

# **Quality, Outcomes and Costs in Early Years Education**

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## Contents

1.	Introduction.....	5
2.	Background .....	7
2.1	Policy context .....	8
2.2	The Effective Provision of Pre-school Education (EPPE) .....	9
2.3	Evidence from other studies.....	9
3.	The Millennium Cohort Study .....	11
3.1	The first sweep .....	11
3.2	The second sweep .....	12
3.3	The third sweep .....	12
3.4	The Quality of Childcare Settings Study.....	13
3.5	Measuring outcomes .....	13
3.5.1	Survey Measures of Cognitive Development.....	14
3.5.2	Survey Measures of Social/Behavioural Development.....	14
3.5.3	Foundation Stage Profile Assessments .....	15
3.6	Measures of Quality .....	17
3.6.1	The Early Childhood Environment Rating Scale (ECERS) ....	17
3.6.2	The Caregiver Interaction Scale .....	19
3.6.3	Measures from Ofsted .....	19
3.7	Other data available from the MCS .....	22
4.	Analytical Approach .....	23
4.1	Quality and Outcome Comparisons .....	23
4.2	Analysis of all MCS Children.....	24
4.3	Analysis of quality and outcomes.....	27
5.	Quality and Outcomes in Early Years Education and Care .....	29
5.1	Quality comparisons .....	29
5.2	Outcome comparisons.....	35
5.3	Analysis of all MCS children .....	38
5.3.1	Attendance at early years provision .....	38
5.3.2	Multivariate models of child outcomes.....	42
5.4	Analysis of children in Quality Sub-study .....	48
5.4.1	The number of children and settings in QCS .....	48
5.4.2	Descriptive analysis .....	50

5.4.3	Multivariate models of child outcomes.....	55
6.	Provider outgoings, rent and salaries .....	68
6.1	Background on Costs of Early Years Education .....	68
6.2	Analysis of costs of providing early years services .....	71
6.2.1	Ownership and nature of provision .....	72
6.2.2	Ownership of premises.....	73
6.2.3	Whether reported cost information in the survey .....	74
6.2.4	Rent paid .....	76
6.2.5	Total wage costs .....	77
6.2.6	Total annual outgoings.....	78
6.2.7	Multivariate analysis of outgoings, wage costs and rent.....	79
7.	Summary and Conclusions.....	83
8.	References .....	86

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## 1. Introduction

This report considers the relationship between the quality of early years education and outcomes that may arise from attendance at early years education. It also briefly considers data on the costs of providing early years education. Our aim is to measure what changes or benefits are provided by early years education services and more specifically what differences these services make to those attending. There are a range of possible outcomes that result from a child's attendance at education services. These extend beyond outcomes for children to include outcomes for parents, such as gaining employment; or outcomes for society, such as when early years providers also provide services for the whole community. To make this work tractable, we have limited our focus to outcomes for children, and to outcomes that accrue within a short time period. We are considering a range of individual outcomes covering cognitive, social and physical development.

In the US Waldfogel (2006) identifies the need to examine ways in which quality and effectiveness can be routinely evaluated in order to increase accountability at local level. She suggests that this may entail monitoring of outcomes in addition to processes and notes that in the US there is already significant interest in using information on outcomes for this purpose.

There is growing interest in assessing the value of public services to service users both within the UK and internationally. In the UK the Atkinson Review into the measurement of government output and productivity for the National Accounts' (Office for National Statistics, 2005) stated that "the output of the government sector should in principle be measured in a way that is adjusted for quality, taking account of the attributable incremental contribution of the service to the outcome". It is under this framework that the following analysis is conducted.

The research forms part of the 'Measuring Outcomes for Public Service Users' (MOPSU) project<sup>1</sup>. Underpinning the project is the idea that value for money should determine who delivers public services and that the voluntary/third sector has the potential to contribute more than at present.

A Treasury discussion paper (HM Treasury, 2005) identified the need to improve the evidence base demonstrating the third sector's contribution to higher quality service provision. The MOPSU project helps to define what measures and evaluation processes can be used to identify services with

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<sup>1</sup> previously known as the Quality Measurement Framework (QMF) project

higher quality or better outcomes, and may thus help to demonstrate the direct and wider benefits of third sector<sup>2</sup> organisations.

The overall project is working towards the aims of:

- more efficient and effective commissioning and procurement of services, placing the issues of quality and value for money at the heart of the decision making process;
- encouraging the use of 'outcomes' measures to assess the impact of services on their users, across the spectrum of providers;
- examining the extent to which the third sector is involved in public service delivery and helping to alleviate barriers to entry to third sector organisations

Underpinning the aims of this research is a goal to minimise the administrative burden on service providers by concentrating on the essentials. In the spirit of this goal we seek to exploit existing regularly collected measures on both the quality and outcomes of early years services. These regularly collected measures are compared with less routinely collected quality and outcome measures to see how the different quality measures compare and how all the quality and outcome measures are related.

The remainder of this report is set out as follows. Section Two considers the background and policy context facing the early years sector and summarises evidence from a major recent UK study, and from international studies. Section Three introduces the data used in the analysis. Section Four sets out the analytical approach used, whilst Sections Five and Six cover the analysis of outcomes and quality and then costs of early years services. Section Seven provides a brief summary of the analysis and gives key conclusions.

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<sup>2</sup> The definition of the third sector is both complex and confusing. There are a variety of terms used and in some cases the terms are used almost interchangeably. For the purpose of this project the government definition of the third sector, as non-governmental organisations that are value driven and which principally reinvest their surpluses to further social, environmental or cultural objectives (Cabinet Office, 2007), has been adopted.

## 2. Background

Several studies have explored the relationship between early years education and care and child development, both in terms of cognitive outcomes, as well as social and behavioural outcomes, see Melhuish (2004) for a review. Research focusing on children aged three to five years, typically shows a positive relationship between early years education and care and both intellectual and social/behavioural development.

Several motivations lie behind the desire to improve and invest in early years care and education. One of the main factors is the recognition that the early years of a child's life are a critical period in terms of development. Heckman and Lochner (2000) find that the greatest return to investments in children's development comes from investment in early childhood.

Some research into the outcomes of early years provision has focused on evaluating particular interventions, such as the Abecedarian project (e.g. Campbell et al., 2002) and the High Scope/Perry Pre-school Study (Schweinhart et al., 1993) in the US, both of which found considerable long-term benefits. Sylva et al. (2006) note that these types of experimental studies, which typically involve high quality provision aimed at disadvantaged children, have tended to provide stronger support for the impact of pre-school than research based on a wider population, whilst evidence from non-experimental studies has been mixed.

In the UK, the past decade has seen a large increase in the investment of government money in early years services, from around £1.1bn in 1997/98 to roughly £5bn in 2007/08 (HM Government, 2009). In England, a free early education place was made available for all four year olds in 1998, following a pledge to do so in Labour's 1997 election manifesto. From September 1999 this was extended to a number of pilot settings which covered three year olds in 57 local authorities. These areas were extended from January 2000 to another seven local authorities, and in 2004, the guarantee of a free early education place was extended to all three year olds. In April and September 2006 two pilot schemes started to provide early education and care for 12,000 disadvantaged two year olds in 32 local authorities.

From 2004, all three and four year old children in England were guaranteed a free early education place which currently consists of five two and a half hour sessions per week, for 38 weeks per year<sup>3</sup>.

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<sup>3</sup> The entitlement is set to increase to 15 hours per week in all local authorities by September 2010 (available for the 25 per cent most disadvantaged children in each local authority since September

Take up of the free entitlement has been high. La Valle and Smith (2009) report figures from The Parents Childcare and Early Years Survey for attendance at an early years setting of 89 and 97 per cent for three and four year-olds respectively. They also show a notable expansion in early years attendance, especially for three year-olds, with attendance rates in 2001 of 64 percent and 90 percent.

Given this expansion of provision, it is important to assess whether this investment continues to yield positive impacts for children.

## **2.1 Policy context**

The childcare and early years sector has been a continuing focus of government policy in recent years. This section briefly outlines some of the key policy developments in England since 1998. It is not intended as an exhaustive review of policy in this area, but to provide an overview of some of the main themes. Further details are available in Stokes and Wilkinson (2007).

In 1998 the National Childcare Strategy set out proposals to increase and improve childcare provision for children aged 0-14 years in England (DfEE, 1998). Three main issues were identified that needed to be addressed, namely the high cost of childcare, the variable quality of provision, and a shortage of childcare places (together with a lack of information about childcare). The National Childcare Strategy proposed to increase the number of affordable, accessible childcare places, improve the quality of provision and improve the availability of information about childcare.

The publication of Every Child Matters (DfES, 2003) set out proposals for improving all services for children and young people. In 2004, the government published its ten year strategy for childcare (HM Treasury, 2004). This outlined a number of measures to increase quality of provision.

Encouraging recruitment and retention, especially given the expansion of childcare and early years provision, as well as raising the status of working in the sector, increasing qualifications and skills and promoting diversity in

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2009), along with greater flexibility in usage, such as the option to spread the entitlement over three days per week instead of five. The free place currently entitles children to up to two years of early years education before they reach compulsory school age. Compulsory school age is defined as the start of the school term following a child's fifth birthday, although it is worth noting that in practice many children begin their school education (reception classes) before reaching compulsory school age. Children become eligible for free early years education from either the beginning of September, January or April, following their third birthday.

the workforce, have all been recurring issues in policy discussions (e.g. DfES 2003; DfES 2005, DfES 2006).

## **2.2 The Effective Provision of Pre-school Education (EPPE)**

The Effective Provision of Pre-school Education (EPPE) project is the most widely cited UK study of the impact of early years education (Sylva et al., 2004). It was the first major UK study to focus on the effectiveness of pre-school education, and has made a key contribution to evidence based policy in this field. Funded by the then Department for Education and Skills (DfES), now the Department for Education (DfE), the first stage of the EPPE project ran from 1997-2003, covering approximately 3,000 children in England attending 141 settings, as well as a sample of children who did not attend any provision. The first stage of the EPPE project followed the children's development between the ages of three and seven. A second stage followed the same group of children until they finished their primary schooling, at age 11 (Sylva et al., 2008)<sup>4</sup>.

The EPPE project found a significant impact of pre-school education in terms of both cognitive and social function (Sylva et al., 2004), still observable through to the end of Key Stage 1 at age seven. Whilst more recent evidence (Sammons et al., 2007, Sylva et al., 2008) show that pre-school still impacts upon cognitive outcomes in years 5 and 6 of primary schooling, at age 10 and 11.

However, the findings from EPPE demonstrated that the impact of pre-school on children's outcomes depends on the quality of provision, with better developmental outcomes for children who had attended early years settings of higher quality (Sylva et al., 2004). The quality of provision was still found to make a difference to children's outcomes at age 11, and for certain outcomes, only pre-schools of medium or high quality were found to still exert a positive influence at this stage. In addition, children who had been to a preschool of high quality, but had subsequently attended a less effective primary school, showed better outcomes at age 11 than children who had been to lower quality preschool or no provision at all.

## **2.3 Evidence from other studies**

Studies in the US have also shown a positive relationship between quality and children's outcomes. The National Institute of Child Health and Human Development (NICHD) Early Childcare Research Network (2000), in a study of approximately 1300 children, found a positive relationship between high quality childcare and children's cognitive and language

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<sup>4</sup> The children's progress is now being followed through to the end of Key Stage 3 (age 14).

ability at age three. In a separate study, Peisner-Feinberg et al. (2001) found that a positive impact of the quality of childcare attended was still present for some cognitive and social outcomes when the children were eight years old.

Magnuson et al. (2007) found a positive effect of pre-kindergarten on children's readiness for school, in terms of academic skills, using a sample of children attending kindergarten in 1998. However, they found negative effects on behaviour. Attending pre-kindergarten located in the same public school as kindergarten however, did not result in negative consequences for behaviour, while the positive cognitive benefits were still observed.

The above provides a flavour of the research findings on early years quality and outcomes, for further details see a more detailed literature review in Stokes and Wilkinson (2007).

### **3. The Millennium Cohort Study**

Our analysis is based on data collected as part of the Millennium Cohort Study (MCS). The MCS is the first new birth cohort study in the UK since 1970, and one of the largest studies of its kind. The survey allows for analysis based on a nationally representative sample of children. The Economic and Social Research Council (ESRC) funded study has been operating since 2000 and is following the lives of nearly 19,000 babies born between 2000 and 2002 in the UK.

#### **3.1 The first sweep**

The first sweep of the MCS (MCS1) comprises information on 18,818 children, collected when they were around 9 months old. Interviews were conducted with the baby's mother (or other main carer) and father (or other partner of main carer).

The mother or main carer interviews covered a wide range of topics including ethnicity and language, the baby's father, lone parenthood, pregnancy, labour and delivery, baby's health and development, childcare, grandparents, friends and social support, parental health, education and training, employment and earnings, housing, community and local services, time with and without the baby and other interests. The interview also included a self-completion element covering baby's temperament and behaviour, relationship with partner, previous relationships, domestic tasks, previous pregnancies, mental health, attitudes to relationships, parenting, work, etc.

The father or main carer's partner interviews were similarly comprehensive covering ethnicity and language, father's involvement with the baby, lone parenthood, baby's mother (if not resident), grandparents and friends, parental health, education and training, employment and earnings, time with and without the baby and other interests. The self-completion element of the father/main carer's partner interview covered baby's temperament and behaviour, relationship with partner, previous partners, previous children, mental health and attitudes to marriage, parenting and work.

Either parent or carer could answer the household module questions, which covered household composition and relationships, children, employment status, caring responsibilities for the baby born in 2000 and language spoken at home.

### **3.2 The second sweep**

The second sweep (MCS2) was carried out with the same respondents when the children were three years of age, mainly in 2004. The survey attempted to follow all the 18,553 families who took part in MCS1 where the child was still alive and living in the UK. It also attempted to make contact with another 1,389 families in England who appeared to have been living in sampled wards at the time of MCS1 but whose addresses reached Department for Work and Pensions (DWP) records too late to be included in the first survey. There were 15,590 productive interviews with 15,808 cohort members.

