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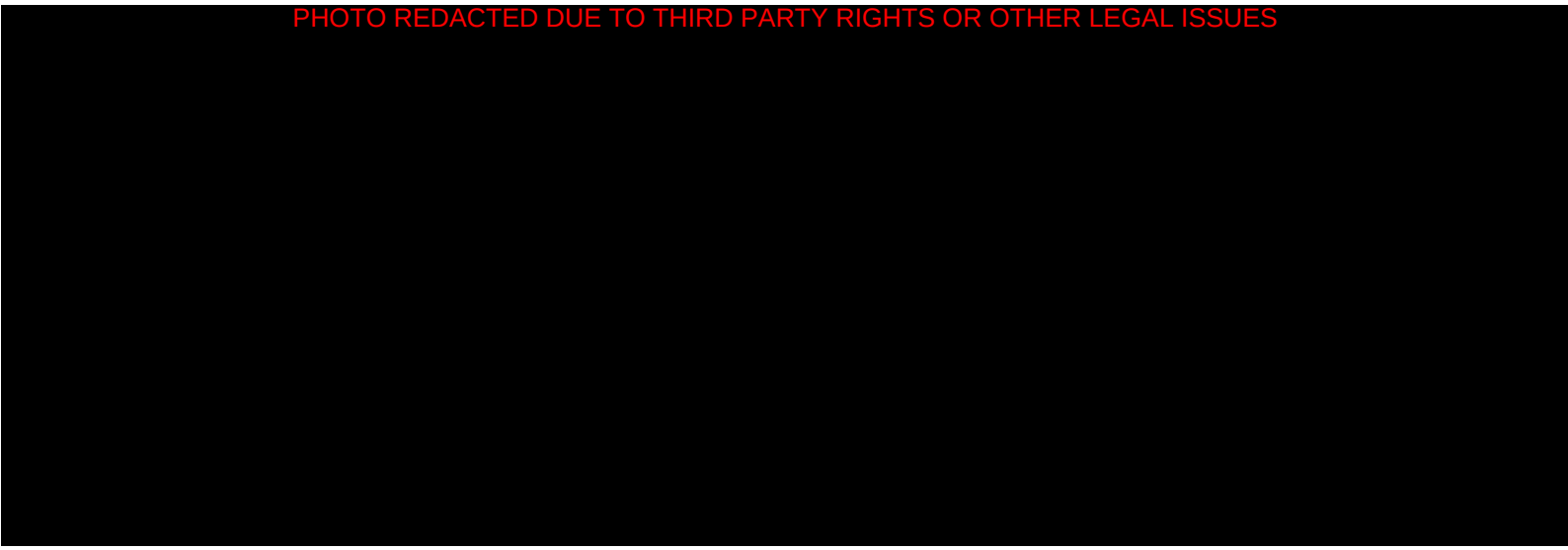

Quality of Childcare Settings in the Millennium Cohort Study

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THE MCS CHILDCARE QUALITY RESEARCH TEAM

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EXECUTIVE SUMMARY

Introduction

The Millennium Cohort Study (MCS) is the first new birth cohort study in the UK since 1970, and one of the largest studies of its kind. The ESRC-funded study has been operating since 2000 and is following the lives of nearly 19,000 babies born between 2000 and 2002 in the UK.

At the time the current study began, the MCS children were in their pre-school years, and many were attending formal childcare provision. The Quality of Childcare Settings in the Millennium Cohort Study (QCSMCS) was established to assess the quality of provision attended by a sample of the 10,000 Millennium children living in England. It aims to answer the following research questions:

1. What is the quality of the group childcare settings attended by a sample of Millennium Cohort Study children?
2. Is there a relationship between the quality of childcare received and children's home background?

A supplementary question which has arisen during the study is:

3. Which centre characteristics are associated with higher or lower quality of provision?

In addition to answering the above questions, the information collected as part of this study will also significantly enhance the value of the MCS data with respect to examining the impact of quality of childcare on future child outcomes. This essential area for future analysis will become possible on data collected at the five year assessments. The age 5 interviews took place between January 2006 and January 2007, and data is likely to be available later in 2007.

Rationale

Since the 1997 election, the Labour Government's commitment to the expansion of early years services in the UK has been one of its most consistent themes. In addition to its focus on early years reform, the UK Government has also committed to delivering 'evidence-based policy'. In 1997, the Effective Provision of Pre-school Education (EPPE) project was commissioned to provide an 'evidence base' for policy decisions. The EPPE research has been invaluable in informing Government policy and in assessing the early impacts of the Labour Government's early years reform. However, many of the new programmes and policies have come into force since the EPPE data was collected in 1997 and 1998.

In addition, while a number of evaluations of the Government's early years programmes have taken place in recent years, the majority of these have focused on targeted initiatives such as the Sure Start Local Programmes and the Neighbourhood Nurseries Initiative, i.e. those targeted at the 20% most deprived wards in the country. Since EPPE, there has been no large scale evaluation focusing on the provision of childcare and education *across* the UK. The Millennium Cohort Study presents a unique opportunity to take a snapshot of childcare quality *across* England – rather than focusing on disadvantaged areas - and to assess the impacts of Government policy on provision for pre-school children since the 1997 election.

Methodology

The starting point for the current study was a sub-sample of 1,217 MCS families (in England) who had reported using a group childcare setting at age 3, and given consent for that setting to be approached . A further sub-sample of families – and the childcare settings they attended - was selected for the Quality of Childcare Settings in the Millennium Cohort Study (QCSMCS), with the aim of identifying a total of 300 group care settings attended by Millennium children.

The final sample comprised 301 settings attended by 632 MCS children. For the current study, all 632 children and families attending the sample settings are included in the analyses. Later analysis linking quality data to child outcomes will involve only those 542 children (of the 632) who meet certain eligibility criteria (for example, length of attendance at the setting, hourly attendance per week).

Visits to the sample MCS settings took place between March 2005 and October 2005. Observations of up to a day were conducted in one of the rooms providing for pre-school children between the ages of 3 and 5 years. Information was gathered using three observational instruments:

- ***Early Childhood Environment Rating Scale –Revised Edition (ECERS-R).*** This revised version of the Early Childhood Environment Rating Scale (Harms, Clifford and Cryer, 2004) is designed to assess provision for children from 2 ½ to 5 years, and covers a comprehensive range of quality features. Three of the seven subscales of the ECERS-R (those most closely related to child development) were used:
  - Personal Care Routines (e.g. health and safety, hygiene, mealtimes);
  - Language-Reasoning (e.g. supporting children's language development);
  - Interaction (e.g. supervision, discipline, staff-child & peer interactions).
- ***Early Childhood Environment Rating Scale – Extension (ECERS-E).*** This UK extension to the ECERS-R was developed by Kathy Sylva and colleagues as part of the Effective Provision of Pre-school Education (EPPE) project, and was revised in 2006. The ECERS-E consists of four subscales: Literacy, Mathematics, Science and Diversity. Items in these sub-scales assess the quality of curricular provision in those domains aimed at fostering children's academic progress.
- ***The Caregiver Interaction Scale (CIS, Arnett, 1989).*** This scale consists of 26 items forming four sub-scales, each of which measures a different aspect of caregiver-child interactions:
  - Positive relationships (e.g. warmth in interaction with children);
  - Punitiveness (e.g. harsh or over-controlling behaviour);
  - Permissiveness (e.g. avoidance of discipline and control of children);
  - Detachment (e.g. lack of involvement with children).

The Effective Provision of Pre-school Education (EPPE) project, which collected data on the quality of 141 pre-school settings in the late 1990s, also used the ECERS-R and the ECERS-E. As a result, it has been possible to make some comparisons across the two studies. Finally, information on a number of additional centre characteristics (for example, sector, qualifications of centre staff, centre size) was collected, with the aim of establishing which of these characteristics were related to, and predicted, quality of provision.

Key findings: overall quality of provision

The quality of provision offered by the sample settings varied widely, with some offering excellent provision and others less than adequate quality. The maintained settings were providing the highest quality provision overall, particularly with regard to the 'learning' aspects of provision. However, comparing the MCS and EPPE data shows that, whilst all sectors have made improvements since the late 1990s, the largest gains have been seen in the voluntary sector. Voluntary providers have made significant improvements in all areas of provision assessed as part of the current study, including personal care routines, interaction and language, curricular provision for literacy, maths and science, and provision for diversity and individual learning needs.

The following sections consider each of the dimensions of quality in turn and describe the quality of provision offered by the MCS settings, and whether any improvements have been seen since the EPPE data was collected.

Language and interactions

The MCS settings achieved significantly higher scores than the EPPE sample on the 'language & reasoning' and 'interaction' subscales of the ECERS-R. This suggests that the quality of pre-school provision for children's developing language and social interactions has improved significantly since the EPPE data was collected. The fact that both studies had large-scale national samples gives credence to these positive results, which demonstrate improvement in provision over a (relatively) short period[1].

In fact, staff-child interaction was the strongest element of provision across the sample, with centres achieving high scores on all three observational instruments. The ECERS-R scores showed that MCS settings were successful at offering children warm and stimulating interactions, and also at encouraging social interactions among children and encouraging children to communicate. On the ECERS-E, the highest scoring subscale was provision for literacy and, in particular, opportunities for talking and listening. Finally, observations made using the Caregiver Interaction Scale showed that staff in the MCS settings often displayed positive relationships with children, while less desirable behaviours such as detachment and lack of involvement with children, over-controlling or over-permissive behaviours, were rarely seen. Overall, the results suggest that provision for children's developing oral language and communication skills was of a good quality. However, provision for other aspects of children's developing literacy skills were not as strong (see below).

Curricular provision

On the whole, scores on the more 'curricular' ECERS-E subscales were lower than on the ECERS-R subscales. This confirms the findings of the EPPE project in suggesting that, while early childhood settings are good at providing nurturing environments for children, they are less successful at offering provision which stimulates children's cognitive development.

Of the aspects of curricular provision assessed by the ECERS-E, the MCS settings scored most highly on provision for literacy (rated as between 'minimal' and 'good'). However, while provision for oral language tended towards 'good', provision for other important aspects of children's literacy development – for example, their developing sound awareness, reading and emergent writing skills – were only adequate.

[1] Some caution must be exercised in making direct comparisons, since the MCS observers did not carry out reliability (agreement) checks with the EPPE team.

Comparisons with the EPPE data suggest that – other than in the voluntary sector - little improvement has been made in literacy provision since the late 1990s. This is a somewhat worrying finding, and suggests that further work is required to help early childhood settings improve their provision for children's emergent reading and writing skills.

Maths and science provision in the MCS sample were rated as just above minimal overall, suggesting that the Foundation Stage may not yet be making a significant contribution to the development of children's mathematical and scientific understanding. As with literacy provision, the voluntary sector was the only group to have improved mathematical provision since the EPPE data was collected. However, the trend for science provision was more positive, with significant gains in all sectors since the late 1990s: in this area of the curriculum it is possible that changes in policy and practice are having a positive effect. The findings suggest that staff teams working in early childhood settings were most confident in offering children the chance to explore science through cooking and food preparation activities. However opportunities for children to experience and learn about non-living processes such as magnetism, sinking and floating, light and sound were more limited. Additional support is needed to ensure that settings have the necessary resources to support these experiences and that staff are confident in supporting children's explorations in these more 'traditional' science areas.

Providing for diverse needs

The lowest scores were achieved on the diversity subscale. On average, the MCS settings were offering below minimal provision in this regard, and (other than in the voluntary sector) no improvement has been made since the EPPE data was collected in the late 1990s. This is a worrying finding, particularly since one of the key aspects of provision assessed by this subscale is planning for individual learning needs: a key element of the Early Years Foundation Stage. It appears that early childhood settings are not yet meeting the diverse needs of the children in their care, for example by providing activities which enable children of all abilities to participate in a satisfying and cognitively demanding way. The diversity subscale also assesses the provision of resources and activities which promote awareness and understanding of racial and cultural diversity. In today's increasingly multi-racial society, the fact that pre-school settings are not adequately addressing these issues cannot be ignored, and settings clearly need support to improve their quality. However, further research is also needed to identify *why* settings are performing so poorly in these areas.

Key findings: variation in quality according to centre characteristics

A range of information was collected in each centre with the aim of establishing which centre characteristics were related to, and predicted, quality of provision (as measured by the ECERS-R and ECERS-E). The most important influences on overall quality of provision for 3 and 4 year old children were (in rank order):

- Sector (maintained sector = higher quality);
- Group size (larger groups = higher quality);
- Staff qualifications (higher qualifications = higher quality);
- Children's Centre status (Children's Centres = higher quality);
- Age range/s of children catered for (older children = higher quality);
- Staff-child ratios (fewer children per adult = higher quality);
- Links with Sure Start Local Programmes/ health services (SSLPs/health links = lower quality);

- Centre size (smaller centres = higher quality);
- Nursery manager qualifications (higher qualifications = higher quality).

Sector

Local Education Authority (LEA) maintained status was linked to higher quality provision in almost all dimensions measured, with the exception of provision for personal care routines. Maintained settings offered higher quality interactions, provision for children's developing language and reasoning skills, and higher curricular quality for literacy, maths, science and diversity. The relationships with 'interactions' and 'maths' were only apparent when staff qualifications were removed from the regression model. This suggests that staff qualification may be one of the main factors driving the higher quality achieved by the maintained sector in these areas.

Size of group and size of centre

A positive impact of group size was identified: rooms with more children present on the day of the observation offered higher quality curricular provision across the board, as well as higher quality interactions and provision for children's developing language and reasoning skills. Larger rooms may be able to provide a more interesting range of activities for children, and may also be led by a larger staff team with a broader range of experiences, interests and expertise. Group sizes of 30 children or more were of the highest quality (once other factors – such as sector - had been taken into account).

One effect of centre size was identified: groups located in larger centres (i.e. with greater numbers of children enrolled) offered lower quality interactions for 3 and 4 year old children. This appears counter-intuitive in light of the findings on group size, and also goes against the findings of the Neighbourhood Nurseries Initiative evaluation (Mathers & Sylva, *in press*) which concluded that larger centres offer higher quality for children under the age of 3½ years. It seems that the relationship of centre size to quality is a complex one, and may vary for different age groups. Further research is recommended to explore the relationships between centre size and quality in greater depth.

Staff and manager qualifications

The childcare qualifications of staff working in the rooms observed were an important predictor of quality, and were most strongly related to those aspects of provision which foster children's developing language, interactions and academic progress. The only area not associated with staff qualifications was the quality of personal care routines (e.g. snack, toileting, safety and hygiene practices). These findings support previous research in identifying the important contribution of staff training and qualifications to the provision of a quality learning environment for pre-school children.

Although the mean qualification level of staff working with the children was the strongest predictor of quality, a number of other qualification measures were also significantly related to quality of provision. In particular, the percentage of staff members unqualified was important (and was negatively related to quality). The presence of a qualified teacher was particularly important for educational quality.

The qualification levels of the centre manager/head teacher were positively related to quality of provision and, in particular to provision for personal care routines. Weak but significant relationships were also found between the qualifications of the managers and the quality of provision for interactions, language and reasoning skills and literacy.

Children's Centre status

A positive impact of Children's Centre status on quality was identified. In some cases, it is possible that these impacts were due to the fact that the majority of Children's Centres were in the maintained sector i.e. it was the maintained influence rather than involvement in the Children's Centre programme which resulted in higher quality. However, the positive relationships with provision for science, diversity and personal care routines were independent of sector. Children's Centres offered significantly better quality provision for children's developing scientific knowledge and understanding, and were better at providing for diverse needs, than centres not involved in the Children's Centre programme. They also offered hygienic and appropriate care routines such as meal times, toileting and naps.

Age range

The ages of children catered for was a significant predictor of quality for 3 to 5 year old children. Having older children (for example, children over 4 ½ years) in the room was beneficial, particularly in terms of the quality of interactions, provision to develop children's language and reasoning skills and overall curricular quality[2]. It is likely that this is due to the higher level of language, communication and educational activities developed to meet the needs of (and challenge) these older children.

While the presence of older children was beneficial in terms of quality, having younger children (i.e. children under the age of 3 years) in the group alongside 3 and 4 year olds had a negative effect on provision quality. This could be because the presence of younger children, and the staff time required to care for them, means that less time and resource is available to devote to challenging educational activities for the older children. In addition, the requirement to have a range of activities and materials appropriate for both older and younger children may lead to a 'dilution' of the educational content required to challenge 3 and 4 year olds.

Ratio

For the age ranges of children in the sample, the legal ratio for private and voluntary sector settings is 8:1. In a local authority maintained nursery class or school, one teacher and one nursery nurse can provide for up to 26 children (a ratio of 13:1). Since the maintained sector offered the highest quality provision, we might expect to find that higher numbers of children per adult are related to higher quality provision. However, once the influence of sector was accounted for (using multiple regression analysis), it was clear that more children per staff member led to *lower* quality in some areas: in particular, the quality of personal care routines, language and reasoning, interactions and provision for diverse needs. Thus, *within* sectors (i.e. once sector is accounted for) better ratios improve the quality of provision in these areas.

Links with Sure Start Local Programmes

In contrast to the positive impacts of Children's Centre status, a *negative* effect of links with the Sure Start programme was found. This related specifically to provision for mathematics, and for the development of children's literacy, language and reasoning skills. A possible explanation is that, while the Children's Centre Programme focuses specifically on centre-based services for children, child services were not the main priority of many Sure Start Local Programmes. Further evidence for this conclusion is provided by the finding that centres offering child and family health services were of significantly lower quality (in many of the same areas) than centres not offering these

[2] This mirrors the results of the Neighbourhood Nurseries Initiative evaluation, which found that quality of provision for infants and toddlers is higher in rooms which also cater for older children.

services. This finding suggests that quality - especially those aspects related to literacy and language, reasoning and mathematics - is lower when the main focus of the programme or centre is *not* the fostering of children's learning but rather the provision of services for families. Providing for children's learning is not incompatible with local Sure Start aims, nor with health-related services. However, constraints on money, staff time and scheduling may lead to one set of activities and aims 'trumping' another.

Key findings: variation in quality according to user characteristics

The final element of the analysis considered the characteristics of the children and families who attended the sample settings. The aim was to establish whether the quality of provision experienced by children varied according to their characteristics i.e. are different types of children and families receiving different qualities of provision?

Comparison of MCS families attending group care setting with those using informal care, or with no childcare arrangements, suggested that the children in group childcare settings tended to be from more advantaged homes. For example, they tended to be from more affluent families, from families with at least one working adult, and to have better qualified mothers. Families not using childcare were more likely to be Indian, Bangladeshi or Pakistani.

However, comparison of family characteristics with the quality of provision their children received showed that children from lone parent households, children from non-working households, children living in rented rather than owned accommodation, and children with health problems all received higher quality provision. Thus, although children from less advantaged backgrounds are less likely to be attending group care, those who do so receive comparable – and in some cases better – quality of provision. This may be a direct result of recent Government initiatives such as the Neighbourhood Nurseries Initiative and the Children's Centre Programme, which aim to improve the quality of early years provision in the most disadvantaged areas of the country.

The finding that disadvantaged children tend to have better quality childcare than more advantaged ones appears to contradict the findings of the Neighbourhood Nurseries Initiative evaluation (Mathers & Sylva, *in press*), which found no relationship between the population of children and families served and quality of provision, and concluded that families from different backgrounds were being offered comparable quality. One explanation for these different results lies in the fact that the samples for the two studies were quite different. Whereas the MCS families represented a wide range of social classes and levels of affluence, the NNI sample was drawn from areas of disadvantage. While the NNI sample did show some variation in the level of disadvantage of centre populations, the MCS sample (with families drawn from all levels of socio-economic status) is much more appropriate for making comparisons between disadvantaged and affluent families. It is likely that the MCS finding that disadvantaged children receive better quality childcare is closer to the truth, and that this effect was masked in the NNI by the lack of more affluent families for comparison.

Finally, analysis of the home environment suggests that children from families which encourage learning at home also receive higher quality centre-based provision. This could be because families who take the time to develop their children's learning at home also place more emphasis on finding stimulating early years provision. Among rich and poor families, those who offered a rich home learning environment also appeared to enroll their children in the highest quality early childhood settings.

In summary

- The MCS settings were particularly successful at providing a warm and nurturing environment for children, and at supporting their developing social skills;
- Literacy provision was strongest of the curricular areas (although was still only rated as 'adequate' overall). Provision for children's developing oral language and communication skills was of a good quality, but the sample settings catered less well for other aspects of children's developing literacy skills, particularly sound awareness, reading and emergent writing. Other than in the voluntary sector (which showed gains across the board) little improvement has been seen in literacy provision since the late 1990s.
- Provision for children's developing mathematical and scientific understanding was rated as just above minimal overall. However, the trend for science was upwards, and improvements have been made since the late 1990s;
- Provision for diversity is not of a good (or even minimal) quality: early years settings are not yet planning for individual learning needs or adequately promoting awareness of diversity in terms of race, culture and gender.
- The maintained sector offered the highest quality provision overall. However, the largest gains since the 1990s were seen in the voluntary sector.
- The study highlighted the importance of a well qualified staff team in ensuring high quality. The presence of a qualified teacher was particularly important for the educational aspects of provision.
- Children's Centres offered better quality provision for children's developing scientific knowledge and understanding, and were better at providing for diverse needs. However, centres linked with Sure Start Local Programmes were of poorer quality, possibly due to a focus on family rather than child-based services.
- The relationship between centre/ group size and quality is complex: while higher quality was seen in larger rooms/groups, rooms located in larger *centres* offered children *lower* quality interactions.
- Higher quality was seen in rooms which catered exclusively for 3 and 4 year old children (rather than a mixed group of pre-schoolers and under 3s).
- Within sectors (i.e. once sector is accounted for), better staff-child ratios improve quality in a number of areas.
- While children from disadvantaged families were less likely to be attending group childcare, those who did so were receiving comparable – and in some cases better – quality than children from more advantaged families.

Recommendations and policy implications

1. Maintained settings should continue to be supported, as these offered the highest quality provision overall. However, the findings also suggest that there is considerable potential in the voluntary sector, which had made the largest gains since the 1990s.
2. Settings in <u>all</u> sectors need support to improve quality of provision for children's developing skills in the areas of literacy, mathematics and science, to plan for children's individual learning needs, and to offer an environment appropriate for today's increasingly racially and culturally diverse society.
3. The development of a well-qualified childcare workforce is vital for improving quality and, in particular, for the provision of a challenging and appropriate educational environment for 3 and 4 year old children.

4. Larger group sizes were beneficial in terms of provision quality. However, it will be important to assess the impact of group size on children's outcomes (as well as on quality) when this information becomes available, particularly with regard to social development and emotional security.
5. The development of Children's Centres should be supported: Children's Centres offered higher quality provision, and the findings of this study suggest that initiatives (such as the Children's Centre Programme) which aim to improve the quality of early years provision in disadvantaged areas are having some success. Although children from less advantaged backgrounds were less likely to be attending group care, those who did so received comparable – and in some cases better – quality of provision.
6. Three and four year old children experienced the highest quality provision in rooms which catered for the older end of the age-range, and which did not include children under the age of 3 years. However, the evaluation of the Neighbourhood Nurseries Initiative (*Mathers & Sylva, in press*) found that children under the age of 3 experience higher quality provision in mixed age rooms which also cater for 3 and 4 year olds. Thus, younger children may benefit from mixed age rooms: older children may not.
7. Within the bounds of the legal ratios applicable for each sector, a number of positive effects of high staff-child ratios were identified (in particular, relating to interactions/language opportunities and planning for diversity/individual learning needs). Centres should be encouraged to plan staffing schedules that allow high adult involvement with each child for at least some time during each session.
8. Thoughtful consideration needs to be given in centres with a broad remit: there is a need to ensure that a focus on childcare and education provision is retained alongside the provision of other services (such as health and family support). Centres with links to SSLPs, and centres which provided child and family health services, offered lower quality provision than centres without these features. All services are important, but a better balance may be needed.

