cognitive risk' were also identified as 'at risk' for Early Number Concepts. This group represents just 11% of the sample.
- Although there is some overlap between the cognitive and social/behavioural categories, the dimensions are fairly distinct and do not comprise the same group of children at entry to target pre-school. There is greater overlap between 'at risk' for cognitive development and 'at risk' for Peer sociability than for Anti-social/worried/upset behaviour. Overall a quarter of children at 'strong cognitive risk' at entry to primary school were also found to be 'at risk' for Anti-social/worried/upset. Around a third of children who were 'at strong cognitive risk' were also categorised as 'at risk' for Peer sociability. These children who show both cognitive and social behavioural difficulties may be viewed as those most vulnerable in terms of developing SEN.
- Around 8% of children who were identified as 'at risk' on a behavioural measure were also classified as at 'strong cognitive risk' at entry to pre-school. The proportion was very similar when children start primary school (9%). This suggests that the degree of overlap between the two categories of risk remains fairly constant across the ages measured.

Movement in and out of 'at risk' status

The EYTSN study allows us to examine whether children identified as 'at risk' at entry to target pre-school were also identified as 'at risk' when they started primary school. Due to the use of 'cut offs' to identify risk it should be noted that some children might show only small changes but move from just below to just above the cut off (or vice versa) between different assessment points. In view of this any change in an individual child's 'at risk' status must be interpreted with caution. Where change in 'at risk' status forms a consistent pattern for particular groups of children, however, we can be more confident in interpretation.

- 76% of children were not identified as at 'strong cognitive risk' at entry to target pre-school, nor at the start of primary school. These may be seen as at low risk of showing SEN related to learning/attainment. By contrast, just under one in ten children were identified as at strong cognitive risk on both occasions. These children may be viewed as at high risk of showing SEN in relation to learning/attainment difficulties.
- For social behavioural development 69% were not identified as 'at risk' for Peer sociability at either time point, whereas nearly 7% were identified as 'at risk' on both. 74% were not classified as 'at risk' for Anti-social/worried/upset at either point whereas nearly 6% were identified as 'at risk' both at entry to pre-school and at entry to primary school.
- It appears that around 10% of children may be seen as at high risk in terms of showing low cognitive attainment during the pre-school period and at school entry, while a rather smaller proportion is likely to show a continuing behaviour problem (6-7%). The identification and follow-up of such children at school entry may be necessary to ensure they make the best start at school (for more detailed discussion of the characteristics of these high risk groups see Appendix 3 of the main report).

Child, parent and home environment characteristics of children with 'at risk' status

The EPPE study collected detailed information about a wide range of child, parent and home environment characteristics of children at entry to pre-school (age 3+ years). The EYTSN

project sought to explore the relationships between these measures and children's 'at risk' classification at different time points. Research has consistently indicated that there are strong associations between certain factors (such as low SES, low income, mother's educational level, etc.) and low cognitive attainment at school. The concept of the 'cycle of disadvantage' has been used to describe such associations and patterns of continuing disparities in attainment levels between different social groups. However, relatively few large-scale research studies have explored these associations in relation to concepts of 'at risk' status and definitions of SEN at different ages, and changes in 'at risk' status over time. The EYTSEN research has sought to explore associations with particular factors and develop an index of multiple disadvantage, to establish whether this shows good predictive validity in terms of definitions of 'at risk' status.

Many factors are inter-related (e.g. the mother's qualification levels and employment status, father's SES, family size, premature birth, marital status, one parent family etc.). Hence, it is important not to attribute causality to individual factors. For example, more children whose mothers were not working were identified as being 'at risk', but the link appears to reflect the higher qualification levels and smaller family size associated with mothers in employment. Likewise, the higher incidence of 'at risk' status amongst children whose mothers reported they were 'never married, single parent', is also likely to reflect the impact of other factors, including younger maternal age at giving birth, lower qualification levels, and reduced employment levels for this group.

- Child and parental factors were found to be more strongly associated with children's cognitive outcomes than with their social/behavioural development. Within the social/behavioural risk categories, Peer sociability showed slightly more association with these factors than Anti-social/worried/upset.
- At entry to pre-school ethnic minority groups and boys were slightly over-represented in most of the 'at risk' categories. Pakistani and Bangladeshi groups were more likely to be identified as 'at risk' for the cognitive and Peer sociability categories (including non-verbal assessments which are less dependent on language fluency), and Black Caribbean groups in the Anti-social/worried/upset categories.
- Children who did not have English as their first language (EAL), showed a higher incidence of identification of cognitive 'at risk' status at entry to pre-school. This was most noted for the 'strong cognitive risk' measure which includes a verbal component, but was less marked for non-verbal measures. At later ages the association of EAL with children's cognitive 'at risk' status for Pre-reading and Early Number was much weaker.
- Children identified as 'at risk' for cognitive needs were more likely to be from a large family, to be of low birth weight or premature, to have mothers with no qualifications, and to be of lower socio-economic status. These factors are themselves associated. Mother's qualification levels showed a particular link with 'at risk' status for all cognitive measures, with children whose mothers reported they had no qualifications most likely to be identified as 'at risk', and those with degrees the least likely to be so categorised.
- Children identified as 'at risk' for social/behavioural needs were a less distinct group in terms of child, parent and home environment characteristics at all ages. However, those identified as 'at risk' for Peer sociability differed in a number of respects at entry to pre-school being more likely to be found amongst those with low birth weight or premature, a mother with no qualifications, a mother or father not employed.
- Information about parents' home activities with their pre-school child was collected at interview. A variety of measures showed a significant link with cognitive attainment and to a lesser extent, with social behavioural measures (for example, reading to child, teaching songs and nursery rhymes, painting and drawing, playing with letters and numbers, visiting the library, teaching alphabet, teaching numbers). A Home Learning Environment index was

created which showed a strong relationship with cognitive attainment at entry to pre-school, and at primary school entry. Home Learning Environment was only moderately associated with mother's educational level or family SES ($r=0.3$). The Home Learning Environment also showed a link with cognitive progress over the pre-school period (EPPE Technical Paper 8a).

- The Home Learning Environment (HLE) was strongly associated with 'at risk' status in all assessments, at pre-school entry and at start of primary school. For example, 9% of our sample obtained very low scores on the Home Learning Environment index (indicating a low level of home learning activities occurring within the family home), but these represented nearly a quarter of children identified as at 'strong cognitive risk' at entry to primary school. In contrast where a lot of home learning activities were reported (indicated by very high HLE scores (representing approximately 12% of the sample), less than 3% of these children were at 'strong cognitive risk' at entry to primary school..
- The link between the Home Learning Environment index and children's social behaviour was weaker at all time points and only significant for Peer sociability.
- Further analyses were conducted for the EYTSEN study to investigate the incidence of multiple disadvantage and its association with 'at risk' status. An index of multiple disadvantage was created based on ten indicators in total (3 child, 6 parent and one related to home learning environment). All indicators were chosen because they showed an association when tested individually with 'at risk' status. Where indicators were closely related (e.g. ethnicity and first language) only the most significant was selected.
- 24% of the sample had no factors related to disadvantage at entry to pre-school, while 21% experienced 3-4 factors. Only 6% experienced a high level of multiple disadvantage on this index (5 plus factors).
- Children experiencing multiple disadvantage were found to be significantly more likely to be identified as 'at risk' in all the cognitive risk categories at entry to pre-school. For example, while a quarter experienced no disadvantage factors in the index, this was the case for only 7% of those identified as at strong cognitive risk. By contrast, 27% experienced 3 or more factors, for those identified as at 'strong cognitive risk', 55% had a multiple disadvantage index score of 3 plus factors. Multiple disadvantage continued to show a strong relationship with 'at risk' status for all cognitive measures at entry to primary school, though this was somewhat less marked for Pre-reading than for Early Number Concepts or GCA.
- The relationships between multiple disadvantage and 'at risk' status for social behavioural outcomes were weaker than those found for cognitive measures. Nonetheless, multiple disadvantage was found to be predictive for 'at risk' status on Peer sociability.

Distribution of 'at risk' children across pre-school provider

The EYTSEN study examined the distribution of 'at risk' children according to type of pre-school provider. Given the differences in geographical location and admissions policies between different providers we would not expect 'at risk' children to be equally distributed. Pre-school centres vary in the characteristics of the children they serve, and overall those in private day nurseries are more socio-economically advantaged than those in other forms of provision (EPPE Technical Papers 2 and 4). The EYTSEN study sought to establish whether certain types of provider are more likely than others to be used by the parents of children who may be seen as 'at risk' in cognitive or social behavioural terms.

- Private day nurseries are less likely to serve children at cognitive risk (21% of our sample in this form of provision at entry to pre-school). By contrast, the majority of children in combined centres were identified as 'at risk' (58%). Fairly substantial proportions of children from local authority centres (42%) and playgroups (41%) were identified as 'at risk' for cognitive attainment.

- For the more stringent strong cognitive risk measure, 40% of the sample of children in combined centres was classified as 'at risk' at entry to pre-school. The figures were much lower for other forms of provision (around 20% for nursery schools and local authority centres, 15% for nursery classes, 18% for playgroups and under 7% for private day nurseries).

For social behavioural measures more children in combined centres were classified as 'at risk' for Peer sociability (26%), followed by nursery classes (20%) and playgroups (just under 20%). Fewer children in private day nurseries (11%) or local authority day nurseries (14%) were classified as 'at risk' for Peer sociability. For Anti-social/worried/upset we find that significantly more children in local authority day nurseries are classified as 'at risk' at entry to pre-school (29%) followed by combined centres (22%).

Research Objective 2

To identify pre-school centre policies and practice in related to the early identification of SEN

Aspects of practice relevant to special educational needs and variations in reported policy or practice between different types of pre-school provider were investigated. In addition, we explored the distribution of children in the sample identified as 'at risk' in cognitive or social behavioural measures at entry to pre-school, and whether 'at risk' children were more likely to attend certain types of pre-school provision. Such variations are likely to be highly relevant to policies designed to target those most 'at risk', or to promote early identification.

Distribution of 'at risk' children by pre-school type

Over three-quarters of centre managers reported that they currently had children on roll with some type of 'special need.' The extent to which managers reported the presence of special needs children in their centres differed significantly across type of setting. Managers in the maintained sector (nursery classes, local authority day centres, nursery schools and combined centre provision) reported higher incidences of having children with some type of special need (80+%). The rates of reporting were lower in private day nurseries (68%), and lowest of all in playgroups (53%). Case study data also suggests that some private day nurseries are less likely to enrol children with SEN (EPPE Technical Paper 10).

There are a number of children 'at risk' who are not recognised as having SEN at pre-school. Thus we found no clear link between the proportion of 'at risk' children in a centre and the likelihood that managers reported they had any SEN children on roll. In particular quite high proportions of 'at risk' children were found to attend playgroups but only around half of playgroups reported they had any children with SEN on roll. This result suggests that understandings of what may constitute SEN in some settings may vary and that poor cognitive development may not always be recognised as constituting a need in pre-school.

Mechanisms for the identification of SEN

Most centre managers (91%) said that they had a system for identifying children with special needs but this varied across pre-school type. Centre managers from the whole of the maintained sector reported having systems for identifying children who had special needs. On the other hand, there were fewer private day nurseries (77%) and playgroups (82%) reporting a system. This suggests that some children 'at risk' of special needs may go unnoticed and miss the opportunity for early intervention. Staff in such centres in the voluntary sector may need to be made aware of, or trained to use, a range of identification systems.

The three most frequently used identification systems were observation schedules, consulting with professionals and parents.

- Observation schedules (52.1% of centre managers reported using this method)

- Consulting professionals (reported by 43% of centre managers)
- Consulting parents (reported by 39% of centre managers)

Parental consultation highlights the role of pre-school settings in fostering 'partnerships' with parents. In view of the sensitivity of the label of 'special needs', pre-school centres need to consider how they can best retain parental co-operation, especially if some parents feel a sense of 'blame' for their child's difficulties. For some parents, their child's particular special need may be apparent for the first time only when their child enrolls at pre-school. They may feel that discussions with the centre workers are intrusive or possibly critical of their style of parenting, family circumstances or dynamics. In order to make consultation valid, language and cultural diversity also needs to be respected. This has considerable implications for appropriate training of pre-school centre staff in working with parents.

The maintained sector was more likely to report the use of the Code of Practice or a nominated person responsible for SEN (SENCO) than the voluntary sector.² The most commonly reported strategies for supporting children with special needs were:

- Consulting other professionals for guidance
This was much more likely to be used by combined centres and local authority day care.
- Meeting with parents
This was common across all pre-school types.
- Using Individual Education Plans or the Code of Practice
This was more likely to be used in the maintained rather than the voluntary sector.

Research Objective 3

To examine the relationship between pre-school centre quality characteristics (using the Early Childhood Environmental Rating Scales) and the subsequent progress and development of different 'at risk' groups.

Centres varied in terms of their environmental quality as rated by trained observers using special observational instruments (EPPE Technical Paper 6). As noted earlier, over the whole sample there was a reduction in the proportion of children classified as 'at risk' by the time they started primary school (down from 1 in 3 to 1 in 5), suggesting a positive impact of pre-school provision on general cognitive development (GCA). We also explored whether changes in children's 'at risk' status were associated with the type of pre-school they attended.

- Our data indicated that children who attended combined centres and nursery school were more likely to move out of 'at risk' status in terms of the strong cognitive risk definition (based on GCA 1 sd below sample mean). They were also more likely to move out of 'at risk' status for Pre-reading, by the time they started primary school. Children from nursery schools were also more likely to move out of 'at risk' status for Early Number Concepts.
- By contrast, proportionately more children who attended nursery classes moved into 'at risk' status for GCA, Pre-reading and Early Number Concepts. Children who attended local authority day nurseries showed a greater likelihood of moving into 'at risk' status for Early Number concepts.

² Unlike the voluntary sector, the maintained sector is statutorily obliged to have a member of staff responsible for SEN provision.

- Overall more children in all forms of provision tended to move out of than into 'at risk' status for Anti-social/worried/upset. For Peer sociability more children in combined centres, playgroups, nursery classes and nursery schools moved out of, than into 'at risk' status.
- These results suggest that certain forms of pre-school provision may be of particular benefit to children aged 3+ who are 'at risk' or more vulnerable in terms of low cognitive attainment and poor social behaviour. Combined centres and nursery schools show the most positive outcomes for movement out of risk for several measures, especially for cognitive outcomes. Nursery classes and playgroups show positive movement for the social behavioural outcome Peer sociability. (EPPE Technical Papers 8a and b provide further information about the impact of pre-school type on young children's progress and development for all children, rather than a particular focus on those 'at risk').

It is worth noting that, of the six different types of provider studied, centres were not equally distributed among the regions in the research design, reflecting historic patterns of differences in provision. Some areas have a strong playgroup tradition whereas for others, Local Authority day nurseries or nursery schools maybe more common.

Measures of pre-school centre quality

An important question for the EYTSSEN research is whether higher quality pre-school provision helps to promote the cognitive and social behavioural development of young children. Different types of pre-school centre vary in terms of their quality characteristics. Combined centres and nursery school provision have the highest scores on pre-school environmental quality, while playgroups, private day nurseries and local authority centres have the lowest average scores. Value added analyses of children's cognitive progress have shown that higher quality scores on the Early Childhood Environment Rating Scale Extension (ECERS-E which measures literacy, mathematics science and environment and diversity) are associated with greater cognitive progress over the pre-school period for all children. Children from low socio-economic status backgrounds and boys benefit particularly from higher quality provision as measured by this instrument. Quality measures from the main ECERS-R scale (which measures a range of aspects of provision including language and reasoning, social interactions etc) also show a significant link with social behavioural development (see EPPE Technical Papers 8a and b). In addition, information from observations of adult-child interactions also shows a significant link with young children's cognitive progress and social behavioural development (see glossary for more details of the centre 'quality' measures).

For the EYTSSEN project we investigated whether children who attended centres rated more highly in terms of quality provision were more likely to move out of 'at risk' status by the time they started primary school.

- Children who moved out of strong cognitive risk status attended higher quality provision than those who moved into 'at risk' status. The results for Pre-reading also indicated that children who moved out of 'at risk' status attended higher quality provision than those who moved into 'at risk' status by entry to primary school. For Early Number Concepts the patterns were similar, but only reached statistical significance for three of the Caregiver Interaction Scale (CIS) sub-scales, which assess quality of adult-child interactions.
- Higher quality pre-school provision is significantly associated with greater movement out of 'at risk' status for cognitive measures, whereas poorer quality is associated with more movement into 'at risk' status by entry to primary school.
- For social behavioural outcomes we do not find any clear overall trends that suggest children moving in or out of 'at risk' status for Peer sociability or Anti-social/worried/upset attended centres which differed in terms of our measures of centre quality.

It appears that pre-school centre quality has a positive role in promoting cognitive development for children who are at the lowest end of the attainment spectrum at entry to pre-school, and that high quality provision may be seen as an effective intervention which can help improve cognitive development and thus provide more vulnerable children with a better start at primary school.

IMPLICATIONS FOR POLICY AND PRACTICE

The research results summarised above have a number of implications for both policy and practice in early years settings.

Identifying children 'at risk'

The EYTSEN project has developed a number of definitions for children who may be vulnerable to future development of SEN on the basis of low cognitive attainments, or in assessments of social behavioural development by pre-school workers, or later by class teachers at entry to primary school. In addition, a number of distinct dimensions of social behaviour can be considered. Peer sociability and Anti-social/worried/Upset form two fairly distinct dimensions and a small minority of children are identified as 'at risk' on both.

The use of 'cut offs' (e.g. one sd below national mean) may be helpful for the identification of children who may be viewed as 'at risk'. There are differences in young children's attainments in different cognitive areas (e.g. verbal, or non verbal / pre-reading or early number concepts). It is therefore important to view children's attainments in a range of areas. Children who obtain very low scores in several different areas may be 'at risk' of general learning difficulties and require different support from those who have difficulties in only one specific area. Early identification may assist children if used positively to make provision to meet needs, but caution should be exercised to avoid negative labelling or lower expectations. The use of a range of assessments may be especially important for children, staff and parents in providing for children for whom English is not their first language.

Young children's cognitive attainments are strongly associated with age. It is important that pre-school workers and early years teachers are fully aware of the impact of age. The use of standardised assessments may help in the more accurate identification of those whose attainments are very low for their developmental age. Children who are especially 'young' for their year at school may be more likely to be identified as having low attainment, while the relatively low attainments of some who are 'old' for their year may be less apparent if standardised assessments which allow age-related comparisons are not used.

The small proportion of children who are identified as 'at risk' in terms of both cognitive and social behavioural measures may be seen to be particularly vulnerable and require different kinds of support at both pre-school and primary school. Additional monitoring and support for such children may be appropriate over pre-school and during the first few years in primary school.

The impact of multiple disadvantage

The EYTSEN study reveals strong links between a range of child, parent and home learning environment characteristics and children's 'at risk' status for all cognitive measures. The impact of some characteristics (e.g. EAL status and low birth weight) appears to reduce by entry to primary school. Others characteristics (e.g. mother's qualification levels) show a continuing impact. The Home Learning Environment was strongly associated with 'at risk' status. Children whose parents reported little involvement in certain activities (such as reading to child, teaching songs and nursery rhymes, visits to the library, playing with letters/numbers, painting and drawing, etc.) were much more likely to be identified as 'at risk' in terms of low cognitive attainments at entry to pre-school and also later at entry to school.

Multiple disadvantage is an important predictor of 'at risk' status and policies that target support for children in the most vulnerable groups may be appropriate. The importance of the Home

Learning Environment for young children's cognitive development is highlighted by the EYTSEN study, which illustrates that this is a powerful predictor of 'at risk' status for cognitive attainment. Parent education policies and encouragement of pre-schools and schools to foster parental involvement and engagement in activities which will promote their children's language are likely to benefit children's subsequent cognitive development and attainment at school.

In view of the significant correlation between mother's educational level and children's cognitive and (to a lesser extent) their social behavioural development, policies that provide opportunities for parents to undertake further study and training may have long term benefits.

Given the strong links between 'at risk' status on cognitive measures (and to a lesser extent Peer sociability) and multiple disadvantage, ways of effectively targeting additional resources to pre-school settings and primary schools that serve high proportions of young children from multiple disadvantaged families should be explored.

Type of pre-school provision

The observed quality of pre-school shows a significant link with children's cognitive progress across the pre-school period, and some aspects are also linked with better social behavioural development. The EYTSEN study investigated whether children who moved out of 'at risk' status were more likely to have attended high quality centres than those who moved into 'at risk' status when they entered primary school. For all measures of quality the results showed that the children who moved out of 'at risk' status had higher average scores for their pre-school centres than those who moved into 'at risk' status for cognitive outcomes (GCA, Pre-reading and Early Number Concepts). However, there were no significant differences for changes in 'at risk' status for social behavioural outcomes related to centre quality.

These results suggest that improvements in pre-school centre quality would be likely to benefit the most vulnerable groups; those with very low cognitive attainments at entry to pre-school. EPPE research has shown that centre quality ratings are significantly associated with higher levels of staff qualification, especially for the centre manager (EPPE Technical Paper 5). The level of staff training and qualifications is associated with improved quality which, in turn, benefits young children's cognitive development.

The EYTSEN study indicates that young children attending certain kinds of provision are more likely to move out of 'at risk' status than other. Those in combined centres and nursery schools showed greater gains and were more likely to move out of 'at risk' status than other children. The positive results for pre-reading in combined centres are particularly striking, given that they served a significantly higher proportion of 'at risk' children identified at entry to target pre-school than other forms of provision. Centres which combine education and care may be of special value for 'at risk' groups of young children. By contrast, the results show that Local Authority day nurseries show poorer cognitive outcomes for 'at risk' children.

Nursery classes and playgroups showed benefits in terms of the movement of children out of 'at risk' status for Peer sociability. This may reflect a greater emphasis given to developing social skills by such centres.

Identifying and meeting special needs in pre-school

Information from pre-school managers' interviews provided an indication of variations in policy and practice for identifying and meeting children's needs, particularly in relation to SEN. Key findings from the interviews have a number of implications for policy and practice in pre-school settings.

Over three-quarters (77%) of centre managers reported that they currently had children on roll with some type of 'special need'.

The extent to which managers reported the presence of special needs children in their centre differed significantly across type of setting, with managers in the maintained sector (nursery classes, local authority day centres, nursery schools and combined centre provision) reporting higher incidences of having children with some type of special need. The rates of reporting were lower in private day nurseries and lowest of all in playgroups.

There is no clear link between the proportion of 'at risk' children in a centre and the likelihood that managers reported they had SEN children on roll. From our assessments at entry to target pre-school we find that cognitively 'at risk' children are concentrated in some forms of provision, particularly combined centres, and are much less likely to attend private day nurseries.

The EYTSEN findings reveal that pre-school managers were more likely to recognise SEN in maintained rather than voluntary settings. In view of this, courses on SEN identification for the non-maintained sector (perhaps alongside maintained sector colleagues) might improve the identification of SEN amongst children in voluntary provision.

The three most frequently used identification systems for SEN were: Observation schedules; Consulting professionals; Consulting parents. Given that Observation schedules were the most common method used for the identification of special needs it would be appropriate for further research to investigate which schedules are effective in identifying children 'at risk'. Guidelines and training on the use of such schedules might assist in the early identification of needs.

The three most frequently reported strategies for supporting children with special needs were: Consulting other professionals for guidance, meeting with parents and Individual Education Plans or the Code of Practice. The use of professional consultation and IEPs was more common in the maintained sector settings (where it is a statutory obligation rather than a recommendation). It would be appropriate to explore the availability of specialised professionals to all pre-school settings. A child's particular special need may be apparent to parents for the first time only when their child enrolls at pre-school. Further research to document and disseminate good practice in pre-school centres and parents working together to recognise and support SEN children would be helpful.

The maintained sector was more likely to use the Code of Practice and/or have a nominated person responsible for SEN (SENCO) than the voluntary sector. Further studies should investigate how the voluntary sector can benefit from these practices used in the maintained sector. Also, resource allocations which enable all provision types to expand on the use of a SENCO would assist in identification and provision for 'at risk' children and those with SEN.

Future papers in the EYTSEN study will follow up the sample across Key Stage 1 and establish whether particular 'at risk' groups identified in the pre-school period are identified by teachers as showing SEN when they move on into the first years of primary school, and whether patterns of attainment and social behaviour change. In addition, information from parents about their perceptions of whether their child had special needs will also be examined.

INTRODUCTION

The Early Years Transitions and Special Educational Needs (EYTSEN) project builds on the work of the Effective Provision of Pre-School Education (EPPE) project, a major longitudinal study of a national sample of young children's progress and development through pre-school age to the end of Key Stage 1 (age 3+ to 7 years) (Sylva et al., 1999).³ The EYTSEN study uses a range of information to explore the concept of Special Educational Needs (SEN) and provision in pre-school centres designed to support such children's needs.

Information for over 2800 children attending 141 pre-school centres selected from five regions across England has been analysed. Centres have been drawn from a range of types of providers (local authority day nursery, combined centres, playgroups, private day nurseries, nursery schools and nursery classes).

Information about individual children has been obtained from direct one-to-one assessments of different aspects of cognitive development by trained researchers at entry to the study (age 3+ years) and later at entry to primary school. We thus have two sets of information that can be used to explore children's cognitive attainment and progress and their social behavioural development. In addition to child assessments, parental interviews conducted when children entered the study have been used to collect detailed information about childcare history and health, and characteristics of children, their families and home environments.

Interviews with centre managers of the pre-school settings attended by the children have been used to provide details about provision for SEN. Observations concerning aspects of centre 'quality' and measures of the environment experienced by children, were made by trained field officers. The links between centre quality and the distribution of children 'at risk' of SEN have been explored.

Aims of the EYTSEN project

The EYTSEN study investigates Special Educational Needs (SEN) recognising that such needs can be viewed as social constructs which are both relative and interactive. A child's SEN depends on an interaction between features of the child and features of the environment. It is further recognised that there is a 'continuum' of special need, from severe needs at one end to relatively lesser needs at the other, and that children's needs change over time; some children may have SEN which are persistent over time, while the needs of others may be temporary or transient. A further point of note is that children's needs will be perceived differently by different adults, (parents, pre-school workers, teachers). Young children develop at different rates and their educational and special educational needs may be expected to change during the ages of 3 to 7 years. Change over time, in children's SEN status, cannot be attributed directly to pre-school or other interventions unless a carefully controlled experimental study is conducted. The children in the EYTSEN project were not involved in an experiment but rather represent naturally occurring variation in a national sample of children in different types of pre-school provision. In contrast to an experimental design, the EYTSEN analysis provides a more accurate picture of the reality of diversity in pre-school experience and variation in young children's cognitive and social/behavioural development.

