March 2007

National Evaluation of the Neighbourhood Nurseries Initiative: The Relationship between Quality and Children's Behavioural Development

SureStart

Evidence & research

Research Report
SSU/2007/FR/022

National Evaluation of the Neighbourhood Nurseries Initiative:
The Relationship between Quality and Children's Behavioural Development

Sandra Mathers and Kathy Sylva

Department of Educational Studies
University of Oxford

ACKNOWLEDGEMENTS

We are grateful to the Regional Research Officers, Faye Linskey, Margaret Kehoe and Denise Jennings, who visited the 103 Neighbourhood Nurseries to carry out observations and collect data; Ana Maria Aricescu and Jenna Jones who entered and cleaned the data; James Hall who contributed to the analysis; and our research colleagues in the NNI Research Team, particularly Teresa Smith, Kate Coxon and Maria Sigala who have worked closely with us as their *Implementation Study Report* and our *Childcare Quality and Children's Behaviour Report* have drawn from the same nurseries. We are also grateful to our DfES sponsors who commissioned the research – particularly Sam Mason, Richard White, Jane Simmonds, Ganka Mueller, Teresa Downing, Emma Marshall, Laura Sukhnandan, and Rajkiran Sidhu; and the members of our Advisory Committee. Finally, we thank all the Neighbourhood Nurseries, their managers and staff, who agreed to take part in the study, and the regional advisors and local authority advisors who agreed to be interviewed – without their participation there would be no study and no report.

THE NNI RESEARCH TEAM (* denotes principal investigator)

Implementation
Dept of Social Policy and Social Work, University of Oxford
Teresa Smith*, Kate Coxon, Dr Maria Sigala

Childcare quality and children's behaviour
Dept of Educational Studies, University of Oxford
Professor Kathy Sylva*, Sandra Mathers

Neighbourhood change
Dept of Social Policy and Social Work, University of Oxford
George Smith*, Dr Maria Sigala

Impact and economic analysis
Institute for Fiscal Studies
Professor Lorraine Dearden*, Alissa Goodman, Jonathan Shaw, Luke Sibieta
National Centre for Social Research
Ivana La Valle*, Dr Susan Purdon, Ruth Smith, Alice Bell

FOR FURTHER INFORMATION ABOUT THIS REPORT CONTACT:

Sandra Mathers
Department of Educational Studies, University of Oxford
15 Norham Gardens, Oxford OX2 6PY
(01865) 274043
Sandra.mathers@edstud.ox.ac.uk

CONTENTS

EXECUTIVE SUMMARY

Introduction

The aim of the Neighbourhood Nurseries Initiative (NNI) was to reduce unemployment - and thus tackle child poverty - by offering high quality, affordable childcare in the most disadvantaged areas of the country. By August 2004, 45,000 new places for 0-4 year olds had been created. This research was part of the NNI National Evaluation, and had two main strands.

The *Childcare Quality* strand described the quality of provision offered by a random sample of 103 Neighbourhood Nurseries. The aim was to establish whether the new places and nurseries created by the NNI were of sufficient quality to foster the development of the children attending them. It also considered a number of other centre characteristics (for example, sector, qualifications of centre staff, centre size), with the aim of establishing which of these characteristics were related to, and predicted, quality of provision.

The *Quality and Children's Behaviour* strand used the information gathered by the quality strand to explore the effects of early centre-based childcare on 810 children[1] attending the sample Neighbourhood Nurseries. It aimed to establish (after taking into account child and family background):

- The effect of provision quality on children's social and behavioural development;
- Which centre and childcare characteristics (in addition to quality) were related to children's social and behavioural development.

This study was intended to fill two major gaps in the UK literature. Firstly, the majority of studies exploring the relationship between quality and child outcomes have focused on provision for 3 and 4 year old children. The current study focused on children under the age of 3½ years. Secondly, although there is a comprehensive body of research which considers the impacts of childcare on children's intellectual development (for example language and reasoning abilities), much less is known about impacts on behavioural outcomes. Previous research has drawn mixed conclusions, and there have been a number of worrying findings relating to the effects of childcare on anti-social behaviour. For this reason, the current study focused on the relationships between quality of care and young children's social behaviour.

This report can be read as a stand-alone document, or in conjunction with the NNI Implementation Study Report[2].

[1] Mean age 2 years 9 months

[2] Smith, T., Coxon, K., and Sigala, M. (in press) The NNI National Evaluation: Implementation Study Report.

Methodology

Visits to the sample Neighbourhood Nurseries took place between February 2004 and July 2005. Two observational instruments were used to assess quality in rooms providing for infants and toddlers:

The Infant Toddler Environment Rating Scale (Harms, Cryer & Clifford, 2003)
This revised version of the ITERS scale (the ITERS-R) is designed to assess provision for children from birth to 2 ½ years, and covers a comprehensive range of quality features:

- *Space and furnishings* (e.g. layout of the room, resources, display);
- *Personal care routines* (e.g. health and safety, hygiene, meal times);
- *Listening and talking* (e.g. supporting children's language development);
- *Activities* (e.g. dramatic play, sand and water, fine motor play);
- *Interaction* (e.g. supervision, discipline, staff-child and peer interactions);
- *Program structure* (e.g. opportunities for free play, group activities);
- *Parents and staff* (e.g. information for parents, staff training).

The Caregiver Interaction Scale (Arnett, 1989)
The 'positive relationships' subscale of the CIS (indicating warmth and enthusiasm in interaction with children) was used in this study.

Where the term 'overall quality of provision' is used in this report, it refers to the mean total score achieved on the ITERS-R. Where 'individual dimensions of quality' are referred to, this relates to one or more of the seven individual subscales of the ITERS-R and the CIS positive relationships subscale.

Information on general centre characteristics (for example, sector, qualifications of centre staff, centre size) was provided by the NNI Implementation Study, with the aim of establishing which of these characteristics were related to children's behaviour. Finally, information on children (and their families) was collected using:

The Adaptive Social Behaviour Inventory (Hogan et al, 1992)
The ASBI records information on the social and behavioural development of pre-school children across five dimensions:

- Co-operation and conformity;
- Peer sociability;
- Confidence;
- Anti-social behaviour;
- Worried and upset behaviour.

Family Profile
As previous research had shown that home background has a large impact on children's social behaviour, it was necessary to take account of these influences when considering the effect of the NNI provision. This questionnaire, devised for the study, recorded information on child characteristics (e.g. gender), family characteristics (e.g. family structure and work status) and current childcare and childcare history (e.g. hours per week in group care).

Key Findings: Overall quality of provision in the NNI sample

Overall quality of provision varied widely across the sample: while some centres were offering a good-to-excellent standard of provision, others were of poor quality. The vast majority of Neighbourhood Nurseries were offering at least adequate quality of provision for children under the age of 3 ½. Most (70%) of the rooms observed were rated as adequate (above minimal but below good). Around one quarter (23%) of the rooms observed offered a good standard of provision. These centres provided children with a nurturing, educationally stimulating and healthy environment. A small proportion (7%) offered less than minimal quality. These centres were missing basic elements of quality provision such as hygiene, safety, educational stimulation and warm staff-child interactions. On the whole, providers in the maintained sector offered the highest quality of provision. The private sector had the lowest mean quality rating, but also displayed the broadest variation in quality, with some centres operating at a very high standard.

Neighbourhood Nurseries were the most successful at providing children with pleasant and appropriate staff-child interaction – they offered good quality provision in this regard. Interactions were warm and respectful, staff helped children to develop appropriate behaviour with their peers, and employed appropriate levels of supervision and positive discipline strategies. The sample centres did less well at providing hygienic and appropriate care routines such as meal times, toileting and naps. The provision of stimulating educational activities was also limited. For example, many centres did not provide opportunities for children to explore natural materials, or use everyday events such as the weather to help children develop their understanding of nature and their environment. This finding is of particular concern, as the provision of educational opportunities during the early years is related to later school success.

The most important predictors of provision quality (as measured by the ITERS-R) were:

- ***Sector:*** fully maintained Local Authority (LA) provision offered the most stimulating environment for children's developing language and cognitive skills, as well as the highest quality physical environment. This effect can partly be explained by variation in staff qualifications between the sectors – the maintained centres in the sample had the most qualified workforce. Maintained pre-school centres also have access to the 'educational infrastructure' and support systems, for example curricular and pedagogical input to planning and access to specialist staff (e.g. speech and language therapists, educational psychologists).
- ***Children's Centre status:*** Neighbourhood Nurseries that were also Children's Centres offered higher quality provision than centres with no involvement in the Children's Centre Programme. Again, one factor behind this positive effect may be the qualifications of centre staff – Children's Centres had a more qualified workforce than non-Children's Centres. The higher quality offered by Children's Centres related to social interactions and daily program structure, rather than to educational provision.
- ***Centre size:*** the larger Neighbourhood Nurseries (number of children registered) offered better overall quality of provision and, in particular, higher quality in relation to personal care routines, language (listening/talking), program structure and provision for parents and staff. Economies of scale mean that larger centres are able to offer a greater range of resources and facilities for children, staff and

parents. In addition, the larger centres are likely to have a larger staff base, with a richer and more diverse adult social environment and a broader range of experiences and interests to draw upon when specialist knowledge is required. However, centre size had a complex relationship with children's behaviour, with larger centres offering some advantages, but also some disadvantages (see p.10).

- ***Age of children:*** many of the rooms observed catered for children over the age of 3 ½ as well as for younger children. Quality scores were significantly higher in these mixed age groups than in rooms which provided only for young children. This supports previous research, for example the NICHD study (1996), which found that children in classrooms providing only for infants and/or toddlers received less positive care-giving than infants in mixed age rooms. Younger children experienced better quality provision in rooms with clear and 'stretching' aims for children's development: the dimensions which improved with the presence of older children were those related to educational provision. In a mixed age room, young children were able to experience higher level language, communication and educational activities developed to meet the needs of the older children. They also had the opportunity to interact with, and model the behaviour of, more mature peers. Thus, they had access to a richer and more stimulating environment than they would have experienced in a room which catered only for children under the age of 3 ½. However, the presence of older children was not always beneficial for the younger ones in terms of behavioural outcomes (see p.10).
- ***Staff childcare qualifications*** had a significant positive relationship with overall quality of provision. The better qualified staff teams provided a more stimulating environment for children's developing communication, and a more appropriate environment in terms of the daily schedule: opportunities for free play, group activities and provision for children with special needs. The qualifications of the centre managers were also important, and were related to overall quality of provision in the infant and toddler rooms (although not to any individual dimensions of quality).

No relationship was found between the population of children and families served and quality of provision. This is an important finding and suggests that families from very different backgrounds, and with different needs, were being offered comparable quality of provision.

Key Findings: Effect of quality on children's behaviour

The identified effects of quality on children's behaviour were significant but modest. Overall quality of provision in the sample Neighbourhood Nurseries (mean total ITERS-R scores) was not significantly linked to children's behaviour, and there was no significant effect of staff-child interaction as measured by the Caregiver Interaction Scale. However, a number of effects were identified for the *individual* dimensions of quality measured by the ITERS-R subscales.

- The quality of the physical environment was important. Children displayed significantly fewer worried and upset behaviours in centres which offered a spacious, well maintained and pleasant physical environment, with appropriate furniture for care routines and educational activities, and comfortable areas for

children to relax and spend quiet time. This study confirms the findings of the EPPE project, which concluded that high quality provision can reduce some of the negative behaviours associated with attending centre-based provision.

- The structure of the day was related to older children's levels of sociability. Children aged between 33 and 42 months were more sociable in centres which scored highly on the 'program structure' subscale of the ITERS-R. These centres offered a predictable yet flexible daily schedule, many opportunities for free play and high quality group play activities. The children attending them were more likely, for example, to say nice or friendly things to others (ASBI item 12) or play games and talk with other children (ASBI item 19) than children in centres which offered lower quality program structure.
- When the sample was split into age groups, the older group displayed a negative relationship between the 'personal care routines' subscale of the ITERS-R and children's co-operative behaviour, social skills and confidence. Children in centres which scored highly on this subscale were rated as less co-operative, less sociable and less confident. It could be that, in centres where hygiene and care routines are paramount, less time and attention is paid to developing children's interactions and social behaviour.

Key Findings: Effect of centre characteristics on children's behaviour

Staff qualifications

The qualifications of centre staff were related to children's social and behavioural development. Children with access to a qualified teacher (either working in their room or as the nursery manager) were significantly more co-operative and sociable than children without access to a trained teacher. These children were more likely to share their toys or possessions (ASBI item 20), say 'please' and 'thank you' when reminded (item 16) or be sympathetic towards other children's distress (item 7). Children in rooms with high mean staff qualification levels were also more co-operative, and displayed fewer worried and upset behaviours, than children cared for by less well-qualified staff teams. Finally, centres with better qualified managers had younger children who were less anti-social. The findings echo previous research in identifying the importance of high quality staffing for both the provision of high quality caregiving and for child outcomes (Melhuish et al, 2000; NICHD, 1999b/ 2000; Peisner-Feinberg and Burchinal, 1997).

Sector

No specific effect of sector was identified in relation to children's social and behavioural development, despite maintained status being identified as an important predictor of centre quality. This apparent contradiction is not surprising when we consider the specific quality subscales on which the maintained sector excelled. Maintained centres provided significantly higher quality in those domains related to *educational* provision - thus, we would expect to see an impact on children's cognitive outcomes but not necessarily on their social behaviour.

Children's Centre Status

Involvement in the Children's Centre Programme had a positive relationship with children's co-operative behaviour, particularly for the younger age group. Children under 2 years 9 months attending Children's Centres were more co-operative than their counterparts in centres not involved in the Children's Centre Programme.

Centre size

The Childcare Quality strand had identified centre size as a predictor of provision quality, with the larger Neighbourhood Nurseries offering higher quality provision. Children in larger centres (number of FTE places and number of children registered) were also less anti-social and displayed fewer worried and upset behaviours than children in smaller centres. For example, they were less likely to tease other children or call them names (ASBI item 21), or get upset when not paid enough attention (item 6). However, the picture was not the same for positive behaviours. Centre size had a *negative* relationship with children's co-operation and sociability: children in larger centres displayed fewer of these behaviours than children in smaller centres. The effect of centre size on children's behaviour is clearly a complex one. It is possible that larger centres show lower rates of anti-social behaviour because they have more explicit procedures for dealing with children's negative behaviours, in comparison to smaller centres which may operate more *ad hoc* and informal approaches to discipline. However, large centres may also be rather overwhelming for young children, who are just beginning to develop their social skills.

Age range

The age range of the rooms had a weak but significant effect on children's worried and upset behaviour. Children under the age of 3 ½ years displayed more worried and upset behaviours when they attended a mixed age room with children aged 4 years and over. In mixed groups, they were more likely to frown, shrug, pout or stamp their feet when given an idea for playing (ASBI item 4), or to be worried about not getting enough attention, or access to toys, food or drink (item 28). This is particularly interesting, since mixed age rooms were rated as being of higher quality. In-depth analysis of quality showed that the elements of provision which improved with the presence of older children related to *educational* provision. Thus, mixed age rooms may be better for children in terms of cognitive outcomes, but not in terms of behavioural outcomes.

Workless households

Attending a centre with a high proportion of working families had a positive relationship with children's behaviour. Children in centres with high proportions of workless households were less co-operative and more anti-social than children from centres with high proportions of working households (families with at least one employed adult). In fact, attending a *centre* with a high proportion of children from working households had more of an effect on anti-social behaviour than the child's own family employment status. Only one employment effect was found for the child's own family - children living in houses with at least one working adult were more sociable with their peers than those living in workless families (and this effect was stronger for the older age group than for the younger). This evidence provides strong support for the aims of the Neighbourhood Nurseries Initiative, and suggests that encouraging parents to return to work will have positive benefits for children.

Key Findings: Effect of time spent in centre-based childcare on children's behaviour

The findings confirm previous research (e.g. Melhuish et al, 2001) in suggesting that attending centre-based childcare provision has both beneficial and detrimental effects on children's social and behavioural development. The more time (hours and days) children spent each week at a childcare centre, the more confident they were, and the more

sociable they were with their peers. Staff in the sample centres rated them as more likely to say nice or friendly things to others (ASBI item 12) or to join a group of other children playing (item 13), and as more confident with other people (item 22). Children who spend more time each week at a pre-school centre have greater opportunities to mix with other children, and to become confident in their social skills, than those who attend for less time. Additional analysis was carried out to establish how much time children need to spend in centres to see significant benefits in terms of their social behaviour and confidence. The results suggest that the 'tipping point' is around 35 hours and/or five days attendance i.e. almost full-time.

Attending centre-based provision also had a number of less positive relationships with children's behaviour. Children who attended for at least 30 hours and/or 3 days every week were rated as more anti-social, for example more likely to tease other children and call them names (ASBI item 21), prevent other children from carrying out routines (item 23) or be bossy and need their own way (item 29). In addition, children who attended for at least 35 hours and/or 5 days each week displayed more worried and upset behaviours. These 'tipping points' identified in relation to time spent in centre-based provision are similar to those identified by the NICHD study (2005).

The effect of time spent in centre-based provision was more important for the younger children in the sample than for the older children. When the sample was split by age, the effects of hours and days attended each week on sociability, confidence and worried/ upset behaviour were significant only for the younger half of the sample i.e. children under 2 years 9 months. However the effect on anti-social behaviour was significant for both age groups, and this suggests that intensity of child care (measured in hours/days per week) is relevant for children up to the age of 3 ½ years.

Length of day (the number of hours children attended their Neighbourhood Nursery each day) did not appear to be detrimental: there were no significant differences between children who attended for long periods each day and those who attended for shorter days in terms of co-operative behaviour, peer sociability, anti-social behaviour or worried/ upset behaviour. A significant effect was seen on children's levels of confidence, but only at very high levels of daily attendance (in comparison to children who attended less than 5 hours per day on average, children who attended for 9 hours or more were significantly more confident). However, the fact that very few of the children in the sample attended for short days (only 16% attended for fewer than 5 hours) means that these results should be interpreted with caution: there was not enough variability in the sample to accurately assess the effects of length of day on children's behaviour.

Duration of childcare during the early years also had a statistically significant effect – the longer children had been attending their Neighbourhood Nursery, the more likely they were to display anti-social behaviours. Interestingly, the age at which children started attending their Neighbourhood Nursery did not have an impact on their behaviour (either positive or negative). Thus, it is not the age at which children start at their centres which is important, but the cumulative number of months they attend, and the amount of time they spend in centre-based provision each week.

Key Findings: Effect of child and family characteristics on children's behaviour

In line with previous research, children's positive behaviours were most strongly predicted by child and family characteristics (Melhuish et al, 2001; NICHD, 1998b) – although negative behaviours were more strongly related to childcare experiences and centre characteristics. In general, girls displayed more positive behaviours than boys, and older children were rated as being more confident, sociable and co-operative than younger children. Perhaps not surprisingly, children with special needs were rated by their caregivers as being less sociable with their peers and less confident than children without special needs. Children for whom English was not the first language spoken at home were also rated as less sociable with their peers.

Final conclusions

- There was wide variation in the quality of provision for children in infant and toddler rooms.
- Higher quality was seen in the Local Authority maintained sector, in Children's Centres and in larger centres.
- Observers found higher quality provision, particularly educational provision, in mixed age rooms which included older children as well as under threes. However, the presence of older children was not always beneficial for the younger ones, who displayed more worried and upset behaviours in mixed age rooms.
- No relationships were found between the population of children and families served and quality of provision. This suggests that families from very different backgrounds, and with different needs, were being offered the same quality of provision.
- The findings highlighted the importance of a well qualified workforce for the provision of high quality caregiving and for child outcomes. Children with access to a trained teacher were more co-operative and sociable, and children in rooms with a better qualified workforce were more co-operative and displayed fewer worried and upset behaviours than children cared for by less well-qualified staff teams.
- The quality of the physical environment was identified as important. Children displayed fewer worried and upset behaviours in centres which offered a spacious, well maintained and pleasant physical environment, with appropriate furniture for care routines and educational activities, and comfortable areas for children to relax and spend quiet time.
- Older children (those aged between 33 and 42 months) showed more peer sociability in centres which provided a high quality daily schedule, for example an appropriate daily routine, opportunities for free play and high quality group play activities.
- The effects of quality on children's behaviour were significant, but moderate in size compared with other (stronger) influences, such as gender, age, special needs and time spent in centre-based childcare.
- Time spent in centre-based childcare (hours/days per week) had some beneficial effects on children, such as greater confidence and sociability. This effect was stronger for the younger children in the sample (those under 2 years 9 months), and for children attending 35 hours per week or more. However, time spent in centre-based childcare was also related to negative behaviours. Children who

attended 30 hours or more each week were rated as more anti-social, while children who attended 35 hours or more displayed more worried and upset behaviours.

- Although the age at which children started attending their Neighbourhood Nursery did not have an impact (either positive or negative) on their behaviour, duration of childcare during the early years was important: the longer children had been attending their Neighbourhood Nursery, the more likely they were to display anti-social behaviours.
- Although larger centres were generally of higher quality, the effects of centre size on children's behaviour was mixed. Children in larger centres were less anti-social and displayed fewer worried and upset behaviours, but were also rated as less co-operative and less sociable than children in smaller centres.
- Attending a centre with a high proportion of working families had a positive effect on children's co-operative behaviour, and also reduced anti-social behaviour. This supports the aims of the Neighbourhood Nurseries Initiative, and suggests that encouraging parents to return to work may have positive benefits for the development of their children.

Recommendations

1. The development of a well-qualified childcare workforce is vital for improving quality and positive child development. In particular, employing qualified teachers to work with children under the age of 3 ½ will have a significant impact on children's developing co-operation and other peer skills.
2. The development of Children's Centres should be supported. NNI settings with Children's Centre status were of higher quality and had better child outcomes. Future support (and evaluation) of the programme should focus on the educational aspects of provision to ensure that the 'learning' aspects of the curriculum are given equal weight to the more 'social' aspects.
3. This research supports the development of larger centres: these offered higher quality (measured on the ITERS-R scale) and their children showed reduced levels of anti-social and worried/upset behaviour. However, larger centres need to be supported in finding ways to ensure that their children are not overwhelmed by size, and are provided with the nurturing environments they need to develop their confidence and sociability.
4. Further research into the impact of mixed age rooms is recommended. They may enhance cognitive development at the price of emotional security.
5. More research is also required to explore the effects of length of day on children's behaviour. In particular, the effects of attending for a small number of long days over a week, as compared to a greater number of short days, need to be explored.
6. A broad social mix is recommended for early childhood settings – higher proportions of working families were related to decreased anti-social behaviour. Initiatives such as the NNI which address unemployment should be encouraged and supported.
7. Maintained centres should continue to be supported and developed, as these were particularly effective at offering high quality educational provision. Nurseries in other sectors need further support to raise the quality of the provision they offer.

1. CONTEXT AND AIMS

1.1 Introduction

The Neighbourhood Nurseries Initiative (NNI), launched in 2000, was one of a number of programmes aiming to expand early years services following the government's announcement of the National Childcare Strategy in 1997. Its remit was to increase the supply of childcare for working parents in disadvantaged neighbourhoods. The NNI programme aimed to tackle child poverty through parent employment, whilst also offering quality childcare and early learning in suitable buildings and environments.

The NNI evaluation was carried out by the Department of Social Policy and Social Work and the Department of Educational Studies in the University of Oxford, the Institute for Fiscal Studies (IFS) and the National Centre for Social Research (NatCen), on behalf of the Department for Education and Skills (DfES).

1.2 The Childcare Quality and Children's Behaviour Study

The Childcare Quality and Children's Behaviour Study was part of the NNI Implementation Study (Smith et al, *in press*)[3]. It had two main strands.

The *Childcare Quality* strand described the quality of provision offered by a random sample of 103 Neighbourhood Nurseries. The aim was to establish whether the new places and nurseries created by the NNI were of 'sufficient quality' to foster the development of the children attending them. It also considered a number of other centre characteristics (for example, sector, qualifications of centre staff, centre size), with the aim of establishing which of these characteristics were related to, and predicted, quality of provision.

The *Quality and Children's Behaviour* strand used the information gathered on the quality of Neighbourhood Nursery provision to explore the effects of quality on children's social and behavioural development. This was intended to fill a major gap in the UK literature – that is, the relationships between the quality of early centre-based childcare and young children's social and behavioural development. The EPPE findings (Sylva et al, 2004) show that some children whose parents retrospectively reported using group care before age 3 were more anti-social than children from similar backgrounds who did not have early care. High quality care between the ages of 3 and 5 ameliorated (although did not eradicate) the anti-social effects of care in the very early years. However, because the quality of settings for children under 3 was not measured in EPPE, we do not know whether the early group care which was related to increased anti-social behaviour was of low quality. The Quality and Children's Behaviour strand aimed to answer this question by investigating the effects of quality of provision on the behaviour of children under the age of 3 ½ years from disadvantaged areas, after controlling for family background. The study also explored which other centre and childcare characteristics were related to children's social and behavioural development.

[3] Smith, T., Coxon, K., and Sigala, M. (in press) The NNI National Evaluation: Implementation Study Report.

1.3 The research context

There is strong evidence from studies in many countries that attending pre-school can be beneficial for children (Melhuish, 2004a& b). The US NICHD study (2002) found that the benefits of attending pre-school - compared to not - were greater than the effects of social disadvantage. In the UK, the Effective Provision of Pre-School Education (EPPE) project has shown conclusively that children benefit intellectually and socially from attending pre-school (Sylva et al, 2004), and that the effects continue into primary school. Research also highlights the role of early years provision in combating disadvantage – the EPPE project found that children from disadvantaged families benefited most from attending childcare provision.

Effects of childcare on children's social behaviour

There is a comprehensive body of research which considers the impacts of childcare on children's intellectual development, for example language and reasoning skills. However, this study focuses attention on children's social behaviour. This area is of particular interest, as previous research has drawn mixed conclusions. On the one hand, it suggests that attending pre-school provision can have a positive impact on 'desirable' behaviours such as social competence, confidence and compliance. The NICHD study (1998a) found that attending group care was linked to more co-operative behaviour at age 2. Likewise, EPPE found that children who begin attending centre-based provision early in life (before the age of 3) are more sociable with other children. However, some of the research findings are more worrying. Some of the EPPE 'early starters' – children who began attending centres before the age of 3 – were found to have higher levels of anti-social behaviour. Similarly, the NICHD study (2003) found that the more time children spent in non-maternal care across the infant, toddler and pre-school years, the more problem behaviours they showed at 54 months of age and in kindergarten.

So, does all pre-school provision have the same effect on children? Are the centres which benefit children, making them more confident and sociable, the same ones that increase levels of anti-social behaviour? The evidence suggests not – and highlights the importance of *quality*.

Quality matters

Research suggests that high quality pre-school centres not only have a positive impact on 'desirable' behaviours, but can also reduce problem behaviours (e.g. Howes, 1988; Melhuish 2004a & b; NICHD1998a; Peisner-Feinberg and Burchinal,1997; Peisner-Feinberg et al, 2001; Whitebook, Howes and Phillips, 1989). In fact, EPPE found that high quality education and care between the ages of 3 and 5 reduced the early effects of childcare on anti-social behaviour. Perhaps more importantly, it seems that entering low quality provision at an early age can have a *negative* effect on children's behaviour (e.g. Howes, 1990; Volling and Feagans, 1995).

It is clear that the quality of pre-school provision needs to be taken into account when considering the role childcare plays in shaping children's behaviour. However, some studies have found the effects of early years quality to be modest in comparison to the influence of children's *home background* (e.g. Deater-Deckard et al, 1996). EPPE argues strongly that family factors need to be taken into account when considering the impacts of educational provision on children's development, stating that 'children's outcomes are

the joint product of home and pre-school, and any research on the effects of early education will have to take into account influences from home' (Sylva et al, 2004). It is possible that the relative influences of home and pre-school vary according to the child's experience of each. Howes (1990) found that, for children enrolled as infants, childcare was a better predictor of outcomes than family socialisation – while the opposite was true for those enrolled as toddlers or pre-schoolers.

This study aimed to explore some of these issues and establish, after child and family characteristics have been accounted for, the effects of early centre-based childcare on young children's social behaviour. In particular, it explored the role of childcare quality in encouraging the development of positive behaviours and/or reducing the likelihood of problem behaviours.

The majority of studies to date have focused on provision for 3 and 4 year old children. This study looked specifically at provision for children under the age of 3 ½, in areas of disadvantage targeted by the Neighbourhood Nurseries Initiative.

What constitutes 'quality of provision'?
Melhuish (2004b) identifies two dimensions of provision quality:

- Process quality is dynamic and interactional. It relates to children's experiences, for example their interactions with adults and peers and educational experiences.
- Structural quality relates to fixed features of the environment such as staff:child ratios, group sizes and caregiver qualifications and training.