1. Introduction

1.1 The UK policy context

In Britain, the post-war years have seen large increases in the number of women in the labour market and, most recently, in mothers of dependent children. The increase of mothers in the labour market has created new challenges for the family and other institutions responsible for childcare. For most mothers with young children below school age, employment requires finding an alternative source of childcare.

Since the 1997 election, the Labour Government's commitment to the expansion of early years services in the UK has been one of its most consistent themes. This is notable in the expansion of childcare provision following the 1998 National Childcare Strategy, in new funding and in the reorganisation of services towards greater co-ordination and integration of previously separate services. The aim of the National Childcare Strategy has been to deliver quality, affordable, accessible childcare in every neighbourhood. The Green Paper 'Meeting the Childcare Challenge', published in 1998 to set out the Government's Childcare Strategy, called for (among other things):

- A free nursery education place for all four year olds. This has since been extended to three year old children, and is now available across all sectors of provision.
- New standards and a more consistent regulatory regime for early education and childcare. In 2000, a new curriculum framework covering provision for pre-school children was published in the form of the 'Foundation Stage'. The Foundation Stage provides for children from the age of 3 to the end of their reception year in primary school, and now forms the first part of the UK National Curriculum. The Foundation Stage guidance was followed in 2003 by 'Birth to Three Matters', which extended the framework to provision for children under the age of 3.
- A new childcare tax credit for working families, intended to assist low income families with up to 70% of their childcare costs.
- Better integration of early education and care. The flagship integrated centres were Early Excellence Centres, offering year-round care and education for children, as well as support for parents. The largest initiative has been Sure Start, with over 500 local programmes set up to serve children up to the age of 4 and their families. These are run by local partnerships and deliver a range of services including childcare, adult training and basic skills education to disadvantaged communities. Similarly, the Neighbourhood Nurseries programme was targeted at disadvantaged areas and provided funding as 'pump priming' to kick-start childcare in disadvantaged areas. The Children's Centre programme was launched in 2003 to build on the Early Excellence, Sure Start and Neighbourhood Nurseries programmes in disadvantaged areas. Most recently, the Government's 2003 Green Paper 'Every Child Matters' and the 'Ten Year Strategy for Early Years and Childcare' published in December 2004 set out further commitments to investment in childcare and education, including a Children's Centre in every community by 2010.

1.2 Evidence-based policy: the EPPE and MCS research

It has long been known that quality of childcare influences child development (Sylva et al, 2004; Phillipsen et al, 1997; Whitebook et al, 1989). In addition to its focus on early years reform, the UK Government has also committed to delivering 'evidence-based policy'. In 1997, the Effective Provision of Pre-school Education (EPPE) project was commissioned to provide an 'evidence base' for policy decisions. This large-scale

longitudinal study collected data on 3,000 children, their parents, home backgrounds and pre-school providers. Its findings on the effects of pre-school education have been used by the Government to support the expansion of early years provision and targeted provision for the most disadvantaged areas of the country.

The EPPE research has been invaluable in informing Government policy and in assessing the early impacts of the Labour Government's early years reform. However, many of the new programmes and policies have come into force since the EPPE data was collected in 1997 and 1998. The Foundation Stage and Birth to Three frameworks have both been introduced since the EPPE research was conducted, as have many of the Sure Start Local Programmes, Neighbourhood Nurseries and Children's Centres.

Several evaluations of the Government's targeted initiatives – those targeted at the 20% most deprived wards – have taken place in recent years, including evaluations of the Sure Start Local Programmes (National Evaluation of Sure Start, 2004) and Neighbourhood Nurseries Initiative (in press, 2007). However, since EPPE, there has been no large scale evaluation focusing on the provision of childcare and education *across* the UK.

The Millennium Cohort Study (MCS) is the first new birth cohort study in the UK since 1970, and one of the largest studies of its kind. The ESRC-funded study has been operating since 2000 and is following the lives of nearly 19,000 babies born between 2000 and 2002 in the UK. At the time the current study began, the MCS children were in their pre-school years, and many were attending formal childcare provision. The Millennium Cohort Study presents a unique opportunity to take a snapshot of childcare quality *across* England – rather than focusing on disadvantaged areas - and to assess the impacts of Government policy on provision for pre-school children since the 1997 election.

1.3 Objectives and purposes of the study

The Quality of Childcare Settings in the Millennium Cohort Study (QCSMCS) – has been established to assess the quality of provision attended by a sample of the 10,000 Millennium children living in England. It aims to answer the following research questions:

1. What is the quality of the group childcare settings attended by a sample of Millennium Cohort Study children?
2. Is there a relationship between the quality of childcare received and children's home background?

A supplementary question which has arisen during the study is:

3. Which centre characteristics are associated with higher or lower quality of provision?

In addition to answering the above questions, the information collected as part of this study will also significantly enhance the value of the MCS data with respect to examining the impact of quality of childcare on future child outcomes. This essential area for future analysis will become possible on data collected at the five year assessments. The age 5 interviews took place between January 2006 and January 2007, and data is likely to be available later in 2007.

2. Methodology

2.1 The Millennium Cohort Study sample

The first sweep of the Millennium Cohort Study (MCS1) comprises information on 18,818 children, collected when they were around 9 months old. The sample design of the MCS allowed for disproportionate representation of areas with high minority populations and high levels of child poverty. This was achieved in the English sample by stratifying the data into three groups: an 'ethnic minority' stratum where at least 30 percent of the population fell into either the 'black' or 'Asian' category (at the 1991 census); a 'disadvantaged' stratum, which included children in wards where there was a high incidence of child poverty (but that had not been classified as high ethnic minority wards); and an 'advantaged' stratum which included wards that had not been classified under either of the first two strata[3]. The second sweep of MCS data (MCS2) was collected when the children were around 3 years of age, mainly in 2004.

2.2 The Quality of Childcare Settings in the Millennium Cohort Study sample

The starting point for the current study (the QCSMCS) was a sub-sample of 1,217 MCS families (in England) who had reported using a group childcare setting at age 3[4] - or, more specifically, the areas where these families lived. The sub-sample of areas was based on the 152 (out of a total of 354) Local Authority Districts (LADs) included in the MCS1 sample as a result of sampling wards within strata. Within each of the 9 English Government regions, clusters of neighbouring LADs were formed from the initial pool of 152. The number of clusters within each region varied from just 2 for the North East region to 10 for the South East. Three clusters were then selected from each region (2 in the North East) to give 26 clusters in total. This strategy generated the sub-sample of 1,217 families and approximately 826** settings. Table 2.1 shows the number of sampled families and settings by region. A more detailed table, showing sampled families by cluster as well as by region, is shown in Appendix 2 (Technical Report on Sampling).

Table 2.1 First sub-sample: number of sampled families and settings by region

Region	n (MCS families)	n (settings)
East Midlands	148	112
East England	114	92
North East	68	57
South East	185	114
South West	116	72
Yorkshire & Humber	132	73
West Midlands	155	83
North West	139	95
London	160	128
TOTAL	1,217*	826 (825)**

* The total number of children is 1235 (including twins and triplets).

** The total of 826 was later confirmed as 825, due to the discovery a duplicate during data cleaning.

[3] Plewis et al (2004) Millennium Cohort First Survey Technical Report on Sampling, Centre for Longitudinal Studies, Institute of Education, London. www.cls.ioe.ac.uk/studies.asp?section=0001000200010010

[4] (and had given permission for these setting to be approached).

A further sub-sample of families – and the childcare settings they attended - was selected for the Quality of Childcare Settings in the Millennium Cohort Study (QCSMCS), with the aim of identifying a total of 300 group care settings attended by Millennium children. A larger sub-sample than was actually required was drawn to allow further sampling refinements. It was also necessary to allow for the possibility that some settings might refuse to take part in the study, or have closed since they were identified in MCS2 (the majority of the MCS2 fieldwork in England took place in 2004, whereas the sampling and observation of nurseries for the current study took place in 2005).

The final sample was determined by the following principles:

- *Maximising the numbers of children in the sample.* The fact that relatively few centres were attended by more than one child meant that much effort was required to achieve a large sample of children in a cost-effective manner. A small sample of children would severely restrict the possibilities for future analysis linking quality of provision to child outcomes. Settings which provided for more than one Millennium child (multiple child settings) were over-sampled.

- *Ensuring that the quality of provision measured was that which had been experienced by (and potentially impacted) the MCS children.* This was essential, since the quality data would later be linked to child outcomes. A number of strategies were employed to ensure that the children in the achieved sample had spent long enough at their group care setting to (potentially) have been affected by their experience. It was also important to check whether, for settings to be visited, the quality of provision observed was that which had been actually experienced by the child/ren attending. For example, if a child had left their setting, it was essential to be able to visit that setting and assess the quality of provision before it changed substantially, as can be the case over time. Settings were only selected for the final sample if they had at least one MCS child who:
    - Had spent 6 months or more at their identified group care setting;
    - Attended 10 hours per week or more; and
    - Was either still attending this setting, or had only recently left.

  Where a substantial time had elapsed since the MCS2 interview, it was necessary to write to parents to check whether their child still attended the identified setting and, if they had left, that this was recently enough to allow the setting to be visited within 6 months of the leaving date.

- *Ensuring that the settings identified by the MCS parents were 'verifiable'* (i.e. that they could be identified on the OFSTED database of providers) and that they were in England (a small number of families had provided details of settings in other countries).

- *Retaining information about the original sampling probability for the family's recruitment into the sample so that results could be generalised.* Settings and families were selected with a known probability in order that these varying chances of selection could be taken into account in subsequent analyses. Settings identified as catering for more than one cohort child had 100% chance of being included in the study. The remainder of the sample consisted of 'singleton' nurseries selected with a known probability from the stratum of all the single child settings identified.

Table 2.2 shows how the sub-sample of 825 settings was further reduced to a total of 328 settings which were approached. Of these, 27 either declined to participate or had closed since the details were gathered from parents (the consent rate was 92%), resulting in an achieved sample of 301 settings.

Table 2.2 Refinement of the sub-sample

	n (settings)
Sub-sample	**825**
Randomly not selected	-174
Non-eligible and/ or discarded during refinement	-300
Identified as a duplicate	-1
Eligible but not used	-22
Settings approached for a visit	**328**
Declined to participate or closed	-27
Visited for data collection	**301**

In total, 632 MCS children attended the issued settings. This includes all children who attended the settings, whether or not they were 'eligible' (i.e. had attended the setting for 6 months or more and for at least 10 hours per week, and were either still attending or had only recently left). In terms of the analyses presented in this report, all of these 632 children are considered. When later work is conducted linking quality data to child outcomes (i.e. when child outcome data at age 5 is available), this will involve only the 542 children of the 632 who did meet these eligibility criteria[5].

2.3 Data weighting

Where analysis relates only to the 301 settings visited for the quality study, no weights have been applied. However, for analysis at the child level - where data on setting quality and/or characteristics is linked to data on children collected as part of the main cohort study - it was necessary to apply both survey and nursery weights. Due to the way that observed nurseries were sampled, children had a differential chance of attending the selected nurseries depending on where they lived. Thus, analyses which use child and/or family data are weighted to take into account both the probability of families being selected for the original MCS sample and, once selected for the MCS survey, the probability of their settings being selected for the current study.

2.4 Data collection

Visits to the sample MCS settings took place between March 2005 and October 2005. Observations of up to a day were conducted in one of the rooms providing for pre-school children between the ages of 3 and 5 years.

Information was gathered using the following four instruments:

- The ECERS-R (Early Childhood Environment Rating Scale-Revised);
- The ECERS-E (Extended Curricular Subscales);
- The CIS (Caregiver Interaction Scale);
- A Centre Manager Interview (developed for this study).

[5] It is possible that some of the children for whom eligibility was not established during the course of the current study may in due course (i.e. in responses to MCS3) be identified as having attended their MCS2 setting for over 6 months.

Early Childhood Environment Rating Scale –Revised Edition (ECERS-R).
The revised version of the Early Childhood Environment Rating Scale (Harms, Clifford and Cryer, 2004) has 43 items divided into 7 subscales, covering a comprehensive range of quality features. Each item is rated on a 7 point scale from 1 (inadequate), through to 3 (minimal), 5 (good) and 7 (excellent). For the purposes of this study, scores under 3 were labeled 'below minimal', scores between 3 and 4.9 were labeled 'adequate quality' and scores of 5 or above were labeled 'good to excellent' quality'. The average of item scores in a subscale gives the mean score for that subscale. An overview of the items and subscales which make up the ECERS-R is shown in Appendix 1.

To maximise time and resources, three of the seven subscales of the ECERS-R (those most closely related to child development) were used. These three subscales measure the quality of:

- Personal Care Routines (e.g. health and safety, hygiene, mealtimes);
- Language-Reasoning (e.g. supporting children's developing communication and reasoning skills);
- Interaction (e.g. supervision, discipline, staff:child interactions and peer interactions).

Since only three of the seven ECERS-R subscales were used, an overall mean score for the ECERS-R was not calculated.

Early Childhood Environment Rating Scale – Extension (ECERS-E).
This UK extension to the ECERS-R was developed by Kathy Sylva and colleagues as part of the Effective Provision of Pre-school Education (EPPE) project, and was revised in 2006. The ECERS-E assesses curricular provision in four areas:

- Literacy;
- Mathematics;
- Science;
- Diversity.

Research carried out as part of the EPPE project (Sylva et al, 2004; Sylva et al, 2006) demonstrated that the ECERS-E is an accurate predictor of children's intellectual and language development at entry to school (a better predictor, in fact, than the ECERS-R). The items which make up the four subscales of the ECERS-E are shown in Appendix 1.

The Arnett Caregiver Interaction Scale (CIS)
The CIS (Arnett, 1989) has been widely used in childcare research studies: for example, the EPPE project showed that the Arnett scale was significantly related to children's cognitive and social behavioural development. The scale consists of 26 items forming four subscales, each of which measures a different aspect of caregiver-child interactions:

- Positive relationships (indicating warmth and enthusiasm in interaction with children);
- Punitiveness (indicating harsh or over-controlling behaviour);
- Permissiveness (indicating avoidance of discipline and control of children);
- Detachment (indicating lack of involvement with children).

The Caregiver Interaction Scale is shown in Appendix 1.

Centre Manager Interview

A questionnaire was designed to gather information on a variety of centre characteristics, particularly those which may relate to quality of provision. Data collected included:

- Sector (maintained, private, voluntary);
- Programme participation (links with Sure Start Local Programmes, Children's Centre status, Neighbourhood Nursery status);
- Hours and weeks of provision offered;
- Centre size;
- Size of room/group observed;
- Ages of children catered for by the whole setting;
- Age range in room observed;
- Staff-child ratios in room observed;
- Number of children with special educational needs in the room observed;
- Qualifications of the centre manager;
- Qualifications of staff working in the room observed;
- Services offered to parents (e.g. outreach, family support services, health services, training);
- Basic information on the population served (mainly affluent, mainly disadvantaged or mixed) and on the housing in the area (private, council/ housing association or mixed).

2.5 Inter-rater reliability

In any study of this nature, it is important to check inter-rater reliability, i.e. how consistently members of the fieldwork team are using the observation instruments. This provides evidence that any differences in observed quality are real, rather than arising from differences between raters. Thirty one paired visits were conducted: each of the 10 fieldworkers was accompanied by a 'gold standard' observer, against whom their scores were compared.

Inter-rater reliability on the ECERS-R, the ECERS-E and the CIS was assessed using Cohen's Kappa. This measures the level of concordance between two raters, allowing for the level of chance agreement. A Kappa value of 0.8 or above indicates an excellent level of agreement between two raters. A value of between 0.6 and 0.8 is reasonable.

Table 2.3 shows the mean kappa values for all observations made using the ECERS-R and E (combined mean) and the CIS, as well as the mean kappa values for each rater. The scores indicate that the reliability for these instruments ranged from reasonable to excellent.

Table 2.3 Mean kappa scores for paired observations with 'gold standard': ECERS-R/E and CIS

	Overall mean	**Rater**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
ECERS-R/ ECERS-E	0.75	0.80	0.71	0.84	0.73	0.62	0.73	0.77	0.76	0.77	0.92
CIS	0.86	0.94	0.95	0.91	0.98	0.74	0.92	0.83	0.77	0.90	0.94

3. Use of childcare in the Millennium Cohort sample

This section considers the characteristics of the children (and their families) who attended the observed settings, and compares them to children and families living in the same areas who were:

1) attending group childcare settings which were not observed;
2) using only informal care; and
3) not using any form of child care[6].

Differences between families using observed and non-observed settings would indicate that children attending the observed settings are not in fact representative of all settings – making it difficult to draw inferences from the sample population to the population of settings as a whole. Table 3.1 shows that, in fact, this was not the case: children attending the observed and non-observed settings were fairly similar in their characteristics. This gives credence to the findings of the study and suggests that, of the settings attended by MCS children in England, those selected for observation had a similar MCS 'clientele' to those not selected for the study.

There were, however, some differences between families using different care arrangements. Children in group childcare settings (both observed and non-observed) tended to be from more advantaged families than children attending informal care, or from families not using childcare. For example, 14% of children in observed group care settings (and 15% of children in non-observed settings) lived in households with a combined income of £52,000 or more, as compared to 2% of children attending informal childcare and 4% of children not attending any form of childcare. This is not a surprising finding, particularly when considered alongside the employment status of the different groups. Families using group childcare were much more likely to have at least one working adult, while families using informal childcare or with no childcare arrangements were more likely to be workless households. For example, 64% of families using the observed group childcare settings were 2 parent 2 worker households, as compared to 42% of families using informal childcare and only 7% of families not using childcare. Conversely, 21% of families not using childcare were single parent workless households, as compared to 13% of families using informal childcare and only 5% of families using the observed group childcare settings. Families with one or more working adult, as well as being more likely to need childcare, are also more able to afford the relatively high cost of group childcare.

Mothers of children attending group childcare settings were older and better educated than mothers of children in informal care or not attending any form of childcare (although these differences were not statistically significant). The mean age of mothers using the observed settings was 31 years (30 in non-observed settings), compared to 28 years for mothers using informal childcare and 29 years for mothers not using childcare respectively. Just under 50% of mothers using the observed settings were educated to degree level, while only 22% of mothers using informal arrangements, and 15% of mothers not using childcare, had achieved this level of education. Again, these findings are unsurprising when considered alongside other sample characteristics. Better educated mothers are more likely to be working and, if working, are likely to be earning a higher income.

[6] Families using only childminders and/or nannies are not included in this analysis.

Table 3.1 Characteristics of families in selected LAs using different childcare arrangements[7]

	Families using observed group care settings	Families using non-observed group care settings	Families using informal childcare only	Families with no childcare arrange-ment
Mothers' mean age	30.8	30.0	27.4	28.6
Mothers' median age	31.0	30.0	28.0	29.0
% of mothers educated to degree level	**47.7**	**45.7**	22.3	**14.8**
% of mothers with less than 5 A-C GCSEs	**13.6**	**15.6**	34.1	**43.9**
% in 2 parent worker households	**64.4**	**59.3**	42.2	**6.7**
% in 2 parent, one worker households	**27.6**	**27.8**	36.9	**58.5**
% in 2 parent, workless households	**1.4**	2.8	5.1	**13.5**
% in single parent worker households	1.2	3.0	3.2	0.4
% in single parent, workless households	**5.3**	7.2	12.6	**20.9**
% with at least one professional parent	**34.3**	**38.8**	**14.9**	**12.8**
% of households with incomes of £52,000+	13.9	**15.0**	**2.0**	**4.1**
% of household with incomes less £10,400	**9.3**	**12.9**	25.6	**35.0**
% of cohort members without siblings	27.1	**31.6**	**26.5**	**15.7**
% of cohort members with 2+ siblings	23.1	**20.1**	**21.6**	**43.6**
% of white cohort members	92.9	90.6	87.6	82.7
% of black cohort members	1.2	2.3	2.0	1.7
% of Indian, Bangladeshi or Pakistani cohort members	**2.2**	3.3	6.7	**10.7**
N (unweighted)	634	835	542	1,215

[7] Results which differ significantly from others in their group (at the 5% level or below) shown in bold/underlined**.** Survey and nursery weights applied (see Appendix 2).

Children without siblings were more likely to have some sort of care arrangement, whether formal or informal. For example, 27% of children in observed nurseries, 32% of children in non-observed settings and 27% of children in informal care had no siblings, compared to only 16% of children not attending childcare. Conversely, larger families where cohort members had two or more siblings were less likely to be using childcare – possibly because of the potentially high cost involved in paying for care for several children.

Families not using childcare were more likely to be Indian, Bangladeshi or Pakistani (11% as compared to 7% of families using informal childcare, 3% of families using non-observed group care settings, and 2% of families using observed settings). The difference between the proportion of Indian/Bangladeshi/Pakistani families not using childcare, and those attending observed group care settings, was statistically significant. White families were more likely to use group care settings than to have no care arrangements, and there was also a slightly higher proportion of black families attending non-observed group care settings than not using any care arrangement (although the proportion of black families attending *observed* group care settings was surprisingly low). However, neither of these differences were statistically significant.

The analyses reported in this section are weighted to take into account both the probability of families being selected for the original MCS sample and, once selected for the MCS survey, the probability of their settings being selected for the current study. The paper in Appendix 3 presents the results obtained using unweighted data, which reveals that the unweighted sample was more disadvantaged and had a higher proportion of ethnic minority children than appears in Table 3.1 – the weights were applied to correct for the over-representation of these groups in the MCS survey. Results for ethnic minority groups are based on more robust evidence than appears in these weighted analyses.

4. Quality of centre-based childcare

This section presents the results of the quality assessments in the sample settings. In each of the 301 sample centres, an observation was carried out in one of the rooms providing for children aged 3 to 5 years. Quality of provision was assessed using the Early Childhood Environment Rating Scale (ECERS-R), the UK curricular extension (the ECERS-E) and the Caregiver Interaction Scale (CIS).

- **Section 4.1** sets the context, and presents the general characteristics of the settings observed.
- **Section 4.2** summarises the overall quality of provision offered by the sample settings, and presents the scores achieved on the three observational instruments.
- **Section 4.3** compares the quality of provision achieved by the current sample to quality data collected as part of the Effective Provision of Pre-school Education (EPPE) project in the late 1990s.
- **Section 4.4** links the quality data to information gathered on centre characteristics such as sector, staff qualifications and centre size, with the aim of establishing which characteristics are related to (and predict) provision quality.
- Finally, **Section 4.5** aims to answer the question 'is there a relationship between the quality of childcare received and children's home background?' It presents the results of an analysis linking quality data from the current study to information from the main Millennium Cohort Study on the families attending the sample settings.

4.1 Characteristics of settings in the sample[8]

Just over half (55%) of the settings defined themselves as private providers, with approximately one fifth in both the maintained and the voluntary sector (20% and 23% respectively, Table 4.1). A small number of settings did not fit into these broad sector categories: these were mainly joint projects with partners in more than one sector.

In terms of programme participation, almost a quarter of the sample (24%) stated that they had a formal link with a Sure Start Local Programme – however, less than 10% were taking part in the Children's Centre or Neighbourhood Nursery initiatives (Table 4.2). This is not a surprising finding, since the sample was spread across all areas of the country, whereas the Children's Centre and Neighbourhood Nurseries initiatives have (to date) been targeted at the 20% most disadvantaged areas of the country.

Table 4.1 Sector (n = 301)

	Frequency	Percent
LA Maintained	60	20
Private	167	55
Voluntary	68	23
Other	6	2

Table 4.2 Programme participation (n = 301)

	Frequency	Percent
Linked with Sure Start Local Programme	72	24
Children's Centres	9	3
Applying for Children's Centre status	18	6
Neighbourhood Nursery	16	5
Early Excellence Centre	5	2

[8] Data presented on settings is unweighted.