At sweep two, six data collection instruments were used: Main Interview, Partner Interview, Proxy Partner Interview, British Ability Scales, Bracken School Readiness Assessment, Height and Weight. These provided further background information on families and children and particularly important for us are the cognitive development assessments, namely the British Ability Scales and the Bracken School Readiness Assessment. Main respondents completed a Strengths and Difficulties Questionnaire (SDQ) that relates to the cohort member, providing further measures of child development at age three.

Further details of these development measures are given in Section 3.5.

### **3.3 The third sweep**

At the beginning of 2006 the third sweep (MCS3) began when children were five years of age. Fieldwork finished in January 2007 with 15,246 families and 15,460 cohort members taking part, for further details about the survey see Hansen and Joshi (2008).

At sweep three, a number of data collection instruments were used again including: Main Interview, Partner Interview, Proxy Partner Interview, Older Sibling Interview British Ability Scales, Height and Weight. These continued to provide further background information on families and children and further measures of cognitive development.

Main respondents again completed a Strengths and Difficulties Questionnaire (SDQ) that relates to the cohort member, providing further measures of child development at age five. In addition, results from Foundation Stage Profile (FSP) assessments were merged to the data.

Further details of these measures are also given in Section 3.5.

### **3.4 The Quality of Childcare Settings Study**

The Quality of Childcare Settings in the MCS (QCS) project (Mathers, Sylva and Joshi, 2007) explored the quality of 301 childcare settings in England attended by 631 children participating in the Millennium Cohort Study (MCS). These settings were visited between March and November 2005, and focused on provision for children aged between three and five.

The settings were chosen from a group of children who were recorded at age three in the MCS as being in a group childcare setting. An initial sample was chosen on the basis of maximising the numbers of children in the sample, such that settings which provided for more than one MCS child were over-sampled. To ensure that these children had experienced the provision at the setting being observed settings were only selected if they had at least one MCS child who had spent six months or more at the setting, attended ten hours per week or more and was either still attending the setting or had only recently left. Settings also had to be verifiable through the Ofsted database of providers.

The 301 settings participating in the sub-study were visited by specialist researchers, who collected data on the quality of the settings using observational rating scales. Information on centre characteristics, such as sector, and number and qualifications of staff employed, were also collected through interviews with centre managers.

### **3.5 Measuring outcomes**

Data on children's development has been collected at all sweeps of the MCS so far and allows us to consider a range of cognitive and social outcome measures. At MCS3, when the children were approximately five years old, data was collected on children's cognitive and social development and data from FSP assessments in England were merged into the data. Overall we thus have six measures of outcomes for children, described in more detail in sections 3.5.1 – 3.5.3:

- three assessments based on the British Ability Scales;
  - naming vocabulary
  - picture similarities
  - pattern construction
- A difficulties score from the Strengths and Difficulties Questionnaire
- A pro-social behaviour score from the Strengths and Difficulties Questionnaire
- FSP assessment and the six areas of learning within it

### **3.5.1 Survey Measures of Cognitive Development**

Measures of cognitive development were collected using three subscales from the British Ability Scales, evaluating children's skills in:

- naming vocabulary
- picture similarities
- pattern construction

The British Ability Scales (BAS) is a battery of individually administered tests of cognitive abilities and educational achievements suitable for use with children and adolescents aged from two years, 6 months to seventeen years, 11 months. The BAS Naming Vocabulary scale was administered by interviewers to the members of the cohort during both the second and third sweep of data collection when the children were aged three and aged five. It is the only measure of cognitive development for which we have a repeat measure.

The Picture Similarities and Pattern Construction scales were only administered during the third sweep of data collection when the children were aged five.

Also at age three, six subtests from the Bracken Basic Concept Scale – Revised (BBCS-R) were administered. Together they form the Bracken School Readiness Assessment (BSRA). The readiness concepts assessed in these sub-tests are argued to be directly related to early childhood education and to predict readiness for more formal education. The test is individually administered and suitable for children aged 2 years 6 months to 7 years 11 months.

### **3.5.2 Survey Measures of Social/Behavioural Development**

Children's behavioural development was evaluated using the Strengths and Difficulties Questionnaire (SDQ). Developed by Goodman (1997), the SDQ consists of 25 items, grouped into the following five scales:

- emotional symptoms
- conduct problems
- hyperactivity
- peer problems
- pro-social behaviour

Main respondents (most often the child's mother) were asked to complete the SDQ as part of the self-completion module during the main MCS interview. It was included in both the second and third sweep of data collection when the children were aged three and aged five and is the only social/behavioural development measure for which we have repeat observations for children.

### **3.5.3 Foundation Stage Profile Assessments**

The foundation stage encompassed education for pupils aged three to five: most commonly the first year being in a nursery setting and the second being in a reception class of school. These are assessments for children in England that are completed by the end of their final foundation stage year. They are cumulative and teacher-assessed, see Qualifications and Curriculum Authority (2003) for more details. Throughout the foundation stage, children attending government-funded settings are assessed in relation to the 'stepping stones' and 'early learning goals' that comprise six areas of learning within the 'Curriculum Guidance for the Foundation Stage', which from September 2008 was replaced by the Early Years Foundation Stage (EYFS), encompassing education up to age five. They are based on thirteen nine-point scales within six areas of learning<sup>5</sup>:

- personal, social and emotional development (PSE)
- mathematical development (MD)
- communication, language and literacy (CLL)
- creative development (CD)
- knowledge and understanding of the world (KUW)
- physical development (PD)

There are two Local Authority National Indicators which relate to these assessments. NI 72 is related to the achievement targets of at least 78 points across the 13 scales of the FSPA and at least six points in each of the personal, social and emotional development and communication, language and literacy scales. NI 92 is related to the narrowing of the gap between the lowest achieving 20 per cent in the FSPA and the rest. The full set of national indicators are the basis of assessment of Local Authority performance, see Department for Communities and Local Government (2007).

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<sup>5</sup> The personal, social and emotional development and mathematical development areas of learning constitute three scales each, communication, language and literacy, four scales, whilst the other three areas of learning are based on single scales.

The first three points of each scale describe a child who is still progressing towards the achievements described in the early learning goals, and are based mainly on the stepping stones in the curriculum guidance. Most children will achieve all of these three points before they achieve any of the early learning goals, but there may be some exceptions to this pattern.

The next five points are drawn from the early learning goals themselves. These are presented in approximate order of difficulty, according to evidence from trials. However, the points are not necessarily hierarchical and a child may achieve a later point without having achieved some or all of the earlier points.

The final point in each scale describes a child who has achieved all the points from 1–8 on that scale, has developed further both in breadth and depth, and is working consistently beyond the level of the early learning goals.

While the assessment process is primarily teacher directed, other contributors will be involved: the child's guardians, the child themselves, records from previous settings, and other practitioners (e.g. learning assistants).

The majority of the foundation stage profile assessments can be made in another language for non-English speakers. However, points 4-9 of the communication, language and literacy scales must be assessed in English. A scale score of 1–3 indicates working towards the early learning goals, a scale score of 4–7 indicates working within the early learning goals, a scale score of 6 or more in all scales indicates a good level of development within the early learning goals, a scale score of 8 indicates completion of the early learning goals and a scale score of 9 indicates working beyond the early learning goals.

The data were collected for DCSF and have been matched into the detailed survey data from the Millennium Cohort Study (MCS). Thus the FSP assessment provides a convenient measure of child attainment to use in analysis of the impact of early years provision on child development. The main advantages of the FSP assessment data are that it is collected nationally, and it covers a range of aspects of development and it is collected every year. Given the project goal of reducing the burden on service providers in terms of data collection, it is a crucial measure and the main focus of our analysis, where we explore how our measures of quality predict our measures of outcomes.

However, the quality of FSP data is uncertain prior to 2008 because the moderation process had not been properly established resulting in

inconsistencies across settings. Analysis of FSP has suggested that since 2005 improvements in the way assessment and moderation have been conducted have contributed to a downturn in the percentage of children achieving the highest scores (DCSF, 2008).

In September 2008 the Early Years Foundation Stage replaced the Foundation Stage Curriculum, the National Standards for Day Care and the non statutory Birth to Three Matters. The EYFS covers both learning and development and children's welfare. It applies to all schools with nursery and reception aged children and to all Ofsted registered settings with children from birth to 5, regardless of their funded status The EYFS was introduced to ensure that all children are provided with a high quality learning experience regardless of the type of setting they attend.

### **3.6 Measures of Quality**

Data was collected on the quality of the settings in the QCS using observational rating scales, namely the Early Childhood Environment Rating Scale (ECERS) and the Caregiver Interaction Scale (CIS). Observations were carried out in one of the rooms in the setting providing for children aged between three and five, although sometimes younger children were also present; around half (49 per cent) of the observed rooms also catered for children under three years old. These observations were carried out by specialist researchers and lasted up to one day. Data from Ofsted (the Office for Standards in Education, Children's Services and Skills) inspections for the QCS settings were merged into the QCS data. Overall we have four key measures of quality of early years settings, described in more detail in sections 3.6.1 – 3.6.3:

- three out of seven scales from ECERS-R
- all four scales from ECERS-E
- scales from the CIS
- Ofsted inspection results

#### **3.6.1 The Early Childhood Environment Rating Scale (ECERS)**

Scales from ECERS have been used extensively as a quality measure in research and are also used in practice for the purpose of quality improvement<sup>6</sup>. The original ECERS (Harms and Clifford, 1980) and the revised version, ECERS-R (Harms et al., 1998) were developed in the US but have been used in many countries, including the UK. ECERS is designed to evaluate the quality of settings providing for children between

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<sup>6</sup> See for example the UK ECERS Website: <http://www.ecersuk.org/index.html>

the ages of two and a half to five years. In the QCS, three of the seven ECERS-R sub-scales were used, namely:

- personal care routines
- language and reasoning
- interaction

Each sub-scale is underpinned by a number of items<sup>7</sup>, for example, personal care routines will consider health and safety practices, mealtimes and hygiene, among other things. Each item is scored from 1 (inadequate) to 7 (excellent); the score for each sub-scale is then calculated as the average of the scores for the items it contains. The remaining four sub-scales of ECERS-R, not collected in the MCS sub-study, are:

- space and furnishing
- activities
- program structure
- parents and staff

It is important to note that some research has suggested that it may be preferable to focus on the overall ECERS-R measure rather than using the sub-scales separately (Essa and Burnham, 2001). Unfortunately it is not possible to obtain an overall ECERS-R score in this analysis, as this would require information on all seven sub-scales. Instead, we consider separately the three sub-scales that are available to us, and also combine these by calculating the mean value of the three sub-scales to form what might be thought of as a 'partial' ECERS-R score.

The extension to ECERS (ECERS-E) was developed in the UK as part of the EPPE project (Sylva, Siraj-Blatchford and Taggart, 2003). Its development was intended to create a measure more appropriate for English settings with a greater focus on curricular aspects of provision. ECERS-E consists of four subscales:

- literacy
- mathematics
- science
- diversity

All four of these subscales were collected in the MCS sub-study. As with ECERS-R, each item is scored from 1 to 7, and sub-scale scores are the

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<sup>7</sup> ECERS-R is made up of a total of 43 items.

mean of the scores for the relevant items. We consider each sub-scale separately and also the overall ECERS-E score (the mean of the four sub-scales).

It is worth noting that in the EPPE project, ECERS-E was found to be significantly and positively correlated with ECERS-R, with a reasonably high correlation coefficient of 0.78 (141 settings). Both ECERS-R and ECERS-E have been shown to be significant predictors of children's outcomes (e.g. Sylva et al., 2006). In the EPPE project, ECERS-E was found to be more strongly related to cognitive outcomes, while ECERS-R was more strongly related to social development.

### **3.6.2 The Caregiver Interaction Scale**

The Caregiver Interaction Scale (Arnett, 1989) evaluates the quality of interactions at a setting between children and those who care for them. It consists of 26 items forming four subscales, namely:

- positive relationships
- punitiveness
- permissiveness
- detachment

Each item is scored from 1 to 4; the score for each sub-scale is then obtained by averaging the relevant item scores. On the positive relationships subscale, a higher score indicates higher quality, while on the remaining three sub-scales a lower score is preferable. Our analysis mainly considers the positive relationships measure in line with previous literature relating CIS to outcomes. We also find little impact of the other measures on the outcomes considered.

### **3.6.3 Measures from Ofsted**

Ofsted carries out hundreds of inspections and regulatory visits each week, publishing findings on its website. It also publishes themed and subject specific findings and recommendations on wider issues within the care, learning, and skills agenda, as well as statistical information.

In England, any provider eligible to deliver the free early education entitlement must be inspected by Ofsted. Inspection of early education in maintained nursery schools and nursery classes in maintained primary schools has been carried out by Ofsted since its formation. Following the

introduction of the free entitlement to early education in 1998, Ofsted has also been responsible for inspecting the quality of education provided by all establishments eligible to deliver this, including those in the private and voluntary sectors. Ofsted inspections happen regularly on a three year cycle and hence provide another piece of routinely collected data that will be a key focus of our analysis.

Data from the 2005-2008 Ofsted inspection cycle were merged with the data from the Quality of Childcare sub-study where possible. In the 2005-2008 cycle, childcare settings were inspected on quality of care with judgements based solely on the 14 National Standards and where the childcare provider was eligible to deliver the free early education entitlement they were also inspected on quality of nursery education. Quality ratings of nursery education focused on the difference provision made to progress towards early learning goals in the six areas of learning and were based on the Curriculum guidance for the Foundation Stage. Inspectors draw on various sources of evidence, including discussions with staff, parents, carers and children and self-evaluation carried out by the setting, as well as first-hand observations (Ofsted, 2006a). Part of the inspection involves checking whether settings meet certain regulatory requirements, as well as evaluating the quality of the setting. Providers receive little or no notice of inspections, with the aim of observing settings on a typical day.