This study considered the role of both process and structural features of provision quality. In addition, a number of other centre characteristics identified by previous research[4] as being potentially relevant to quality of caregiving and/or to children's development were considered. For example:

- Sector/ type of centre (e.g. maintained, private, voluntary);
- Community partnerships and links with other programmes;
- The physical environment (e.g. safety);
- The age ranges of children catered for.

1.4 The structure of this report

This report presents the findings of the Childcare Quality and Children's Behaviour Study. The methodology of the study is outlined in Chapter 2. Chapters 3 and 4 consider the quality of provision offered by a sample of 103 Neighbourhood Nurseries. In Chapter 5, the effects of quality on children's social and behavioural development are considered. Finally, Chapter 6 draws conclusions and discusses implications.

[4] NICHD (2000/2001), Sylva et al (2004), Vollings and Feagans (1995), Whitebook et al (1990)

2. METHODOLOGY

2.1 Sampling

2.1.1 Centres

The sampling procedure began with 102 Neighbourhood Nurseries randomly selected for the NNI Implementation Study (Smith et al, *in press*). This sample was stratified to be representative of the overall population of Neighbourhood Nurseries on several criteria – their geographies (London, East West, etc), sectors (private, voluntary, etc) types (new build, refurbishment, etc), and links to other related programmes (Sure Start Local Programmes, Children's Centres, etc). Nurseries were sampled in three stages, to ensure early openers were represented, as well as later groups that took more time to set up. The stratified sampling procedure was undertaken for all nurseries that were declared to be open, had more than ten NNI places and (for stages 2 and 3) had not been included in the sampling process at an earlier stage.

A number of nurseries in the original sample of 102 were not yet offering provision for infants and toddlers. Since this was the main focus of the Childcare Quality and Children's Behaviour Study, these centres were not suitable for inclusion in this element of the evaluation. In addition, a number of Neighbourhood Nurseries in the implementation sample had two NNI funded sites. While the Implementation Study considered both sites, only one was selected and visited as part of the Childcare Quality and Children's Behaviour Study (usually the site with the largest number of children under the age of 3 ½). As a result, only 96 of the centres in the implementation sample were included in the quality sample.

In order to meet the target sample of 100 nurseries for the Childcare Quality and Children's Behaviour Study, a number of additional centres were selected using the same randomised method described above. This resulted in a sample of 103 Neighbourhood Nurseries for the Childcare Quality strand, 100 of which also had children eligible for the Quality and Children's Behaviour strand (see following section).

2.1.2 Children

Information was collected on 810 children attending 100 Neighbourhood Nurseries. Children were selected using the following criteria:

- *Age*: between 20 months and 42 months;
- *Length of attendance at Neighbourhood Nursery*: at least 6 months;
- *Hours of attendance*: at least 10 hours per week[5].

The mean age of children in the sample was 33 months (2 years 9 months). A maximum of 20 children were selected from each centre. In many cases, the number of eligible children in each centre was less than 20. The upper limit was imposed to ensure that the

[5] In practice, a small number of children fell outside these criteria. This was due to the time lapse between child selection and the centres submitting the child data, resulting in children who were within the age range at selection but outside it at the time of data collection. In other cases, details entered on the Child Selection Sheet proved to be slightly different (or circumstances had changed) when the child and family profiles were submitted. Each analysis was run with and without these children, to ensure that their inclusion did not affect the results.

larger centres (i.e. those with more than 20 eligible children) did not have an undue influence on the sample.

An additional method was employed to ensure that, where possible, the quality of provision measured for each centre was that experienced by the children in the sample. Where there were more than 20 eligible children in any one centre, children were selected according to the amount of time they had spent in the room observed.

2.2 Data collection

2.2.1 Information collected on quality of provision

Visits to the sample Neighbourhood Nurseries took place between February 2004 and July 2005. Observations of up to a day were conducted in one of the rooms providing for children under the age of 3 ½. Two observational instruments were used to assess quality:

The Infant Toddler Environment Rating Scale (Harms, Cryer & Clifford, 2003)

The revised version of the ITERS scale (the ITERS-R) consists of 39 items divided into seven subscales, covering a comprehensive range of quality features:

- *Space and furnishings* (e.g. layout of the room, resources, display);
- *Personal care routines* (e.g. health and safety, hygiene, meal times);
- *Listening and talking* (e.g. supporting children's language development);
- *Activities* (e.g. dramatic play, sand and water, fine motor play);
- *Interaction* (e.g. supervision, discipline, staff-child interactions, peer interactions);
- *Program structure* (e.g. opportunities for free play, group activities, transitions);
- *Parents and staff* (e.g. information for parents, staff training opportunities).

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 between 1 and 3 were labeled 'below minimal', scores between 3 and 5 were labeled 'adequate quality' and scores between 5 and 7 were labeled 'good quality'.

The average of item scores in a subscale gives the mean score for that subscale. An overall quality rating for each centre is calculated by taking the mean of all items across all subscales. An overview of the items and subscales which make up the ITERS-R is shown in Appendix 3.

The ITERS-R is designed to assess provision for children from birth to 2 ½ years. A second scale in the same 'family', the Early Childhood Environment Rating Scale or ECERS-R, assesses provision for children from 2 ½ to 5 years. Since this study focused on provision for infants and toddlers, the ITERS-R was selected as the quality assessment instrument. In practice, many rooms observed also catered for older children: 36% catered for children over the age of 3, and 19% for children aged 4 years or over (see Section 4.7). However, since 64% provided only for children aged 3 or under, the ITERS-R was considered to be a more appropriate instrument than the ECERS-R.

The Caregiver Interaction Scale (Arnett, 1989)

The CIS consists of 26 items forming four subscales, each of which measures a different aspect of caregiver-child interaction. Each item is rated on a four point scale, ranging from 1 (not at all) to 4 (very much), according to how often caregivers display a particular behaviour. For example:

- Seems to enjoy the children 1 2 3 4

The 'positive relationships' subscale (indicating warmth and enthusiasm in interaction with children) was used for this study. This subscale has been shown to predict children's later academic success, for example in pre-reading (Sylva et al, 2004). The 10 items which make up the positive relationships subscale of the CIS are shown in Appendix 3.

Quality terminology used in this report:

- Where the term 'overall quality of provision' is used in this report, it refers to the mean total score achieved on the ITERS-R.
- Where 'individual dimensions of quality' are referred to, this relates to one or more of the seven individual subscales of the ITERS-R and/or the CIS positive relationships subscale.

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. Sixteen paired visits were conducted, where two observers scored independently of each other and then compared ratings.

Inter-rater reliability on the ITERS-R 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. The average Kappa value for ITERS-R scores across all 16 paired visits was 0.8, with scores ranging from 0.6 to 0.9. This indicates that the reliability for this instrument was very good.

2.2.2 Information collected on centre characteristics

The NNI Implementation Study (Smith et al, *in press*) provided information on the general characteristics of centres in the sample, including[6]:

- *Sector* (Local Authority maintained; voluntary; private; joint[7]);

[6] In some cases, data was available for all 96 nurseries common to the Implementation Study and Quality Study samples. In other cases, data was only available for the 'later openers' (approximately two thirds of the full sample). For a number of variables, data was also provided by the DfES (NNI data, March 2005) for the whole population of Neighbourhood Nurseries. For each analysis, the source and the number of nurseries for which information was available is reported

[7] Type of sector refers to the sector that is responsible for the day-to-day running and management of the nursery. A private sector nursery is one run by private individuals or private sector companies; a voluntary nursery is managed by a voluntary organization; a maintained nursery is run by the public sector and managed by the education arm of the local authority; and a joint sector nursery is the result of close cooperation between two or more sectors.

- *Community partnerships and links with other programmes* (involvement in Children's Centre Programme; links with Sure Start Local Programmes; school site location);
- *Physical environment* (new build; extension; refurbishment);
- *Centre size* (number of FTE places; number of children registered);
- *Populations of children and families served* (proportion of: lone parent families; families living in disadvantaged postcodes; workless households; children from ethnic minorities; and children with special educational needs).

When the sample centres were visited for the quality observations, information was also gathered on the general characteristics of the rooms observed, and on the qualifications of staff:

- *Group size* (number of children registered; maximum capacity of room);
- *Staff:child ratios*;
- *Age ranges of children* (age-segregated; mixed rooms);
- *Childcare qualifications* (nursery manager; all paid staff working at least 10 hours per week in the room observed).

2.2.3 Information collected on children and families

Information on the children in the sample (and their families) was collected using the Adaptive Social Behaviour Inventory (ASBI) and a family profile devised for this study.

The Adaptive Social Behaviour Inventory (Hogan et al, 1992)

The ASBI is made up of a series of 30 behaviour statements. The person completing the profile rates each statement from 1 to 3, according to how often the child displays that particular behaviour. For example:

	Rarely or never	Some-times	Almost always
1. Understands others' feelings, like when they are happy, sad or mad	1	2	3
2. Is helpful to other children	1	2	3
3. Is obedient and compliant	1	2	3
4. When you give him/her an idea for playing, s/he frowns, shrugs shoulders, pouts or stamps foot	1	2	3

The items of the ASBI are grouped into five categories, each measuring a different dimension of children's social and behavioural development:

The 'co-operation and conformity' subscale contains items such as:

- 'Is helpful to other children'
- 'Is calm and easygoing'

The 'peer sociability' subscale contains items such as:

- 'Understands others' feelings, like when they are happy, sad or mad'
- 'Will join a group of children playing'

The 'confidence' subscale contains items such as:

- 'Is open and direct about what s/he wants'
- 'Is confident with other people'

The 'anti-social' subscale contains items such as:

- 'Teases other children and calls them names'
- 'Is bossy/ needs to have his/her own way'

The 'worried and upset' subscale contains items such as:

- 'When you give him/her an idea for playing, s/he frowns, shrugs shoulders, pouts or stamps foot'
- 'Gets upset when you don't pay enough attention'

The five subscales of the ASBI (and the items which relate to each) are shown in Appendix 3.

The original sample on which the ASBI was developed and tested comprised children aged 36 months (Hogan et al, 1992). However, the children in the Hogan study were all born prematurely. Hogan suggests that the ASBI scale should in fact be 'sensitive to a broader developmental span' and have 'the greatest utility for children who range in age from younger to slightly older than 36 months i.e. 24 – 40 months'. Since this is very close to the age range seen in the current sample (20 – 42 months), the ASBI was considered to be the most appropriate instrument for this study.

In the original Hogan study, conducted on pre-term children, the 30 ASBI items were grouped into three subscales – 'social competence', 'comply' and 'disrupt'. More recently, the EPPE study (Melhuish et al, 2001) developed the five subscale resolution used in the current study. These five dimensions of behaviour were thought to be more appropriate for the current sample, since the EPPE analysis was conducted more recently than the Hogan study, comprised a larger sample of typically developing children and, most importantly, was carried out in the UK.

Staff at the Neighbourhood Nurseries were asked to complete the ASBI. This was seen as an important strand of the evaluation methodology, and one which ensured accurate ratings of child behaviour. In each case, the ASBI was completed by the member of staff who knew the child best, usually their key worker. The nurseries were paid £20 for each completed ASBI (and accompanying family profile and consent form) to reflect the serious nature of the data collection.

Family Profile

A Family Profile was devised for this study to collect information on the children's home backgrounds. The families of children attending the sample Neighbourhood Nurseries were not the main focus of this study. However, as previous research had shown that home background has a large impact on children's social behaviour and development, it was necessary to take account of these influences when considering the effects of the NNI provision. The full family profile is shown in Appendix 3. Information was collected on:

- *Child characteristics (*e.g. gender, age, birthweight, special needs, ethnic group);
- *Family characteristics* (e.g. family structure and work status, number of siblings, age of mother/ father/ partner, age mother/ father/ partner left full time education, language spoken at home);
- *Current childcare and childcare history (*e.g. starting age at Neighbourhood Nursery, duration of time at Neighbourhood Nursery, hours/ days per week in centre-based/ family/ childminder care, childcare history aged 1 to 2 years, childcare history under the age of 1).

2.2.4 Ethics

The study reported here was carried out under the ethical guidelines of the Department of Educational Studies at the University of Oxford. It meets the standards laid down by the British Educational Research Association as regards to consent, confidentiality and data protection.

2.2.5 Summary of data collected

Tables 2.1 and 2.2 summarise the data collected on both outcomes and predictors.

Table 2.1 Outcome data collected

Quality of provision
• Quality of provision (as measured by the ITERS-R)
o Individual subscales:
▪ Space and furnishings
▪ Personal care routines
▪ Listening and talking
▪ Activities
▪ Interactions
▪ Program structure
▪ Provision for parents and staff
o Overall quality of provision (mean of all items)
• Quality of staff-child interactions (as measured by the CIS)
Child outcomes
• Social and behavioural development (as measured by the ASBI):
o Co-operation and conformity
o Peer sociability
o Confidence
o Anti-social behaviour
o Worried and upset behaviour

Table 2.2 Predictor data collected

Child

- Gender
- Age
- Birthweight
- Special needs
- Medical problems during first three months of life
- Ethnic group

Family

- Family structure (living with both parents/ parent plus partner; living with lone parent)
- Number of siblings
- Place in birth order
- Language spoken at home (English; other language)
- Age of mother
- Age of father/ partner
- Age mother left education
- Age father/ partner left education
- Mother work status (full time; part time; not working)
- Father/ partner work status (working; not working; father or partner not present)
- Household work status (anyone in household working; workless household)

Current childcare and childcare history

- Starting age (age at which child first attended Neighbourhood Nursery)
- Duration of childcare (months spent at Neighbourhood Nursery)
- Weekly attendance at centre-based provision:
    - Number of hours per week (at Neighbourhood Nursery; at any centre)
    - Number of days per week (at Neighbourhood Nursery)
- Average hours per day at Neighbourhood Nursery (derived variable: hours pw/ days pw)
- Hours per week spent in family care
- Hours per week spent in childminder care
- Childcare between the ages of 1 and 2 years (centre-based; family care; childminder)
- Childcare under the age of 1 (centre-based; family care; childminder)

General centre characteristics

- Sector (maintained; private; voluntary; joint project)
- Level of involvement in Children's Centre Programme
- Links with Sure Start Local Programmes
- School-site location
- Physical environment/ project type (new build; extension; refurbishment)
- Centre size (total FTE places; number of children registered)
- Group size (room observed)
- Staff:child ratio (room observed)
- Age range of children catered for (room observed)
- Staff childcare qualifications:
    - Nursery manager qualifications
    - Mean qualification level of staff (working 10 hours or more) in room observed
    - Qualified teacher present (either working in room or as manager)
- Characteristics of children and families served (by the whole centre):
    - Proportion of lone parents

- Proportion of families living in deprived postcode areas
- Proportion of families with no working parent/s
- Proportion of families from ethnic minorities
- Proportion of children with special education needs

Quality of provision*

- Quality of provision (as measured by the ITERS-R)
  - Individual subscales:
    - Space and furnishings
    - Personal care routines
    - Listening and talking
    - Activities
    - Interactions
    - Program structure
    - Provision for parents and staff
  - Overall quality of provision (mean of all items)
- Quality of staff-child interactions (as measured by the CIS)

* For the 'childcare quality' strand, quality was an outcome measure. For the 'quality and children's behaviour' strand, quality was a predictor variable.

2.3 Design and analysis

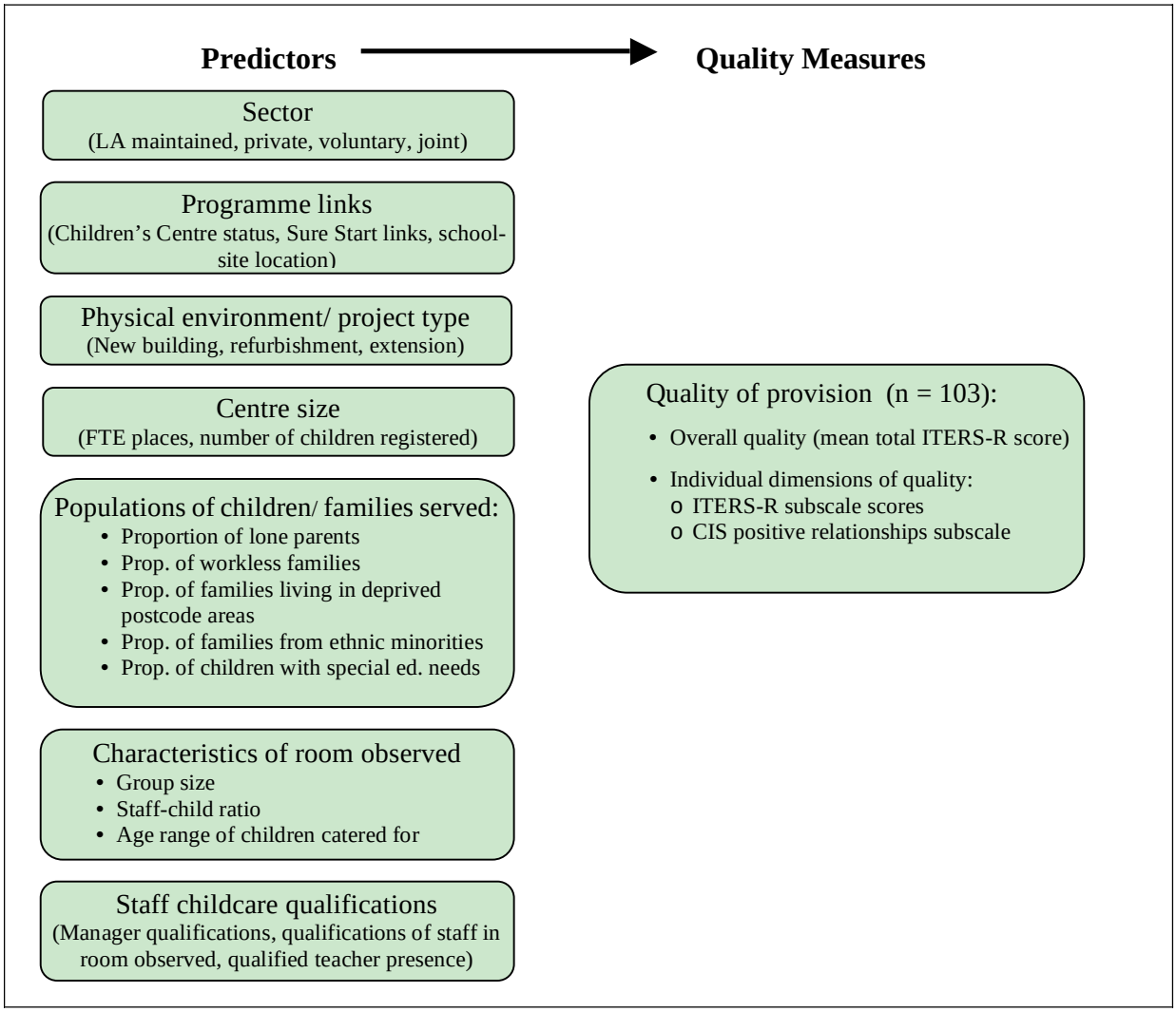
2.3.1 The Childcare Quality strand

The first aim of the Childcare Quality strand was to describe the quality of provision offered by a random sample of 103 Neighbourhood Nurseries, in order to establish whether the new places and nurseries created by the NNI were of sufficient quality to foster the development of the children attending them. Two observational instruments were used to assess quality of provision: the Infant Toddler Environment Rating Scale (ITERS-R) and the Caregiver Interaction Scale (CIS) (see section 2.2 for details).

The second aim of the quality strand was to establish which centre characteristics were related to, and predicted, quality of provision. The majority of characteristics considered were those identified by previous research as being relevant to quality of provision (e.g. sector, staff qualifications). In addition, a number of characteristics particularly relevant to the sample were collected – for example, level of involvement in the Children's Centre Programme and links with Sure Start Local Programmes. Information on the populations served by the sample centres was also gathered, with the aim of establishing whether centres providing for high proportions of disadvantaged families offered comparable quality to those catering for a less disadvantaged clientele.

Figure 2.1 shows the analysis carried out to explore the relationships between the characteristics of the sample centres and quality of provision as measured by the ITERS-R and the CIS. Relationships between each individual characteristic (e.g. sector) and quality were first established using univariate techniques (analysis of variance, t-tests and correlation). Once initial relationships had been identified, multiple regression analyses were used to explore which centre characteristics were most predictive of quality of provision. This technique makes it possible to establish the individual contribution made by each characteristic, *after* controlling for the effects of other relevant variables.

Figure 2.1 Identifying contributors to quality



2.3.2 The Quality and Children's Behaviour strand

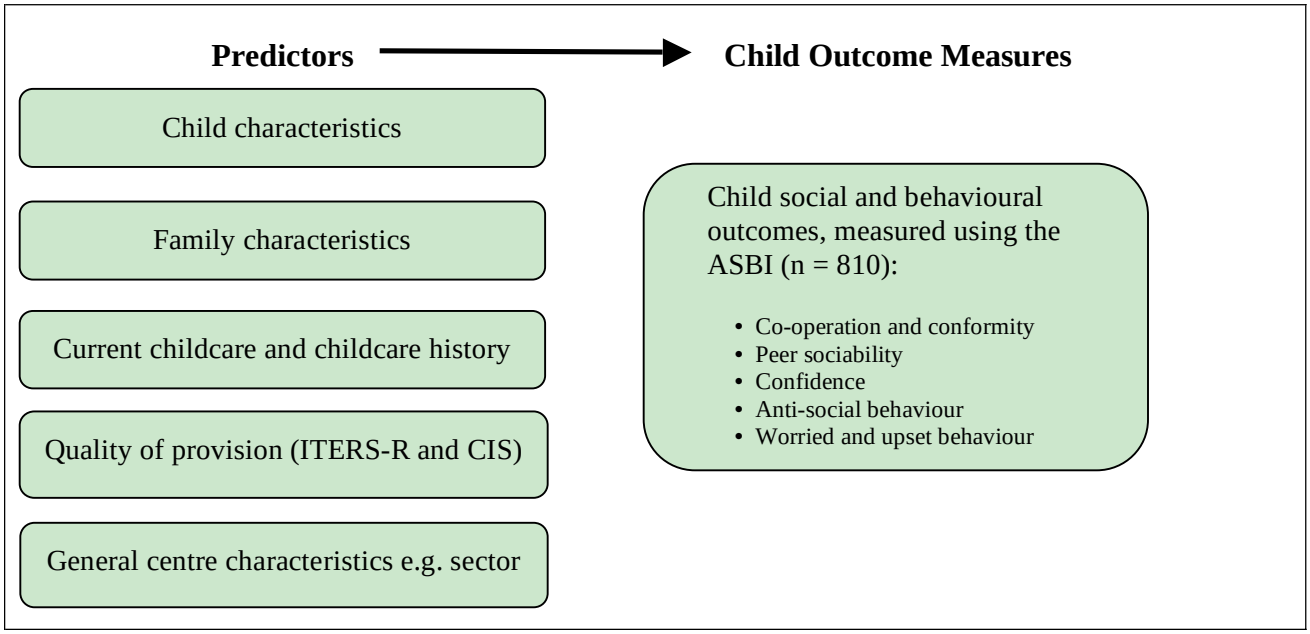
The Quality and Children's Behaviour strand used the information gathered by the Childcare Quality strand to explore the effects of centre-based childcare on young children's social and behavioural development. The analysis aimed to establish (after taking into account child and family background):

- The effect of provision quality on children's behavioural development;
- Which centre and childcare characteristics (in addition to quality) were related to children's behavioural development.

Figure 2.2 summarises the analyses carried out to explore relationships between centre characteristics (including quality) and child social and behavioural outcomes. A separate analysis was carried out for each of the five dimensions of behaviour measured by the ASBI. In each case, variables identified through univariate analysis as having a significant relationship with the outcome measure were entered into the regression model. Non-significant variables were then removed. As an additional test, each rejected variable was then entered into the compact model separately to test for significance. A final

'compact' model was built for each behavioural outcome, comprising all variables identified as being significantly related to the outcome.

Figure 2.2 Identifying contributors to child outcome measures



Initial analyses were conducted on the whole sample (i.e. 810 children). Once the significant influences on behaviour had been identified for the whole group, post hoc analysis was conducted to establish whether the effects varied by age group. The 800 children for whom age data was available were split into two equal groups:

- 400 children aged 20 months to just under 33 months;
- 400 children aged 33 months to 42 months.

The compact regression models identified for each behavioural outcome (co-operation and conformity; peer sociability; confidence; anti-social behaviour; worried and upset behaviour) were tested on each of the smaller age groups to explore which results remained significant. In addition, each of the quality, qualifications and weekly attendance variables (i.e. those previously rejected as non-significant for the whole sample) were entered one at a time to explore whether new effects could be identified for the different age groups. This further test was conducted because the effects of quality, staff qualifications and weekly attendance were identified by the DfES as particularly important in terms of the analysis.

Further analysis was also conducted to explore in greater depth the effects of time spent in centre-based childcare. Children in the sample were divided into groups according to their weekly attendance, with the aim of identifying the 'tipping points' for each behavioural outcome. For example, how many hours per week did children in the sample need to spend in centre-based provision before they were rated as significantly more sociable by their caregivers? The groups were created as follows:

- Five groups were created for hourly attendance per week in centre-based provision: less than 15 hours per week (reference category); 15 - 24.9 hours; 25 - 34.9 hours; 35 - 44.9 hours; and 45 hours or more.

- In order to explore the effects of hourly attendance in more detail, a further five categories were created which split the time bands in a different way: less than 15 hours per week (reference category); 15-19.9 hours; 20 – 29.9 hours; 30 – 39.9 hours; and 40 hours or more.
- Four groups were created for daily attendance per week (at Neighbourhood Nursery): 1 or 2 days per week (reference category); 3 days; 4 days; and 5 days.

These groups were entered separately into the regression model in order to establish when the time effect 'became' significant for each outcome.[8]

There was also an interest in whether the number of hours children spent in their centres each *day* made a difference to their behaviour. An estimate of children's hourly attendance each day was created for the purposes of the analysis, by dividing by number of hours they spent at their Neighbourhood Nursery each week by the number of days per week attended. As before, the sample was divided into groups to explore – for those outcomes where an effect of average hours per day was identified – at what point the effect 'became' significant. Four groups were created as follows: less than 5 hours per day; 5 to 6.9 hours per day; 7 to 8.9 hours per day; and 9 or more hours per day.

Groups were also created according to the length of time children had been attending their Neighbourhood Nursery. The sample was divided into four 'attendance' groups: less than 12 months (reference category); 12 to 17 months; 18 to 23 months; and 24 months or more.

[8] In all analyses of time spent in centre-based provision, the family context was taken into account. This was necessary to ensure that any effects found were related to hours spent in centres, rather than factors relating to the types of family likely to use childcare more regularly (for example, families with different education and work statuses). Three variables were taken into account: household work status, mother age, and the age the mother left full time education. These variables were included in the tipping point analyses, even where no significant relationship with child behaviour had been found.

3. QUALITY OF PROVISION

In each of the 103 sample Neighbourhood Nurseries, an observation was carried out in one of the rooms providing for children under the age of 3 ½ years. Quality of provision was assessed using the Infant Toddler Environment Rating Scale (ITERS-R) and the Caregiver Interaction Scale (CIS).

The subscales of the ITERS-R measure seven individual dimensions of quality:

- *Space and furnishings* (e.g. layout of the room, resources, display);
- *Personal care routines* (e.g. health and safety, hygiene, meal times);
- *Listening and talking* (e.g. supporting children's language development);
- *Activities* (e.g. dramatic play, sand and water, fine motor play);
- *Interaction (*e.g. supervision, discipline, staff-child and peer interactions);
- *Program structure* (e.g. opportunities for free play, group activities);
- *Provision for parents and staff* (e.g. information for parents, staff training).

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 between 1 and 3 were labeled 'below minimal', scores between 3 and 5 were labeled 'adequate quality' and scores between 5 and 7 were labeled 'good quality'. The average of item scores in a subscale gives the mean score for that subscale. An overall quality rating for each centre is calculated by taking the mean of all items across all subscales.

The 'positive relationships' subscale of the CIS (indicating warmth and enthusiasm in interaction with children) was also used for this study. The 10 items which make up this subscale are shown in Appendix 3. Each item is rated on a four point scale, ranging from 1 (not at all) to 4 (very much) according to how often caregivers display a particular behaviour (e.g., 'seems to enjoy the children').