It is recognised that both '*definitions of*' and '*criteria for the identification of need*' are contested concepts. The EYTSEN study attempts to identify different categories of possible 'risk' for SEN. It seeks to address three main research objectives:

³ Full details about the children in the main EPPE study are given in a series of EPPE Technical Papers. For the EYTSEN study three Technical Reports have also been produced (listed in Appendix 1).

- 1 To examine the impact of different pre-school settings on the progress and development of children who may be seen as vulnerable or 'at risk' of developing 'special needs' over the pre-school period and to the end of Key Stage 1, including:
 - The identification and description of the characteristics of those children who fall into a number of potential 'at risk' categories, using a range of information including cognitive assessments, childcare workers assessments of social behaviour and parental interviews.
 - An analysis of the distribution of the 'at risk' groups across different types of pre-school provider.
 - A description of patterns of progress and changes in cognitive and social/behavioural development of the various 'at risk' groups across the pre-school period and to the end of KS1.
- 2 To identify pre-school centres' policies and practice in relation to the early identification of SEN.
- 3 To examine the relationship between pre-school centre quality characteristics (using information from observations using Early Childhood Environmental Rating Scales) and the progress and development of different 'at risk' groups.

The SEN Code of Practice (DfES, 2001) provides the following definition of Special Educational Needs:

"Children have special educational needs if they have a learning difficulty which calls for special educational provision to be made for them.

Children have a learning difficulty if they:

- a) *have a more significant delay in learning than children of the same age*
- b) *have a disability which prevents or hinders them from making use of educational facilities generally provided for children of the same age in schools within the area of the local education authority*
- c) *are under compulsory school age and fall within the definitions a) or b) above or, would do so if special educational provision was not made for them.*

Children must not be regarded as having a learning difficulty solely because the language or form of language of their home is different from the language in which they will be taught." (DfES, SEN Code of Practice 2001, p. 6)

The Code of Practice focuses on cognitive attainment, but a child may be statemented if their behaviour is such that it is affecting their attainment potential. The SEN Code of Practice (2001) stresses the benefits of early identification of need(s):

"The importance of early identification, assessment and provision for any child who may have special educational needs cannot be over-emphasised. The earlier the action is taken the more responsive the child is likely to be, and the more readily can intervention be made without undue disruption to the organisation of the school. Assessment should not be regarded as a single event but rather as a continuing process. If a child's difficulties prove to be transient, the child will subsequently be able to learn and progress normally. If the child's difficulties prove less responsive to the provision made by the school, then an early start can be made in considering the additional help the child may need." (DfES, SEN Code of Practice, 2001, p. 46)

The EYTSEN project examines the concept of SEN within a framework of potential risk, rather than attempting to identify a fixed cognitive or social/behavioural problem. We focus on both cognitive and social/behavioural measures of young children's development, to enable us to explore the relationships between the two and to acknowledge the importance of looking at multiple outcomes within the education and care system, and their association with different child, parent and family characteristics.

This paper focuses on young children in pre-school and variations in the nature of SEN provision in different settings. It is divided into three main sections which address the three main research objectives identified earlier. Future analyses will track the same children across primary school to the end of Key

Stage 1. The views of parents and teachers on SEN status will be examined in later reports, as well as information about the child collected from parents (such as details of any recognised medical conditions, etc.). Information about an additional group of children who had very little or no pre-school experiences (the 'home' sample), recruited to the EPPE study at the start of primary school will also be investigated to establish whether such children are at greater risk of SEN than those who attended pre-school.

SECTION ONE

The impact of different pre-school settings on the progress and development of children who may be seen as 'at risk' of developing 'special needs' over the pre-school period and in transition to primary school

SECTION 1A: The characteristics of children identified as 'at risk' at different time points:

The identification of young children 'at risk' of SEN at entry to pre-school

Cognitive attainment at entry to pre-school

Trained research officers using four sub-scales of the British Ability Scales (BAS), assessed all children in the EPPE study on a one-to-one basis (for details see EPPE Technical Paper 1). The assessments were made when children were aged 3 years if they were already attending one of the study's 141 pre-schools or, if they joined after the age of 3 years, within 10 weeks of entry. Children in the study ranged between 34 and 54 months at assessment, the average age being 41 months and standard deviation (sd) being 4.6.

The BAS baseline sub-scales make up the General Cognitive Ability composite (GCA), an overall age-standardised score. Forty-five pupils did not take the verbal subscales due to language difficulties, but were assessed using the two non-verbal scales. A 'Special Non-verbal Composite' (SNC) was created from the two non-verbal scales.⁴

Using nationally age-standardised scales enabled us to compare the performance of the EPPE sample with children nationally. The mean GCA and SNC for the sample were substantially lower than the national average of 100 (sd = 15.0), at 91.6 (sd = 14.0) for the GCA scale and 93.6 (sd = 13.0) for the SNC scale.⁵

Overall, approximately one-third (33%) of the EPPE children were 1 standard deviation below the national average on the GCA scale (a score of 85 or below). Rather a smaller proportion, though still higher than for a national sample, nearly one-quarter (24%) was 1 standard deviation below on the non-verbal SNC scale. This profile reflects the EPPE study's sampling strategy, which sought to include statistically viable sample sizes for individual pupil groups such as ethnic minorities and those of low socio-economic status, and thus focused on a range of Local Authority areas (rural, urban, ethnically diverse, shire county, etc.).

In addition to making national comparisons, using the mean and standard deviation from our own sample, approximately 16% of the pupils were 1 standard deviation below sample average on the GCA scale (a score of 78 or below), and the SNC scale (a score of 81 or below). Children scoring one standard deviation below for the EPPE sample can thus be seen to provide a tighter (more rigorous) definition of low cognitive development and possible risk of subsequent identification of special need at school (see Table 1A.1).

⁴ Of those children with SNC scores only 2 were White UK, 17 White European, 3 Black African, 1 Indian, 8 Pakistani, 3 Bangladeshi, 11 other and 2 mixed heritage. Of those children with no cognitive baseline scores at all, 19 were White UK, 2 White European, 2 Black African, 1 Indian, 4 Pakistani, 4 Bangladeshi, 1 Chinese, 2 other and 6 mixed heritage.

⁵ EPPE children also performed lower than the national average (national average=50.0, sd=10) in the individual scale standardised scores: Block building - mean=43.6 (sd=9.5): Verbal comprehension - mean=41.7 (sd=10.1): Picture similarities - mean=47.3 (sd=8.9): Picture naming - mean = 45.6 (sd=10.4).

Table 1A.1 Mean and standard deviation for national and EYTSEN sample on BAS General Cognitive Abilities

	National mean and standard deviation	Sample mean and standard deviation
General cognitive ability	100.0 (sd=15.0)	91.6 (sd=14.0)
Special Non-verbal composite	100.0 (sd=15.0)	93.6 (sd=13.0)

Identifying children ‘at risk’, *after* age correcting was extremely important, as the effects of age at this stage of children’s development are pronounced.

Table 1A.2 shows the correlation between children’s raw BAS assessment scores and age in months at assessment. There is evidence in the literature to suggest that at school younger children in a year group are more likely to be ‘labelled’ as having a special educational need and this will be explored by following up the sample after entry to primary school.

Table 1A.2 Correlation between Raw and Standardised scores and age at testing⁶

	Raw score	Nationally standardised score	Internally Standardised score
Block Building	0.46** (n=2816)	0.13** (n=2816)	-0.02 (n=2816)
Verbal Comprehension	0.25** (n=2771)	0.06** (n=2771)	0.01 (n=2771)
Picture Similarities	0.34** (n=2817)	0.11** (n=2817)	0.02 (n=2817)
Picture Naming	0.31** (n=2768)	0.07** (n=2768)	0.01 (n=2768)
Total score/GCA (General Cognitive Ability composite)	0.35** (n=2764)	0.12** (n=2769)	0.00 (n=2769)
Total non-verbal score/ SNC (Special Non verbal composite)	0.44** (n=2813)	0.14** (n=2813)	-0.00 (n=2813)

** Significant at the 0.01 level

Age was found to be most strongly related to attainment in the non-verbal assessments, especially block building. It is notable that the nationally standardised scores did not totally erase the age effect, so we commissioned NFER-NELSON, the test developers, to create internally standardised scores, based only on our EPPE children. As can be seen above, these standardised scores control for the age effect in the project sample.

Characteristics of ‘at risk’ children

How ‘at risk’ status is defined is an extremely important issue, as the children identified will differ depending on the particular criteria used. Warnock’s ‘1 in 5’ is still sometimes seen as an unofficial benchmark for likely incidence of SEN status (DES Warnock report, 1978; DFE SEN Code of Practice, 1994). It must be remembered that if 20% is seen as the likely proportion of children with some kind of special need on a national basis, this is likely to vary between regions.⁷ Using the national criteria, a higher (or lower) proportion would be identified in some areas because SEN can be associated with factors such as socio-economic disadvantage that are not randomly distributed due to geographical concentrations reflecting housing and other factors.

When national standards related to cognitive attainments are applied to the EPPE sample a much larger proportion of children are identified as ‘at risk’. Table 1A.3 shows three different approaches to identification of ‘risk’ based on cognitive data that will be used in this section. An additional risk classification was included that assessed children on Non-verbal skills only, to provide a fairer assessment of the cognitive skills of children who did not speak English as their first language.

⁶ In our sample the correlation between raw and nationally standardised scores is relatively high (ranging from 0.92-0.95 for the subscales and 0.93 for overall score). The correlation between raw and internally standardised scores is slightly lower (ranging from 0.86-0.93 for the subscales and 0.93 for overall score). Block building, with a correlation of 0.86 is the lowest correlation.

⁷ Variation across geographical areas was found in our own sample.

Table 1A.3 Different classifications of ‘at risk’ status for cognitive baseline attainment⁸

Risk type	Classification specification and n
Cognitive risk (national basis)	Nationally standardised scores (GCA/SNC) 1 sd below national mean, n=946, 33.1%
Strong cognitive risk (sample basis)	Internally standardised scores (GCA / SNC) 1 sd below sample mean, n=461, 16.1%

The two cut-offs (below national average and below sample average) were used to define children at **cognitive risk** (1 sd below *national* average) and those at **strong cognitive risk** (1 sd below *sample* average). These provide definitions of children who may be seen to be ‘at risk’ on the basis of their low cognitive attainment at entry to pre-school.

We have explored the characteristics of the EPPE children on entry to pre-school, and the relationship between various background characteristics and their attainment on the BAS scales (see EPPE Technical Papers 2 and 7). The measures listed in Table 1A.4 showed the strongest relationship with BAS baseline attainment, when tested in combination, so were used as the basis for exploring the impact of child, family and home environment factors on the likelihood of ‘at risk’ classification in this section. Additional variables have since been analysed and found to have predictive validity. The proportions of young children in the two cognitive ‘at risk’ groups are compared to those of the EPPE sample for each characteristic in turn, as well as the impact of multiple disadvantage.

Table 1A.4 Child, parent and home characteristics investigated for relationship to cognitive ‘at risk’ status

Child variables	Parent variables	Home environment variables
<ul style="list-style-type: none"> • Gender • Ethnic group • First language • Age at entry to Pre-school • Number of siblings • Prematurity 	<ul style="list-style-type: none"> • Mother’s highest qualification level • Mother’s employment status • Mother’s age • Social class of Father’s occupation • Father’s employment status • Family average SES • Marital status 	<ul style="list-style-type: none"> • Parents’ emphasis on home learning environment (total) • Frequency parent reads to child • Frequency child taken to library • Frequency child plays with letters/numbers • Parents’ emphasis on teaching alphabet/letters • Parents’ emphasis on teaching songs/poems/nursery rhymes • Frequency child paints or draws <ul style="list-style-type: none"> • Frequency child plays with friends elsewhere (outside home)

• Gender

Gender has been identified as a factor that relates to pupil achievement from school entry through to GCSE and A level performance in England, with boys tending to under-perform in comparison to girls at most phases. More sophisticated multilevel studies of pupil attainment and progress which control for the impact of other factors have provided more detail about variations in the size of ‘gender effects’ (e.g. Mortimore et al., 1988; Sammons, 1995; Sammons and Smees 1998; Tymms, 1999; Strand, 1999). Overall, a significantly higher number of boys than girls were identified as ‘at risk’ in terms of their cognitive attainments at entry to pre-school.

⁸ 1 standard deviation below the mean was taken as the cut off for risk identification. Children were identified on the basis of their GCA scores. Where GCA scores were missing, SNC scores were used for risk identification.

Table 1A.5 Gender and percentage of children identified at cognitive risk

	All children	Cognitive risk	Strong cognitive risk
Male	52.3	57.1	58.8
Female	47.7	42.9	41.2

• Ethnic group

Just under three-quarters of the EPPE sample’s parents classified their child as of white UK heritage. All the non-white UK ethnic groups had a higher incidence of children included in the cognitive ‘at risk’ categories than the White UK group. This is likely to reflect both the verbal component of two of the BAS sub-scales (for children for whom English was not their first language), and the higher incidence of socio-economic disadvantage affecting such families. EPPE Technical Paper 2 explored this issue in some detail and found that, when account is taken of the impact of other factors, especially SES and parents’ educational level, ethnic differences in cognitive attainment at entry to pre-school are reduced. It was shown that they are not statistically significant in the non-verbal assessments which are less dependent on language.

Table 1A.6 Ethnic background and percentage of children identified at cognitive risk

	All children		Cognitive risk		Strong cognitive risk	
	%	n	%	n	%	n
White UK heritage	74.5	2128	62.5	282	59.5	283
White Euro heritage	4.1	118	5.4	22	5.7	27
Black Carib heritage	4.1	116	5.4	27	5.7	27
Black African heritage	2.2	64	3.6	18	4.0	19
Black – Other	0.8	22	1.0	2	0.4	2
Indian	1.9	55	3.2	17	3.6	17
Pakistani	2.6	75	5.6	37	8.4	40
Bangladeshi	0.9	25	1.8	11	2.7	13
Chinese	0.2	5	0.4	2	0.4	2
Other	2.1	60	3.2	15	3.6	17
Mixed heritage	6.5	185	7.8	26	5.7	27
White non Euro heritage	0.1	2	0.0	0	0.0	0
Unknown	0.1	2	0.2	0	0.4	0

• First language

Proportionately more children who did not have English as their first language were included in each of the ‘at risk’ groups for cognitive assessments at entry to pre-school (Table 1A.7). Children who did not have English as their first language were also more likely to be identified as ‘at risk’ on the non verbal risk classification. It should be noted that, as a group, children who did not speak English as a first language began pre-school significantly later than children whose first language was English, a factor also found to be related to cognitive development. Such children were also more likely to experience socio-economic disadvantage.

Table 1A.7 Child’s language and percentage of children identified at cognitive risk

	All children	Cognitive risk	Strong cognitive risk
English	91.3	83.7	80.0
English not first language	8.7	16.3	19.9

• Age at entry to target pre-school

Children at strong cognitive risk were significantly older at entry to the target pre-school than the not ‘at risk’ group using groupings based on the internally standardised scores. However, there were no significant differences in age at entry in terms of the national cognitive ‘at risk’ definition.⁹

⁹ The relationship with time spent at the pre-school before recruitment to the EPPE study and children’s cognitive scores was also investigated. Partial correlations of age at start of pre-school and the BAS scores, controlling for age at testing, were carried out. The results indicate that children who started at their pre-school centre at an older age had significantly lower cognitive scores (-0.13, p<0.001).

• Family size

A higher proportion of children in each of the cognitive ‘at risk’ categories came from a large family (three-plus siblings, i.e. four children including the EPPE sample child). The relationship here is a complex one, as large family size (four or more children) is also strongly related to other characteristics including social class.¹⁰

Table 1A.8 Family size and percentage of children identified at cognitive risk

No of siblings	All children	Cognitive risk	Strong cognitive risk
0	21.1	20.3	17.6
1–2	63.3	60.4	61.1
3+	13.1	16.4	19.1
Unknown	2.5	3.1	2.2

• Prematurity and Low birth weight

Babies born weighing less than 2501 grams (5lbs 8oz) are defined as low birth weight (Scott and Carran, 1989). In total 72.5% of babies in our sample who had a low birth weight were reported by parents to have been born premature. Children born prematurely were over-represented in each of the cognitive ‘at risk’ groups at entry to the pre-school study (age 3+). Children identified ‘at cognitive risk’ had significantly lower birth weights than those not identified. There is growing research evidence to suggest that children of lower birth weight tend to have poorer academic outcomes in later life (Richards et al., 2001; Sorenson et al., 1997; Martyn et al., 1996; Breslau, 1995). Scott and Carran (1989) also note that children under the normal birth weight range were more likely to require special education services. Low birth weight has been shown to be associated with mothers’ age and, educational level and social class.

Table 1A.9 Prematurity, birth weight and percentage of children identified at cognitive risk

Prematurity	All children	Cognitive risk	Strong cognitive risk
Yes	16.1	19.8	20.0
No	81.5	77.2	77.7
Unknown	2.4	3.1	2.4
Average birth weight in grams	3316.0	3207.4	3159.5
Foetal Infant	0.5	1.3	1.4
Very low birth weight	0.8	1.2	1.0
Low birth weight	6.7	9.4	9.9
Normal birthright range	88.2	83.1	81.2
Unknown	3.7	5.1	6.3

• Mother’s highest qualification level

There is strong evidence to suggest a significant link between the mother’s educational level and young children’s cognitive attainments for the project sample (see EPPE Technical Papers 2 and 7). A significantly large proportion of children in each of the cognitive ‘at risk’ classifications had mothers who reported they had no educational qualifications (over one-third for those at strong cognitive risk), as reported in table 1A.10 below.

¹⁰ Children from large families were much more likely to have mothers with no qualifications (33.4% compared to 15.7% for only children and 15.3% 2-3 children), more likely to have an unemployed father (24.4% compared to 7.8% for only children and 10.0% 2-3 children), and more likely to have a father in unskilled manual work (4.8% compared to 1.2% for only children and 1.2% 2-3 children).

Table 1A.10 Mother's qualification and percentage of children identified at cognitive risk

	All children	Cognitive risk	Strong cognitive risk
None	17.5	27.0	35.4
16yr vocational	2.0	2.5	2.6
16 academic	36.7	36.8	31.9
18 vocational	12.8	14.2	12.5
18 academic	8.7	6.1	6.3
Degree or equivalent	13.1	7.1	5.3
Higher degree	4.5	1.2	0.8
Other professional	0.7	0.6	0.4
Other miscellaneous	0.8	0.6	0.8
Unknown	3.2	3.9	4.0

• Mother's employment status

A larger percentage of at risk children, than the overall sample of children, had unemployed mothers, and a lower percentage had mothers working (either part time or full time).

Table 1A.11 Mother's employment status and percentage of children identified 'at risk'

	All children	Cognitive risk	Strong cognitive risk
Not employed	47.0	58.7	63.8
Employed full time	15.7	12.1	9.1
Employed part time	30.1	23.0	21.1
Self employed	4.0	2.4	1.8
Combination*	0.4	0.2	0.2
Other	0.0	0.0	0.0
Unknown	2.7	3.6	4.0

*Part time and self employed

• Social class of father's occupation

Much previous research has indicated that measures of parents' social class or occupational status are related to pupils' educational attainments at school (see Mortimore and Blackstone, 1982; Essen and Wedge, 1982). For this sample of pre-school children it can be seen that the father's social class level is associated with low cognitive attainment with a smaller percentage of the children in the cognitive 'at risk' categories having fathers in the occupations classified as non-manual class I and II. A higher proportion of children 'at risk' had fathers in semi- or unskilled manual work. Also it is notable that proportionately more of the 'at risk' group were recorded as 'father absent'.

Table 1A.12 Father's occupation level and percentage identified at cognitive risk

	All children	Cognitive risk	Strong cognitive risk
Professional I non manual	8.3	3.9	2.2
Other professional II non manual	19.2	11.7	10.9
Skilled non man III non manual	12.2	11.1	10.7
Skilled manual III manual	22.3	23.5	21.9
Semi skilled IV manual	11.1	13.4	15.4
Unskilled V manual	2.2	3.5	4.7
Never worked	0.8	1.7	1.8
Father absent	21.6	28.3	28.7
Unknown	2.3	2.9	3.8

• Father's employment status

Fewer children at 'cognitive risk' had fathers who were reported to be in full time employment (for example 37.4% of those at strong cognitive risk had father in full time work, compared with 52.1% of all children in the EPPE sample), and a somewhat higher proportion, though still a minority had fathers who were unemployed.

- **Mother’s marital status**

Pre-school children living in single parent families were somewhat over-represented in the cognitive ‘at risk’ categories. It should be noted that the factor single parent status is associated with lower levels of mother’s qualification and SES. Elsewhere it has been shown that single parent status does not have a significant additional impact on attainment, when the influence of other factors, including SES and mother’s qualification levels, is taken into account. (EPPE Technical Paper 8a).

Table 1A.13 Marital status and percentage of children identified at cognitive risk

	All children	Cognitive risk	Strong cognitive risk
Never married, single parent	13.8	18.0	18.2
Never married, living with partner	14.2	14.1	12.8
Married, live with spouse	58.5	51.1	51.6
Separated/divorced	10.5	13.1	12.8
Widow/widower	0.2	0.1	0.2
Other	0.6	0.7	0.6
Unknown	2.3	3.0	3.8

- **Home learning environment**

Earlier analyses on the EPPE sample show a strong net impact for individual measures related to children’s home learning environment (parents engaging with children in activities to promote learning i.e. reading to children, visits to libraries, teaching songs and nursery rhymes, etc.) and children’s cognitive attainments at entry to pre-school, even after control for the influence of parents’ SES and mother’s educational level (EPPE Technical Paper 2). A composite home learning environment scale shows a greater association between cognitive development than family SES or mother’s highest qualification level (EPPE Technical Paper 7).

Young children identified as at ‘cognitive risk’ had significantly lower home learning environment scores than the sample as a whole. Children with the lowest home learning scores (0–13) were much more likely to be categorised as ‘at risk’ in terms of their cognitive attainment at entry to pre-school than children with higher scores.

Table 1A.14 Home learning environment and percentage of children identified at ‘cognitive risk’

	All children	Cognitive risk	Strong cognitive risk
Mean home learning score	23.4 (sd=7.6)	20.2 (sd=7.5)	19.0 (sd=7.7)
0–13	9.1	17.3	23.1
14–19	20.7	27.5	26.1
20–24	23.3	22.4	20.8
25–32	31.5	23.5	21.3
33–45	11.7	4.4	3.0
Unknown	3.7	4.9	5.7

It is also interesting to look at the individual home learning environment items. Children whose parents did not mention, or reported never engaging in home learning activities, were over-represented in the risk categories. Any mention of visits to the library relates to under-representation in the cognitive ‘at risk’ categories. Likewise, fewer children whose parents reported reading to the child daily, or twice daily, were identified as ‘at risk’. Parents who indicated they taught their child songs and nursery rhymes and played with letters and numbers also showed a positive link with cognitive attainment and lower incidence of risk.

- **Frequency child plays with friends outside home**

Children whose parent reported that they never play with friends elsewhere and those who go outside the home to play with them very often (5–7 times a week elsewhere) are over-represented in the ‘at risk’ categories, whereas children who go to play with friends elsewhere sometimes (1–2 times a week) are under-represented.

Table 1A.15 Playing with friends and percentage of children identified at cognitive risk

	All children	Cognitive risk	Strong cognitive risk
Never	32.9	39.0	38.8
Occasionally	3.8	2.4	2.8
1–2 times a week	43.1	28.4	27.9
3–4 times a week	10.3	11.9	11.9
5–7 times a week	7.4	14.9	15.6
Unknown	2.5	3.4	4.0

‘Multiple disadvantage’ and cognitive ‘at risk’ status at entry to pre-school

In educational priority research in Inner London, Sammons et al. (1983) developed an Educational Priority Index (EPI) based on the concept of groups at greater risk of low attainment at school. Others have also looked at ‘at risk’ similar classifications in the past (Alberman and Goldstein, 1970). Sammons et al. found that, amongst the ILEA infant pupil population, only 23% experienced no factors that were classified as statistically significantly related to educational disadvantage, and approximately 25% experienced 3 or more indicators of disadvantage.¹¹ A strong relationship between multiple disadvantage and the number of pupils in the lowest verbal reasoning band was found at age 11 years, suggesting that the effect of disadvantage measures can be cumulative, though not necessarily additive. The EYTSEN analyses has already reported that ‘at risk’ children in terms of cognitive attainment at entry to pre-school, differ from the non-‘at risk’ group in terms of a number of child, parent and home environment characteristics. Further analyses were conducted to investigate the impact of ‘multiple disadvantage’. An index was created based on 10 indicators in total: three child variables, six parent variables, and one related to the home learning environment. All the variables were chosen because they related to low baseline attainment when looked at in isolation (as described above). Where indicators were closely related, such as first language and ethnicity, only the most significant was included.

Table 1A.16 Multiple disadvantage indicators

Child variables	Disadvantage indicator
<ul style="list-style-type: none"> • First language • Large family • Prematurity/ low birth weight 	English not first language 3 or more siblings Premature at birth or below 2500 grams
Parent variables	
<ul style="list-style-type: none"> • Mother’s highest qualification level • Social class of Father’s occupation • Father’s employment status • Young mother • Lone parent • Mother’s employment status 	No qualifications Semi-skilled, unskilled, never worked, absent father Not employed Age 13–17 at birth of EPPE/EPPE-E child Single parent Unemployed
Home environment variables	
<ul style="list-style-type: none"> • Home environment scale 	Bottom quartile

In all, just under a quarter of the EPPE sample (23.5%) experienced none of the indicators of disadvantage we looked at, while 26.8% experienced three or more indicators of disadvantage. Only a very small proportion (5.5%) experienced 5 or more.

Multiple disadvantage shows a strong link with cognitive ‘at risk’ classifications for pre-school children. Within the groups of children identified as ‘at risk’ there was a much higher incidence of young children experiencing 3 or more indicators of disadvantage. For example, using the strong cognitive risk categorisation, within the group of children experiencing no indicators of disadvantage, only around one in twenty (5.2%) were identified as ‘at risk’. By contrast, within the group of children experiencing 5 indicators of disadvantage, nearly half (47.5%) were identified as ‘at risk’. This strong association

¹¹ The following indicators were used in the Primary data collection 1981: Eligibility for free school meals, Large families, One-parent families, Parental occupation, Behaviour difficulties measured by class teacher, Pupil mobility, Fluency in English, Ethnic family background

provides pointers which may help our understanding of the factors which may influence the development of later SEN.