In terms of services for parents (Table 4.3), the vast majority (93%) of centres offered support for children with special needs and their families. Almost half (47%) offered some kind of family support. These included links to Sure Start services, advice, support or counselling services, housing or benefits advice, and parent and toddler groups. Many (41%) also offered child and family health services, including access to Health Visitors, GPs or dental services, and child health clinics. Just over a fifth (21%) offered some form of job or career services for parents, and one fifth (20%) offered some kind of parental outreach.

Table 4.3 Services for parents (n = 301)

	Frequency	Percent
Support for children with SEN (and their parents)	281	93
Family support services	140	47
Child/family health services	123	41
Jobcentre Plus or career support/ advice	63	21
Parental outreach services	61	20
Base for a childminder network	20	7

Nursery managers were asked to characterise the areas served by their centre. Table 4.4 shows that managers generally characterised their catchment populations as mixed, both in terms of levels of disadvantage/affluence (55%) and type of housing (43%). However in the less mixed areas, substantially more centres considered their families to be mainly affluent (32%) than mainly disadvantaged (13%). Similarly, with housing, a greater proportion of areas comprised mainly private housing (41%) than mainly Council/ Housing Association (14%).

Table 4.4 Nursery manager estimates of centre population characteristics (n = 301)

	Frequency	Percent
Families using provision		
Mixed	165	55
Mainly affluent	97	32
Mainly disadvantaged	39	13
Housing in local area		
Mixed	128	43
Mainly private	124	41
Mainly Council/ Housing Association	42	14
Other/missing	7	2

Turning now to the childcare provision offered by the settings in the sample, Table 4.5 shows the spread of age ranges catered for by the centres as a whole. All settings catered for children in the pre-school age range (3 to 5 years). The high number of settings which also catered for children under the age of 3 may reflect the high proportion of private providers in the sample. In terms of the *rooms* observed, all catered for children between the ages of 3 and 5 years (Table 4.6). However, just under half also catered for children under 3 years, with the youngest child in any of the rooms observed only 4 months of age. The oldest child was 75 months (6 years and 3 months) – this child attended a school for children with special educational needs.

Table 4.5 Age ranges catered for (sample centres) (n = 301)

	Frequency	Percent
Children aged 3 to 5 years	301	100
2 year olds	254	84
1 year olds	131	44
Children under 1 year	121	40

Table 4.6 Age ranges catered (rooms observed)[9]

	Frequency		Percent	
Children aged 3 to 5 years	301		100	
Children under 3 years	144		49	
	N	**Minimum**	**Maximum**	**Mean**
Age of youngest child (months)	295	4	48	34
Age of oldest child (months)	299	42	75	54
Age range catered for (months)	295	5	53	19

Table 4.7 shows the size of the settings in the sample, which ranged from a setting with 12 places to a setting with 237 places. The size of the rooms observed for the quality assessments also varied widely (from 6 to 180 children enrolled): on average, 22 children were present on the day the observations were conducted. Staff-child ratios ranged from a setting which, on the day of the visit, had one paid staff member for each child attending, to a setting with 14 children to one staff member. As would be expected, ratios tended to vary by sector.

Table 4.8 shows that the majority of settings in the sample offered either term-time only provision of 39 weeks or fewer (47%) or almost year-round provision of 50 weeks or more (47%). Similarly, providers tended to either offer sessional provision (31% of the sample, in all likelihood those operating during term time) or full day care (54%).

Table 4.7 Centre size, group size and staff-child ratios

	N	Minimum	Maximum	Mean
Total number of places (whole centre)	301	12	237	80
No. of children registered (whole centre)	301	6	416	63
No. of children registered (room observed)	301	6	180	40
No. of children present on day of observation (room observed)	301	3	92	22
Children to 1 adult (room observed)	299	1	14	5

[9] Some settings did not provide data for all variables measured. An 'n' of less than 301 indicates that data was missing for that particular variable in a number of settings.

Table 4.8 Hours and weeks of provision

	Frequency	Percent
Weeks of the year		
30-39 weeks	140	46.5
40-49 weeks	21	7
50 weeks or more	140	46.5
Hours of provision		
Half day (sessional)	94	31
School hours (at least 9am-3pm but less than full day care)	44	15
Full day care (9am-5pm or more)	163	54

For each room observed, information on childcare qualifications was gathered for centre managers and for all staff members who worked at least 10 hours per week with the children (including working managers). Table 4.9 shows that on the whole, centre managers and staff in the rooms were adequately qualified, with a mean qualification level of NVQ 3 or equivalent (e.g. NNEB). On average, 14% of staff members working in the rooms observed were unqualified, while 70% were qualified to Level 3 or above. Of the 301 sample settings, 106 (35%) had a staff member with a qualification at Level 4 or 5 (for example a degree or higher degree) working with the children in the room observed, while 78 (26%) had a qualified teacher either working within the room or as the centre manager.

Table 4.9 Qualifications of centre managers and staff in room observed

	N	Minimum	Maximum	Mean
Manager qualification (standard qualification levels 1-5)	298	0	4	3
Mean qualification level of all staff in room observed (standard qualification levels 1-5)	300	1	4	3
% of staff in room qualified to level 3 or above	300	0	100	70
% of unqualified staff in room	300	0	67	14

Finally, information was gathered on the proportion of children in the rooms observed with identified special educational needs (SEN). This ranged from settings with no SEN children, to a special school where all children had some kind of additional need. In all, 96 (32%) of the rooms observed had 5% or more of children on register with SEN.

4.2 Quality of provision across the whole sample

4.2.1 The Environment Rating Scales

Figures 4.1 and 4.2 show the quality scores achieved by the 301 settings in the sample. Scores achieved by individual settings varied widely, with some offering high quality provision and others of less than adequate quality across the dimensions measured.

This study used three of the seven subscales of the Early Childhood Environment Rating Scale Revised Edition (**ECERS-R**) to measure the quality of:

- Personal care routines (e.g. health and safety, hygiene, mealtimes);
- Language and reasoning (e.g. supporting children's developing communication);
- Interactions (e.g. supervision, staff-child interactions and peer interactions).

Each of the three sub-scales comprises a number of individual items, which are rated using a 7 point scale, where 1 = inadequate, 3 = minimal, 5 = good and 7 = excellent. For the purposes of this study, scores under 3 were labeled 'below minimal', scores between 3 and 4.9 were labeled 'adequate quality' and scores of 5 or above were labeled 'good to excellent' quality'. The average of item scores in a subscale gives the mean score for that subscale. Since only three of the seven ECERS-R subscales were used, an overall mean score for the ECERS-R was not calculated.

The MCS settings achieved the highest scores on the **interaction** subscale of the ECERS-R. The mean score for this subscale was 5.3, suggesting that the Millennium children experienced good quality interactions in their pre-school environments. The individual components of the interaction subscale include:

- Supervision of gross motor activities (mean score 4.3);
- General supervision (mean score 5.2);
- Discipline (mean score 5.2);
- Staff-child interaction (mean score 6.2);
- Interactions amongst children (mean score 5.8).

The individual item scores suggest that staff in the MCS settings were most successful at providing their children with a warm and nurturing environment, and at encouraging peer interactions (offering 'good to excellent' provision in these areas).

Scores on the **language and reasoning subscale** also tended towards 'good' (mean score 4.6). This subscale measures provision for children's developing communication and reasoning skills and comprises four items:

- Books and pictures (mean score 4.3);
- Encouraging children to communicate (mean score 5.1);
- Using language to develop reasoning skills (mean score 3.9);
- Informal use of language (mean score 5.1).

The highest scoring items on this subscale were 'informal use of language' and 'encouraging children to communicate', which suggest that the quality of oral language and communication opportunities was good (and this is supported by the high scores achieved on the 'interaction' subscale). Scores for reading, and for the more 'educational' aspects of language and reasoning, were adequate but not as strong.

The mean score for the third ECERS-R subscale - **personal care routines** - was 4.0, suggesting that improvements need to be made. The personal care routines subscale considers the following elements of provision[10]:

- Greeting/ departing (mean score 5.7);
- Meals and snacks (mean score 2.7);
- Toileting (mean score 3.6);
- Health practices (mean score 3.0);
- Safety practices (mean score 4.7).

Arrivals and departures were generally well managed and pleasant, and safety practices were adequate (and tending towards good). However, the quality of mealtimes, toileting and health practices were not good. Common problems included the washing of hands before snack time, and after toileting.

[10] This subscale also considers the quality of provision for sleeping. However, since only a small proportion (11%) of the sample settings offered facilities for children to sleep, this item was not used and has not been included in the subscale average.

Figure 4.1 **ECERS-R and ECERS-E: mean scores achieved by the MCS sample (box plot) (n = 301)**[11]

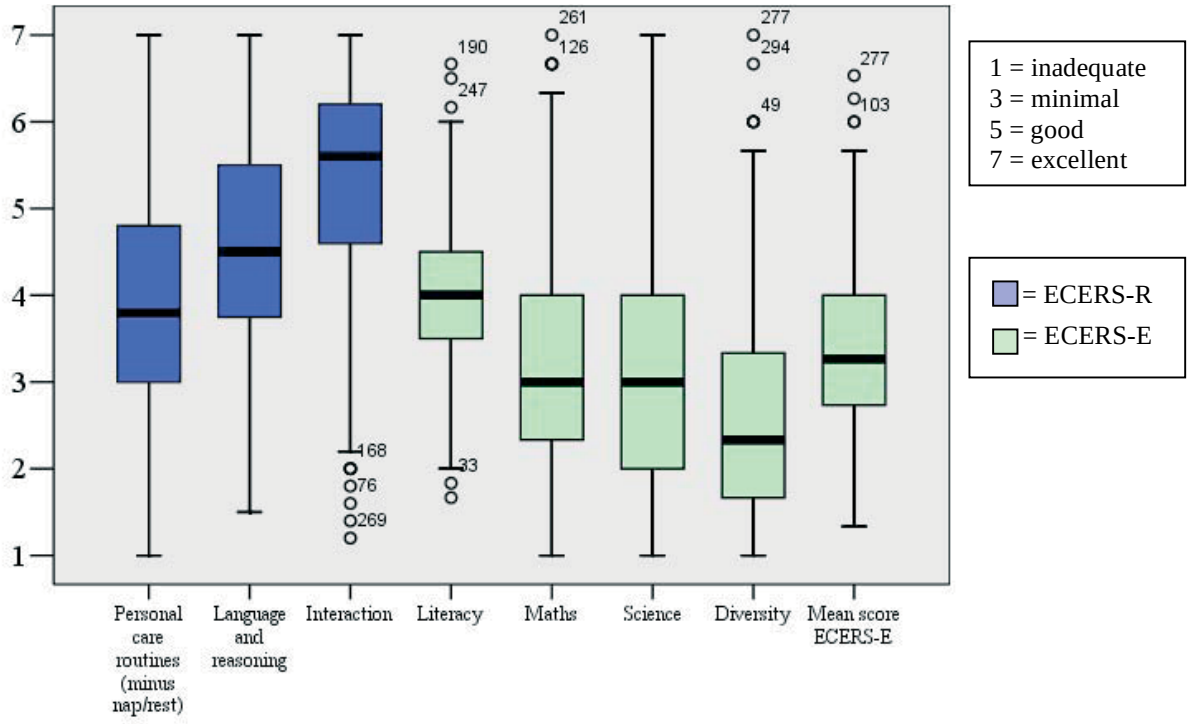
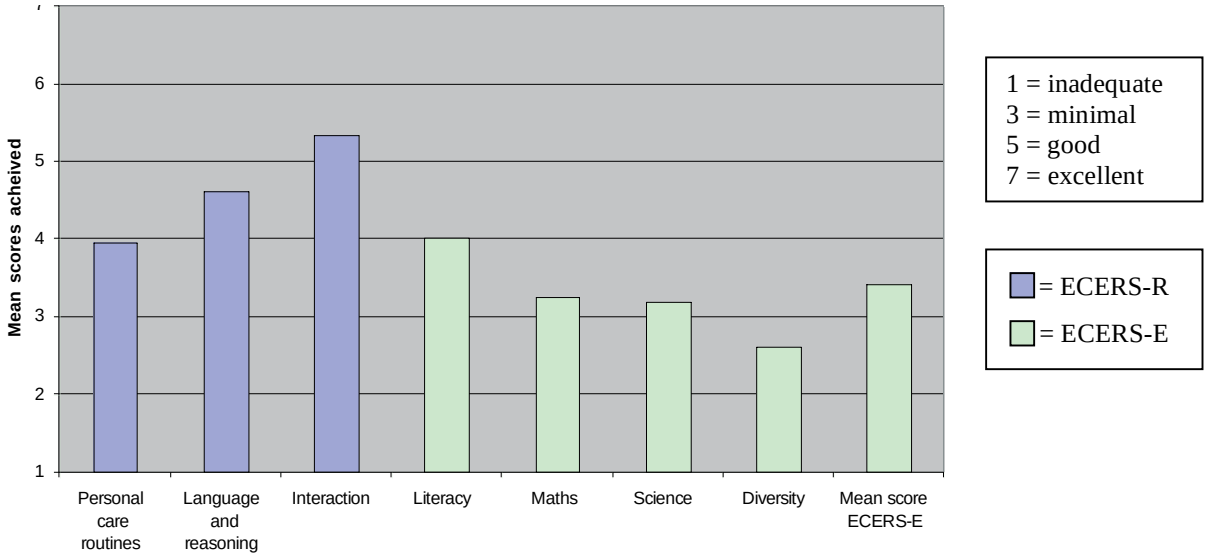


Figure 4.2 **ECERS-R and ECERS-E: mean scores achieved by the MCS sample (bar graph) (n = 301)**



Educational quality of provision was measured using the UK extension of the ECERS-R (**the ECERS-E**). The ECERS-E comprises four subscales, each of which assesses a different area of curricular provision:

- Literacy;
- Mathematics;
- Science and environment;
- Diversity.

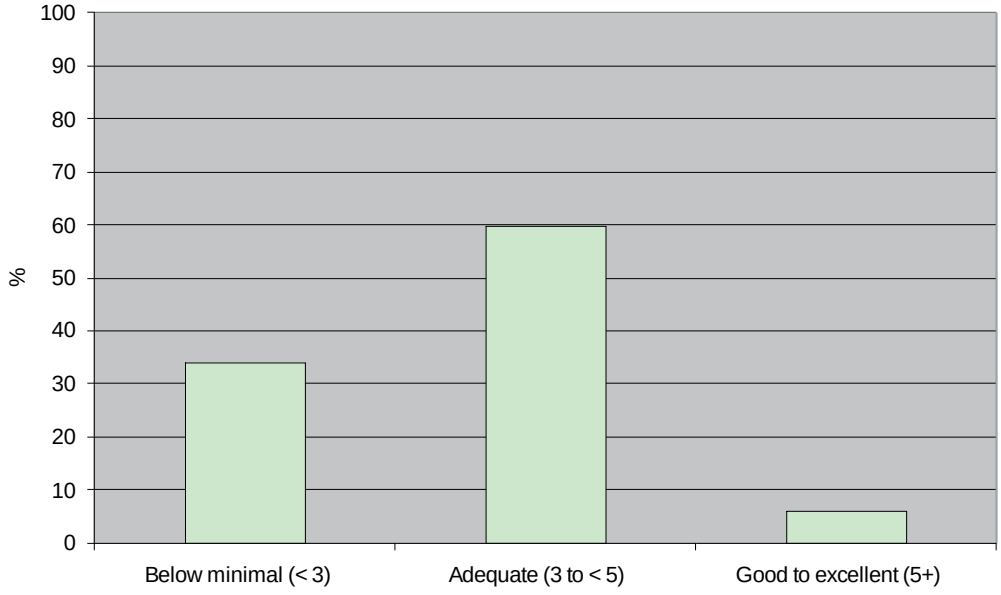
[11] The circles shown in the box plot are the outliers in each case (i.e. single observations or values which are markedly smaller or larger than the other values in the dataset). The numbers represent the case numbers of each outlier in the database.

Subscale averages are calculated as for the ECERS-R, using the same 7 point scale. In addition – since the whole of the ECERS-E was used – it was possible to calculate an overall rating of curricular quality. An overall ECERS-E rating for each centre was calculated by taking the mean of all items across all subscales.

In general, the scores achieved on the more 'curricular' ECERS-E subscales were lower than those achieved on the ECERS-R subscales. This mirrors the results of other UK research, for example the Effective Provision of Pre-school Education (EPPE) Project (Sylva et al, 2004), the Effective Pre-School Provision in Northern Ireland (EPPNI) Project (Melhuish et al, 2006) and the Monitoring and Evaluation of the Effective Implementation of the Foundation Phase (MEEIFP) Project across Wales (Siraj-Blatchford et al, 2006).

The mean ECERS-E score (i.e. the mean across all four subscales) achieved by the sample as a whole was just above minimal (3.4). There was variation within the sample, with some types of settings offering higher quality provision than others (see section 4.4). However, these findings suggest that the quality of provision to support young children's developing cognitive skills is not yet of a good quality overall. Figure 4.3 shows that only 6% of the sample settings offered children 'good' or 'excellent' quality curricular provision, achieving a mean ECERS-E score of 5 or higher. The majority (60%) of settings offered adequate curricular quality, with a mean ECERS-E score between 3 and 5. Most worrying is the finding that just over one third (34%) of the sample settings were offering 'below minimal' quality curricular provision.

Figure 4.3 Mean total ECERS-E scores: proportions in each quality band (n=301)



Figures 4.1 and 4.2 show that, of the four curricular areas assessed by the ECERS-E, **literacy** provision was the strongest with a mean score of 4 (i.e. 'adequate' quality). The dimensions of quality assessed by this subscale include:

- Environmental print (mean score 3.6);
- Books and literacy areas (mean score 4.3);
- Adults reading with children (mean score 3.9);
- Sounds in words (mean score 3.2);
- Emergent writing (mean score 4.3);
- Talking and listening (mean score 4.8).

These individual item scores show that provision for speaking and listening was strongest overall, tending towards 'good' quality. However, provision for other aspects of children's developing literacy skills (for example books and reading, environmental print, opportunities for emergent writing, attention to sounds in words) was not as strong. These findings complement the ECERS-R analysis and suggest that, while provision for children's developing oral language is good, children's developing sound awareness, reading and writing skills are less well catered for.

Maths and science provision were weaker overall, with mean scores of 3.2 (just above minimal) across the sample. The **mathematics** subscale assesses provision for children's developing counting skills, reading and writing simple numbers, sorting/ matching/comparing skills, and understanding of shape and space (scores on these four items ranged between 3.0 and 3.4).

The **science** subscale considers the provision of natural materials, science resources, and opportunities for children to develop an understanding of science processes (e.g. growing plants or caring for animals, sinking and floating at the water tray, cooking activities). 'Science resources' was the weakest aspect of provision (mean item score 2.6) suggesting that settings need to be encouraged to buy materials to support children's developing scientific understanding: for example, magnets, magnifying glasses, simple kaleidoscopes, funnels and containers for the sand/water tray. Of course, this has financial implications, and it may be that many settings simply cannot afford to buy expensive science equipment. These settings need support and advice on how to make the most of everyday objects which can support science learning. Of the items considering 'science processes', the lowest quality was seen in opportunities for children to learn about non-living processes such as magnetism, sinking/ floating, light and sound (mean item score 2.8). The highest quality was found in provision for cooking and food preparation skills (mean item score 4.5). This may reflect the fact that cooking activities require less specialized equipment. However, it is also likely that these findings reflect the confidence of staff members in supporting children's knowledge in these areas: while many are confident in leading a cooking activity, they may be less confident in leading more traditional 'science' activities.

The lowest scores were achieved on the **diversity** subscale, with a mean score of just 2.6 (below minimal) overall. This subscale measures:

- Planning for individual learning needs, including the provision of differentiated activities for children of varying capabilities, and the use of Individual Education Plans (IEPs) for children with special educational needs. The results suggest that these practices are not yet widespread, with settings achieving a mean score of 2.5 on this item.
- Gender equity and awareness, which includes the provision of books, pictures and resources showing non-stereotyped images. Provision on this item was also rated as below minimal (mean score 2.4), suggesting that there is still considerable progress to be made in this area.
- Race equality, including the provision of books, resources and activities which promote awareness and understanding of different races and cultures. The mean score for this item was 3 (minimal).

These findings on diversity are worrying, particularly the low score on planning for individual learning needs. Settings clearly need support in these areas to improve quality. However, further research is also needed to identify *why* settings are performing so poorly in these areas. Although this study did collect some basic data on centre

characteristics (e.g. staff qualifications), it was not designed to gather detailed information on centre implementation and management practices (e.g. resources, staff deployment, centre ethos, continuing professional development for staff) which may further illuminate the reasons for the poor quality offered in some areas.

4.2.2 The Caregiver Interaction Scale

The scores achieved using the ECERS scales indicates that the MCS settings were particularly successful at offering children warm and stimulating interactions. Additional in-depth information was gathered on staff-child interactions using a third observational instrument – the Caregiver Interaction Scale (CIS). This scale consists of 26 items forming four subscales, each of which measures a different aspect of caregiver-child interactions (see Appendix 1).

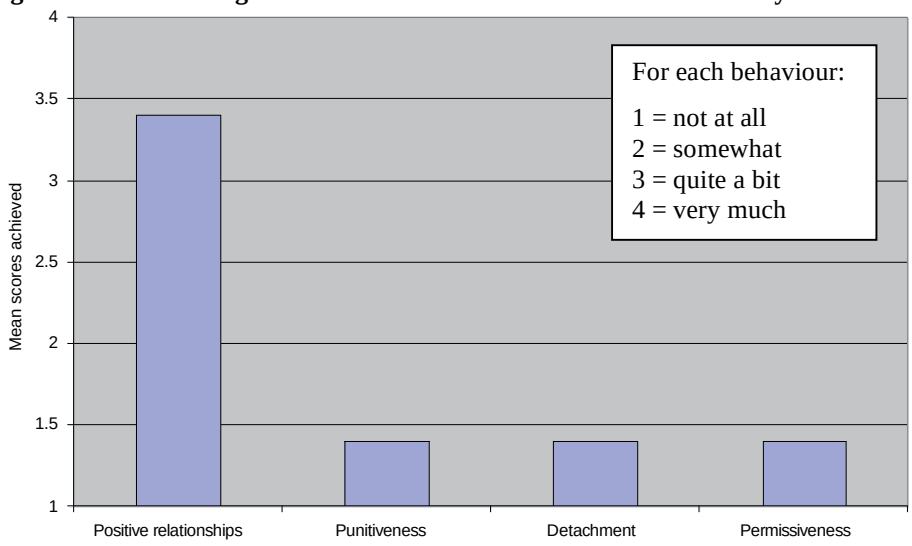
For each behaviour (for example, 'speaks warmly to the children') observers rated the staff team using a four point scale, where 1 = not at all and 4 = very much. Figure 4.4 shows the mean scores achieved by the MCS centres on the four subscales of the Caregiver Interaction Scale (CIS). The first subscale – positive relationships – measures desirable behaviours among caregivers, such as warmth and enthusiasm in interaction with children. The relatively high mean score of 3.4 (on a scale of 1-4) reflects the fact that staff in the MCS settings generally provided a warm and positive environment.

The remaining three subscales measure undesirable behaviour among caregivers:

- 'Punitiveness' measures harsh or over-controlling behaviour;
- 'Permissiveness' measures avoidance of discipline and control of children;
- 'Detachment' indicates lack of involvement in interaction with children.

Thus, the low means on all three of these subscales (all 1.4) suggest that these less favourable behaviours were rarely observed in the MCS settings.

Figure 4.4 Caregiver Interaction Scale: mean scores achieved by the MCS sample



4.3 Has quality of provision in England improved since 1999? Comparisons with EPPE

How can we put these scores into context? The EPPE project (Sylva et al 2004; Sylva et al, 1999) collected data from 141 pre-school settings during the late 1990s, using two of the same observational instruments as the current study (the ECERS-R and the ECERS-E). This provides a useful 'yardstick' with which to compare quality in the MCS sample.