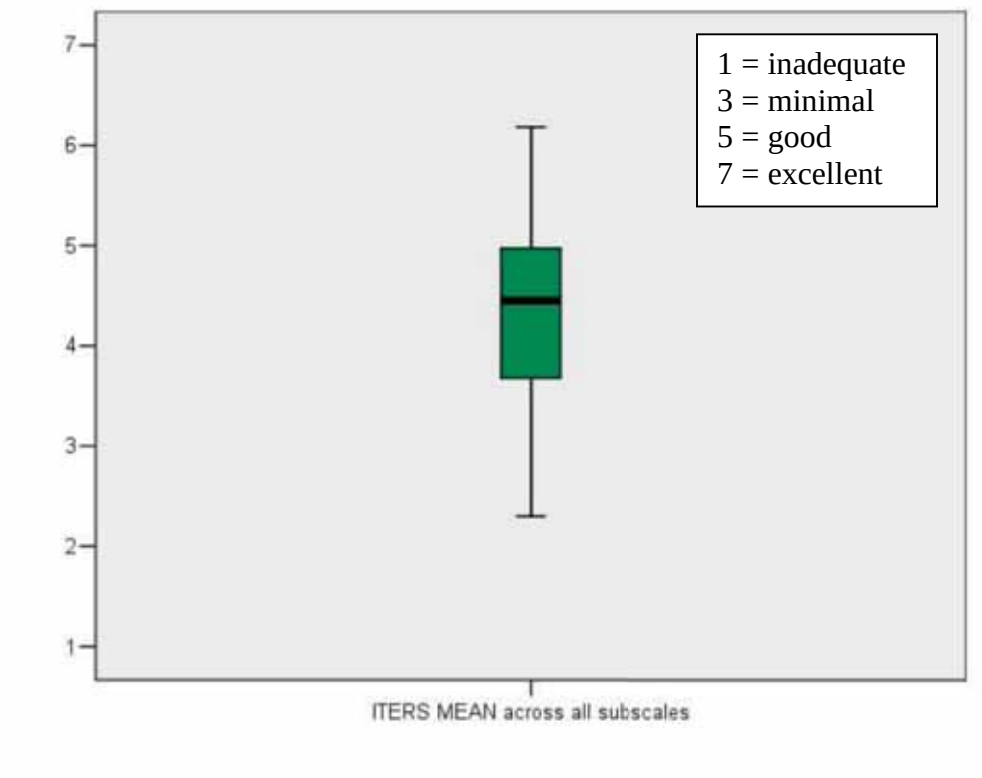
Where the term 'overall quality of provision' is used in this report, it refers to the mean total score achieved on the ITERS-R. Where 'individual dimensions of quality' are referred to, this relates to one or more of the seven individual subscales of the ITERS-R and/or the CIS positive relationships subscale.

3.1 Overall quality of provision (as measured by the ITERS-R)

Overall quality of provision varied widely across the sample, with the lowest quality centre displaying a mean total of 2.3 (below minimal), while the highest quality centre achieved a mean total of 6.2 (good to excellent). The mean total score across the whole sample was 4.4 (standard deviation 0.9)[9], which suggests that the quality of 'typical centres' was adequate i.e. above minimal and tending towards good (Figure 3.1).

[9] Mean ITERS-R scores were normally distributed and met parametric assumptions.

Figure 3.1 Box plot showing mean total scores achieved on the ITERS-R (n = 103)



The majority (93%) of Neighbourhood Nurseries were offering at least adequate quality of provision: they achieved a mean total score of 3 or higher (Figure 3.2). This means that children were provided with an adequate standard of safety and hygiene, a basic daily schedule, some developmentally appropriate activities and resources, and some warmth of interaction between staff and children. Most (70%) of these centres were rated as adequate (above minimal but below good), while 23% offered children a good standard of provision, achieving a total score of 5 or higher. These centres provided children with a nurturing, educationally stimulating and healthy environment. Within the sample, a number of centre types provided consistently higher quality. For example, 62% of the maintained sector providers and 39% of the Children's Centres offered a good standard of provision.

A small proportion (7%) of the sample offered less than a minimal standard (Figure 3.2). These centres were missing basic elements of quality provision such as hygiene, safety, educational stimulation and warm staff-child interactions.

How can we put these scores into context? Although very few studies in the UK have used the ITERS-R scale to measure quality of provision, there is a good body of comparative evidence from the US. The Cost, Quality and Child Outcomes Study (CQO, 1995) used the original version of the scale to carry out over 200 observations in infant/ toddler classrooms in 1993. Burchinal and colleagues (2000) used the ITERS to assess 45 infant and toddler classrooms. Figure 3.3 shows that the Neighbourhood Nurseries did well in comparison to both these US samples.

Figure 3.2 Mean total ITERS-R scores: proportions in each quality band (n = 103)

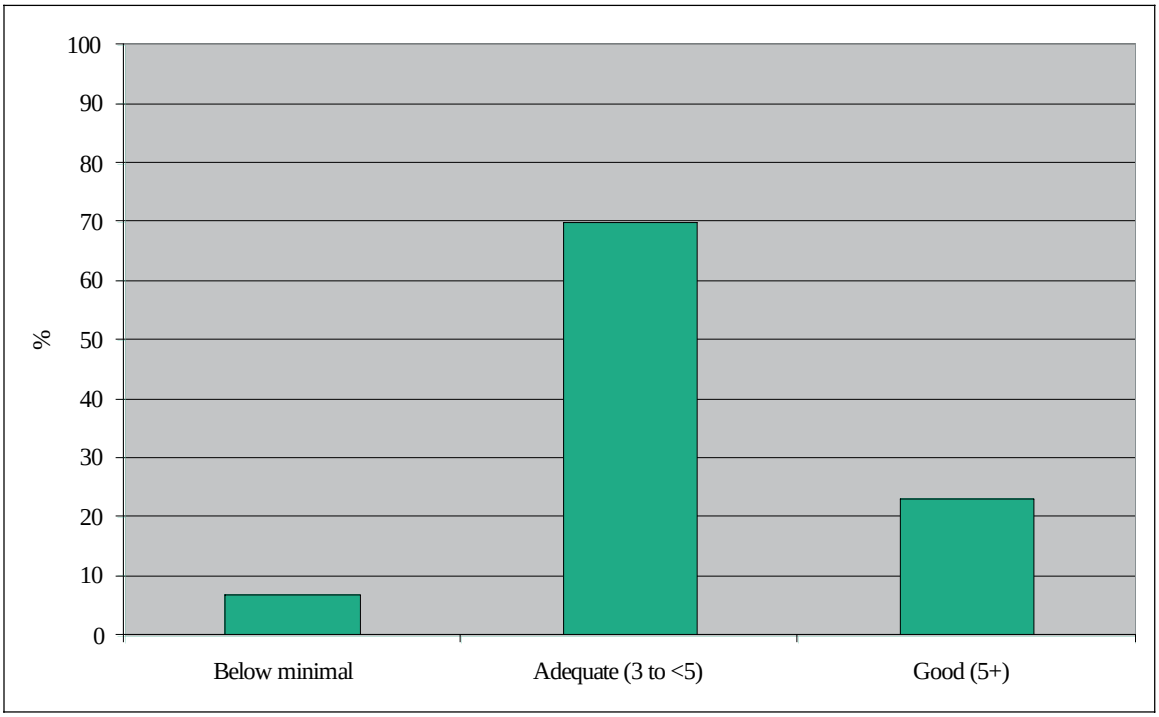
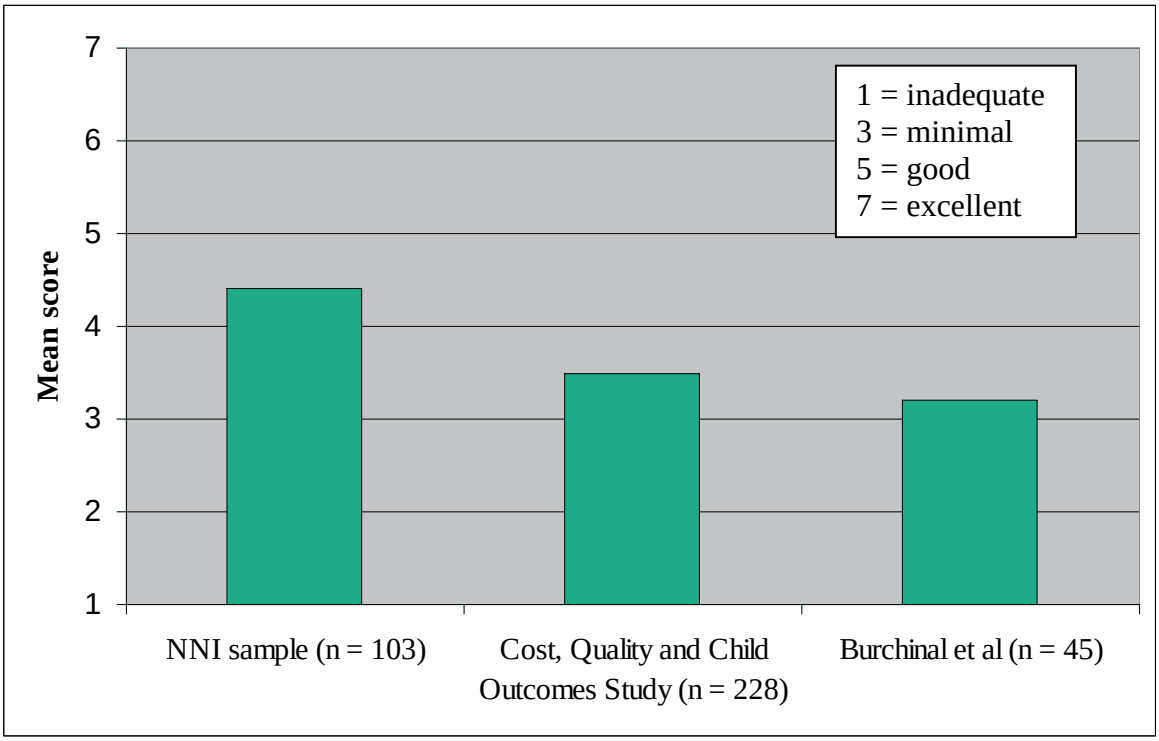


Figure 3.3 Mean total ITERS scores achieved in published studies (compared to NNI)



The higher quality scores achieved by the NNI sample may in part be due to greater legislative regulation in the UK, as compared with the US. In addition, the NNI programme offered additional resources to participating centres which were not on offer in the US.

Another possibility relates to the age range of children being catered for. In the US, children are often highly age segregated. So, for example, a centre might operate separate rooms for babies, infants, toddlers and pre-schoolers. While this also happens in the UK, there is generally less age segregation and greater mixing of age ranges. Many of the NNI rooms observed as part of this study provided for children over the age of 3 ½ as well as for younger children. Later analysis (Chapter 4) shows a statistically significant relationship between the ages of children catered for and quality of provision as measured by the ITERS-R: rooms which catered for older children alongside under 3s were of higher quality than those which catered only for infants and/or toddlers. Other research studies (e.g., Burchinal et al, 2000) have shown that scores on the ECERS (an environment rating scale similar in structure to the ITERS, but intended for slightly older children) are generally higher than scores on the ITERS. Thus, the higher scores achieved on the ITERS-R by the NNI sample in comparison to the US samples could be partly due to the presence of older children in the rooms observed. However, even allowing for the age effect, this is no small achievement for the Neighbourhood Nurseries.

3.2 Dimensions of quality

3.2.1 The ITERS-R subscales

In addition to looking at overall quality, analysis of the individual subscales of the ITERS-R can provide greater detail on the strengths and weaknesses of the NNI sample. Table 3.1 and Figure 3.4 show the mean scores achieved by the sample centres on each of the individual ITERS-R subscales:

- *Space and furnishings* (e.g. layout of the room, resources, display);
- *Personal care routines* (e.g. health and safety, hygiene, meal times);
- *Listening and talking* (e.g. supporting children's language development);
- *Activities* (e.g. dramatic play, sand and water, fine motor play);
- *Interaction* (e.g. supervision, discipline, staff-child and peer interactions);
- *Program structure* (e.g. opportunities for free play, group activities, transitions);
- *Parents and staff* (e.g. information for parents, staff training opportunities).

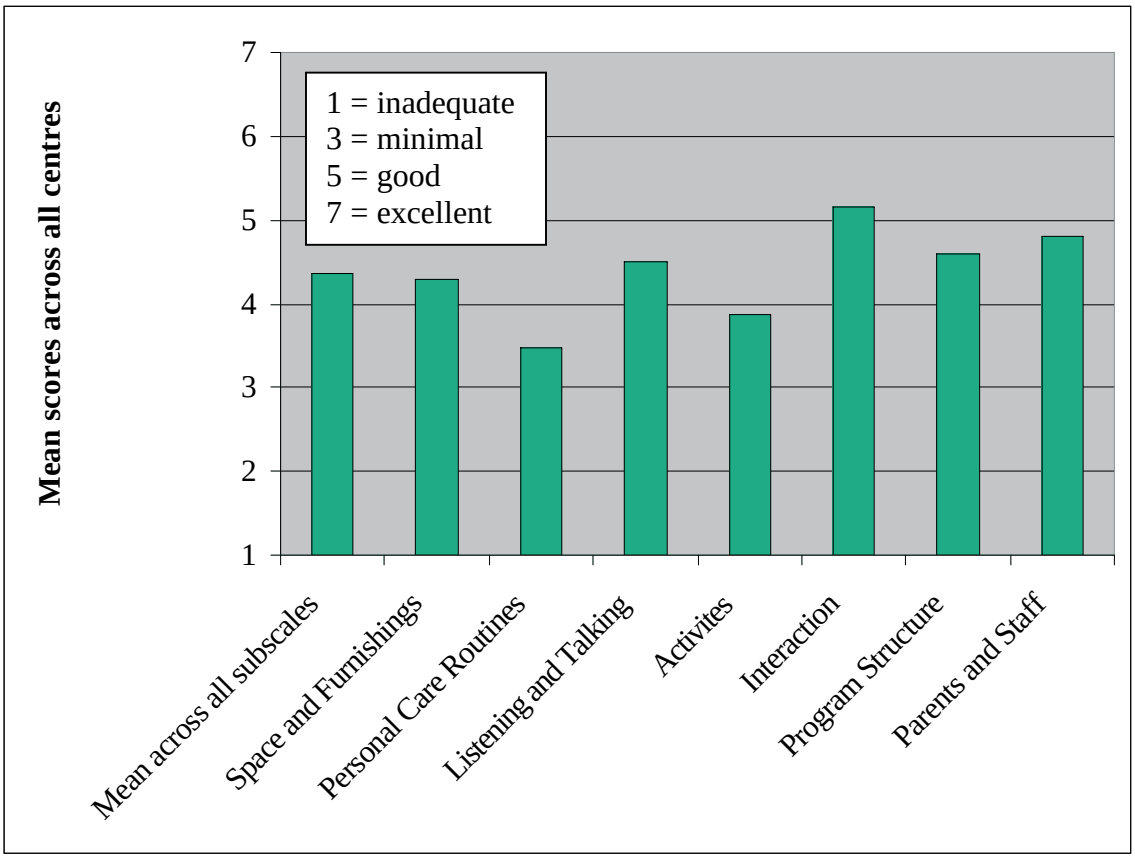
The majority of scores were in the adequate range (i.e. between 3 and 5). One subscale – 'interaction' – had a mean above 5, which suggests that the sample Neighbourhood Nurseries were offering good quality of provision in this regard. Staff offered children warm and respectful interactions, helped them to develop appropriate behaviour with their peers and employed appropriate levels of supervision and positive discipline methods.

Table 3.1 Descriptive statistics: ITERS-R subscale scores[10]

	Minimum	Maximum	Mean	Std. Dev.
Space and Furnishings	1.4	6.8	4.3*	1.0
Personal Care Routines	1.6	6.0	3.5	1.0
Listening and Talking	1.0	7.0	4.5*	1.4
Activities	1.8	6.3	3.9	1.1
Interaction	1.8	7.0	5.2	1.3
Program Structure	1.0	7.0	4.6*	1.7
Parents and Staff	3.4*	6.6	4.8	0.6

Source: Quality Study sample, 2003-2005 (n=98)

Figure 3.4 Mean ITERS-R subscale scores across all centres



Source: Quality Study sample, 2003-2005 (n=98)

[10] Five sample centres had not yet moved into their permanent NNI premises at the time visits were conducted and were in temporary accommodation (of potentially lower quality). Mean quality scores were calculated with and without these five centres. Overall mean quality was unaffected, but three of the subscale means were higher when the centres in temporary accommodation were excluded. Table 3.1 and Figure 3.4 present the results for the 98 centres in permanent accommodation i.e. the higher quality scores. The subscale scores affected are marked with an asterisk in Table 3.1. However, since relationships between quality and child outcomes were not expected to be different for centres in temporary as compared to permanent accommodation, these five centres were included in the sample for all subsequent analysis.

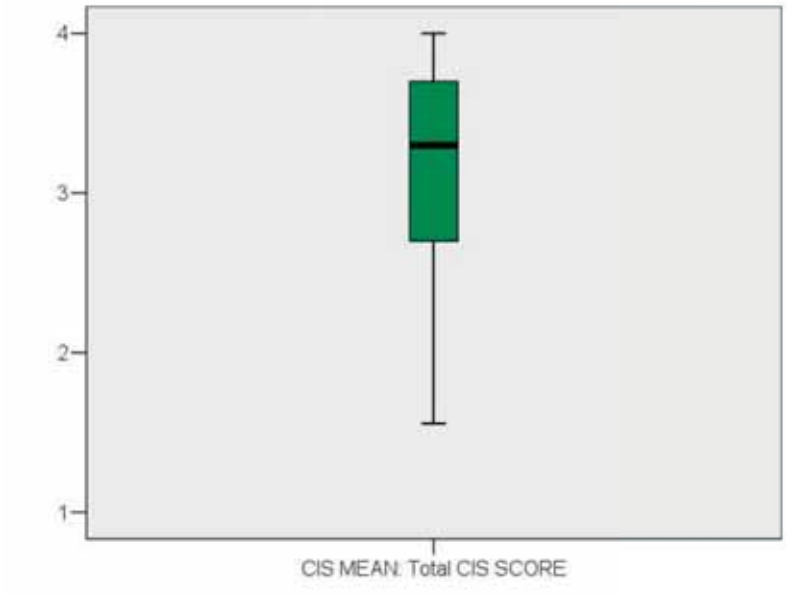
Two subscales – 'personal care routines' and 'activities' - had a mean score below 4, suggesting that improvements need to be made in these areas. The personal care routines subscale considers elements of provision such as health and hygiene, meal times, toileting and naps. Common problems included the washing of hands before snack time, and after toileting. Sleep rooms were often too small for the number of children using them, with beds set up very close together. The provision of stimulating activities was also limited particularly with regard to breadth of experience. For example, opportunities for musical experiences were often lacking - very few centres offered children an exciting range of musical toys, rattles and music boxes to explore.

3.2.2 The Caregiver Interaction Scale (CIS)

The positive relationships subscale of the CIS, indicating warmth and enthusiasm in interaction with children, was used for this study. Each item is rated on a four point scale, ranging from 1 (not at all) to 4 (very much) according to how often caregivers display a particular behaviour (e.g., 'seems to enjoy the children'). The 10 items which make up the positive relationships subscale of the CIS are shown in Appendix 3.

Mean scores achieved on the positive relationships subscale of the CIS ranged from 1.6 to 4 (where 1 is the minimum score and 4 the maximum). The overall mean across centres was 3.2 (standard deviation 0.6). This confirms the findings of the ITERS-R analysis, and suggests that staff in Neighbourhood Nurseries generally did well at providing warm and positive environments for children. For example, staff spoke warmly to the children, listened attentively when children spoke to them, showed enthusiasm for children's activities and efforts, and encouraged pro-social behaviour such as sharing and co-operating.

Figure 3.5 Box plot showing overall mean scores achieved on the CIS (n = 103)



4. FACTORS RELATED TO QUALITY OF PROVISION

4.1 Introduction

Chapter 3 presented the results of the quality observations conducted in 103 Neighbourhood Nurseries providing for children under the age of 3 ½ years. Quality was assessed using two observational instruments – the Infant Toddler Environment Rating Scale (ITERS-R) and the Caregiver Interaction Scale (CIS).

The Implementation Study highlighted considerable variation in the characteristics of Neighbourhood Nurseries: not only did the nurseries have different characteristics, but the centres situated in the most disadvantaged areas were often different in nature to those not located in the poorest areas. In addition, much of the variation was seen in characteristics likely to relate to quality: for example, centres varied by sector, and by the qualifications of their staff. The second aim of the Childcare Quality strand was therefore to establish which centre characteristics related to, and predicted quality of provision. The study also explored whether families with different characteristics and needs were being offered comparable quality of provision.

Information on a number of centre characteristics was collected, with the aim of establishing which of these characteristics were most strongly related to (and predicted), quality of provision. The majority of characteristics considered were those identified by previous research as being relevant to quality of provision. In addition, a number of characteristics particularly relevant to the sample were collected – for example, level of involvement in the Children's Centre Programme and links with Sure Start Local Programmes. Finally, information was provided by the Implementation Study on the populations of children and families attending the sample Neighbourhood Nurseries.

The centre characteristics used to predict quality scores included:

- *Sector* (maintained; private; voluntary; joint projects);
- *Community partnerships and links with other programmes* (level of involvement in Children's Centre Programme; links with Sure Start Local Programmes; school-site location);
- *Physical environment* (new build; extension; refurbishment);
- *Staff childcare qualifications*:
    - Nursery manager qualifications;
    - Mean qualification level of staff (working 10 hours or more) in room observed;
    - Qualified teacher presence (either working in room or as manager);
- *Centre size* (total FTE places, number of children registered);
- *Characteristics of the room observed* (group size; staff:child ratio; age range of children catered for);
- *Characteristics of children and families served by the whole centre* (proportion of: lone parent families; families living in deprived postcode areas; families with no working parent/s; families from ethnic minorities; children with special education needs).

The analysis considered relationships between the characteristics of the sample centres and quality of provision, as measured by the ITERS-R and the CIS:

- Overall quality of provision was measured using the mean total score achieved on the ITERS-R.
- Individual dimensions of quality were assessed using the seven individual subscales of the ITERS-R, and the CIS positive relationships subscale.

Relationships between each individual characteristic (e.g. sector) and overall quality of provision were first established using univariate statistics (analysis of variance, t-tests and correlation). Once initial relationships had been identified, multiple regression analyses were used to explore which centre characteristics were most predictive of provision quality. This technique makes it possible to establish the individual contribution made by each characteristic, *after* controlling for the effects of other relevant variables.

Once the regression model predicting overall provision quality had been developed, it was tested on each of the individual ITERS-R subscales. The aim was to identify the *specific* effects of each centre characteristic in relation to provision quality i.e. the individual dimensions of quality affected.

4.2 Relationship of quality to sector[11]

Table 4.1 shows the breakdown by sector of the 103 Neighbourhood Nurseries in the sample, and also for the NNI population across the country. The majority of providers in this sample (41%) were in the private sector. This closely reflects the overall NNI population and the fact that private sector providers were generally quicker off the mark in responding to the NNI. The current sample contained proportionally more voluntary providers and fewer Local Authority maintained providers than the overall NNI population. However, the differences were not large, and it is considered that the sample adequately represents the NNI population. Finally, 19% of the sample described themselves as joint projects. These included collaborations between centres in any two sectors, and also collaborations with Sure Start.

4.2.1 Differences in overall quality of provision

Both maintained centres and joint projects were offering good quality provision, with mean total ITERS-R scores of 5 or just below (Table 4.1, Figure 4.1) [12]. Mean quality scores for the voluntary and private sectors were closer to 4. Analysis of variance showed that these differences were statistically significant ($F = 10.33$, $p<0.01$), with the maintained centres and joint projects offering significantly higher quality provision than the voluntary and private centres. There were no significant differences in quality between the maintained centres and the joint projects, nor between the private centres and the voluntary centres.

[11] Type of sector refers to the sector that is responsible for the day-to-day running and management of the nursery. A private sector nursery is one run by private individuals or private sector companies; a voluntary nursery is managed by a voluntary organization; a maintained nursery is run by the public sector and managed by the education arm of the local authority; and a joint sector nursery is the result of close cooperation between two or more sectors.

[12] Where 1 = inadequate, 3 = minimal, 5 = good and 7 = excellent

Multiple regression analysis confirmed the findings for the maintained sector: maintained status was a strong predictor of overall provision quality, even when other significant influences on quality had been accounted for (std $\beta = 0.29$, $p<0.01$)[13].
This confirms the findings of the EPPE (Effective Provision of Pre-school Education) project, which collected data on 141 pre-school settings across England in the late 1990s (Sylva et al, 2004) and concluded that the highest quality provision for 3-5 year olds was offered by Local Authority maintained settings.

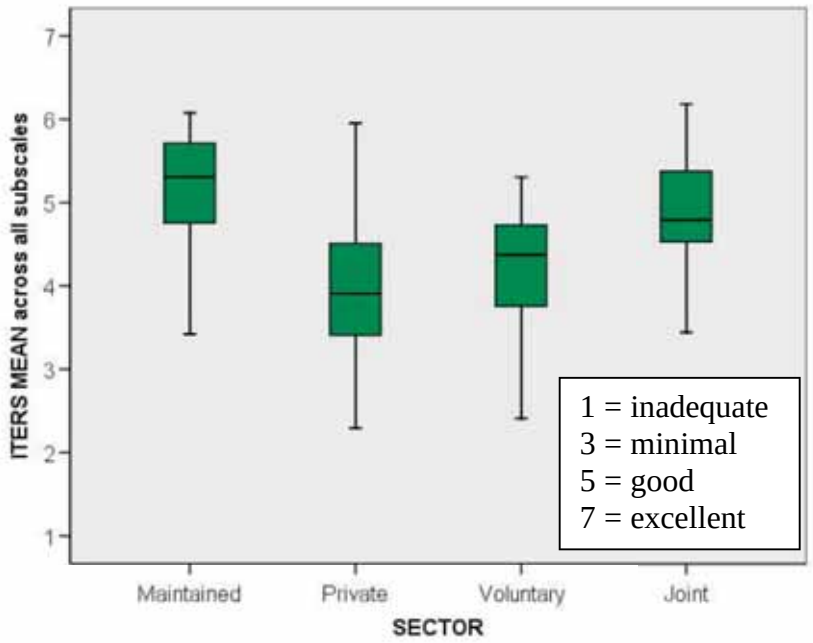
The findings for the joint sector were not confirmed by the multiple regression analysis. This suggests that the joint nature of projects was not crucial, and less important than the influence of maintained status and Children's Centre status (see section 4.2.3).

Table 4.1 Breakdown of the sample by sector

	Quality Study sample			Whole NNI population	
	Number	**Percent**	**Mean ITERS score (range 1-7)**	**Number**	**Percent**
LA maintained	12	12%	5.1	263	20%
Private	42	41%	4.0	531	40%
Voluntary	29	28%	4.2	309	23%
Joint projects	20	19%	4.9	226	17%
Total	103	100%	4.4	1,329	100%

Source: Quality Study sample, 2003-2005 (n=103); DfES NNI data, March 2005 (n=1329)

Figure 4.1 Box plot showing mean total ITERS-R scores by sector (n = 103)



[13] Classifying centres by their level of maintained status had more predictive power than considering each sector separately – see section 4.2.3 for details.

4.2.2 Differences in individual dimensions of quality

Table 4.2 shows the scores achieved by each sector on the individual subscales of the ITERS-R, and on the Caregiver Interaction Scale (CIS). The Local Authority maintained sector offered good quality provision across the board, achieving the highest mean score on all of the ITERS-R subscales with the exception of 'personal care routines'.