Early years education and care are provided in a variety of different settings and while the vast majority of providers in our sample (71 per cent) are categorised by Ofsted as 'childcare on non-domestic premises', the sample also includes some primary schools (12 per cent) and a small number of nursery education providers (6 per cent). The different types of provider are subject to different inspection systems. In 2005-08 inspections of nursery education providers included a rating for the overall effectiveness of provision; inspections of primary schools included an assessment of the quality and standards in the Foundation Stage.

Since 2005, judgements have been made on the same four point scale from 'outstanding' to 'inadequate' (Box 3.1). Providers which are deemed inadequate are required to take actions to improve their results and are re-inspected.

### **Box 3.1: Description of Ofsted outcomes**

Outstanding	Exceptional settings that have excellent outcomes for children
Good	Strong settings that are effective for children
Satisfactory	Settings that have acceptable outcomes for children but which have scope for improvement
Inadequate	Weak settings that have unacceptable outcomes for children

*Source: Ofsted (2006b)*

For childcare settings Ofsted inspection reports include a judgement for both the quality and standards of the care and the quality and standards of the nursery education at the setting, where applicable. In our analysis we mostly use the nursery education rating, but in practice using the care rating instead makes little difference to our findings. For nursery education providers we use ratings for the overall effectiveness of the provision, taken from their most recent inspection prior to the introduction of the EYFS.<sup>8</sup> For primary schools, we use the judgement relating to the quality and standards in the Foundation Stage, again from inspections prior to the introduction of the EYFS, where possible.<sup>9</sup>

We were able to obtain Ofsted inspection data for 268 of the 301 QCS settings<sup>10</sup>. For the other 33 settings it is possible that some had closed down, others may have changed name or address and so could not be matched using current Ofsted information. Nursery education was inspected for most, but not all childcare providers within our sample; we therefore excluded a further 13 childcare providers from our analysis for which nursery education inspection results were not available. This left us with 255 settings that formed the basis of our quality comparison analysis, see Table 3.1.

**Table 3.1: Number of settings available for analysis**

	<b>Number of settings</b>
Observed settings	301
Ofsted data available	268
Childcare providers	215
Nursery education providers	18
Primary schools	35
All providers with Ofsted data	268
Nursery education inspection results available	255
<b>Total</b>	<b>255</b>

It is important to note that there have been several changes to the inspection of early years settings over time. As noted above, the analysis presented in this paper uses results from the 2005-2008 inspection cycle. This period is closest to the time when the settings were observed within

<sup>8</sup> With the exception of one setting where this was not available; instead we use results from their inspection after the introduction of the EYFS.

<sup>9</sup> For three primary schools this is not available, instead we use results for effectiveness of the EYFS from their inspection following its introduction.

<sup>10</sup> We are very grateful to Ofsted and the Centre for Longitudinal Studies for their help in matching this data.

the QCS study<sup>11</sup>. Inspection systems changed in September 2008, following legislative changes to the Foundation Stage. There is now a stronger focus on outcomes for children and safeguarding<sup>12</sup>. Some further changes were made in September 2009, partly to aid consistency of inspection across the different provider types.

### **3.7 Other data available from the MCS**

The MCS collects very detailed information on a wide range of topics. These have included child's health and development, early education, schooling and childcare, parenting activities, grandparents and friends involvement with the children, details of siblings, parental health, employment, education and earnings, housing, local area and household demographics and family context. Some parts of the interview are completed via self-completion modules; these have included questions about the child's behaviour, the respondent's relationship with their partner, mental health and attitudes to parenting.

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<sup>11</sup> Although sometimes there was a considerable period of time between the date of observation for the QCS study and the date of Ofsted inspection, see the discussion in Section 5.1.

<sup>12</sup> For more information see the Ofsted website <http://www.ofsted.gov.uk>

## **4. Analytical Approach**

The previous section introduced our six key measures of child outcomes and four key measures of the quality of early years settings. The main aims of our analysis are to see how the four quality measures relate to each other and to see how our setting quality measures predict our outcomes measures for children. Our main focus is on the routinely collected measures, that is, outcomes as measured by the FSP assessment and quality as measured by Ofsted inspections, primarily because these are the measures considered by parents of children who attend such settings and they are routinely available and regularly collected.

### **4.1 Quality and Outcome Comparisons**

For our quality and outcome comparisons, we consider correlations between all our quality measures and all our outcome measures. We then look at how mean scores on the various rating scales relate to Ofsted inspection judgements. The quality comparisons are the focus of Section 5.1 of the report and the outcome comparisons are the focus of Section 5.2.

We also compared the characteristics of our 255 settings with the full sample of 301 settings included in the full sub-study sample (see Table 4.1). The mean scores on our three quality measures were all the same and the distribution of settings by sector, centre population, age ranges catered for, hours of provision and whether there were more than five per cent of children with Special Education Needs were also very similar. However, the settings in our analysis sample were slightly less likely to have less than 20 per cent unqualified staff than the full sample. Overall we feel that our sample of settings on which our analysis is based are in line with the full sample of settings in the QCS study.

**Table 4.1 Characteristics of QCS analysis sample and the full QCS sample**

	<b>Analysis sample (255 settings)</b>	<b>Full sample (301 settings)</b>
<b>Quality measures (mean scores):</b>		
ECERS-E	3.4	3.4
ECERS-R	4.6	4.6
CIS positive relationships	3.4	3.4
<b>Sector (%):</b>		
Maintained	20	20
Private	55	55
Voluntary	22	23
Joint	2	2
<b>Centre population (nursery manager estimates, %):</b>		
Mixed	54	55
Mainly affluent	33	32
Mainly disadvantaged	13	13
<b>Age ranges catered for (centres, %):</b>		
3 – 5 years	100	100
2 year olds	83	84
1 year olds	46	44
Under 1 year	42	40
<b>Hours of provision (%):</b>		
Half day (sessional)	31	31
School hours	14	15
Full day care	55	54
<b>Special Educational Needs (%):</b>		
More than 5% children in room with SEN	32	32
<b>Staff qualifications (%):</b>		
Manager with Level 4 qualification or above	30	29
Less than 20% unqualified staff	60	62
Qualified teacher present in room	27	26

## 4.2 Analysis of all MCS Children

As noted above the QCS data covers just 301 settings and 631 children, whilst the MCS as a whole includes more than 15,000 children in each of the first three sweeps of data collection. The benefits of the full MCS sample are its' size, but it lacks detailed data on service providers and in

particular measures of quality of service. However, the MCS does include a rich source of data on many of the other determinants of child outcomes that we will need to include in our analysis of the smaller QCS sample. Given this, we first estimate models for our outcome measures using the full MCS sample in order to gauge the relative importance of these factors on our child development measures and this provides us with some insight for the key variables to consider in our analysis of the QCS. The full MCS data does include some information about the settings that the children attended and we use this information to investigate the relationship between attendance at early years education, the type of provider, the age of the child when first attended and whether attended full-time or part-time on each of the child outcome measures.

We select our analysis sample here such that all the children in our sample have completed all the various assessments in the survey and have FSP scores available, including separate scores for each of the six areas of learning and have lived in England throughout the survey period. This leaves us with 7,939 children in our analysis sample compared with 9,640 children recorded as living in England throughout the survey period in the full MCS sample.

Table 4.2 shows how these two samples compare. The average assessments scores are similar for all the assessments across both groups of children. The only difference was that children in our analysis sample scored slightly higher on the FSP assessment than children in the full sample of MCS children. The types of setting they attended were broadly similar, but ethnic minority children were slightly less likely to be in our analysis sample than in the MCS as a whole.

**Table 4.2 Characteristics of MCS analysis sample and the full MCS sample**

	<b>Analysis sample</b> (7,939 children)	<b>All Children in England</b> (9,640 children)
<b>Child assessments (mean scores):</b>		
Total FSP Score	88	87
British Ability Scales:		
Naming Vocabulary Score	55	55
Picture Similarities	55	55
Pattern Construction	51	51
Strengths and Difficulties Questionnaire		
Overall Difficulties	7	7
Pro-social behaviour	8	8
<b>Percentage who attended:</b>		
Any Early Years Education	93	93
Nursery school/class	56	56
Playgroup	31	31
Pre-school	28	27
Childminder	14	13
Day nursery	16	16
<b>Child characteristics:</b>		
Percentage Female:	49	49
Age at July 2006 in months	65	66
Percentage Not White	13	16
<b>Mothers' highest qualification level</b>		
None or overseas only	13	14
NVQ Level 1	8	8
NVQ Level 2 or 3	44	42
NVQ Level 4 or 5	35	35
<b>Family socio-economic status</b>		
High	42	42
Medium	12	12
Low	44	44
Missing	2	2

Our outcomes measures are typically scores with a reasonable number of values and thus all approximate to continuous variables. In order to allow simple comparison of our analysis findings we convert them all to scores that have an average value (mean) of 0 and a standard variability (standard deviation of 1). Statistically these are known as z scores. We then estimate ordinary least squares regression models (OLS) to identify

associations between these scores and other factors that we expect to be related to these scores. These factors, we call our control variables. The estimation produces coefficients for each of these control variables which indicate how much they influence the scores.

The estimation also allows us to identify how significant this influence is in a statistical sense. This gives a measure of how confident we can be that our estimated coefficient would be the same if we were to re-estimate the same model but on different samples of children. An impact is deemed to be significant if 95 or more times out of 100 we would expect to get the same result. This is termed as significant at the five per cent level, which is the conventional measure of designating that an impact is likely to be replicable. Many of our estimates are only significant at the ten per cent level, which means that if we were to re-estimate the same model but on different samples of children, we would only expect to get the same result in 90 to 95 cases out of every 100.

The exception to this approach is when we consider the six areas of learning within the FSP assessment. Here, the scores for some of the areas of learning only range from 1 to 9, and for this analysis we split the scores into four categories. The lowest category is equivalent to a score of 1-3 on that scale; the second category is 4-5, then 6-7 and finally 8-9<sup>13</sup>. For these measures we then estimate ordered probit models, which estimate the probability of achieving each of the range of scores. In the same way as for the OLS models discussed above, the procedure results in coefficients and an indicator of significance for each of the control variables included in the models. These models are the focus of Section 5.3 of the report.

### **4.3 Analysis of quality and outcomes**

The main goal of this research is to investigate whether routinely collected measures of early years setting quality (Ofsted inspection judgements) can predict routinely collected measures of child outcomes (FSP assessments). The analysis of Section 5.3, outlined above, will indicate what other factors we need to include in our models, but given the relatively small sample size we will need to reduce the number of these measures to a coherent level.

In addition to streamlining our control variables we also in our analysis group the scores for the six areas of learning within the FSP assessment.

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<sup>13</sup> Recall that some of the scores for these areas of learning come from more than one nine point scale so, for example, for personal, social and emotional development which is comprised of three scales, the lowest category is a combined score of 1-8 and the other three categories correspond to scores 10-16, 16-21 and 22-27.

As noted above, the scores for some of the areas of learning only range from 1 to 9, and there is often a concentration of scores towards the top of the range. For these measures we only consider whether the score is equivalent to six or more or not; we then estimate probit models to estimate the probability of achieving a score of six or more.

## 5. Quality and Outcomes in Early Years Education and Care

As discussed above our analysis of quality and outcomes in early years education is split into four parts. First we consider how our measures of quality compare with each other and also how our measures of outcomes compare and then we develop models for the outcomes from early years education and care using a full sample of MCS children. Finally we bring the two elements together to consider how quality of early years education relates to outcomes controlling for other factors that relate to these outcomes.

### 5.1 Quality comparisons

We have a range of indicators for the quality of early years education and care that were discussed in Section 3.6. These include:

- Early Childhood Environment Rating Scale – Extended (ECERS-E)
- Early Childhood Environment Rating Scale – Revised (ECERS-R)
- Caregiver Interaction Scale
- Inspection ratings from Ofsted

Table 5.1 shows a correlation matrix between each of our quality measures, where 0 would indicate no association between the two measures and one is a perfect correlation. All correlations are positive and statistically significant at conventional significance levels. The correlation between the two ECERS measures is strong (0.64), as would be expected, as are the correlations between the CIS positive relationships subscale and both ECERS measures (0.55 and 0.69). However, Ofsted measures are only weakly correlated with any of the other quality measures. The largest correlation for the Ofsted ratings is with the ECERS-E measure, (0.26 for childcare and 0.24 for nursery education).

**Table 5.1: Spearman's rank correlations between quality measures**

	ECERS-E	ECERS-R <sup>1</sup>	CIS <sup>2</sup>	Ofsted Childcare	Ofsted Nursery Education
ECERS-E	1.00				
ECERS-R*	0.64	1.00			
CIS <sup>^</sup>	0.55	0.69	1.00		
Ofsted Childcare	0.26	0.19	0.17	1.00	
Ofsted Nursery Education	0.24	0.14	0.15	0.82	1.00

1 The ECERS-R measure is the mean score for the three subscales included in the QCS.

2 Positive relationships subscale

All correlations are significant at 1% level, with the exception of the correlation between the Ofsted nursery education rating and ECERS-R\*, which was significant at the 5% level.

We might expect the ECERS-E quality measure to correlate most strongly with the Ofsted measures, because both measures are related to the early years curriculum, but it is important to remember that Ofsted inspections focus on both meeting regulatory requirements as well as some consideration of the quality of service provided, so weak correlations between Ofsted ratings and other quality measures may not be such a surprise.

The two Ofsted measures, the quality of care and the quality of the nursery education, are very strongly correlated (0.82), but for the 53 settings not deemed to be childcare settings there is only a single inspection result. For the remaining 202 settings with a separate childcare and nursery education rating the correlation was also high at 0.75 and here 166 settings had the same rating for the quality of care and the quality of the nursery education.

For the 202 childcare settings we have more detailed ratings from Ofsted, with these settings being assessed in terms of the Every Child Matters goals: being healthy, staying safe, enjoying and achieving, making a positive contribution; as well as in terms of setting organisation, leadership and management, teaching and learning, and partnership with parents. Table 5.2 shows how all of these separate ratings are correlated with our ECERS-E, ECERS-R and CIS measures.