Table A1.17 Multiple disadvantage and percentage of children identified at cognitive risk

Number of factors	All children		Cognitive risk	Strong cognitive risk
	n	%		
0	637	23.5	11.3	7.0
1-2	1345	49.6	43.9	38.1
3-4	575	21.3	34.1	40.0
5+	151	5.5	10.7	15.0

Social behaviour at entry to pre-school

Information about EPPE children’s social behaviour was obtained at entry to preschool using the Adaptive Social Behaviour Inventory (ASBI). This is specifically designed to measure social and behavioural skills of pre-school children (Hogan et al., 1992), and consists of 30 items completed by a pre-school centre worker who is familiar with the child (See Melhuish, 2000 for more details).

Previous analyses of the 30 items identified five underlying dimensions (or factors related to behaviour): Cooperation and conformity, Peer sociability, confidence, anti-social and worried/upset.

Two of these dimensions were examined as likely to be relevant to possible ‘at risk’ status for later social behavioural difficulties. The Peer sociability and the Anti-social and Worried/upset factor scales were used to classify children who might be viewed as ‘at risk’. Peer sociability was chosen as a factor for special analyses as this is an important element of social development especially in very young children. Peer sociability is important because it may help children to move from an egocentric view of the world to one that encompasses other aspects of social adjustment, such as sharing, empathy etc. The Anti-social and Worried/upset scales were found to be fairly closely related and were combined to create a mean score.

Relationships with age were generally very weak for the social behavioural factors and thus it was not considered necessary to correct for child age in creating the social behavioural ‘at risk’ definitions.

Time spent in pre-school and social/behavioural scores

The relationship with time spent at the pre-school before recruitment to the EPPE study and children’s social behavioural scores was also investigated. Partial correlations of age (at start of target pre-school) and the factor scales, controlling for age at testing, were carried out. The results indicate that the less time spent in the target pre-school prior to childcare workers’ assessments the less sociability exhibited by the child (-0.18, $p < 0.01$). In contrast, less time spent in the target pre-school was also weakly related to reduced Anti-social/ worried upset behaviours ($r = 0.15$, $p < 0.01$) This maybe due to children exhibiting behavioural difficulties being entered into pre-school earlier than other children, or alternatively this may reflect their reaction to early entry to pre-school (see EPPE Technical Paper 7 for further exploration of these associations).

Identifying ‘at risk’ children for social behaviour

Using the criteria of one standard deviation below the mean for the sample as a cut off, 19.9% (564 children) were identified as ‘at risk’ on the mean Anti-social/worried upset scale, and 17.7% on the Peer sociability scale (502 children). The two social/behavioural ‘at risk’ categories overlap to only a limited extent with around one in five (20.4%) of children ‘at risk’ on the Anti-social/worried/upset factor also being identified by childcare workers’ ratings as ‘at risk’ in terms of Peer sociability. These children identified as ‘at risk’ on both categorisations represented only a small proportion of the total sample (102 children or 3.4%).

This provides evidence that the two dimensions distinguish children who show fairly different types of social behavioural difficulty. In total, two-thirds (1877 or 66.1%) of children were not identified as exhibiting difficulties on either social/behavioural dimension that might be seen as placing them ‘at risk’.

Table 1A.18 Cross-tabulation of social/behavioural risk classifications

	Not at Anti-social/worried/upset risk n	At Anti-social/worried/upset risk n
No risk Peer sociability	1877 (66.1%)	398 (14.0%)
At risk Peer sociability	462 (16.3%)	102 (3.4%)

Characteristics of child, parent and home environment have been shown to relate to social behavioural development as assessed by childcare workers at entry to the study (see EPPE Technical Paper 7). Nonetheless, it must be stressed that relationships were generally very much weaker than in the analyses of cognitive attainment. These aspects were therefore investigated for the EYTSSEN study in relation to the classification of children ‘at risk’ for social behavioural measures.

• Gender

More boys than girls were identified as showing some behavioural difficulties for both Peer sociability but not for Anti-social/worried/upset categories at entry to pre-school study (age 3+ years). Davis (1991) found that boys had greater difficulties in coping with pre-school than others but also pinpointed the problem of adult assessors possibly misperceiving boisterous behaviour in boys as aggression.

Table 1A.19 Gender and percentage of children at social behavioural risk

	All children	Anti-social/worried/upset risk	Peer sociability risk
Male	52.3	54.4	61.8
Female	47.7	45.6	38.2

• Ethnic group

There are some indications that childcare workers’ assessments of children’s social behavioural development are associated with both ethnic group and language. It must be remembered that childcare workers’ perceptions are subjective and that few childcare workers at the centres were of ethnic minority origin (see EPPE Technical Paper 5). Cultural aspects may intervene. For example, slightly more Pakistani and Bangladeshi children were rated in the low scoring group for Peer sociability; speaking English as a second language may inhibit very young children’s peer interactions at entry to pre-school. Slightly more children of mixed heritage or of Black Caribbean heritage were given higher scores in terms of the Anti-social/worried/upset measure. Again it must be stressed that the proportions are low for all ethnic groups and may be confounded with socio-economic and other influences.

Table 1.20 Ethnicity and percentage of children at social behavioural risk

	All children		Anti-social/worried/upset risk		Peer sociability risk	
	%	N	%	n	%	n
White UK heritage	74.5	2128	69.0	389	68.5	344
White European	4.1	118	3.9	22	4.0	20
Black Caribbean	4.1	116	6.6	37	3.4	17
Black African heritage	2.2	64	3.7	21	2.4	12
Black – Other	0.8	22	1.1	6	0.6	3
Indian	1.9	55	1.8	10	3.8	19
Pakistani	2.6	75	2.7	15	5.4	27
Bangladeshi	0.9	25	0.9	5	1.2	6
Chinese	0.2	5	0.0	0	0.4	2
Other	2.1	60	2.0	11	3.6	18
Mixed heritage	6.5	185	8.5	48	6.8	34
White non European	0.1	2	0.0	0	0.0	0
Unknown	0.1	2	0.0	0	0.0	0

- **First language**

Children whose first language was not English were not more likely to be identified as ‘at risk’ for anti-social/anxious behaviour but, proportionately, more were in the ‘at risk’ category for Peer sociability. This may be related to communication problems where some children are only beginning to learn English.

Table 1A.21 First language and percentage of children at social behavioural risk

	All children	Anti-social/worried/upset risk	Peer sociability risk
English	91.3	90.6	83.7
English not 1 st lang	8.7	9.4	16.3

- **Number of siblings**

‘Only children’ were identified as more likely to exhibit Anti-social/worried/upset behaviour, but less likely to show Peer sociability problems. However, the number of siblings a child has is related to the age the child started at pre-school, with ‘only children’ starting much earlier than children from larger families ($p=0.12$, $p<0.001$). For example, the average start age for ‘only children’ is 32.6 months, compared with 38.3 months for children with four siblings.

Table 1A.22 Number of siblings and percentage of children at social behavioural risk

No of siblings	All children	Anti-social/worried/upset risk	Peer sociability risk
0	21.1	26.4	14.3
1–2	63.3	59.0	62.8
3+	13.1	11.4	20.1
Unknown	2.5	3.2	2.8

- **Prematurity**

Significantly higher proportions of premature children were identified ‘at risk’ for Peer sociability problems. Children identified as ‘at risk’ for Peer sociability were also found to have significantly lower birth weight than those not identified. By contrast, there was no evidence that prematurity or low birth weight was related to ‘at risk’ for Anti-social/worried/upset.

Table 1A.23 Prematurity and percentage of children at social behavioural risk

Prematurity/ lbw	All children	Anti-social/worried/upset risk	Peer sociability risk
Yes	16.1	14.7	19.1
No	81.5	82.1	78.3
Unknown	2.4	3.2	2.6
Average birth weight in grams	3316.0	3318.2	3262.1

• Mother’s highest qualification level

There are indications that children whose mothers have no qualifications are over-represented in the group of children identified as ‘at risk’ in terms of Peer sociability, while children whose mothers had degrees were somewhat under-represented. However, no significant differences were found for Anti-social/worried/upset.

Table 1A.24 Mother’s highest qualification and percentage of children at social behavioural risk

	All children	Anti-social/worried/upset risk	Peer sociability risk
None	17.5	18.4	25.1
16yr vocational	2.0	2.3	2.2
16 academic	36.7	33.7	34.1
18 vocational	12.8	14.7	11.6
18 academic	8.7	9.8	8.8
Degree or equivalent	13.1	11.7	10.6
Higher degree	4.5	4.3	3.8
Other professional	0.7	0.9	0.8
Other miscellaneous	0.8	0.2	0.6
Unknown	3.2	4.1	2.6

• Mother’s employment status

As a group children whose mothers work full time start pre-school much earlier than those who do not work (mean age 29.9 months compared with 37.3 months), which may help explain why children with non-working mothers are more likely to be identified as ‘at risk’ on the Peer sociability scale.

Table 1A.25 Mother’s employment status and percentage of children at social behavioural risk

	All children	Anti-social/worried/upset risk	Peer sociability risk
Not employed	47.0	44.7	57.2
Employed full time	15.7	17.2	10.8
Employed part time	30.1	29.3	23.9
Self employed	4.0	4.8	5.6
Combination*	0.4	0.4	0.0
Other	0.0	0.0	0.0
Unknown	2.7	3.7	2.6

* Part time and self employed

• Social class of father’s occupation

In contrast to the findings for cognitive attainment at entry to pre-school, father’s occupation showed much weaker associations with social behavioural ‘at risk’ status. Children with absent fathers are slightly over-represented in the Anti-social/worried/upset risk categories.

There were some indications that children whose fathers were in class I, or II had a slightly lower risk than those in class IV or V occupations for Peer sociability.

Table 1.26 Father’s occupation and percentage of children at social behavioural risk

	All children	Anti-social/worried/upset risk	Peer sociability risk
Professional	8.3	8.5	7.6
Other professional	19.2	16.1	15.9
Skilled non manual	12.2	11.9	13.1
Skilled manual	22.3	20.6	20.5
Semi skilled	11.1	12.2	13.9
Unskilled	2.2	2.3	3.0
Never worked	0.8	1.1	0.8
Father absent	21.7	24.1	22.7
Unknown	2.2	2.9	2.4

• Father’s employment status

Children whose fathers were in full time employment were under-represented in the group of children identified as showing poorer Peer sociability and Anti-social/worried/upset tendencies. Children with a father not working showed an increased incidence of being ‘at risk’ for poor Peer sociability.

Table 1A.27 Father’s employment status and percentage of children at social behavioural risk

	All children	Anti-social/worried/upset risk	Peer sociability risk
Not employed	10.5	10.8	14.7
Employed full time	52.1	47.0	46.0
Employed part time	2.6	3.4	2.4
Self employed	11.0	11.9	11.8
Combination*	0.2	0.0	0.0
Father absent	21.4	24.1	22.7
Unknown	2.2	2.9	2.4

* part time and self employed

• Marital status

There were some indications that children whose mothers were never married and were single parents scored more highly in terms of Anti-social/worried/Upset, while those whose parents were married and living with spouse (the largest group) were slightly under-represented. There were no differences in terms of ‘at risk’ for Peer sociability by contrast.

Table 1A.28 Marital status and percentage of children at social behavioural risk

	All children	‘at risk’ Anti-social/ Worried/upset	‘at risk’ Peer sociability
Never married, single parent	13.8	16.0	14.1
Never married, living with partner	14.2	14.7	12.2
Married, live with spouse	58.5	55.5	59.8
Separated/divorced	10.5	10.5	10.2
Widow/widower	0.2	0.0	0.4
Other	0.6	0.4	1.0
Unknown	2.3	3.0	2.4

• Home environment characteristics of ‘at risk’ children

The home learning environment scale has a positive relationship with Peer sociability and is associated with less Anti-social/worried/upset behaviour in analyses for the whole EPPE sample (see EPPE Technical Paper 7). Analyses of those classified as ‘at risk’, likewise indicate a statistically significant association for Peer sociability.

Table 1A.29 Home learning environment and percentage at social behavioural risk

	All children	Anti-social/worried/upset risk	Peer sociability risk
Mean home learning score	23.4 (sd=7.6)	22.8 (sd=7.8)	21.5 (sd=8.1)
0–13	9.1	10.6	14.7
14–19	20.7	21.8	25.1
20–24	23.3	23.0	21.9
25–32	31.5	28.7	25.1
33–45	11.7	11.0	9.2
Unknown	3.7	4.9	4.0

Children in the highest or lowest categories of the home learning experience scale showing differences in terms of the proportions identified as ‘at risk’. For example 14.7% of those identified ‘at risk’ for Peer sociability had the lowest home learning scores (0-13), compared with 9.1% overall (and only 3.7% of non identified children). The effect was stronger for Peer sociability than for Anti-social/worried/upset.

• Frequency plays with friends

Children whose parents reported at interview that they never play with friends elsewhere are significantly more likely to be found in the ‘at risk’ classification for Peer sociability. Children who played 1–2 times a week with friends showed less incidence of Peer sociability problems. Thus a degree of exposure to play with friends outside the home shows the most desirable impact.

Table 1A.30 Playing with friends and percentage of children at social behavioural risk

	All children	Anti-social/worried/upset risk	Peer sociability risk
Never	32.9	33.3	41.2
Occasionally	3.8	3.7	2.8
1–2 times a week	43.1	42.6	37.8
3–4 times a week	10.3	9.4	9.4
5–7 times a week	7.4	7.6	6.0
Unknown	2.5	3.4	2.8

Multiple disadvantage and social/behavioural ‘at risk’ status at entry to pre-school

The EYTSN analyses show that pre-school children’s social behavioural development at entry to pre-school has weaker relationships with any of the individual background measures analysed than cognitive attainment in terms of the analysis of ‘at risk’ categories. The results indicate that children ‘at risk’ in terms of Peer sociability are more likely than others to be affected by multiple disadvantage. However, multiple disadvantage does not show a link with children ‘at risk’ status for Anti-social or worried/upset behaviour at entry to pre-school.

Table 1A.31 Multiple disadvantage and percentage of children identified as being at social behavioural risk

Number of factors	All children		Anti-social/worried/upset risk	Peer sociability risk
	%	n		
0	23.5	637	22.8	13.8
1–2	49.6	1345	49.1	47.1
3–4	21.3	575	21.4	28.2
5–6	5.3	144	6.0	10.0
7–8	0.2	7	0.6	0.8
Unknown	--	149	--	--

Relationships between cognitive and behavioural ‘at risk’ classifications at entry to pre-school

We investigated whether young children with low scores in terms of their cognitive assessments are more likely than others to also show possible social behavioural difficulties. Roughly a fifth of those identified as ‘at risk’ for cognitive development were also identified by child-care workers as showing difficulties with Anti-social/worried/upset behaviours. A slightly higher proportion was seen as showing some difficulties related to Peer sociability (between a quarter to a third). The clearest link was between ‘strong cognitive risk’ and ‘at risk’ for Peer sociability. Nearly a third (31.6%) of children at ‘strong cognitive risk’ also show poor Peer sociability. However it should be noted that this represents only a small percentage of the total sample (5.6%), or around one in 20 children. Further analyses will follow up whether these children are more vulnerable in terms of likelihood of showing special needs at primary school.

Table 1A.32 Cross tabulation of social behavioural and cognitive risk classifications

		N and % of overall sample 'at risk' on both		% of those 'at risk' on cognitive also 'at risk' on social behavioural
		%	n	%
Anti-social/ worried/upset risk	Cognitive risk	7.3	203	21.7
	Strong cognitive risk	3.9	109	22.0
Peer sociability risk	Cognitive risk	8.5	238	25.4
	Strong cognitive risk	5.6	158	31.6

Table 1A.33 Cross tabulation of cognitive 'at risk' status and multiple behavioural risk at entry to pre-school study

	Cognitive risk		Strong cognitive risk	
	%	n	%	n
Not 'at risk' on either behavioural	9.1	544	9.4	264
'At risk' either behavioural	12.8	341	7.1	199
'At risk' both behavioural	1.8	49	1.2	33
Valid total n 'at risk' on cognitive measures		934		505

N.B. Percentages of overall valid sample shown

Characteristics of children identified as ‘at risk’ of SEN at entry to primary school

This sub-section seeks to establish whether the characteristics of children classified as ‘at risk’ at entry to primary school were similar to those identified earlier when children entered pre-school (see previous sub section).

Cognitive attainment at entry to primary school

At school entry all children in the EPPE study were assessed on a one-to-one basis by a trained research officer using five BAS sub-scales, two phonological (letter sounds) awareness sub-scales (rhyme and alliteration), and a letter recognition assessment.¹² Phonological awareness is a powerful predictor of later reading skills, and research suggests that children with poor phonological skills are more likely to experience problems learning to read fluently (Moats and Lyon, 1993). Rhyming activities prior to beginning formal schooling have been found to be particularly important in developing children’s phonological awareness (Bryant and Bradley, 1985).

If phonological awareness has a strong instructional basis, it has been argued that deficits in this area should not be treated as evidence of disability (Fletcher et al., 1994).

Using nationally age-standardised scales enabled us to compare the performance of the EPPE sample with children nationally, as we have done previously at entry to the pre-school study. Table 1A.34 shows that the means for the subscales are still lower than the national average.

Approximately one-fifth (21.0%) of the children were 1 standard deviation below the national average on the GCA scale (a score of 85 or below). This is an important finding because it suggests that pre-school experience can have a positive impact in reducing the proportion of children with low cognitive attainments who may be considered ‘at risk’. The equivalent proportion for this group of children at entry to pre-school was significantly higher at one in three (33.6%).

Table 1A.34 Mean BAS scores and standard deviation for national and EPPE sample

	Entry to pre-school study	Entry to primary school
Block building	43.6 (sd=9.5)	Not available
Verbal Comprehension	41.7 (sd=10.1)	45.65 (sd=8.69)
Picture Similarities	47.3 (sd=8.9)	51.42 (sd=9.28)
Picture Naming	45.3 (sd=10.4)	48.66 (sd=10.21)
Early number concepts	Not available	48.75 (sd=8.20)
Pattern construction	Not available	48.40 (sd=10.98)
Total score (GCA composite)	91.6 (sd=14.0)	96.73 (sd=14.51)
Total non verbal score (SNC)	93.6 (sd=13.0)	Not available

As at entry to primary school it is again necessary to identify children ‘at risk’ in terms of cognitive attainment *after* age correction, because children vary considerably in the age at which they enter primary school. Table 1A.35 shows the correlation between children’s raw BAS assessment scores and age in months at assessment. The association is strongest for the two non-verbal assessments, followed by Early number concepts ($r=0.36$) and the Pre-reading measure ($r=0.29$). This finding has important implications for early years teachers. Age is not always taken into account in teachers’ day-to-day interactions with very young children. There is evidence in the literature to suggest that younger children are more likely to be labelled as having an educational need. For example, Croll and Moses (1985) found two-thirds (66.7%) of pupils nominated by teachers as poor readers were born in the summer term, and this nomination did not relate to their standardised test performance. Likewise, Mortimore et al. (1988) have shown that term of birth influenced teachers’ judgements of primary pupils’ ability, with summer born pupils rated as of lower ‘ability’ than their older autumn born classmates.

¹² Six subscales make up GCA at this age range: Verbal comprehension and Naming vocabulary (verbal ability), Picture similarities and Early number concepts (pictorial reasoning ability) and Pattern construction and Copying (Spatial ability). The EPPE/EPPE-E dataset only has Copying scores for a minority of children, so GCA is calculated on the five remaining scales.

Table 1A.35 Correlation between Raw and Standardised cognitive scores and pupil's age in months when assessed at entry to primary school

	Raw score	Nationally standardised score	Internally Standardised score
Verbal Comprehension	0.24** (n=2727)	-0.03 (n=2717)	0.01 (n=2717)
Picture Similarities	0.38** (n=2733)	-0.01 (n=2715)	0.02 (n=2715)
Picture Naming	0.25** (n=2725)	0.07** (n=2723)	0.03 (n=2723)
Pattern Construction	0.38** (n=2835)	-0.06** (n=2711)	0.02 (n=2711)
Early Number Concepts	0.36** (n=2711)	0.00 (n=2585)	-0.01 (n=2585)
Phonological awareness	0.25** (n=2705)	Not available	0.01 (n=2705)
Letter recognition	0.26** (n=2711)	Not available	-0.02** (n=2711)
Pre-reading composite	0.29** (n=2705)	Not available	0.01 (n=2705)

** Significant at the 0.01 level

N.B. National norms for Phonological awareness and Letter recognition are not available

Characteristics of 'at risk' pupils for cognitive attainment at entry to primary school

When national standards related to cognitive attainments are applied to the EPPE sample a larger proportion of children are identified as 'at risk' than using the more stringent cut off based on one standard deviation below the sample average, although this difference is less marked than at entry to pre-school. The measures of non-verbal skills provide a fairer assessment of the cognitive skills of children who do not speak English as their first language.

• Gender

'At school' studies reveal that gender differences in attainment are stronger in some curriculum areas e.g. reading and English than others, such as maths and science. Regional Baseline assessment schemes in England at entry to reception classes have also identified some gender effects (Sammons and Smees, 1998). At pre-school entry, gender was found to be related to cognitive 'at risk' status. The follow up, at primary school entry, also shows that higher numbers of boys than girls were identified as 'at risk' in all categories. Moreover, the gender gap in terms of percentage 'at risk' was slightly larger than that found at entry to pre-school. In the total sample 20.2% of boys were identified as 'strong cognitive risk' (GCA 1 sd below sample mean) but only 15.5% of girls. The table below shows the gender balance for children who were identified as 'at risk' at entry to school.

Table 1A.36 Gender and percentage of pupils identified as at 'cognitive risk' at entry to primary school

	All children	Cognitive risk	Strong Cognitive risk	Pre-reading risk	Early Number risk
Male	52.5	59.1	59.3	60.7	59.9
Female	47.5	40.9	40.7	39.3	40.1

• Ethnic group

In general children from ethnic minority groups were slightly over-represented in the cognitive 'at risk' categories at school entry. This was most marked for Pakistani and Bangladeshi children. Such differences are likely to reflect both the verbal components of two of the BAS sub-scales, and the higher incidence of socio-economic disadvantage affecting such families. It is notable however, those children from Black Caribbean group were under-represented in several of the cognitive 'at risk' categories, particularly in terms of pre-reading skills. Children of Mixed heritage were also proportionately under-represented in the 'at risk' group for Pre-reading.

Analyses of children's cognitive progress over the pre-school period indicate that certain ethnic minority groups (e.g. Black Caribbean and Black African) make greater cognitive gains than predicted given their attainment at entry to pre-school (see EPPE Technical Paper 8a). These differences in the proportions of some groups of children identified as 'at risk' in terms of low cognitive scores point to the importance of using a range of measures in assessing young children at school entry. Some measures may also be of greater predictive value in terms of likelihood of SEN or specific learning difficulties and more relevant to future attainment in core subjects such as English and maths.

Table 1A.37 Ethnic background and percentage pupils identified as 'at risk' in cognitive assessments at primary school entry

	All children		Cognitive risk		Strong Cognitive risk		Pre-reading risk		Early Number risk	
	%	n	%	n	%	n	%	n	%	n
White UK heritage	75.9	2052	61.1	330	57.7	254	78.2	356	66.5	323
White Euro h/tage	3.8	103	6.5	35	6.6	29	5.7	26	4.9	24
Black Carib h/tage	4.0	109	3.7	20	4.1	18	2.6	12	3.3	16
Black African h/ta	2.2	60	4.1	22	4.3	19	1.3	6	3.7	18
Black – Other	0.7	19	1.1	6	0.9	4	0.2	1	0.4	2
Indian	1.8	50	2.2	12	2.7	12	1.1	5	1.9	9
Pakistani	2.1	58	7.4	40	9.1	40	3.5	16	7.4	36
Bangladeshi	0.7	18	2.2	12	2.0	9	1.1	5	1.6	8
Chinese	0.2	5	0.7	4	0.9	4	0.2	1	0.4	2
Other	1.8	49	3.3	18	3.4	15	0.7	3	2.1	10
Mixed heritage	6.6	179	7.4	40	8.0	35	5.3	24	7.8	38
White non Euro	0.1	2	0.0	0	0.0	0	0.0	0	0.0	0
Unknown	0.0	0	0.2	1	0.2	0	0.0	0	0.0	0

• First language

More children who do not use English as their first language (EAL) were included in each of the 'at risk' groups for cognitive assessments at entry to primary school. This is similar to the pattern identified at pre-school entry. The differences were most marked for the strong cognitive risk in terms of GCA score. Interestingly, children who do not use English as a first language were much less likely to be low scorers in terms of their Pre-reading skills than in other areas (e.g. under one in ten as many of the 'at risk' group for Pre-reading spoke English as a second language, in comparison with one in five for strong risk at GCA).

It should be noted that children who have English as an additional language began pre-school significantly later than children whose first language was English and also differed in socio-economic characteristics. In terms of GCA there was no evidence of a closing of the gap in cognitive attainment in terms of the proportion in the 'at risk' group by primary school entry. Nonetheless, evidence from the 'home sample' (which will be reported in EYTSN Technical Paper 2) indicates that EAL children who do not experience pre-school are at a much *greater* cognitive disadvantage when they start school.

Table 1A.38 Child's language and percentage of pupils identified as 'at risk' in cognitive assessments at entry to primary school

	All children	Cognitive risk	Strong Cognitive risk	Pre-reading risk	Early Number risk
English	92.6	81.5	78.6	90.5	83.7
English as an additional lang	7.4	18.6	21.4	9.5	16.2

• Age at entry to target pre-school

Age at entry to the target pre-school was shown to relate to higher cognitive scores at age 3+ years, even when differences in other child, parent and home environment factors are controlled (see EPPE Technical Papers 2 and 7). Interestingly, there were no significant differences for the cognitive 'at risk' groups in age at entry to primary school. The average for primary school entry, 4 years and 9 months (57 months, sd 3.7).

Analyses of children's cognitive progress up to primary school entry indicates that the 'dose' of pre-school (period of time in months over which children attend pre-school) has a positive impact, taking account of other factors (such as Socio-Economic Status [SES], EAL status mother's qualifications, home learning environment, etc.). In combination with evidence about the lower cognitive attainments of 'home children' we can conclude that pre-school tends to boost young children's cognitive development and a larger 'dose' reduces the risk of low cognitive scores by the time children join primary school.