Table 4.2 Mean quality scores by sector

	LA maintained	Private	Voluntary	Joint projects
ITERS-R: Space and Furnishings	**5.1**	3.7	4.1	4.8
ITERS-R: Personal Care Routines	3.7	3.1	3.6	**4.0**
ITERS-R: Listening and Talking	**5.6**	4.0	4.1	5.1
ITERS-R: Activities	**4.6**	3.5	3.7	4.4
ITERS-R: Interaction	**6.1**	4.8	5.1	5.6
ITERS-R: Program Structure	**6.0**	4.0	4.2	5.2
ITERS-R: Parents and Staff	**5.0**	4.7	4.8	**5.0**
CIS: Positive Relationships	**3.5**	3.1	3.1	3.3

Source: Quality Study sample, 2003-2005 (n=103)

- Bold font denotes the highest mean score for each subscale.
- ITERS-R subscales are measured on a scale of 1-7
- Caregiver Interaction Scale is measured on a scale of 1-4

Univariate analysis identified significant differences between sectors for all subscales of the ITERS-R except 'parents and staff' [14] (no significant differences were found for the CIS). Post hoc tests showed that all the significant differences were found in favour of the Local Authority maintained centres and the joint projects:

- Maintained centres provided significantly higher quality than both the private and voluntary sectors in those dimensions most related to educational provision: the physical environment (space and furnishings), language (listening and talking), activities and program structure. These results were confirmed by the multiple regression analysis, and suggest that maintained LA provision offers a richer and more stimulating environment for children's developing language and cognition compared to voluntary and private sector provision.
- Joint projects offered significantly better quality physical environments (space and furnishings) and language (listening and talking) than both the private and voluntary sectors, and better quality activities, program structure and personal care routines than the private sector. There were no significant differences in mean scores achieved on the interaction subscale of the ITERS-R, or on the Caregiver Interaction Scale. This suggests that joint centres offered better quality than non-maintained settings in relation to learning and care routines, but not to relationships. However, when other variables were taken into account during

[14] Analysis of variance: Space and furnishings $F=11.0$, $p<0.001$; Personal Care Routines $F=3.9$, $p<0.05$; Listening and Talking $F=7.0$ $p<0.001$; Activities $F=7.2$, $p<0.001$; Interaction $F=4.4$, $p<0.01$; Program Structure $F=7.4$, $p<0.001$.

multiple regression analysis, the positive effects of joint status were lost. Thus, the higher quality offered by joint centres was not due to the 'joint nature' of such projects, but to some other characteristic (see section 4.2.3).

No significant differences were found between the private and voluntary sectors. In addition, no differences were found in relation to provision for parents and staff, which suggests that all sectors provide equally well in this regard.

The differences in quality found between the sectors can, at least partially, be attributed to differences in the qualifications of centre staff. Section 4.5 shows that staff in the maintained centres were the most qualified, while non-maintained centres (in particular, the private sector) had the least qualified workforce[15]. In addition, maintained centres have advantages in terms of access to 'educational infrastructure' and mainstream support systems. Even where trained teachers are not employed to work with the under 3 ½s, centre staff generally have access to curricular and pedagogical input from trained teachers elsewhere on-site. Staff in the maintained sector also have access to specialist staff, for example educational psychologists and speech and language therapists. Finally, although not considered as part of this study, it may be that differences in pay and working conditions contribute to the differences in quality between sectors.

4.2.3 Focus on the joint projects

The high scores achieved by the joint projects are particularly interesting, since these projects involved collaborations between different sectors. What is it about these collaborations which is successful? It is possible that collaboration of any kind raises quality. Alternatively, it may be certain 'partners' which raise the quality of provision (for example centres in the maintained sector, Children's Centres, or centres with a link to Sure Start).

Since many of the joint projects had a maintained partner, it was difficult establish whether the high scores achieved by these centres were due to their joint status, or to the maintained influence. In order to separate these two possible influences, multiple regression analysis was used to establish the individual contributions of the 'maintained' and the 'joint' element of the sample centres.

In order to do this, it was necessary to create a new sector variable which related only to maintained status and not to the joint nature of projects. A new measure of 'maintained status' was created by assigning each Neighbourhood Nursery to one of three categories:

- Fully Local Educational Authority maintained (sole maintained centre or joint project with two maintained partners);
- Partially LA maintained (joint projects with one LA maintained partner); or
- Non-maintained (sole voluntary or private provider, or joint project with no maintained partner).

This categorisation enabled separate (but simultaneous) consideration of the 'joint', and 'maintained' elements of the sample Neighbourhood Nurseries (see Appendix 2 for multiple regression analysis). The results suggested that the joint nature of projects was

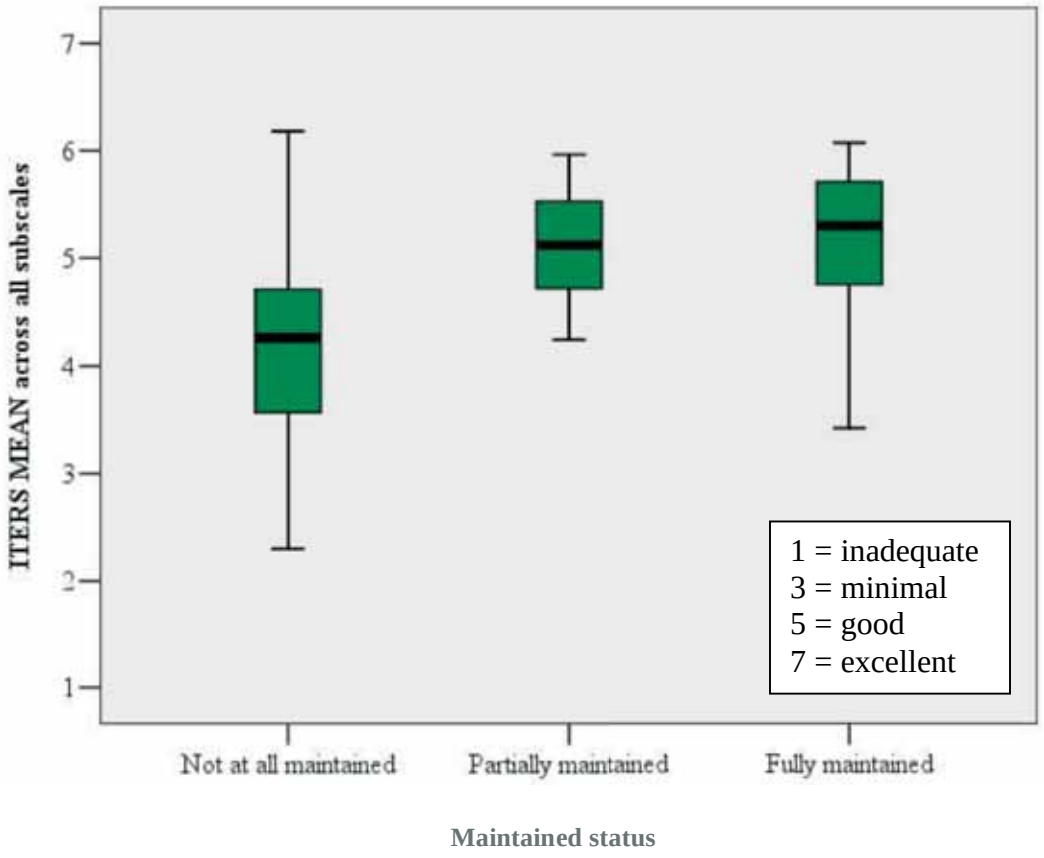
[15] This variation in qualification levels was also highlighted by the Implementation Study (Smith et al, *in press*).

not crucial, and less important than the influence of maintained status (and also Children's Centre status).

Figure 4.2 shows the variation in quality across each of the new categories of 'maintained status'. Both the fully and partially maintained categories have mean total ITERS-R scores of 5 or higher, compared to a mean score of 4.2 for the 'non-maintained' category. Analysis of variance showed significant differences in quality ($F = 10.59$, $p<0.001$), with fully and partially maintained projects offering significantly higher quality of provision than those without a maintained element. This was confirmed by multiple regression analysis, which showed that maintained status was a strong predictor of overall provision quality (std $\beta = 0.29$, $p<0.01$). In fact, classifying centres by their level of maintained status had more predictive power than considering each sector separately. This classification was used for all subsequent analysis.

It is interesting to note that, although the non-maintained sector had the lowest overall mean quality score, it also displayed the greatest variation in quality, with mean scores ranging from below minimal (less than 3) to above 6 (good to excellent).

Figure 4.2 **Box plot showing mean total ITERS-R scores by 'maintained status' (n = 103)**



4.3 Relationship of quality to community partnerships and links with other programmes

Three 'partnership' measures were considered for the Neighbourhood Nurseries in the sample:

- Involvement in Children's Centre Programme;
- Links with Sure Start Local Programmes;
- School-site location.

Table 4.3 shows the characteristics of the sample. For comparison purposes, it also shows the characteristics of all Neighbourhood Nurseries, as recorded in March 2005.

Table 4.3 Sample characteristics: programme participation and location

	Quality study sample		Whole NNI population	
	Frequency	**Valid Percent**	**Frequency**	**Valid Percent**
Main Children's Centre	31	34%	364	32%
Contributing to Children's Centre	23	26%	292	26%
Not part of a Children's Centre	22	24%	294	26%
Undecided	14	16%	188	17%
Missing	13	-	191	-
Sure Start link	35	44%	494	45%
No Sure Start link	44	56%	609	55%
Missing	24	-	226	-
School site	32	33%	436	33%
Not a school site	66	67%	892	67%
Missing	5	-	1	-

Source: Implementation sample, 2004 – 2005; DfES NNI data, March 2005

4.3.1 Children's Centre Status

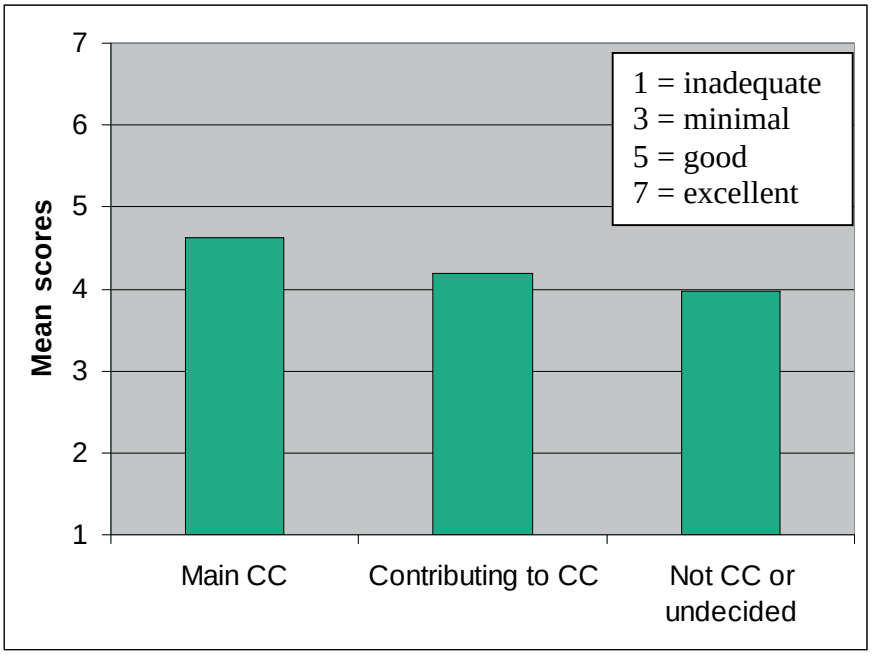
Just under two thirds (60%) of the sample were participating in the Children's Centre Programme – 34% as a main Children's Centre and 26% contributing to a Children's Centre. This reflected the pattern of involvement in the Children's Centre Programme seen in the overall Neighbourhood Nursery population.

Figure 4.3 shows the mean quality scores achieved by the sample centres, according to their Children's Centre status. Main Children's Centres achieved the highest mean total ITERS-R score (4.8, just below 'good'). Settings which were not themselves main

centres, but contributed towards a Children's Centre, achieved a mean of 4.2 while those not designated as Children's Centres (or of undecided status) achieved a mean of 4. This is not surprising, but shows that the higher quality Neighbourhood Nurseries have met all (or most) of the stringent criteria required for Children's Centre status. The differences were statistically significant i.e. Neighbourhood Nurseries taking part in the Children's Centre Programme - either as a main centre or by contributing to a Children's Centre - offered significantly higher quality provision than those not taking part or of undecided status ($t = 3.4$, $p<0.001$).

There was a relationship between sector and participation in the Children's Centre Programme. All but one of the Local Authority (LA) maintained Neighbourhood Nurseries were also Children's Centres, or contributing to a Children's Centre, compared with just over half of the non-maintained settings. Thus, the higher quality scores achieved by the maintained sector and Children's Centres may be closely related and stem from the same source. For example, both this study (see section 4.5) and the Implementation Study (Smith et al, *in press*) conclude that the most highly qualified staff teams were found in the maintained sector, and in Children's Centres. However, multiple regression analysis showed that Children's Centre status had a positive influence on overall quality of provision, over and above the effect of sector (std $\beta = 0.32$, $p<0.01$). It is difficult to establish to what extent there is a positive effect of taking part in the programme, and to what extent centres which were already of a high quality were selected to become Children's Centres. Whatever the combination of factors, the Children's Centres Programme appears to be offering good quality provision.

Figure 4.3 Mean total ITERS-R scores by Children's Centre status



Source: Quality Study sample, 2003-2005; Implementation sample, 2004-2005 (n=90)

By looking at the individual subscales of the ITERS-R, it is possible to establish the specific dimensions of quality in which Children's Centres excelled (Table 4.4). Main Children's Centres offered the highest quality across the board, achieving the highest mean score on all of the ITERS-R subscales and on the Caregiver Interaction Scale.

Table 4.4 Mean quality scores by Children's Centre status

	Main Children's Centre	Contributing to a Children's Centre	Not Children's Centre/ undecided
ITERS-R: Space and Furnishings	**4.7**	4.1	3.8
ITERS-R: Personal Care Routines	**3.7**	**3.7**	3.1
ITERS-R: Listening and Talking	**4.9**	4.1	4.0
ITERS-R: Activities	**4.4**	3.5	3.6
ITERS-R: Interaction	**5.6**	5.0	4.6
ITERS-R: Program Structure	**5.2**	4.3	3.9
ITERS-R: Parents and Staff	**5.0**	4.8	4.7
CIS: Positive Relationships	**3.4**	3.1	3.0

Source: Quality Study sample, 2003-2005 (n=103)

- Bold font denotes the highest mean score for each subscale.
- ITERS-R subscales are measured on a scale of 1-7
- The Caregiver Interaction Scale is measured on a scale of 1-4

Univariate analysis showed that the differences between Children's Centres and centres not taking part in the programme were statistically significant for six of the seven ITERS-R subscales[16], with centres taking part in the programme offering higher quality than those not participating. Children's Centres provided significantly higher quality in terms of provision relating to childcare and education, but not to provision for parents and staff. The majority of these differences related to main Children's Centres, rather than to nurseries which were linked to a Children's Centre.

However, multiple regression analysis showed that, when other variables were controlled for, only two of these effects were related specifically to Children's Centre status: Children's Centres provided significantly higher quality interactions (e.g. warm staff-child interaction, good support for peer interactions) and program structure (e.g. opportunities for free play, appropriate group activities, smooth transitions between activities). It is likely that the higher quality achieved by Children's Centres in the other domains identified by univariate analysis was due to the high proportion of maintained centres participating in the programme.

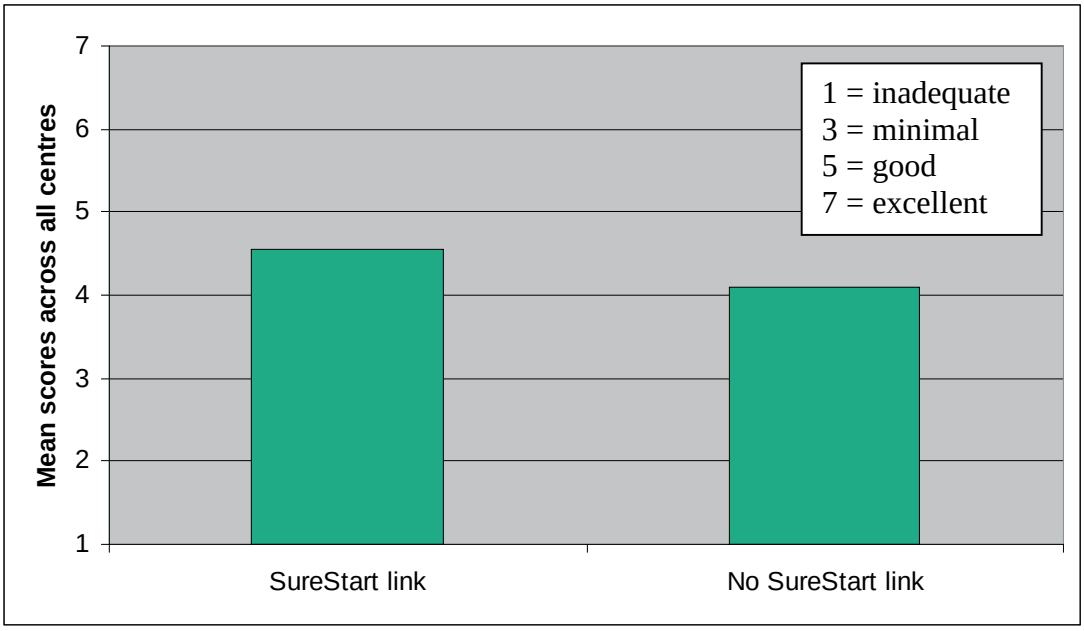
4.3.2 Sure Start links

A large proportion of the Neighbourhood Nursery sample (44%) was linked to the Sure Start programme, a similar proportion to that seen in the whole NNI population. Centres

[16] Analysis of variance: Space and furnishings $F=11.0$, $p<0.001$; Personal Care Routines $F=3.9$, $p<0.05$; Listening and Talking $F=7.0$ $p<0.001$; Activities $F=7.2$, $p<0.001$; Interaction $F=4.4$, $p<0.01$; Program Structure $F=7.4$, $p<0.001$.

with a link to Sure Start offered better quality provision than those without, achieving a mean total ITERS-R score of 4.6 as compared with 4.1 for non-Sure Start centres (Figure 4.4). Univariate analysis showed that this difference was statistically significant ($t=2.34$, $p<0.05$). However, there was a strong relationship between Sure Start links, sector and Children's Centre status. Just over 60% of centres with a link to Sure Start were Children's Centres, compared to only 14% of centres without a Sure Start link. Similarly, 28% of centres linked to Sure Start were fully or partially maintained, compared to 11% of those without a Sure Start link, and the private sector centres were least likely to be linked with the Sure Start programme. This may mean that the higher scores achieved by Sure Start settings are due to the positive influences of the maintained sector and Children's Centres status. The results of the multiple regression analysis confirmed this, showing that Sure Start links were not related to quality when other centre characteristics (such as maintained status and Children's Centre status) were taken into account.

Figure 4.4 Mean total ITERS-R scores: centres with and without a Sure Start link



Source: Quality Study sample, 2003-2005; Implementation sample, 2004-2005 (n=79)

4.4 Relationship of quality to the physical environment

The Neighbourhood Nurseries Initiative provided capital funding for redevelopment. Many (41%) of the nurseries in the sample were new buildings funded, at least in part, by the NNI. Others were refurbishments (44%) or extensions (15%) of existing buildings (Table 4.5). There were no differences in the mean total ITERS-R scores achieved by the three different project types – although new buildings did significantly better on the ITERS-R space and furnishings subscale than the extensions and refurbishments ($t=1.97$, $p<0.05$). This is not surprising, but gives confidence in the validity of the quality scales used in this research.

Table 4.5 Sample characteristics: project type

	Quality Study sample		Whole NNI population	
	Number	**Valid Percent**	**Number**	**Valid Percent**
New building	40	41%	473	40%
Refurbishment	43	44%	457	39%
Extension	14	15%	254	21%
Missing/ other	6	-	145	-

Source: Implementation sample, 2004 – 2005; DfES NNI data, March 2005

A small number (5%) of the sample had not yet moved into their permanent NNI accommodation at the time they were visited for the evaluation. Three of these were new buildings which had not yet been completed, and two were refurbishments. Due to the timescale of the evaluation, it was not possible to wait until these had been completed before visiting. As might be expected, there was a significant difference between the overall quality scores achieved by centres in their permanent accommodation and by the five projects still in temporary accommodation ($t=-4.71$, $p<0.01$). Those in temporary accommodation also scored significantly less well on all subscales of the ITERS-R except personal care routines and activities[17]. However, since relationships between quality and child outcomes were not expected to be different for centres in temporary as compared to permanent accommodation, these centres were included in the sample for all subsequent analysis.

School-site location

One third (33%) of the sample were located at a school site. There were no differences in the mean total ITERS-R scores achieved by Neighbourhood Nurseries based at a school site compared with those not located at a school. When the individual ITERS-R subscales were considered, school-based Neighbourhood Nurseries did offer significantly higher quality space and furnishings than those not located on school sites ($t=2.46$, $p<0.05$). It was not possible to establish to what extent school-based settings had access to school resources such as trained teachers, advice on planning, or access to professional help in supporting children with special educational needs. However it appears that, while formal links to the maintained sector improved the quality of pre-school provision, simply being based at a school site was not sufficient.

4.5 Relationship of quality to staff qualifications

4.5.1 Nursery Manager qualifications

The qualifications of the centre managers are shown in Table 4.6. The majority (95%) of managers had a childcare qualification equivalent to NVQ level 3 or higher. Just over one fifth of the sample (21%) had an NVQ 4, degree or higher degree level qualification, for example qualified teacher status, an advanced diploma in childcare, HNC or HND. The different sectors showed very similar patterns in terms of manager qualifications, although the managers of maintained settings were slightly better qualified.

[17] Independent samples T-tests: Space and furnishings $t=-2.3$, $p<0.05$; Listening and talking $t=-7.5$ $p<0.001$; Interaction $t=-3.7$, $p<0.01$; Program structure $t=-2.4$, $p<0.05$; Parents and staff $t=-2.2$, $p<0.05$.

There was a significant relationship between the qualifications of the nursery managers and overall quality of provision, identified by both univariate ($R = 0.22$, $p<0.05$) and multivariate analysis (std $\beta = 0.23$, $p<0.05$). However, it was difficult to separate the effects of staff qualifications from the effects of sector and Children's Centre status: the effect of manager qualifications on overall quality was only visible when sector and Children's Centre status were removed from the regression model.

Looking in detail at the individual dimensions of quality, nursery manager qualifications were most strongly related to provision for parents and staff ($R = 0.29$, $p<0.01$), although this effect was not significant in the multiple regression analysis. The parents and staff subscale of the ITERS-R considers elements such as the information provided for parents, opportunities for parents to become involved in nursery life, and staff professional development, supervision and evaluation. Considering the role of the managers, it is perhaps not surprising that these elements of provision are related to manager qualifications.

Univariate analysis identified less strong (but still significant) relationships between manager qualifications and the 'program structure' subscale of the ITERS-R ($R = 0.21$, $p<0.05$) and between manager qualifications and the 'listening and talking' subscale ($R = 0.21$, $p<0.05$) although again, these effects were not retained in the multiple regression analysis.

Table 4.6 Nursery manager qualifications (by sector)

	Maintained	Private	Voluntary	Joint projects	Total
NVQ 2 or below	0%	7%	4%	5%	5%
NVQ 3	75%	76%	74%	69%	74%
NVQ4, degree, higher degree	25%	17%	22%	26%	21%

Source: Quality Study sample, 2003-2005 (95 nurseries that provided manager data)

4.5.2 Childcare qualifications of staff in rooms observed

For each room observed as part of the Childcare Quality strand, information was gathered on the childcare qualifications of all staff working at least 10 hours per week with the children (including working managers). This was used to calculate the mean qualification level for each room observed, as well as the proportion of staff unqualified (Table 4.7). Further details on the qualifications of staff in the sample Neighbourhood Nurseries are provided in the Implementation Study Report (Smith et al, *in press*).

Table 4.7 Childcare qualifications of staff working 10 hours per week or more in rooms observed (including working managers)

	Maintained	Private	Voluntary	Joint projects	Total
Mean qualification level (standardised levels 1-5)	2.7	2.1	2.2	2.5	2.3
Proportion of staff unqualified	6%	21%	19%	14%	17%

Source: Quality Study sample, 2003-2005 (98 nurseries that provided staffing data)

The differences between sectors were more apparent here than when considering manager qualifications. Overall, Local Authority (LA) maintained providers had the most qualified workforce, and private sector providers the least qualified. Similar conclusions were drawn by the Implementation Study (Smith et al, *in press*), which reviewed the qualifications of all staff working in the sample Neighbourhood Nurseries.

The results of the univariate analysis suggest that staff qualifications had a positive relationship with quality of provision. The mean qualification level of staff members (working 10 hours per week or more with the children) was positively correlated with overall quality of provision as measured by the ITERS-R ($r=0.23$, $p<0.05$). These findings were confirmed by the multiple regression analysis (std $\beta = 0.22$, $p<0.05$). However, as with the manager qualifications, the effects of staff childcare qualifications were only visible when 'sector' and 'Children's Centre status' were removed from the regression model. It is likely that staff qualification levels are one of several factors which contribute towards the higher quality of provision offered by the maintained sector and by Children's Centres.

Looking at the individual dimensions of quality, mean qualifications were most strongly related to the 'educational' aspects of provision. Positive correlations were found with the activities, listening/talking, interaction and program structure subscales of the ITERS-R, but not with personal care routines or provision for parents and staff[18]. Multiple regression analysis confirmed the results for 'listening and talking' and 'program structure': these effects were independent of any other influences on quality.

There was no significant relationship between quality and the proportion of staff unqualified. This suggests that it is not the avoidance of unqualified staff which raises quality, but an overall attention to providing a well qualified workforce.

4.5.3 Qualified teacher presence

A very small minority (only 2%) of the sample centres had a qualified teacher who worked at least 10 hours every week with the toddlers in the rooms observed. There were concerns that this would not be enough to detect a teacher effect (should one exist). For this reason, a new variable was created which combined the teachers working with the children and the teaching qualifications of nursery managers. It was thought that the knowledge and skills of the teacher-qualified managers might transfer to centre staff working with the children. This new variable was labelled 'qualified teacher presence' (Table 4.8). Even using this combination variable, no effect of teacher presence on quality of provision was found. However, it is likely that this was due to the small sample size in this centre-level analysis (n=103). Significant effects of teacher presence on children's behavioural outcomes were found in the child-level analysis (n=810) presented in Chapter 5.

One interesting point to note is that all of the teachers identified in the sample (either working with children under 3 ½, or as nursery manager) were in the non-maintained

[18] Correlations with mean qualification levels (staff working 10 hrs per week or more in room):
Space and furnishings $r=0.19$, $p<0.05$; Listening and talking $r=0.22$ $p<0.05$; Activities $r=0.21$,$p<0.05$; Interaction $r=0.20$, $p<0.05$; Program structure $r=0.24$, $p<0.05$.

sector. It is possible that the maintained centres employed teachers to work with 3 and 4 year old children rather than with the younger age groups.

Table 4.8 Teacher presence (by sector)

	Maintained	Private	Voluntary	Joint projects	Total
Proportion of centres with a qualified teacher as manager, or working in the room observed	0%	15%	7%	2%	6%

Source: Quality Study sample, 2003-2005 (99 nurseries that provided staffing data)

4.5.4 Qualifications, Children's Centre status and links to Sure Start

Table 4.9 shows the qualifications of staff by Children's Centre status and links to Sure Start. There was a relationship between Children's Centre status and staff qualifications (with main Children's Centres employing the most qualified workforce), whereas involvement in Sure Start made little difference to qualification levels. This may be because the main thrust of local Sure Start projects was on community development. In contrast, one of the main aims of the Children's Centre Programme is to provide high quality centre-based child care and education.

Table 4.9 Staff qualifications (by Children's Centre status and Sure Start links)

	Main Children's Centre	Linked to a Children's Centre	Not Children's Centre/ undecided	Sure Start link	No Sure Start link
Mean qualification level	2.5	2.2	2.2	2.3	2.3
Proportion unqualified	11%	22%	18%	16%	19%
Teacher present as manager or working in room observed	10%	0%	6%	6%	7%

Source: Quality Study sample, 2003-2005 (99 nurseries that provided staffing data)

4.6 Relationship of quality to centre size

Table 4.10 gives an overview of the sample Neighbourhood Nurseries in terms of size. The number of full time equivalent (FTE) places ranged from a minimum of 6 in the smallest centre, to a maximum of 126 in the largest. The mean number of places offered was 48, while the mean number of children registered was 59.