Figure 4.5 Mean ECERS scores achieved by the MCS and EPPE samples

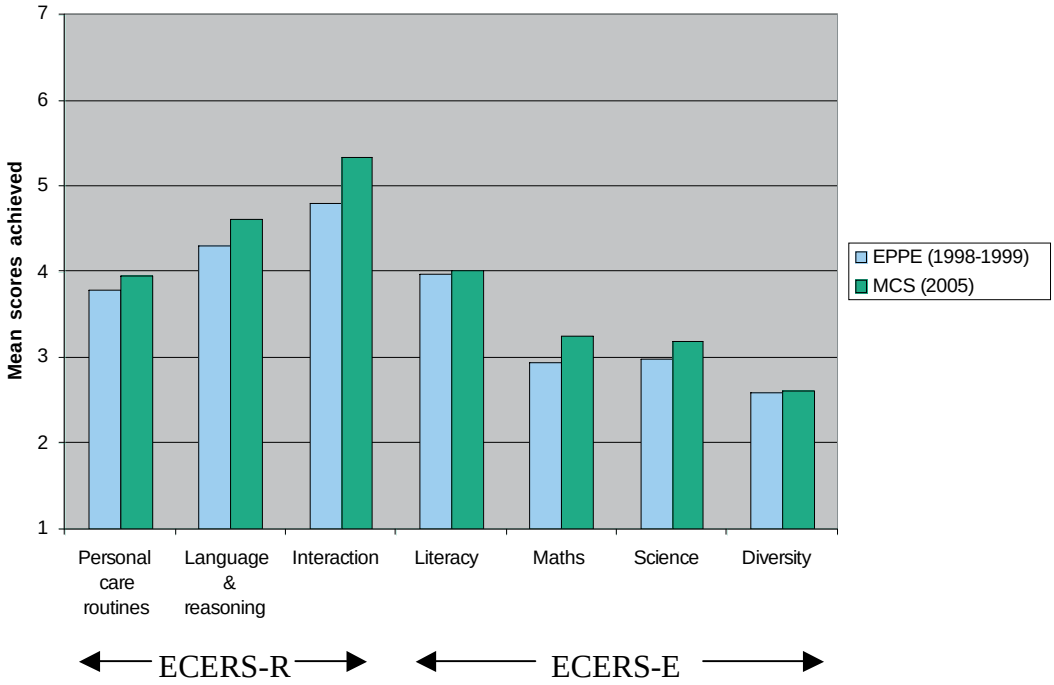
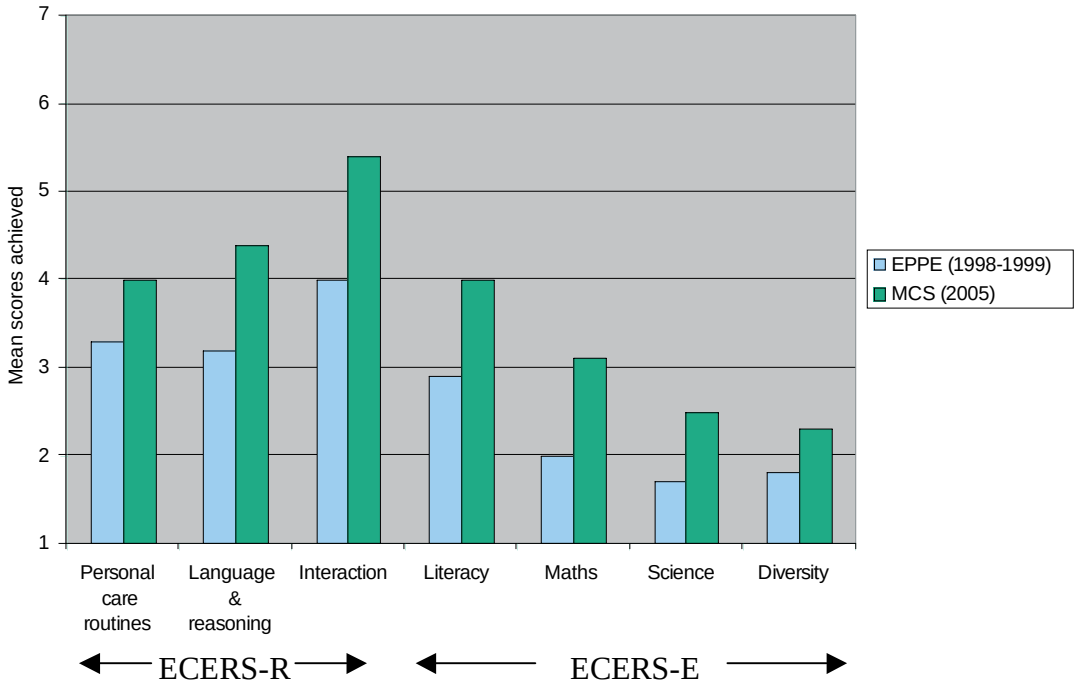


Figure 4.5 shows that, although the MCS sample achieved higher scores than the EPPE sample on all of the ECERS-R and ECERS-E subscales (suggesting that provision quality has improved), the majority of these differences were not large. However, it is important to consider the different characteristics of the two samples when making direct comparisons. Just over half (54%) of the EPPE settings were in the maintained sector, and 22% in the private sector. In contrast, only 20% of the MCS settings were in the maintained sector, and a much higher proportion (55%) of settings were private. These differences are highly relevant when attempting to compare the two samples, since both the current study (see section 4.4) and the EPPE project concluded that the maintained sector offers significantly higher quality of provision than the private sector: the higher proportion of private settings in the current sample may be 'depressing' the quality scores. Thus, rather than considering change in quality across all sectors, it is more useful to compare differences by sector.

Figure 4.6 shows that it is the voluntary sector which has shown the most improvement since the EPPE data were collected in the late 1990s. This is confirmed by statistical analysis which shows that the MCS voluntary settings achieved significantly higher mean scores than the EPPE voluntary settings on *all* sub-scales of the ECERS-R and the ECERS-E used in the current study[12].

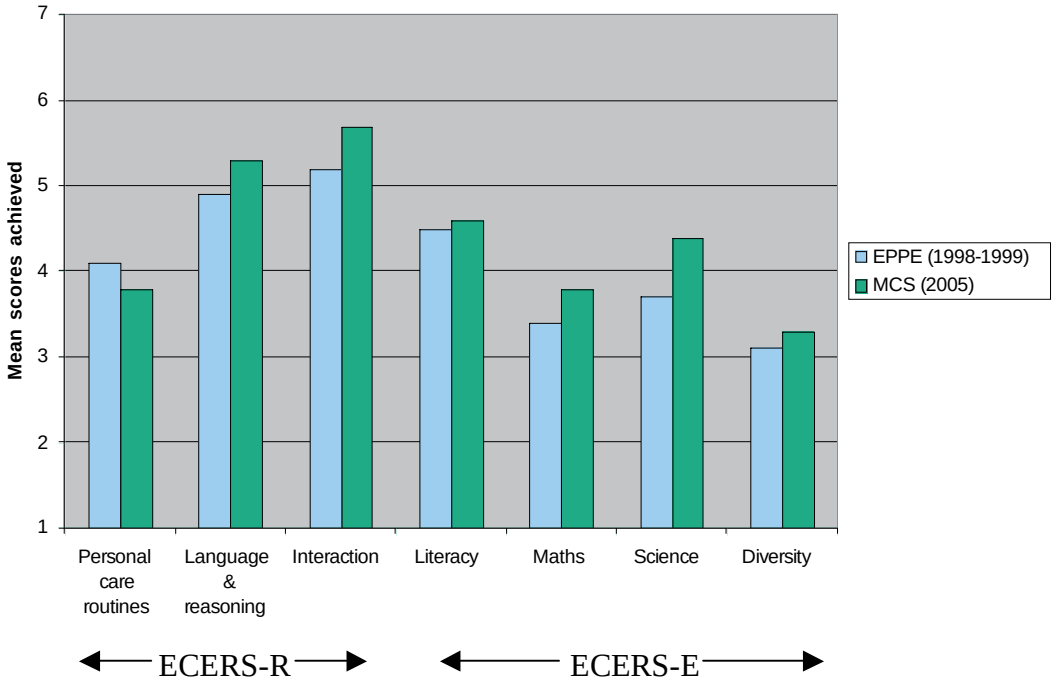
[12] The EPPE study used 7 ECERS-R subscales, whereas the current study used 3. Independent samples t-tests voluntary sector: Personal care routines ($t=2.4$, $p<0.05$), Language & reasoning ($t=5.0$, $p<0.001$), Interaction ($t=5.3$, $p<0.001$), Literacy ($t=6.2$, $p<0.001$), Maths ($t=4.8$, $p<0.001$), Science ($t=4.3$, $p<0.001$), Diversity ($t=2.7$, $p<0.01$).

Figure 4.6 Voluntary sector: Mean ECERS scores achieved by the MCS and EPPE samples



Although the differences are not as striking as for the voluntary sector, Figure 4.7 shows that the MCS maintained settings also achieved higher scores than the EPPE settings on all of the ECERS-R and E subscales used in the current study (with the exception of personal care routines). Three of these differences were significant: the 'language & reasoning' and 'interactions' subscales of the ECERS-R, and the science subscale of the ECERS-E[13].

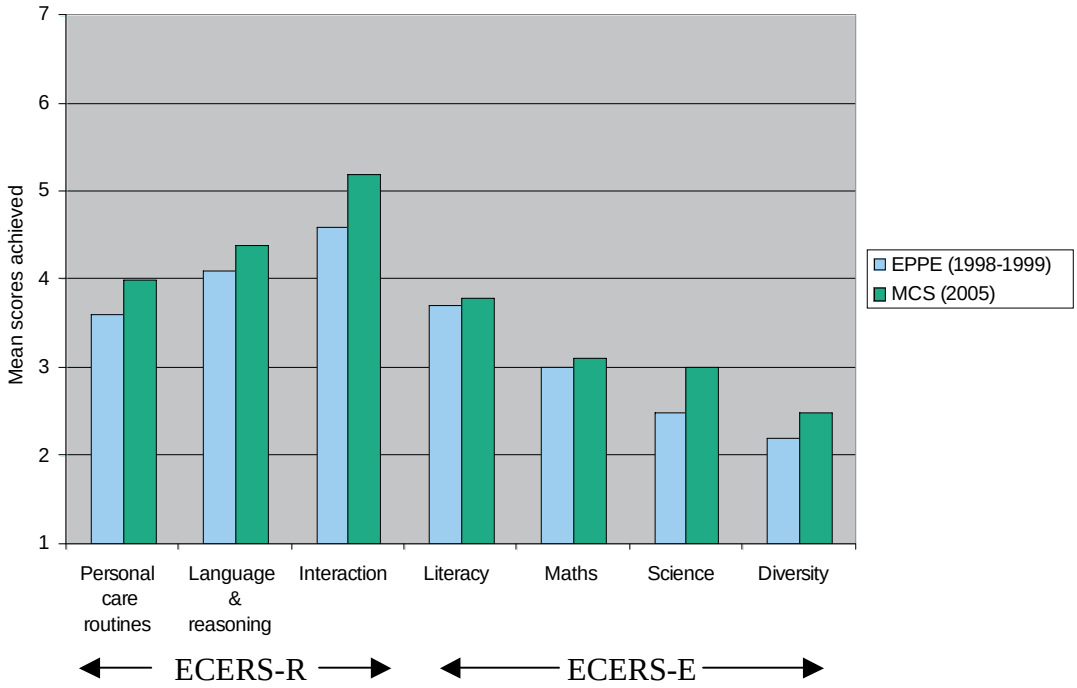
Figure 4.7 Maintained sector: Mean ECERS scores achieved by the MCS and EPPE samples



[13] Independent samples t-tests maintained sector: Language & reasoning ($t=2.1$, $p<0.05$), Interaction ($t=2.2$, $p<0.05$), Science ($t=2.4$, $p<0.05$).

Within the private sector (Figure 4.8), two significant improvements were seen – on the interaction subscale of the ECERS-R and the science subscale of the ECERS-E[14].

Figure 4.8 Private sector: Mean ECERS scores achieved by the MCS and EPPE samples



These findings suggest that the main improvements in early years provision since the late 1990s have been in:

- Staff-child interactions;
- Provision for children's developing language and reasoning; and
- Science provision.

The largest improvements have been seen in the voluntary sector, which has raised quality of provision in all areas considered by this study. The fact that both the MCS and the EPPE studies had large-scale national samples gives credence to these positive results, which demonstrate improvement in provision over a (relatively) short period. Some caution must be exercised in making direct comparisons, since it was not possible for MCS observers to carry out reliability (agreement) checks with the EPPE team.

On a less positive note: other than gains made by the voluntary sector, little improvement has been seen since the late 1990s in provision for literacy, maths, diversity and personal care routines. Further work is required to help early childhood settings in all sectors (but particularly the maintained and private sectors) improve provision for children's developing skills in the areas of literacy and mathematics, to plan for children's individual learning needs, to provide an environment appropriate for today's increasingly racially and culturally diverse society, and to offer appropriate and hygienic personal care routines.

[14] Independent samples t-tests private sector: Interaction ($t=2.3$, $p<0.05$), Science ($t=1.9$, $p<0.05$). A weak significant effect was found for the diversity subscale using parametric tests, but this was not confirmed by non-parametric tests.

4.4 Variation in quality according to centre characteristics

Sections 4.2 and 4.3 presented the results of the quality observations conducted in 301 settings providing for MCS children between the ages of 3 and 5. Quality was assessed using three observational instruments – the Early Childhood Environment Rating Scale (ECERS-R), the UK curricular extension (ECERS-E) and the Caregiver Interaction Scale (CIS).

Information on a number of additional centre characteristics was collected, with the aim of establishing which centre characteristics were related to, and predicted, quality of provision in the following areas:

- Personal care routines (ECERS-R);
- Language and reasoning (ECERS-R);
- Interactions (ECERS-R);
- Literacy (ECERS-E);
- Maths (ECERS-E);
- Science (ECERS-E);
- Diversity (ECERS-E);
- Overall quality of curricular provision (mean total ECERS-E scores across all four subscales)[15].

The majority of characteristics considered were those identified by previous research as being relevant to quality of provision. In addition, information on centres' participation in relevant Government initiatives and programmes was gathered – for example, their level of involvement in the Children's Centre Programme and links with Sure Start Local Programmes.

Initial univariate analysis revealed a number of centre characteristics which were linked to quality of provision in each of the above dimensions. Multiple regression analysis was then used to explore which of these centre characteristics were most predictive of provision quality. Multiple regression is the most stringent test of the factors related to quality, as it shows the predictive power of each variable while controlling for the others. A separate regression model was developed for each of the individual subscales shown above, and for the mean total ECERS-E score. The final regression models are shown in Appendix 4, and results are presented below:

- Section 4.4.1 Sector;
- Section 4.4.2 Children's Centre Status;
- Section 4.4.3 Links with Sure Start Local Programmes;
- Section 4.4.4 Qualifications;
- Section 4.4.5 Group size;
- Section 4.4.6 Age range of room;
- Section 4.4.7 Ratio;
- Section 4.4.8 Centre size;
- Section 4.4.9 Summary.

[15] The multiple regression analysis focused on quality as measured by the ECERS subscales rather than the CIS. The ECERS-R and ECERS-E scales are widely used all over the world and as such represent an international 'yardstick'. Both scales have been shown to be powerful predictors of children's developmental progress.

4.4.1 Sector

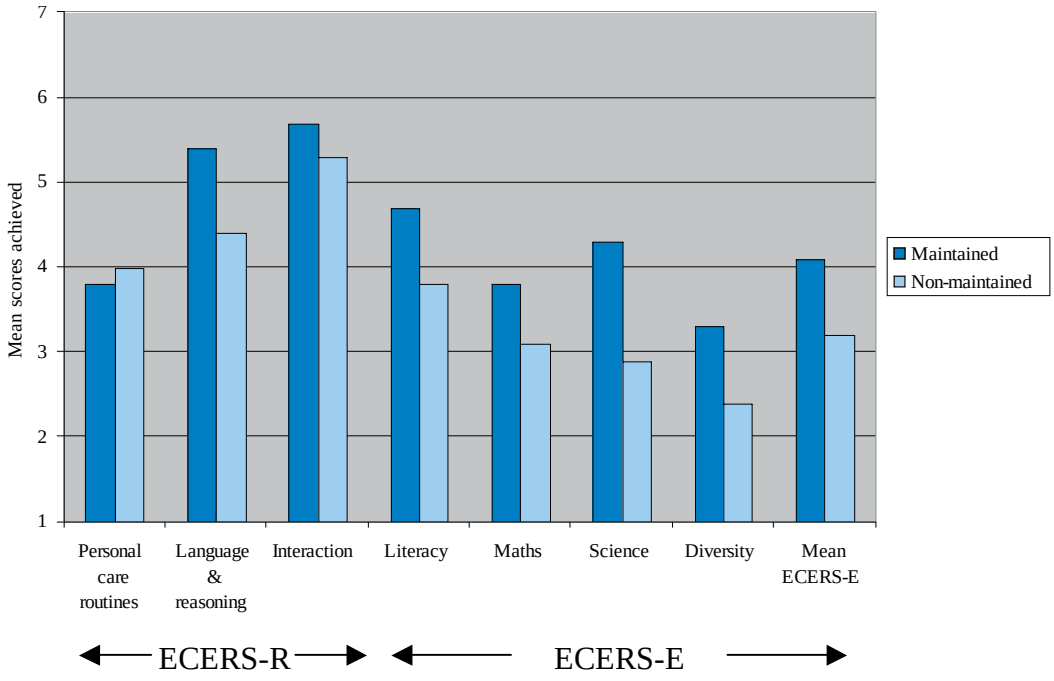
Table 4.10 shows the scores achieved by each sector on the ECERS subscales, and for the ECERS-E as a whole[16]. Comparing quality scores by sector, it can be seen that the maintained sector offered higher quality than the private and voluntary sectors, while the quality of provision offered by the private and the voluntary sectors was very similar.

Table 4.10 Mean ECERS scores by sector

	Maintained	Private	Voluntary
ECERS-R: Personal Care Routines	3.8	4.0	4.0
ECERS-R: Language-Reasoning	5.3	4.2	4.4
ECERS-R: Interaction	5.7	5.2	5.4
ECERS-E: Literacy	4.6	3.8	4.0
ECERS-E: Maths	3.8	3.1	3.1
ECERS-E: Science	4.4	3.0	2.5
ECERS-E: Diversity	3.3	2.5	2.3
Mean ECERS-E	4.1	3.2	3.2

Since the key differences in quality were between the maintained and the non-maintained sectors, a new variable ('maintained status') was created for the multiple regression analysis. Private and voluntary providers were combined into a 'non-maintained' category[17]. Figure 4.9 shows the scores achieved on each of the ECERS subscales by the maintained and non-maintained settings and confirms that the maintained settings offered higher quality across the board, with the exception of personal care routines.

Figure 4.9 Mean ECERS scores by sector



[16] Since only three of the seven ECERS-R subscales were used, an overall mean score for the ECERS-R was not calculated.

[17] A small number of settings described themselves as 'joint projects' – these were collaborations between any two sectors. Joint projects with at least one partner in the maintained sector were classified as 'maintained'. Joint projects with no partners in the maintained sector were classified as 'non-maintained'.

Multiple regression analysis confirmed these findings: sector was the strongest predictor of provision quality, with maintained status linked to higher quality provision in all dimensions measured (with the exception of personal care routines). Sector was positively related to the quality of:

- Language & reasoning (std $\beta = 0.20$, $p < 0.01$);
- Interactions (std $\beta = 0.14$, $p < 0.05$);
- Literacy (std $\beta = 0.22$, $p < 0.01$);
- Maths (std $\beta = 0.19$, $p < 0.01$);
- Science (std $\beta = 0.32$, $p < 0.001$);
- Diversity (std $\beta = 0.26$, $p < 0.001$);
- Overall curricular quality: mean ECERS-E score (std $\beta = 0.30$, $p < 0.001$).

Thus, maintained settings provide higher quality interactions and language opportunities for children, as well as higher quality curricular provision, but are less concerned with the routine elements of provision such as snack, toileting and hygiene (the quality of personal care routines was significantly lower in the maintained sector). The relationships with 'interactions' and 'maths' were only apparent when staff qualifications were removed from the regression model. This suggests that staff qualifications may be one of the main factors driving the higher quality achieved by the maintained sector in these areas.

4.4.2 Children's Centre status

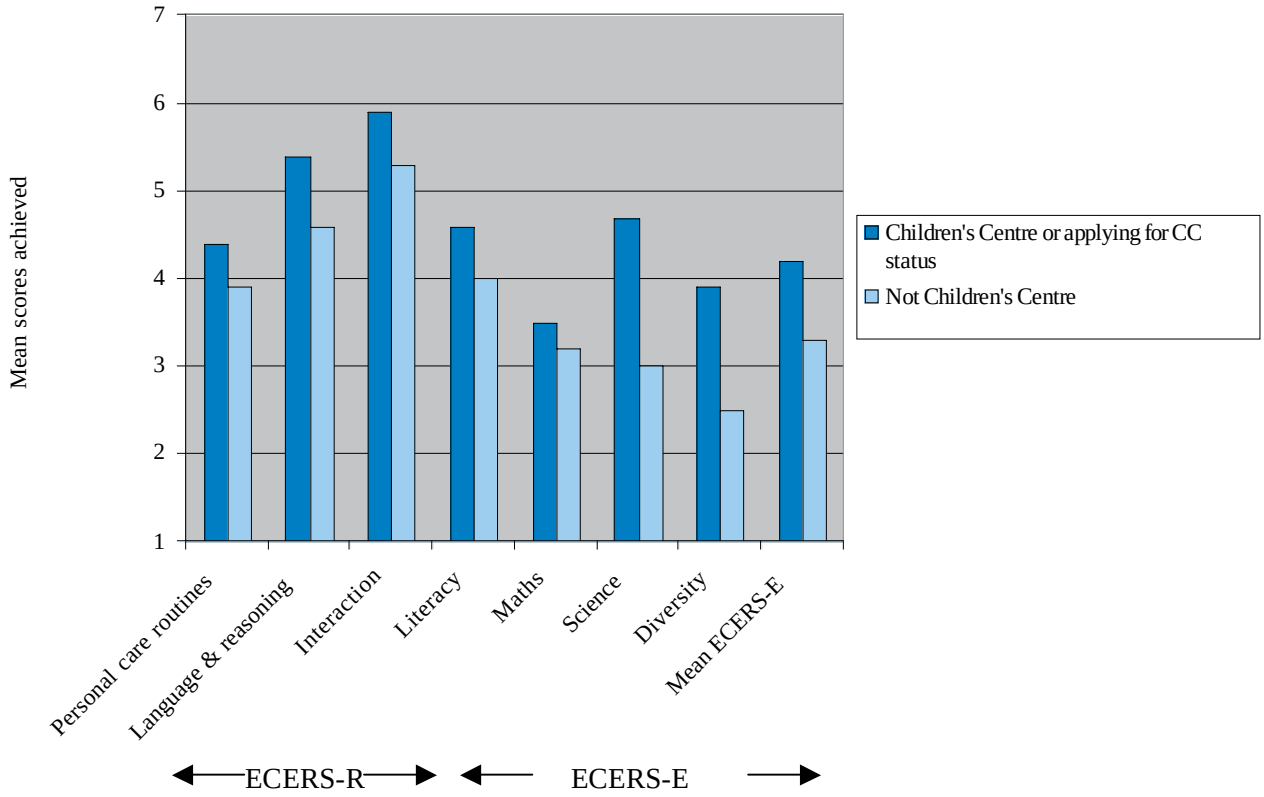
A significant impact of Children's Centre status was identified: centres already designated as Children's Centres (or in the process of applying) offered higher quality:

- Personal care routines (std $\beta = 0.20$, $p<0.01$);
- Science (std $\beta = 0.19$, $p<0.01$);
- Diversity (std $\beta = 0.22$, $p<0.05$);
- Overall curricular quality: mean ECERS-E score (std $\beta = 0.13$, $p < 0.05$).