**Table 5.2: Spearman's rank correlations with detailed Ofsted ratings**

	ECERS-E	ECERS-R <sup>1</sup>	CIS <sup>2</sup>
Overall care	0.32	0.24	0.28
Overall nursery education	0.29	0.18	0.25
Being healthy	0.33	0.25	0.26
Staying safe	0.26	0.17	0.23
Enjoying & achieving	0.31	0.22	0.30
Making a positive contribution	0.34	0.24	0.24
Organisation	0.28	0.22	0.26
Leadership & management	0.28	0.19	0.24
Teaching & learning	0.28	0.18	0.23
Partnership with parents	0.33	0.22	0.25

1 The ECERS-R measure is the mean score for the three subscales included in the QCS.

2 Positive relationships subscale

All significant at the 1% level, with the exception of the correlation between 'staying safe' and ECERS-R, which is significant at the 5% level.

Base: 202 childcare settings

It is worth noting that for this sample of childcare settings, the correlation of the overall care and nursery education ratings with the ECERS-E, ECERS-R and CIS measures are slightly higher than for the full sample of 255 settings reported in Table 5.1 e.g. the correlation between the ECERS-E score and the Ofsted childcare rating was 0.26 in the full sample and 0.32 for the 202 childcare settings.

However, Table 5.2 shows that correlations between all the separate Ofsted areas of inspection and ECERS-E, ECERS-R and the CIS positive relationships scale are all weak. The highest correlation is just 0.34 between the ECERS-E mean score and the Ofsted rating of making a positive contribution. This may be explained by the fact there is little variation in the rating across the different scales.

For 91 of the 202 childcare settings, the rating is the same for each of the ten inspection areas outlined in Table 5.2 and for a further 64 settings eight out of the ten ratings were the same. Furthermore, when we tested whether there were any significant differences between the correlations with ECERS-E, ECERS-R and CIS for each of the ten ratings, we find that none of the different correlations were significantly different from each other.

Given this limited variation between the separate Ofsted scales, we limit the remainder of our analysis to just the quality of nursery education. A final point worth noting on the Ofsted inspections is that there may be some time between the setting's observation for the MCS sub-study and the date of their Ofsted inspection, which may influence the correlations reported in Table 5.1 and 5.2. One might expect higher correlations where

less time had elapsed between the observation and inspection. In fact, the correlations were actually lowest for providers inspected within one year of the MCS observation, which is somewhat puzzling<sup>14</sup>.

By virtue of the fact that we only have four categories for the Ofsted data, there is limited variation in the data. While this may reduce the correlations, polyserial correlation techniques also produce similar results.

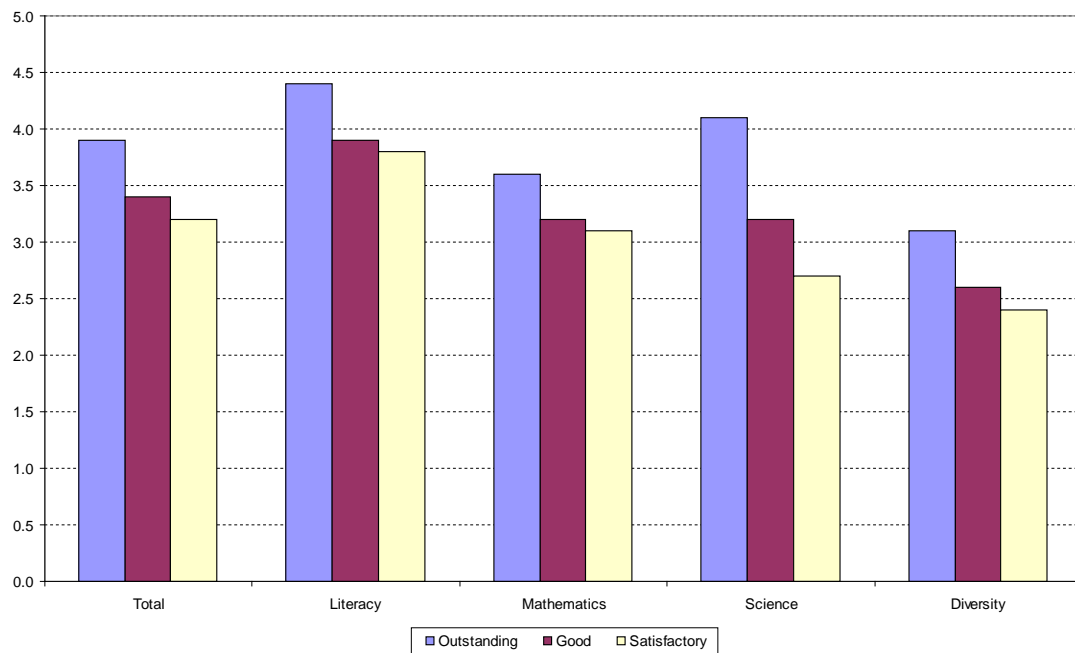
Figure 5.1 shows how the Ofsted judgements<sup>15</sup> compare with average scores for each ECERS-E subscale, as well as the overall mean ECERS-E score. Only a small number of settings in this sample were deemed inadequate by Ofsted and so mean scores are not shown for this group. The ECERS-E scores were on average highest in those settings deemed outstanding by Ofsted and lowest for those deemed satisfactory. However, for both the overall ECERS-E score and the subscales, only the difference between good and outstanding settings was statistically significant. The one exception was the science subscale, where the difference in average scores between good and satisfactory settings was also statistically significant.

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<sup>14</sup> The correlations between ECERS-E and the Ofsted care rating, and between ECERS-E and the Ofsted nursery education rating, were 0.11 and 0.12 respectively, for settings inspected within a year of the MCS observation, with neither of these correlations statistically significant (60 settings). The equivalent correlations for those providers inspected more than two years after the MCS observation were 0.34 and 0.27, both statistically significant at the 1 per cent level (112 settings). It is important to bear in mind that these figures are based on relatively small sample sizes.

<sup>15</sup> This uses the judgement for quality of nursery education for the 202 childcare providers within the sample. Similar results are found if the judgement for quality of care is used instead.

**Figure 5.1: Average ECERS-E score by Ofsted inspection outcome**

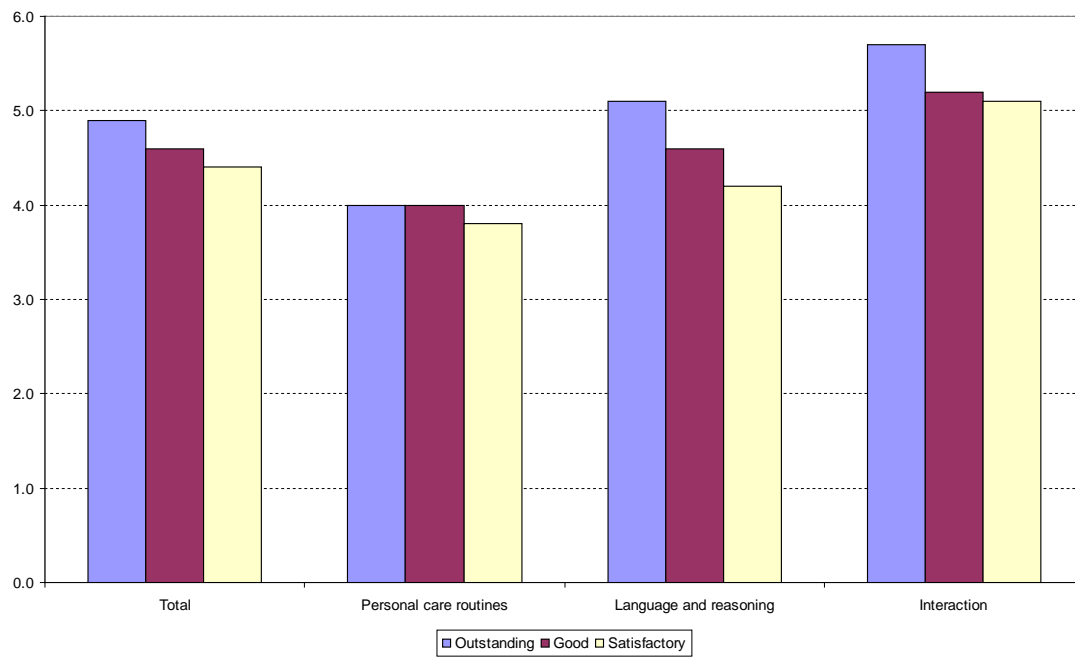


Base: 252 settings (255 settings in our analysis sample, excluding 3 rated inadequate by Ofsted)

Similar patterns are observed if we use average scores on the ECERS-R (Figure 5.2), although for the personal care routines subscale, there was no statistically significant difference in the average scores across the Ofsted categories.

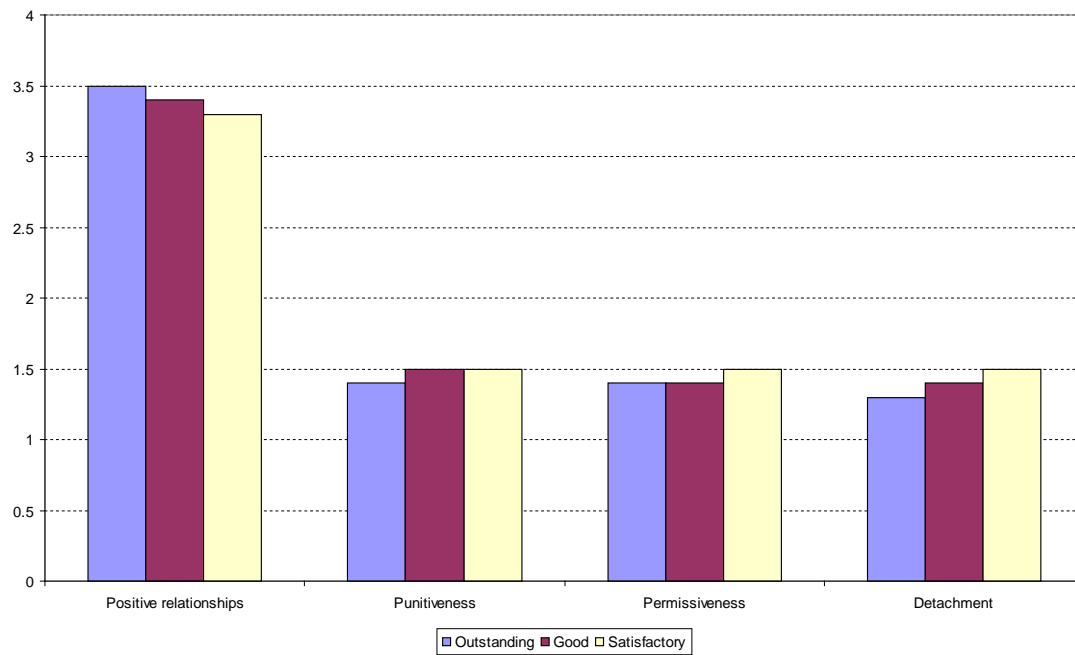
Looking next at the relationship between the CIS scores and Ofsted outcomes, (Figure 5.3), settings with better Ofsted inspection outcomes had higher average scores on the positive relationships subscale, although only the difference between good and satisfactory settings was statistically significant (and only using a 10% significance level). On the remaining three CIS subscales, punitiveness, permissiveness and detachment, better quality is indicated by a lower score. While the average scores for these subscales are lowest for settings with an outstanding Ofsted rating, these differences are not statistically significant, with the exception of the detachment subscale, where the difference between outstanding and good settings was weakly statistically significant, at the 10% level.

**Figure 5.2: Average ECERS-R score by Ofsted inspection outcome**



Base: 252 settings (255 settings in our analysis sample, excluding 3 rated inadequate by Ofsted)

**Figure 5.3: Average CIS score by Ofsted inspection outcome**



Base: 252 settings (255 settings in our analysis sample, excluding 3 rated inadequate by Ofsted)

## 5.2 Outcome comparisons

The FSP is a key measure of child development for our analysis, but it is useful to see how it compares with other outcome measures available to us, in the same way that we compare Ofsted inspection ratings with our other quality measures. Table 5.3 shows correlations between the cognitive areas of learning within the FSP and the cognitive measures from the British Ability Scales, whilst Table 5.4 shows correlations between the social and emotional development area of learning within the FSP and the social / behavioural measures from the Strengths and Difficulties Questionnaire.

It is interesting to note that the correlations between the FSP areas of learning are much higher than correlations between the three BAS sub-scales and also higher than correlations between any of the FSP areas of learning and any of the BAS sub-scales (Table 5.3). The correlations for the social development measures in Table 5.4 are also of a similar magnitude to the correlations between the FSP and BAS cognitive measures.

These are all measures of different things, so it is not clear what the pattern of correlations should look like. However, the high correlations for the FSP areas of learning may reflect the fact that teacher assessments of children include a higher common assessment of development than is evident in the BAS measures.

**Table 5.3 Spearman's rank correlations between FSP cognitive development area of learning and measures from the British Ability scales**

	FSP- communication language and literacy	FSP- mathematical development	FSP- creative development	FSP- knowledge and understanding of the world	BAS- naming vocabulary	BAS- picture similarities	BAS- pattern construction
FSP- communication, language and literacy	1.00						
FSP- mathematical development	0.89	1.00					
FSP- creative development	0.71	0.67	1.00				
FSP- knowledge and understanding of the world	0.74	0.74	0.69	1.00			
BAS- naming vocabulary	0.42	0.41	0.30	0.35	1.00		
BAS- picture similarities	0.25	0.25	0.19	0.21	0.28	1.00	
BAS- pattern construction	0.34	0.35	0.25	0.26	0.34	0.34	1.00

Base: 7,939 children in the analysis sample  
 All correlations were significant at the 1% level

**Table 5.4 Spearman's rank correlations between FSP social development area of learning and SDQ measures**

	FSP – personal, social and emotional development	SDQ total difficulties	SDQ pro-social behaviour
FSP – personal, social and emotional development	1.00		
SDQ total difficulties	-0.33	1.00	
SDQ pro-social behaviour	0.19	-0.39	1.00

Base: 7,939 children in the analysis sample

All correlations were significant at the 1% level

### 5.3 Analysis of all MCS children

Next we turn to our analysis of all children in the MCS. As discussed above, we have a range of outcome measures for children and also some detail about the early years services accessed. We only include in our analysis children where complete FSP assessment data was available. In addition we only include children who have data for all our outcome measures at sweep 3 of the survey. This leaves a sample of 7,939 children and we have already seen in Section 4 that this analysis sample is broadly similar in terms of key characteristics of the children and their families to the sample of all MCS children living in England.