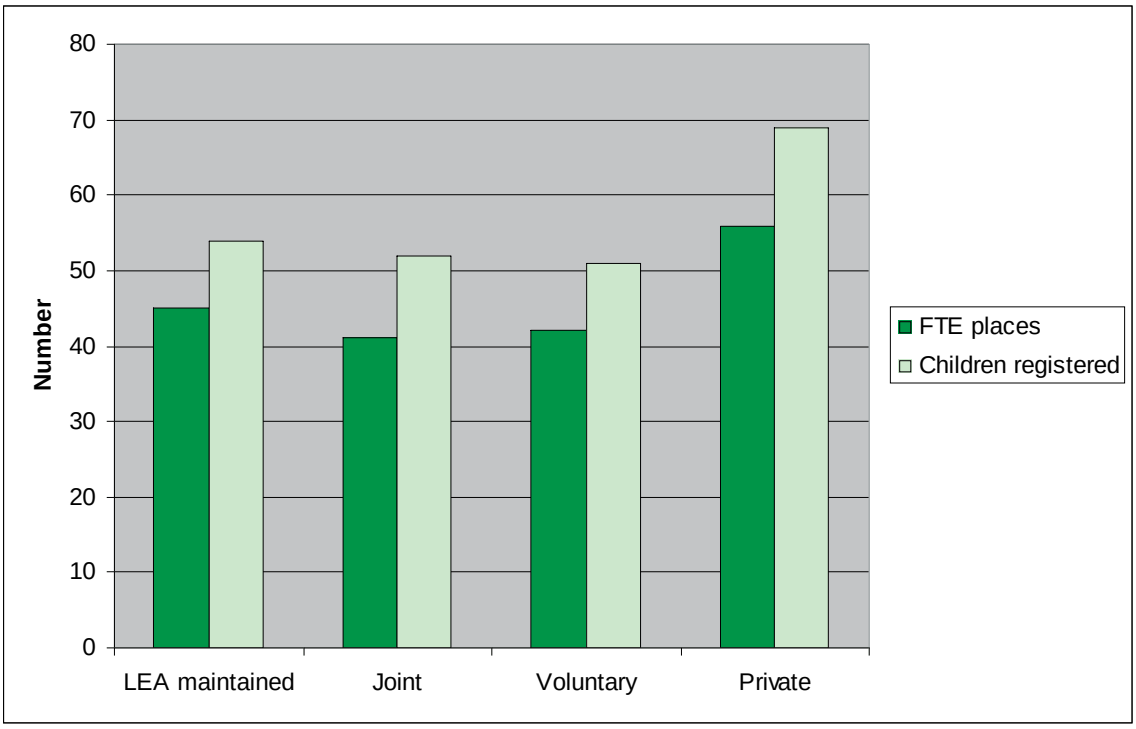
Table 4.10 Sample characteristics: centre size

	N	Minimum	Maximum	Mean	Std. Deviation
Number of full-time equivalent (FTE) places	90	6	126	48	23.3
Number of children registered	84	11	167	59	31.1

Source: Implementation sample, 2004 – 2005

The private centres tended to be larger (Figure 4.5), with a mean of 56 FTE places compared to 45 in the maintained sector, 42 in the voluntary sector and 41 in joint projects.

Figure 4.5 Size of centre by sector (n=90, n=84)



While univariate analysis did not identify an effect of centre size on overall quality of provision, a size effect was identified by the multiple regression analysis. Centre size (number of children registered) had a significant and positive relationship with overall quality i.e. larger centres offered higher quality provision (std $\beta = 0.28$, $p<0.01$).

Analysis of the individual dimensions of quality showed that the larger centres offered higher quality personal care routines, provision for children's developing language (listening and talking), program structure and provision for parents and staff. This may be because the larger centres are better resourced, and are able to offer facilities for children, staff and parents which the smaller centres would find prohibitively expensive. Larger centres with a bigger staff base are also more able to provide cover for staff members to plan and attend training events, and may find it easier to set aside the resources required for staff training and professional development.

4.7 Relationship of quality to group characteristics

Information on group size, age range and staff:child ratios was collected for each room observed (Table 4.11).

Table 4.11 Group size, age range and staff:child ratios

	N	Minimum	Maximum	Mean	Std. Deviation
Room capacity	103	6	44	17	6.8
Children on register	96	6	60	22	9.8
Children per staff member	97	0.8	8.0	3	1.2
Age range in months	97	4	47 (3yrs 11mths)	17.3 (1yr 5 mths)	10.3

Source: Quality Study sample, 2003-2005

Group size

The sizes of the groups observed varied widely. The smallest room had a capacity of only 6 children at any one time, with 6 children registered for those places. The largest room capacity was 44 children, and the largest number of children on register for any observed room was 60. Overall, the average number of children on register in the rooms observed was 22. Group sizes were largest in the joint projects, with an average capacity of 20 children and 27 children enrolled. Univariate analysis identified a positive relationship between group size and mean total ITERS-R scores - as the number of children on the register increased, so did the quality of provision ($R = 0.25$, $p<0.01$). However, this effect was not retained in the multiple regression analysis, when other influences on quality were taken into account.

Staff:child ratios

The majority of rooms observed had ratios of 4 children or fewer to 1 staff member, with a mean of 3 children to 1 adult across all sectors[19]. One of the rooms visited had more staff than children (0.8 children per staff member), while at the other end of the scale a ratio of 8 children to 1 member of staff was observed (usually in rooms which provided for children over 3). There was no relationship between quality of provision and staff:child ratios. This is not surprising - since centres more or less observed the statutory ratios, there was little variation in ratios.

Age range

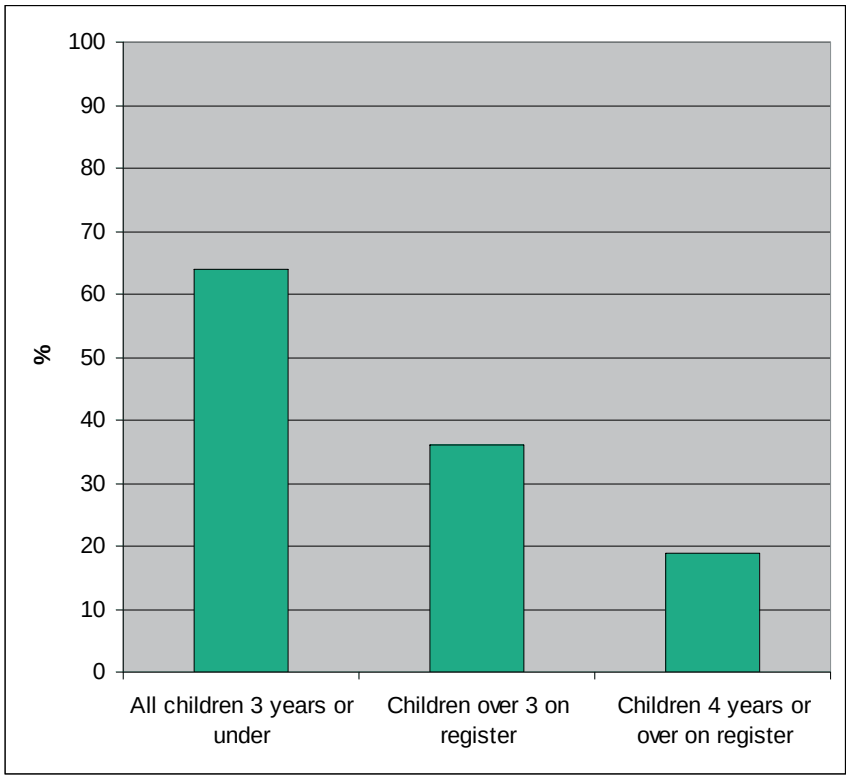
The age ranges of children attending the rooms observed varied broadly, from a highly age-segregated room with an age range of less than 6 months, to a room with almost four years between the youngest and the oldest child (Table 4.11). The first of these was a room in a private setting which had children on the register from 2 years 3 months to just under 2 years 8 months. The second was a joint project which catered for children from 6 months old to rising fives.

Many of the rooms observed catered for older children as well as for children under the age of 3 years (Figure 4.6). In all, 36% of the rooms observed catered for children over 3 years as well as for children aged 3 or under. Just under one fifth (19%) had children on

[19] The legal ratios in the UK are: 1:3 for children under 2 years; 1:4 for children 2 to 3 years of age; and 1:8 or 1:13 for children aged 3 to 5 years (depending on sector).

the register aged 4 years or over. It is clear that many infants and toddlers attending the sample Neighbourhood Nurseries were also experiencing contact with older children.

Figure 4.6 Ages of children provided for in rooms observed (n=97 centres)



A significant positive relationship was found between the age of children catered for and quality of provision. Mean total ITERS-R scores increased with age range ($R = 0.27$, $p<0.01$), and also with the age of the oldest child on register ($R = 0.27$, $p<0.01$). These findings were confirmed by the multiple regression analysis, which found that under 3 ½s experienced better overall quality of provision in rooms which also catered for children aged 4 years or over (std $\beta = 0.39$, $p<0.001$).

These results suggest that rooms which also provide for older children offer better quality of provision. This may be due to greater care and attention being given by staff to developing activities and supporting children's developing language and communication. When the individual subscales of the ITERS-R were considered, the dimensions which improved with the presence of older children included activities, listening and talking and program structure – the three subscales with the most 'educational' focus[20]. The quality of interactions was not affected, nor was the quality of personal care routines or provision for parents and staff. This suggests that the improvements in quality arising from the presence of older children were related to educational provision.

[20] Independent samples T-tests: Listening and talking $R=0.22$, $p<0.05$; Activities $R=0.35$, $p<0.001$; Program structure $R=0.28$, $p<0.01$. These findings were confirmed by the multiple regression analysis.

4.8 Relationship of quality to the population of children and families served

The Neighbourhood Nurseries Initiative was targeted at disadvantaged areas, and the Implementation Study (Smith et al, in press) shows that the programme was broadly successful in achieving that aim. However, within the sample there remained some variation in the families attending the nurseries. Some centres provided almost exclusively for families living in deprived postcodes (as defined by the Index of Multiple Deprivation), while others had a much lower proportion of disadvantaged families (Table 4.12).

The final aim of the Childcare Quality strand was to establish whether families with differing needs, and with different characteristics, were being offered similar quality of provision by the Neighbourhood Nurseries Initiative. The analysis considered the relationship between quality of provision and the populations of children and families served by each of the sample Neighbourhood Nurseries. Information for this analysis was provided by the NNI Implementation Study, and was collected on all children (and their families) using the sample nurseries at the time of the evaluation[21]. Data was also collected at room level on the proportion of children with special educational needs.

Table 4.12 shows the characteristics of the sample. The mean proportion of families from disadvantaged postcode areas was 42%. On average, one quarter (24%) of the centre populations were from ethnic minority groups. The mean proportion of lone parents was 28%, and of workless households 17%. A small proportion of children had special educational needs (5% of children attending the sample centres, 3% of children in the rooms observed)[22].

Table 4.12 Population of children and families served

% of all children in centre…	N	Minimum	Maximum	Mean	Std. Dev.
…from deprived postcodes	65	0%	95%	42%	28
…with lone parents	88	0%	67%	28%	15
…in workless households	88	0%	67%	17%	17
…from ethnic minority groups	83	0%	95%	24%	28
…with special educational needs	88	0%	30%	5%	6
% of children in rooms observed with SEN	100	0%	48%	3%	7

Source: Implementation sample, 2004 – 2005; Quality Study sample, 2003-2005

[21] In some cases, data was available for all 96 nurseries common to the Implementation Study and Quality Study samples. In other cases, data was only available for the 'later openers' (approximately two thirds of the full sample). Finally, in a number of cases, comparative data was available for the whole population of Neighbourhood Nurseries. This was provided by the DfES (NNI data, March 2005). In each case, the source and the number of nurseries for which information was available is reported (Table 4.12).

[22] It should be remembered that the NNI population was not necessarily representative of the proportion of SEN children living in disadvantaged areas (which tend to show higher proportions of SEN children than seen in this sample). The NNI sample was heavily biased towards the private sector, and previous research suggests that children with a high risk of special educational needs are less likely to attend private day nursery provision. The fact that the proportion of children with SEN in the rooms observed is lower than that seen for the centres as a whole reflects the focus of the quality study on infants and toddlers (very few children are diagnosed with a special need at this early age).

There were no significant relationships between quality of provision and any of the child and family characteristics measured. We can conclude that, within the Neighbourhood Nurseries sample, families from different backgrounds and with different needs were being offered comparable quality of provision.

4.9 Summary of findings: which centre characteristics relate to quality?

Initial univariate analysis highlighted a number of characteristics which were linked to quality of provision (these are summarised in Appendix 2). Multiple regression analysis was then used to explore which of these centre characteristics were most predictive of overall quality of provision (mean total ITERS-R scores). This is the most stringent test of the factors related to quality, as it shows the predictive power of each variable while controlling for others. The final regression models are shown in Appendix 2, and the results are presented below. The most important influences on overall quality of provision were identified as follows:

- Sector (LA maintained status);
- Children's Centre status;
- Staff qualifications (mean qualification level and nursery manager qualifications);
- Centre size (number of children registered);
- Age of children catered for (children 4 or over alongside under 3 ½s).

Once the regression model predicting overall provision quality had been developed, it was tested on each of the individual ITERS-R subscales. The aim was to identify the *specific* effects of each of these five centre characteristics in relation to provision quality i.e. the individual dimensions of quality affected. A summary of the multiple regression results is shown in Table 4.13

Table 4.13 Results of multiple regression analysis: contributors to quality of provision

	ITERS-R mean total	Space/ furnish-ings	Personal care routines	Listen-ing/ talking	Activities	Interact-ion	Program structure	Parents and staff
Maintained status	✓	✓		✓	✓		✓	
Children's Centre status	✓					✓	✓	
Mean qualification level	✓			✓			✓	
Nursery manager qualification	✓							
Centre size	✓		✓	✓			✓	✓
Children 4yrs or over in group	✓			✓	✓		✓	

Sector

Maintained status was a strong predictor of provision quality (std $\beta = 0.29$, $p<0.01$)[23]. Local Authority (LA) maintained provision offered the most stimulating environment for children's developing language and educational abilities, as well as the highest quality physical environment. This conclusion was also drawn by the Implementation Study (Smith et al, in press) which found – as did this study - that the LA maintained centres had the most qualified workforce. In addition, maintained pre-school centres have advantages in terms of access to the 'educational infrastructure' and mainstream support systems, for example input to planning and/or access to professional help in supporting children with special educational needs (e.g. educational psychologists, speech and language therapists). Although not considered as part of this study, it may also be the case that differences in pay and working conditions contribute to the differences in quality between sectors.

Although joint projects[24] were also identified by univariate analysis as offering higher quality provision, the results of the regression analysis suggested that the joint nature of projects was not crucial. It is likely that the initial effect identified was due to the fact that many joint projects had a link with the maintained sector and/or the Children's Centre Programme. The 'key ingredient' for successful joint projects seemed to be at least one partner in the LA maintained sector.

Children's Centre status

Involvement in the Children's Centre Programme was a strong predictor of provision quality (std $\beta = 0.32$, $p<0.01$), over and above the influence of sector. As involvement in the Children's Centre Programme increased, so did overall quality of provision. The higher quality scores found in settings with Children's Centre status related to interactions (e.g. warm staff-child interaction, good support for peer interactions) and daily schedule (e.g. opportunities for free play, appropriate group activities, smooth transitions between activities), rather than to educational provision. It is important to bear in mind that the Children's Centres visited as part of the current evaluation were very early openers (the first Children's Centres were only designated in summer 2003). Although staff in Children's Centres were on the whole better qualified than in non-Children's Centres, we do not have any information on how they were being deployed during these very early stages of the programme. It is possible that early efforts were being channelled into setting up integrated provision and that strength in educational quality might have been observed if centres had been visited at a later time.

Qualifications

Staff qualifications had a significant positive relationship with quality of provision, although it was difficult to separate the effect of qualifications from the effects of sector and Children's Centre status. The qualification effect was only evident when the 'maintained status' and 'Children's Centre status' variables were removed from the

[23] Classifying centres by their level of LA maintained status (fully maintained, partially maintained, non maintained) had more predictive power than considering each sector (maintained, joint, voluntary and private) separately.

[24] These included collaborations between centres in any two sectors, and also collaborations with Sure Start.

regression model. It is likely that staff qualification levels are one of several factors which contribute towards the higher quality of provision offered by the maintained sector and by Children's Centres.

The mean qualification level of staff had a positive relationship with overall quality and, in particular, to provision for children's developing language (listening/talking) and to the daily schedule. A better qualified workforce provides a more stimulating environment for children's developing communication, and a more appropriate environment in terms of opportunities for free play, group activities and provision for children with special needs. The qualifications of the centre managers were also related to overall quality of provision, but not to any specific individual dimensions of quality.

A surprising finding was that the presence of a qualified teacher did not appear to have a direct impact on quality, despite this being an important factor in predicting children's social behaviour. However, it is likely that this was due to the small sample size in this centre-level analysis (n=103). Significant effects of teacher presence on children's behavioural outcomes were found in the child-level analysis (n=810).

Finally, univariate analysis identified no significant relationship between quality and the proportion of staff unqualified, and this was confirmed by the multiple regression analysis. This suggests that it is not the avoidance of unqualified staff which raises quality, but an overall attention to providing a well qualified workforce.

Centre size

Centre size (number of children registered) had a significant and positive relationship with overall quality i.e. larger centres offered higher quality provision (std $\beta = 0.28$, $p<0.01$). Looking at the individual dimensions of quality, the larger centres offered higher quality care routines, language (listening/talking), program structure and provision for parents and staff. Economies of scale may mean that larger centres are able to offer a greater range of resources and facilities for children. It is also likely that they are able to offer facilities for staff and parents which the smaller centres would find prohibitively expensive (e.g. parent meeting rooms, large staffrooms with food preparations facilities and lockers for personal belongings). Larger centres with a bigger staff base are also more able to provide cover for staff members to plan and attend training events, and may find it easier to set aside the resources required for staff training and professional development. A larger staff team also provides a richer and more diverse adult social environment and a broader range of experiences and interests to draw on when specialist knowledge is required.

It is interesting that this positive effect of centre size was shown more clearly by regression techniques than by the earlier analyses. It is possible that the effect of centre size was previously being masked by the fact that the private Neighbourhood Nurseries (i.e. those of generally lower quality) tended also to be the larger centres. Interestingly, when centre size was measured in terms of the number of full time equivalent (FTE) places, this variable was not significant.

Age of children

The strongest age-related predictor of quality in the rooms observed was whether or not the room catered for older children (4 years or over) as well as for infants and toddlers. Under 3 ½s experienced better overall quality of provision in rooms which also catered for older children (std $\beta = 0.39$, $p<0.001$). Analysis of the ITERS-R subscale scores showed that the elements of quality which improved with the presence of older children related to educational provision (i.e. activities, listening/talking and program structure). In a mixed age room, younger children are able to experience higher level language, communication and educational activities developed to meet the need of the older children. They are also able to interact with, and observe, children older than themselves. Thus, they have access to a richer and more stimulating environment than they would do in a room which catered only for children under the age of 3 ½. The quality of interactions (the warmth of relationships between staff and children, and between children) was not affected by age range, nor was the quality of personal care routines or provision for parents and staff.

Since previous research has shown that quality of provision as measured by the ITERS is a good predictor of children's development, this suggests that younger children may do better socially and educationally when they are able to mix with slightly older children. Chapter 5 considers the effects on children's behaviour i.e. do under 3 ½s attending mixed age rooms with older children do better socially than children in rooms providing only for younger children? An interesting topic for future research would be to consider educational outcome in each case – do children under 3 ½ who are mixed with older children do better educationally? And likewise, do older children who mix with younger children benefit from this mix, or are they negatively affected?

Which results were non-significant in the multiple regression?

A number of the initial relationships identified by univariate analysis were found to be less significant once other variables were taken into account. For example, the effect of a link to the Sure Start programme did not remain significant once sector had been taken into account. It is likely that the observed effect was due to the fact that centres in the maintained sector and joint projects (i.e. those of generally higher quality) were also more likely to be linked to Sure Start. In this case, it appears that the sector influence was more important than a link to Sure Start.

No relationship was found at any stage of the analysis between staff:child ratios and quality of provision. This may be because centres more or less observed the statutory limits, thus little variation in ratio was seen.

Finally, no relationship was found between the population of children and families served and quality of provision. This is an important finding and suggests that families from very different backgrounds, and with different needs, were being offered the same quality of provision.

5. EFFECTS ON CHILDREN'S BEHAVIOURAL DEVELOPMENT

5.1 Introduction

Chapters 3 and 4 presented the results of the Childcare Quality strand. This sub-study described the quality of provision in the 103 sample Neighbourhood Nurseries, as measured by the Infant Toddler Environment Rating Scale (ITERS-R) and the Caregiver Interaction Scale (CIS). In addition, a number of other centre characteristics (e.g. sector, qualifications of centre staff, centre size) were explored, with the aim of establishing which of these characteristics were related to, and predicted, quality of provision.

Chapter 5 presents the second element of this research – the Quality and Children's Behaviour strand. This sub-study considered 810 children (with a mean age of 2 years 9 months) attending the sample Neighbourhood Nurseries. The aim was to establish, after taking into account child and family background:

- The effect of provision quality on children's social and behavioural development;
- Which centre and childcare characteristics (in addition to quality) were related to children's social and behavioural development.

Information on children's social and behavioural development was collected using the Adaptive Social Behaviour Inventory or ASBI (Hogan et al, 1992). This instrument records information on children's behaviour across five dimensions:

- The ***co-operation and conformity*** subscale contains items such as 'is helpful to other children'.
- The ***peer sociability*** subscale contains items such as 'will join a group of children playing'.
- The ***confidence*** subscale contains items such as 'is open and direct about what s/he wants'.
- The ***anti-social*** subscale contains items such as 'is bossy/ needs to have his/her own way'.
- The ***worried and upset*** subscale contains items such as 'gets upset when you don't pay enough attention'.

Multiple regression analysis was used to explore which centre characteristics (including quality of provision) were most predictive of children's social behaviour, after taking into account the influences of child and family background. Possible influences on children's behaviour were grouped into the following categories:

- ***Child characteristics*** (e.g. gender, age, birthweight, special needs, ethnic group);
- ***Family characteristics*** (e.g. family structure and work status, number of siblings, age of mother/father/partner, age mother/father/partner left full time education, language spoken at home);
- ***Current childcare and childcare history*** *(*e.g. starting age at Neighbourhood Nursery, duration of time at NN, hours/ days per week in centre-based/ family/ childminder care, childcare history aged 1 to 2 years, childcare history under the age of 1);

- ***General centre characteristics*** *(*e.g. sector, Children's Centre status, links with Sure Start, centre size, staff:child ratios, age ranges of children catered for, staff qualifications, characteristics of the centre populations); and
- ***Quality of provision*****:**
    - Overall quality of provision (ITERS-R mean total)
    - Individual dimensions of quality (ITERS-R subscales):
        - Space and furnishings;
        - Personal care routines;
        - Listening and talking;
        - Activities;
        - Interaction;
        - Program structure;
        - Provision for parents and staff;
    - CIS 'positive relationships' subscale.

A full list of the predictor variables is given in section 2.2.

Multiple regression analysis was used to establish which characteristics of childcare were most predictive of children's social behaviour, after taking into account the influences of child and family background. Initial analysis was conducted on the whole sample i.e. 810 children. Once the significant influences on behaviour had been identified for the whole group, secondary analysis was conducted to establish whether the effects varied by age group. The 800 children for whom age data were available were split into two equal groups:

- 400 children aged 20 months to just under 33 months;
- 400 children aged 33 months to 42 months.

Further analysis was also conducted in order to explore in greater depth the effects of time spent in centre-based childcare. Children in the sample were divided into groups according to their weekly attendance, with the aim of identifying the 'tipping points' for each behavioural outcome. For example, how many hours per week did children in the sample need to spend in centre-based provision before they were rated as significantly more sociable by their caregivers? Groups were also created to according to the average number of hours children spent at their Neighbourhood Nursery each day, and according to the length of time they had been attending their Neighbourhood Nursery. These groups were entered separately into the regression model in order to establish when the time effect 'became' significant for each outcome.[25].

More specific details on the analysis conducted, including details of the groups created, are provided in section 2.3.

[25] In all analyses of time spent in centre-based provision, the family context was taken into account. This was necessary to ensure that any effects found were related to hours spent in centres, rather than factors relating to the types of family likely to use childcare more regularly (for example, families with different education and work statuses). Three variables were taken into account: household work status, mother age, and the age the mother left full time education. These variables were included in the tipping point analyses, even where no significant relationship with child behaviour had been found.

5.2 Characteristics of the sample

5.2.1 The children

The mean age of children in the sample was 33 months (2 years and 9 months) and there were similar proportions of girls (47%) and boys (53%). Just under one tenth of the sample (9%) had an identified special need, and a similar proportion (14%) had experienced medical problems during the first three months of life. Birthweights varied widely, ranging from a 16 ounce premature baby to a maximum of 215 ounces.

The majority - just over three quarters - of children were white (77%). One tenth (10%) were black, 8% were of mixed heritage, 4% Asian and 1% from other ethnic groups (including Chinese). Table A1.1 in Appendix 1 gives full details of the child characteristics.

5.2.2 The families

Just under three quarters of the children (72%) lived in a household with two adults – either with both parents, or with one parent plus the parent's partner. One quarter (26%) lived with a lone parent, while a small proportion (2%) had other household arrangements.

The majority of children came from small families, and were either only children (39%) or had one sibling (37%). Only a very small proportion (3%) had four or more siblings. Just over half of the sample (52%) were the first born child in the household.

The average age of mothers in the sample was 31 years, with fathers and partners slightly older on average (mean age 35 years). There was a broad range of educational experiences, with four mothers in the sample who left full time education at the age of 10 and, at the other end of the scale, a mother still in full time education at the age of 44. The average age for mothers to leave full time education was 18 (i.e. following A levels). The picture was similar for fathers, and for mothers' partners.

In terms of parent employment, almost all children (92%) lived in households with at least one working adult. Most mothers (82%) were working – 37% full time and 45% part-time. Around two thirds (69%) of children had a father (or parent's partner) who was working.

English was the main language spoken at home in almost all families (97%). This included families from ethnic minorities (e.g. Afro-Caribbean) as well as white families. Full details of the family characteristics are shown in Table A1.2 (Appendix 1).

5.2.3 Childcare

The age at which children in the sample started attending their Neighbourhood Nursery varied widely, from 3 months to 39 months. The mean starting age was 18 months (1.5 years). On average, the children in the sample had attended their Neighbourhood Nursery for 15 months prior to taking part in the study. This gives us confidence in attributing aspects of children's developmental status to their experiences in childcare.

Children in the sample spent an average of 24 hours per week at their Neighbourhood Nursery, and 25 hours per week in centre-based childcare as a whole (a very small

proportion – only 5% - attended more than one centre). Daily attendance ranged from 1 day to 5 days per week, with an average of 3.6 days per week. An estimate of the number of hours children attended their Neighbourhood Nursery each day was calculated by dividing the number of hours children attended each week by the number of days they attended: the average was 7 hours per day.

Two fifths of the sample (40%) were also cared for by grandparents, other friends or relatives in addition to their time in centre-based provision. However, very few (2%) were cared for by childminders.

Between the ages of 12 and 24 months, around three quarters (72%) of the sample were attending some form of centre-based provision. Just over one quarter (27%) were being cared for by relatives or family friends and, again, only a small proportion (5%) were cared for by childminders.

Although centre-based provision was less common during the first year of life, one third (33%) of children in the sample did attend a centre during this period, while two fifths (40%) were cared for by a relative, friend or childminder. Tables A1.3 and A1.4 in Appendix 1 give full details of childcare use within the sample.

5.3 Effects on children's behavioural development

Multiple regression analysis was used to establish which characteristics of childcare were most predictive of children's social behaviour, after taking into account the influences of child and family background. The following sections describe the effects of child and family characteristics, childcare attendance, general centre characteristics and provision quality on:

- Children's co-operation and conformity;
- Children's peer sociability;
- Children's confidence;
- Children's anti-social behaviour;
- Children's worried and upset behaviour.

5.3.1 Effects on children's co-operation and conformity

Child and family characteristics

As in previous research (Melhuish et al, 2001), child characteristics were found to be important predictors of children's co-operation and conformity. Staff at the Neighbourhood Nurseries rated girls as being significantly more co-operative than boys (std $\beta = 0.17$, $p<0.001$), and children with special educational needs as being less co-operative than their peers (std $\beta = -0.17$, $p<0.001$).

Older children were rated as being more co-operative than younger children (std $\beta = 0.30$, $p<0.001$). However, when the sample was split by age it was apparent that this effect applied only to the younger group. For children aged 2 years 9 months and over, age was not an important factor in determining their co-operative behaviour.

General centre characteristics

Several centre characteristics were identified as predictors of co-operative behaviour. Children from centres with a high proportion of workless families were rated as being less co-operative by centre staff (std $\beta = -0.14$, $p < 0.001$). Univariate analysis showed a weak effect of living in a workless household, but this did not hold up to rigorous checks during multivariate analysis. This suggests that attending a *centre* with high proportion of workless families may be more detrimental for children than living in a *household* with no working adults. However, the weaker effects at the individual household level may also be due to the low numbers of workless households (only 8% of the whole sample).

Involvement in the Children's Centre Programme was related to children's levels of co-operation. Children in Children's Centres were rated as being more co-operative by their caregivers (std $\beta = 0.15$, $p<0.001$) than children in centres not taking part in the programme. This effect was more important for younger children than for older – when the sample was split, no significant effect was found for the older age group.