There was a strong link between Children's Centre status and maintained status: 21 of the 27 Children's Centres were in the maintained sector. However, the findings of the multiple regression analysis suggest that the relationships between Children's Centre status and the quality of provision for personal care, science and diversity were independent of sector i.e. they remained even when sector was included in the regression model.

Children's Centres also achieved significantly higher scores on the 'language & reasoning' and 'interactions' subscales of the ECERS-R (Figure 4.10). However, these effects were not independent of sector: when both sector and Children's Centre status were entered into the regression model together, sector remained significant while Children's Centre status did not. This suggests that the maintained status of the Children's Centres in the sample may be one of the main factors behind the higher language and interaction scores achieved by this group.

Figure 4.10 Mean ECERS scores by Children's Centre status



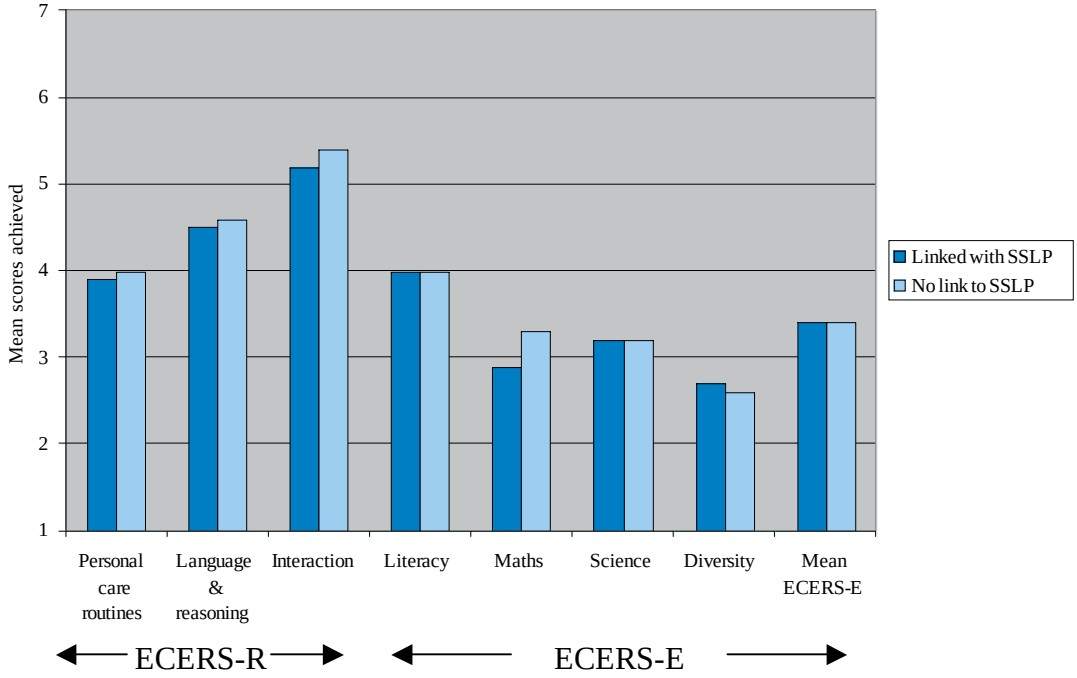
4.4.3 Links with Sure Start Local Programmes

Figure 4.11 shows the quality of provision offered by centres which were linked to a Sure Start Local Programme (SSLP) and those which had no SSLP link. Centres which were linked to a SSLP offered lower quality provision than centres with no SSLP link in a number of areas. This was confirmed by the multiple regression analysis: a *negative* effect of links with the Sure Start Local Programme was found. Centres with a link to a SSLP offered significantly lower quality provision for:

- Language and reasoning (std $\beta = -0.12$, $p < 0.05$);
- Literacy (std $\beta = -0.11$, $p < 0.05$);
- Maths (std $\beta = -0.22$, $p < 0.001$).

A negative relationship was also found between SSLP links and the overall quality of curricular provision as measured by the mean ECERS-E score (std $\beta = -0.14$, $p < 0.05$): it is likely that this was a result of the literacy and maths effects identified.

Figure 4.11 Mean ECERS scores by SSLP links



These findings are particularly interesting given that Children's Centre status was linked to *higher* quality for children. One explanation could be that the Children's Centre programme focuses specifically on centre-based services for children, whereas the main priority of many Sure Start Local Programmes was family and outreach services rather than centre-based education and care. It may be that crucial difference lies in the focus of each centre's work and in the relative contribution of resources, including staff time and training resources, devoted to the different areas (e.g. child services, family services and health). Further evidence for this conclusion is provided by the finding that centres offering child and family health services were of significantly lower quality provision than centres not offering these services in the areas of:

- Personal care routines (std $\beta = -0.18$, $p < 0.01$);
- Language and reasoning (std $\beta = -0.11$, $p < 0.05$);
- Interactions (std $\beta = -0.15$, $p < 0.05$);
- Literacy (std $\beta = -0.12$, $p < 0.05$);
- Maths (std $\beta = -0.12$, $p < 0.05$).

However, since this study was not designed to collect detailed information on centre implementation and management practices (such as resources, staff time and deployment) it has not been possible to confirm this hypothesis. Further research is required to explore the provision of integrated services, and the impacts on service quality for each of the centre populations (children, parents, families) when the 'balance' is tipped towards one group rather than another.

4.4.4 Qualifications

The childcare qualifications of staff working in the rooms observed[18] were an important predictor of provision quality. The ***mean qualification level of all staff*** had the strongest relationship with quality (compared with other qualification measures) and was significantly related to all aspects of provision measured with the exception of personal care routines:

- Language & reasoning (std $\beta = 0.22$, $p < 0.001$);

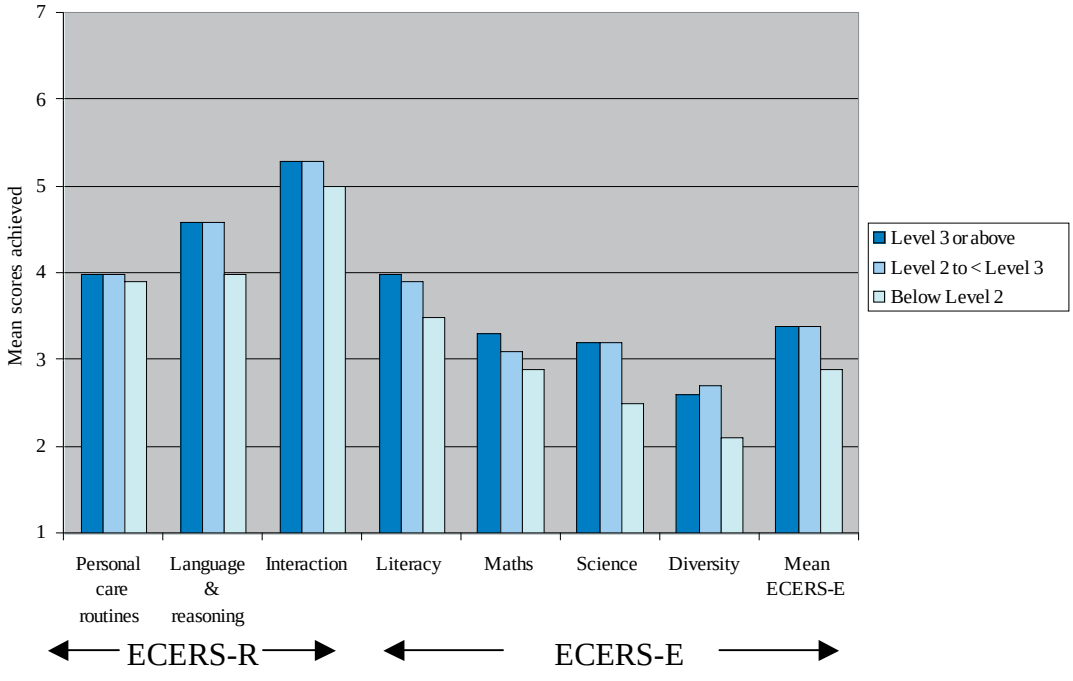
[18] Staff working 10 hours or more in the rooms observed (including working managers).

- Interactions (std $\beta = 0.16$, $p < 0.05$);
- Literacy (std $\beta = 0.25$, $p < 0.001$);
- Maths (std $\beta = 0.15$, $p < 0.05$);
- Science (std $\beta = 0.18$, $p < 0.01$);
- Diversity (std $\beta = 0.13$, $p < 0.05$);
- Overall curricular quality: mean ECERS-E score (std $\beta = 0.21$, $p < 0.001$).

These findings suggest that improving the overall level of staff qualifications will have a beneficial effect on provision quality. Qualifications were most strongly related to the 'language & reasoning' subscale of the ECERS-R, and to the 'literacy' subscale of the ECERS-E. These findings support previous research in identifying the important contribution of staff training and qualifications to the provision of a challenging academic curriculum for pre-school children and, in particular, for encouraging children's developing communication and reasoning skills. The majority of the effects identified for staff qualifications were independent of sector i.e. they predicted quality over and above the impact of maintained status[19].

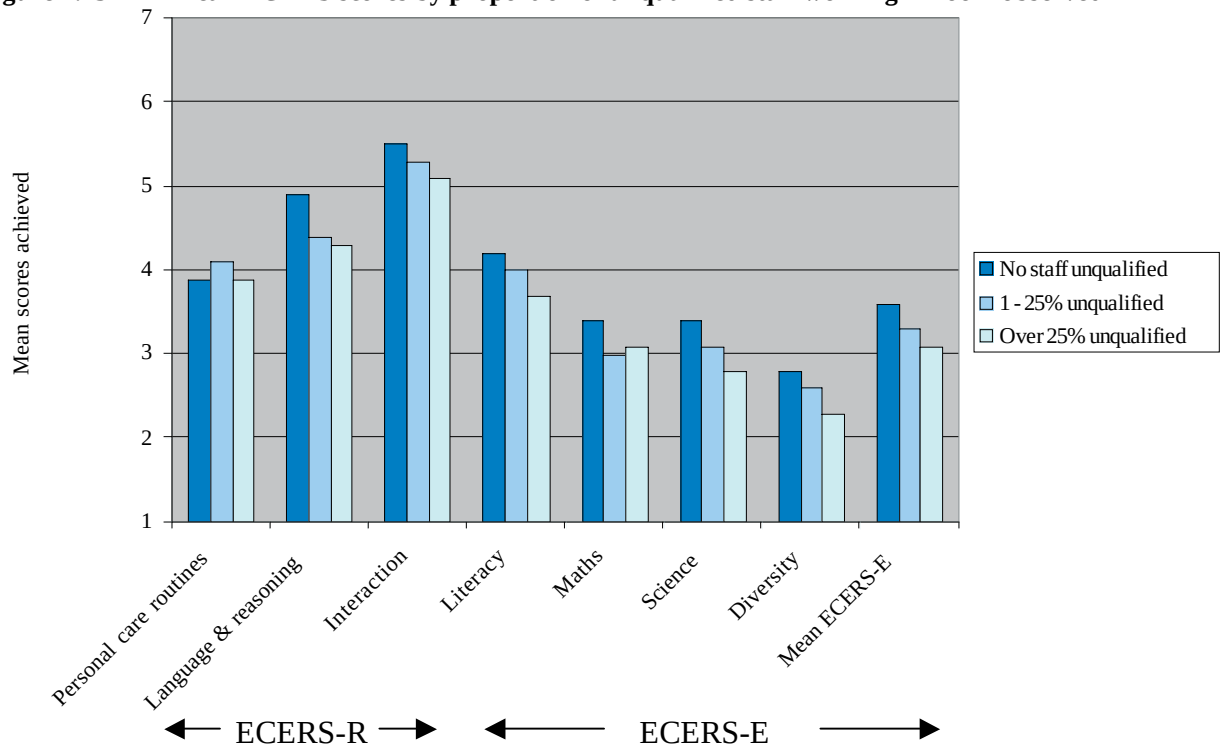
Figure 4.12 shows the higher scores achieved by rooms with better qualified staff teams and, in particular, highlights the poorer quality offered by staff teams with average qualifications of below Level 2. This was confirmed by the finding that the ***proportion of staff members unqualified*** was also a strong predictor of provision quality (almost as predictive as the mean qualification level). Rooms with a low proportion of unqualified staff members offered significantly higher quality in all areas of provision measured, with the exception of personal care routines (Figure 4.13).

Figure 4.12 ECERS scores by mean qualification level of all staff working in room observed



[19] The only exception to this was science provision: the impact of qualifications on the quality of science provision was only evident when sector was removed from the regression model.

Figure 4.13 Mean ECERS scores by proportion of unqualified staff working in room observed



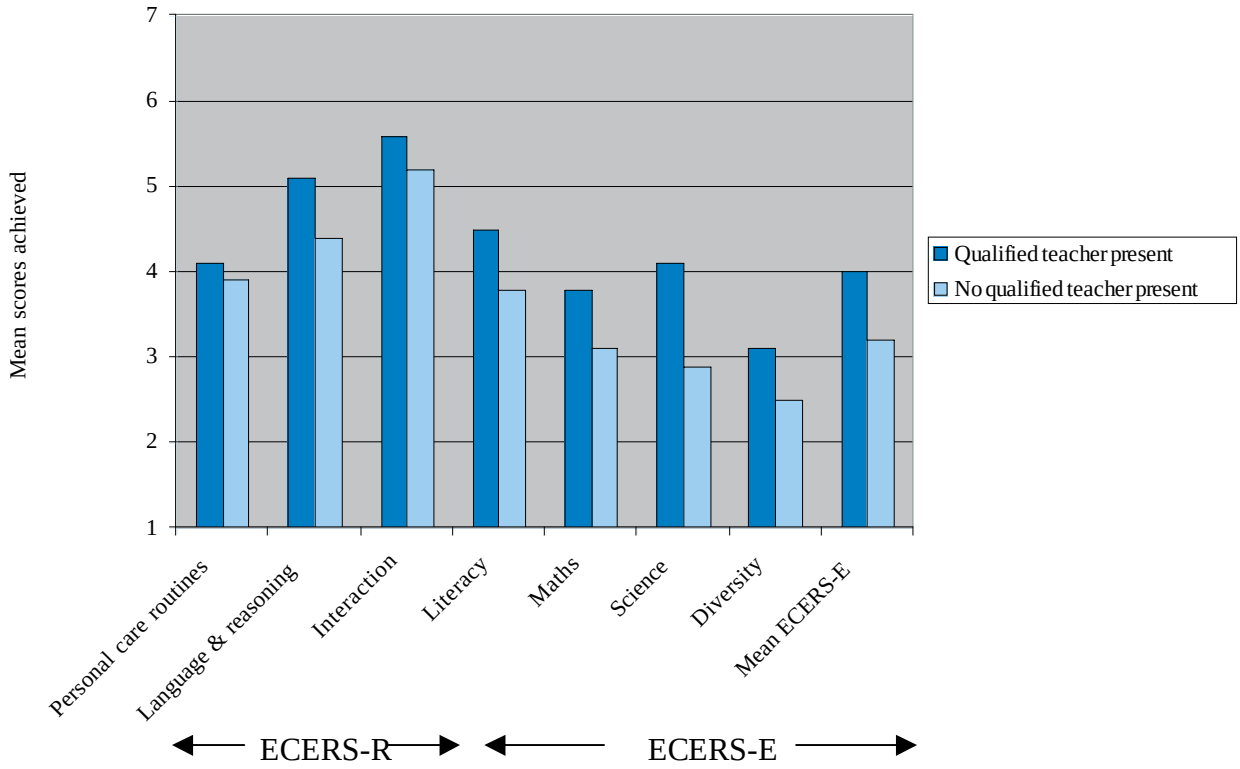
Other measures of staff qualification levels – for example, the ***proportion of staff qualified to Level 3 or higher***, the ***presence of a qualified teacher*** and the ***presence of a staff member qualified to Level 4 or higher*** - were also tested and were all found to be significantly related to quality of provision.

The presence of a qualified teacher (working in the room or as centre manager) was most important for academic provision, and in particular to provision for:

- Literacy (std $\beta = 0.14$, $p < 0.05$);
- Maths (std $\beta = 0.15$, $p < 0.05$);
- Science (std $\beta = 0.16$, $p < 0.05$);
- Overall curricular quality: mean ECERS-E score (std $\beta = 0.17$, $p < 0.05$).

Relationships were also found with scores on the language and reasoning and interaction subscale of the ECERS-R, and the diversity subscale of the ECERS-E, although these effects were not independent of sector. It may be that the presence of a qualified teacher is one of the contributing factors to the higher quality offered by the maintained sector in these areas. Figure 4.14 shows the quality of provision offered by rooms with and without access to a qualified teacher.

Figure 4.14 Mean ECERS scores for rooms with and without access to a qualified teacher



The qualification level of the centre manager/head teacher was also positively related to quality of provision and, in particular, to provision for personal care routines (std β = 0.14 , $p < 0.05$). Weak but significant relationships were found with the quality of provision for language and reasoning, interactions and literacy. However, these effects were only detected when manager qualifications were entered into the model as the sole qualifications measure – the effect was not strong enough to remain when stronger (more predictive) qualification variables were included in the model.

4.4.5 Group size

For each room/group visited, a measure of group size was taken by counting the number of children present on the day of the observation. A positive impact of group size on provision quality was identified: the more children present on the day of the observation[20], the higher the quality of:

- Language & reasoning (std $\beta = 0.21$, $p < 0.01$)[21];
- Interactions (std $\beta = 0.16$, $p < 0.05$);
- Literacy (std $\beta = 0.16$, $p < 0.05$);
- Maths (std $\beta = 0.22$, $p < 0.01$);
- Science (std $\beta = 0.18$, $p < 0.05$);
- Diversity (std $\beta = 0.22$, $p < 0.01$);
- Overall curricular quality: mean ECERS-E score (std $\beta = 0.23$, $p < 0.01$).

Larger rooms may be able to provide a more interesting range of activities for children, and may also offer a larger staff team with a broader range of experiences, interests and expertise. In order to further explore this impact – for example to investigate whether an

[20] The number of adults present was also accounted for: staff-child ratio at the time of the observation was included in the regression model.

[21] The impact on language and reasoning was only evident when sector was removed from the regression model.

optimal group size could be identified – the groups observed were split into four size categories:

- Less than 15 children;
- 15 to 19 children;
- 20 to 29 children;
- 30 or more children.

The four groups were entered separately into the regression model predicting the mean ECERS-E score (overall curricular provision). The results - shown in Appendix 4 - suggest that the largest group sizes offered the highest quality. Groups with more than 30 children offered significantly higher curricular provision than all of the other three categories; no other significant effects were identified.

4.4.6 Age range of room

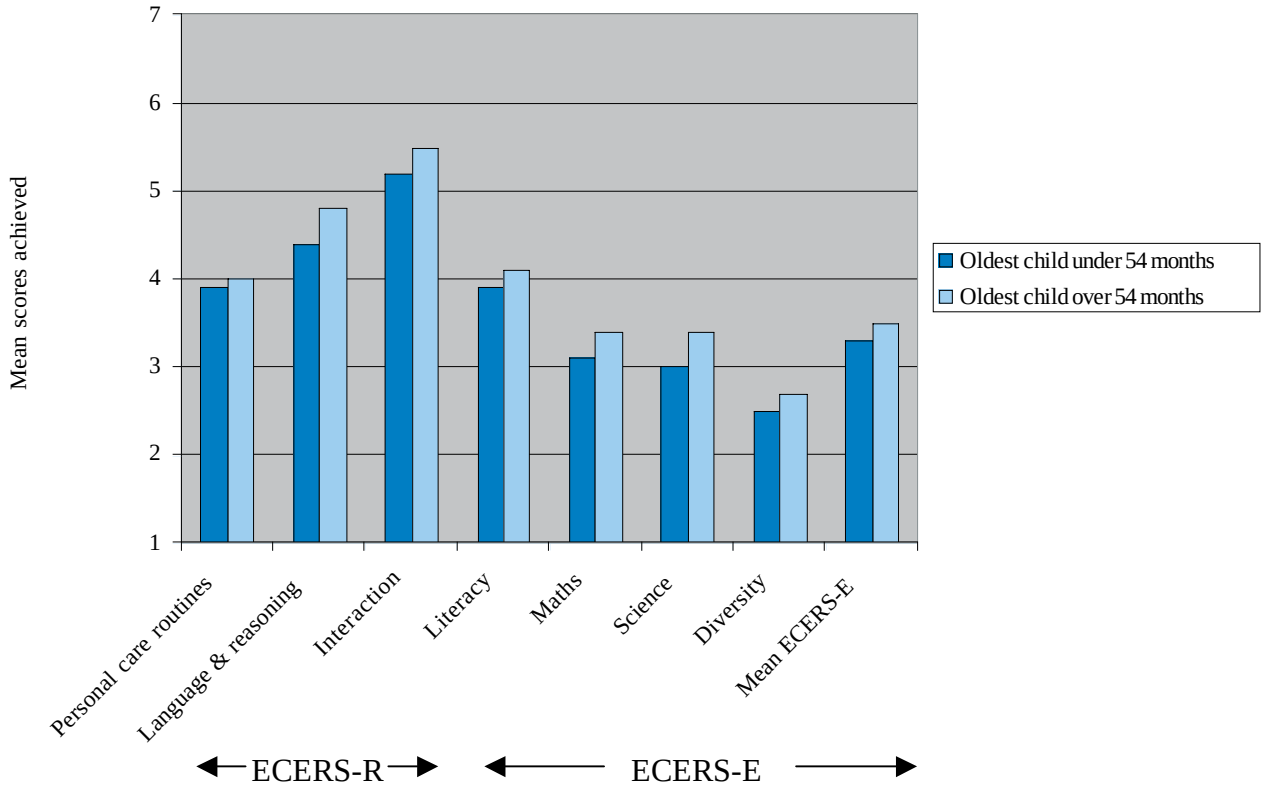
The age range of the group observed was linked to centre quality, in terms of both the younger and the upper age limits. As the age of oldest child (in months) increased, so did the quality of:

- Language and reasoning (std $\beta = 0.15$, $p < 0.01$);
- Interactions (std $\beta = 0.16$, $p < 0.01$).

Thus, the presence of older children in the group had a positive impact on the quality of 'talk'. This finding is unsurprising, since the interaction and language-reasoning subscales of the ECERS-R give credit for the complexity and educational quality of language and communication, which are likely to be higher in rooms catering for older children. This result mirrors findings from the Neighbourhood Nurseries Initiative evaluation (Mathers & Sylva, *in press*), which showed the same relationship between the presence of older children and quality (although the NNI evaluation focused on provision for children under the age of 3½).

Figure 4.15 compares the quality scores achieved on each of the ECERS subscales by groups where all children were aged under 54 months (4½ years), and groups which catered for children over the age of 4½. The graph shows that, as well as achieving higher scores for language and interactions, the groups which catered for older children also offered higher quality curricular provision (as measured by the four ECERS-E subscales). In fact, a significant positive relationship was found between the age of the oldest child and the overall quality of curricular provision (mean ECERS-E score: std $\beta = 0.12$, $p < 0.05$), but not with any of the individual subscales.