#### 5.3.1 Attendance at early years provision

Information on attendance at childcare has been collected at all three sweeps of the MCS. Here we focus mainly on the information from the third sweep where respondents were asked whether their child had ever attended any of the following types of provider: nursery school or class, playgroup, preschool, childminder or day nursery<sup>16</sup>. Information on start and finish dates was collected for each provider type attended and depending on type, whether attendance had been full or part-time, or average hours.

If children attended nursery school or class, play group or pre-school, the survey asked whether they had attended full-time or part-time. Here part-time attendance was defined as either a morning or afternoon session 4-5 days a week or a full day on 1-3 days a week. However, if they had attended a childminder or day nursery, the survey asked "about how many hours per week the child attended". This makes it difficult to create a consistent part-time – full-time indicator for provision. We do so by categorising children as having attended a childminder or day nursery part-time if they attended for less than 30 hours per week. This indicator is then combined with the self reporting of full or part-time attendance for the other types of provision.

Using the dates for the beginning of spells of early years education, we can identify the age of children when they started provision and thus we create the early years measures used in our analysis.

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<sup>16</sup> Respondents were also asked separately about current childcare use. We focus on the questions about provision ever attended, firstly because we are interested in attendance at formal provision, and the questions about current use focus on mostly informal care (with the exception of day nurseries and childminders) and secondly because we are most interested in attendance prior to starting school; by the time of interview at sweep 3, most children were already attending school.

Ideally we want to use data from earlier sweeps of the survey to give us a full early years provision history, but inconsistencies in questions asked and in reporting of spells of provision mean that it was better to limit our analysis to sweep 3 data to give us consistent data. The MCS questions for sweep three were designed partly with the intention of gathering data on previous attendance, as information collected at the first two sweeps was felt not to have sufficiently captured this (Jones, 2008).

Most children (93 per cent) had attended some form of early years education by the time of the interview at sweep three, with just seven per cent having never attended any of the five specified provider types (Table 5.5). The most common form of provider used was a nursery school or class, with just over half (56 per cent) of children having attended this type of setting. Just under a third (31 per cent) of children had attended a playgroup, while a similar proportion (28 per cent) had attended a pre-school. Day nurseries had been used by 16 per cent of parents, and childminders by 14 per cent. While around half (52 per cent) of children had attended one type of provider only, around one third (32 per cent) had attended two types of provider and almost one in ten (9 per cent) had attended three or more.

**Table 5.5 Per cent of children ever attending early years education and care**

	<b>Ever attended</b>
Has attended nursery school/class	56
Has attended playgroup	31
Has attended pre-school	28
Has attended childminder	14
Has attended day nursery	16
Never attended any of these providers	7
<b>Total no. of children</b>	<b>7939</b>

Our measure of the extent of children's attendance at early years education is a three way classification covering full-time provision, part-time provision with one provider and part-time provision with more than one provider<sup>17</sup>. Table 5.6 shows that 18 per cent of children attended some provision that was usually full-time whilst 42 per cent attended part-

<sup>17</sup> Ideally we would like to identify the hours of free education and care, but as discussed above we only have hours of attendance for the two least frequently attended types of provider: childminders and day nurseries. It is difficult to categorise part-time provision, particularly when children often attended more than one provider for part-time hours at the same time. For example, for nursery school, nursery class, play group or pre-school provision we don't know whether two spells of part-time attendance were two spells of one full day a week, which would in total still be part-time provision, or whether the two spells of part-time provision were three full days and two full days thus constituting full-time provision. Thus to extend our categorisation beyond a simple full-time - part-time split we have created this classification.

time with just one provider. The remaining 32 percent of children attended part-time with more than one provider.

**Table 5.6 Full-time and part-time attendance at early years education and care**

	Weighted per cent
Attended full-time	18
Attended part-time with one provider	42
Attended part-time with more than one provider	32
Never attended any providers	7
<b>Total no. of children</b>	<b>7939</b>

Our third measure of early years provision relates to the age children started provision. Once started, most children remain in early years education and care up until they start full-time school. Therefore, in most cases the difference between the age the child started full-time schooling and the age they started early years education and care gives the duration of early years provision. This is useful to bear in mind when interpreting the impact of the age children started early years provision.

Table 5.7 shows that most children started early years provision between the ages of two and four years old. 31 per cent started when they were two and 27 per cent when they were three. A further 30 per cent started before they were aged two and just three per cent started after they became four years old.

**Table 5.7 Age children started early years provision**

	Weighted per cent
Less than 12months	18
12 -24 months	12
24 -36 months	31
36 -48 months	27
More than 48 months	3
Age started unknown	2
Never attended any providers	7
<b>Total no. of children</b>	<b>7939</b>

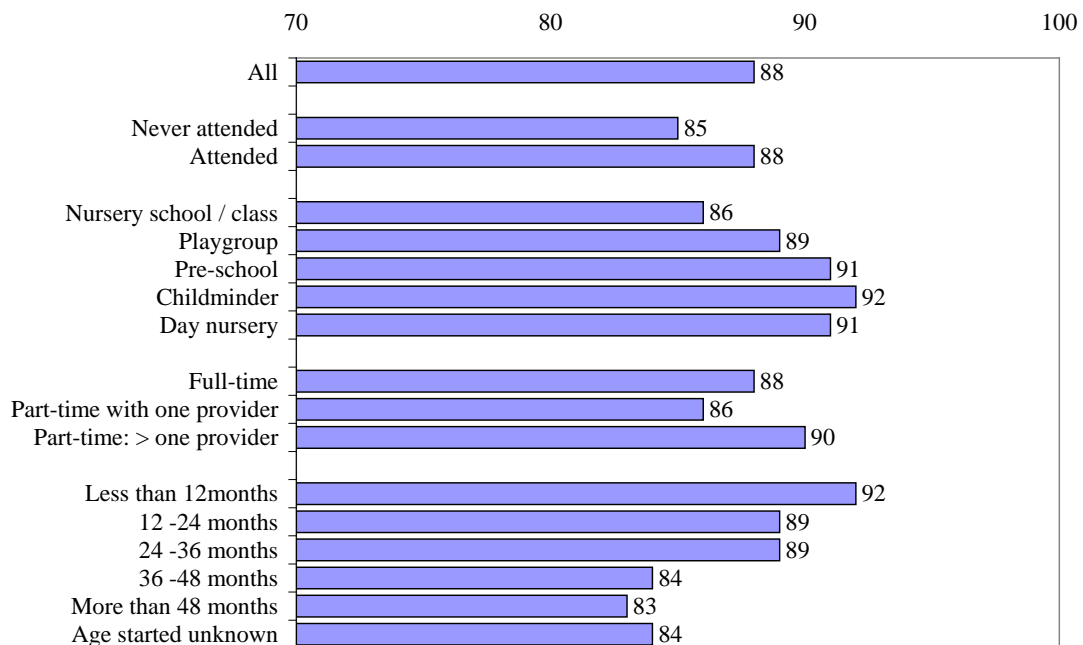
Figure 5.4 shows the average total FSP score by these characteristics of early years education. Overall, the average score is 88. The average score is higher for children that attended early years education (88) than for children who did not (85); a difference that is statistically significant. This is in line with earlier evidence indicating a positive relationship between attendance at early years education and child outcomes.

Differences by type of provider show that the lowest average scores were for children who attended a nursery school or class (86). This was significantly lower than all the other average scores. This is opposite to what we might have expected where evidence from EPPE indicated that children who attended nursery schools generally had better outcomes.

Differences between the other types of provision are less striking. The next set of bars considers our measures of full and part-time attendance. Children who attended early years education part-time at more than one provider came out with the highest average scores (90) followed by children who attended some full-time early years education (88) and the lowest average scores were for children who attended one provider part-time.

Differences by age started attending early years education are also evident. The lowest average scores were for children who started early years provision after their third birthday (or when age started was unknown) and highest for children who started provision before their first birthday. The differences observed here are the largest. Children who started education before their first birthday had an average score of 92 compared with just 83 for children who started after their fourth birthday and 84 for children who started education when they were three.

**Figure 5.4 Average Total FSP scores by type of early years education**



### 5.3.2 Multivariate models of child outcomes

The above descriptive statistics give some indication of how attendance at early years education may influence child outcomes. However, the differences shown above may simply reflect differences in the characteristics of the children in different types of provision. In order to explore whether FSP scores vary with early years attendance, we need to control for a range of other variables that may be affecting children's performance in their FSP assessment.

Included in the model are our selection of early years variables described above and a wide range of other characteristics. These can be split into child characteristics, family and parent characteristics and the early years characteristics already mentioned.

The child characteristics include:

- gender
- ethnicity
- whether birth weight was low
- whether any development delays were recorded at age nine months
- whether the child has a long-term illness
- cognitive and social development scores at age 3
- age started full-time school
- age in July 2006, when all children should have completed the FSP assessment

The family characteristics include:

- mother's qualifications
- mother's and father's age
- family socio-economic status
- parental marital status
- whether the child has siblings
- the home learning environment

The home learning environment has been shown to be an important predictor of child outcomes, see Ermisch (2008), and is captured through whether the child had help with reading, writing and numbers at home.

As discussed in Section 4, we estimate ordinary least squares models to assess the impact of independent variables on these scores. We would, in

addition, want to control for parents selection into whether their children attend early years education and which type of provider they choose, but valid instruments for this selection are not obvious.

La Valle and Smith (2009) report that non attendance at early years education is partly due to parents' preferences and attitudes, with some parents preferring to look after their child at home. However, other reasons for non attendance relate to difficulties in accessing provision such as lack of places and costs. Unfortunately the survey does not allow any measure of parental attitude or availability of places.

We did look at the characteristics of children and their families who did not attend any early years education. This analysis found that whilst children who did not attend were similar in terms of age and gender to children who did attend early years education, they were much more likely to be from ethnic minority families (13 per cent of attendees were from minority families compared with 20 per cent of non-attendees).

We also found some differences in terms of mothers' qualifications whereby mothers of non attendees were more likely to have no qualifications or only overseas qualifications and less likely to have NVQ level 2 or 3 qualifications. However, there was little difference in the percentage of mothers with a degree or higher qualification in whether their children attended early years education or not.

These differences were also evident in terms of family socio-economic status with similar proportion of attendees coming from the highest (44 per cent) and lowest (42 per cent) groups, whilst non-attendees were much more likely to come from the lowest socio-economic group (48 per cent) than the highest (38 per cent).

The results from our estimation are presented in Table 5.8. We only report coefficient estimates for the early years education variables and the asterisks indicate the degree to which these estimates are statistically significant. Full model specifications are in Appendix Table A1.

The first column of Table 5.8 shows the estimated coefficient for a dummy variable identifying whether a child had attended any early years education. The model includes all the control variables discussed above. The attendance coefficient is positive but not statistically significant and translates to an increase in the FSP score of 0.8. Comparing with the differences shown in Figure 5.4 we note that including all the other variables in the model reduces the difference in scores by whether a child attended early years education from three to less than one and renders the difference not statistically significant.

The evidence on the overall impact of attendance at early years education is in contrast to previous evidence on child outcomes. Where attendance at early years education is nearly universal then it may not be surprising to find estimates that are not statistically significant, because one of the groups concerned is relatively small. However, this is a large data set and even with just seven per cent of children not attending we have nearly 600 children not attending provision in the sample.

Other possible explanations for such results are that the average quality of the service may have reduced because of the large expansion in the numbers of children attended or that when nearly all children attend provision then the positive effects previously observed become diluted by children who do not greatly benefit from the provision, but still attend because nearly all other children attended.

With this in mind we investigated whether there was a significant impact of attending early years education for any disadvantaged groups in line with evidence cited by Sylva et al. (2006). Results, not reported here, showed that for children from the lowest socio-economic groups there was a positive impact on their total FSP score of roughly two points, but the impact was only statistically significant at the ten per cent level. A similar impact was found for ethnic minorities, this time adding almost three points to their total FSP score, but again the impact was only statistically significant at the ten per cent level.

**Table 5.8 The impact of early years education on FSP scores**

	(1)	(2)	(3)	(4)	(5)
<b>Early years education</b>					
Attended early years education	0.048 (0.037)				
<b>Attended Full-time or part-time</b>					
Full-time		0.083* (0.042)			
Part-time with 1 provider		0.019 (0.038)			
Part-time with multiple providers		0.063 (0.043)			
<b>Age started</b>					
Less than 12 months			0.079* (0.041)		
12-24 months			0.048 (0.049)		
24-36 months			0.090** (0.043)		
Less than 36 months					0.084** (0.042)
36-48 months			0.016 (0.039)		0.030 (0.038)
48 months or more			-0.189*** (0.065)		-0.174*** (0.061)
<b>Type of Provider</b>					
Nursery school or class				0.007 (0.029)	-0.010 (0.032)
Playgroup				0.038 (0.024)	0.009 (0.025)
Pre-school				0.081*** (0.028)	0.057* (0.029)
Childminder				0.031 (0.027)	0.016 (0.027)
Day nursery				0.007 (0.031)	-0.021 (0.031)
Observations (weighted)	9717	9717	9717	9717	9717
R-squared	0.348	0.348	0.350	0.349	0.351

Standard errors in parentheses

\* indicates significant at 10 percent level. \*\* indicate significant at 5 per cent level \*\*\* indicates significant at 1 per cent level

The estimates in the next three columns show the impact for different characteristics of early years education. In each column we report estimates from models with each of the characteristics of early years education included in turn. So the model reported in column two includes the same control variables as the model reported in the first column and our measures of whether attendance at early years education was full or part-time.