Finally, children in larger centres (more full-time equivalent places) were rated as being less co-operative than children from smaller centres (std $\beta = -0.10$, $p<0.05$). This is an interesting result, as it apparently contradicts the finding that larger centres are of higher quality (section 4.6). The effect of centre size was relatively weak and was not significant for either age group when the sample was split by age, probably due to the reduction in sample size. The effect of centre size on children's behaviour is clearly a complex one, and further research is recommended to investigate this issue.

Staff qualifications

The qualifications of centre staff were related to children's behavioural outcomes, the strongest predictor being the presence of a qualified teacher, which had a positive influence on children's levels of co-operation and conformity (std $\beta = 0.12$, $p<0.01$). Children with access to a qualified teacher, either working in their room or as the centre manager, were rated as more co-operative than children without this experience.

The mean qualification level of staff working in the room observed also had a positive relationship with co-operative behaviour. However, this was a relatively weak effect and was only evident when Children's Centre status was removed from the regression model. Section 4.5 showed that there was a relationship between Children's Centre Status and staff qualifications. The fact that, when both of these variables are entered into the model together, it is Children's Centre status which remains significant suggests that the positive effect of Children's Centre status on children's behaviour is the result of a complex set of factors, only one of which is staff qualifications. Therefore, when these two effects 'compete' for explanatory variance, it is the Children's Centre effect which prevails.

Different staff qualifications were important within the different age groups. Teacher presence was significant for the older children but not the younger. This appears to suggest that teacher presence is more important for older children. However, very few (only 13) of the younger children had access to a teacher. This means it is not possible to conclude that teacher presence is not important for this age group – only that few within the younger sample had access to a qualified teacher. The mean qualification level of staff, on the other hand, was significant for the younger age group but not for the older children. This could suggest that, for children aged 2 years 9 months and over, a

specifically 'educational' qualification is more important than general qualification levels.

The qualifications of the nursery manager were not significantly related to children's co-operative behaviour.

Quality of provision
Mean overall quality (as measured by the ITERS-R) did not predict co-operative behaviour. However, a rather surprising result was found in relation to the 'personal care routines' subscale of the ITERS-R. Children in centres which scored highly on this subscale were rated as less co-operative (std $\beta = -0.12$, $p<0.01$), although this effect applied only to the older age group. A possible explanation is that, in centres where hygiene and care routines are paramount, less time and attention is paid to developing children's interactions and social behaviour. No effect of the CIS 'positive relationships' subscale was found.

The final regression models for co-operation and conformity are shown in Appendix 2 (A2.3).

5.3.2 Effects on children's peer sociability

Child and family characteristics
Staff at the sample Neighbourhood Nurseries rated girls as being significantly more sociable than boys (std $\beta = 0.14$, $p<0.001$), and children with special educational needs as being less sociable than those without SEN (std $\beta = -0.17$, $p<0.001$).

Older children were more sociable than younger children (std $\beta = 0.24$, $p<0.001$). However, when the sample was split by age, this effect applied only to the younger age group. For children 2 years 9 months and over, there was no effect of age on levels of sociability.

Children who lived in a household with at least one working adult were rated as more sociable than those who came from workless households (std $\beta = 0.11$, $p<0.01$). This effect was more important for the older children - when the sample was split by age, no significant effect was found for the younger age group.

The language spoken at home was also relevant - children whose family spoke a language other than English at home were rated as being less sociable with their peers (std $\beta = -0.12$, $p<0.001$).

Childcare attendance
The amount of time children spent in centre-based provision each week had a significant positive relationship with their levels of sociability. Both the number of hours children spent in centre-based provision (std $\beta = 0.14$, $p<0.001$) and the number of days each week that they attended[26] (std $\beta = 0.10$, $p<0.01$) had a positive relationship with their levels of sociability. This may be because children who spend more time every week at pre-school

[26] Daily attendance related only to Neighbourhood Nurseries (and not to time spent at other centre-based provision).

centres have greater opportunities to mix with their peers, and to practice their social skills, than those who attend for less time.

How long do children need to attend each week to see benefits in terms of their sociability? The results indicate that, when compared with children who attended less than 15 hours per week, children who attended 35 hours per week or more were rated as significantly more sociable by their caregivers. The 'tipping point' in terms of daily attendance was 5 days per week. This suggests that positive effects in terms of sociability are only seen with fairly substantial weekly attendance. When the sample was split by age, it became apparent that the effects of weekly attendance rates were only significant for the younger age group – the older children did not benefit from increased attendance (hours or days per week) in terms of their levels of sociability.

Interestingly, length of day (the number of hours children attended their Neighbourhood Nursery each day) was not related to children's levels of sociability. There were no significant differences between children who attended for long periods each day and those who attended for shorter days. However, the fact that very few of the children in the sample attended for short days (only 16% attended for fewer than 5 hours) means that these results should be interpreted with caution: there was not enough variability in the sample to accurately assess the effect of daily attendance on children's behaviour[27].

Neither the age at which children started at their Neighbourhood Nursery, nor the duration of time they had been attending, had a significant effect on their levels of sociability.

General centre characteristics
Children from larger centres (more FTE places) were rated as being less sociable than children from smaller centres (std $\beta = -0.09$, $p<0.05$). As with co-operative behaviour, this is a slightly unexpected result in view of the finding that larger centres are of higher quality (section 4.6). When the sample was split by age, the effect of centre size was not significant for the younger age group.

Staff qualifications
The presence of a qualified teacher on the staff had a positive influence on children's levels of sociability (std $\beta = 0.09$, $p<0.05$). It is likely that qualified teachers are more able to develop and extend children's attempts at communication, and provide more structured opportunities for peer interaction. When the sample was split by age, the effect of qualified teacher presence was not seen for the younger age group. However, as previously stated, this is likely to be due to the small numbers of younger children with access to a qualified teacher. No other qualification effects were identified in relation to children's sociability.

[27] In particular, there were very few children in the sample who attended for many short days each week, and also few children who attended for a small number of long days. Further exploration in a sample with greater variability in attendance is recommended.

Quality of provision
Mean overall quality (as measured by the ITERS-R) did not predict sociability for the sample as a whole. However, a number of quality effects were identified when the sample was split by age. Two of the ITERS-R subscales were significantly related to sociability for children aged 2 years 9 months and over. These older children's levels of sociability increased with the quality of the program structure (std $\beta = 0.26$, $p<0.001$). However, as with co-operative behaviour, a negative effect of personal care routines was identified – older children in centres which scored more highly on the personal care routines subscale were rated as less sociable than children in centres which scored lower on this subscale (std $\beta = -0.27$, $p<0.001$). A similar explanation is suggested: staff in centres which pay close attention to hygiene and care routines spend less time and attention developing children's interactions and social behaviour. No effect of the CIS 'positive relationships' subscale was found.

The final regression models for peer sociability are shown in Appendix 2 (A2.4).

5.3.3 Effects on children's confidence
The predictors of children's confidence were very similar to those identified for peer sociability: both child characteristics (such as gender, age and special needs) and the time spent each week in centre-based provision were important.

Child and family characteristics
Staff at the Neighbourhood Nurseries rated girls as being significantly more confident than boys (std $\beta = 0.09$, $p<0.05$). This difference became more apparent with age - when the sample was split, gender was significant for the older age group but not for the younger[28].

Children with special educational needs were rated as being less confident than those without SEN (std $\beta = -0.14$, $p<0.001$). Older children were more confident than younger children (std $\beta = 0.16$, $p<0.001$). However, when the sample was split by age, this effect only applied to the younger age group. For children aged 2 years 9 months and over, there was no relationship between age and confidence.

Finally, for the older children in the sample, birthweight was related to confidence - children who were heavier when they were born were rated as more sociable than children with low birthweights (std $\beta = 0.20$, $p<0.001$).

Childcare attendance
The time children spent in centre-based provision each week had a significant positive effect on their levels of confidence. As with peer sociability, both the number of hours per week children spent in centre-based provision (std $\beta = 0.14$, $p<0.001$) and the number of days each week that they attended[29] (std $\beta = 0.09$, $p<0.01$) had a positive relationship with their levels of confidence. Children who attended for more time each week were rated as more confident by caregivers than those who attended for less time.

[28] This may have been partially due to the reduced sample size, as the standardized beta was similar for the whole group and for the younger age group.
[29] Daily attendance related only to Neighbourhood Nurseries (and not to time spent at other centre-based provision).

The 'tipping point' was also similar to that identified for peer sociability[30]. When compared with children who attended less than 15 hours per week, children who attended 35 hours per week or more were significantly more confident. When compared with children who attended 1 or 2 days per week, children who attended for 5 days per week were significantly more confident. There was no significant difference in confidence for children who attended 3 or 4 days per week. Again, as with peer sociability, the effects of time spent in centre-based provision each week were only seen for the younger age group. Older children's confidence was not significantly affected by the amount of time they spent in group childcare.

Length of day (the number of hours children attended their Neighbourhood Nursery each day) also had a positive effect on their confidence: children who spent a greater number of hours per day at their centres were more confident than children who spent fewer hours each day attending (std $\beta = 0.10$, $p<0.01$). This effect was identified for the whole sample, but was not apparent for either group when the sample was split by age. Splitting the sample into groups according to average daily attendance showed that, when compared with children who attended less than 5 hours per day on average, children who attended for 9 hours or more were significantly more confident: the positive effects were only seen at very high levels of daily attendance. However, these results should be interpreted with caution. The children in the sample were relatively high attenders: average daily attendance was 7 hours, and only 16% of the sample attended for fewer than 5 hours each day on average. Thus, the lower end of the range is not well represented. Further exploration in a sample with greater variability in attendance, and for which data on actual (rather than derived) daily attendance has been collected is recommended.

Neither the age at which children started at the Neighbourhood Nursery, nor the duration of time they had been attending had a significant effect on children's confidence.

Staff qualifications
Staff qualifications did not have a significant impact on children's confidence.

Quality of provision
Mean overall quality (as measured by the ITERS-R) did not predict confidence for the sample as a whole. However, as with the results for co-operative behaviour and peer sociability, a negative relationship with the quality of personal care routines was identified for the older age group (std $\beta = -0.11$, $p<0.05$). No effect of the CIS 'positive relationships' subscale was found.

The final regression models for confidence are shown in Appendix 2 (A2.5).

5.3.4 Effects on children's anti-social behaviour
For the sample of children in the study, childcare and centre characteristics were more important in predicting anti-social behaviour than were child or family variables. One possible explanation is the relatively small range in demographics i.e. the majority of children came from disadvantaged families.

[30] See section 2.3 for a more detailed description of the 'tipping point' analysis.

Child and family characteristics
Mother age had a significant influence on children's anti-social behaviour: children with older mothers were less anti-social than those with young mothers (std $\beta = -0.10$, $p<0.01$). This effect was only apparent for the older age group once the sample was split.

Childcare attendance
In contrast to the positive influence of centre-based provision on children's sociability and confidence, it seems that the amount of time children spend in their childcare centres can also increase problem behaviour. Both the number of hours children spent in centre-based provision (std $\beta = 0.19$, $p<0.001$) and the number of days each week that they attended[31] (std $\beta = 0.19$, $p<0.001$) had a positive relationship with levels of anti-social behaviour. Children who attended for more time every week were rated as more anti-social by their caregivers than those who attended for less time. This effect was found for the group as a whole, and for both the younger and the older age group independently.

More detailed analysis was carried out to establish the relevant 'tipping points' in terms of weekly hours/days of attendance[32]. When compared with children who attended for less than 15 hours per week, children who attended for 30 hours or more each week were significantly more anti-social. The 'tipping point' for daily attendance appears to be relatively low in relation to anti-social behaviour. When compared with children who attended either 1 or 2 days per week, children who attended for 3 days per week or more were significantly more anti-social.

Length of day (the number of hours children attended their Neighbourhood Nursery each day) was not related to children's levels of anti-social behaviour: there were no significant differences between children who attended for shorter days, and those who attended for long periods. However, the fact that very few of the children in the sample attended for short days (only 16% attended for fewer than 5 hours) means that these results should be interpreted with caution: there was not enough variability in the sample to accurately assess the effect of daily attendance on children's behaviour[33].

For the group as a whole, the number of months children had been attending their Neighbourhood Nursery also had an impact. The longer they had been attending their Neighbourhood Nursery, the more anti-social they were (std $\beta = 0.14$, $p<0.001$). Further analysis suggested that, when compared with children who had been attending their Neighbourhood Nursery for less than a year, children who had been attending for 18 months or more were rated as significantly more anti-social. When the sample was split by age, this effect was stronger for the older children than for the younger (the significant effect was lost for the younger age group). This is not surprising, since the younger children were less likely to have been attending their Neighbourhood Nursery for a long period of time.

---

[31] Daily attendance related only to Neighbourhood Nurseries (and not to time spent at other centre-based provision).
[32] See section 2.3 for a more detailed description of the 'tipping point' analysis.
[33] In particular, there were very few children in the sample who attended for many short days each week, and also few children who attended for a small number of long days. Further exploration in a sample with greater variability in attendance is recommended.

The age at which children started attending their Neighbourhood Nursery did not have a significant influence on their levels of anti-social behaviour. Therefore, it is not the age at which children start at their centres which is important, but the cumulative number of months they attend, and the amount of time they spend in centre-based provision each week.

General centre characteristics
Children from centres with a high proportion of workless households were rated as being more anti-social by centre staff (std $\beta = 0.08$, $p < 0.05$)[34]. This ties in with the finding for co-operative behaviour[35], and confirms the theory that attending a centre with a high proportion of workless families has a negative effect on children's social behaviour. Interestingly, this effect did not appear to hold true at the individual level – children living in workless households were not significantly more anti-social than children living with a working adult. Thus, the employment status of peer families may be more important than the employment status of the child's own family.

Children from larger centres were rated as being less anti-social than children from smaller centres. This was the case both for the number of children registered (std $\beta = -0.09$, $p<0.05$) and for the number of full time equivalent places (std $\beta = -0.12$, $p<0.01$). This ties in with the finding that larger centres offer higher quality provision (section 4.6).

Staff qualifications
When all children were considered together, the level of staff qualifications did not have a significant relationship with their levels of anti-social behaviour. However, when the groups were split by age an interesting effect became apparent. The qualifications of the nursery managers appeared to have a significant positive relationship with anti-social behaviour for the older children (std $\beta = 0.11$, $p<0.05$) – but a significant *negative* relationship with anti-social behaviour for the younger age group (std $\beta = -0.13$, $p<0.05$). Centres with better qualified managers had younger children who were *less* anti-social, but older children who displayed *more* of these behaviours. This is a puzzling finding, which requires further research.

Quality of provision
Quality, as measured by the ITERS-R and the CIS, did not predict anti-social behaviour for the sample as a whole, nor for the different age groups.

The final regression models for anti-social behaviour are shown in Appendix 2 (A2.6).

5.3.5 Effects on children's worried and upset behaviour
For children attending Neighbourhood Nurseries, their patterns of attendance and the characteristics of their childcare centre were more important in predicting their worried and upset behaviours than either child or family traits.

[34] When the samples were split, this effect was only seen for the younger children.
[35] Children from centres with a high proportion of workless households were rated as less co-operative by their caregivers (see section 5.3.1).

Childcare attendance
The more time children spent at their Neighbourhood Nursery each week, the more worried and upset they were. Both the number of hours children spent in centre-based provision (std $\beta = 0.15$, $p<0.01$) and the number of days each week that they attended[36] (std $\beta = 0.19$, $p<0.001$) had a positive relationship with the levels of worried and upset behaviours they displayed.

Further analysis was carried out to identify the 'tipping point' – the point at which time spent in childcare began to have a significant effect on children's worried and upset behaviour. When compared with children who attended less than 15 hours per week, children who attended 35 hours per week or more were significantly more worried and upset. When compared with children who attended 1 or 2 days per week, children who attended for 5 days a week were significantly more worried and upset. There was no significant difference in behaviour for children who attended 3 or 4 days per week. As with several of the other behavioural outcomes, these effects on worried and upset behaviour were only seen for the younger age group – the older children were not significantly affected by the amount of time they spent in centre-based childcare.

Daily attendance rates (the number of hours children attended their Neighbourhood Nursery each day) were not related to children's levels of worried and upset behaviour. There were no significant differences between children who attended for long days and those who attended for shorter periods each day. However, as has been noted previously, the fact that the majority of children attended for a relatively long period each day means that this sample may not be appropriate for accurately assessing the effect of length of day on children's behaviour (see section 5.3.2 for further details).

Neither the age at which children started at the Neighbourhood Nursery, nor the duration of time they had been attending, had a significant effect on worried and upset behaviour.

General centre characteristics
Children in the sample were more worried and upset in rooms which catered for older children (aged 4 or over) as well as for the younger age range (std $\beta = 0.10$, $p<0.05$). However, this effect was not strong enough to be retained when the sample was split into age groups.

Children attending centres with a large proportion of families living in deprived postcode areas were rated as less worried and upset by their caregivers (std $\beta = -0.12$, $p<0.05$). This may be due to the fact that staff working in deprived areas are more used to children and families experiencing problems, and that their ratings are affected by what they consider to be normal. When the sample was split by age group, this effect was only significant for the older children.

As with anti-social behaviour, centre size was related to children's worried and upset behaviours, with children from larger centres displaying fewer of these behaviours than children from smaller centres. This was the case both for the number of children registered (std $\beta = -0.11$, $p<0.05$) and the number of full time equivalent places

[36] Daily attendance related only to Neighbourhood Nurseries (and not to time spent at other centre-based provision).

(std β = -0.16, $p<0.01$). This ties in with the finding that larger centres offer higher quality provision (section 4.6).

Staff qualifications
Children in rooms with a better qualified staff team were significantly less worried and upset than those in rooms where the mean qualification level was lower (std β = -0.10, $p<0.05$). Splitting the sample by age revealed that this effect was more important for the older children – no significant effect was found for the younger age group. No other qualification variables were significantly related to children's levels of worried and upset behaviour.

Quality of provision
The provision of a high quality physical environment was important – children in centres which scored highly on the ITERS-R 'space and furnishings' subscale were significantly less worried and upset (std β = - 0.10, $p<0.05$). Centres which did well on this subscale offered children a spacious, well maintained and pleasant physical environment, with appropriate furniture for care routines and educational activities, as well as comfortable areas for children to relax and spend quiet time. However, this effect was not strong enough to remain when the sample was split by age (possibly due to reduced sample sizes). No effect of the CIS 'positive relationships' subscale was found.

The final regression models for worried and upset behaviour are shown in Appendix 2 (A2.7).

6. CONCLUSIONS

This report presents the results of two analyses. The first of these considered the 103 sample Neighbourhood Nurseries at the centre level and described overall quality of provision. It also considered a number of centre characteristics (for example, sector, qualifications of centre staff, centre size), with the aim of establishing which of these characteristics were related to, and predicted, quality of provision. The conclusions of this Childcare Quality strand are presented in section 6.1.

The second analysis was carried out at the child level, and considered 810 children attending the sample Neighbourhood Nurseries. This analysis aimed to establish, after taking into account child and family background:

- The effect of provision quality on children's behaviour;
- Which centre and childcare characteristics (in addition to quality) were related to children's behaviour.

The results of this second analysis on children's behavioural development are summarised in the following sections:

- Section 6.2 The effect of quality on children's behaviour;
- Section 6.3 The effect of other centre characteristics on children's behaviour;
- Section 6.4 The effect of time spent in centre-based childcare on children's behaviour;
- Section 6.5 The effect of child and family characteristics on children's behaviour.

Finally, section 6.6 presents an overall summary of the findings.

6.1 Quality of provision

Overall quality of provision varied widely across the sample: while some centres were offering a good-to-excellent standard of provision, others were of poor quality. The vast majority of Neighbourhood Nurseries were offering at least adequate quality of provision for children under the age of 3 ½. Most (70%) of the rooms observed were rated as adequate (above minimal but below good). Around one quarter (23%) of the rooms observed offered a good standard of provision. These centres provided children with a nurturing, educationally stimulating and healthy environment. A small proportion (7%) offered less than minimal quality. These centres were missing basic elements of quality provision such as hygiene, safety, educational stimulation and warm staff-child interactions. On the whole, providers in the maintained sector offered the highest quality of provision. The private sector had the lowest mean quality rating, but also displayed the broadest variation in quality, with some centres operating at a very high standard.

Neighbourhood Nurseries were the most successful at providing children with pleasant and appropriate staff-child interaction – they offered good quality provision in this regard. Interactions were warm and respectful; staff helped children to develop appropriate behaviour with their peers, and employed appropriate levels of supervision and positive discipline strategies. The sample centres did less well at providing hygienic and appropriate care routines such as meal times, toileting and naps. The provision of stimulating educational activities was also limited. For example, many centres did not provide opportunities for children to explore natural materials, or use everyday events

such as the weather to help children develop their understanding of nature and their environment. This finding is of particular concern, as the provision of educational opportunities during the pre-school years is related to later school success.

The most important predictors of provision quality were identified as:

- Sector;
- Children's Centre status;
- Centre size;
- The ages of children catered for;
- Staff qualifications.

Sector

Local Authority (LA) maintained provision offered the most stimulating environment for children's developing language and educational abilities, as well as the highest quality physical environment. This confirms the findings of the EPPE project (Sylva et al, 2004), which concluded that quality of provision for 3 – 5 year olds was highest in the maintained sector. This effect can partly be explained by variation in staff qualifications between the sectors – the maintained sector had the most qualified workforce, while the private sector had the lowest staff qualification levels. This explanation is supported by the finding that staff qualifications are directly related to quality of provision (see below), as well as to children's behaviour (see section 6.3). Pre-school centres in the maintained sector also have access to the 'educational infrastructure' and support systems, for example curricular and pedagogical input to planning and access to specialist staff (e.g. speech and language therapists, educational psychologists). In addition – although not considered by this study – variations in working conditions and pay may contribute to the differences in quality between sectors.

Children's Centre status

Neighbourhood Nurseries which were also main Children's Centres offered higher quality provision than centres with no involvement in the programme. It is difficult to establish to what extent there is a positive effect of taking part in the programme, and to what extent centres which were already of a high quality were selected to become Children's Centres. Whatever the combination of factors, the Children's Centres programme appears to be offering good quality provision. As with the maintained sector, one factor behind this positive effect may be the qualifications of centre staff – Children's Centres had a more qualified workforce than centres not involved in the programme.

Looking in more depth at the individual dimensions of quality, the nurseries involved in the Children's Centre Programme offered higher quality staff-child interactions, and higher quality program structure (e.g. opportunities for free play, and appropriate group activities) than centres not taking part. However, there were no differences in the quality of educational activities, or in provision for children's developing language and communication. It is important to bear in mind that the Children's Centres visited as part of the current evaluation were very early openers (the first Children's Centres were only designated in summer 2003). Although staff in Children's Centres were on the whole better qualified than in non-Children's Centres, we do not have any information on how they were being deployed during these very early stages of the programme. It is possible that early efforts were being channelled into setting up integrated provision and that

greater strength in educational quality might have been observed if centres had been visited at a later time.

Centre size

The larger Neighbourhood Nurseries (in terms of the number of children registered) offered a higher overall quality of provision and, in particular, higher quality in relation to personal care routines, language (listening/talking), program structure and provision for parents and staff. Economies of scale mean that larger centres are able to offer a greater range of resources and facilities for children. It is also likely that they are able to offer facilities for staff and parents which the smaller centres would find prohibitively expensive (e.g. parent meeting rooms, large staffrooms with food preparation facilities). Larger centres with a bigger staff base are more able to provide cover for staff members to attend training events, and may find it easier to set aside the resources required for staff training and professional development. In addition, the larger centres are likely to have a larger staff base, with a richer and more diverse adult social environment and a broader range of experiences and interests to draw on when specialist knowledge is required. However, the Quality and Children's Behaviour Study found that centre size had a complex relationship with children's behaviour (see section 6.3), with larger centres offering some advantages, but also some disadvantages.

Age of children

Many of the rooms observed provided for older children as well as for infants and toddlers. Quality scores were significantly higher in these mixed age groups than in rooms which provided only for infants and toddlers. This supports previous research, for example the NICHD study (1996), which found that children in classrooms providing only for infants and/or toddlers received less positive care-giving than infants in mixed age rooms. The dimensions which improved with the presence of older children included activities, language (listening and talking) and program structure – that is, the aspects related to educational provision. Thus, younger children experienced better quality of provision in rooms with clear and 'stretching' aims for children's development. In a mixed age room, they were able to experience higher level language, communication and educational activities developed to meet the need of the older children. Younger children also had the opportunity to interact with, and model the behaviour of, more mature peers. Thus, they had access to a richer and more stimulating environment than they would have experienced in a room which catered only for infants and toddlers. However, the presence of older children was not always beneficial for the younger ones in terms of behavioural outcomes (see section 6.3).

Qualifications

The qualifications of staff working with infants and toddlers had a significant positive relationship with quality of provision, although it was difficult to separate the effect of qualifications from the effects of sector and Children's Centre status. It is likely that staff qualifications are one of several factors which contribute towards the higher quality of provision offered by the maintained sector, and by Children's Centres. The results suggest that a better qualified workforce provides a more stimulating environment for children's developing communication, and a more appropriate environment in terms of the daily schedule: opportunities for free play, group activities and provision for children with special needs.

The qualifications of the centre managers were also important, and were related to overall quality of provision in the infant and toddler rooms (although not to any individual dimensions of quality). There was no significant relationship between quality and the proportion of staff unqualified. This suggests that it is not the avoidance of unqualified staff which raises quality, but an overall attention to providing a well qualified workforce.

The one surprising finding was that the presence of a qualified teacher did not appear to have a direct effect on quality, despite this being an important factor in predicting children's social behaviour (see section 6.3). It is likely that this was due to the differences in sample sizes in the two analyses. The sample size for the quality analysis was 103 centres, whereas the sample size for the child level analysis was 810 children, making it much easier to show significant effects. The lack of qualified teachers is an interesting finding in itself. The Implementation Study found that only 10% of their sample employed a 0.5 FTE qualified teacher. The Childcare Quality results reveal that even fewer nurseries (2%) have teachers working 10 hours or more with children under the age of 3 ½ years. This is particularly relevant in light of the findings of the Quality and Children's Behaviour strand (section 6.3), which suggest that employing qualified teachers to work with children under the age of 3 ½ has a significant impact on children's developing co-operation and other peer skills.

Does quality vary by level of disadvantage?
No relationship was found between the population of children and families served and quality of provision. This is an important finding and suggests that families from very different backgrounds, and with different needs, were being offered the same quality of provision.

Table 6.1 summarises the findings of the Childcare Quality strand:

Table 6.1 Summary of results: contributors to quality of provision

	ITERS-R mean total	Space/ furnish-ings	Personal care routines	Listen-ing/ talking	Activities	Interact-ion	Program structure	Parents and staff
Maintained status	✓	✓		✓	✓		✓	
Children's Centre status	✓					✓	✓	
Mean qualification level	✓			✓			✓	
Nursery manager qualification	✓							
Centre size	✓		✓	✓			✓	✓
Children 4yrs or over in group	✓			✓	✓		✓	

6.2 The effects of quality on children's behaviour

The identified effects of quality on children's behaviour were significant but modest. Overall quality of provision in the sample Neighbourhood Nurseries (mean total ITERS-R scores) was not significantly linked to children's behaviour, and there was no significant effect of staff-child interaction as measured by the Caregiver Interaction Scale. However, a number of effects were identified for the *individual* dimensions of quality measured by the ITERS-R subscales.

- The quality of the physical environment was important. Children displayed significantly fewer worried and upset behaviours in centres which offered a spacious, well maintained and pleasant physical environment, with appropriate furniture for care routines and educational activities, and comfortable areas for children to relax and spend quiet time. This study confirms the findings of the EPPE project, which concluded that quality provision can reduce some of the negative behaviours associated with attending centre-based provision.
- The structure of the day was related to older children's levels of sociability. Children aged between 33 and 42 months were more sociable in centres which scored highly on the 'program structure' subscale of the ITERS-R. These centres offered a predictable yet flexible daily schedule, many opportunities for free play and high quality group play activities. The children attending them were more likely, for example, to say nice or friendly things to others (ASBI item 12) or play games and talk with other children (ASBI item 19) than children in centres which offered lower quality program structure.
- An interesting effect was found in relation to the quality of routine care. When the sample was split into age groups, the older age group displayed a negative relationship between the 'personal care routines' subscale of the ITERS-R and children's co-operative behaviour, social skills and confidence. Children in centres which scored highly on this subscale were rated as less co-operative, less sociable and less confident. It could be that, in centres where hygiene and care routines are paramount, less time and attention is paid to developing children's interactions and social behaviour. For example, children in these centres were less likely to understand the feelings of others (ASBI item 1), to be calm and easy going (item 18), or to be confident with other people (item 22).