Table 1A.39 Age at starting pre-school centre and percentage of pupils identified as 'at risk' in cognitive assessments at entry to primary school

Age in months	All children	Cognitive risk	Strong Cognitive risk	Pre reading risk	Early Number risk
Average age in months – entry to pre-sch	35.1	36.3	37.1	36.6	36.7
0–12	6.5	3.3	3.0	3.5	3.5
13–24	6.0	5.7	5.0	6.4	5.3
25–36	34.3	33.1	32.7	29.9	32.1
37–48	45.5	52.6	51.1	53.2	50.6
Above 48	7.7	5.2	8.2	7.0	8.4
unknown	0.0	0.0	0.0	0.0	0.0
Average age in months – entry to primary sch	60.0	56.8	57.2	56.8	57.1

• Family size

In line with findings at entry to pre-school, the relationship between family size and young children's cognitive attainments remains very stable for all measures at entry to primary school. By the time they join primary school, there is still a greater 'risk' of low cognitive attainment for children from larger families (only children have a reduced risk). As noted earlier, family size is related to parents' SES and qualification levels.

Table 1A.40 Family size and percentage pupils identified 'at risk' on cognitive assessments at entry to primary school

No of siblings	All children	Cognitive risk	Strong Cognitive risk	Pre reading risk	Early Number risk
0	21.3	17.4	17.0	17.4	16.3
1–2	64.4	61.4	61.6	60.6	61.3
3+	11.5	18.5	19.2	19.5	19.7
Unknown	1.2	2.6	2.2	2.4	2.7

• Prematurity and low birth weight

Children reported by their parents as being born prematurely were over-represented in each of the cognitive 'at risk' groups at entry to the pre-school study (age 3+ years). Analyses of their attainments at primary school entry confirm that there remains a significant link with lower attainment and over-representation in the cognitive 'at risk' groups. The difference is most noticeable for the GCA measure. Children identified as 'at risk' had significantly lower birth weights than those not identified using all four classifications.

Table 1a.41 Prematurity, birth weight and percentage pupils identified at cognitive risk at entry to primary school

Prematurity	All children	Cognitive risk	Strong Cognitive risk	Pre reading risk	Early Number risk
Yes	16.1	19.6	20.5	19.1	19.3
No	82.4	78.0	77.7	78.9	77.8
Unknown	1.5	2.4	1.8	2.0	2.9
Average weight in grams	3318.3	3149.4	3136.5	3173.1	3164.7
Fetal Infant	1.3	1.5	1.6	1.1	1.4
Very low birth weight	1.4	2.0	2.3	1.5	1.6
Low birth weight	6.7	10.0	10.0	9.9	9.1
Normal birthright range	89.0	82.0	82.0	83.5	83.1
Unknown	1.4	4.4	4.1	4.0	4.7

• Mother’s highest qualification level

We have already demonstrated a strong link between mothers’ educational level and young children’s cognitive attainments at entry to pre-school. This is also a factor which has been shown to remain significant, using value added analyses of children’s cognitive progress over the pre-school period. Those children whose mothers have a degree or above showing greater progress compared with those children whose mothers have no qualifications (EPPE Technical Paper 8a). A significantly larger proportion of children in each of the cognitive ‘at risk’ classifications had mothers who reported they had no educational qualifications. The difference is particularly marked for the ‘strong cognitive risk’ group. The increased risk of low cognitive attainment associated with maternal lack of qualifications therefore remains stable during the pre-school period.

Table 1A.42 Mother’s highest qualification level and percentage of pupils identified as at cognitive risk at entry to primary school

	All children	Cognitive risk	Strong Cognitive risk	Pre reading risk	Early Number risk
None	17.1	32.2	35.5	30.8	34.2
16yr vocational	2.1	3.0	2.7	2.9	2.1
16 academic	37.2	36.3	35.7	40.0	33.7
18 vocational	13.1	13.0	11.4	13.6	14.0
18 academic	8.8	6.1	6.4	5.3	6.0
Degree or equivalent	13.2	4.4	4.1	4.4	5.6
Higher degree	4.6	0.7	0.9	0.2	0.8
Other professional	0.7	0.4	0.7	0.0	0.4
Other miscellaneous	0.9	0.6	0.0	0.0	0.0
Unknown	2.3	3.3	2.7	2.9	3.3

• Mother’s employment status

A larger percentage than the overall population of children in all the cognitive ‘at risk’ categories had mothers who were not employed, and a lower percentage had mothers working (either part time or full time). This is very much in line with the pattern found at entry to target pre-school. It must be noted that employment status is strongly related to SES and mother’s qualification levels. The value added analyses of children’s progress over their time in pre-school do not find any statistically significant relationship with mother’s employment status, in other words the attainment gap does not increase or decrease.

Table 1A.43 Mother's employment status and percentage of pupils identified 'at risk' in cognitive assessments at entry to primary school

	All children	Cognitive risk	Strong Cognitive risk	Pre reading risk	Early Number risk
Not employed	46.8	62.2	65.0	60.4	61.5
Employed full time	16.1	10.6	9.3	9.2	8.8
Employed part time	30.7	21.5	20.2	26.4	24.1
Self employed	4.2	2.4	2.5	1.1	2.3
Combination*	0.4	0.2	0.2	0.2	0.2
Other	0.0	0.0	0.0	0.0	0.0
Unknown	1.8	3.1	2.7	2.6	3.1

* Part time and self employed

• Social class of father's occupation

It can be seen that the father's occupational level is still associated with cognitive attainment with a smaller percentage of the children in the 'at risk' categories having fathers in the occupations classified as non-manual class I and II . By contrast, a higher proportion of children in 'at risk' categories had fathers in semi- or unskilled manual work. Also, it is notable that proportionately more of the 'at risk' group were recorded as 'father absent'. This pattern remains very similar to that identified at entry to the pre-school study, although the relative advantage of the non-manual group (I and II) has slightly increased, while the percentage of children whose fathers are absent in the strong cognitive risk group has risen slightly.

Table 1A.44 Father's occupation level and percentage of children identified as at cognitive risk at entry to primary school

	All children	Cognitive risk	Strong Cognitive risk	Pre reading risk	Early Number risk
Professional	8.5	1.9	1.4	1.1	3.1
Other professional	19.4	10.0	9.8	10.5	9.9
Skilled non man	12.3	11.5	10.2	9.9	10.1
Skilled manual	22.7	23.1	21.6	25.3	22.6
Semi skilled	11.3	16.1	16.8	15.4	17.5
Unskilled	2.2	3.5	4.3	4.6	4.3
Never worked	0.8	0.9	1.6	0.9	1.0
Father absent	21.1	30.6	32.5	30.3	29.0
Unknown	1.4	2.4	1.8	2.0	2.5

• Father's employment status

The relationship between father's employment status and 'at risk' status remained very stable across the pre-school period. A significantly lower percentage of children in the Strong cognitive risk group had fathers in full time work (only 35.0% compared with 52% for all children in the sample).

• Mother's marital status

As at entry to pre-school the analysis of scores at the start of primary school indicate that children in the most commonly reported group (married live with spouse) were somewhat less likely to be in the lowest scoring 'at risk' groups for each cognitive outcome, the difference being most noticeable for pre-reading. Children whose mothers indicated they were 'never married single parent' were somewhat over-represented (20.2% of those in the strong cognitive risk group compared with 13.8% in the sample as a whole). As with all the child and parent characteristics considered here, there are associations between factors. Other analyses suggest the link between one parent family status and cognitive attainment is linked with differences in SES and mother's educational qualification. (See EPPE Technical papers 2, 7, 8a and 8b).

Table 1A.45 Marital status and percentage pupils identified at cognitive risk at entry to primary school

	All children	Cognitive risk	Strong Cognitive risk	Pre reading risk	Early Number risk
Never married, single parent	13.9	18.5	20.2	19.6	18.7
Never married, living with partner	14.6	13.9	14.3	16.5	15.6
Married, live with spouse	58.9	51.3	49.5	48.6	50.8
Separated/divorced	10.4	13.1	13.9	12.7	11.7
Widow/widower	0.1	0.6	0.0	0.2	0.0
Other	0.5	0.0	0.2	0.4	0.4
Unknown	1.5	2.6	1.8	2.0	2.7

•Home environment characteristics of ‘at risk’ children

Earlier analyses on the EPPE sample show a strong net impact for individual measures related to children’s home learning environment and children’s cognitive attainments at entry to pre-school, even after control for the influence of parent’s SES and mother’s educational level. In the previous sub-section of this paper the relationships between cognitive ‘at risk’ status and a composite home learning environment scale were explored.

Young children identified as being ‘at risk’ had significantly lower home learning environment scores than those not identified using all four classifications. Children with the lowest home learning scores (0–13) were much more likely to be categorised as ‘at risk’ than children with higher scores. In all, nearly a quarter of children identified as at strong cognitive risk had the lowest scores in terms of home learning environment, although less than one in ten of the whole sample were in the lowest home environment group. This relationship is very similar but somewhat stronger than that identified at entry to pre-school (age 3+ years). Value added analyses of children’s progress over pre-school indicates that a more positive home learning environment is related to greater gains when the impact of other child, parent and family factors is controlled (EPPE Technical Paper 8a). We can conclude that the absence of a positive home learning environment adversely affects progress and increases the risk of poor cognitive attainment.

Table 1A.46 Home learning environment and percentage of pupils identified as at cognitive risk at entry to primary school

	All children	Cognitive risk	Strong Cognitive risk	Pre reading risk	Early Number risk
Mean home learning score	23.6 (sd=7.5)	19.2 (sd=7.5)	18.8 (sd=7.4)	19.9 (sd=7.7)	19.6 (sd=7.8)
0–13	8.6	21.3	24.5	19.8	21.8
14–19	20.6	31.1	29.8	26.4	27.8
20–24	23.6	18.7	19.1	23.5	19.1
25–32	32.2	20.9	19.5	22.4	23.7
33–45	12.2	3.3	2.7	4.6	3.5
Unknown	2.8	4.7	4.4	3.3	4.1

• Frequency child plays with friends

Children whose parent reported that they never play with friends elsewhere or by contrast, those who play with them frequently (5–7 times a week outside the home) are over-represented in all the cognitive ‘at risk’ categories. Children who play with friends 1-2 times a week are under-represented. It is particularly notable that the percentage of children whose parents reported at age 3+ years that they **never** played with friends elsewhere (just under a third of the sample) were more likely to be in the strong cognitive risk group at entry to primary school (58.2% of this group were reported never to play with friends elsewhere). The impact was somewhat less noticeable for Pre reading and Early Number Concepts ‘at risk’ groups. Playing with friends elsewhere 1–2 times a week was related to a reduced risk of low cognitive scores. Children reported never to play with friends outside the home had a significantly increased risk for GCA than was the case at pre-school entry.

Table 1A.47 Playing with friends and percentage of pupils identified as at cognitive risk at entry to primary school

	All children	Cognitive risk	Strong Cognitive risk	Pre reading risk	Early Number risk
Never	32.9	41.2	58.2	37.9	39.4
Occasionally	4.0	1.9	1.6	2.2	1.6
1–2 times a week	43.7	32.0	32.7	31.9	33.1
3–4 times a week	10.4	12.2	12.3	14.3	11.7
5–7 times a week	7.4	9.6	9.3	10.8	10.9
Unknown	1.6	3.1	2.3	2.9	3.3

Multiple disadvantage and cognitive ‘at risk’ status at school entry

In the first part of this report we showed that children who experienced multiple disadvantage were much more likely to be in the cognitive ‘at risk’ categories at entry to the pre-school study age 3+ years. It is relevant to know whether the impact of multiple disadvantage remains similar at primary school entry or whether it shows a stronger or weaker association with cognitive ‘at risk’ status. In our sample, 23.5% of children experienced none of the indicators of disadvantage selected. This group was much less likely to be identified as at ‘strong cognitive’ risk at entry to primary school (only 8.4% of children in this group experienced none of the disadvantage factors). By contrast, those experiencing 5 or more factors (only 5.5% of all children in the EPPE sample) formed 16.6% of those identified as at ‘strong cognitive’ risk at entry to primary school. This is three times higher than expected. These data confirm that multiple disadvantage remains an important risk indicator for low cognitive attainment during the early years. The association between multiple disadvantage and ‘at risk’ status is revealed to be most important for strong risk on GCA.

Table 1A.48 Multiple disadvantage and percentage of pupils identified as 'at risk' in cognitive assessments at entry to primary school

Number of factors	All children		Cognitive risk	Strong cognitive risk	Pre reading risk	Early number risk
	%	n				
0	24.2	626	9.0	8.4	9.2	11.1
1–2	50.0	1293	30.8	37.6	46.3	38.2
3–4	21.0	544	36.2	37.4	33.8	36.5
5+	4.9	127	14.0	16.6	10.7	14.3
Mean MD score	1.67(sd=1.46)		2.65 (sd=1.63)	2.82 (sd=1.66)	2.46 (sd=1.56)	2.62 (sd=1.67)

Of the children experiencing five or more multiple disadvantage factors over 54 per cent were at strong cognitive risk in terms of general cognitive ability (i.e. 1 sd below sample mean GCA). However, the impact of multiple disadvantage was rather less marked for the pre-reading measure for the same group of children. Of those experiencing 5 or more indicators of multiple disadvantage, just under 38% were in the ‘at risk’ group for Pre-reading (scored 1 sd below the sample mean).

Social behaviour at entry to primary school

For social behavioural development at entry to pre-school children’s class teachers were asked to complete the child social behaviour inventory when they started primary school (usually a reception teacher though in a small number of cases children went straight into year 1). Analyses of teachers’ ratings for individual children in the sample identified six underlying dimensions (or factors related to social behaviour) at school entry: independence and concentration, co-operation and conformity, Peer sociability, anti-social/worried/upset, peer empathy and confidence.

Identifying ‘at risk’ children and characteristics to be investigated

To remain consistent with the earlier analyses of entry to pre-school data, it was decided to look at the Peer sociability and the Anti-social and Worried/upset factor scales to classify children who might be viewed as ‘at risk’ in more detail. Using the criteria of one standard deviation below the mean for the sample as a ‘cut off’ point, 14.6% (375 children) were identified as ‘at risk’ on the mean Anti-social/worried upset scale, and 18.0% on the Peer sociability scale (461 children).

The two social/behavioural ‘at risk’ categories overlap to only a limited extent. We find that fewer than one in five children (17.6%) children classified as ‘at risk’ on the Anti-social/worried/upset dimension were also identified by class teachers’ ratings as ‘at risk’ for Peer sociability. These children represent only 3.2% (81 children in all) of the sample at entry to primary school. This indicates that the assessments are identifying different kinds of behavioural difficulties. In total, more than two-thirds (1813 or 70.6%) of children were not identified as ‘at risk’ for either of the two measures of possible social/behavioural difficulties at entry to primary school.

Table 1A.49 Cross-tabulation of social/behavioural risk classifications for pupils at primary school entry

	Not ‘at risk’	Anti-social/worried/upset risk
Not ‘at risk’	1813 (70.6%)	380 (14.8%)
‘at risk’ for Peer sociability	293 (11.4%)	81 (3.2%)

Child characteristics of social behaviour ‘at risk’ pupils at entry to primary school

• Age and social/behavioural scores

It was important to see whether teachers’ social behavioural assessments of individual children were related to the children’s age because children enter school at different ages depending on their birth date and LEA policies/parents’ preferences. Peer sociability was not found to be associated with children’s age in months but there was a very weak negative correlation between age and Anti-social/worried/upset. This suggests that older children are seen as having more problems with anti-social/worried/upset behaviours than younger children at entry to school.

• Gender

More boys than girls were identified as showing some behavioural difficulties for both Peer sociability and Anti-social/worried/upset categories at primary school entry. The proportion of boys amongst children identified as ‘at risk’ for Peer sociability (54.9%) has decreased from entry to pre-school (61.8% of those identified as ‘at risk’ at entry to target preschool were boys), possibly indicating that pre-school has assisted boys in developing their social skills. Alternatively, this may indicate that primary school provides more opportunities for boys to develop or demonstrate social skills, or that boys develop their social skills at a slightly older age than girls. By contrast, the gender gap in terms of Anti-social/worried/upset is slightly larger at primary school entry than at entry to the pre-school study.

Table 1A.50 Gender and percentage of pupils identified as showing social behavioural risk at entry to primary school

	All children	Anti-social/worried/upset risk	Peer sociability risk
Male	52.3	56.6	54.9
Female	47.7	43.4	45.1

• Ethnic group

The distribution of children identified as 'at risk' in terms of social behavioural difficulties at entry to primary school shows few differences according to ethnic group. Slightly more Pakistani and Bangladeshi children were in the low scoring group for Peer sociability, and slightly more children of mixed heritage were given higher scores in terms of the Anti-social/worried/upset. Children of Black Caribbean origin were not over-represented in the 'at risk' category for this factor, in contrast to the findings at entry to pre-school. Given the relatively small numbers of children in some of the ethnic groups, interpretations must remain tentative, although it appears that ethnicity is not strongly associated with primary teachers' perceptions of social behaviour at this age.

Table 1A.51 Ethnicity and percentage of pupils identified as showing social behavioural risk at entry to primary school

	All children		Anti-social/ Worried/upset risk		Peer sociability risk	
	%	n	%	n	%	n
White UK heritage	76.2	1957	73.1	337	72.5	272
White European her	3.7	94	4.8	22	4.5	17
Black Caribbean heritage	3.7	96	3.5	16	4.3	16
Black African heritage	2.0	52	3.0	14	1.3	5
Black – Other	0.7	18	1.3	6	0.3	1
Indian	1.9	49	1.1	5	1.9	7
Pakistani	2.3	59	1.5	7	3.5	13
Bangladeshi	0.7	18	0.2	1	2.1	8
Chinese	0.2	5	0.2	1	0.5	2
Other	1.9	49	3.5	16	1.9	7
Mixed heritage	6.6	169	7.8	36	7.2	27
White non European heritage	0.0	1	0.0	0	0.0	0
Unknown	0.0	1	0.0	0	0.0	0

• First language

Children whose first language was not English were not more likely to be identified as 'at risk' for Anti-social/anxious behaviour, but proportionately more were in the 'at risk' category for Peer sociability. However, the differences are smaller than at entry to pre-school, and the proportion of EAL children in the Peer sociability 'at risk' group has declined. It is possible that increased fluency in English during the pre-school period and opportunities to interact with more children may account for this change.

Table 1A.52 First language and percentage of pupils at social behavioural risk at entry to primary school

	All children	Anti-social/worried/upset risk	Peer sociability risk
English	92.2	91.3	86.9
English an additional lang	7.8	8.6	13.1

• Age at entry to Pre-school

Although there were indications that an earlier entry to pre-school was associated with slightly increased risk for the factor Anti-social/worried/upset at pre-school assessment (age 3+ years), this was no longer the case at entry to primary school. An older age start to pre-school, however, remains associated with increased risk for poor Peer sociability at primary school entry, in line with findings at age 3+ years.

• Number of siblings

Singleton (only) children (as parents reported at pre-school interview) were likely to show an increased risk of Anti-social/worried/upset behaviour at school entry, but no differences for risk of Peer sociability. Children from smaller families (1–2 siblings) showed reduced risk for both social behaviour factors. It should be noted that the number of siblings may have altered by the time EPPE children moved on to primary school.

Table 1A.53 Number of siblings and percentage of pupils at social behavioural risk at entry to primary school

No of siblings	All children	Anti-social/worried/upset risk	Peer sociability risk
0	21.3	27.6	21.1
1-2	64.1	58.3	60.5
3+	13.3	11.9	17.6
Unknown	1.3	2.2	0.8

• Prematurity

The relationship between prematurity and ‘at risk’ status for social behavioural measures was weaker at primary school entry than was the case at age 3+ years (entry to target pre-school).

Table 1A.54 Prematurity and percentage of pupils at social behavioural risk at entry to primary school

	All children	Anti-social/worried/upset risk	Peer sociability risk
Yes	16.1	18.0	18.4
No	82.5	79.8	80.8
Unknown	1.4	2.2	0.8
Average birth weight in grams	3314.8	3321.8	3208.3

• Mother’s highest qualification level

As at entry to target pre-school there is evidence that children whose mothers have no educational qualifications are at increased risk of social behavioural difficulties for Peer sociability when they join primary school. In addition, such children show a higher representation in the ‘at risk’ group for Anti-social/worried upset (a difference not found at age 3+ years). Children whose mothers had degrees were somewhat under-represented for both ‘at risk’ groups.

Table 1A.55 Mother’s highest qualification level and percentage of pupils at social behavioural risk at entry to primary school

	All children	Anti-social/worried/upset risk	Peer sociability risk
None	17.4	22.6	26.9
16yr vocational	2.1	3.5	1.6
16 academic	37.0	32.5	33.6
18 vocational	13.0	13.7	12.3
18 academic	8.8	9.5	7.2
Degree or equivalent	13.3	9.3	12.3
Higher degree	4.5	4.8	4.0
Other professional	0.7	0.4	0.5
Other miscellaneous	0.7	0.4	0.0
Unknown	2.4	3.3	1.6

• Mother’s employment status

The associations between mother’s employment status and social behavioural risk at entry to primary school remain very similar to the patterns identified at entry to the study age 3+ years. Children whose mothers reported they were not employed show a higher risk than others in terms of Peer sociability. Interestingly, children whose mothers work part time show lower risk for Ant-social/worried/upset behaviour.

Table 1A.56 Mother's employment status and percentage of pupils at social behavioural risk at entry to primary school

	All children	Anti-social/worried/upset risk	Peer sociability risk
Not employed	46.3	49.0	57.1
Employed f/t	16.3	17.1	11.2
Employed p/t	30.9	25.8	25.1
Self employed	4.2	5.2	4.3
Combination*	0.4	0.2	0.8
Other	0.0	0.0	0.0
Unknown	1.8	2.6	1.6

* Part time and self employed

• **Social class of father's occupation**

The link between father's SES and young children's social behaviour is fairly weak. The patterns identified at entry to pre-school remained fairly stable at primary school entry. Children with absent fathers are slightly over-represented in the Anti-social/worried/upset risk categories. Those with fathers in non-manual work (class I and II) are slightly under-represented in both social behavioural 'at risk' groups.

Table 1A.57 Social class of father's occupation and percentage of pupils at social behavioural risk

	All children	Anti-social/worried/upset risk	Peer sociability risk
Professional	8.5	7.4	5.9
Other professional	19.4	17.1	16.8
Skilled non manual	12.3	11.7	12.3
Skilled manual	23.2	21.3	21.9
Semi skilled	11.4	10.6	14.9
Unskilled	2.1	3.0	2.4
Never worked	0.8	0.9	1.6
Father absent	22.3	25.6	23.5
Unknown	1.4	2.4	0.8

• **Father's employment status**

Children whose fathers were in full time employment were under-represented in the group of children identified as showing poorer Peer sociability and more so for Anti-social/worried/upset tendencies. The relationship for Peer sociability is stronger at entry to primary school than at pre-school.

Table 1A.58 Father's employment status and percentage of children at social behavioural risk (at entry to primary school)

	All children	Anti-social/worried/upset risk	Peer sociability risk
Not employed	8.5	9.3	17.3
Employed full time	19.4	50.5	46.4
Employed part time	12.3	1.5	2.7
Self employed	23.2	10.2	9.3
Combination*	11.4	0.0	0.5
Father absent	20.7	26.2	22.9
Unknown	1.3	2.2	0.8

* part time and self employed

• **Marital status**

As at entry to pre-school, there were some indications that children whose mothers were 'single parents who never married' were at slightly higher risk in terms of Anti-social/worried/upset behaviour. Children from the largest numerical group (married live with spouse) showed a slightly reduced risk of Anti-social/worried/upset behaviour at entry to primary school, this tendency was more evident than at entry to pre-school. There were no significant associations for Peer sociability.

Table 1A.59 Marital status and percentage of pupils at social behavioural risk at entry to primary school

	All children	Anti-social/worried/upset risk	Peer sociability risk
Never married, single parent	13.4	17.8	14.7
Never married, living with partner	14.6	16.3	14.1
Married, live with spouse	59.5	51.2	57.9
Separated/divorced	10.4	11.7	11.5
Widow/widower	0.2	0.0	0.3
Other	0.5	0.7	0.8
Unknown	1.5	2.4	0.8

• **Home learning environment**

The home learning environment scale has already been found to have a positive relationship with incidence of Peer sociability and Anti-social/worried/upset behaviour at entry to target pre-school, especially for Peer sociability. In this paper differences were found for the social behaviour ‘at risk’ groups at age 3+ years. A very similar pattern remained evident at entry to primary school. A more positive home learning environment is associated with a reduced risk of poor social behaviour, as well as with better cognitive outcomes.

Table 1A.60 Home learning environment and percentage of pupils at social behavioural risk at entry to primary school

	All children	Anti-social/worried/upset risk	Peer sociability risk
Mean home learning score	23.6 (sd=7.6)	22.3 (sd=8.0)	21.9 (sd=7.6)
0–13	8.5	12.1	13.9
14–19	21.0	23.0	22.7
20–24	23.3	24.1	24.3
25–32	31.8	26.0	29.3
33–45	12.5	10.5	8.0
Unknown	2.8	4.3	1.9

• **Frequency child plays with friends**

Children whose parents reported at interview that they never play with friends elsewhere are more likely to be found in the ‘at risk’ classification for Peer sociability at entry to pre-school and after they join primary school. In addition, at primary school these children show a slight increase in ‘at risk’ status for Anti-social/worried/upset. By contrast, children who were reported to play with friends elsewhere 1–2 a week were somewhat under-represented in the ‘at risk’ groups.

Table 1A.61 Playing with friends and percentage of pupils at social behavioural risk at entry to primary school

	All children	Anti-social/worried/upset risk	Peer sociability risk
Never	32.8	37.9	41.7
Occasionally	3.9	4.8	2.9
1–2 times a week	43.9	39.7	36.8
3–4 times a week	10.4	10.8	10.4
5–7 times a week	7.4	8.5	6.9
Unknown	1.6	2.4	1.3

Multiple disadvantage and social/behavioural ‘at risk’ status at primary school entry

Social/behavioural outcomes have a weaker relationships with children’s background characteristics than is the case for cognitive outcomes, in this analysis of ‘at risk’ categories (in line with overall findings reported in EPPE Technical Paper 7). Relationships between the incidence of multiple disadvantage and young children’s social behavioural development at the start of primary school were also investigated.

We found that multiple disadvantage shows a significant association with increased risk of behaviour difficulties for Peer sociability in line with findings at entry to pre-school. In addition, at school entry there are indications that multiple disadvantage is now beginning to show a significant association with increased risk of Anti-social/worried/upset behaviour.