We find that attending full-time has a positive impact on the total FSP score, but the impact is only significant at the ten per cent level. Attendance part-time with one provider or more than one provider has no impact on the total FSP score.

The next column focuses on the age children started at early years education. Here we find that starting early years education before the child's first birthday has a positive impact on the total FSP score, but again the impact is only significant at the ten per cent level. However, children who started early years education at age two had a positive and statistically significant impact of attendance on their FSP score at conventional levels of significance.

Starting early years education when aged one and aged three had no impact on the score, but starting after age four had a large negative and significant impact reducing the total FSP score.

The next column looks at estimates by type of provider and shows that only attendance at pre-school has a positive significant impact on the FSP score.

In the final column of Table 5.8 we seek to include all three measures of early years education in the same model. We omit the variables from our models that capture whether attendance was full-time or part-time because once we control for age and type of provider, attending full-time or part-time has no impact on the FSP score. We also combine some of our age started categories, having tested that the estimated coefficients were not significantly different from each other. This leaves us with a model that controls for the type of provider and just three age started categories.

This final specification indicates that the age the child started early years education has the biggest influence on the scores. Starting before age three increases, on average, the FSP score, but starting early years education after age four reduces the FSP score by twice as much. Attendance at pre-school has a small impact on the FSP score, which is positive but only significant at the ten per cent level. Previous studies have indicated that maintained sector providers had the largest positive impact

on child outcome measures. It is not possible to be completely sure about the categories of provider reported in this survey. The pre-school label is quite a generic one and it is easy to imagine that parents might term pre-school as any form of provider. It is notable that nursery schools and classes do not have a positive impact on the FSP assessment scores. We have conducted similar analysis of the impact of early years education on all our other outcome measures and the results are too numerous to discuss in detail here. Full results are reported in Appendix Tables A2 and A3, whilst Table A4 reports results for all outcome measures, but just for our QCS sample.

The large sample results indicate that on average attending early years education had no impact on any of our outcome measures. And none of our early years indicators had any impact on the naming vocabulary or the pattern construction scores, but attending a day nursery had a positive significant impact on the picture similarity score.

The age started indicators were much more related to the social and behavioural development indicators. Here we found that starting early years education before age four reduced the total difficulties score significantly and similarly increased the pro-social behaviour scores.

## **5.4 Analysis of children in Quality Sub-study**

Finally we turn to our analysis of outcomes for the QCS sample where we include indicators of quality.

### **5.4.1 The number of children and settings in QCS**

The QCS study included 301 settings where 631 MCS children were present. However, not all of the children who attended these settings at MCS2 were present at MCS3. In addition, not all children attending settings in the QCS study have data on outcomes. For example, not all parents gave consent for their children's achievement in the FSP to be linked to the MCS data or for the cognitive assessments to be completed. There were 631 children in the original 301 settings, but not all of these children appear in the third sweep of the MCS. Most longitudinal surveys suffer from sample attrition and Table 5.9 shows that we lose 47 children who were not present in the survey at age five. We drop a further 13 children for whom the cognitive assessment data at age five was not available and another 11 children for whom comparable assessment data was not available at age three. There was also one child for whom there was no parent interview at MCS3, but who remained in the survey sample. This leaves our analysis sample for considering cognitive outcomes at 559 children in 277 of the original 301 settings.

FSP data could not be matched for all children and some parents did not give consent for the data to be linked, resulting in a sample of 506 children from 259 settings with FSP data for this part of our analysis. Turning to social and behavioural development, both a total difficulties score and a pro-social behaviour score were available for 571 of the children present at MCS3, in 281 settings. Comparable data at MCS2 was available for all but 23 of these children, resulting in a sample of 548 children attending 268 settings for our analysis of social and behavioural outcomes.

Ideally, the analysis of the different outcomes would all be based on the same sample of children and settings as was the case with the full MCS sample analysis in Section 5.3, but due to the small sample sizes, we have allowed the samples to vary in order to maximise the number of children in the analysis. In practice, restricting the analysis to the same consistent group of children across all outcomes makes little difference to our results. It is also worth noting that by definition, all the children in the QCS sample were in early years education at age three, so our age started measures reported in Table 5.8 are not relevant to this sample and the only provider type characteristic we consider is whether the settings were in the private, voluntary or maintained sector.

**Table 5.9: Number of children and settings available for child outcome analysis**

	Number of children	Number of settings attended by these children
In observed settings	631	301
Present at MCS3	584	284
All MCS3 cognitive assessments available	571	280
<i>Of which:</i>		
MCS2 naming vocabulary assessment available	560	277
Excluding case with no parent interviews	559	277
FSP data available	506	259
MCS3 social-behavioural measures available	571	281
<i>Of which:</i>		
MCS2 social-behavioural measures available	548	268

It is worth noting that the number of settings available for analysis from the QCS project is considerably greater than the number of settings used in analysis in both the EPPE project (141 settings) and the quality strand of the NNI evaluation (103 settings). The data collected for the pre-school centres in the EPPE project are now more than a decade out of date, with many changes having taken place in the early years sector in the intervening period. While the data collected as part of the NNI evaluation relate to a similar period to the QCS data, this only considers disadvantaged areas. Although the data on the settings in the QCS project relate to 2005, in any study of children's outcomes, data on the settings will inevitably be slightly out of date by the time information on outcomes becomes available. Using data from the QCS project therefore provides us with the most recent data available on provision, which is not solely focused on disadvantaged areas, for a considerable number of settings.

#### 5.4.2 Descriptive analysis

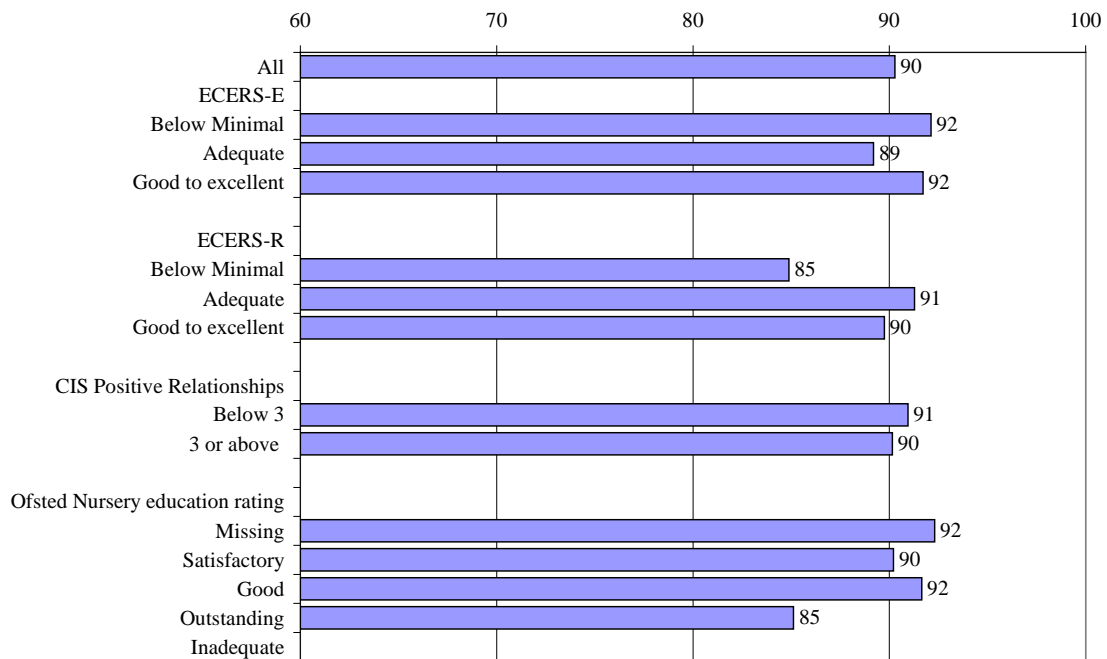
First we consider how our outcome measures vary by all of our quality measures.

For the sample under consideration the average total FSP score was 90. This is slightly higher than the mean scores for the full sample discussed in the previous section. We find little relationship between quality as assessed by ECERS-E and the FSP score. Children who attended settings with low ECERS-E scores, termed 'below minimal', had the same FSP score (92) as those that attended settings with high ECERS-E scores, termed 'good to excellent', (92). The middle group, termed 'adequate', however, had slightly lower FSP scores (89).

Turning to ECERS-R, children who attended below minimal providers had lower FSP scores than children who attended adequate or good to excellent providers, whilst differences by the CIS Positive relationships measure were small.

The biggest difference in FSP scores was by the Ofsted nursery education ratings. Here children who attended Outstanding settings had, on average, much lower FSP scores (85) than those attending good settings (92) or satisfactory settings (90). This is very much against expectations, but all the differences in FSP scores by quality rating may be explained by differences in the characteristics of children attending these settings. These characteristics will be controlled for in the multivariate analysis reported in Section 5.4.3 and we will reconsider FSP scores in outstanding settings in more detail there.

**Figure 5.5 Average Total FSP scores by quality indicators**

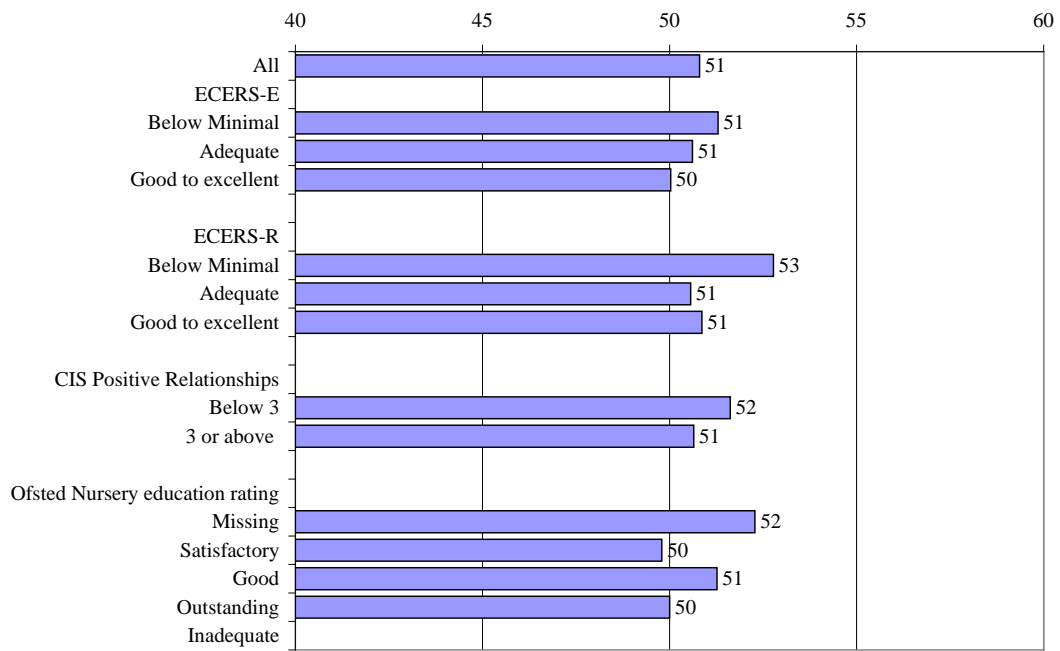


For the naming vocabulary assessment sample, the average total score was 51. Here we do not find large differences in average naming vocabulary scores by any of our quality indicators.

For ECERS-R, children who attended below minimal providers had higher naming vocabulary scores (53) than children who attended adequate (51) or good to excellent providers (51), but for other scales differences are minimal.

We do however find some large differences by some child and family characteristics e.g. ethnicity and sector of provider, as can be seen from the results of our multivariate analysis reported in Table A6.

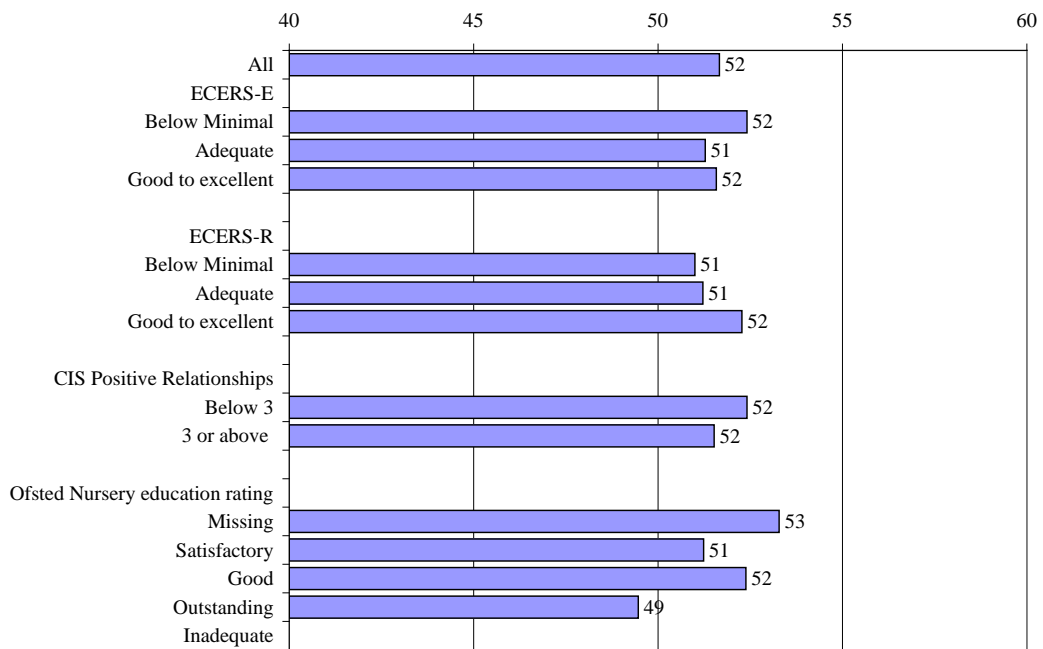
**Figure 5.6 Average Total Naming Vocabulary scores by quality indicators**



For the pattern construction scores differences by our quality indicators were also typically small. The only large differences were by Ofsted inspection rating and here again children who attended Outstanding settings had lower scores (49) than children who attended Satisfactory (51) or Good (52) settings.