Thus, quality of provision appears to have a relatively modest relationship with children's social and behavioural development. Although many of the studies highlighted in the literature review suggested a link between quality and child outcomes, other research (e.g. Kontos, 1991; Deater-Deckard et al, 1996) has found a minimal impact of quality on child behaviour. In both the Cost, Quality and Child Outcomes study and the EPPE project, relationships with quality were - although statistically significant - modest. EPPE found stronger relationships between quality and *cognitive* outcomes.

A possible reason for the modest relationships found between quality and children's behaviour may lie in the instruments chosen to measure quality. Peisner-Feinberg et al, (1997, 2001) found that observed classroom practices were more strongly linked to language and cognitive skills, while social skills were more related to the closeness of the teacher-child relationship. All of the instruments used in this study measure observed *global* quality i.e. quality of provision for a group of children. It may be that measures

which are more sensitive to the *individual relationships* between caregivers and children are required to further investigate the links between quality of caregiving and children's social and behavioural development.

A further confounding influence may be the fact that research studies must generally rely on staff members to provide information on children's social behaviour. It would be very difficult for an external observer, one who did not know the children in question, to visit a centre for a short period of time and complete an accurate assessment of children's social behaviour. Asking staff members to complete these social behaviour profiles ensures that the information is provided by someone who knows the child well, and has had the opportunity to observe their behaviour over a substantial period of time. However, it also means that data collection is open to potential differences in the way this information is collected, and in the criteria used by staff to make judgements. If, for example, staff members in poor quality centres are less aware of what is appropriate in terms of social behaviour, they may rate children as more co-operative, sociable and confident – and less anti-social and worried/ upset – than caregivers in high quality centres who are more demanding in their expectations. Thus, a positive impact of quality on children's social behaviour would be masked. This study does not propose an answer to this dilemma, but raises it as a possible issue to consider for future studies exploring the relationships between quality of provision and children's social development.

6.3 The effects of other centre characteristics on children's behaviour

In addition to provision quality (as measured by the ITERS-R and the CIS), a number of additional centre characteristics were tested for effects on children's behaviour. The first to be considered here are those which were shown (in Section 6.1) to relate to provision quality:

- Sector;
- Children's Centre Status;
- Staff qualifications;
- Centre size;
- Ages of children catered for.

Other centre characteristics tested as part of the analysis included, for example, the population characteristics of children and families served by the sample Neighbourhood Nurseries, staff-child ratios in the rooms observed, and group sizes. A full list of the centre characteristics considered is provided in Chapter 4, and only those which were related to children's behavioural outcomes are reported here.

Sector and Children's Centre Status
Involvement in the Children's Centre Programme had a positive relationship with children's co-operative behaviour, particularly for the younger age group. Children under 2 years 9 months attending Children's Centres were more co-operative than their counterparts in centres not involved in the Children's Centre Programme.

No specific effect of sector was identified in relation to children's social and behavioural development, despite maintained status being identified as an important predictor of centre quality. This apparent contradiction is not surprising when we consider the specific quality subscales on which the maintained sector excelled. Maintained centres provided

significantly higher quality in those domains related to *educational* provision - thus, we would expect to see an impact on children's cognitive outcomes but not necessarily on their social behaviour.

Staff qualifications (often called an aspect of 'structural quality')
In general, the findings echo previous research in identifying the importance of high quality staffing for both the provision of high quality caregiving and for child outcomes (Melhuish et al, 2000; NICHD, 1999b/ 2000; Peisner-Feinberg and Burchinal, 1997). They also confirm the findings of the EPPE project, which concluded that employing a highly qualified staff team can reduce some of the negative behaviours associated with attending centre-based provision.

The qualifications of centre staff were related to children's social and behavioural development. Particularly important were the presence of a qualified teacher, and the mean qualification level of staff working with the infants and toddlers[37]. Children with access to a qualified teacher (either working in their room or as the nursery manager) were significantly more co-operative and sociable than children without access to a trained teacher. These children were more likely to share their toys or possessions (ASBI item 20), say 'please' and 'thank you' when reminded (item 16) or be sympathetic towards other children's distress (item 7). It is likely that qualified teachers are more able to develop and extend children's attempts at communication, and provide more structured opportunities for social interactions. When the sample was split by age, the effect of qualified teacher presence was not seen for the younger age group. This appears to suggest that teacher presence is more important for older children. However, very few (only 13) of the younger age group had access to a teacher. This means it is not possible to conclude that teacher presence is not important for the younger children – only that few had access to a qualified teacher.

Children in rooms with high mean staff qualification levels were more co-operative and displayed fewer worried and upset behaviours than children cared for by less well qualified staff teams. For example, they were more likely to follow rules in games (item 5), and more likely to accept changes without fighting against them or becoming upset (item 25). The effect of staff qualifications on co-operative behaviour appeared to be more important for the younger age group, while the effect on worried and upset behaviour was more important for the older children. Finally, centres with better qualified managers had younger children who were less anti-social, although this effect was not found for the older children in the sample.

Centre size
The Childcare Quality strand had identified centre size as a predictor of provision quality, with the larger Neighbourhood Nurseries offering higher quality provision. Children in larger centres (number of FTE places and number of children registered) were also less anti-social and displayed fewer worried and upset behaviours than children in smaller centres. For example, they were less likely to tease other children or call them names (item 21), or get upset when not paid enough attention (item 6). However, the picture was not the same for positive behaviours. Centre size had a *negative* relationship with children's co-operation and sociability i.e. children in larger centres displayed fewer of

[37] Staff working 10 hours or more per week with the children.

these behaviours than children in smaller centres. The effect of centre size on children's behaviour is clearly a complex one. It is possible that larger centres show lower rates of anti-social behaviour because they have more explicit procedures for dealing with children's negative behaviours, in comparison to smaller centres which may operate more *ad hoc* and informal approaches to discipline. However, large centres may also be rather overwhelming for young children, who are just beginning to develop their social skills.

Age range
The age range of the rooms had a weak but significant relationship with children's worried and upset behaviour. Children under the age of 3 ½ years displayed more worried and upset behaviours when they attended a mixed age room with children aged 4 years and over. In mixed groups, they were more likely to frown, shrug, pout or stamp their feet when given an idea for playing (item 4), or to be worried about not getting enough attention, or access to toys, food or drink (item 28). This is particularly interesting, since mixed age rooms were rated as being of higher quality. In-depth analysis of quality showed that the elements of provision which improved with the presence of older children related to *educational* provision. Thus, mixed age rooms may be better for children in terms of cognitive outcomes, but not in terms of behavioural outcomes.

Workless households
Attending a centre with a high proportion of working families had a positive relationship with children's behaviour. Children in centres with high proportions of workless households were less co-operative and more anti-social than children from centres with high proportions of working households (families with at least one employed adult). In fact, attending a *centre* with a high proportion of children from working households had more of an effect on anti-social behaviour than the child's own family employment status. Only one employment effect was found for the child's own family - children living in houses with at least one working adult were more sociable with their peers than those living in workless families (and this effect was stronger for the older age group than for the younger). This evidence provides strong support for the aims of the Neighbourhood Nurseries Initiative, and suggests that encouraging parents to return to work will have positive benefits for children.

6.4 The effects of time spent in centre-based childcare on children's behaviour

Attending centre-based provision had a number of positive effects on children's behaviour. The more time (hours and days) that children spent each week at a childcare centre, the more confident they were, and the more sociable they were with their peers. Staff in the sample centres rated them as more likely to say nice or friendly things to others (ASBI item 12) or to join a group of other children playing (item 13), and as more confident with other people (item 22). This confirms the findings of the EPPE project (Melhuish et al, 2001) in showing that time spent in centre-based provision before the age of 3 can be beneficial for young children in terms of developing and displaying positive behaviour traits. Children who spend more time each week at a pre-school centre have greater opportunities to mix with other children, and to become confident in their social skills, than those who attend for less time. Additional analysis was carried out to establish how much time children need to spend in centres to see significant benefits in terms of their social behaviour and confidence. The results suggest that the 'tipping point' is around 35 hours and/or five days attendance i.e. almost full-time.

Attending centre-based provision also had a number of less positive relationships with children's behaviour. Children who attended for at least 30 hours and/or 3 days each week were rated as more anti-social, for example more likely to tease other children and call them names (ASBI item 21), prevent other children from carrying out routines (item 23) or be bossy and need their own way (item 29). Children who attended for at least 35 hours and/or 5 days each week displayed more worried and upset behaviours[38].

A further interesting finding was that the effect of time spent in centre-based provision was more important for the younger children in the sample than for the older children. When the sample was split by age, the effects of hours and days attended each week on sociability, confidence and worried/ upset behaviour were significant only for the younger half of the sample i.e. children under 2 years 9 months. However the effect on anti-social behaviour was significant for both age groups, and this suggests that intensity of child care (measured in hours/days per week) is relevant for children up to the age of 3½ years.

Length of day (the number of hours children attended their Neighbourhood Nursery each day) did not appear to be detrimental: there were no significant differences between children who attended for long periods each day and those who attended for shorter days in terms of co-operative behaviour, peer sociability, anti-social behaviour or worried/ upset behaviour. A significant effect was seen on children's levels of confidence, but only at very high levels of daily attendance (in comparison to children who attended less than 5 hours per day on average, children who attended for 9 hours or more were significantly more confident). However, this sample was not the most appropriate for assessing the effect of length of day, and these results should be interpreted with caution[39].

Duration of childcare during the early years also had a statistically significant effect – the longer children had been attending their Neighbourhood Nursery, the more likely they were to display anti-social behaviours. When the sample was split by age, this effect was only seen for the older children. This may be because the younger children had not been attending for long enough for an effect to be identified. Interestingly, the age at which children started attending their Neighbourhood Nursery did not have an impact on their behaviour (either positive or negative). Thus, it is not the age at which children start at their centres which is important, but the cumulative number of months they attend, and the amount of time (hours and/or days) they spend in centre-based provision each week.

---

[38] The high attenders rated as more co-operative, sociable and confident were not usually the same children who were rated as more anti-social or worried/ upset by their caregivers. In fact, inter-correlations between the sub-scales of the ASBI generally show small (≤0.22) or non-significant relationships between positive behaviours (such as peer sociability) and negative ones (such as anti-social behaviour). Thus, some children showed increased positive behaviours with time spent in centre-based care while others showed increased negative behaviours. Inter-correlations between the ASBI subscales are shown in Appendix 2 (A2.8).

[39] The children in the sample were relatively high attenders: average daily attendance was 7 hours, and only 16% of the sample attended for fewer than 5 hours each day on average. In particular, there were very few children in the sample who attended for many short days each week, and also few children who attended for a small number of long days. Further exploration in a sample with greater variability in attendance, and for which data on actual (rather than derived) daily attendance has been collected is recommended.

These results support the findings of previous large-scale research studies, such as the EPPE project (Melhuish et al, 2001) and the US NICHD study (NICHD, 2003), which found both positive and negative behaviour effects of time spent in centre-based provision. The 'tipping points' identified (i.e. the number of hours/months of childcare beyond which a statistical effect is shown) are similar to those identified by the NICHD study (NICHD, 2005).

6.5 Child and family influences on children's behaviour

In line with previous research, children's positive behaviours were most strongly predicted by child and family characteristics (Melhuish et al, 2001; NICHD, 1998b) – although negative behaviours were more strongly related to childcare experiences and centre characteristics. In general, girls displayed more positive behaviours than boys, and older children were rated as being more confident, sociable and co-operative than younger children (although when the sample was split, this age effect applied only to the younger group). For children between 2 years 9 months and 3 ½ years, age was not important in relation to their positive behaviours.

Perhaps not surprisingly, children with special needs were rated by their caregivers as being less sociable with their peers and less confident than children without special needs. Children for whom English was not the first language spoken at home were also rated as less sociable with their peers. This points to a need for these children to be supported in developing their interactions with other children, helping them to become confident communicators. There was also a relationship between birthweight and confidence – children in the older age group (2 years 9 months to 3 ½ years) with lower birthweights were considered to be less confident.

Finally, a relationship between anti-social behaviour and mother age was identified, with children of younger mothers rated as more anti-social by their caregivers.

Table 6.2 summarises the findings of the Quality and Children's Behaviour Study.

Table 6.2 Summary of results: influences on children's behavioural development

	Co-operation/ conformity	Peer sociability	Confidence	Anti-social behaviour	Worried/ upset behaviour
Child					
Gender (girls vs boys)	+	+	+ (O)		
Age	+ (Y)	+ (Y)	+ (Y)		
Birthweight			+ (O)		
Special need	-	-	-		
Family					
Working adult in household		+ (O)			
Language other than English spoken at home		-			
Age of mother				- (O)	
Childcare					
Hours/days per week in centre-based provision		+ (Y)	+ (Y)	+	+ (Y)
Average hours per day at Neighbourhood Nursery			+		
Months spent at Neighbourhood Nursery				+ (O)	
Centre					
Children's Centre status	+ (Y)				
Centre size	-	- (O)		-	-
Proportion of families living in deprived postcodes					- (O)
Proportion of workless families	-			+ (Y)	
Room observed caters for children over 4 years					+
Qualifications					
Qualified teacher present (manager or staff)	+ (O)	+ (O)			
Mean qualification level (room observed)	+ (Y)				- (O)
Quality					
Space and furnishings (ITERS-R subscale 1)					-
Personal care routines (ITERS-R subscale 2)	- (O)	**ns** (-O)	**ns** (-O)		
Program structure (ITERS-R subscale 6)		**ns** (+O)			

- + or – indicates a significant effect for the whole sample (and the direction of that effect).
- If the effects were seen only for the older or younger age group when the sample was split by age, this is indicated by **(O)** or **(Y)**
- Where an effect was not significant for the whole group, but was evident for either the older or younger age group, this is indicated by '**ns (O)'** or '**ns (Y)'**

6.6 Final conclusions and recommendations

6.6.1 Final conclusions

- There was wide variation in the quality of provision for children in infant and toddler rooms.
- Higher quality was seen in the Local Authority maintained sector, in Children's Centres and in larger centres.
- Observers found higher quality provision, particularly educational provision, in mixed age rooms which included older children as well as under threes. However, the presence of older children was not always beneficial for the younger ones, who displayed more worried and upset behaviours in mixed age rooms.
- No relationships were found between the population of children and families served and quality of provision. This suggests that families from very different backgrounds and with different needs were being offered the same quality of provision.
- The findings highlighted the importance of a well qualified workforce for the provision of high quality caregiving and for child outcomes. Children with access to a trained teacher were more co-operative and sociable, and children in rooms with a better qualified workforce were more co-operative and displayed fewer worried and upset behaviours than children cared for by less well-qualified staff teams.
- The quality of the physical environment was identified as important. Children displayed fewer worried and upset behaviours in centres which offered a spacious, well maintained and pleasant physical environment, with appropriate furniture for care routines and educational activities, and comfortable areas for children to relax and spend quiet time.
- Older children (those aged between 33 and 42 months) showed more peer sociability in centres which provided a high quality program structure, for example an appropriate daily schedule, opportunities for free play and high quality group play activities.
- The effects of quality on children's behaviour were significant, but moderate in size compared with other (stronger) influences, such as gender, age, special needs and time spent in centre-based childcare.
- Time spent in centre-based childcare (hours/days per week) had some beneficial effects on children, such as greater confidence and sociability. This effect was stronger for the younger children in the sample (those under 2 years 9 months), and for children attending 35 hours per week or more. However, time spent in centre-based childcare was also related to negative behaviours. Children who attended 30 hours or more each week were rated as more anti-social, while children who attended 35 hours or more displayed more worried and upset behaviours.
- Although the age at which children started attending their Neighbourhood Nursery did not have an effect (either positive or negative) on their behaviour, duration of childcare during the early years was important: the longer children had been attending their Neighbourhood Nursery, the more likely they were to display anti-social behaviours.
- Although larger centres were generally of higher quality, the effects of centre size on children's behaviour was mixed. Children in larger centres were less anti-

social and displayed fewer worried and upset behaviours, but were also rated as less co-operative and less sociable than children in smaller centres.

- Attending a centre with a high proportion of working families had a positive effect on children's co-operative behaviour, and also reduced anti-social behaviour. This supports the aims of the Neighbourhood Nurseries Initiative, and suggests that encouraging parents to return to work may have positive benefits for the development of their children.

6.6.2 Recommendations

1. The development of a well-qualified childcare workforce is vital for improving quality and positive child development. In particular, employing qualified teachers to work with children under the age of 3 ½ will have a significant impact on children's developing co-operation and other peer skills.
2. The development of Children's Centres should be supported. NNI settings with Children's Centre status were of higher quality and had better child outcomes. Future support (and evaluation) of the programme should focus on the educational aspects of provision to ensure that the 'learning' aspects of the curriculum are given equal weight to the more 'social' aspects.
3. This research supports the development of larger centres: these offered higher quality (measured on the ITERS-R scale) and their children showed reduced levels of anti-social and worried/upset behaviour. However, larger centres need to be supported in finding ways to ensure that their children are not overwhelmed by size, and are provided with the nurturing environments they need to develop their confidence and sociability.
4. Further research into the impact of mixed age rooms is recommended. They may enhance cognitive development at the price of emotional security.
5. More research is also required to explore the effects of length of day on children's behaviour. In particular, the effects of attending for a small number of long days over a week, as compared to a greater number of short days, need to be explored.
6. A broad social mix is recommended for early childhood settings – higher proportions of working families were related to decreased anti-social behaviour. Initiatives such as the NNI which address unemployment should be encouraged and supported.
7. Maintained centres should continue to be supported and developed, as these were particularly effective at offering high quality educational provision. Nurseries in other sectors need further support to raise the quality of the provision they offer.

REFERENCES

Arnett, J. (1989) *Caregivers in day-care centers: Does training matter?* Journal of Applied Developmental Psychology, 10: 541-552.

Burchinal, M. R., Roberts, J. E., Riggins Jr., R., Zeisel, S. A., Neebe, E. & Bryant, D. (2000) *Relating quality of center-based child care to early cognitive and language development longitudinally*. Child Development, 71 (2): 339-357.

Cohen J (1960) *A coefficient of agreement for nominal scales*. Educational and Psychological Measurement,. 20: 37-46.

Cost, Quality and Child Outcomes Study Team (1995) *Cost, quality and child outcomes in child care centers public report*. Denver: Economics Department, University of Colorado-Denver.

Deater-Deckard, K., Pinkerton, R. & Scarr, S. (1996) *Child care quality and children's behavioural adjustment: A four year longitudinal study.* Journal of Child Psychology and Psychiatry, 37: 937-948.

Hogan, A.E., Scott, K.G. and Bauer, C.R. (1992) *The Adaptive Social Behaviour Inventory (ASBI): A new assessment of social competence in high risk three year olds.* Journal of Psychoeducational Assessment, 10 (3), 230-239.

Harms, T., Clifford, M., & Cryer. (2003). *Infant/Toddler Environment Rating Scale, Revised Edition (ITERS-R).* New York: Teachers College Press.

Howes, C. (1988) *Relations between early child care and schooling*. Developmental Psychology, 24: 53-57.

Howes, C. (1990) *Can the age of entry into child care and the quality of child care predict adjustment in kindergarten?* Developmental Psychology, 26: 292-303.

Howes, C. & Smith, E. (1995) *Relations among child care quality, teacher behaviour, children's play activities, emotional security and cognitive activity in child care*. Early Childhood Research Quarterly, 10: 381-404.

Kontos, S. J. (1991) *Child care quality, family background and children's development.* Early Childhood Research Quarterly, 6: 249-262.

Love, J.M., Raikes, H., Paulsell, D. and Kisker, E., E. (2000) *New directions for studying quality in programs for infants and toddlers*. In Cryer, D. and Harms, T. (Eds.) *Infants and Toddlers in Out of Home Care* (pp.117-162). Maryland: Paul H. Brookes Publishing.

Melhuish, E., C., Quinn, L., McSherry, K., Sylva, K., Sammons, P., Siraj-Blatchford, I., Taggart, B. & Guimares, S. (2000a) *The Effective Pre-School Provision Northern Ireland (EPPNI) Project: Technical paper 1 – characteristics of pre-school environments in Northern Ireland: an analysis of observational data.* Belfast: Stranmillis University College.

Melhuish, E., C., Quinn, L., Sylva, K., Sammons, P., Siraj-Blatchford, I., Taggart, B. & Shields, C. (2000b) *The Effective Pre-School Provision Northern Ireland (EPPNI) Project: Technical paper 5 – progress of cognitive development at the start of P1*. Belfast: Stranmillis University College.

Melhuish, E. C., Sylva, K., Sammons, P., Siraj-Blatchford, I. & Taggart, B. (2001) *The Effective Provision of Pre-School Education (EPPE) Project: Technical Paper 7 – Social/Behavioural and Cognitive Development at 3-4 years in relation to family background.* London: DfEE/Institute of Education, University of London.

Melhuish, E.C. (2004a) *A literature review of the impact of early years provision upon young children with emphasis given to children from disadvantaged backgrounds.* Report to the Comptroller and Auditor General. London: National Audit Office. Available at http://www.nao.org.uk/publications/nao_reports/03-04/268_lieraturereview.pdf

Melhuish, E.C. (2004b) *Child benefits: The importance of investing in quality childcare.* London: Daycare Trust.

National Institute of Child Health and Development Early Child Care Research Network (1996) *Characteristics of infant child care: Factors contributing to positive caregiving.* Early Childhood Research Quarterly, 11: 269-306.

NICHD (1998a) *Early child care and self-control, compliance and problem behavior at 24 and 26 months.* Child Development, 69: 1145-1170.

NICHD (1998b) *Relations between family predictors and child outcomes: Are they weaker for children in child care?* Developmental Psychology, 34: 1119-1128.

NICHD (1999b) *Child outcomes when child-care center classes meet recommended standards for quality.* American Journal of Public Health, 89: 1072-1077.

NICHD (2000a) *Characteristics and quality of child care for toddlers and pre-schoolers*. Applied Developmental Science, 4: 116-135.

NICHD (2000b) *The relation of child care to cognitive and language development*. Child Development, 71: 960-980.

NICHD (2001b) *Child care and family predictors of preschool attachment and stability from infancy.* Developmental Psychology, 37: 847-862.

NICHD (2002) *Early Child Care and Children's Development Prior to School Entry: results from the NICHD Study of Early Child Care.* American Educational Research Journal, 39 (1): 133-164.

NICHD (2003) *Does amount of time spent in child care predict socioemotional adjustment during the transition to kindergarten?* Child Development, 74: 976-1005.

NICHD (2005) *Child Care and Child Development: results from the NICHD Study of Early Child Care and Youth Development.* New York: The Guilford Press.

Peisner-Feinberg, E. S. & Burchinal, M. R. (1997) *Relations between pre-school children's child care experiences and concurrent development: The Cost, Quality and Outcomes Study*. Merrill-Palmer Quarterly, 43 (3): 451-477.

Peisner-Feinberg, E. S., Burchinal, M. R., Clifford, R. M., Culkin, M. L., Howes, C., Kagan, S. L. & Yazejian, N. (2001) *The relation of pre-school child care quality to children's cognitive and social development trajectories through second grade.* Child Development, 72(5): 1534-1553.

Smith, T., Coxon, K., and Sigala, M. (in press) *The NNI National Evaluation: Implementation Study Final Report*.

Sylva, K., Melhuish, E. C., Sammons, P., Siraj-Blatchford, I. and Taggart, B. (2004) *The Effective Provision of Pre-School Education (EPPE) Project: Final Report.* London: DfES/Institute of Education, University of London.

Volling, B. L. & Feagans, L. V. (1995) *Infant day care and children's social competence*. Infant Behavior and Development, 18: 177-188.

Whitebook, M., Howes, C. & Phillips, D. (1989/1990) *Who cares? Child care teachers and the quality of care in America: Final report of the National Child Care Staffing Study*. Oakland, CA: Child Care Employee Project.

APPENDIX 1. CHARACTERISTICS OF THE SAMPLE (n=810)

Table A1.1 Sample characteristics: children

	Frequency	Percent
Gender (n = 810)		
Male	431	53%
Female	397	47%
Special need (n = 791, 19 missing)		
Yes	71	9%
No	720	91%
Medical problems during first 3 months of life (n = 790, 20 missing)		
Yes	108	14%
No	682	86%
Ethnic group (n = 807, 3 missing)		
White	618	77%
Black	83	10%
Mixed	64	8%
Asian	34	4%
Other	8	1%

	Minimum	Maximum	Mean	Std. Dev
Child age in months (n=800, 10 missing)	18	47	33	6
Birthweight in ounces (n=773, 37 missing)	16	215	115	23

Table A1.2 Sample characteristics: families

	Frequency	Percent
Family structure (n = 809, 1 missing)		
Lives with 2 adults	581	72%
Lives with lone parent	209	26%
Other home situation	19	2%
Number of siblings (n = 800, 10 missing)		
0	315	39%
1	296	37%
2	124	16%
3	41	5%
4+	24	3%
NNI child's place in birth order (n = 805, 5 missing)		
1st child	397	52%
2nd child	246	32%
3rd child	78	10%
4th child	34	4%
5th or more	14	2%
Language spoken at home (n = 810)		
English	785	97%
Other language	25	3%
Mother work status (n = 787, 23 missing)		
Mother works full time	295	37%
Mother works part time	352	45%
Mother does not work	140	18%
Father/partner work status (n = 786, 24 missing)		
Father/partner works (full or part time)	546	69%
Father/partner does not work or not present	240	31%
Household work status (n = 792, 18 missing)		
Working adult in household	726	92%
No adult in household working	66	8%

	Minimum	Maximum	Mean	Std. Dev
Age of mother (n= 761, 49 missing)	19	46	31	6
Age of father/partner (n=558, 252 not present/missing)	18	57	35	6
Age mother left education (n=759, 51 missing)	10	44	18	4
Age father/partner left education (n=547, 263 not present/missing)	14	37	18	4

Table A1.3 Sample characteristics: current childcare

	Minimum	Maximum	Mean	Std. Dev
Months spent at NN (n=774, 36 missing)	5	41	15	8
Days per week spent at NN (n=796, 14 missing)	1	5	3.6	1.3
Hours per week at NN (n=683, 127 missing)	8	60	24	13
Average hours per day at NN (n=683, 127 missing)	1.6	12	7	2.3
Hours per week all centres (n=683, 127 missing)	8	60	25	13
Hours per week relative care: full sample (n=803, 7 missing)	0	48	4	8
Hours per week relative care: only those receiving n=316 (40%)	1	48	11	10
Hours per week with childminder: full sample (n=805, 5 missing)	0	35	0.3	2
Hours per week with childminder: only those receiving n=20 (2%)	3	35	13	9

Table A1.4 Sample characteristics: childcare history

	Frequency	Percent
Between 12 and 24 months		
Centre-based (n= 788, 22 missing)	570	72%
Grandparent, other friend or relative (n = 805, 5 missing)	218	27%
Childminder (n = 805, 5 missing)	38	5%
Other type of care (n = 805, 5 missing)	7	1%
Under 12 months		
Centre-based (n = 786, 24 missing)	259	33%
Grandparent, other friend or relative (n = 805, 5 missing)	266	33%
Childminder (n = 805, 5 missing)	57	7%
Other type of care (n = 805, 5 missing)	10	1%

APPENDIX 2 UNI/ MULTIVARIATE ANALYSES

A2.1 Summary of univariate analysis results

- **Sector**: maintained centres and the joint projects were of significantly higher quality than voluntary and private sector centres.
- **Children's Centre status:** main Children's Centres offered significantly higher quality child care and education than centres not taking part in the programme (or of undecided status).
- **Sure Start links:** centres with a link to Sure Start were of higher overall quality than those without a Sure Start link.
- **Type of building:** there were no differences in the overall quality of provision offered by the three different build types (new buildings, extensions and refurbishments). However, new buildings provided significantly better quality space and furnishings than the extensions and refurbishments.
- **Permanence of premises**: projects in their permanent accommodation offered higher overall quality than those in in temporary accommodation.
- **Nursery Manager qualification:** the qualifications of the nursery manager were positively related to overall quality of provision (and most strongly to provision for parents and staff).
- **Staff qualifications:** quality of provision was higher in rooms with a higher mean staff qualification level. However, the proportion of staff unqualified was not significantly related to quality.
- **Centre size:** although no relationship with overall quality was identified by univariate analysis, larger centres did offer better quality provision for parents and staff.
- **Group size:** as group size (number of children on the register) increased, so did the quality of provision.
- **Ages of children:** rooms which provided for older children, and for a broader age range of children, were of higher quality.