Table 1A.62 Multiple disadvantage and percentage of pupils identified as at social behavioural risk at entry to primary school

Number of factors	All children		Anti-social/worried/upset risk	Peer sociability risk
	%	n		
0	24.3	598	19.9	16.9
1-2	50.0	1225	50.2	45.3
3-4	20.6	505	22.3	27.8
5+	5.0	123	7.7	10.1

Relationships between pupils' cognitive and behavioural 'at risk' classifications at entry to primary school

We investigated whether young children with low attainments in terms of their cognitive assessments at primary school entry are perceived by their primary class teachers as having more behavioural problems. Roughly one-quarter of those identified as 'at risk' for cognitive development were also identified by teachers as showing difficulties with Anti-social/worried/upset behaviours. At primary school the relationship between cognitive risk status and difficulties related to Peer sociability was stronger than we had found at entry to the pre-school study. In all, 39.2% of those at cognitive risk (1 sd below national mean) were also rated as showing poor behaviour for Peer sociability (at pre-school entry the figure was only 25.4%). This represents 135 children in all (5.6% of the total sample).

Table 1A.63 Cross-tabulation of social behavioural and cognitive risk classifications at entry to primary school

	'at risk' cognitive	n and % of overall sample 'at risk' on both		% of those 'at risk' on cognitive also at risk on social behavioural development
		%	n	%
Anti-social/worried/upset risk	Cognitive	5.2	126	28.6
	Strong cognitive	4.3	110	24.0
	Pre reading	3.8	96	21.1
	Early Number	4.3	109	23.7
Peer sociability risk	Cognitive	5.6	135	39.2
	Strong cognitive	4.8	122	32.9
	Pre reading	4.4	111	30.0
	Early Number	4.8	123	33.2

It is important to note that only a small minority of children are identified as 'at risk' for both behavioural and cognitive measures at primary school entry. Such children may be considered to have the greatest likelihood of showing some form of SEN in future. Between 38-50% of the children identified on the cognitive classifications are found to be 'at risk' on at least one of the behavioural 'at risk' classifications, but only a tiny percentage of the overall sample were identified as showing difficulties in terms of both behavioural dimensions and also in cognitive development (around 1%)

Table 1A.64 Cross tabulation of cognitive ‘at risk’ status and multiple behavioural risk at entry to primary school

	Cognitive risk		Strong cognitive risk		Pre reading risk		Early number risk	
	%	n	%	n	%	n	%	n
Not ‘at risk’ on either behavioural	12.1	312	9.2	237	10.6	274	11.0	284
‘At risk’ for either behavioural	8.9	228	7.9	203	7.0	181	7.8	202
‘At risk’ for both behavioural	1.3	33	1.1	29	1.0	26	1.2	30
Valid total N ‘at risk’ for cognitive measure		573		459		481		516

N.B. Percentages of overall valid sample shown

SECTION 1B Analysis of the distribution of ‘at risk’ children across different types of pre-school providers

The data used for this section of the report comes from semi-structured interviews with 140 pre-school managers conducted between October 1997 and December 1998 in 5 regions (six local authorities) in England. The definition of a centre manager used here, was the member of staff who had overall day-to-day responsibility for the pre-school setting.¹³ The interviews explored a range of practices within the centres, and there were several questions on the interview schedule which were relevant to the early identification and provision for young children who could potentially be ‘at risk’ of SEN.¹⁴

The current debate about moving towards ‘inclusive’ experiences for special needs children assumes rigorous and reliable identification, followed by sensitively designed programmes which match needs with provision. Without early identification by pre-school workers and the ability to identify appropriate action to ensure that needs are met, the implementing of ‘inclusive’ education and care can not take place.

SEN children reported ‘on roll’

In order to explore the extent to which centres in our sample catered for special needs centre managers were asked a number of questions about early identification. The most obvious question was whether or not managers currently had children enrolled in their centres with ‘special educational needs’. The term ‘special educational needs’ was deliberately chosen to cover a wide spectrum of ‘needs’ which went beyond the narrow definition of ‘handicapped’, physical disability or those with an SEN statement, to cover less obvious SEN such as cognitive and social/behavioural aspects.

Table 1B.1 Whether centre has any special needs children on roll (reported by centre managers) and pre-school type

Any SEN children on roll	Nursery Classes	Playgroup	Private Day nursery	Local Authority	Nursery schools	Combined centres
Centre managers perception of SEN children on roll	83.3% (n=24)	52.9% (n=34)	67.7% (n=31)	91.7% (n=24)	100% (n=20)	100% (n=7)
% of children in centres identified as at strong cognitive risk	80.0% (n=24)	79.4% (n=34)	54.8% (n=31)	91.7% (n=24)	95.0% (n=20)	100% (n=7)

Over three-quarters (77.1%) of centre managers reported that they currently had children on roll with some type of ‘special need.’ The extent to which managers reported the presence of special needs children in their centre differed significantly across type of setting (see above). Managers in the maintained sector (nursery classes, local authority day centres, nursery schools and combined centre provision) reported higher incidences of having children with some type of special need (80+%). The rates of reporting were lower in private day nurseries (67.7%), and lowest of all in playgroups (52.9 %).

¹³ In nursery schools it was usually the head teacher. In nursery classes it would usually be the teacher in charge of the nursery unit rather than the head teacher of the primary or infant school. In private day care settings the interviews were conducted with the manager who was usually, though not always, the senior worker. In playgroups the senior worker was interviewed, often speaking on behalf of a management group. In local authority day care and combined centres the interviews were conducted with the head/manager of the centre. Full details of the results of centre managers’ interviews are reported in EPPE Technical Paper 5.

¹⁴ Manager interview data were collected for 140 of the 141 centres in the study.

It is conceivable that the extent to which any pre-school centre manager and staff are sensitive to early SEN detection may be associated with the numbers of SEN children they recruit and therefore the exposure they have to SEN in young children. It might also be hypothesised that the greater number of 'at risk' children, the more time and resource constraints there are in the system for the identification of special needs. In order to explore these possibilities further we examined whether there was an association between the proportion of 'at risk' children within the centre (as identified by EPPE cognitive and social/behavioural measures) and the managers' reports of whether they had any children with SEN currently on roll. Using the EPPE measures we found that centres varied quite markedly with respect to the proportion of 'at risk' children within them. For analysis purposes we grouped centres within the categories of having proportions of 'at risk' children in the EPPE child sample enrolled under each of the four 'at risk' definitions outlined earlier (national cognitive risk, strong cognitive risk, Peer sociability risk, Anti-social/worried upset risk).

“few”	“some”	“more”
Under 10%	11-24%	25+%

Identification of cognitive 'at risk' and concentrations of SEN children

Comparisons of the two sets of data suggests that there are a number of children who appear to fall within an 'at risk' group (either as identified by the EPPE cognitive and social/behavioural development measures by the childcare worker) who are not recognised as having SEN by centre managers. The lower half of Table 1B.1 shows the percentage of centres with each provision that had one or more child in the sample classified as the strong cognitive 'at risk' group operationalised by the GCA assessment results at entry to pre-school. It can be seen that, even when behavioural measures are not taken into account, playgroups were less likely to report SEN children on roll even though the majority (79.4%) of playgroups had children in the sample attending who were in the strong cognitive 'at risk' group.

When account is taken of the concentration of cognitively 'at risk' children in the centre and whether managers reported any SEN children on roll no clear patterns emerged. There were suggestions of a trend for centre managers, where only a “few” cognitive risk children were enrolled, to state that they currently did not have special needs children on roll (46.7% compared to 23.2% of centres overall), although the difference just fails to reach statistical significance with this sample of 140 centres. We can conclude therefore, that there is no straightforward link between the proportion of cognitive 'at risk' children in a centre and whether or not SEN is identified. This may suggest that poor cognitive development is not always recognised as constituting a 'need' in some pre-school settings.

Identification of social/behavioural 'at risk' and concentrations of SEN children

The measure of social 'at risk' used for this analysis was 'Peer sociability' as this is an important element of social development which is given considerable importance in many pre-schools. Overall, 77% of centre managers reported that they had children with some form of SEN on roll. Paradoxically, only 60% of centres managers where there were “more” (25+% category) children in the sample categorised as 'at risk' for Peer sociability stated that they enrolled children with special needs. In contrast, 88% of centre managers, with only “some” (11–24% category) 'at risk' children for Peer sociability, said that they had enrolled children with special needs. This finding illustrates that the term 'special needs' is probably understood in very different ways by centre managers and their staff and its definition and meaning is often unclear. Some aspects of potential 'social behavioural' need may not be well recognised.

Children showing difficulties in terms of poor Peer sociability (measured on the ASBI) may not be seen as constituting 'special needs.' There may be implications for raising staff awareness and accessing more appropriate assessments in the early identification of children who show problems with Peer

sociability. Overall, there is no clear link between the proportion of 'at risk' children in a centre for either cognitive or social behavioural measures and the likelihood that managers reported they had SEN children on roll. Further research is needed to explore in depth pre-school staff perceptions of what constitutes SEN and ways such needs may be identified and supported at pre-school if the potential benefits of early intervention are to be maximised.

SEN and enrolment policies

It should be noted that there may be certain characteristics of the private sector and voluntary provision which suggest they were less likely to enrol children with SEN. EPPE case study data taken from a private day nursery supports this view (see Technical Paper 10). In one case study for example, the SEN policy of the centre requires that children with special needs be recognised and their needs addressed. Indeed, the centre does provide a service for a small number of children with special needs. However, the centre does not fully commit to an integrated view of special needs. It states in its SEN policy that *'children should be taught at the nursery as long as we are able to provide suitable teaching and materials for every child'* and that *'it may be necessary for a child with recognised special needs to be placed in a special unit where his/her needs can be more appropriately met'*. Whilst working with outside professionals to support children with special needs, this centre's policy is that it will only do so providing this does not draw disproportionately on the time and energies of the staff.

Children identified as potentially 'at risk' on cognitive development by pre-school type and at two time points

As might be expected given the generally more socio-economically advantaged backgrounds of children attending private day nurseries, this group were the least likely to be identified as 'at risk' of SEN at pre-school entry (21.2%) for the national cognitive risk. Their likelihood as being classified 'at risk' for Peer sociability was also lower on the whole than for children from other types of provision, although not to the same extent.

At entry to the target pre-school it is clear that significantly more children from combined provision were identified as at cognitive risk in national terms (58.0%). Local authority centres (42%) and playgroups (40.7%) also served proportionately more children 'at risk' in national comparisons (see Table 1.B.2). In the light of this trend for playgroups the relatively smaller numbers of playgroup centre managers reporting any children with SEN on roll noted earlier, is rather surprising.

More children in the sample in combined centres were identified in the 'at risk' group for Peer sociability (26.2%), while Local Authority Day nurseries showed the highest percentage at risk for Anti-social/worried upset (28.8%).

Table 1B.2 Distribution of 'at risk' children across pre-school type at entry to pre-school

Entry to pre school	Cognitive risk		Strong cognitive risk		Peer sociability risk		Anti-social/worried/Upset risk	
	%	n	%	n	%	n	%	n
Nursery Class	25.5	148	16.0	93	20.3	119	17.7	104
Playgroup	40.7	242	18.2	108	19.5	119	18.8	114
Private Day	21.2	109	6.8	35	11.3	58	19.4	100
Local Authority	42.0	177	21.1	89	14.1	61	28.8	124
Nursery schools	31.1	161	20.3	105	18.7	96	15.8	81
Combined Centres	58.0	109	39.9	75	26.2	49	22.0	41

By entry to primary school fewer children overall were 'at risk' in national terms for cognitive outcomes (as noted earlier in this report). The proportion was down from one in three to one in five. For the strong cognitive risk classification we find that the proportion of children who attended combined centres at strong risk had fallen from 39.9% to only 24.0% (see Table 1.B.3). For nursery schools it had fallen from 20.3% to 12.9%. However for children from local authority centres the proportion at strong cognitive risk had increased from 21.1% to 23.1%. For nursery classes the proportion at strong cognitive risk had risen from 16.0% to 21.3%. This suggests that some forms of provision (especially combined centres and nursery schools) may be particularly beneficial in boosting the cognitive progress for young children 'at risk' of SEN.

Differences were less marked for social behavioural outcomes although it should be noted that nursery classes and playgroups show a significant drop in the percentages of children classified as 'at risk' for Peer sociability. This suggests that these forms of provision may focus on promoting Peer sociability to a greater extent than other centres.

Table 1B.3 Distribution of 'at risk' children across pre-school type at entry to primary school

Entry to primary school	Strong cognitive risk		Pre-reading risk		Early number risk		Peer sociability risk		Anti-social/Worried/Upset risk	
	%	n	%	n	%	n	%	n	%	n
Nursery Class	21.3	122	19.7	112	22.0	126	14.7	83	15.4	87
Playgroup	16.7	95	19.3	110	19.1	109	11.7	62	18.2	96
Private Day Nursery	4.8	24	8.9	44	7.7	38	12.9	61	17.3	82
Local Authority	23.1	95	20.0	82	23.9	98	16.4	63	24.8	95
Nursery schools	12.9	64	17.1	85	15.6	78	15.7	74	15.3	72
Combined centres	24.0	40	13.4	22	22.2	37	21.6	32	19.6	29

SECTION 1C Patterns of progress and changes in cognitive and social/behavioural development of ‘at risk’ groups across the pre-school period

Movement in and out of ‘at risk’ status from pre-school entry to primary school entry for cognitive and social behavioural measures

An important aim of the EYTSEN study is to investigate the extent of change in ‘at risk’ status as children move from pre-school settings into primary school. The amount of change and the extent to which it is possible to describe the characteristics of children most likely to show persistent ‘at risk’ status for either cognitive or social behavioural development has implications for early identification and intervention of SEN. Table 1C.1 shows the extent of movement for the whole sample across the pre-school period.

Table 1C.1 Movement in and out of ‘at risk’ status from pre-school entry to primary school entry for cognitive and social behavioural measures

	Out of risk		Into risk		Never ‘at risk’		Always ‘at risk’	
	%	n	%	n	%	n	%	n
General cognitive ability	7.8	208	6.3	168	76.4	2046	9.6	256
Pre-reading	10.5	281	10.2	272	72.7	1939	6.6	176
Early number concepts	8.7	233	10.5	281	73.7	1971	7.0	188
Peer sociability	13.2	338	10.9	279	68.9	1757	6.9	177
Anti-social/worried/upset	11.8	308	8.9	227	73.6	1882	5.7	146

It can be seen from the table above that around three-quarters of children in the EPPE sample were not identified as at strong cognitive risk at either entry to pre-school or entry to primary school. By contrast, just under one in 10 (9.6%) were classified as at strong cognitive risk (GCA) on both occasions. Those identified as at strong cognitive risk on both occasions are expected to be more likely to require some form of additional learning support at school and may be identified as having some form of SEN related to learning difficulties. It can also be seen that around one in 10 children had moved into ‘at risk’ status by primary school entry and around the same proportion moved out of ‘at risk’ status for GCA.

For Pre-reading and Early Number Concepts the relationship between those identified as at strong cognitive risk on GCA at entry to pre-school and low attainment for these outcomes at primary school entry is less strong. Only 6.6% were identified as ‘at risk’ on both occasions for Pre-reading, while the figure was 7.0% for Early Number Concepts. It is important to note that young children’s performance varies in different outcomes and subsequent analyses will establish whether low performance in some measures proves to be a better predictor of poor attainment in certain areas of attainment later in primary school. It is possible, for example, that General Cognitive Ability is a poorer predictor of later reading or mathematics results than say prior attainment in Pre-reading or Early Number Concepts at entry to school.

Multiple disadvantage and movement in and out of risk

We explored the characteristics of children who moved in and out of ‘at risk’ status for the strong cognitive risk measure (GCA 1 sd below sample mean) and the two social behavioural measures in terms of our ‘multiple disadvantage’ index. In this way we can see whether children who experienced more disadvantage were most likely to remain ‘at risk’.

The results show that there is a clear difference between the majority of children who comprise the ‘never “at risk”’ group, and those who were identified as ‘at risk’ on both occasions (entry to target pre-school and again at start of primary school). In all 64.0% of those in the ‘always “at risk”’ group experienced three or more disadvantage factors, compared with only 18.3% of those in the ‘never “at risk”’ group. Likewise, under 5% experienced no disadvantage factors compared with a figure of 29.0% for the ‘never “at risk”’ group.

The picture for those moving out of 'at risk' status indicates that these were somewhat less disadvantaged than the 'always "at risk"' group. In all, 41.8% of those who moved out of 'at risk' status experienced three or more disadvantage factors.

For the measures of social behaviour the link with the experience of multiple disadvantage is somewhat weaker than for cognitive outcomes. However, the association with Peer sociability is more noticeable than for Anti-social/worried/upset. Over 52% of children in the 'always "at risk"' group for Peer sociability experienced three or more disadvantage factors, while for those in the 'never "at risk"' group this was the case for only 22.4%.

Tables 1C.2 – 1C.4 Multiple disadvantage and changes in young children's 'at risk' status over the pre-school period

Table 1C.2 Strong cognitive risk (General Cognitive Ability 1 sd below sample mean)

	Moved out of risk		Moved into risk		Never at risk		Always at risk	
	%	n	%	n	%	n	%	n
0	11.2	22	14.8	23	29.0	565	4.7	11
1–2	46.9	92	50.3	78	52.8	1030	31.4	54
3–4	36.2	71	26.5	41	15.9	309	43.6	103
5+	5.6	11	8.4	13	2.4	46	20.4	48

Table 1C.3 Peer sociability risk

	Moved out of risk		Moved into risk		Never at risk		Always at risk	
	%	n	%	n	%	n	%	n
0	17.5	50	21.6	47	27.2	483	10.0	14
1–2	53.8	154	50.4	110	50.3	896	37.9	53
3–4	21.0	60	21.1	46	18.7	333	37.9	53
5+	7.7	22	6.9	15	3.7	67	14.3	20

Table 1C.4 Anti-social/worried/upset risk

	Moved out of risk		Moved into risk		Never at risk		Always at risk	
	%	n	%	n	%	n	%	n
0	26.4	82	19.1	50	25.3	427	21.7	35
1–2	52.0	162	52.6	138	49.7	838	44.7	72
3–4	18.0	56	22.1	58	20.3	341	23.0	37
5+	3.5	11	6.1	16	4.7	79	10.5	17

Children with the following background characteristics were particularly over-represented amongst the group who remained at strong cognitive risk for the General Cognitive Ability measure across the pre-school period (for further details see Appendix 3);

- A higher proportion of boys remained 'at risk' across the pre-school period (61%).
- Home learning showed a particularly strong relationship with staying 'at risk'. Over one-third of children with the lowest home learning scores remained 'at risk' compared with only 2% of children with the highest scores. A similar relationship between home learning and 'at risk' status is also found when we look at children whose mothers have no qualifications, although more children stay at risk in this group. Interestingly, the children who have the poorest home learning environment have similar levels of cognitive risk, irrespective of their mother's highest qualification level (35% of the overall sample compared with 36% of children whose mothers have no qualifications were identified as 'at risk' at both time points).
- Ethnic group and first language are areas with differences between the groups. Children of Pakistani or Bangladeshi heritage had the largest proportions of children remaining 'at risk' (52% and 39% respectively). Higher proportions of Black African and 'other' heritage children also remained 'at risk' (24% and 22% respectively). In total, 31% of children whose first language was not English remained 'at risk' (compared with only 8% of children for whom English is their first language). Although the actual numbers of children in each minority ethnic group are relatively small, the patterns are consistent for

GCA. Interestingly when Pre-reading is considered, the results for specific ethnic groups (especially Black Caribbean) are more positive (see EPPE Technical Paper 8a).

- Mother’s qualifications are associated with remaining ‘at risk’. In total 23% of children whose mother has no qualifications remained ‘at risk’.
- Mother’s and father’s employment status showed a link with staying ‘at risk’ for cognitive outcomes. Those whose mother’s were not working were relatively twice as likely to remain at risk. Of those ‘at risk’ on both occasions, 30% had a father not working, compared with 10% of those never at risk.

Type of provision and change in risk status

There are differences between types of pre-school providers in the proportion of children moving out of risk. As suggested earlier, for cognitive outcomes a number of patterns emerged. Combined centres had the highest percentage of children moving out of risk, followed by nursery schools (tables 1C.5 – 1C.7). Nursery classes had the highest percentage of children moving into risk across all three cognitive outcomes, although playgroups and local authority centres also had high percentages going into risk for Pre-reading and Early Number concepts. Private day nurseries had extremely high percentages of children who were never ‘at risk’ (ranging between 87–90% across the cognitive outcomes). Local authority and combined centres had the highest proportion of persistently ‘at risk’ children (‘always “at risk”’). This reflects the higher levels of disadvantage amongst children in their intakes.

Table 1C.5 Changes in young children's cognitive 'at risk' status across the pre-school period by type of provision

	Moved out of risk (%)	Moved into risk (%)	Never at risk (%)	Always at risk (%)
Nursery class	5.8	10.8	73.2	10.2
Playgroup	7.7	5.9	76.4	9.9
Private day nursery	4.7	2.6	90.4	2.2
Local authority	6.5	8.3	71.0	14.3
Nursery schools	10.7	4.4	76.5	8.5
Combined centres	18.1	3.6	58.4	19.9

Table 1C.6 Changes in young children's 'at risk' status across the pre-school period for Pre-reading by type of provision

	Moved out of risk (%)	Moved into risk (%)	Never at risk (%)	Always at risk (%)
Nursery class	9.1	13.4	71.1	6.4
Playgroup	9.5	11.3	71.0	8.1
Private day nursery	4.5	6.5	86.6	2.4
Local authority	12.3	11.5	67.9	8.3
Nursery schools	12.3	10.3	70.6	6.8
Combined centres	27.6	3.1	59.5	9.8

Table 1C.7 Changes in young children's 'at risk' status across the pre-school period for Early Number Concepts by type of provision

	Moved out of risk (%)	Moved into risk (%)	Never at risk (%)	Always at risk (%)
Nursery class	7.1	14.9	71.0	7.1
Playgroup	9.4	10.3	72.3	8.1
Private day nursery	5.3	4.9	87.2	2.6
Local authority	8.8	14.1	68.0	9.1
Nursery schools	11.4	8.0	72.9	7.6
Combined centres	13.9	12.0	64.5	9.6

For the social/behavioural outcomes across the same time period a number of patterns emerged. Local authority and private day nurseries had the highest percentage of children moving out of the Anti-social/worried/upset 'at risk' group (15.9%), and combined centres and playgroups had the highest percentage of children moving out of the Peer sociability 'at risk' group. (18.8% and 15.0% respectively, see tables 1C.8 – 1C.9). There was little difference across types of pre-school provision in the proportion of children moving into the Anti-social/worried/upset 'at risk' group, although private day nurseries and Local authority had somewhat higher figures, (15.9% and 12.3%). For Peer sociability combined centres had the highest proportion of children moving into risk, but this form of provision also served the most socio-economically disadvantaged intakes, and this may be influential.

Nursery classes and Nursery schools had the highest proportion of children who were never identified as 'at risk' for anti-social behaviour. Local authority and combined centres had the highest proportion of children found to be still at risk for Anti-social/worried/upset behaviour ('always "at risk"', 10.8% and 9.1% respectively), and combined centres and nursery classes have the highest proportion of children rated for Peer sociability as 'always "at risk"' (8.3 and 7.1).

Table 1C.8 Changes in 'at risk' status across the pre-school period for Anti-social/worried/upset behaviour

	Moved out of risk (%)	Moved into risk (%)	Never at risk (%)	Always at risk (%)
Nursery class	11.7	9.4	73.0	5.9
Playgroup	11.6	9.5	70.4	8.5
Private day nursery	15.9	12.3	66.7	5.1
Local authority	17.8	13.9	57.5	10.8
Nursery schools	11.0	10.8	73.8	4.5
Combined centres	11.9	10.5	68.5	9.1

Table 1C.9 Changes in 'at risk' status across the pre-school period for Peer sociability

	Moved out of risk (%)	Moved into risk (%)	Never at risk (%)	Always at risk (%)
Nursery class	13.3	7.6	71.9	7.1
Playgroup	15.0	7.4	73.3	4.4
Private day nursery	8.7	9.7	78.4	3.2
Local authority	7.1	9.7	76.4	6.8
Nursery schools	11.2	9.4	73.0	6.4
Combined centres	18.8	12.5	60.4	8.3

Section Two: To identify pre-school centres policies and practice in relation to the early identification of SEN

Mechanisms used for the identification of and provision for special needs

Given the potential importance of early identification and intervention for children who may have some form of special educational or health need, the EPPE project explored with centre managers the types of systems they had in place to detect and monitor children who may fall within this category. Centre managers were interviewed about a range of features of their provision. Interviews were conducted in 140 of the 141 centres in the study.

Most centre managers (90.7%) said that they had some sort of system for identifying children with special needs but this varied markedly across pre-school type. Centre managers from the whole of the maintained sector reported having systems for identifying children who had special needs. On the other hand, it was rather less likely to find identification systems reported in private day nurseries (77.4%) and playgroups (82.4%). This suggests that some children 'at risk' of special needs may go unnoticed and miss the earliest opportunity for intervention.

The use of systems for the identification of 'at risk' and concentrations of SEN children

There was no significant variation between the proportion (under 10% [few], 11–24% [some], 25+% [more]) of 'at risk' children attending the centres that had systems to identify special needs and those centres that did not have systems. Each of the four 'at risk' groups was just as likely to be found in centres with systems and in those without systems for the identification of special needs. Thus we can conclude that the level of possible need amongst children in a centre did not show a relationship with the use of a system to identify need.

Having established that many pre-school providers do have systems for the identification of special needs, we asked how these systems worked in practice. Table 2.1 shows the systems most likely to be reported as being used by pre-school centres to monitor children who might be 'at risk' of having a special need.

Table 2.1 The frequency of use of different identification systems

Identification system	Number of centres reporting usage	%
Observation schedule	73	52.1
Consult professionals	60	42.9
Consult parent	54	38.6
Use of the code of practice	40	28.6
Checklists/records	28	20.0
Specific person responsible	27	19.3
Development charts	18	12.9
Policy on special needs	11	7.9
Procedure for special needs	7	5.0
Any other	5	3.6
Liaise with special school	3	2.1

Only 13 centres (9.3%) reported having no system. For each identification system, we investigated whether its use depended on the type of pre-school and also whether it was related to the proportion of cognitive and social behaviourally 'at risk' children in the centre. When considering the number of 'at risk' children in the centre, the following categories were used under 10% or '**few**'; 11–24% or '**some**'; and 25+% or '**more**' children.