Again we find some large differences by some child and family characteristics e.g. mothers' qualifications and age at interview, as can be seen from the results of our multivariate analysis reported in Table A8.

**Figure 5.7 Average Total Pattern Construction scores by quality indicators**



For the picture similarity scores there were some large differences by our quality measures. Children who attended below minimal settings according to ECERS-E scored higher (58) than those that attended adequate settings (56) and good to excellent settings (55). A similar pattern is evident for ECERS-R measures with the highest average scores for children who attended below minimal providers.

Children who attended setting with lower scores on the CIS Positive relationships scale also had higher picture similarity scores than those with higher scores, and children who attended settings deemed Outstanding by Ofsted also scored lower (54) than those who attended good settings (57) or satisfactory settings (57).

**Figure 5.8 Average Total Picture Similarities scores by quality indicators**

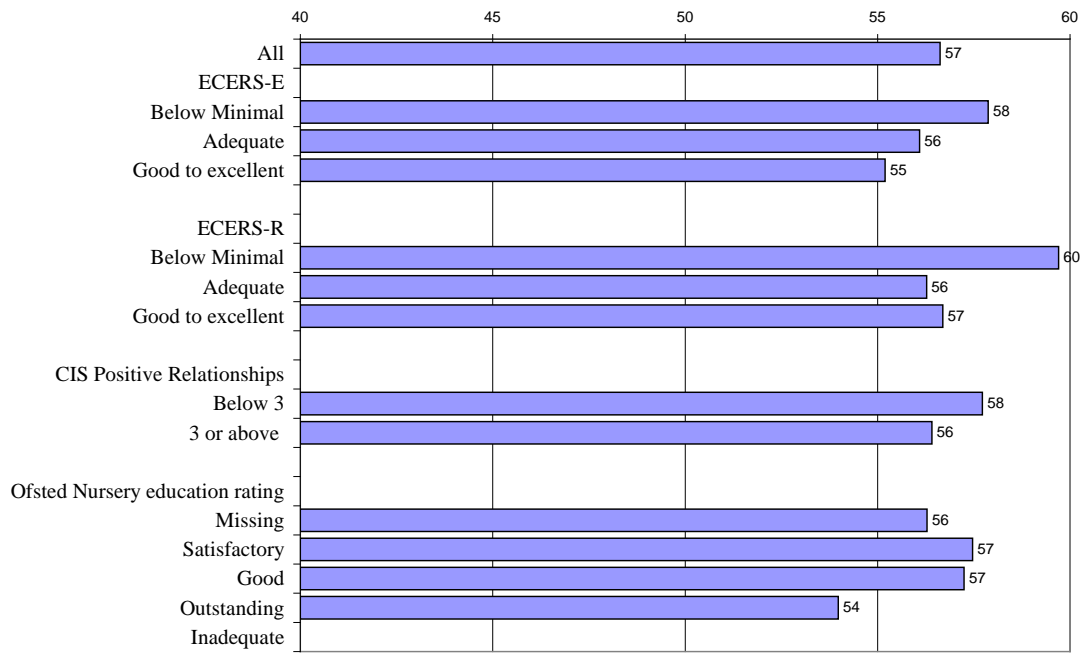
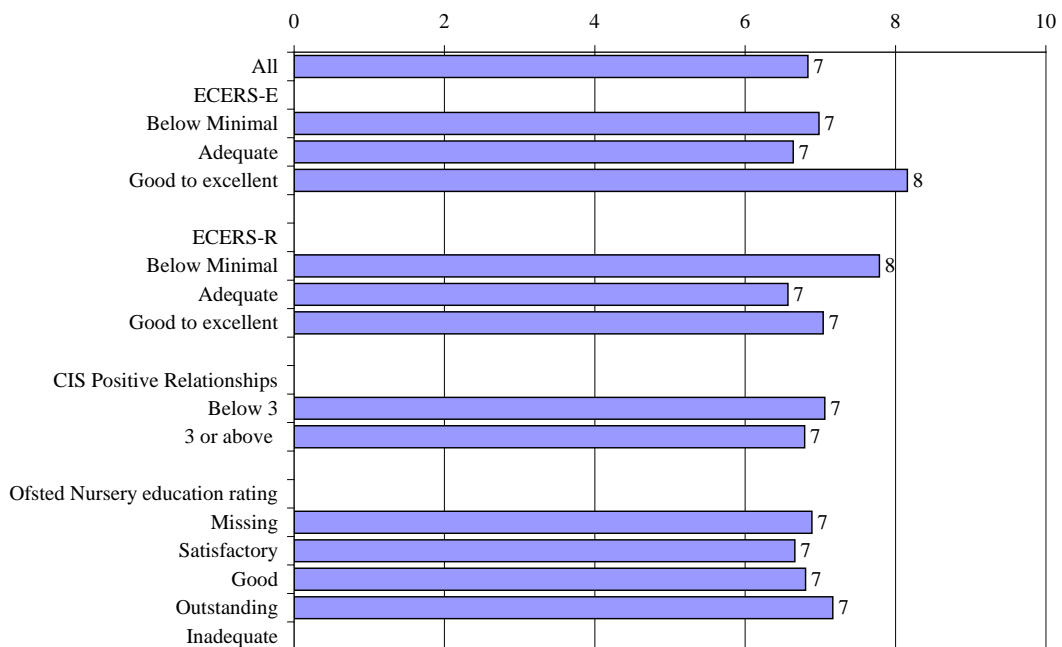
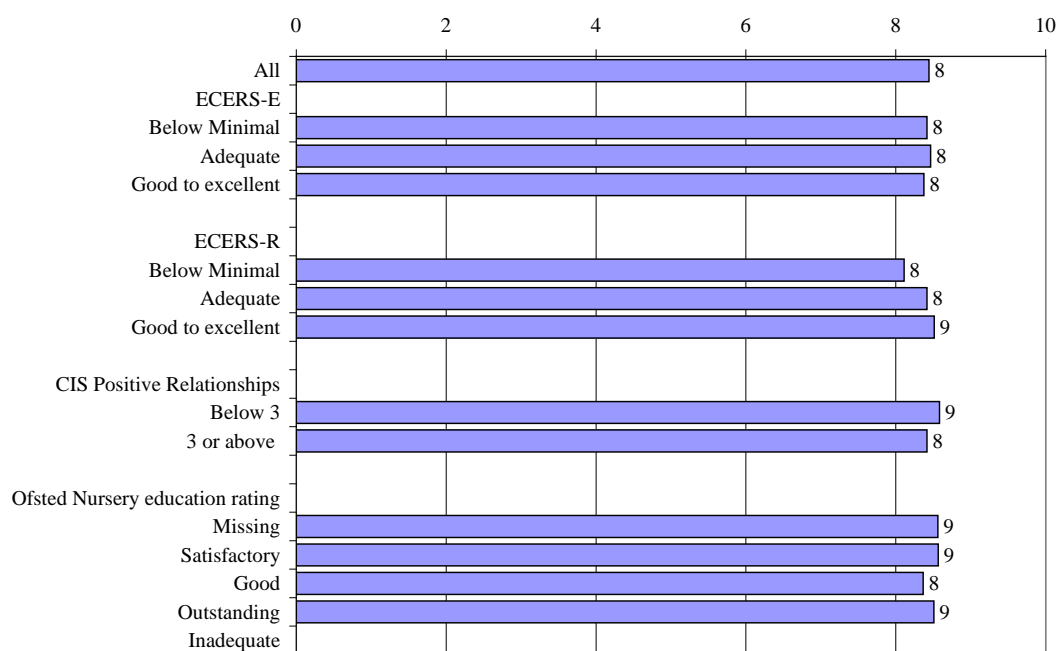


Figure 5.9 show average total difficulties scores and Figure 5.10 pro-social behaviour scores and here there were little differences by the quality of setting.

**Figure 5.9 Average Total Difficulties scores by quality indicators**



**Figure 5.10 Average Total Pro-social behaviour scores by quality indicators**



### 5.4.3 Multivariate models of child outcomes

As discussed in Section 4.3, to assess the impact of setting quality on child outcomes we estimate multivariate models for our range of child outcome measures and include our quality indicators in the models. We first consider the FSP score and then look at the naming vocabulary score, the total difficulties score and the pro-social behaviour score; all three of these latter measures have repeat observations at age three and five allowing us to estimate how quality related to changes in development, which is the approach most often used in the literature.

Our regression models incorporate a wide range of controls, including child characteristics:

- ethnicity
- gender
- age
- number of siblings
- cognitive development at age 3 (BAS naming vocabulary score and Bracken School Readiness Composite score)

Family characteristics:

- language spoken at home
- region of residence
- mother's highest qualification level
- whether child received free school meals
- the home learning environment (parent painting or drawing with their child, both parents reading to their child every day<sup>18</sup>, and if child helped at home with numbers or counting every day);

Attendance at early years education:

- months attended
- whether attended more than 12.5 hours per week
- when child started school

Setting characteristics:

- sector
- percentage of staff qualified to Level 3 and above

The analysis focuses on the early years education for which quality was observed, but it is important to bear in mind that many children will also have attended some other form of early years education or childcare at some point before starting school. It should also be borne in mind that whilst we account for the differing amounts of time children have spent in primary school in our analysis, we do not have information on the quality of schooling, which may have an impact on the results.

The results of our estimations are shown in Tables 5.10 to 5.15. We only report coefficients on our quality measures, sector of provider and staff qualification variables given their importance in this context. Full model specifications are given in the Appendix.

### **Quality and the FSP**

Table 5.10 shows the estimated coefficients for our models for the FSP score. The first column is for a model that includes a mean score from ECERS-E. Here the coefficient is zero indicating that the quality of an early

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<sup>18</sup> Or if lone parent read to child every day in lone parent households.

years setting, as measured by ECERS-E, has no impact on FSP scores for children. The second column includes a mean score based on the three ECERS-R scales collected in the study. Here the coefficient is small and positive and not statistically significant, again indicating that the quality of an early years setting, as measured by ECERS-R, has no impact on FSP scores for children.

The CIS positive relationships measure has a negative coefficient that is significant at 10% level indicating a weak relationship between observed positive relationships and FSP scores such that where there were better relationships FSP scores were worse.

Finally considering the Ofsted judgement, we again only find a weak relationship with the FSP score. This time it is only for settings judged as Outstanding relative to those judged as Good, and indicates that children who attended an "Outstanding" setting performed slightly worse in their FSP assessment than children who attended a setting judged to be "Good". None of the other differences were statistically significant.

Differences by sector were also not significant and we also find in some models that attending a setting with a higher proportion of staff qualified to at least level 3 leads to lower FSP scores, although again these coefficients were only significant at 10% level. Qualifications are known to be strong predictors of setting quality, so any impact of having more qualified staff may be reflected in a better quality setting and we may not expect any additional impact on outcomes for children once we have controlled for setting quality.

Overall, these results are puzzling, but not out of line with the results from Section 5.3, which showed little relationship between characteristics of early years settings and FSP scores and also broadly in line with the descriptive statistics discussed above. We may have expected some relationship between setting quality and FSP scores, but the evidence is generally weak and often counter intuitive with better quality settings leading to lower FSP scores.

**Table 5.10: Foundation Stage Profile, overall quality measures**

		(1)	(2)	(3)	(4)
ECERS-E		0.00 (0.05)			
ECERS-R			0.02 (0.04)		
CIS^				-0.18* (0.10)	
Ofsted (good)	Outstanding				-0.23* (0.14)
	Satisfactory				-0.10 (0.14)
	Inadequate				-0.36 (0.41)
	Missing				-0.05 (0.14)
Sector (private)	Maintained	-0.07 (0.21)	-0.07 (0.20)	-0.02 (0.19)	-0.05 (0.19)
	Voluntary	0.02 (0.11)	0.01 (0.12)	0.03 (0.11)	0.01 (0.12)
Proportion staff qualified to Level 3 and above		-0.33* (0.18)	-0.35* (0.19)	-0.25 (0.18)	-0.29* (0.17)
No. of observations		506	506	506	506
R-squared		0.33	0.33	0.33	0.33

Notes: Standard errors in parentheses. \*\*\*Significant at 1%, \*\*Significant at 5%,  
\*Significant at 10%

^CIS positive relationships subscale

Table 5.11 shows results from models where the ECERS scales are broken down into their subscales and again here we find no evidence of any subscale having a significant impact on FSP scores.

**Table 5.11: Foundation Stage Profile, ECERS subscales**

		(1)	(2)
ECERS-E	Literacy	0.03 (0.08)	
	Mathematics	-0.03 (0.05)	
	Science	-0.01 (0.04)	
	Diversity	0.05 (0.05)	
ECERS-R	Personal care routines		0.04 (0.04)
	Language and reasoning		0.05 (0.05)
	Interaction		-0.07 (0.05)
Sector (private)	Maintained	-0.09 (0.22)	-0.04 (0.20)
	Voluntary	0.02 (0.12)	0.02 (0.12)
Proportion staff qualified to Level 3 and above		-0.33* (0.19)	-0.37** (0.19)
No. of observations		506	506
R-squared		0.33	0.33

Notes: Standard errors in parentheses. \*\*\*Significant at 1%, \*\*Significant at 5%, \*Significant at 10%

Further analysis has looked at how the quality measures related to each of the six areas of learning in the FSP. This produced a range of estimated coefficients, some negative and some positive.

For 'Personal, Social and Emotional Development' (PSE), both ECERS-E and ECERS-R mean scores are positively related to a higher PSE score, but for CIS and Ofsted measures there was no relationship.