A2.2 Final regression models: quality of provision

Compact model (staff qualifications not included)

$R = 0.65$ $R^2 = 0.42$ Adjusted $R^2 = 0.38$ $F(4, 60) = 10.80$

Variable	B	Standardised beta	Significance
LA maintained status (fully maintained, partially maintained, non maintained)	0.38	0.29	p<0.01
Level of involvement of Children's Centre Programme (main CC, link to CC, not CC; centres of undecided status coded as missing)	0.35	0.32	p<0.01
Children aged 4 or over present in room observed	0.89	0.39	p<0.001
Number of children registered (whole centre)	0.01	0.28	p<0.01

Full model

R = 0.68 R^2 = 0.47 Adjusted R^2 = 0.30 F (15, 49) = 2.85

Variable	**B**	**Standardised beta**	**Significance**
LA maintained status (fully maintained, partially maintained, non maintained)	0.38	0.29	p<0.05
Joint project	0.16	0.07	Non-sig
Level of involvement of Children's Centre Programme (main CC, link to CC, not CC, centres of undecided status coded as missing)	0.33	0.31	p<0.05
Link to Sure Start Local Programme	0.13	0.07	Non-sig
On school site	0.04	0.02	Non-sig
Permanent accommodation (comparison to temporary)	0.24	0.06	Non-sig
Physical environment/ project type (new build, comparison to extension)	0.01	0.01	Non-sig
Physical environment/ project type (refurbishment, comparison to extension)	0.29	0.16	Non-sig
Number of children registered (whole centre)	0.01	0.29	p<0.05
Room capacity (room observed)	0.02	0.12	Non-sig
Children aged 4 or over present in room observed	0.73	0.32	p<0.05
Staff:child ratio (children per staff member) in room observed	-0.03	-0.04	Non-sig
Proportion of children with special educational needs (in room observed)	-1.64	-0.13	Non-sig
Qualified teacher present (in room or as manager)*	-0.02	-0.004	Non-sig
Mean qualification level of staff working 10 hours or more in room observed (incl. working managers)*	0.33	0.22	p<0.05
Childcare qualifications of nursery manager*	0.26	0.23	p<0.05

***** These variables are from different models. The effect of qualifications was only visible when the following variables were removed from the model: Sector (maintained and joint status); Children's Centre Status; links to Sure Start.

A2.3 Final regression models: co-operation and conformity

Whole group

R = 0.44 R^2 = 0.20 Adjusted R^2 = 0.18 F (8, 524) = 16.02

Variable	B	Standardised beta	Significance
CHILD			
Gender (girls vs boys)	0.15	0.17	p < 0.001
Age	0.001	0.30	p < 0.001
Special need	-0.26	-0.17	p < 0.001
CENTRE			
Proportion of workless families using centre	-0.004	-0.14	p < 0.001
Level of involvement of Children's Centre Programme	0.08	0.15	p < 0.001
Centre size (total FTE places)	-0.002	-0.10	p < 0.05
Qualified teacher present (in room or as manager)	0.21	0.12	p < 0.01
Mean qualification level of staff in room observed *	0.06	0.07	p < 0.05
QUALITY			
ITERS-R: Personal care routines subscale (mean total score)	-0.57	-0.12	p < 0.01

* This variable is from a different model. Only one qualifications variable was entered into the model at one time, due to overlapping information between the variables. In addition, the effect of qualifications was only visible when the Children's Centres variable was removed from the model.

Sample split by age

	Oldest half R = 0.42 R^2 = 0.18 Adjusted R^2 = 0.15 F (8, 255) = 6.93			**Youngest half** R = 0.46 R^2 = 0.21 Adjusted R^2 = 0.18 F (8, 253) = 8.30		
Variable	**B**	**Stand. beta**	**Sig.**	**B**	**Stand. beta**	**Sig.**
CHILD						
Gender (girls vs boys)	0.19	0.22	p < 0.001	0.12	0.14	p < 0.05
Age	0.0001	0.05	Non-sig	0.001	0.33	p < 0.001
Special need	-0.34	-0.24	p < 0.001	-0.20	-0.12	p < 0.05
CENTRE						
Proportion of workless families using centre	-0.005	-0.17	p < 0.01	-0.004	-0.14	p < 0.05
Level of involvement of Children's Centre Programme	0.05	0.09	Non-sig	0.09	0.19	p < 0.001
Centre size (total FTE places)	-0.002	-0.12	Non-sig	-0.002	-0.11	Non-sig
Qualified teacher present (in room or as manager)	0.27	0.19	p < 0.01	-0.07	-0.03	Non-sig
Mean qualification level of staff in room observed *	0.04	0.05	Non-sig	0.09	0.11	p < 0.05
QUALITY						
ITERS-R: Personal care routines subscale (mean total score)	-0.06	-0.15	p < 0.05	-0.02	-0.04	Non-sig

* This variable is from a different model. See note on previous model.

A2.4 Final regression models: peer sociability

Whole group

R = 0.41 R^2 = 0.17 Adjusted R^2 = 0.16 F (8, 659) = 16.30

Variable	B	Standardised beta	Significance
CHILD			
Gender (girls vs boys)	0.11	0.14	p < 0.001
Age	0.001	0.24	p < 0.001
Special need	-0.24	-0.17	p < 0.001
FAMILY			
Working adult in household	0.15	0.11	p < 0.01
Language other than English spoken at home	-0.27	-0.12	p < 0.001
CHILDCARE			
Hours per week in centre-based provision	0.004	0.14	p < 0.001
Days per week at Neighbourhood Nursery*	0.03	0.10	p < 0.01
CENTRE			
Centre size (total FTE places)	-0.002	-0.09	p < 0.05
Qualified teacher present (in room or as manager)	0.14	0.09	p < 0.05

* This variable is from a different model (too correlated with hours per week to enter both together)

'TIPPING POINT' ANALYSIS			
Compared with 15 hours pw or fewer….			
15 to 24.9 hours per week	0.03	0.03	Non-sig
25 to 34.9 hours per week	0.08	0.08	Non-sig
35 to 44.9 hours per week	0.15	0.13	p < 0.01
45 hours per week or more	0.17	0.14	p < 0.001
Compared with 15 hours pw or fewer….			
15 to 19.9 hours per week	0.03	0.03	Non-sig
20 to 29.9 hours per week	0.06	0.07	Non-sig
30 to 39.9 hours per week	0.07	0.06	Non-sig
40 hours per week or more	0.16	0.17	p < 0.001
Compared with 1 or 2 days per week….			
3 days per week	0.05	0.05	Non-sig
4 days per week	0.07	0.05	Non-sig
5 days per week	0.10	0.12	p < 0.01

Sample split by age

	Oldest half $R = 0.45$ $R^2 = 0.20$ Adjusted $R^2 = 0.18$ $F (10, 313) = 8.03$			**Youngest half** $R = 0.46$ $R^2 = 0.21$ Adjusted $R^2 = 0.19$ $F (10, 324) = 8.74$		
Variable	**B**	**Stand. beta**	**Sig.**	**B**	**Stand. beta**	**Sig.**
CHILD						
Gender (girls vs boys)	0.13	0.17	$p < 0.001$	0.11	0.13	$p < 0.01$
Age	0.00002	-0.01	Non-sig	0.001	0.30	$p < 0.001$
Special need	-0.26	-0.21	$p < 0.001$	-0.29	-0.18	$p < 0.001$
FAMILY						
Working adult in household	0.15	0.11	$p < 0.05$	0.13	0.09	Non-sig
Language other than English spoken at home	-0.22	-0.11	$p < 0.05$	-0.30	-0.11	$p < 0.05$
CHILDCARE						
Hours per week in centre-based provision	0.002	0.07	Non-sig	0.006	0.20	$p < 0.001$
Days per week at Neighbourhood Nursery*	-0.002	-0.01	Non-sig	0.06	0.19	$p < 0.001$
CENTRE						
Centre size (total FTE places)	-.002	-0.16	$p < 0.01$	-0.001	-0.04	Non-sig
Qualified teacher present (in room or as manager)	0.20	0.17	$p < 0.01$	-0.08	-0.03	Non-sig
QUALITY						
ITERS-R: Personal Care Routines subscale (mean total score)	-0.10	-0.27	$p < 0.001$	0.04	0.09	Non-sig
ITERS-R: Program Structure subscale (mean total score)	0.06	0.26	$p < 0.001$	-0.01	-0.04	Non-sig

* This variable is from a different model (too correlated with hours per week to enter both together)

A2.5 Final regression models: confidence

Whole group

R = 0.29 R^2 = 0.08 Adjusted R^2 = 0.07 F (5, 647) = 11.50

Variable	B	Standardised beta	Significance
CHILD			
Gender (girls vs boys)	0.08	0.09	p < 0.05
Age	0.0004	0.16	p < 0.001
Birthweight	0.002	0.11	p < 0.01
Special need	-0.21	-0.14	p < 0.001
CHILDCARE			
Hours per week in centre-based provision	0.01	0.14	p < 0.001
Days per week at Neighbourhood Nursery*	0.03	0.09	p < 0.01
Hours per day (hours per week/days per week)*	0.02	0.10	p < 0.01

* These variables are from different models (too correlated with hours per week, and with each other, to be entered together)

'TIPPING POINT' ANALYSIS			
Compared with 15 hours pw or fewer….			
15 to 24.9 hours per week	-0.03	-0.03	Non-sig
25 to 34.9 hours per week	0.07	0.06	Non-sig
35 to 44.9 hours per week	0.11	0.09	p < 0.05
45 hours per week or more	0.16	0.12	p < 0.01
Compared with 15 hours pw or fewer….			
15 to 19.9 hours per week	-0.03	-0.03	Non-sig
20 to 29.9 hours per week	0.03	0.03	Non-sig
30 to 39.9 hours per week	0.06	0.05	Non-sig
40 hours per week or more	0.14	0.14	p < 0.01
Compared with 1 or 2 days per week….			
3 days per week	0.05	0.05	Non-sig
4 days per week	-0.01	-0.01	Non-sig
5 days per week	0.10	0.12	p < 0.01
Compared with less than 5 hours per day...			
5 to 6.9 hours per day	0.01	0.01	Non-sig
7 to 8.9 hours per day	0.04	0.04	Non-sig
9 hours or more per day	0.12	0.12	p<0.05

Sample split by age

	Oldest half R = 0.29 R^2 = 0.09	Adjusted R^2 = 0.07 F (6, 312) = 4.90		**Youngest half** R = 0.36 R^2 = 0.13	Adjusted R^2 = 0.11 F (6, 319) = 7.91	
Variable	**B**	**Stand. beta**	**Sig.**	**B**	**Stand. beta**	**Sig.**
CHILD						
Gender (girls vs boys)	0.10	0.12	$p < 0.05$	0.07	0.08	Non-sig
Age	0.0002	0.04	Non-sig	0.001	0.22	$p < 0.001$
Birthweight	0.004	0.20	$p < 0.001$	0.001	0.05	Non-sig
Special need	-0.15	-0.11	$p < 0.05$	-0.35	-0.21	$p < 0.001$
CHILDCARE						
Hours per week in centre-based provision	0.002	0.07	Non-sig	0.01	0.18	$p < 0.001$
Days pw at Neighbourhood Nursery*	0.01	0.02	Non-sig	0.05	0.14	$p < 0.01$
Hours per day (hours per week/days per week)*	0.02	0.10	Non-sig	0.02	0.08	Non-sig
QUALITY						
ITERS-R: Personal Care Routines subscale (mean total score)	-0.05	-0.11	$p < 0.05$	0.01	0.02	Non-sig

* These variables are from different models (too correlated with hours per week, and with each other, to be entered together)

A2.6 Final regression models: anti-social behaviour

Whole group

R = 0.29 R^2 = 0.09 Adjusted R^2 = 0.08 F (5, 663) = 12.50

Variable	B	Standardised beta	Significance
FAMILY			
Age of mother (years)	-0.004	-0.10	p < 0.01
CHILDCARE			
Days per week at Neighbourhood Nursery	0.04	0.19	p < 0.001
Hours per week in centre-based provision*	0.004	0.19	p < 0.001
Months spent at Neighbourhood Nursery	0.005	0.14	p < 0.001
CENTRE			
Proportion of workless families using centre	0.001	0.08	p < 0.05
Centre size (FTE places)	-0.001	-0.12	p < 0.01
Centre size (children registered)**	-0.001	-0.09	p < 0.05

* This variable is from a different model (too correlated with days per week to enter both together)

** This variable is from a different model (too correlated with FTE places to enter together)

'TIPPING POINT' ANALYSIS			
Compared with 15 hours pw or fewer….			
15 to 24.9 hours per week	0.03	0.04	Non-sig
25 to 34.9 hours per week	0.06	0.09	Non-sig
35 to 44.9 hours per week	0.12	0.15	p < 0.001
45 hours per week or more	0.13	0.16	p < 0.001
Compared with 15 hours pw or fewer….			
15 to 19.9 hours per week	-0.01	-0.01	Non-sig
20 to 29.9 hours per week	0.05	0.08	Non-sig
30 to 39.9 hours per week	0.10	0.13	p < 0.01
40 hours per week or more	0.13	0.20	p < 0.001
Compared with 1 or 2 days per week….			
3 days per week	0.07	0.11	p < 0.05
4 days per week	0.09	0.10	p < 0.05
5 days per week	0.13	0.23	p < 0.001
Compared with less than 12 months at NN….			
12 to 17 months at NN	0.05	0.08	Non-sig
18 to 23 months at NN	0.08	0.11	p < 0.05
24 months or more at NN	0.08	0.11	p < 0.05

Sample split by age

	Oldest half R = 0.32 Adjusted R^2 = 0.08 R^2 = 0.10 F (6, 330) = 6.14			**Youngest half** R = 0.33 Adjusted R^2 = 0.09 R^2 = 0.11 F (6, 321) = 6.55		
Variable	**B**	**Stand. beta**	**Sig.**	**B**	**Stand. beta**	**Sig.**
FAMILY						
Age of mother (years)	-0.01	-0.13	$p < 0.05$	-0.002	-0.05	Non-sig
CHILDCARE						
Days per week at Neighbourhood Nursery	0.05	0.21	$p < 0.001$	0.04	0.20	$p < 0.001$
Hours per week in centre-based provision*	0.01	0.24	$p < 0.001$	0.003	0.16	$p < 0.01$
Months spent at NN	0.01	0.14	$p < 0.01$	0.004	0.09	Non-sig
CENTRE						
Proportion of workless families using centre	0.001	0.04	Non-sig	0.002	0.13	$p < 0.05$
Centre size (FTE places)	-0.001	-0.13	$p < 0.05$	-0.002	-0.14	$p < 0.05$
Centre size (children registered)*	-0.001	-0.09	Non-sig	-0.001	-0.14	$p < 0.05$
Nursery manager qualification	0.04	0.11	$p < 0.05$	-0.04	-0.13	$p < 0.05$

* This variable is from a different model (too correlated with days per week to enter both together)

A2.7 Final regression models: worried and upset behaviour

R = 0.29 R^2 = 0.09 Adjusted R^2 = 0.07 F (7, 434) = 5.96

Variable	B	Standardised beta	Significance
CHILDCARE			
Days per week at Neighbourhood Nursery	0.06	0.19	p < 0.001
Hours per week in centre-based provision*	0.004	0.15	p < 0.01
CENTRE			
Proportion of families using centre who live in deprived postcode	-0.002	-0.12	p < 0.05
Children over 4 present in room observed	0.10	0.10	p < 0.05
Centre size (children registered)	-0.001	-0.11	p < 0.05
Centre size (FTE places)**	-0.003	-0.16	p < 0.01
Mean qualification level	-0.07	-0.10	p < 0.05
QUALITY			
ITERS-R: Space and Furnishings subscale (mean total score)	-0.04	-0.10	p < 0.05

* This variable is from a different model (too correlated with days per week to enter both together)

** This variable is from a different model (too correlated with children registered to enter both together)

'TIPPING POINT' ANALYSIS			
Compared with 15 hours pw or fewer….			
15 to 24.9 hours per week	-0.01	-0.01	Non-sig
25 to 34.9 hours per week	0.03	0.03	Non-sig
35 to 44.9 hours per week	0.15	0.14	p < 0.05
45 hours per week or more	0.14	0.13	p < 0.05
Compared with 15 hours pw or fewer….			
15 to 19.9 hours per week	-0.02	-0.02	Non-sig
20 to 29.9 hours per week	0.03	0.04	Non-sig
30 to 39.9 hours per week	0.04	0.04	Non-sig
40 hours per week or more	0.15	0.16	p < 0.01
Compared with 1 or 2 days per week….			
3 days per week	0.03	0.04	Non-sig
4 days per week	0.10	0.08	Non-sig
5 days per week	0.17	0.21	p < 0.001

Sample split by age

	Oldest half R = 0.32 R^2 = 0.10 Adjusted R^2 = 0.08 F (6, 189) = 3.62			**Youngest half** R = 0.31 R^2 = 0.09 Adjusted R^2 = 0.07 F (6, 235) = 4.01		
Variable	**B**	**Stand. beta**	**Sig.**	**B**	**Stand. beta**	**Sig.**
CHILDCARE						
Days per week at Neighbourhood Nursery	0.04	0.13	Non-sig	0.08	0.25	$p < 0.001$
Hours per week in centre-based provision*	0.003	0.12	Non-sig	0.01	0.19	$p < 0.01$
CENTRE						
Proportion of families using centre who live in deprived postcode	-0.003	-0.24	$p < 0.01$	-0.001	-0.09	Non-sig
Children over 4 present in room observed	0.14	0.15	Non-sig	0.07	0.07	Non-sig
Centre size (children registered)	-0.002	-0.13	Non-sig	-0.001	-0.11	Non-sig
Centre size (FTE places)**	-0.003	-0.18	$p < 0.05$	-0.003	-0.17	$p < 0.05$
Mean qualification level	-0.14	-0.21	$p < 0.01$	-0.02	-0.03	Non-sig
QUALITY						
ITERS-R: Space and Furnishings subscale (mean total score)	-0.5	-0.14	Non-sig	-0.04	-0.11	Non-sig

* This variable is from a different model (too correlated with days per week to enter both together)
** This variable is from a different model (too correlated with children registered to enter both together)

A2.8 Inter-correlations between scores on ASBI sub-scales

		Co-operation & conformity	Peer sociability	Confidence	Anti-social	Worried/ upset
Co-operation & conformity	Pearson correl. Significance		0.67 p<0.001	0.50 p<0.001	-0.35 p<0.001	0.01 Non-sig
Peer sociability	Pearson correl. Significance	0.67 p<0.001		0.73 p<0.001	-0.02 Non-sig	0.22 p<0.001
Confidence	Pearson correl. Significance	0.50 p<0.001	0.73 p<0.001		0.07 p<0.05	0.17 p<0.001
Anti-social	Pearson correl. Significance	-0.35 p<0.001	-0.02 Non-sig	0.07 p<0.05		0.40 p<0.001
Worried/ upset	Pearson correl. Significance	0.01 Non-sig	0.22 p<0.001	0.17 p<0.001	0.40 p<0.001	

APPENDIX 3. INSTRUMENTS

Overview of the Subscales and Items of the ITERS-R (Harms, Cryer and Clifford, 2003)

Space and Furnishings
- Indoor space
- Furniture for routine care and play
- Provision for relaxation and comfort
- Room arrangement
- Display for children

Personal Care Routines
- Greeting/departing
- Meals/snacks
- Nap
- Diapering/toileting
- Health practices
- Safety practices

Listening and Talking
- Helping children understand language
- Helping children use language
- Using books

Activities
- Fine motor
- Active physical play
- Art
- Music and movement
- Blocks
- Dramatic play
- Sand and water play
- Nature/science
- Use of TV, video and/or computer
- Promoting acceptance of diversity

Interaction
- Supervision of play and learning
- Peer interaction
- Staff-child interaction
- Discipline

Program Structure
- Schedule
- Free play
- Group play activities
- Provisions for children with disabilities

Parents and Staff
- Provisions for parents
- Provisions for personal needs of staff
- Provisions for professional needs of staff
- Staff interaction and cooperation
- Staff continuity
- Supervision and evaluation of staff
- Opportunities for professional growth

Caregiver Interaction Scale (CIS)
Arnett, (1989)
Positive Relationships Subscale

Nursery_____ Observer_____

Date_____

Observer: To what extent are each of the following statements characteristic of this caregiver? For each item, circle one of the numbers indicated:

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

1. Speaks warmly to the children	1 2 3 4
2. Listens attentively when children speak to her	1 2 3 4
3. Seems to enjoy the children	1 2 3 4
4. When children misbehave, explains the reason for the rule they are breaking	1 2 3 4
5. Encourages the children to try new experiences	1 2 3 4
6. Seems enthusiastic about the children's activities and efforts	1 2 3 4
7. Pays positive attention to the children as individuals	1 2 3 4
8. Talks to the children on a level they can understand	1 2 3 4
9. Encourages children to exhibit prosocial behaviour e.g, sharing, cooperating	1 2 3 4
10. When talking to the children, kneels, bends, or sits at their level to establish better eye contact	1 2 3 4

Neighbourhood Nurseries Initiative: Child Profile (ASBI)

Child ID…… Date of birth ..... Gender (M or F)…… Date profile completed .....

Name of nursery..... Staff member completing profile ..... Length of time you have known child……(months)

	Rarely or never	Some-times	Almost always
1. Understands others' feelings, like when they are happy, sad or mad	1	2	3
2. Is helpful to other children	1	2	3
3. Is obedient and compliant	1	2	3
4. When you give him/her an idea for playing, s/he frowns, shrugs shoulders, pouts or stamps foot	1	2	3
5. Follows rules in games	1	2	3
6. Gets upset when you don't pay enough attention	1	2	3
7. Is sympathetic toward other children's distress, tries to comfort others when they are upset	1	2	3
8. Waits his/her turn in games or other activities	1	2	3
9. Is open and direct about what s/he wants	1	2	3
10. Co-operates with your requests	1	2	3
11. Can easily get other children to pay attention to him/her	1	2	3
12. Says nice or friendly things to others, or is friendly towards others	1	2	3
13. Will join a group of children playing	1	2	3
14. In social activities, tends to just watch others	1	2	3
15. Follows household or pre-school centre rules	1	2	3

	Rarely or never	Some-times	Almost always
16. Says "please" and "thank you" when reminded	1	2	3
17. Asks or wants to go play with other children	1	2	3
18. Is calm and easy-going	1	2	3
19. Plays games and talks with other children	1	2	3
20. Shares toys or possessions	1	2	3
21. Teases other children, calls them names	1	2	3
22. Is confident with other people	1	2	3
23. Prevents other children from carrying out routines	1	2	3
24. Tends to be proud of things s/he does	1	2	3
25. Accepts changes without fighting against them or becoming upset	1	2	3
26. Bullies other children	1	2	3
27. Is interested in many and different things	1	2	3
28. Is worried about not getting enough (where enough might include attention access to toys, food/drink etc.)	1	2	3
29. Is bossy, needs to have his/her way	1	2	3
30. Enjoys talking with you	1	2	3

Factors in the ASBI[40]

Factor 1: Co-operation & Conformity (Cronbach alpha = 0.88)[41]
2. Is helpful to other children
3. Is obedient and compliant
5. Follows rules in games
8. Waits his/her turn in games or other activities
10. Co-operates with your requests
15. Follows household or pre-school centre rules
16. Says "please" and "thank you" when reminded
18. Is calm and easy-going
20. Shares toys or possessions

Factor 2: Peer Sociability (Cronbach alpha = 0.85)
1. Understands others' feelings, like when they are happy, sad or mad
7. Is sympathetic toward other children's distress, tries to comfort others when they are upset
11. Can easily get other children to pay attention to him/her
12. Says nice or friendly things to others, or is friendly towards others
13. Will join a group of children playing
14. In social activities, tends to just watch other (note that this item is reversed in the analysis)
17. Asks or wants to go play with other children
19. Plays games and talks with other children

Factor 3: Confidence (Cronbach alpha = 0.70)
9. Is open and direct about what he/she wants
22. Is confident with other people
24. Tends to be proud of things she/he does
27. Is interested in many and different things
30. Enjoys talking with you

Factor 4: Anti-social (Cronbach alpha = 0.70)
21. Teases other children, calls them names
23. Prevents other children from carrying out routines
26. Bullies other children
29. Is bossy, needs to have his/her way

Factor 5: Worried / Upset (Cronbach alpha = 0.61)
4. When you give him/her an idea for playing, he/she frowns, shrugs shoulders, pouts or stamps foot
6. Gets upset when you don't pay enough attention
25. Accepts changes without fighting against them or becoming upset (note that this item is reversed in the analysis)
28. Is worried about not getting enough (where enough might include attention, access to toys, food/drink etc)

---

[40] From Appendix C in: Sammons, P., Sylva, K., Melhuish, E. C., Siraj-Blatchford, I., Taggart, B. and Elliot, K. (2003), *The Effective Provision of Pre-School Education (EPPE) Project: Technical Paper 8b - Measuring the Impact of Pre-School on Children's Social/behavioural Development over the Pre-School Period*. London: DfES / Institute of Education, University of London.

[41] Cronbach alpha measures internal consistency of the scale, that is, whether respondents answer items in a systematic way across the scale. Values of 0.60 and above are considered appropriate.

Neighbourhood Nurseries Initiative: Family Profile

Child ID…… **Date completed ….....**

Initials of staff member ..... **Name of nursery.....**

Child date of birth ……. **Child gender (M or F) ……**

---

1. Family postcode __ __ __ __ __ __ __

2. What is the child's home situation? (please tick one)

Lives with both parents □ Lives with one parent plus parent's partner □

Lives with one parent only □ Other (please state)…… □

3. How many siblings (brothers and sisters) does s/he have? (please circle one)

0 1 2 3 4 5 6+ **How many of these siblings live with the child?.....**

4. Thinking about children in the household in order of birth:

Is the child in our study the 1st 2nd 3rd 4th 5th 6th 7th 8th 9th child in the household?

Oldest ⟷ Youngest (please circle one)

5. How much did the child weigh when s/he was born? ……pounds ……..ounces

6. During the first 3 months after s/he was born did s/he have to spend more than 3 days in hospital because of medical problems? eg. prematurity, breathing or heart difficulties

Yes □ No □

7. What is the child's ethnic group? (please tick one)

White		Mixed		Black/ Black British		Asian/ Asian British	
British	□	White & Black Caribbean	□	Caribbean	□	Indian	□
Irish	□	White & Black African	□	African	□	Pakistani	□
Other white	□	White & Asian	□	Other Black	□	Bangladeshi	□
		Other mixed	□			Other Asian	□
Chinese	□	Other ethnic group	□				

8. What language does s/he mainly speak at home? (please tick one)

English □ Other □ (please specify)…….

9. Has anyone outside the child's family ever suggested/ recognized/ diagnosed that s/he has any type of special need? eg. staff at the nursery, health visitor, doctor, speech therapist

No □ Yes □ **IF YES** Who was this? …….

What was the special need?.....

10. On average, how often does this child attend your centre?

Days per week 1 2 3 4 5 6 (please circle)

Hours per week …….. hours

11. At what age did s/he start at your centre? …….years …….months

12. How many hours per week does the child spend in other forms of care? Please enter hours per week for each type of care (number of hours can be 0)

Grandparent ……hrs pw Other friend/ relative ……hrs pw

Childminder ……hrs pw Other centre-based care (eg. nursery, playgroup) ……hrs pw

Other ……hrs pw (please specify type) …….

13. During this child's early years, did anyone other than his/her parents look after him/ her for more than 12 hours per week? (Please tick all which apply)

When child was under 1		Age 1-2 years	
No-one	□	No-one	□
Grandparent	□	Grandparent	□
Other friend/ relative	□	Other friend/ relative	□
Childminder	□	Childminder	□
Other centre-based care (eg. nursery, playgroup)	□	Other centre-based care (eg. nursery, playgroup)	□
Other (please specify) …….	□	Other (please specify) …….	□

For children who live with one or both of their parents, we would like some information on the adults <u>who live in the household</u>:

14. Age:

Mother……years Father ……years Mother/ father's partner (if relevant)……years

15. Work patterns:

Mother		Father		Mother/ father's partner	
Working full time (30 or more hrs a week)	□	Working full time	□	Working full time	□
Working part-time (less than 30 hrs a week)	□	Working part-time	□	Working part-time	□
Not working	□	Not working	□	Not working	□

16. The age they left full-time (FT) education. Some people may still be in full-time education. If this is the case, please tick the relevant box below.

Mother		Father		Mother/ father's partner	
Age left FT education .....years		Age left FT education .....years		Age left FT education .....years	
Still in full time education	□	Still in full time education	□	Still in full time education	□

SSU/2007/FR/022