Figure 4.15 Mean ECERS scores by age range of room/ group

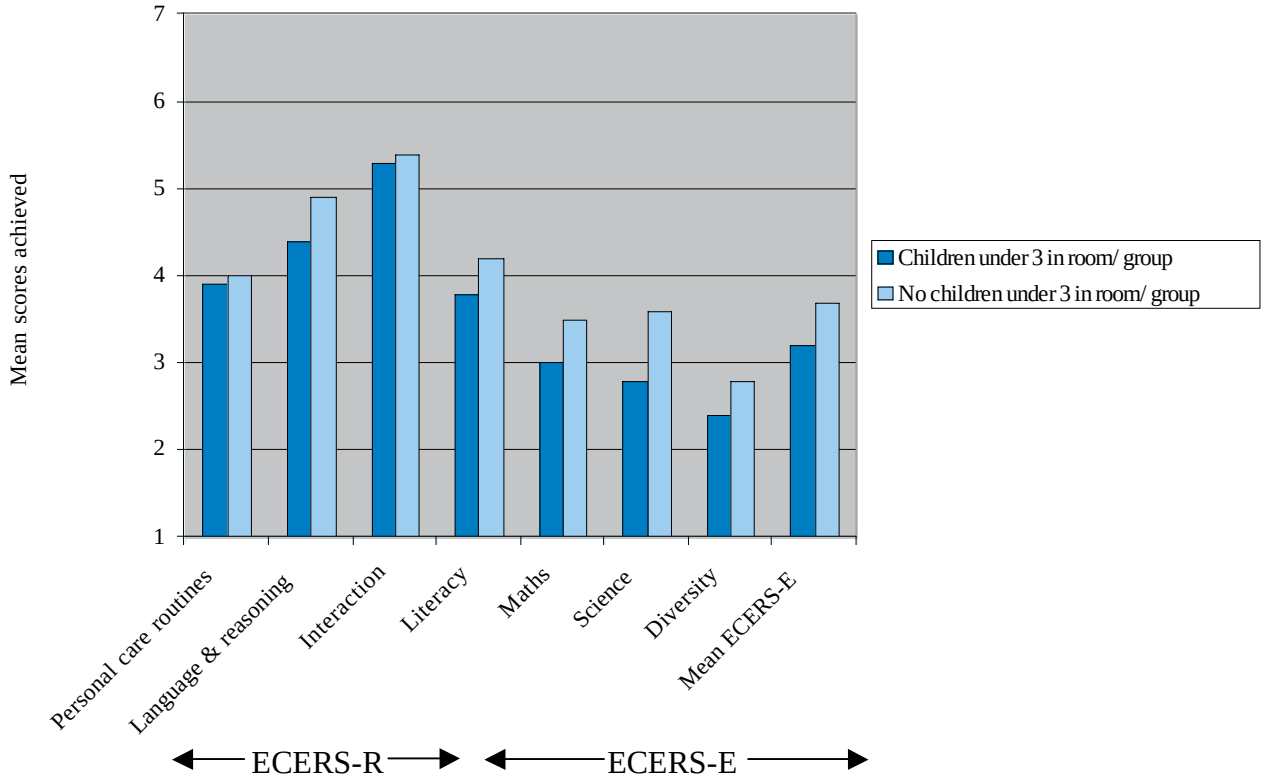


While the presence of older children was beneficial in terms of quality, having younger children (i.e. children under the age of 3 years) in the group alongside 3 and 4 year olds had a *negative* effect on provision quality (Figure 4.16). Rooms which catered for children under 3 years offered significantly lower quality:

- Language and reasoning (std $\beta = -0.14$, $p < 0.05$);
- Literacy (std $\beta = -0.13$, $p < 0.05$);
- Maths (std $\beta = -0.16$, $p < 0.05$);
- Science (std $\beta = -0.13$, $p < 0.05$);
- Overall curricular quality: mean ECERS-E score (std $\beta = 0.14$, $p < 0.05$).

Thus, 3 and 4 year old children experienced *lower* quality of provision in groups which also catered for children under the age of 3. This could be because the presence of younger children, and the staff time required to care for them, means that less time and resource is available to devote to challenging educational activities for the older children. In addition, the requirement to have a range of activities and materials appropriate for both older and younger children may lead to a 'dilution' of the educational content required to challenge 3 and 4 year olds. The effects of age range were evident for all areas of curricular provision assessed by the ECERS-E with the exception of provision for diversity (planning for individual learning needs, racial/ cultural/gender awareness). They were significant even when sector was included in the regression model i.e. the lower quality offered by rooms catering for children under 3 years alongside older children was not due to the fact that centres in the private and/or voluntary sectors were more likely be catering for younger children.

Figure 4.16 Mean ECERS scores by age range of room/group (children under the age of 3 years present)



4.4.7 Ratio

An effect of ratio was identified**:** the more children per staff member, the lower the quality of:

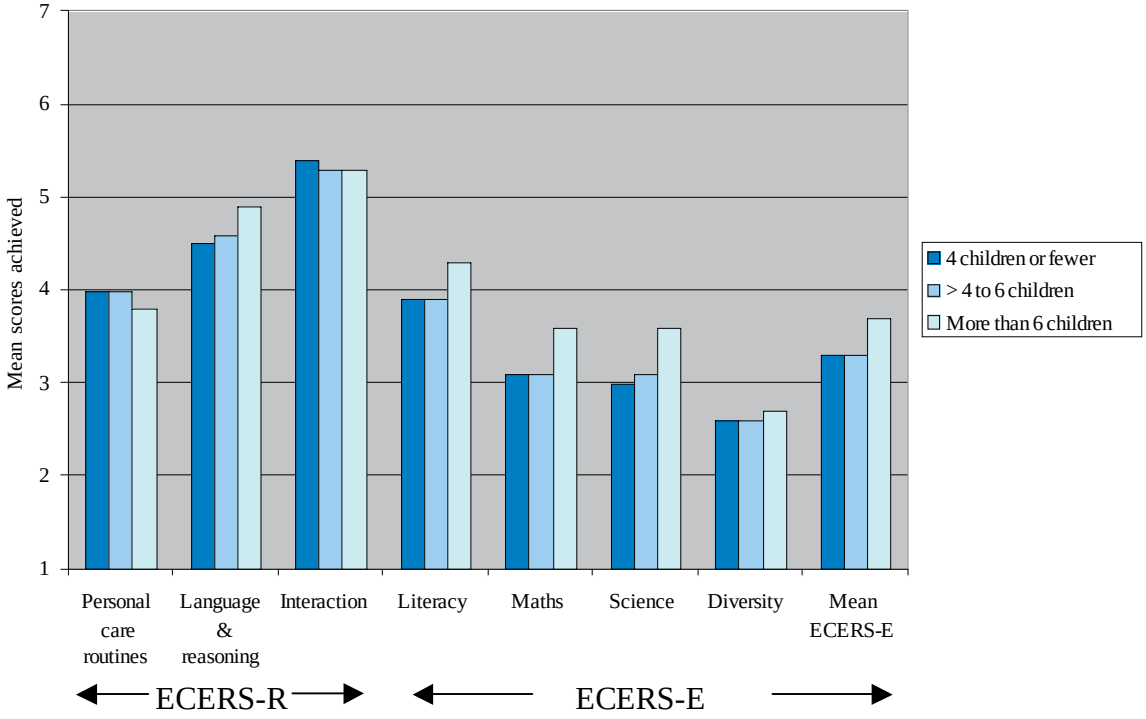
- Personal care routines (std $\beta = -0.15$, $p < 0.05$);
- Language and reasoning (std $\beta = -0.13$, $p < 0.05$);
- Interactions (std $\beta = -0.17$, $p < 0.05$);
- Diversity (std $\beta = -0.25$, $p < 0.001$) [22].

The overall quality of curricular provision (mean ECERS-E score) was also significantly lower in rooms/ groups with a greater number of children to adults (although this may be largely due to the relationship between ratio and the diversity subscale of the ECERS-E). These findings are surprising since the maintained sector - which is able to operate with a greater number of children per adult - is generally of *higher* quality, particularly in terms of curricular provision. In fact, as Figure 4.17 shows, many of the 'actual' subscale scores achieved by centres with more children per adult (i.e. maintained settings) were greater than the mean scores achieved by centres with fewer children per adult. It was only when the influence of sector was accounted for (via multiple regression analysis) that the effect of ratio could be seen.

In summary, the positive effects of ratio on personal care routines, interactions and provision for diversity were evident whether or not sector was included in the regression model. However, the effects on curricular provision and opportunities for language/reasoning were only significant *within* sectors (i.e. only once sector was accounted for).

[22] In each analysis, the age range of children in the groups observed was accounted for (since provision for children under the age of 3 is subject to different legal ratios).

Figure 4.17 Mean ECERS scores by staff-child ratio



4.4.8 Centre size

Finally, an effect of centre size was identified for one of the ECERS-R subscales. The greater the number of children enrolled in the centre, the lower the quality of interactions in the room observed (std $\beta = -0.17$, $p < 0.01$). This is particularly interesting in light of the finding that interactions were of higher quality in larger groups. Thus, larger *groups/rooms* offered *better* quality interactions, but groups/ rooms located in larger *centres* offered *lower* quality interactions.

It is interesting to compare this finding with the findings of the Neighbourhood Nurseries Initiative National Evaluation (Mathers and Sylva, *in press*), which conducted a similar analysis using centre characteristics to predict quality of provision for children under the age of 3 ½ years. This NNI analysis concluded that larger centres offered *higher* quality provision for very young children and, in particular, higher quality personal care routines and opportunities for language. No effect was found on the quality of interactions. In contrast, this study (which focused on provision for 3 and 4 year old children) found no effect of centre size on the quality of personal care routines or language/reasoning, but a negative relationship with the quality of interactions.

It seems that the relationship of centre size to quality is a complex one, and may vary for different age groups. Further research is recommended to explore the relationships between centre size and quality in greater depth.

4.4.9 Summary

Table 4.11 summarises the influences on quality of provision for 3 and 4 year old children (as measured by the ECERS-R and ECERS-E). There are two possible methods of comparing the size of the effect each of these variables has on quality. The first is to consider how many individual dimensions of quality (as measured by the ECERS subscales) each was related to. The second (and more statistical) method of comparing the relative impacts is to look at the standardised beta for each variable, as shown in the regression models in Appendix 4. The standardized beta gives an indication as to the size of the relationship with quality.

For example, for curricular provision (mean ECERS-E score), looking at the standardized betas suggests that the most important predictors of quality were: sector (std $\beta = 0.30$); group size (std $\beta = 0.23$); and the mean qualification level of staff working with the children (std $\beta = 0.21$). The presence of a qualified teacher (std $\beta = 0.17$) or staff member qualified to Level 4 or above (std $\beta = 0.17$) were also important.

Looking at both the number of subscales each variable was related to, and to the standardised betas in each of the regression models, suggests that the most important influences on quality of provision for 3 and 4 year old children were (in rank order):

- Sector (maintained sector = higher quality);
- Group size (larger groups = higher quality);
- Staff qualifications (higher qualifications = higher quality);
- Children's Centre status (Children's Centres = higher quality);
- Age range/s of children catered for (older children = higher quality);
- Staff-child ratios (fewer children per adult = higher quality);
- Links with Sure Start Local Programmes/ health services (SSLPs/health links = lower quality);
- Centre size (smaller centres = higher quality interactions);
- Nursery manager qualifications (higher qualifications = higher quality personal care routines).

Section 5 discusses these conclusions in greater detail, and considers implications for the future of early years provision and policy.

Table 4.11 Multiple regression analysis: contributors to quality of provision

	Personal care routines (ECERS-R)	Language & reasoning (ECERS-R)	Interaction (ECERS-E)	Literacy (ECERS-E)	Maths (ECERS-E)	Science (ECERS-E)	Diversity (ECERS-E)	Mean ECERS-E score
Sector (maintained status)	-	+	(+)	+	(+)	+	+	+
Children's Centre status	+	(+)	(+)			+	+	+
Link with Sure Start Local Programmes		-		-	-			-
Centre offers child/ family health services	-	-	-	-	-			
Manager qualification	+	(+)	(+)	(+)				(+)
Mean qualification level		+	+	+	+	(+)	+	+
Qualified teacher		(+)	(+)	+	+	+	(+)	+
Staff member qualified to Level 4+		(+)	+	+	(+)	(+)		+
Proportion of staff in room observed qualified to NVQ level 3 or above		+	(+)	+	+	(+)	(+)	+
Proportion of unqualified staff in room obs		-	-	-	-	(-)	-	-
Age of oldest child in room observed (months)		+	+					+
Children under 3 present in room		-		-	-	-		-
Group size (children present on day)		(+)	+	+	+	+	+	+
Ratio in room observed (children to 1 adult)	-	-	-				-	-
Centre size (total enrolled)			-					

+ or – indicates the direction of an effect.
Where an effect was not independent of other variables (i.e. was only significant when one or more other variables were removed from the regression model) this is indicated using brackets, for example: (+). Further details can be found in Appendix 4.

4.5 Variation in quality according to user characteristics

The final element of the analysis considered the characteristics of the children and families attending the sample settings. The aim was to establish whether the quality of provision experienced by children varied according to user characteristics, i.e. are different types of children and families receiving different qualities of provision? Information gathered on quality as part of the current study was linked with data from the main MCS study on child and family characteristics. In all, 628 families using 299 settings were included in the analysis[23].

The analyses reported here are weighted to take into account both the probability of families being selected for the original MCS sample and, once selected for the MCS survey, the probability of their settings being selected for the current study. The data were stratified as described in the MCS guide (using 3 strata according to "advantage level"). A survey design was set up in STATA and used throughout all the analyses. The majority of analyses were conducted using univariate regression techniques. Where appropriate, multivariate techniques were used to control for the influence of other variables[24]. Table 4.12 presents the results of the analysis. Due to the large number of user characteristics tested, only those with a significant relationship to quality are reported.

Children with health problems appeared to be receiving higher quality provision. Children of older mothers also attended higher quality centres – possibly because older mothers are more knowledgeable about the importance of quality, and more able to identify and select high quality care.

Children living in lone parent households received higher quality early years provision, while children from families with two resident parents attended lower quality centres. The employment status of the household was also relevant: children whose mothers were at home rather than working received higher quality care. The impact of partner's work status was more mixed – while two-adult families with a non-working partner received lower quality provision, families in which neither adult was working received higher quality. The impact of socio-economic status was also complex to interpret.

Housing tenureship was also associated with quality of provision received. Children from families who rented (from the Local Authority, a housing association or private landlord) or lived rent-free received higher quality provision than children from families who owned their home outright. There were also differences in use of childcare according to ethnic group: children of Pakistani/Bangladeshi origin received higher quality curricular provision than those who were White British. Taken together, these results suggest that disadvantaged families are receiving higher quality provision than advantaged families. It is possible that this is due to recent Government initiatives such as Sure Start Local Programmes, the Neighbourhood Nurseries Initiative and the Children's Centre Programme, which aim to improve the quality of early years provision in the most disadvantaged areas of the country.

Analysis of home learning support suggests that children from families which encourage learning at home also receive higher quality centre-based provision. This

[23] A small number of families (and thus, settings) were unsuitable for the analysis and were excluded, as they had reported living in Scotland or Wales rather than England (the focus of the current study).

[24] Variables relating to children's development at 9 months and 3 years were tested together, as were variables relating to the home learning environment. When appropriate, child age was used as a control variable.

could be because families who take the time to develop their children's learning at home also place more emphasis on finding stimulating early years provision.

Table 4.12 Child and family characteristics related to quality of provision (univariate analysis)

	Mean ECERS-R (3 subscales)	Mean ECERS-E
Child characteristics		
Health problem @ 9 months (compared to none)	+	
Child has longstanding health condition @ 3 years	+	
Child limited in normal life due to health condition @ 3 years	+	
Child's ethnic group (reference category = white): Pakistani/ Bangladeshi		+
Household characteristics		
Mother older than 40 years at birth	+	
Two resident parents		-
Lone natural parent household		+
Father not present in household		+
Neither mother or partner working		+
Mother at home (vs. working)		+
Partner at home (vs. in work)	-	
Mother's socio-economic status NS SEC 5 class categorization (reference category = 1: managerial and professional): • 4: Lower supervisory and technical • 5: Semi-routine and routine		 - +
Partner's socio-economic status NS SEC 5 class categorization (reference category = 1: managerial and professional): • 3: Small employers and self-employed		 -
Housing tenureship (in comparison to owning home outright): • Renting from Local Authority • Renting from private landlord/housing association • Living rent free or with parents		 + + +
Home learning support @ 3 years (controlling for other home learning variables)		
How often main respondent reads to child	+	
How often child helped to learn about sports	+	
How often help to learn about alphabet	+ - *	

* U-shaped relationship: parents who helped their child often (daily) and parents who didn't help their child at all received higher quality provision than parents who sometimes helped their child learn the alphabet.

5. Summary and conclusions

5.1 Overall quality of provision

Quality of provision across the whole sample - 301 settings providing for 632 MCS children - was assessed using three observational instruments: the ECERS-R, the ECERS-E and the Caregiver Interaction Scale (CIS). Since the Effective Provision of Pre-school Education project (which collected data on 141 pre-school settings in the late 1990s) also used the ECERS-R and the ECERS-E, it has been possible to make some comparisons across the two studies.

Scores achieved by individual settings varied widely across the dimensions measured, with some offering high quality provision and others of less than adequate quality. The maintained settings were providing the highest quality provision overall, particularly with regard to the 'learning' aspects of provision. However, comparing the MCS and EPPE data shows that, whilst all sectors have made improvements since the late 1990s, the largest gains have been seen in the voluntary sector. Voluntary providers have made significant improvements in all areas of provision assessed as part of the current study, including personal care routines, interaction and language, curricular provision for literacy, maths and science, and provision for diversity and individual learning needs.

The following sections consider each of the dimensions of quality in turn and describe the quality of provision offered by the MCS settings, and whether any improvements have been seen since the EPPE data was collected.

Language and interactions

The MCS settings achieved significantly higher scores than the EPPE sample on the 'language & reasoning' and 'interaction' subscales of the ECERS-R. This suggests that the quality of pre-school provision for children's developing language and social interactions has improved significantly since the EPPE data was collected. The fact that both studies had large-scale national samples gives credence to these positive results, which demonstrate improvement in provision over a (relatively) short period[25].

In fact, staff-child interaction was the strongest element of provision across the sample, with centres achieving high scores on all three observational instruments. The ECERS-R scores showed that MCS settings were successful at offering children warm and stimulating interactions, and also at encouraging social interactions among children and encouraging children to communicate. On the ECERS-E, the highest scoring subscale was provision for literacy and, in particular, opportunities for talking and listening. Finally, observations made using the Caregiver Interaction Scale showed that staff in the MCS settings often displayed positive relationships with children, while less desirable behaviours such as detachment and lack of involvement with children, over-controlling or over-permissive behaviours, were rarely seen. Overall, the results suggest that provision for children's developing oral language and communication skills was of a good quality. However, provision for other aspects of children's developing literacy skills were not as strong (see below).

[25] Some caution must be exercised in making direct comparisons, since the MCS observers did not carry out reliability (agreement) checks with the EPPE team.

Curricular provision

On the whole, scores on the more 'curricular' ECERS-E subscales were lower than on the ECERS-R subscales. This confirms the findings of the EPPE project in suggesting that, while early childhood settings are good at providing nurturing environments for children, they are less successful at offering provision which stimulates children's cognitive development.

Of the aspects of curricular provision assessed by the ECERS-E, the MCS settings scored most highly on provision for **literacy** (rated as between 'minimal' and 'good'). However, while provision for oral language tended towards 'good', provision for other important aspects of children's literacy development – for example, their developing sound awareness, reading and emergent writing skills – were only adequate. Comparisons with the EPPE data suggest that – other than in the voluntary sector - little improvement has been made in literacy provision since the late 1990s. This is a somewhat worrying finding, and suggests that further work is required to help early childhood settings improve their provision for children's emergent reading and writing skills.

Maths and science provision in the MCS sample were rated as just above minimal overall, suggesting that the Foundation Stage may not yet be making a significant contribution to the development of children's mathematical and scientific understanding. As with literacy provision, the voluntary sector was the only group to have improved mathematical provision since the EPPE data was collected. However, the trend for science provision was more positive, with significant gains in all sectors since the late 1990s: in this area of the curriculum it is possible that changes in policy and practice are having a positive effect. The findings suggest that staff teams working in early childhood settings were most confident in offering children the chance to explore science through cooking and food preparation activities. However opportunities for children to experience and learn about non-living processes such as magnetism, sinking and floating, light and sound were more limited. Additional support is needed to ensure that settings have the necessary resources to support these experiences and that staff are confident in supporting children's explorations in these more 'traditional' science areas.

Providing for diverse needs

The lowest scores were achieved on the **diversity** subscale. On average, the MCS settings were offering below minimal provision in this regard, and (other than in the voluntary sector) no improvement has been made since the EPPE data was collected in the late 1990s. This is a worrying finding, particularly since one of the key aspects of provision assessed by this subscale is planning for individual learning needs: a key element of the Early Years Foundation Stage. It appears that early childhood settings are not yet meeting the diverse needs of the children in their care, for example by providing activities which enable children of all abilities to participate in a satisfying and cognitively demanding way. The diversity subscale also assesses the provision of resources and activities which promote awareness and understanding of racial and cultural diversity. In today's increasingly multi-racial society, the fact that pre-school settings are not adequately addressing these issues cannot be ignored, and settings clearly need support to improve the quality of their provision. However, further research is also needed to identify *why* settings are performing so poorly in these areas.

In summary:

- The MCS settings were particularly successful at providing a warm and nurturing environment for children, and at supporting their developing social skills;
- Literacy provision was strongest of the curricular areas (although was still only rated as 'adequate' overall). Provision for children's developing oral language and communication skills was of a good quality, but the sample settings catered less well for other aspects of children's developing literacy skills, particularly sound awareness, reading and emergent writing. Other than in the voluntary sector (which showed gains across the board) little improvement has been seen in literacy provision since the late 1990s.
- Provision for children's developing mathematical and scientific understanding was rated as just above minimal overall. However, the trend for science was upwards, and improvements have been made since the late 1990s.
- Provision for diversity is not of a good (or even minimal) quality: early years settings are not yet planning for individual learning needs, or adequately promoting awareness of diversity in terms of race, culture and gender.
- The maintained sector offered the highest quality provision overall. However, the largest gains since the 1990s were seen in the voluntary sector.

5.2 Which centre characteristics are related to quality?

A range of information was collected in each centre with the aim of establishing which centre characteristics were related to, and predicted, quality of provision (as measured by the ECERS-R and ECERS-E). The most important influences on overall quality of provision for 3 and 4 year old children were (in rank order):

- Sector (maintained sector = higher quality);
- Group size (larger groups = higher quality);
- Staff qualifications (higher qualifications = higher quality);
- Children's Centre status (Children's Centres = higher quality);
- Age range/s of children catered for (older children = higher quality);
- Staff-child ratios (fewer children per adult = higher quality);
- Links with Sure Start Local Programmes/ health services (SSLPs/health links = lower quality);
- Centre size (smaller centres = higher quality);
- Nursery manager qualifications (higher qualifications = higher quality).

Sector

Local Education Authority (LEA) maintained status was linked to higher quality provision in almost all dimensions measured, with the exception of provision for personal care routines. Maintained settings offered higher quality interactions, provision for children's developing language and reasoning skills, and higher curricular quality for literacy, maths, science and diversity. The relationships with 'interactions' and 'maths' were only apparent when staff qualifications were removed from the regression model. This suggests that staff qualification may be one of the main factors driving the higher quality achieved by the maintained sector in these areas.

Size of group and size of centre

A positive impact of group size was identified: rooms with more children present on the day of the observation offered higher quality curricular provision across the board, as well as higher quality interactions and provision for children's developing language and reasoning skills. Larger rooms may be able to provide a more interesting range of activities for children, and may also be led by a larger staff team with a broader range of

experiences, interests and expertise. Group sizes of 30 children or more were of the highest quality (once other factors – such as sector - had been taken into account).