The use of observation schedules, consulting professionals and consulting parents

According to table 2.1 the three most frequently used identification systems across the 140 school centres were: observation schedules (52.1%), consulting professionals (42.9%) and consulting parents (38.6%). The reported use of each of these systems did not show any differences between the types of pre-school provider.

• Observation schedules

Observation schedules were the most popular identification system (52.1%), across the 140 pre-schools. Observation schedules require the pre-school worker to observe a child in different contexts with different people (play and interaction with peers and adults) and activities (group and solitary) and in different places (playground and classroom; structured versus unstructured). Repeated observations over time can help to focus on a specific area of difficulty that may not be apparent from one observation alone.

The incidence of use of these schedules was similar across the six types of pre-school. The use of schedules was not related to whether centres have a 'few', 'some', or 'more' 'at risk' children. Hence, centres do not appear to be responding to the proportion of children possibly in need in their pre-school by increasing their use of observation schedules. Given the relatively extensive use of observation schedules, reported by managers, a number of interesting issues emerge:

- what are the common kinds of observation schedules in use?
- are certain types of schedules more likely to be used than others?
- what level of detail is contained in different observation schedules?
- how sensitive are observations schedules in picking up cognitive, social/behavioural, physical and emotional 'needs'?
- what kinds of training do staff receive in the administration and interpretation of schedules?

• Consulting professionals

The second most commonly adopted mechanism noted for the identification of children with special needs by pre-school centre managers was to consult 'professionals'. Specialist advice external to the pre-school or school is sought at stage 3 of the Code of Practice (DFE, 1994). This can be from the Educational Psychology Service, an advisory teacher or other Support Services, and includes the use of health visitors, speech therapists, etc.

Whether pre-school centre staff consulted professionals or not (as reported by the manager) did not show any significant association with the type of pre-school provider. We found that the mean percentage of 'at risk' children identified on the grounds of strong cognitive risk are significantly under-represented in centres which say they liaise with professionals. There were no significant differences for the other 'at risk' categories. Again, this finding suggests that centres do not appear to be responding to the proportion of children possibly at risk of SEN need in their pre-school by consulting with professionals.

The use of this as a mechanism, as with the use of observational schedules, raises a number of interesting issues:

- to what extent do pre-school workers have access both formally and informally to specialist professionals?
- what kinds of specialist professionals are most likely to be involved?
- when a concern about a child arises, at what point is a referral enacted?
- how varied are referral procedures, such as the average length of time between referral and the type of 'professional' seeing the child, which determines how *early* the process of identification of special needs begin?
- are any significant regional differences with referrals when other services such as 'health services' rather than educational are involved?

Given the recent emphasis on 'joined up thinking' in services for young children the whole notion of how multi-agencies liaise is an important one. It would be relevant to explore the availability of specialised professionals to pre-school settings in both the maintained and voluntary sectors.

•Consulting parents

Consulting parents was the third most commonly noted system reported by managers as used for identifying children with special needs. Managers from 38.6% of centres reported that they consulted parents to help in the identification of special needs.

There were no differences between types of pre-school in whether parents were said to be consulted. We found that 'at risk' children identified as Anti-social/worried/upset have a significantly lower representation in centres that report that they consult parents. In centres with '**few**' Anti-social/anxious children, managers were more likely to say they consulted parents (57.1%). However, centres with '**more**' Anti-social/worried/upset children were less likely to say they consulted with parents (20.5%), compared with the pattern for centres as a whole (39.1%).

Parental consultation as a method for SEN identification again raises a number of issues about best practice in pre-school settings for fostering 'partnerships' with parents. Given the sensitivity of special needs, pre-school centres need to consider how they can best retain parental co-operation if parents feel a sense of 'blame' for their child's difficulties. For some parents, their child's particular special need may be apparent for the first time only when their child enrolls at pre-school. They may feel that discussions with the centre workers are intrusive or possibly critical of their style of parenting or family circumstance or dynamics. In order to make consultation valid, language and cultural diversity needs to be taken account. This has significant implications for training pre-school centre staff in working with parents.

Methods for identification of 'at risk' which differed by pre-school type

The only significant differences in the use of different types of methods for the identification of 'at risk' across pre-school types were: the use of the code of practice, having a nominated or specific person responsible for special needs (often referred to as a 'special educational needs co-ordinator or SENCO), and having an agreed 'procedure for special needs.'

• Use of the Code of Practice

The Code of Practice (DfE, 1994)¹⁵ gives practical guidance to schools on their responsibilities to children with SEN and also clarifies the school-based assessment stage of the statementing process. The use of the Code of Practice was more common in the maintained sector, though this was less marked for the nursery classes than nursery schools and combined centres.

We explored whether the use of the Code of Practice might vary depending on the proportions of 'at risk' children in different pre-school types. For the strong cognitive 'risk' there was a relatively higher percentage of centres with '**more**' rather than '**few**' of these children that used the Code of Practice (39.3% compared with 19.7%). There was also a similar pattern for centres with '**some**' strong cognitive risk children where over two thirds of nursery schools with '**some**' strong cognitive risk children used the Code of Practice compared with only a third of the sample overall. It seems strong cognitive risk children in nursery schools were well placed if they needed to be identified for special needs.

• The appointment of a SENCO

The SENCO (or appointed special educational needs co-ordinator) has an essential role in the assessment, planning, monitoring and review of those children in identifying and meeting special educational needs. Having an appointed SENCO, and a system which supported them was given very

¹⁵ The centres involved in the EPPE project at this time point would have been following the guidelines of the 1994 Code of Practice.

different emphasis across pre-school types. The incidence of a centre having a SENCO was a strong feature of the majority of combined centres (noted for 5 out of the 7 centres).

Further analyses was conducted to see if proportion of 'at risk' children was associated with the use of a SENCO. Overall, there were no statistically significant differences between centres with '**few**', '**some**' or '**more**' 'at risk' children and the presence of a specific person responsible for identifying children with special needs. Interestingly, however, all of the centres with only a '**few**' cognitive risk children reported that they did not use a SENCO.

The proportion of strong cognitive risk children in the centre was not related to the centre having a SENCO. However, it appears that combined provision with '**some**' (11–24%) strong cognitively 'at risk' children are over-represented (100%) in having a specific person responsible for identifying special needs compared to the overall sample.

Overall, the proportion of children with Peer sociability risk was not significantly associated with the presence of a SENCO. Combined centres with '**more**' children 'at risk' of poor Peer sociability were more likely to have a SENCO in post.

There were some indications that for Anti-social/worried/upset 'at risk' children that centres with '**more**' rather than '**few**' such children were more likely than others to have a SENCO (about 1 in 4).

Overall, combined centres, and to a lesser extent local authority centres were more likely to use the SENCO as a means to identify children 'at risk' of special needs. Children 'at risk' due to strong cognitive factors, poor Peer sociability and Anti-social/worried/upset behaviour were over-represented in these two pre-school types and having this system in place may benefit early identification of their needs. However, the numbers of centres in which these findings are based are small and therefore the results should be treated with caution.

It is fairly common practice in the maintained sector for pre-school workers to have access to a nominated colleague who has specific responsibility for children with special needs. The advantage of this is that the nominated person should have additional expertise and experience in the field and can offer advice, support and guidance about appropriate actions to support a specific child. A potential disadvantage of the SENCO system may be that special needs could be seen less as an issue for **all** staff, where additional responsibility for this area is invested in one person. It would be interesting to explore in those centres which do not have a SENCO whether or not there is a stronger collegiate approach to special needs and how this works in practice.

- **Having an agreed procedure for special needs**

The third system for identifying special needs, which differed across pre-school type, was having a set procedure within the centre. We found that more nursery schools than any other settings reported they had a set procedure for identifying special needs. It also appeared that nursery schools with under 10% of strong cognitive risk children were over-represented (1 in 4) in having a procedure for special needs.

Looking at the overall pattern for the different systems that pre-school centres might use to identify children with special educational needs, it would appear that nursery schools seemed to have a greater balance between formal and informal systems of identification. They were more likely to use a formal system in terms of adopting the Code of Practice but they also regularly used other more informal systems, such as the consultation of parents. Private day nurseries were more likely to use an agreed procedure for special needs.

Other systems for the identification of special needs

The three most frequently reported systems in pre-school centres for the identification of special needs (observation schedules, consult professionals and consult parents) and the three systems for which use appears to differ by pre-school type (Code of Practice, SENO and procedures of special needs) have been described already. There were several other systems mentioned by pre-schools which are interesting to note.

• Checklists/Records

One in five (20%) of pre-school centre managers mentioned the use of 'checklists' or 'special needs records' specifically. These were different documents from the observation schedules referred to earlier in this report. When we considered more closely the distribution of 'at risk' children and type of pre-school, some noticeable trends emerged.

A total of 8 centres (28.6%), that used checklists/records, had under 10% of children 'at risk' of Anti-social/worried/upset behaviours. Nursery classes (83.3%) with a '**few**' of these children were over-represented in using checklists/records. However, playgroups, private day nurseries and local authority centres with few 'at risk' children were less likely to use checklists/records.

Children 'at risk' in terms of poor Peer sociability, Anti-social/worried/upset behaviours and strong cognitive risk may be less likely to be identified by staff in voluntary sector provision, as they tended not to use checklists/records. This difference is perhaps surprising, given that checklists are considerably less time-consuming to use than observation schedules.

• Liaise with special schools

The move away from educating children with particular special needs in special schools towards mainstream provision is the main tenet of the policy of 'inclusive' practice. There has been an marked decline in the numbers of special schools across the county. It is therefore not surprising that only 2 per cent of pre-school centres reported liaising with special schools as part of their mechanisms for identifying special educational needs. Despite the small number of pre-schools involved this type of liaison could be mutually beneficial. Special schools have teachers with extensive expertise in identification and devising programmes for children with SEN. They are often able to advise on a wide range of cognitive 'needs' as well as medical conditions which might be associated with a specific need. This type of liaison means that there could be unique opportunities for the sharing of specific skills and best practice in dealing with very vulnerable children but may be very difficult due to the limited number of special schools involved and their geographical distribution.

Strategies for dealing with special educational needs

The DfEE (1997a) states that 'for some children, giving more effective attention to early signs of difficulties can prevent the development of special educational needs'. The earlier intervention programmes can begin the increased chances a child has of making progress. Roffey (1999) stresses that these programmes should be appropriate for the child's developmental stage and suitable for his/her needs. Taking a broad perspective, a child's needs should be seen across their overall development and this means that early interventions should be identified and devised through collaborations between parents, teachers and professionals who may hold a range of views about the child.

Having discussed how they identified a 'need' we explored with the pre-school centre managers how they managed that need and the strategies they used to support SEN children. Nearly all centre managers (95%) in the EPPE study reported they had programmes to meet special needs. We asked centre managers which strategies they employed (or they would employ if required) to support any children they identified as having special needs in their centres. A range of strategies was mentioned,

and the incidence of these across the sample is shown in the Table 2.2 below. Centres often noted several strategies; therefore totals do not sum to 100.

Table 2.2 Strategies used within pre-school centres to meet special needs

Strategy	n	%
Liaise with other professionals	70	50.0
Regular meeting parents	47	33.6
IEP/code of practice	46	32.9
Extra helpers/carer	19	13.6
Observation/supervision	18	12.9
Other specially trained staff	15	10.7
Designated SENCO	13	9.3
Checklists/records	11	7.9
Educate other children/integrate	11	7.9
Special equipment	9	6.4
Special needs policy	5	3.6
Awareness (courses) for staff	3	2.1
Use of role play/play	1	0.7
Other	48	34.3

The six main strategies most frequently noted by pre-school centre managers to support special needs are discussed below.¹⁶

• Liaise with other professionals

As can be seen in Table 2.2 above, the most popular strategy for supporting children with special needs (reported by 50%) of pre-school managers was to consult with 'other professionals'. When differences between types of pre-school and liaison with other professionals about children with special need were studied it was found that over two-thirds of combined centres (85.7%) and local authority day care (70.8%) reported doing so. Only private day nurseries (38.7%) and nursery schools (30%) dropped below the 50% figure (see Table 2.3). These differences are statistically significant.

Table 2.3 Strategies used to meet the special needs of children across pre-school type

	Nursery class		Playgroup		Private day nursery		Local authority		Nursery school		Combined	
	%	n	%	n	%	n	%	n	%	n	%	n
Liaise professionals	50.0	12	50.0	17	38.7	12	70.8	17	30.0	6	85.7	6
IEP/Code of pract.	29.2	7	11.8	4	19.7	6	50.0	12	60.0	12	71.4	5
Other trained staff	12.5	3	0.0	0	3.2	1	8.3	2	35.0	7	28.6	2
Designated SENCO	25.0	6	0.0	0	6.5	2	0.0	0	15.0	3	28.6	2
Total n	24		34		31		24		20		7	

Type of pre-school was associated with the early intervention for children 'at risk' of special needs with mostly maintained provision (local authority and combined) showing strengths in communicating with other professionals. The use of this strategy raises some questions for further exploration:

- Are pre-school centre staff sufficiently aware of the range of specialist SEN professionals available to call upon?
- If specialist input is required, are pre-school centre workers sufficiently clear about their roles and responsibilities, particularly if interventions are to be implemented across settings, e.g. pre-school and home?
- Are pre-school centre staff training and resources sufficient to deliver the intervention devised by other professionals?

¹⁶ Only strategies used by 10% or more of centres reported here.

• Regular meetings with parents

Altogether, only around 1 in 3 managers stated that they or their staff met regularly with parents. This was not related to the type of pre-school nor did the incidence of meeting parents vary depending on the proportion (under 10%, 11–24%, 25+%) of children ‘at risk’ of special needs in centres.

Involving parents in the planning of interventions can be seen as essential for several reasons. Parents have a different perspective of their child’s personality, motivations, strengths, dislikes, medical needs, level of communication, ability to form relationships, self-help skills, and behavioural issues which may be affected by circumstances within the home. Building on existing approaches and discussing consistency of approaches across settings can be helpful, for families and their child with special needs. Again this aspect highlights an important element in the training of pre-school centres workers. Working in partnership with parents whose children have a range of ‘needs’ demands specific skills and sensitivities, but in many centres staff may have had no training in this area of work.

• Individual education plans/code of practice

The Individual Education Plan (IEP) is intended to identify short-term targets for the child with special needs. The IEP states clearly what the child needs to achieve, how these achievements are to be managed, specific support needed to achieve the target and has build in dates for review of progress. Plans will often include information on adaptations, e.g. in the curriculum or the environment to assist the child. IEPs are most commonly associated with the Code of Practice as a statutory requirement for maintained pre-schools, but some institutions have also introduced IEPs for children for whom concern has been expressed informally. Just under a third (32.9%) of managers said their centre used an IEP/Code of Practice. At least 1 in 2 pre-schools in the maintained sector were likely to report the use of IEPs or the Code of Practice, although this was rather less apparent for nursery classes (3 in 10). This pattern parallels the use of the Code of Practice as a method of identification of children with special needs. By contrast only 1 in 10 playgroups and 1 in 5 private day nurseries used IEPs or a Code of Practice.

The number of ‘at risk’ children in the centres did not show any association with the reported use of IEP/Code of Practice. Centres with a ‘few’, ‘some’ or ‘more’ children in each of the four ‘at risk’ groups showed no association in the use of IEPs. The present study suggests that children with special needs may be more likely to be helped in the maintained sector where this strategy is more readily available.

• Extra helpers/carers

There is a long tradition in pre- and primary school in this country for ‘volunteer’ or additional help being available to work with children, in both formal and informal settings. Extra helpers/carers can be paid staff who work, usually part-time, for specific purposes (i.e. to give practical support to paid workers, as in helping children to dress, undress and toilet, etc. or they can assist in the delivery of the curriculum, i.e. listening to children read, etc).

Many additional pre-school staff work in a voluntary capacity; they are often parents with children at the pre-school. This was the fourth most popular strategy cited as being used (by 1 in 10 managers) to help children with special needs. The reported use of extra helpers/carers was similar across pre-school provisions. Having different proportions of cognitive risk, strong cognitive risk and behavioural risk children did not show any association with the reported use of this strategy. So for example, if we take the examples of centres that have ‘more’ children rated low in terms of Peer sociability, compared to centres that have ‘few’ children, both types of provision were equally likely to note the use of voluntary helpers.

However, 29.4% of centres, which had ‘some’ cognitive risk children, were more likely to note extra helpers compared to the overall sample. This difference is unexpected because centres with ‘more’ ‘at risk’ children did not differ from those with ‘few’. Also, rather surprisingly, strong cognitive risk children were found in significantly lower percentages within centres that reported they use extra helpers/carers in order to meet children’s special needs. The use of additional helpers raises a number of interesting issues. If the additional staff are paid, then the issue of levels of resourcing is highly relevant. There is considerable difference both within and across pre-school types in the level of resourcing they are able to draw on for staff costs. There may also be regional differences which need to be explored. Similarly,

if the additional staff are paid but are specifically assigned to support a named special needs child (as a result of being on the Code of Practice, and there is statutory right to their time), this again raises issues about the extent to which different pre-school settings have access to resourcing.

If the helper volunteers are unpaid then again there are implications. EPPE Technical Paper 5 has explored the extent to which different types of pre-school providers are likely to have access to volunteer help. In this analysis combined centres appear to benefit the most from occasional unpaid helpers and private day nurseries the least. Nursery classes and nursery schools reported broadly similar amounts of occasional unpaid help. The extent to which a child with special needs has access to one-to-one adult support could impact greatly on the progress and development the child makes in pre-school.

• **Observation schedules and checklists/records**

Only 12.9% of managers (currently, or would if required) stated that they used observation/ supervision and, just 7.9% used checklists/records. Interestingly, much smaller numbers of centres stated they used these two systems as strategies to meet the needs of children with special needs compared to their reported use as tools for the identification of special needs. Over half (52.1%) the centres reported that they adopted observation schedules as a means of identifying children with special needs and 20% had checklists/records (see Table 2.2). This decrease from the identification to intervention levels is greater for the observation/supervision strategy compared to checklists/records strategy. This may reflect the convenience of using checklists as opposed to schedules. Schneider et al. (1992) found factors such as complexity and quantity of material and also time affects teachers' decisions in their approach to behavioural management within the classroom. Behavioural techniques are likely to be of this nature; however, checklists are less time consuming compared with the open-ended questions found in many schedules. Given that only approximately 1 in 10 centres used observation/supervision and checklists/records as strategies for meeting special needs, further exploration of the possible advantages of the use of such tools by staff in different pre-school settings may be informative. It would appear this was not a commonly used strategy. (Interviews were conducted in 1998/9).

• **Other specially trained staff**

The reported use of this strategy by managers was noted by just over 1 in 10 (10.7%) and therefore was not a common strategy. Managers in the maintained sector were more likely to report the use of staff who had been trained to address the needs of children with special needs, although the numbers were very small.

Other factors which may be relevant in the identification of special needs

Parts of the centre manager's interview schedule, whilst not initially designed to address special needs specifically nevertheless have some relevance. As the EYTSEN project is interested in a range of characteristics of pre-school centres which might influence how they approach their provision for SEN these other factors are briefly noted.

•Early identification via entry assessments

Since 1998, schools have been required to carry out baseline entry assessments within seven weeks of a child starting in reception class.¹⁷ As well as monitoring what children can do, most baseline assessment highlight areas of difficulty experienced by a child, thus intending to contribute to the early identification of special educational needs (Roffey, 1999). Baseline assessment can help in planning individual work and allows subsequent progress to be measured. Carrying out entry assessments at the pre-school stage could, similarly, assist in the early identification of special needs and developing approaches tailored to the child. However, entry assessments may, in some instances, be the starting point of a process that leads to a child being labelled. Labels may be intended to describe behaviour, but McDermott (1993) highlights the dangers of early labelling which may adversely affect adults' expectations of a child's performance. In the EYTSEN study, entry assessments were performed for the children at only 38.8% of pre-schools. Over half of nursery classes (62.5%), nursery schools (60%) and combined (57.1%) centres carried out entry assessments on children. This proportion decreased to fewer than 1 in 6 for playgroups.

• Staff turnover

Children feel most secure when they have confidence in the adults around them. This is especially important for children with SEN, who often rely on the stability which comes from regular routines and carefully thought out and implemented programmes of work. The extent to which a pre-school centre's staff are stable is an important consideration for all children, but most of all for children with SEN. Ideally, stable staffing helps to produce harmonious teams and agreed aims and objectives. When staffing is unstable, pre-school workers may have to be redistributed to provide cover and the child–staff ratio may be negatively affected. In addition, the quality of the curriculum can be impaired as activities are reduced or delivered with fewer staff. Maintaining consistency in the learning environment of children with special needs is a key element to their successful learning and is, therefore, good practice. High staff turnover would tend to disrupt this consistency. Also, the costs in money and time in recruiting staff can adversely affects the quality of service provided. Nursery classes had the most stable staff teams of all pre-school provision (82.6% of centre managers said no staff had left during the last year). The range of the number of permanent staff leaving was widest within private day nurseries.

¹⁷ A new 'Foundation Stage scheme' for all schools and government-funded settings, will become statutory in 2002/2003, whereby a new national wide assessment, 'the Foundation Stage Profile', will move to the end of the foundation stage.

Section 3: The relationship between pre-school centre quality characteristics and the subsequent progress and development of different 'at risk' groups

Quality in pre-school settings and special needs

In the early stages of the EPPE project a 'centre profile' was created for each individual centre through systematic observation and questions to staff by trained researchers. The Early Childhood Environment Rating Scale: Revised (ECERS-R) was used in drawing up each centre's profile along with an extension of that based on the Desirable Learning Outcomes (ECERS - English Extension, DFEE, 1996) and the Caregivers Interaction Scale (CIS) addressing more specifically the interactions between caregivers and children.

The Early Childhood Environment Rating Scale (ECERS, now revised; Harms, Clifford and Cryer, 1998) is one of the most widely used observational measures for describing the characteristics of early childhood education and care. The revised ECERS-R has 43 items, which are divided into 7 sub-scales. These sub-scales are: space and furnishing; personal care routines; language and reasoning; activities; social interactions; organisation and routines; and adults working together. Each item is rated on a 7-point scale (1 = inadequate, 3 = minimal/adequate, 5 = good, 7 = excellent).

As the ECERS was developed in the United States of America and intended for use in both care and educational settings, the EPPE team thought it necessary to devise a second early childhood environment rating scale which was focused on provision in Britain as well as good practice in catering for diversity. Thus, the ECERS-R was supplemented by a new rating scale, ECERS-Extension (Sylva, Siraj-Blatchford, Taggart and Colman, 1998), based on the Desirable Learning Outcomes for 3- and 4-year-olds and pedagogical practices associated with it. The ECERS-E consists of 4 sub-scales: literacy; mathematics; science and environment; and diversity (for further details of the instruments used see EPPE Technical Paper 6).

Both scales identify 4 quality points 'Excellent', 'Good', 'Minimal/Adequate' and 'Inadequate'. No centre in the EPPE sample fell into the 'Inadequate' category. Further details on the distribution of the ECERS-R and its subscales can be found in EPPE Technical Paper 6. It is worth noting that the word 'environment' in ECERS-R as well as ECERS-E is taken in its broadest sense to include social interactions, pedagogical strategies and relationships between children as well as adults and children. Both rating scales are based on a conceptual framework, which takes account of pedagogical processes and curriculum.

The Caregivers Interaction Scale (Arnett, 1989) centres on the interactions between childcare workers and children, covering positive relationships, punitiveness, permissiveness and detachment.

Distribution of 'at risk' children across pre-school settings

We explored the distribution of children identified as being 'at risk' of special needs across the 141 early years centres in our sample, grouped on the basis of quality assessment provided by the two ECERS ratings and the CIS sub-scales. In order to complete this analysis overall ECERS scores and sub-scale scores were mapped with the distribution of children in the four EYTSEN 'at risk' categories.

Those centres that scored higher on the ECERS-E tended to have more children in the sample identified as 'at risk' for Peer sociability. As the centres which scored higher on ECERS-E tended to be combined provision and other 'educational' settings i.e. nursery schools, this is unsurprising, as these centres

contained a higher concentration of disadvantaged children and those identified by our social behavioural measures.

Proportionately more children with a strong cognitive risk were entering centres of a higher quality, measured by the ECERS R and E scales. In particular, programme structure and parents and staff scores come up as significantly higher for centres where more children were identified as 'at risk'. The higher scores for the 'diversity' sub-scale on ECERS-E may reflect centres' willingness to accept children with existing SEN. Children at strong cognitive risk also tended to attend centres with higher scores on specific curriculum areas (e.g. maths).

Interestingly, proportionately more children at risk for the Anti-social/worried/upset measure attended centres with significantly lower quality scores relating to the ECERS-E scale, and language functioning (ECERS-R sub-scale).

Table 3.1 Relationship between risk status and pre-school centre quality scores

	Cognitive risk	STRONG COGNITIVE RISK	PEER SOCIABILITY RISK	ANTI-SOCIAL/WORRIED UPSET RISK
ECERS-E Total	NS	Sig+ (p<0.001)	Sig+ (p<0.05)	Sig- (p<0.05)
Literacy	NS	Sig+ (p<0.001)	NS	Sig- (p<0.05)
Mathematics	NS	NS	Sig+ (p<0.05)	Sig- (p<0.05)
Science	NS	Sig+ (p<0.001)	Sig+ (p<0.001)	Sig- (p<0.05)
environment	NS	Sig+ (p<0.001)	NS	NS
Diversity				
ECERS-R TOTAL	NS	Sig+ (p<0.001)	NS	NS
Space and furnishings	NS	Sig+ (p<0.001)	NS	NS
Personal care	NS	NS	NS	NS
Language functioning	Sig- (p<0.001)	NS	NS	Sig- (p<0.05)
Activities	NS	Sig+ (p<0.001)	Sig+ (p<0.05)	NS
Interaction	Sig- (p<0.05)	NS	NS	NS
Programme structure	NS	Sig+ (p<0.001)	NS	NS
Parents and staff	NS	Sig+ (p<0.001)	NS	NS
CIS				
Positive relationship	Sig- (p<0.001)	NS	NS	Sig- (p<0.05)
Punitiveness	NS	NS	NS	NS
Permissiveness	Sig- (p<0.05)	NS	NS	Sig- (p<0.05)
Detachment	NS	NS	NS	NS

Sig - At risk children attended centres with significantly lower quality scores

Sig+ At risk children attended centres with significantly higher quality scores

NB In the cases of punitiveness and permissiveness, a lower score is indicative of high levels of punitiveness and permissiveness

When the proportion of at risk children in the centre was correlated with score on the quality measures, few statistically significant results emerged. However, for strong cognitive risk the sub-scales 'activities' and 'programme structure' showed an association, centres with higher quality scores tending to serve higher numbers of 'at risk' children.