One effect of centre size was identified: groups located in larger centres (i.e. with greater numbers of children enrolled) offered lower quality interactions for 3 and 4 year old children. This appears counter-intuitive in light of the findings on group size, and also goes against the findings of the Neighbourhood Nurseries Initiative evaluation (Mathers & Sylva, *in press*) which concluded that larger centres offer higher quality provision for children under the age of 3½ years. It seems that the relationship of centre size to quality is a complex one, and may vary for different age groups. Further research is recommended to explore the relationships between centre size and quality in greater depth.

Staff and manager qualifications

The childcare qualifications of staff working in the rooms observed were an important predictor of quality, and were most strongly related to those aspects of provision which foster children's developing language, interactions and academic progress. The only area not associated with staff qualifications was the quality of personal care routines (e.g. snack, toileting, safety and hygiene practices). These findings support previous research in identifying the important contribution of staff training and qualifications to the provision of a quality learning environment for pre-school children.

Although the mean qualification level of staff working with the children was the strongest predictor of quality, a number of other qualification measures were also significantly related to quality of provision. In particular, the percentage of staff members unqualified was important (and was negatively related to quality). The presence of a qualified teacher was particularly important for educational quality.

The qualification levels of the centre manager/head teacher were positively related to quality of provision and, in particular to provision for personal care routines. Weak but significant relationships were also found between the qualifications of the managers and the quality of provision for interactions, language and reasoning skills and literacy.

Children's Centre status

A positive impact of Children's Centre status on quality was identified. In some cases, it is possible that these impacts were due to the fact that the majority of Children's Centres were in the maintained sector i.e. it was the maintained influence rather than involvement in the Children's Centre programme which resulted in higher quality. However, the positive relationships with provision for science, diversity and personal care routines were independent of sector. Children's Centres offered significantly better quality provision for children's developing scientific knowledge and understanding, and were better at providing for diverse needs, than centres not involved in the Children's Centre programme. They also offered hygienic and appropriate care routines such as meal times, toileting and naps.

Age range

The ages of children catered for was a significant predictor of quality for 3 to 5 year old children. Having older children (for example, children over 4 ½ years) in the room was beneficial, particularly in terms of the quality of interactions, provision to develop children's language and reasoning skills and overall curricular quality[26]. It is likely that

[26] This mirrors the results of the Neighbourhood Nurseries Initiative evaluation, which found that quality of provision for infants and toddlers is higher in rooms which also cater for older children.

this is due to the higher level of language, communication and educational activities developed to meet the needs of (and challenge) these older children.

While the presence of older children was beneficial in terms of quality, having younger children (i.e. children under the age of 3 years) in the group alongside 3 and 4 year olds had a negative effect on provision quality. This could be because the presence of younger children, and the staff time required to care for them, means that less time and resource is available to devote to challenging educational activities for the older children. In addition, the requirement to have a range of activities and materials appropriate for both older and younger children may lead to a 'dilution' of the educational content required to challenge 3 and 4 year olds.

Ratio

For the age ranges of children in the sample, the legal ratio for private and voluntary sector settings is 8:1. In a local authority maintained nursery class or school, one teacher and one nursery nurse can provide for up to 26 children (a ratio of 13:1). Since the maintained sector offered the highest quality provision, we might expect to find that higher numbers of children per adult are related to higher quality provision. However, once the influence of sector was accounted for (using multiple regression analysis), it was clear that more children per staff member led to *lower* quality in some areas: in particular, the quality of personal care routines, language and reasoning, interactions and provision for diverse needs. Thus, *within* sectors (i.e. once sector is accounted for) better ratios improve the quality of provision in these areas.

Links with Sure Start Local Programmes

In contrast to the positive impacts of Children's Centre status, a *negative* effect of links with the Sure Start programme was found. This related specifically to provision for mathematics, and for the development of children's literacy, language and reasoning skills. A possible explanation is that, while the Children's Centre Programme focuses specifically on centre-based services for children, child services were not the main priority of many Sure Start Local Programmes. Further evidence for this conclusion is provided by the finding that centres offering child and family health services were of significantly lower quality (in many of the same areas) than centres not offering these services. This finding suggests that quality - especially those aspects related to literacy and language, reasoning and mathematics - is lower when the main focus of the programme or centre is *not* the fostering of children's learning but rather the provision of services for families. Providing for children's learning is not incompatible with local Sure Start aims, nor with health-related services. However, constraints on money, staff time and scheduling may lead to one set of activities and aims 'trumping' another.

5.3 Variation in quality according to user characteristics

The final element of the analysis considered the characteristics of the children and families who attended the sample settings. The aim was to establish whether the quality of provision experienced by children varied according to their characteristics i.e. are different types of children and families receiving different qualities of provision?

Comparison of MCS families attending group care setting with those using informal care, or with no childcare arrangements, suggested that the children in group childcare settings tended to be from more advantaged homes. For example, they tended to be from more affluent families, from families with at least one working adult, and to have better qualified mothers. Families not using childcare were more likely to be Indian, Bangladeshi or Pakistani.

However, comparison of family characteristics with the quality of provision their children received showed that children from lone parent households, children from non-working households, children living in rented rather than owned accommodation, and children with health problems all received higher quality provision. Thus, although children from less advantaged backgrounds are less likely to be attending group care, those who do so receive comparable – and in some cases better – quality of provision. This may be a direct result of recent Government initiatives such as the Neighbourhood Nurseries Initiative and the Children's Centre Programme, which aim to improve the quality of early years provision in the most disadvantaged areas of the country.

The finding that disadvantaged children tend to have better quality childcare than more advantaged ones appears to contradict the findings of the Neighbourhood Nurseries Initiative evaluation (Mathers & Sylva, *in press*), which found no relationship between the population of children and families served and quality of provision, and concluded that families from different backgrounds were being offered comparable quality.

One explanation for this might be that the NNI and MCS quality studies measured disadvantage in slightly different ways. The NNI looked at the characteristics of centre populations, and concluded that centres with high proportions of disadvantaged families offered comparable quality of provision to those with lower proportions of disadvantaged families. Thus, centres located in (or serving) disadvantaged neighbourhoods were as high quality as those serving (relatively) more affluent neighbourhoods. The QCSMCS looked at individual *children* attending the sample centres. It may be that the *centres* located in disadvantaged and non-disadvantaged areas were offering comparable quality of provision – but that *children* from disadvantaged families were more likely to get a place in a high quality centre. For example, we know that the maintained sector offers higher quality provision, and the private sector the lowest quality. Families from disadvantaged backgrounds are less likely to be able to afford the cost of private day care and, as a result, may be less likely to attend private centres and more likely to attend higher quality maintained provision. The analysis presented in section 4.5 used mainly univariate regression techniques, and therefore did not account for the influence of sector (or other variables) when looking at the relationships between disadvantage and quality of provision received.

Another (and possibly more robust) explanation for the difference in results lies in the fact that the samples for the two studies were quite different. Whereas the MCS families represented a wide range of social classes and levels of affluence, the NNI sample was drawn from areas of disadvantage. While the NNI sample did show some variation in the level of disadvantage of centre populations, the MCS sample (with families drawn from all levels of socio-economic status) is much more appropriate for making comparisons between disadvantaged and affluent families. It is likely that the MCS finding that disadvantaged children receive better quality childcare is closer to the truth, and that this effect was masked in the NNI by the lack of more affluent families for comparison.

Finally, analysis of the home environment suggests that children from families which encourage learning at home also receive higher quality centre-based provision. This could be because families who take the time to develop their children's learning at home also place more emphasis on finding stimulating early years provision. Among affluent and less affluent families, those who offered a rich home learning environment also appeared to enroll their children in the highest quality early childhood settings.

5.4 Recommendations and policy implications

1. Maintained settings should continue to be supported, as these offered the highest quality provision overall. However, the findings also suggest that there is considerable potential in the voluntary sector, which had made the largest gains since the 1990s.
2. Settings in all sectors need support to improve quality of provision for children's developing skills in the areas of literacy, mathematics and science, to plan for children's individual learning needs, and to offer an environment appropriate for today's increasingly racially and culturally diverse society.
3. The development of a well-qualified childcare workforce is vital for improving quality and, in particular, for the provision of a challenging and appropriate educational environment for 3 and 4 year old children.
4. Larger group sizes were beneficial in terms of provision quality. However, it will be important to assess the impact of group size on children's outcomes (as well as on quality) when this information becomes available, particularly with regard to social development and emotional security.
5. The development of Children's Centres should be supported: Children's Centres offered higher quality provision, and the findings of this study suggest that initiatives (such as the Children's Centre Programme) which aim to improve the quality of early years provision in disadvantaged areas are having some success. Although children from less advantaged backgrounds were less likely to be attending group care, those who did so received comparable – and in some cases better – quality of provision.
6. Three and four year old children experienced the highest quality provision in rooms which catered for the older end of the age-range, and which did not include children under the age of 3 years. However, the evaluation of the Neighbourhood Nurseries Initiative (*Mathers & Sylva, in press*) found that children under the age of 3 experience higher quality provision in mixed age rooms which also cater for 3 and 4 year olds. Thus, younger children may benefit from mixed age rooms: older children may not.
7. Within the bounds of the legal ratios applicable for each sector, a number of positive effects of high staff-child ratios were identified (in particular, relating to interactions/language opportunities and planning for diversity/individual learning needs). Centres should be encouraged to plan staffing schedules that allow high adult involvement with each child for at least some time during each session.
8. Thoughtful consideration needs to be given in centres with a broad remit: there is a need to ensure that a focus on childcare and education provision is retained alongside the provision of other services (such as health and family support). Centres with links to SSLPs, and centres which provided child and family health services, offered lower quality provision than centres without these features. All services are important, but a better balance may be needed.

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APPENDIX 1. INSTRUMENTS

Overview of the Subscales and Items of the ECERS-R (Harms, Cryer and Clifford, 2004)

Space and Furnishings

1. Indoor space
2. Furniture for routine care, play & learning
3. Furnishings for relaxation and comfort
4. Room arrangement for play
5. Space for privacy
6. Child-related display
7. Space for gross motor play
8. Gross motor equipment

Personal Care Routines

9. Greeting/departing
10. Meals/snacks
11. Nap/rest
12. Toileting/ diapering
13. Health practices
14. Safety practices

Language-reasoning

15. Books and pictures
16. Encouraging children to communicate
17. Using language to develop reasoning skills
18. Informal use of language

Activities

19. Fine motor
20. Art
21. Music/movement
22. Blocks
23. Sand/water
24. Dramatic play
25. Nature/science
26. Math/number
27. Use of TV, video and/or computer
28. Promoting acceptance of diversity

Interaction

29. Supervision of gross motor activities
30. General supervision of children (other than gross motor)
31. Discipline
32. Staff-child interaction
33. Interactions among children

Program Structure

34. Schedule
35. Free play
36. Group time
37. Provisions for children with disabilities

Parents and Staff

38. Provisions for parents
39. Provisions for personal needs of staff
40. Provisions for professional needs of staff
41. Staff interaction and cooperation
42. Supervision and evaluation of staff
43. Opportunities for professional growth

Overview of the Subscales and Items of the ECERS-E
(Sylva et al, Revised Edition 2006)

Literacy 1. Environmental print: letters and words 2. Book and literacy areas 3. Adults reading with children 4. Sounds in words 5. Emergent writing/mark making 6. Talking and listening	**Science and Environment** 1. Natural materials 2. Areas featuring science/ science resources 3. Science activities: non-living processes (select either 3, 4 or 5) 4. Science activities: living processes and the world around us (select either 3, 4 or 5) 5. Science activities: food preparation (select either 3, 4 or 5)
Maths 1. Counting and the application of counting 2. Reading and writing simple number 3. Mathematical activities: shape and space (select either 3 or 4) 4. Mathematical activities: sorting, matching and comparing (select either 3 or 4)	**Diversity** 1. Planning for individual learning needs 2. Gender equality and awareness 3. Race equality and awareness

The Caregiver Interaction Scale (Arnett, 1989)

1 = not at all, 2 = somewhat, 3 = quite a bit, 4 = very much.

1.Speaks warmly to the children	1 2 3 4
2.Seems critical of the children	1 2 3 4
3.Listens attentively when children speak to her/him	1 2 3 4
4.Places high value on obedience	1 2 3 4
5.Seems distant or detached from the children	1 2 3 4
6.Seems to enjoy the children	1 2 3 4
7.When children misbehave, explains the reason for the rule they are breaking	1 2 3 4
8.Encourages the children to try new experiences	1 2 3 4
9.Exercises no control over the children	1 2 3 4
10.Speaks with irritation or hostility to the children	1 2 3 4
11.Seems enthusiastic about the children's activities and efforts	1 2 3 4
12.Threatens children in trying to control them	1 2 3 4
13.Spends considerable time in activity not involving interaction with the children	1 2 3 4
14.Pays positive attention to the children as individuals	1 2 3 4
15.Ignores children when they misbehave	1 2 3 4
16.Talks to the children on a level they can understand	1 2 3 4
17.Punishes the children without explanation	1 2 3 4
18.Exercises firmness when necessary	1 2 3 4
19.Encourages children to exhibit prosocial behaviour e.g, sharing, cooperating	1 2 3 4
20.Finds fault easily with the children	1 2 3 4
21.Not interested in the children's activities	1 2 3 4
22.Seems to prohibit many of the things the children want to do	1 2 3 4
23.Little close supervision of the children	1 2 3 4
24.Encourages the children to exercise self-control, e.g. to be undisruptive for group, teacher-led activities, to be able to stand in line calmly	1 2 3 4
25. When talking to the children, kneels, bends, or sits at their level to establish better eye contact	1 2 3 4
26.Seems unnecessarily harsh when scolding or prohibiting children	1 2 3 4

APPENDIX 2. TECHNICAL REPORT ON SAMPLING

Ian Plewis, Heather Joshi, Jon Johnson and Sandra Mathers

1. Selecting the sample

QCSMCS observed the settings attended by a sub-sample of children in the 3 year-old survey of MCS, who were in turn drawn at an earlier stage from a subset of the areas of England (only) in which MCS2 carried out interviews. The first stage sample was based on the 152 (out of a total of 354) Local Authority Districts (LADs) that were included in the MCS1 sample as a result of sampling wards within strata.

Within each of the nine English regions, clusters of neighbouring LADs (from the initial pool of 152) were formed by eye. The number of clusters within each region varied from just two for the North East region to 10 for the South East. This variation arose partly from the different sizes of the regions and also because some regions were over-represented in MCS1. Three clusters were then selected from each within region (two in the North East) to give 26 clusters in total[27]. As there is no sub-sampling of institutions within clusters, at this stage the sample weights come from sub-sampling clusters within regions and vary as described in sections 3 and 4.

It should be noted that:

a) The clusters are often quite large and include 'satellite' LADs arising from mobility from MCS1 to MCS2.
b) Some children went to settings outside the cluster (e.g. to workplace nurseries)

This strategy generated a sample of 1217 families with children interviewed before the end of January 2005, using group care, and giving permission to approach the provider, and (approximately) 826 settings.

[27] It should be noted that the clusters were often quite large and include 'satellite' LADs arising from mobility from MCS1 to MCS2; and also that some children went to settings outside the cluster (to workplace nurseries for example).

Table A2.1: Number of sampled families and settings by region and cluster

Region	Cluster	n (MCS families)	n (settings)
East Midlands	1	46	31
	2	40	33
	3	62	48
East England	1	40	27
	2	31	27
	3	43	38
North East	1	41	34
	2	27	23
South East	1	60	42
	2	40	30
	3	85	42
South West	1	47	20
	2	36	32
	3	33	20
Yorks. & Humber	1	46	33
	2	33	22
	3	53	18
West Midlands	1	35	21
	2	30	23
	3	90	39
North West	1	54	40
	2	32	22
	3	53	33
London	1	57	38
	2	30	24
	3	73	66
TOTAL		**1217***	**826****

*The total number of children is 1235 including twins and triplets.
** One duplicate was later identified, bringing the total down to 825.

2. The achieved sample

Sampling principles:
The sampling was determined by the following principles:

- *Maximising the numbers of children in the sample*. The fact that very few centres were attended by more than one child meant that much effort was required to achieve a large sample of children in a cost-effective manner. A small sample of children would severely restrict the possibilities for future analysis linking quality of provision to child outcomes. Settings which provided for more than one Millennium child (multiple child settings) were over-sampled.

- *Ensuring that the quality of provision measured was that which had been experienced by (and potentially impacted) the MCS children.* This is essential where quality data is to be linked to child outcomes. Once the initial sample had been drawn, a number of additional strategies were employed to ensure that the children in the achieved sample had spent long enough at their group care setting to have (potentially) been affected by their experience. It was also important to check whether, for settings to be visited, the quality of provision observed was that which had been actually experienced by the child/ren attending. For

example, if a child had left their setting, it was essential to be able to visit that setting and assess the quality of provision before it changed substantially, as can be the case over time. Children (and thus their settings) were only selected for the final sample if they:

- Had spent 6 months or more at their identified group care setting;
- Attended for 10 hours a week or more;
- Were either still attending this setting, or had only recently left.

Where a substantial time had elapsed since the MCS2 interview, it was necessary to write to parents to check whether their child still attended the identified setting and, if not, when they had left. To allow for a certain proportion of children (and settings) to be excluded from the achieved sample at this stage, the initial sample contained substantially more children than were required.

- *Retaining information about the original sampling probability for the family's recruitment into the sample so that results could be generalised.* Settings and families were selected with a known probability in order that these varying chances of selection could be taken into account in subsequent analyses. Settings identified as catering for more than one cohort child had 100% chance of being included in the study. The remainder of the sample consisted of 'singleton' nurseries selected with a known probability from the stratum of all the single child settings identified.

The sampling process took place in three 'waves'. Once the initial sample of cohort families had been drawn, an operation was started to ensure that the children had attended their setting for 6 months or more and were either still attending or, if they had left, that this was recently enough to allow the setting to be visited within 6 months of the leaving date.

For families interviewed in October 2004 or later, it was not necessary to check whether/ when the child had left:- even if they had stopped attending soon after the interview date, it would still be possible to visit the setting/s within 6 months. The settings attended by those children could be issued straight away. Wave 1 (n=124) was therefore issued in February 2005 with 100% probability.

For families interviewed before November 2004, a postal survey was sent out to ascertain whether the child had attended the setting reported in the interview for at least 6 months, whether s/he was still attending and, if not, when they left. While waiting for responses to be returned, a second wave of 124 settings was issued. This consisted of 'multiple child' settings ie. those thought to cater for more than one cohort child (and at least one known to be eligible for follow-up), to maximise the number of children covered in a quota of 300 settings[28]. Wave 2 was therefore also issued with 100% probability.

The third wave, issued in July 2005 included the remaining 15 multiple child settings with at least one eligible child (selected at 100% probability) and a sample, one in 2.27 (= 137/311) of the remaining single child settings, after discarding as ineligible any setting for which the postal survey had not produced evidence of eligibility.

Table A2.2: Number of settings issued by type and wave

[28] The responses to the postal survey revealed that the initial classification into multiple and single-MCS-child settings had not always been correct, nor had all the settings names and addresses reported in the interview.

Setting type(no of MCS children attending)	Wave	Wave	Wave	Randomly not selected	No eligible children	Total
	1	2	3			
Singleton	80	11	137	174	216	618
Multiple	44	113	15	0	35	207
TOTAL	124	124	152	174	251	825*

* The difference between this figure of 825 and the previous setting total of 826 (Table A2.1) was due to the discovery of a duplicate as checking and data cleaning procedures were undertaken.

Table A2.3: Number of settings issued and observed by wave

Wave	Issued	Setting not eligible (not UK setting)	No eligible children	Eligible but not selected	Selected but address non-verifiable	Selected but refused/ closed	Visited
1	124	2	1	0	5	9	107
2	125	0	8	3	3	5	106
3	150	0	28	19	2	13	88
TOTAL	399*	2	37	22	10	27	301

* discrepancy of one issued setting between tables 2 and 3 due to discovery of a duplicate during fieldwork

Table 3 shows how the 399 settings issued reduced to the 301 finally visited. One setting disappeared between Table 2 and 3 as a duplicate entry was detected at a later stage. Two were not eligible as the reported address was outside the UK. A further 37 were deemed ineligible because no children eligible for follow-up had been identified, 10 were not contactable as their address could not be verified, and 27 had refused or closed. The last 22 settings had eligible children, but were not needed to make up the target sample of 300. In fact 301 were observed.

Table A2.4: Number of MCS children in issued settings by wave

Wave	1	2	3	Total
	248	343	174	765

Note MCS children were not the only children attending the settings.

Table A2.4 displays the number of MCS children attending the issued settings, whether eligible for follow-up or not. Altogether 765 children in the survey attended the issued settings. Table A2.5 presents the number of children attending the setting which were observed (632 in total, of whom 542 are known to be eligible for follow-up). It is possible that some of the children for whom eligibility was not established in the postal survey may in due course (i.e. in responses to MCS3) turn out to have attended the MCS2 setting for over 6 months.

Table A2.5: Number of children in observed settings by wave

	Wave 1	Wave 2	Wave 3	Total
Settings	107	106	88	301
All MCS children	227	301	104	632
Of whom eligible for follow-up	198	246	98	542

3. Weights for the child sample

On the assumption that inferences about children in the MCS1 population are required, then the weights for each child are obtained by multiplying.weight1 (as defined at MCS1: see sampling report by Plewis et al 2004) and a set of weights that apply to each English region as follows:

East Midlands	0.75
East England	0.50
North East	1
South East	0.30
South West	0.38
Yorks & Humber	0.50
West Midlands	0.38
North West	0.50
London	0.38

The introduction of these regional weights will increase the overall sampling variance. There is an argument for not using them if the variables of interest are unlikely to be related to region.

It is important to note that these weights do not take account of:

1. Non-response at MCS1.
2. Further non-response at MCS2.
3. Any non-response in the nursery sample.

4. Weights for the sample of settings

Weights for analysis that use the 'nursery' as the unit of analysis are obtained as follows:

Settings sampled in waves 1 and 2 with just one MCS attender ('singleton nurseries'): These just take the child weights as set out above.
Singleton settings sampled in wave 3: child weight multiplied by 2.27 (inverse of the sampling fraction of singleton settings in Wave 3)
Settings sampled with more than one MCS attender ('multiple nurseries'): these take the **mean** child weight for that nursery multiplied by the reciprocal of the number of attenders in the sample (whether or not eligible for follow-up). For most, but not all, settings every child in a particular setting has the same weight.

As with the weights for the child sample, it would be prudent to compare estimates with and without weights because there is likely to be a lot of variability in the weights.

APPENDIX 3. DESCRIBING THE CHARACTERISTICS OF CHILDREN ATTENDING THE OBSERVED NURSERIES

Report for the DfES

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19 May 2006

Introduction

In Britain, the post-war years have seen large increases in the number of women in the labour market, particularly over more recent years mothers of dependent children. The increase of mothers in the labour market has created new challenges for the family and other institutions responsible for childcare. For most mothers with young children below school age, employment requires finding an alternative source of childcare. The type of childcare used varies considerably, from relying on a grandparent to hiring a child-minder or a nanny.

The largest provision for working mothers in the First Survey of the Millennium Cohort (MCS1) comes from the family: grandparents and partners. In the MCS1 47 percent of employed mothers used grandparents to care for their child at some point and for 31 percent of employed mothers their partners looked after their child at some time. The most common formal arrangement is provided by nurseries or crèches. 18 percent of MCS mothers use this form of care with a further 14 percent of MCS working mothers using a childminder and 2 percent employing a nanny to look after their child.

The effect that non-maternal childcare has on the development of children is a contentious and complex issue. The consensus, emerging from research to date, is that long hours of non-maternal childcare for very young children can have adverse effects on children's development, but this varies according to individual circumstances. Additionally, there is recognition that there can also be beneficial effects for children with working mothers. How children suffer (or benefit) depends, amongst other things, on the quality of alternative maternal care.

Characteristics of childcare quality commonly found to be negatively associated with child outcomes include group size and staff - child ratios. Positive associations are

found between child outcomes and qualifications of care providers, stability of staff, the structure and content of daily activities and the space and facilities of the child care setting (Kisker and Maynard 1995).

For this reason researchers at the University of Oxford and the Centre for Longitudinal studies at the Institute of Education set out to sample and observe a number of nursery and group care settings attended by Millennium Cohort members at age three to examine differences between institutions. These settings include day nurseries playgroups, pre-schools and nursery schools or classes, here after collectively referred to as 'nurseries',

This report looks at the characteristics of the children and families who attended the observed nurseries and compares them to children and families living in the same areas and: 1) attending nurseries and group settings which were not observed; 2) using some form of informal care (only), and; 3) not using any form of child care.

Data

MCS is a large-scale survey of babies born at the beginning of the 21st century; the first sweep contains information about 18,818 babies collected when the babies were 9 months old. The sample design allowed for the disproportionate representation of areas with high minority populations and child poverty. This was done in England by stratifying the data into three groups: an 'ethnic minority' stratum where at least 30 percent of the population fell into either the 'black' or 'Asian' category; a 'disadvantaged' stratum, which included children in wards where there was a high incidence of child poverty but that had not been classified as a high ethnic minority wards and: an 'advantaged' stratum which included wards that had not been classified under either one of the first two strata.

As it is expensive to observe the quality of day care settings, only a sample of group settings attended by children in the survey were included in this study. Sampling the children and nurseries involved selecting children attending group childcare setting from locations in England, and then selecting the institutions that were attended by the selected children. This information was issued to the nursery observation team. Not all of these issued institutions were actually observed for various reasons: the nursery may

have refused, gone out of business, or been surplus to the requirement to meet 301 achieved observations.

Results

When comparing the families of children in observed and non-observed nursery settings it is expected that few differences would be seen between the two groups. If differences are detected then children at the observed nurseries are not representative of all nurseries and making inferences from our sampled population to the population of nurseries as a whole is more difficult.

Table A3.1, below, shows that children attending the observed and non-observed nurseries are fairly similar, however some distinctions can be seen between children from the different care settings. On the whole, children in the observed and non-observed nurseries tend to be from more advantaged families than children who only experience informal care or are from families that do not have childcare arrangements. The settings selected for observation do not seem to have a very different clientele of MCS cohort children from the other group care settings in these English LEAs.

For example, children attending centre-based providers have slightly older mothers. The mothers' mean age in the observed nurseries is 30.8 and 30.2 in non-observed nurseries, compared to 27.6 and 28.7 in informal childcare and no childcare arrangement settings respectively. There is a higher proportion of white children in centre-based settings: 91.8 percent of children are white in the observed settings, 90.0 percent in non-observed settings, informal childcare settings have 85.2 percent white children and 80.4 percent of children are white where no childcare arrangements have been made.

When considering family size, the results show that children without siblings are more likely to have some sort of care arrangement whether formal or informal: 25.5 percent of children in observed nurseries, 30.4 percent in non-observed and 27.2 percent in informal childcare settings did not have siblings, whereas 15.9 percent of children from families without any childcare arrangements were only children. Conversely, in larger families where cohort members had two or more siblings there was a greater likelihood that children would not have specific childcare arrangements: 44.8 percent of children who did not have childcare arrangements had two or more siblings, whilst 23.3

percent of children from observed nurseries, 20.7 percent of children from non-observed nurseries and 20.8 percent of children who had informal care had two or more siblings.

Table A3.1: Characteristics of Families in Different Childcare Settings (survey weights applied)

Percentage in each childcare arrangement within the following categories	Observed nursery attendees in issued settings	Non-observed nursery attendees in the same LEA	Informal childcare only	No childcare arrangement
Mothers' mean age	30.8	30.2	27.6	28.7
Mothers' median age	31.0	31.0	28.0	29.0
% of mothers educated to degree level	47.8	47.2	23.9	16.2
% of mothers with less than 5 A-C GCSEs	13.1	14.8	33.7	42.8
% in 2 parent worker households	62.4	57.5	41.8	6.3
% in 2 parent, one worker households	29.3	29.9	37.3	60.0
% in 2 parent, workless households	1.3	2.4	4.1	13.0
% in single parent worker households	1.2	2.7	3.3	0.5
% in single parent, workless households	5.8	7.5	13.4	20.1
% with at least one professional parent	34.7	39.9	16.2	13.7
% of households with incomes of £52,000+	14.8	16.6	2.2	4.8
% of household with incomes less £10,400	9.5	12.8	24.4	34.1
% of cohort members without siblings	25.5	30.4	27.2	15.9
% of cohort members with 2+ siblings	23.3	20.7	20.8	44.8
% of white cohort members	91.8	90.0	85.2	80.4
% of black cohort members	1.4	2.7	2.6	2.4
% of Indian, Bangladeshi or Pakistani cohort members	2.4	3.1	7.5	11.8
N (unweighted)	634	835	542	1,215

Data weighting

Due to the way that observed nurseries were sampled children had a differential chance of attending the selected nurseries depending on where they lived; special weights were applied to take this into account. When the analyses were carried with these weights there was very little variation in the results, as can be seen below in Table A3.2. Table A3.3 shows the results obtained using unweighted data, which reveals that the actual proportion of ethnic minority children and children of lone mothers attending the observed nurseries is considerably higher than appears in Table A3.1, which corrects for their over-representation in the survey

Table A3.2: Characteristics of Families in Different Childcare Settings (survey and nursery sampling weights applied)

Percentage in each childcare arrangement within the following categories	Observed nursery attendees in issued settings	Non-observed nursery attendees in the same LEA	Informal childcare only	No childcare arrangement
Mothers' mean age	30.8	30.0	27.4	28.6
Mothers' median age	31.0	30.0	28.0	29.0
% of mothers educated to degree level	47.7	45.7	22.3	14.8
% of mothers with less than 5 A-C GCSEs	13.6	15.6	34.1	43.9
% in 2 parent worker households	64.4	59.3	42.2	6.7
% in 2 parent, one worker households	27.6	27.8	36.9	58.5
% in 2 parent, workless households	1.4	2.8	5.1	13.5
% in single parent worker households	1.2	3.0	3.2	0.4
% in single parent, workless households	5.3	7.2	12.6	20.9
% with at least one professional parent	34.3	38.8	14.9	12.8
% of households with incomes of £52,000+	13.9	15.0	2.0	4.1
% of household with incomes less £10,400	9.3	12.9	25.6	35.0
% of cohort members without siblings	27.1	31.6	26.5	15.7
% of cohort members with 2+ siblings	23.1	20.1	21.6	43.6
% of white cohort members	92.9	90.6	87.6	82.7
% of black cohort members	1.2	2.3	2.0	1.7
% of Indian, Bangladeshi or Pakistani cohort members	2.2	3.3	6.7	10.7
N (unweighted)	634	835	542	1,215

Table A3.3: Characteristics of Families in Different Childcare Settings (unweighted)

Percentage in each childcare arrangement within the following categories	Observed nursery attendees in issued settings	Non-observed nursery attendees in the same LEA	Informal childcare only	No childcare arrangement
Mothers' mean age	30.2	29.7	27.1	28.0
Mothers' median age	31.0	30	28.0	28.0
% of mothers educated to degree level	43.8	41.8	20.1	12.1
% of mothers with less than 5 A-C GCSEs	16.9	18.7	38.5	52.2
% in 2 parent worker households	57.6	53.7	34.7	4.5
% in 2 parent, one worker households	30.6	30.9	39.7	56.8
% in 2 parent, workless households	2.4	3.1	6.5	16.1
% in single parent worker households	1.6	3.4	3.7	0.5
% in single parent, workless households	7.9	9.9	15.5	22.2
% with at least one professional parent	30.6	34.1	13.3	10.0
% of households with incomes of £52,000+	12.7	13.5	1.8	2.7
% of household with incomes less £10,400	13.9	16.8	31.8	43.1
% of cohort members without siblings	25.5	31.0	25.8	14.9
% of cohort members with 2+ siblings	24.8	22.4	25.8	49.9
% of white cohort members	84.2	81.0	72.3	61.4
% of black cohort members	2.4	5.8	3.9	4.4
% of Indian, Bangladeshi or Pakistani cohort members	8.0	7.9	17.2	27.1
N (unweighted)	634	835	542	1,215

APPENDIX 4 REGRESSION MODELS

ECERS-R: PERSONAL CARE ROUTINES

Basic model

R = 0.46 R^2 = 0.21 Adjusted R^2 = 0.18 F (9, 280) = 8.2

Variable	B	Standardised beta	Significance
Sector (maintained status)	-0.51	-0.15	**p < 0.05**
Mean qualifications of staff in room obs.	0.16	0.07	ns
Manager qualification	0.27	0.14	**p < 0.05**
Age of oldest child in months (room observed)	0.01	0.04	ns
Children under 3 present in room observed	-0.15	-0.06	ns
Proportion SEN children in room/ group	-0.001	-0.01	ns
Centre size (total enrolled)	0.01	0.11	ns
Link with Sure Start Local Programmes	-0.16	-0.05	ns
Centre offers child/ family health services	-0.50	-0.18	**p < 0.01**
Children's Centre status	0.93	0.20	**p < 0.01**
Ratio (children to 1 paid adult in room obs)	-0.09	-0.15	**p < 0.05**
Group size (children present on day of obs)	0.01	0.04	Ns

- Children's Centre status, ratio and group size were highly correlated with sector ($r \geq 0.5$). The figures reported here are from a model which included sector. However, all three effects were checked with sector removed from the model: the ratio effect was
- Staff qualifications variables were entered individually into the model.

ECERS-R: LANGUAGE-REASONING

Basic model

R = 0.46 R^2 = 0.21 Adjusted R^2 = 0.18 F (9, 280) = 8.2

Variable	B	Standardised beta	Significance
Sector (maintained status)	0.58	0.20	**p < 0.01**
Mean qualifications of staff in room obs.	0.43	0.22	**p < 0.001**
Proportion of unqualified staff in room observed	-0.02	-0.23	**p < 0.001**
Proportion of staff in room observed qualified to Level 3 or above	0.01	0.14	**p < 0.05**
Manager qualification	0.10	0.06	ns
Age of oldest child in months (room obs)	0.04	0.15	**p < 0.01**
Children under 3 present in room observed	-0.32	-0.14	**p < 0.05**
Proportion SEN children in room/ group	0.003	0.02	ns
Centre size (total enrolled)	-0.001	-0.04	ns
Link with Sure Start Local Programmes	-0.31	-0.12	**p < 0.05**
Centre offers child/ family health services	-0.27	-0.11	**p < 0.05**
Children's Centre status	0.22	0.05	ns
Ratio (children to 1 paid adult in room obs)	-0.07	-0.13	**p < 0.05**
Group size (number of children present on day of observation)	0.01	0.14	ns

- Children's Centre status, ratio and group size were highly correlated with sector ($r \geq 0.5$). The figures reported here are from a model which included sector. All three effects were checked with sector removed from the model: the ratio effect was lost; group size and Children's Centre status were significant when sector was removed from the model (see below).
- Staff qualifications variables were entered individually into the model.

Variables only significant if others removed from regression model

Variable	B	Standardised beta	Significance	Significant when following variables removed from model:
Group size (children present on day of obs)	0.02	0.21	**p < 0.01**	Sector (maintained status)
Children's Centre (or applying for CC status)	0.55	0.14	**p < 0.05**	Sector (maintained status)
Qualified teacher present	0.45	0.17	**p < 0.01**	Sector (maintained status) Manager qualification
Staff member qualified to Level 4 or above employed to work in room observed	0.37	0.15	**p < 0.05**	Sector (maintained status) Manager qualification
Manager qualification	0.27	0.16	**p < 0.01**	Sector (maintained status) Quals of staff in room

ECERS-R: INTERACTION

Basic model

R = 0.39 R^2 = 0.15 Adjusted R^2 = 0.13 F (9, 280) = 5.6

Variable	B	Standardised beta	Significance
Sector (maintained status)	0.28	0.09	ns
Mean qualifications of staff in room obs.	0.32	0.16	**p < 0.05**
Proportion of unqualified staff in room observed	-0.01	-0.14	**p < 0.05**
Staff member qualified to Level 4 or above employed to work in room observed	0.36	0.14	**p < 0.05**
Manager qualification	0.15	0.09	ns
Age of oldest child in months (room observed)	0.05	0.16	**p < 0.01**
Children under 3 present in room observed	-0.18	-0.01	ns
Proportion SEN children in room/ group	-0.002	-0.01	ns
Centre size (total enrolled)	-0.01	-0.17	**p < 0.01**
Link with Sure Start Local Programmes	-0.30	-0.10	ns
Centre offers child/ family health services	-0.37	-0.15	**p < 0.05**
Children's Centre status	0.44	0.10	ns
Ratio (children to 1 paid adult in room obs)	-0.09	-0.17	**p < 0.05**
Group size (children present on day of obs)	0.02	0.16	**p < 0.05**

- Children's Centre status, ratio and group size were highly correlated with sector ($r \geq 0.5$). The figures reported here are from a model which included sector. However, all three effects were checked with sector removed from the model: ratio and group size remained significant. Children's Centre status was also significant when sector was removed (see below).
- Staff qualifications variables were entered individually into the model.

Variables only significant if others removed from regression model

Variable	B	Standardised beta	Significance	Significant when following variables removed from model:
Sector (maintained status)	0.44	0.14	**p < 0.05**	Quals of staff in room
Children's Centre (or applying for CC status)	0.63	0.15	**p < 0.05**	Sector (maintained status)
Qualified teacher present	0.44	0.16	**p < 0.05**	Sector (maintained status) Manager qualification
Proportion of staff in room observed qualified to Level 3 or above	0.01	0.14	**p < 0.05**	Sector (maintained status)
Manager qualification	0.22	0.12	**p < 0.05**	Quals of staff in room

ECERS-E: LITERACY

Basic model

R = 0.50 R^2 = 0.25 Adjusted R^2 = 0.23 F (9, 280) = 10.35

Variable	B	Standardised beta	Significance
Sector (maintained status)	0.48	0.22	**p < 0.01**
Mean qualifications of staff in room observed	0.36	0.25	**p < 0.001**
Proportion of unqualified staff in room observed	-0.10	-0.21	**p < 0.001**
Proportion of staff in room observed qualified to Level 3 or above	0.01	0.15	**p < 0.05**
Staff member qualified to Level 4 or above employed to work in room observed	0.41	0.23	**p < 0.01**
Qualified teacher present	0.28	0.14	**p < 0.05**
Manager qualification	0.08	0.06	ns
Age of oldest child in months (room observed)	0.02	0.09	ns
Children under 3 present in room observed	-0.22	-0.13	**p < 0.05**
Proportion SEN children in room/ group	0.01	0.08	ns
Centre size (total enrolled)	-0.001	-0.03	ns
Link with Sure Start Local Programmes	-0.22	-0.11	**p < 0.05**
Centre offers child/ family health services	-0.21	-0.12	**p < 0.05**
Children's Centre status	0.10	0.03	ns
Ratio (children to 1 paid adult in room obs)	-0.02	-0.06	ns
Group size (children present on day of obs)	0.01	0.16	**p < 0.05**

- Children's Centre status, ratio and group size were highly correlated with sector ($r \geq 0.5$). The figures reported here are from a model which included sector. However, all three effects were checked with sector removed from the model: levels of significance remained the same.
- Staff qualifications variables were entered individually into the model.

Variables only significant if others removed from regression model

Variable	B	Standardised beta	Significance	Significant when following variables removed from model:
Manager qualification	0.16	0.13	p < 0.05	Qualifications of staff in room

ECERS-E: MATHS

Basic model

R = 0.39 R^2 = 0.15 Adjusted R^2 = 0.13 F (9, 280) = 5.6

Variable	B	Standardised beta	Significance
Sector (maintained status)	0.43	0.14	ns
Mean qualifications of staff in room observed	0.32	0.15	$p < 0.05$
Proportion of unqualified staff in room observed	-0.01	-0.12	$p < 0.05$
Proportion of staff in room observed qualified to Level 3 or above	0.01	0.13	$p < 0.05$
Qualified teacher present	0.44	0.15	$p < 0.05$
Manager qualification	0.05	0.03	ns
Age of oldest child in months (room observed)	0.03	0.08	ns
Children under 3 present in room observed	-0.40	-0.16	$p < 0.05$
Proportion SEN children in room/ group	-0.002	-0.01	ns
Centre size (total enrolled)	-0.003	-0.09	ns
Link with Sure Start Local Programmes	-0.64	-0.22	$p < 0.001$
Centre offers child/ family health services	-0.32	-0.12	$p < 0.05$
Children's Centre status	-0.03	-0.01	ns
Ratio (children to 1 paid adult in room obs)	-0.02	-0.03	ns
Group size (children present on day of obs)	0.02	0.22	$p < 0.01$

- Children's Centre status, ratio and group size were highly correlated with sector ($r \geq 0.5$). The figures reported here are from a model which included sector. However, all three effects were checked with sector removed from the model: levels of significance remained the same.
- Staff qualifications variables were entered individually into the model.

Variables only significant if others removed from regression model

Variable	B	Standardised beta	Significance	Significant when following variables removed from model:
Staff member qualified to Level 4 or above employed to work in room observed	0.37	0.14	$p < 0.05$	Manager qualification
Sector (maintained status)	0.60	0.19	$p < 0.01$	Staff qualifications Group size (number of children present on day of observation)

ECERS-E: SCIENCE

Basic model

R = 0.46 R^2 = 0.21 Adjusted R^2 = 0.18 F (9, 280) = 8.2

Variable	B	Standardised beta	Significance
Sector (maintained status)	1.23	0.32	p < 0.001
Mean qualifications of staff in room observed	0.27	0.11	ns
Qualified teacher present	0.54	0.16	p < 0.05
Manager qualification	-0.01	-0.004	ns
Age of oldest child in months (room observed)	0.04	0.11	ns
Children under 3 present in room observed	-0.41	-0.13	p < 0.05
Proportion SEN children in room/ group	-0.01	-0.04	ns
Centre size (total enrolled)	0.002	0.04	ns
Link with Sure Start Local Programmes	-0.24	-0.07	ns
Centre offers child/ family health services	-0.03	-0.01	ns
Children's Centre status	1.03	0.19	p < 0.01
Ratio (children to 1 paid adult in room obs)	-0.05	-0.08	ns
Group size (children present on day of obs)	0.22	0.18	p < 0.05

- Children's Centre status, ratio and group size were highly correlated with sector ($r \geq 0.5$). The figures reported here are from a model which included sector. However, all three effects were checked with sector removed from the model: significance levels were unchanged.
- Staff qualifications variables were entered individually into the model.

Variables only significant if others removed from regression model

Variable	B	Standardised beta	Significance	Significant when following variables removed from model:
Mean qualifications of staff in room observed	0.47	0.18	p < 0.01	Sector (maintained status)
Proportion of unqualified staff in room observed	-0.01	-0.14	p < 0.05	Sector (maintained status)
Proportion of staff in room observed qualified to Level 3 or above	0.01	0.11	p < 0.05	Sector (maintained status)
Staff member qualified to Level 4 or above employed to work in room observed	0.48	0.15	p < 0.05	Sector (maintained status)

ECERS-E: DIVERSITY

Basic model

R = 0.37 R^2 = 0.14 Adjusted R^2 = 0.11 F (9, 280) = 5.0

Variable	B	Standardised beta	Significance
Sector (maintained status)	0.74	0.26	p < 0.001
Mean qualifications of staff in room observed	0.26	0.13	p < 0.05
Proportion of unqualified staff in room observed	-0.01	-0.17	p < 0.01
Manager qualification	-0.04	-0.02	ns
Age of oldest child in months (room observed)	0.02	0.07	ns
Children under 3 present in room observed	-0.09	-0.04	ns
Proportion SEN children in room/ group	0.01	0.05	ns
Centre size (total enrolled)	0.001	0.05	ns
Link with Sure Start Local Programmes	-0.13	-0.05	ns
Centre offers child/ family health services	-0.10	-0.04	ns
Children's Centre status	0.89	0.22	p < 0.05
Ratio (children to 1 paid adult in room obs)	-0.14	-0.25	p < 0.001
Group size (children present on day of obs)	0.02	0.22	p < 0.01

- Children's Centre status, ratio and group size were highly correlated with sector ($r \geq 0.5$). The figures reported here are from a model which included sector. However, all three effects were checked with sector removed from the model. All three remained significant.
- Staff qualifications variables were entered individually into the model.

Variables only significant if others removed from regression model

Variable	B	Standardised beta	Significance	Significant when following variables removed from model:
Proportion of staff in room observed qualified to Level 3 or above	0.01	0.13	p < 0.05	Sector (maintained status)
Qualified teacher present	0.36	0.14	p < 0.05	Sector (maintained status)

ECERS-E: MEAN TOTAL SCORES

Basic model

R = 0.52 R^2 = 0.27 Adjusted R^2 = 0.25 F (9, 280) = 11.6

Variable	B	Standardised beta	Significance
Sector (maintained status)	0.67	0.30	p < 0.001
Mean qualifications of staff in room observed	0.31	0.21	p < 0.001
Proportion of unqualified staff in room observed	-0.01	-0.19	p < 0.01
Proportion of staff in room observed qualified to Level 3 or above	0.01	0.12	p < 0.05
Staff member qualified to Level 4 or above employed to work in room observed	0.32	0.17	p < 0.01
Qualified teacher present	0.34	0.17	p < 0.05
Manager qualification	0.03	0.03	ns
Age of oldest child in months (room observed)	0.03	0.12	p < 0.05
Children under 3 present in room observed	-0.25	-0.14	p < 0.05
Proportion SEN children in room/ group	0.003	0.03	ns
Centre size (total enrolled)	0.001	-0.01	ns
Link with Sure Start Local Programmes	-0.29	-0.14	p < 0.05
Centre offers child/ family health services	-0.17	-0.09	ns
Children's Centre status	0.41	0.13	p < 0.05
Ratio (children to 1 paid adult in room obs)	-0.05	-0.12	p < 0.05
Group size (number of children present on day of observation)	0.02	0.23	p < 0.01

- Children's Centre status, ratio and group size were highly correlated with sector ($r \geq 0.5$). The figures reported here are from a model which included sector. However, all three effects were checked with sector removed from the model. Children's Centre status and group size remained significant. The ration effect was lost.
- Staff qualifications variables were entered individually into the model.

Variables only significant if others removed from regression model

Variable	B	Standardised beta	Significance	Significant when following variables removed from model:
Manager qualification	0.23	0.17	p < 0.01	Sector (maintained status) Qualifications of staff in room

'TIPPING POINT' ANALYSIS: GROUP SIZE	B	Standardised beta	Significance
Compared with groups of fewer than 15 children ….			
Groups of 15 to 19 children	0.11	0.05	ns
Groups of 20 to 29 children	0.01	0.01	ns
Groups of 30 children or more	0.54	0.22	$p < 0.01$
Compared with groups of 15 to 19 children….			
Groups of fewer than 15 children	-0.11	-0.05	ns
Groups of 20 to 29 children	-0.10	-0.05	ns
Groups of 30 children or more	0.44	0.18	$p < 0.05$
Compared with groups 20 to 29 children….			
Groups of fewer than 15 children	-0.01	-0.01	ns
Groups of 15 to 19 children	-0.10	0.05	ns
Groups of 30 children or more	0.53	0.21	$p < 0.01$
Compared with groups of 30 children or more….			
Groups of fewer than 15 children	-0.54	-0.27	$p < 0.01$
Groups of 15 to 19 children	-0.44	-0.21	$p < 0.05$
Groups of 20 to 29 children	-0.53	-0.27	$p < 0.01$

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