Distribution of children with 'disabilities' across pre-school settings

In examining the distribution of children with specific 'disabilities', as opposed to those at risk in terms of 'special need' we had two sources of data to compare.¹⁸ At the centre level, the ECERS-R quality instrument allows a centre to be assessed for its provision for children with disabilities (item 37). The other source of data was parental perceptions of children's health and development, recorded during interviews.

From parental interviews we know that there were children, spread across the sample of centres, who showed a range of 'disabilities'. But, during ECERS observations, 103 of the 141 centres (73%)

¹⁸ This term 'disabilities' is used in the ECERS-R instrument which assesses different aspects of environmental quality.

identified themselves in the 'not applicable' category, i.e. they did not have any children with disabilities enrolled. This raises a number of issues, the most obvious of which is that there are a number of children whose parents consider them as having some sort of disability, who are not recognised as such by pre-school providers. This however, should be interpreted with caution because there may be different interpretations of terms, such as special needs and disabled. There is not a widely shared, common understanding of such concepts. The existence of a physical disability may be considered the most likely one to identify but there are other possible 'disabling' conditions which may not be so easy to identify in the pre-school setting.

Despite this discrepancy, however, it is interesting to note that for those centres that claimed to have special needs children and were scored for provision for children with disabilities, provision tended to be rated as better than adequate, as scores tended to cluster around the 'good' mark.

The relationship between 'quality' and children moving 'in' and 'out' of risk

One of the key questions is whether children moving out of risk are coming from higher quality pre-school settings. The evidence from the EYTSEN project suggests that this is the case for cognitive outcomes, but not for social/behavioural outcomes. Children who have moved out of cognitive risk by the end of pre-school come from significantly higher quality pre-school centres when looking at GCA and pre-reading. For Early number concepts quality is also higher for children moving out of 'at risk status, although differences do not reach statistical significance.

The CIS scales (which measures the pre-school workers' relationship and engagement with young children) look at four quite different aspects of pre-school quality. Pre-schools having a positive relationship between children and staff was found not to be related to movement out of risk for any of the cognitive outcomes. However, children moving out of 'at risk' status for all three cognitive outcomes attended centres with lower scores on three negative sub-scales 'punitive', 'permissive' and 'detachment' levels. Detachment displayed the lowest scores for children moving out of risk.

Table 3.2 Mean scores on quality of pre-school centre and children's movement in and out of 'at risk' status across the pre-school period for GCA¹⁹

	Moved out of risk	Moved into risk	Never at risk	Always at risk	Anova ²⁰
ECERS R	4.64 (sd=1.08)	4.43 (sd=0.97)	4.46 (sd=0.99)	4.61 (sd=1.02)	0.010
ECERS E	3.46 (sd=1.13)	3.21 (sd=0.97)	3.25 (sd=0.98)	3.41 (sd=1.03)	0.004
CIS					
Positive relationship	3.17 (sd=0.95)	3.26 (sd=0.49)	3.27 (sd=0.58)	3.23 (sd=0.76)	0.097 (ns)
Punitiveness	1.36 (sd=0.53)	1.50 (sd=0.29)	1.43 (sd=0.31)	1.40 (sd=0.43)	0.001
Permissiveness	1.42 (sd=0.71)	1.53 (sd=0.48)	1.42 (sd=0.43)	1.47 (sd=0.58)	0.028
Detachment	1.32 (sd=0.67)	1.49 (sd=0.53)	1.38 (sd=0.51)	1.35 (sd=0.61)	0.015

ns not significant at the $p < 0.05$ level

Table 3.3 Mean scores on quality of pre-school centre and children's movement in and out of 'at risk' status across the pre-school period for Pre-reading²¹

	Moved out of risk	Moved into risk	Never at risk	Always at risk	Anova
ECERS R	4.69 (sd=0.99)	4.39 (sd=1.06)	4.46 (sd=0.97)	4.52 (sd=1.13)	0.002
ECERS E	3.47 (sd=1.06)	3.20 (sd=0.99)	3.26 (sd=0.98)	3.34 (sd=1.09)	0.003
CIS					
Positive relationship	3.28 (sd=0.77)	3.22 (sd=0.55)	3.28 (sd=0.58)	3.08 (sd=0.97)	0.000
Punitiveness	1.37 (sd=0.42)	1.50 (sd=0.31)	1.43 (sd=0.30)	1.41 (sd=0.57)	0.000
Permissiveness	1.42 (sd=0.57)	1.52 (sd=0.50)	1.42 (sd=0.42)	1.50 (sd=0.75)	0.003
Detachment	1.29 (sd=0.57)	1.49 (sd=0.54)	1.37 (sd=0.51)	1.42 (sd=0.74)	0.000

Table 3.4 Mean scores on quality of pre-school centre and children's movement in and out of 'at risk' status across the pre-school period for Early Number Concepts²²

	Moved out of risk	Moved into risk	Never at risk	Always at risk	Anova
ECERS R	4.62 (sd=1.03)	4.48 (sd=1.02)	4.47 (sd=0.98)	4.45 (sd=1.07)	0.196 (ns)
ECERS E	3.39 (sd=1.06)	3.19 (sd=1.00)	3.28 (sd=0.98)	3.34 (sd=1.05)	0.108 (ns)
CIS					
Positive relationship	3.21 (sd=0.87)	3.25 (sd=0.52)	3.28 (sd=0.60)	3.21 (sd=0.72)	0.249 (ns)
Punitiveness	1.38 (sd=0.48)	1.51 (sd=0.30)	1.42 (sd=0.32)	1.42 (sd=0.40)	0.000
Permissiveness	1.39 (sd=0.60)	1.53 (sd=0.50)	1.42 (sd=0.44)	1.50 (sd=0.59)	0.000
Detachment	1.30 (sd=0.61)	1.49 (sd=0.58)	1.37 (sd=0.51)	1.42 (sd=0.59)	0.000

ns Not significant at the $p < 0.05$ level

¹⁹ Change from entry to pre-school Strong Cognitive risk to entry to primary Strong Cognitive risk.

²⁰ ANOVA looks at whether there are any significant differences in means between any of the four change categories.

²¹ Change from entry to pre-school Strong Cognitive risk to entry to primary Pre-reading risk (internally standardised).

²² Change from entry to pre-school Strong Non-Verbal risk to entry to primary Early Number Concepts risk (internally standardised).

Table 3.5 Mean scores on quality of pre-school centre and children's movement in and out of 'at risk' status across the pre-school period for Anti-social/worried/upset²³

	Moved out of risk	Moved into risk	Never at risk	Always at risk	Anova
ECERS R	4.44 (sd=0.95)	4.39 (sd=0.96)	4.49 (sd=1.00)	4.37 (sd=0.98)	0.206 (ns)
ECERS E	3.16 (sd=0.93)	3.25 (sd=0.96)	3.30 (sd=1.00)	3.17 (sd=1.00)	0.041
CIS					
Positive relationship	3.27 (sd=0.47)	3.26 (sd=0.54)	3.29 (sd=0.59)	3.21 (sd=0.67)	0.230 (ns)
Punitiveness	1.45 (sd=0.24)	1.46 (sd=0.30)	1.43 (sd=0.31)	1.44 (sd=0.38)	0.490 (ns)
Permissiveness	1.47 (sd=0.38)	1.46 (sd=0.47)	1.44 (sd=0.46)	1.48 (sd=0.50)	0.372 (ns)
Detachment	1.40 (sd=0.46)	1.41 (sd=0.49)	1.38 (sd=0.53)	1.46 (sd=0.58)	0.206 (ns)

ns Not significant at the p<0.05 level

Table 3.6 Mean scores on quality of pre-school centre and children's movement in and out of 'at risk' status across the pre-school period for Peer sociability²⁴

	Moved out of risk	Moved into risk	Never at risk	Always at risk	Anova
ECERS R	4.45 (sd=1.00)	4.48 (sd=0.95)	4.45 (sd=0.99)	4.59 (sd=1.02)	0.445 (ns)
ECERS E	3.36 (sd=1.02)	3.33 (sd=1.00)	3.23 (sd=0.98)	3.45 (sd=0.93)	0.013
CIS					
Positive relationship	3.33 (sd=0.48)	3.26 (sd=0.68)	3.29 (sd=0.55)	3.18 (sd=0.77)	0.082 (ns)
Punitiveness	1.44 (sd=0.23)	1.42 (sd=0.36)	1.44 (sd=0.30)	1.41 (sd=0.43)	0.516 (ns)
Permissiveness	1.49 (sd=0.44)	1.41 (sd=0.48)	1.44 (sd=0.44)	1.48 (sd=0.60)	0.232 (ns)
Detachment	1.38 (sd=0.43)	1.39 (sd=0.56)	1.39 (sd=0.52)	1.42 (sd=0.64)	0.909 (ns)

ns Not significant at the p<0.05 level

Multilevel analyses of children's attainments at the start of primary school were carried out to look at the effect of quality on young children's cognitive progress and changes in social behavioural development after having taken account of significant prior attainment (or prior social behaviour) and child background characteristics. Once these had been accounted for a number of significant relationships (interactions) were found (see EPPE Technical Papers 8a and b):

- Children who are 'at risk' for Peer sociability problems make more Verbal progress in higher quality pre-schools (statistically significant effects identified for total ECERS-E, and CIS sub-scales 'positive', 'punitive' and 'detachment'). There is also evidence that children who are 'at risk' for Peer sociability problems make more progress in Pattern construction in higher quality pre-schools (significant CIS positive, punitive and detachment).
- Children who are at national cognitive risk and strong cognitive risk make more Pre-reading progress in pre-schools with higher quality ECERS-R scores.
- Children who are at strong cognitive risk, (including non-verbal) make more Early Numbers progress in pre-schools with higher quality ECERS-R scores. Children who are at strong non-verbal cognitive risk make more Early Numbers progress in pre-schools with high CIS 'positive' relationships sub-scale scores.

²³ Change from Entry to pre-school Anti-social Risk to Entry to reception Anti-social risk

²⁴ Change from Entry to pre-school Peer sociability to Entry to reception Peer sociability risk

- Children at cognitive risk (national and strong) make more progress for picture similarities in centres with low CIS punitive scores. In contrast, children at Anti-social/worried upset risk make less progress for picture similarities in centres with low CIS punitive scores.

Overall therefore, the results indicate that young children who attend higher quality pre-school centres (as measured by ECERS and CIS observational scales) tend to make more cognitive progress and show better social behavioural development during pre-school. There is also evidence that children attending higher quality pre-school provision are more likely to move out of strong cognitive 'at risk' status by the time they start primary school.

Summary and conclusions

The EYTSEN study has explored ways of identifying children who may be 'at risk' in terms of showing later SEN using a wide range of data for a large sample of approximately 2800 children drawn from a 141 pre-school centres and a range of types of pre-school providers. The study has explored attainment, progress and social behavioural development over the pre-school period from entry to the study (3+ years) to start at primary school (rising 5 years). Future reports will follow up the sample across KS1. Information from child assessments, pre-school care staff ratings of social behaviour, centre manager interviews, parent interviews and observations of pre-school centres has been analysed. A number of findings relevant to our understanding of SEN in the pre-school age group and the nature and variation in provision for SEN in different pre-school settings have been identified. In particular, a method of defining children who may be most 'at risk' of SEN is reported and the characteristics (child, parent and family) of 'at risk' children described at two time points. Significant differences in the distribution of 'at risk' children across different types of pre-school settings were identified.

• The impact of pre-school

The proportion of children identified as 'at risk' of SEN in terms of cognitive attainment (GCA 1 sd below national mean) reduced from one-third at entry to the target pre-school, to one in five at the start of primary school. This provides an indication of improvement for low attainers and suggests a positive impact of pre-school on cognitive development. Value added analyses of progress for the whole sample also indicate that the experience of pre-school over a longer period of time (in months) has a positive impact for all children (see EPPE Technical Paper 8a).

The EYTSEN analyses indicate that children who made an earlier start (below 3 years) at their target pre-school had significantly higher cognitive attainments than other children at age 3+ years. This cognitive advantage remains at entry to primary school. An earlier start at pre-school was also weakly associated with increased incidence of risk for Anti-social/worried/upset behaviour. Earlier start was mainly associated with two forms of provision (private day nursery and local authority day nursery) where the early start often occurred in the infancy period. Early start across the pre-school period (2+ years) was not associated with increased risk for Anti-social/worried/upset behaviour by start of school. Children who started at a younger age continued to show higher cognitive scores at entry to primary school.

• Overlap between different definitions of 'at risk' status

There is a fair degree of overlap between the identification of children in terms of strong cognitive risk on GCA at entry to primary school and 'at risk' status for Pre-reading. Just under half those identified as at strong cognitive risk for GCA (48.1%) were also identified for Pre-reading risk (this represents just under 8 per cent of the total child sample). For Early Number Concepts the overlap is greater, with over two-thirds (68.8%) of those identified as 'at strong cognitive risk' also identified as 'at risk' for Early Number Concepts. This group represents just over a tenth (11.1%) of the total sample of children.

Although there is some overlap between the cognitive and social/behavioural categories, the dimensions are fairly distinct and do not comprise the same group of children at entry to target pre-school. There is greater overlap between 'at risk' for cognitive development and 'at risk' for Peer sociability than for Anti-social/worried/upset behaviour. This pattern remains similar at entry to primary school.

• Movement in and out of 'at risk' status

The EYTSEN study allows us to examine whether children identified as 'at risk' at entry to target pre-school were also identified as 'at risk' when they joined primary school. It appears that around 10% of children may be seen as at high risk compared with their peers in terms of showing very low cognitive attainment during the pre-school period which persists at school entry, while a smaller proportion is likely to show a continuing behaviour problem (6-7%).

- **Child, parent and home environment characteristics which show an association with young children's cognitive or social behavioural 'at risk' status**

Child, parent and family factors were found to be more strongly associated with young children's cognitive outcomes than with their social/behavioural development. Within the social/behavioural risk categories, Peer sociability showed slightly more association with these factors than Anti-social/worried/upset.

At entry to pre-school ethnic minority groups and male children were slightly over-represented in most of the 'at risk' categories. Pakistani and Bangladeshi groups were more likely to be identified as 'at risk' for the general cognitive measure (GCA) and Peer sociability categories (including non-verbal assessments which are less dependent on language fluency), and Black Caribbean groups in the Anti-social/worried/upset categories. Children who do not use English as their first language (EAL), showed a higher incidence of identification of cognitive 'at risk' status at entry to pre-school. This was most noted for the strong cognitive risk measure, which includes a verbal component, but was less marked for non-verbal measures.

Children identified as 'at risk' for cognitive needs were more likely to be from a large family, be of low birth weight or premature, to have mothers with no qualifications, and be of lower socio-economic status (represented by father's employment status and occupational social class). These factors are themselves associated. Mother's qualification levels showed a particular association with 'at risk' status for all cognitive measures at each time point, with children whose mothers reported they had no qualifications most likely to be categorised as 'at risk', and those with degrees the least likely to be categorized in this way.

Children with better scores on the home learning environment index (measuring parental interactions with their child such as teach rhymes, songs, play with letters/numbers, read to child, paint and draw, etc.) had a significant cognitive advantage and were much less likely to be identified as 'at risk' even for the group whose mothers had no qualifications.

Children identified as 'at risk' for social/behavioural needs were a less distinct group from the overall sample in terms of child, parent and home environment characteristics at all ages. However, they differed in a number of respects at entry to pre-school. They were more likely to be low birth weight or premature (Peer sociability only), have a mother with no qualifications (Peer sociability only), and have a mother or father not employed (Peer sociability only).

Using an index of multiple disadvantage developed for the EYTSN study, just under a quarter of all children (24%) were found to experience no multiple disadvantage and only a small proportion of children (5%) experienced a very high level of multiple disadvantage (5-plus factors). A substantial group experienced fairly high levels of disadvantage (3–4 factors). Children experiencing multiple disadvantage were found to be significantly more likely to be identified as 'at risk' in all the cognitive risk categories at entry to pre-school. Multiple disadvantage continued to show a strong relationship with 'at risk' status for all cognitive measures at entry to primary school, though this was somewhat less marked for Pre-reading than for Early Number Concepts or GCA. Multiple disadvantage was found to be predictive for 'at risk' status on Peer sociability. This set of disadvantage indicators appear not to predict Anti-social/worried/upset risk status at pre-school or the start of primary school.

- **Mechanisms for the identification of SEN**

Although three-quarters of centre managers reported that they currently had children on roll with some type of 'special need', this differed significantly across type of setting with managers in the maintained sector reporting higher incidences of having children with some type of special need (80+%). The results suggest that there are a number of children who fall within an 'at risk' group who are not recognised as having SEN by centre managers. It would appear that there is no clear link between the proportion of 'at risk' children in a centre and the likelihood that managers reported they had SEN children on roll. Case study data suggests that private day nurseries are less likely to enrol children with SEN. Playgroups were the form of provision least likely to report having any SEN children on roll.

Most centre managers (91%) said that they had some sort of system for identifying children with special needs but this varied across pre-school type. Centre managers from the whole of the maintained sector reported having systems for identifying children who had special needs. On the other hand, there were fewer centres reporting identification systems in the category private day nurseries (77%) and playgroups (82%). This suggests that in some centres children 'at risk' of special needs may go unnoticed and miss the earliest opportunity for intervention. Staff may need to be made more aware of, or be trained to use, a broader range of identification systems.

The three most frequently used identification systems were observation schedules (52%), consulting with professionals (43%) and consulting parents (39%). In the light of the recent emphasis on 'joined up thinking' in services for young children the whole notion of how multi-agencies liaise is an important one. It would be relevant to explore the availability of specialised professionals to pre-school settings in both the maintained and voluntary sectors.

The most commonly reported strategies for supporting children with special needs were consulting other professionals for guidance, meeting with parents and using Individual Education Plans or the Code of Practice

• **Pre-school centre quality characteristics and the subsequent progress and development of different 'at risk' groups**

Our data indicated that children who attended combined centres and nursery schools were more likely to move out of 'at risk' status in terms of the strong cognitive risk. They were also more likely to move out of risk status for Pre-reading by the time they started primary school. Children from nursery schools were more likely to move out of 'at risk' status for Early Number Concepts. By contrast, proportionately more children who attended nursery classes moved into 'at risk' status for strong cognitive risk, Pre-reading and Early Number Concepts. Children who attended local authority day nurseries showed a greater likelihood of moving into 'at risk' status for Early Number concepts.

Combined centres and nursery schools show the most positive outcomes for movement out of risk for several measures, especially for cognitive outcomes. Nursery classes and playgroups show positive movement for the social behavioural outcome, Peer sociability.

• **Measures of pre-school centre quality**

Value added analyses of EPPE children's cognitive progress have shown that higher quality scores on the Early Childhood Environment Rating Scale are associated with greater cognitive progress over the pre-school period for all children. Interactions also show that low SES children and boys benefit particularly from higher quality provision as measured by this instrument. Quality measures from the main ECERS-R scale also show a significant link with social behavioural development (see EPPE Technical Paper 8b). In addition, information from the CIS observational scales which focus on adult-child interactions also shows a significant link with young children's cognitive progress and social behavioural development.

For the EYTSEN project we investigated whether children who attended centres rated more highly in terms of quality provision were more likely to move out of 'at risk' status by the time they start primary school. We can conclude that higher quality pre-school provision is significantly associated with greater movement out of 'at risk' status for cognitive measures, whereas poorer quality is associated with more movement into 'at risk' status by entry to primary school. For social behavioural outcomes we did not find any clear overall trends that children moving in or out of 'at risk' status for Peer sociability or Anti-social/worried/upset attended centres which differed in terms of our measures of centre quality.

It appears that pre-school centre quality is especially important in terms of cognitive development for children who are at the lowest end of the attainment spectrum at entry to pre-school, and that high quality provision may be seen as an effective intervention which may reduce the risk of such children experiencing difficulties when they enter primary school.

Appendix 1 –EPPE and EYTSEN Technical Papers

Technical Paper 1 – An Introduction to the Effective Provision of Pre-School Education (EPPE) Project
ISBN: 0 85473 591 7 Published: Autumn 1999 Price £3.50

Technical Paper 2 – Characteristics of the Effective Provision of Pre-School Education (EPPE) Project
sample at entry to the study ISBN: 0 85473 592 5 Published: Autumn 1999 Price £4.00

Technical Paper 3 – Contextualising EPPE: Interviews with Local Authority co-ordinators and centre
managers ISBN: 0 85473 593 3 Published: Autumn 1999 Price £3.50

Technical Paper 4 – Parent, family and child characteristics in relation to type of Pre-School and socio-
economic differences ISBN: 0 85473 594 1 Published: Autumn 1999 Price £4.00

Technical Paper 5 – Report on centre characteristics in the EPPE Study : (Interviews)
ISBN: 0 85473 595 X Published: Autumn 2000 Price £5.00

Technical Paper 6 – Characteristics of the Centres in the EPPE Sample: Observational Profiles
ISBN: 0 85473 596 8 Published: Autumn 1999 Price £5.00

Technical Paper 6A – Characteristics of Pre-School Environments
ISBN: 0 85473 597 6 Published: Autumn 1999 Price £3.50

Technical Paper 7 – Social/behavioural and cognitive development at 3–4 years in relation to family
background ISBN: 0 85473 598 4 Published: Spring 2001 Price £5.00

Technical Paper 8a – Measuring the Impact of Pre-School on Children's Cognitive Progress over the
Pre-School Period ISBN: 0 85473 599 2 Publication Date: Autumn 2002

Technical Paper 8b – Measuring the Impact of Pre-School on Children's Social Behavioural
Development over the Pre-School Period ISBN: 0 85473 684 2 Publication Date: Autumn 2002

Technical Paper 9 – Report on age 6 assessment ISBN: 0 85473 600 X Publication Date: Spring 2003

Technical Paper 10 – Intensive study of selected centres ISBN: 0 85473 601 8 Publication Date:
Summer 2002

Technical Paper 11 – Report on the continuing effects of pre-school education at age 7
ISBN: 0 85473 602 6 Publication Date: Summer 2003

Technical Paper 12 – The final report ISBN: 0 85473 603 4 Publication Date: Spring 2004

EYTSEN Papers

Technical Paper 1 – Special needs across the Pre-School Period ISBN 085473 680 8 Publication Date
Autumn -2002 Price £6.00

Technical Paper 2 – Special needs in the Early Years at Primary School ISBN 085473 681 6 Publication
Date Autumn 2002. -Price to be arranged

Technical Paper 3 – Special needs in the Early Years : The Parents' Perspective ISBN 085473 682 4
Publication Date Autumn -2002. Price to be arranged

Ordering information

The Bookshop at the Institute of Education. 20, Bedford Way. London WC1H 0AL.
Tel: 00 44 (0) 207 612 6050 Fax: 0207 612 6407 Email: ioe@couttsbookshops.com
Website: www.couttsbookshops.com/ioe

or The EPPE Office. The University of London, Institute of Education. 20 Bedford Way, London. WC1H
0AL. U.K. Tel: 00 44 (0) 207 612 6219 Fax: 00 44 (0) 207 612 6230 Email: b.taggart@ioe.ac.uk
Website: <http://www.ioe.ac.uk/cdl/eppe/>

Please note : Prices will vary according to size of publication and quantities ordered.

Appendix 2 – Child assessments

Four common points of assessment were used in the EPPE study:

• Entry to pre school study

Table A2.1 Entry to Target Pre-school assessments (age 3.0 to 4 years 3 months)

Name of Assessment	Assessment Content	Administered by:
British Ability Scales Second Edition (BASII) (Elliot et al., 1996): <ul style="list-style-type: none"> • Block Building • Verbal Comprehension • Picture Similarity • Naming Vocabulary 	Cognitive development battery <ul style="list-style-type: none"> • Spatial skills • Verbal skills • Pictorial reasoning skills • Verbal skills 	EPPE Researcher EPPE Researcher EPPE Researcher EPPE Researcher
Adaptive Social Behavioural Inventory (ASBI) (Hogan et al., 1992)	Social behaviour and emotional adjustment	Centre Staff
Children not fluent in English: Assessed only on the non-verbal BAS II scales (Block Building and Picture Similarity) and social and emotional behaviour.		

These assessments were chosen to provide a baseline against which later progress and development can be compared. The British Ability Scales (BAS sub-scales) are designed for use with this age range. Research Officers in each region were trained in their use and checked for reliability. They assessed children on a one-to-one basis. Where possible an interpreter was recruited who spoke the child's home language if the child was not fluent in English. Centre staff who were familiar with the child completed an Adaptive Social Behaviour Inventory (ASBI) for each sample child to provide a measure of social and behavioural development.

Entry to primary school (age rising 5 years)

All children were assessed at entry to school (usually at the start of reception, though some children went straight into a year 1 class). These assessments provide both a measure of current attainment and development at exit from pre-school and serve as a baseline for entry to school. The assessments were chosen to be compatible with the Desirable Outcomes for Pre-School Education (DfEE 1996).

Table A2.2 Entry to Target primary school assessments

Name of Assessment	Assessment Content	Administered by:
British Ability Scales Second Edition (BASII) (Elliot et al., 1996): <ul style="list-style-type: none"> • Verbal Comprehension • Picture Similarity • Naming Vocabulary • Pattern Construction 	Cognitive development battery <ul style="list-style-type: none"> • Verbal skills • Pictorial reasoning skills • Verbal skills • Spatial skills 	EPPE Researcher EPPE Researcher EPPE Researcher EPPE Researcher
BAS Early Number Concepts	Reasoning ability	EPPE Researcher
Letter Recognition	Lower case letters	EPPE Researcher
Phonological Awareness (Bryant and Bradley, 1985)	Rhyme and Alliteration	EPPE Researcher
Adaptive Social Behavioural Inventory (ASBI - R) (Hogan et al., 1992)	Social and emotional behaviour, hyperactivity and settling-into-school	Class Teacher
Children not fluent in English: Assessed only on two of the non-verbal BAS II scales (Picture Similarity and Pattern Construction) and social behaviour. In addition they were assessed on BAS II Copying, a measure of spatial ability, (Elliot et al., 1996), which was also administered by the EPPE researcher.		

The ASBI was also adapted and extended by the EPPE team to cover a greater range of behaviours considered appropriate for school age children by incorporating selected additional items from other published tests, covering hyperactivity and prosocial behaviour.

• **End of Year 1 in Primary**

Table A2.4 Outcome measures at age 6 plus include:

Name of Assessment	Assessment Content	Administered by:
Primary Reading: Level 1 (NFER-Nelson)		Class Teacher
Maths 6 (NFER-Nelson)		Class Teacher
Strengths and Difficulties Questionnaire (Goodman, 1997) for extended study	Hyperactivity, conduct problems, peer problems, emotional problems and prosocial	Class Teacher

• **End of Year 2 in Primary**

Table A2.5 Outcome measures at age 7 plus include:

Name of Assessment	Assessment Content	Administered by:
Strengths and Difficulties Questionnaire (Goodman, 1997) extended for study	Hyperactivity, conduct problems, peer problems, emotional problems and pro-social	Class Teacher
Attitudes to School Questionnaire	Children's views on academic and social activities	Completed by child
Record of conduct / emotional problems		From school records
National Assessments	Reading, Writing and Maths: National Assessments Science: teacher assessed	From school records

APPENDIX 3 – Characteristics of children identified with differing ‘at risk’ histories from Entry to Pre-school and Entry to Primary School

An important aim of the EYTSEN study is to establish the extent to which young children identified as ‘at risk’ in pre-school for either cognitive or social-behavioural measures continue to show difficulties in these areas at an older age. By examining the ‘at risk’ classifications at two different time points we can establish whether some children form a common ‘core’ who may be viewed as particularly vulnerable (identified at pre-school entry and at the start of primary school).

Table A3.1 below displays the pupil or parental background factors where a high proportion of children were remaining ‘at risk’ across the pre-school period for the cognitive outcomes. Details for the social/behavioural outcomes are also shown for comparison, although there were very few factors that emerged as statistically significant. Children who had experienced family violence were more likely to remain ‘at risk’ for Anti-social/worried/upset behaviour and Bangladeshi children had the highest likelihood of continuing to show Peer sociability ‘at risk’ status.

Table A3.1 Ethnic group and percentage of pupils at primary school entry remaining within the group identified as ‘at risk’

	General Cognitive Ability	Pre-reading	Early Number Concepts	Peer sociability	Anti-social/worried upset
Pakistani heritage	52	20	21	14	---
Bangladeshi heritage	39	13	17	17	---
Home learning scale 0–13	35	22	23	10	11
English not first language	31	12	16	13	---
Birth trauma	27	27	36	9	9
Absent mother/shared btwn parents	26	26	19	---	15
Family violence	25	22	31	---	18
Father working part time	25	---	12	---	---
Black African heritage	24	---	16	---	12
Highest social class unskilled	24	13	15	9	9
Mother has no qualifications	23	16	15	12	9
Accident/hospitalisation	22	21	14	---	---
Other heritage	22	---	---	10	10
Highest social class never worked	21	15	12	---	12
Father not working	19	11	14	14	---
Highest social class semi-skilled	19	12	13	11	9
White European	16	9	10	---	10
Mother not working	15	10	10	---	---
Premature or Low birth weight	14	9	10	---	---
Problems with siblings	14	10	---	---	10
Single parent	13	11	10	---	11
Home learning scale 14–19	13	9	---	---	---
Highest social class skilled manual	13	---	10	---	---
Separated/divorced	12	---	9	---	---
Indian heritage	12	---	---	10	---
5 or more Multiple disadvantages	39	22	26	16	13
3-4 Multiple disadvantages	20	14	13	11	--
% overall remaining at risk	10	7	7	7	6

--- In line with the overall sample

• **Gender**

A higher proportion of boys remained 'at risk' across the pre-school period (61%).

Table A3.2 Differences between males and females in risk status histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of males in risk categories	8.3	6.8	73.8	11.1
% of females in risk categories	7.2	5.7	79.2	7.8
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who are male	55.8	56.5	50.5	60.9
% of risk categories who are female	44.2	43.5	49.5	39.1

Chi=12.42, p<0.01

• **Ethnicity**

White UK children are much more likely to stay out of risk during the pre-school period (81% of white children were never at risk). In contrast, the Asian groups, in particular Pakistani and Bangladeshi are most likely to remain 'at risk'. Children of Black African and Indian heritage are also more likely to remain at risk.

Table A3.3 Differences between the ethnic groups in risk status histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% White UK heritage in risk categories	7.0	5.4	80.8	6.8
% White Euro in risk categories	7.8	11.8	64.7	15.7
% Black Carib in risk categories	12.7	5.5	70.9	10.9
% Black African in risk categories	12.1	6.9	56.9	24.1
% Black – Other in risk categories	5.3	15.8	73.7	5.3
% Indian in risk categories	20.0	12.0	56.0	12.0
% Pakistani in risk categories	5.4	14.3	28.6	51.8
% Bangladeshi in risk categories	27.8	5.6	27.8	38.9
% Chinese in risk categories#	0.0	25.0	25.0	50.0
% Other in risk categories	7.8	5.9	64.7	21.6
% Mixed heritage in risk categories	8.1	8.1	72.8	11.0
% white non euro heritage in risk categories#	0.0	0.0	100.0	0.0
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who are White UK	68.3	65.5	80.4	54.1
% of risk categories who are White Euro	3.8	7.1	3.2	6.3
% of risk categories who are Black Caribbean	6.7	3.6	3.8	4.7
% of risk categories who are Black African	3.4	2.4	1.6	5.5
% of risk categories who are Black – Other	0.5	1.8	0.7	0.4
% of risk categories who are Indian	4.8	3.6	1.4	2.4
% of risk categories who are Pakistani	1.4	4.8	0.8	11.4
% of risk categories who are Bangladeshi	2.4	0.6	0.2	2.7
% of risk categories who are Chinese	0.0	0.6	0.0	0.8
% of risk categories who are Other	1.9	1.8	1.6	4.3
% of risk categories who are Mixed heritage	6.7	8.3	6.2	7.5
% of risk categories who are white non euro	0.0	0.0	100.0	0.0

Chi=256.99, p<0.001 (50% cells less than 5) # very small sample size

• English as a second language

Children whose first language is not English are more likely to be always at risk than other children (31.2% always at risk compared with 7.9% of children who have English as their first language).

Table A3.4 Differences between the language groups in risk histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of English speakers in risk categories	7.2	5.7	79.2	7.9
% of EAL in risk categories	15.3	13.2	40.2	31.2
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who are English speakers	86.1	84.5	96.0	76.2
% of risk categories who are EAL	13.9	15.5	4.0	23.8

Chi=166.06, p<0.001

• Family size

Children from large families have a greater likelihood of being at risk at both entry to pre-school and entry to primary school than other children. From our sample, 17.5% of children from large families were at risk at both time points compared with 6.0% of singletons (only children).

Table A3.5 Differences between the family size groups in risk status histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of children from singleton families	6.8	6.8	80.4	6.0
% of children from 2–3 child families	7.2	6.1	77.7	9.1
% of children from 4-plus child families	12.2	6.2	64.1	17.5
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories from singleton families	19.1	23.6	22.7	13.6
% of risk categories from 2–3 child families	60.8	63.6	66.6	62.8
% of risk categories from 4-plus child families	6.9	12.7	10.7	23.6

• Prematurity

It can be seen that children reported as born premature are somewhat over-represented in the always at risk category.

Table A3.6 Differences between the Premature groups in risk status histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of not premature in risk categories	7.5	6.1	77.6	8.8
% of premature in risk categories	8.8	6.9	71.1	13.2
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who are not premature	81.4	81.8	84.8	77.3
% of risk categories who are premature	18.6	18.2	15.2	22.7

Chi=10.36, p<0.05

Parental background

• Mother’s highest qualification level

Approximately 23% of children whose mother had no qualifications were in the always ‘at risk’ group compared with only 3% whose mothers had a degree qualification.

Table A3.7 Differences between the qualification groups in risk status histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of no qualifications in risk categories	12.4	8.7	55.5	23.4
% of 16yr academic in risk categories	12.5	10.7	66.1	10.7
% of 16yr vocational in risk categories	7.4	7.8	77.1	7.6
% of 18yr academic in risk categories	7.3	4.5	78.7	9.5
% of 18yr vocational in risk categories	7.2	5.1	81.7	6.0
% of degree in risk categories	4.5	2.0	90.7	2.8
% of higher degree in risk categories	2.5	2.5	95.0	0.0
% of other professional in risk categories	10.5	0.0	89.5	0.0
% of other miscellaneous in risk categories	4.3	0.0	82.6	13.0
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who no qualifications	28.1	24.7	12.7	42.8
% of risk categories who 16yr academic	3.4	3.7	1.8	2.4
% of risk categories who 16yr vocational	36.5	48.1	38.3	30.4
% of risk categories who 18yr academic	12.8	9.9	14.0	13.6
% of risk categories who 18yr vocational	8.4	7.4	9.6	5.6
% of risk categories who degree	7.9	4.3	16.0	4.0
% of risk categories who higher degree	1.5	1.9	5.7	0.0
% of risk categories who other professional	1.0	0.0	0.8	0.0
% of risk categories who other miscellaneous	0.5	0.0	0.9	1.2

Chi=225.85, p<0.001

• Mother's employment status

Mother not working appears to be of greatest significance for risk at the two time points. For example 73% of the children 'at risk' at both time points had a mother who was not working compared with 43% of children not at risk at both time points.

Table A3.8 Differences between the mother's employment groups in risk status histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of not working in risk categories	8.9	7.2	69.3	14.5
% of employed full time in risk categories	5.3	4.4	85.2	5.1
% of employed part time in risk categories	7.8	5.6	81.6	5.0
% of self employed in risk categories	4.4	6.2	85.8	3.5
% of combination in risk categories	0.0	0.0	91.7	8.3
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who not working	54.9	55.6	43.1	72.8
% of risk categories who employed full time	11.3	11.7	18.3	8.8
% of risk categories who employed part time	31.4	28.4	33.3	16.4
% of risk categories who self employed	2.5	4.3	4.8	1.6
% of risk categories who combination	0.0	0.0	0.5	0.4

Chi=95.07, p<0.001,

very small sample size

• Father's employment status

Having a father who is not working shared a stronger relationship with risk status than a mother who is not working. For example, 30% of the children at risk at both time points had a father who was not working compared with 10% of children not at risk at both time points.

Table A3.9 Differences between the father's employment groups in risk status change during pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of not working in risk categories	10.9	8.3	61.6	19.2
% of employed full time in risk categories	6.9	4.9	82.5	5.7
% of employed part time in risk categories	6.2	9.2	60.0	24.6
% of self employed in risk categories	4.6	4.6	83.1	7.6
% of combination in risk categories	0.0	0.0	71.4	28.6
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who not working	20.5	20.4	10.4	30.3
% of risk categories who employed full time	67.1	61.9	71.6	46.3
% of risk categories who employed part time	2.7	5.3	2.4	9.1
% of risk categories who self employed	9.6	12.4	15.3	13.1
% of risk categories who combination	0.0	0.0	0.3	1.1

Chi=107.15, p<0.001

• **Social class of Father's occupation**

Having a father who is semi-skilled, unskilled or who has never worked increases the likelihood of being in the at risk categories at both time points.

Table A3.10 Differences between social class groups (father's social class) in risk status histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of professional non manual in risk categories	3.9	1.8	93.4	0.9
% of other prof non manual in risk categories	4.6	3.4	87.2	4.8
% of skilled non manual in risk categories	7.7	6.4	78.8	7.1
% of skilled manual in risk categories	7.7	5.4	77.2	9.7
% of semi-skilled in risk categories	10.6	8.6	66.2	14.6
% of unskilled in risk categories	16.1	7.1	51.8	25.0
% of never worked in risk categories	18.2	9.1	54.5	18.2
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who prof non manual	6.0	3.7	13.0	1.2
% of risk categories who prof non manual	16.0	16.7	27.9	14.6
% of risk categories who skilled non manual	16.7	19.4	15.7	13.5
% of risk categories who skilled manual	31.3	30.6	28.7	34.5
% of risk categories who semi-skilled	21.3	24.1	12.2	25.7
% of risk categories who unskilled	6.0	3.7	1.8	8.2
% of risk categories who never worked	2.7	1.9	0.7	2.3

Chi=124.93, p<0.001

• **Marital status**

Children from single parents and separated/divorced families had the highest proportion of children always at risk.

Table A3.11 Differences between the marital status groups in risk status histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of single parents in risk categories	10.2	9.7	66.7	13.4
% of never married, living with partner in risk categories	5.3	5.1	78.9	10.7
% of married, living with spouse in risk categories	7.4	5.3	79.5	7.9
% of separated/divorced in risk categories	9.6	8.9	69.3	12.1
% of widow/widower in risk categories	25.0	0.0	75.0	0.0
% of other in risk categories	7.1	0.0	85.7	7.1
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who are single parents	28.1	24.7	12.7	42.8
% of risk categories who are never married, living with partner				
% of risk categories who are married, living with spouse	3.4	3.7	1.8	2.4
% of risk categories who are separated/divorced	36.5	48.1	38.3	30.4
% of risk categories who are widow/widower	12.8	9.9	14.0	13.6
% of risk categories who are other	8.4	7.4	9.6	5.6
	7.9	4.3	16.0	4.0

Chi=45.84, p<0.001

• The Home learning environment

Home learning environment appears to be very strongly related to the likelihood of remaining in risk. Over a third of children remaining at risk had very low scores on home learning environment. Even amongst groups already more likely to be at risk (such as children whose mothers have no qualifications) children with strong home learning experiences are less likely to remain at risk.

Table A3.12 Differences between the Home learning groups in risk status histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of scores 0–13 HLE in risk categories	11.6	10.3	43.3	34.8
% of scores 14–19 HLE in risk categories	8.8	9.7	68.3	13.2
% of scores 20–24 HLE in risk categories	8.8	5.6	78.5	7.2
% of scores 25–32 HLE in risk categories	7.2	5.0	83.0	4.8
% of scores 33–45 HLE in risk categories	2.7	1.8	93.6	1.8
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who scores 0–13 HLE	12.9	14.3	4.9	32.0
% of risk categories who scores 14–19 HLE	24.4	33.5	19.0	29.9
% of risk categories who scores 20–24 HLE	27.4	21.7	24.7	18.4
% of risk categories who scores 25–32 HLE	30.8	26.7	36.1	17.2
% of risk categories who scores 33–45 HLE	4.5	3.7	15.4	2.5

N.B Mean score for the HLE is 23.4 (sd=7.6) Approximately 79% of children always at risk have HLE scores below the average for this sample.

Chi=307.23, p<0.001

Figures in Table A3.13 show that even for children who have mothers with no qualifications, the home learning environment operates as a powerful protective factor in relation to staying in cognitive ‘at risk’ status.

Table A3.13 Home learning environment for children whose mother had no qualifications

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of scores 0-13 HLE in risk categories	14.9	10.6	38.3	36.2
% of scores 14-19 HLE in risk categories	9.5	10.1	55.4	25.0
% of scores 20-24 HLE in risk categories	16.5	5.8	58.3	19.4
% of scores 25-32 HLE in risk categories	11.1	7.8	66.7	14.4
% of scores 33-45 HLE in risk categories	0.0	0.0	92.9	7.1

Chi=30.60, p<0.01

• **Multiple disadvantage**

The multiple disadvantage index is made up of a number of factors as discussed earlier in this report. In total 29% of children who were never at risk were in the no disadvantage group compared with only 5% of those who were always at risk. In contrast, only, 2% of those never at risk had 5 or more disadvantages compared with 20% of those always at risk.

Table A3.14 Differences between the multiple disadvantage groups in risk status histories across pre-school

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of no disadvantages in risk categories	3.5	3.7	91.0	1.8
% of 1–2 disadvantages in risk categories	7.2	6.1	80.8	5.9
% of 3–4 disadvantages in risk categories	13.8	8.0	58.3	19.9
% of 5-plus disadvantages in risk categories	9.7	11.4	39.8	39.0
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories who have no disadvantages	11.2	14.8	29.0	4.5
% of risk categories who have 1–2 disadvantages	46.9	50.3	52.8	31.4
% of risk categories who have 3–4 disadvantages	36.2	26.5	15.9	43.6
% of risk categories who have 5-plus disadvantages	5.6	8.4	2.4	20.4

Chi=352.62, p<0.001

• **Significant life events**

At entry to pre-school parents reported on any life events that they felt had significantly affected their child’s development. Table A3.15 displays the movement of these children across the pre-school period in and out of ‘at risk’ classification. Particularly strong factors are birth trauma, family violence and accident/hospitalisation. Children whose parents felt there had been sibling problems at entry to pre-school are also more likely to remain in risk, with only 2% actually moving out. It should be noted that due to the sensitive nature of some events, particularly family violence, it is quite likely that their incidence is under-reported. Due to the small numbers involved effects would need to be large for statistical significance to be established.

Table A3.15 Children reported to be effected by particular life events: risk status histories across pre-school²⁵

	Strong cognitive risk			
	Out of risk	Into risk	Never at risk	Always at risk
% of event affected in risk categories	8.3	6.8	73.8	11.1
% of bereaved in risk categories	6.5	6.5	81.5	5.6
% of moved house in risk categories	7.9	7.1	78.7	6.3
% of sibling birth in risk categories	6.9	4.9	81.3	6.9
% of divorce/separated in risk categories	4.8	8.8	75.3	11.0
% of parental illness in risk categories	7.7	7.7	75.4	9.2
% of sibling problems in risk categories	2.0	4.0	80.0	14.0
% of transition in risk categories	4.5	2.3	84.1	9.1
% of birth trauma in risk categories	0.0	18.2	54.5	27.3
% of family violence in risk categories	5.6	13.9	55.6	25.0
% of accident/hospitalisation in risk categories	11.1	3.2	63.5	22.2
% of absent/mother in risk categories	11.1	3.7	59.3	25.9
% of other in risk categories	10.0	5.4	76.8	7.9
	Out of risk	Into risk	Never at risk	Always at risk
% of risk categories event affected	32.8	32.7	34.1	33.6
% of risk categories bereaved	10.3	12.7	12.7	7.0
% of risk categories moved house	14.7	16.4	14.5	9.4
% of risk categories sibling birth	14.7	12.7	17.0	11.8
% of risk categories divorced/separated	16.2	36.4	24.8	29.4
% of risk categories parental illness	7.4	9.1	7.1	7.1
% of risk categories sibling problems	1.5	3.6	5.8	8.2
% of risk categories transition	2.9	1.8	5.4	4.7
% of risk categories birth trauma	0.0	3.6	0.9	3.5
% of risk categories family violence	2.9	9.1	2.9	10.6
% of risk categories accident/hospitalisation				
% of risk categories absent/mother	10.3	3.6	5.8	16.5
% of risk categories other	4.4	1.8	2.3	8.2
	35.3	23.6	26.8	22.1

The effect of significant life events on young children's progress over pre-school was also investigated after prior attainment and all other significant pupil background details had been taken into account.²⁶ Significant effects were found for children from divorced/separated households for the Total Verbal and Picture similarities outcomes. Children who were reported by their parent as having problems with siblings and those experiencing family violence also made less progress for the Pattern construction outcome.

²⁵ Significant differences between children experiencing life events and those not were found for birth trauma (Chi=7.92, p<0.05); family violence (Chi=15.59, p<0.001); and absent mother (Chi=9.75, p<0.05)

²⁶ Multilevel modelling was used to look at the effect of all the prior attainment and pupil background variables simultaneously. See technical paper 8 for more details.

Table A3.16 The effect of life events on cognitive progress across pre-school

	Pre-reading	Total Verbal	Picture Similarities	Pattern construction	Early Number concepts
Any life event	--	--	--	--	--
Bereavement	--	--	--	--	--
Moving house	--	--	--	--	--
Birth of a sibling	--	--	--	--	--
Divorce/separation	--	Sig (-1.8)	Sig (-1.4)	--	--
Parental illness	--	--	--	--	--
Problems with siblings	--	--	--	Sig (-2.7)	--
Transition from home/sch	--	--	--	--	--
Birth trauma	--	--	--	--	--
Family violence	Bord (-2.6)	--	--	Sig (-3.3)	--
Accident/hospitalisation	Bord (-1.8)	--	--	--	--
Absent mother/shared	Bord (-2.9)	--	--	--	--
Other	--	--	--	--	--
Assessment range	30-70	40-160	20-80	20-80	20-80
Bord	Borderline significance		Sig	Significant (p<0.05)	-- Not significant

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Glossary of terms

Age standardised scores – Assessment scores that have been adjusted to take account of the child's age at time of testing.

Anti-social / worried – This is measured on the ASBI scale (see social / behavioural development in this glossary). Items on the scale which identify anti-social behaviour would be: teases other children, calls them names.

'at risk' – The report acknowledges that the term 'at risk' is a complex one which will differ depending on the particular criteria used. In this study we have referred to **cognitive risk** (1 sd below national average) and **strong cognitive risk** (1 sd below sample average). These provide definitions of children who may be seen to be 'at risk' on the basis of their cognitive attainment at entry to pre-school. For social / behavioural 'at risk' we use one standard deviation below the mean for the sample, as measure on the ASBI (see social / behavioural in this glossary) as a cut off (see cut off in this glossary) for the factors, Anti-social/worried upset and Peer sociability. The EPPE definitions of 'at risk' (using standardised assessments) could therefore be said to be 'actual' rather than 'perceptual' risk. However, the views of parents, pre-school workers and teachers about whether or not a child falls into an 'at risk' category are based more on 'perceptual' than 'actual' risk.

British Ability Scales (BAS) – This is a battery of assessments specially developed by NFER/Nelson to assess very young children's abilities. The assessments used at entry and end of pre-school were:

Block building which measures Visual-perceptual matching, especially in spatial orientation

Naming Vocabulary – Expressive language and knowledge of names

Pattern construction – Non-verbal reasoning and spatial visualisation.

Picture Similarities – Non-verbal reasoning

Early number concepts – Knowledge of, and problem solving using pre-numerical and numerical concepts.

Copying – Visual - perceptual matching and fine-motor co-ordination. Used specifically for children without English as a first language or who are not fluent in English.

Verbal comprehension – Receptive language: understanding of oral instructions involving basic language concepts.

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

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

Child/parent factors – Examples of child factors would be gender, ethnicity etc. Examples of parent factors would be mother's qualifications and father's employment.

Cognitive development – Children's intellectual and conceptual development, measured on the EPPE project by assessments which quantified: Verbal Ability, Non-verbal Ability and Spatial Ability, at entry to Pre- school. Subsequent assessments measure children's pre-reading abilities, phonological awareness (knowledge of alphabetic sounds) and number awareness. For information on assessments see British Ability Scales in this glossary.

Cut off – The score below which children are deemed to be ‘at risk’, 1 standard deviation below the mean (see standard deviation in this glossary).

The Early Childhood Environment Rating Scale – Revised (ECERS-R) is a rating scale consisting of 43 items completed by an observer that assesses the overall quality of the childhood setting. The items are grouped to produce 7 subscales: space and furnishings, personal care practices, language and reasoning, pre-school activities, social interaction, organization and routines, adults working together.

The Early Childhood Environment Rating Scale – Extension (ECERS-E) is a new rating scale developed specifically for the EPPE project to supplement the ECERS-R consisting of 18 items. It is based on the Desirable Learning Outcomes for 3 and 4 year olds and pedagogical practices associated with it and consists of items completed by an observer of the childhood setting’s activities. The items are grouped to produce 4 subscales: literacy, maths, science/environment, diversity.

General Cognitive Ability (GCA) – a measure of children’s overall cognitive ability, incorporating non-verbal and verbal BAS subscales. At entry to the study the BAS subscales that made up the ‘GCA’ were: Block Building, Naming Vocabulary, Picture Similarities and Verbal Comprehension. At entry to Primary School, ‘GCA’ was made from Naming Vocabulary, Picture Similarities, Verbal Comprehension, Early Number Concepts and Pattern Construction. (See cognitive development and British Ability Scales in this glossary).

Goodman Strengths and Difficulties Questionnaire

(Goodman 1997) is made up of five sub-scales: Pro-social, hyperactivity, emotional problems, and Peer sociability.

Home learning environment – A composite score derived from reports from parents (at interview) about what children do at home, combining seven types of home learning activities; reading, library visits, playing with letters or numbers, painting and drawing, playing/teaching alphabet or letters, playing/teaching with numbers/shapes and playing/teaching of songs/nursery rhymes. The composite scores identifies households which have a rich or more impoverished home learning environment for children.

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

Peer sociability – This is the ability to ‘get on’ with other children. It is an important milestone in young children’s social development and includes the ability to empathise, sympathise and relate to peers. Children with poor Peer sociability can often be withdrawn and isolate. Examples of Peer sociability on our rating scale were: willing to join a group of children playing, understands others’ feeling, like when they are happy, sad or mad, asks or wants to go and play with other children etc.

Multiple Disadvantage Index (MDI) – An index based on three child variables, six parent variables, and one related to the home learning environment which were considered ‘risk’ indicators when looked at in isolation. A child’s MDI was calculated by summing the number of indicators the child was at risk on.

Sampling profile / procedures – The EPPE sample was constructed by :

Five regions (six LEAs) randomly selected around the country, but being representative of urban, rural, inner city areas.

Pre-schools from each of the 6 types of target provision (nursery classes, nursery schools, Local authority day care, private day nurseries, play groups and combined centres) randomly selected across the region.

Children randomly selected within each target centre, of the required age who met criteria for eligibility (i.e. assessed within 10 weeks of entry if over 3, assessed just after third birthday if already at centre at a younger age).

Social / behavioural development – By this we mean a child’s ability to ‘socialise’ with other adults and children and their general behaviour to others. EPPE, unlike other studies, has considered both social and cognitive development of young children. Children’s social / behavioural development considers children’s social competence, pro-social behaviour (social skills) and anti-social behaviour. Social / behavioural development is measured by the Adaptive Social Behavioural Inventory (ASBI) specifically developed for very young children’s behaviour at entry to pre-school. Subsequent assessments measure any peers and emotional problems children may be experiencing.

Special Non-verbal Composite (SNC) - Created from the non-verbal BAS scores (see British Ability Scales in this glossary)

Standard deviation – A measure of the spread around the mean. In a normal distribution 68 percent of cases fall within one, plus or minus standard deviation of the mean and 95 percent of case fall within two standard deviations.

Stress factor loading – Level of perceived stress associated with a particular life event i.e. divorce, bereavement, taken from McCubbin, H., and Patterson J. (1991) (see reference section of this report).

Value added analyses of progress

The analyses use statistical (multilevel) models to explore individual children’s progress over time and variations in centre effectiveness, taking account of their prior attainment at entry to pre-school using attainments at entry to primary school as outcomes.

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