Children in settings with a higher CIS positive relationships score did worse in terms of 'Mathematical Development' and 'Creative Development', but Children in settings with a higher ECERS-E score did better in Creative Development, although the impact was only significant at the ten per cent level. For 'Creative Development', children who attended 'Good' settings according to the Ofsted nursery education rating scored higher than children who attended 'Outstanding' or 'Satisfactory' settings.

Children who attended 'Outstanding' settings according to the Ofsted nursery education rating also scored lower than children who attended

'Good' settings in terms of 'Knowledge and understanding of the world' and in terms of 'Physical development'.

None of the quality measures were related to the Communications, Language and Literacy score.

Details of all models are in Appendix Tables A11-A16.

### **Quality and the Naming Vocabulary assessment**

Next we turn to the Naming Vocabulary assessment from the British Ability Scales. A similar approach is used, but it is important to note that for these models we have two measures of the naming vocabulary score, at ages three and five years, so we can assess changes in the score. We have also estimated the same naming vocabulary assessment models without the age three naming vocabulary score, to see how this affected the model and this resulted in little change in either the size or significance of the coefficients on the quality measures. Thus we feel that the model specification used is not driving our results.

Children undertaking the naming vocabulary assessment are not necessarily tested on the same set of items. The raw test scores are therefore adjusted for the difficulty of the items assessed, as well as the age of the child. These scores can then be converted to normative scores, using the standard BAS tables from the standardisation sample used in the development of the test. These variables are provided on the MCS datasets (Hansen, 2008).

Tables 5.12 and 5.13 show the estimated coefficients for our models for the naming vocabulary assessment. The first column for Table 5.12 is for a model that includes a mean score from ECERS-E. Here the coefficient is positive and statistically significant indicating that children who attended a higher quality early years setting, as measured by ECERS-E, do better on the naming vocabulary assessment. This result is broadly in line with the results of EPPE.

**Table 5.12 Naming vocabulary, overall quality measures**

		(1)	(2)	(3)	(4)
ECERS-E		0.08** (0.04)			
ECERS-R			0.05 (0.03)		
CIS^				0.09 (0.07)	
Ofsted (good)	Outstanding				0.04 (0.09)
	Satisfactory				-0.06 (0.10)
	Inadequate				-0.20 (0.30)
	Missing				0.01 (0.12)
Sector (private)	Maintained	0.24** (0.12)	0.29*** (0.12)	0.28** (0.12)	0.27** (0.12)
	Voluntary	-0.01 (0.09)	-0.01 (0.09)	-0.02 (0.09)	-0.01 (0.09)
Proportion staff qualified to Level 3 and above		-0.13 (0.16)	-0.12 (0.15)	-0.12 (0.16)	-0.09 (0.15)
No. of observations		559	559	559	559
R-squared		0.46	0.46	0.46	0.46

Notes: Standard errors in parentheses. \*\*\*Significant at 1%, \*\*Significant at 5%, \*Significant at 10%

^CIS positive relationships subscale

When we estimate the same model, but with an overall ECERS-R mean score (column 2), we get a smaller coefficient that is positive, but not statistically significant, indicating that children who attended a higher quality early years setting, as measured by ECERS-R, do not have statistically significant better scores on the naming vocabulary assessment.

The results for the CIS positive relationships measure are also positive, but not statistically significant (column 3), whilst the results in the final column are for when we include Ofsted judgements in the model. Here the estimated coefficients are relative to being classified by Ofsted as good. In this model the coefficients follow the expected pattern, with the highest for outstanding providers and the lowest for inadequate providers, although none of the coefficients are statistically significant. This means that the Ofsted rating of a setting that a child attended does not impact on their naming vocabulary assessment.

The estimated coefficients for the effect of sector are relative to a private sector provider (this group also includes a small number of joint sector providers). In all three models, the coefficient for the maintained sector is positive and statistically significant, indicating that children attending maintained sector providers fared better in their naming vocabulary assessment than children attending private sector providers. The same is true relative to voluntary sector providers. It is important to note however that there are relatively few maintained sector providers in the sample. Children attending providers in the voluntary sector showed little difference on average to those attending private sector settings; the coefficients here are not statistically significant and are close to zero. Previous research has indicated that quality is higher in maintained sector provision and there may be complex relationships between quality and sector. For these reasons we have also tried the models without the sector variables included; this makes little difference to the coefficients on ECERS-R. There are small changes to the coefficients on the Ofsted measures, for example the estimated coefficient on the outstanding variable increases from 0.04 to 0.07, but these are not large enough changes to make these statistically significant. Omitting sector in the ECERS-E model increases the coefficient on ECERS-E to 0.10 and increases its significance to significant at the 1 per cent level.

Table 5.13 presents results for when we include mean scores for each of the ECERS sub-scales in our model. Here we find that children who attended settings with a higher mean score on the ECERS-E literacy sub-scale have higher scores on the naming vocabulary assessment, but a higher score on the mathematics sub-scale leads to a lower score on the naming vocabulary assessment, although this is only significant at the ten per cent level (omitting sector from the model causes this to become significant at the 5 per cent level). The coefficient on the maintained sector variable remains positive but is no longer significant in this model. Similarly, children who attended settings with a higher mean score on the ECERS-R language and reasoning sub-scale have higher scores on the naming vocabulary assessment; here this is only significant at the ten per cent level. When sector is omitted from the model however, this becomes significant at the five per cent level, with a similar size coefficient of 0.08. These results are coherent in so much as it is the ECERS sub-scales that are most related to naming vocabulary that predict better naming vocabulary outcomes.

**Table 5.13 Naming vocabulary, ECERS subscales**

		(1)	(2)
ECERS-E	Literacy	0.20*** (0.05)	
	Mathematics	-0.07* (0.04)	
	Science	0.01 (0.02)	
	Diversity	-0.00 (0.03)	
ECERS-R	Personal care routines		-0.03 (0.03)
	Language and reasoning		0.07* (0.04)
	Interaction		0.02 (0.04)
Sector (private)	Maintained	0.15 (0.12)	0.21* (0.12)
	Voluntary	-0.03 (0.09)	-0.01 (0.09)
Proportion staff qualified to Level 3 and above		-0.12 (0.14)	-0.13 (0.15)
No. of observations		559	559
R-squared		0.47	0.46

Notes: Standard errors in parentheses. \*\*\*Significant at 1%, \*\*Significant at 5%, \*Significant at 10%

Overall the naming vocabulary results are re-assuring in so much as the data identifies a positive relationship between quality and outcomes that is in line with existing literature. It does, however promote questions about the routinely collected measures that we set out to focus on as the same was not found for the FSP and better Ofsted ratings do not predict better outcomes on either measure.

Taken together the results in Tables 5.10 to 5.13 show that children who attended better quality settings, as measured by ECERS-E and ECERS-R, do better in their naming vocabulary assessment, but when we look at setting quality as measured by Ofsted, then there is no relationship between quality and outcomes. Together with the weak correlations between quality, as measured by Ofsted, and both ECERS indicators, shown in Table 5.1, it is unclear from this analysis as to what aspects of quality Ofsted judgements reflect. As discussed earlier, Ofsted inspections also have a regulatory function as well as considering quality of service, but none of the areas which have a separate rating are strongly related to other quality measures. Furthermore, attending a setting with a better

Ofsted rating does not predict better outcomes for children whilst the other quality measures can predict better outcomes for children. Turning to the FSP scores, we found that quality as measured by ECERS-E and ECERS-R is not related to better FSP scores (Tables 5.10 and 5.11), but ECERS-E and ECERS-R scores can predict better scores on the naming vocabulary assessment (Tables 5.12 and 5.13). Here we are concerned about a child outcome measure that is not related to accepted quality measures.

When we take the FSP scores and Ofsted judgements together (Table 5.10) the evidence points to children attending outstanding settings doing worse than those who attended good ones, which goes against our prior expectations, but if both separate measures are uncertain, as outlined above then this may not be quite such a surprise.

### **Quality and Difficulties Scores**

Tables 5.14 and 5.15 present the results for our models of social/behavioural development from the Strengths and Difficulties Questionnaire. The first panel of each table gives the results for the models where the dependent variable is the total difficulties score, while the second panel presents results for pro-social behaviour. For the total difficulties score, a lower score is preferable (indicating fewer difficulties), while for the pro-social behaviour score, a higher score is desirable. For both measures, the estimated coefficients for the overall ECERS-E and ECERS-R quality measures were not statistically significant. None of the individual ECERS-R sub-scales showed a relationship with either behavioural outcome measure, but of the ECERS-E sub-scales, the mathematical sub-scale was statistically significant for both; better quality in terms of mathematical provision was associated with a lower total difficulties score and a higher pro-social behaviour score. Higher quality as assessed by the diversity sub-scale was also associated with a higher total difficulties score, although this was only significant at the ten per cent level.

Again, the Ofsted measures showed no relationship with either social development measure.

Sector of provider made no difference to children's total difficulties scores in any of the models and excluding sector from these models had little impact on the coefficients on the quality measures. In comparison, in the pro-social behaviour models, attending a maintained sector provider was significantly associated with a poorer pro-social behaviour score compared with attending a private or voluntary sector setting. Thus children who attended private or voluntary sector settings were found to have more pro-social behaviour.

Omitting sector from the pro-social behaviour models generally made little difference to the coefficients on the quality measures for ECERS-R and Ofsted, but in the model with the ECERS-E subscales, while the positive coefficient on the mathematical sub-scale increased in statistical significance, the negative coefficient on the literacy sub-scale became statistically significant.

**Table 5.14: Social/behavioural development, overall quality measures**

		Total Difficulties Score				Pro-Social Behaviour			
		(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
ECERS-E		-0.00 (0.05)				-0.00 (0.06)			
ECERS-R			0.00 (0.04)				0.00 (0.04)		
CIS <sup>^</sup>				-0.02 (0.09)				-0.06 (0.09)	
Ofsted (good)	Outstanding				-0.02 (0.10)				0.12 (0.12)
	Satisfactory				-0.03 (0.11)				0.06 (0.10)
	Inadequate				0.15 (0.17)				-0.43 (0.29)
	Missing				0.14 (0.17)				-0.14 (0.12)
Sector (private)	Maintained	0.16 (0.15)	0.16 (0.15)	0.16 (0.15)	0.16 (0.15)	-0.35** (0.18)	-0.35** (0.18)	-0.34** (0.18)	-0.37** (0.18)
	Voluntary	0.21 (0.12)	0.21 (0.12)	0.21 (0.12)	0.21 (0.11)	-0.04 (0.11)	-0.04 (0.11)	-0.04 (0.11)	-0.06 (0.11)
Proportion staff qualified to Level 3 and above		0.09 (0.18)	0.08 (0.18)	0.09 (0.18)	0.08 (0.17)	-0.07 (0.16)	-0.07 (0.16)	-0.04 (0.17)	-0.08 (0.16)
No. of observations		548	548	548	548	548	548	548	548
R-squared		0.42	0.42	0.43	0.43	0.29	0.29	0.29	0.30

Notes: Standard errors in parentheses. \*\*\*Significant at 1%, \*\*Significant at 5%, \*Significant at 10%; <sup>^</sup>CIS positive relationships subscale

**Table 5.15: Social/behavioural development, ECERS subscales**

		Total difficulties score		Pro-social behaviour	
		(1)	(2)	(1)	(2)
ECERS-E	Literacy	0.01 (0.06)		-0.09 (0.07)	
	Mathematics	-0.10*** (0.04)		0.09** (0.04)	
	Science	0.02 (0.03)		-0.00 (0.03)	
	Diversity	0.07* (0.04)		-0.01 (0.04)	
ECERS-R	Personal care routines		0.00 (0.03)		-0.00 (0.04)
	Language and reasoning		-0.02 (0.04)		-0.00 (0.05)
	Interaction		-0.01 (0.04)		0.02 (0.05)
Sector (private)	Maintained	0.07 (0.14)	0.16 (0.15)	-0.41*** (0.16)	-0.48*** (0.17)
	Voluntary	0.10 (0.10)	0.08 (0.11)	-0.09 (0.10)	-0.10 (0.10)
Proportion staff qualified to Level 3 and above		0.04 (0.14)	0.05 (0.15)	-0.02 (0.15)	-0.01 (0.15)
No. of observations		548	548	548	548
R-squared		0.43	0.42	0.30	0.29

Notes: Standard errors in parentheses. \*\*\*Significant at 1%, \*\*Significant at 5%, \*Significant at 10%

Further analysis has looked at how the quality measures related to the picture similarities and pattern construction measures. These produced a range of estimated coefficients, but none were statistically significant indicating no clear relationship between quality and these outcomes, see Appendix Tables A9 and A10 for the results.

## **6. Provider outgoings, rent and salaries**

We have considered in some detail outcomes from early years education and the quality of these services and the relationship between quality and outcomes. Here we turn to analysis of how much it costs early years providers to deliver these services. We are interested in assessing quality of services in terms of value for money or cost effectiveness, and focus here on whether there were significant differences between providers in different sectors.

### **6.1 Background on Costs of Early Years Education**

As we have shown, the MCS provides a rich source of information on children and their families and the early years settings that they attend. Unfortunately, no data was collected in the QCS project on the costs of providing these services. Clearly, this renders impossible a value for money assessment for these providers.

However, we can still consider the costs of providing early years services through analysis of other data from the Childcare and Early Years Providers Survey series (see Nicholson et al. for technical report on the 2007 survey). This is a large-scale study that provides us with data for a much greater number of providers than we could have included in a separate cost study and it highlights important issues for measuring costs.

The term cost, along with related terms such as fees, income and expenditure, are often used in different ways depending upon the context, and are sometimes even used interchangeably. Many studies of childcare costs are from the perspective of cost to parents. In England, for example, data on parents' childcare expenditure is collected in the Childcare and Early Years Survey of Parents. Some information about how much parents spend on childcare is also available from other sources such as the Family Resources Survey (Department for Work and Pensions, 2009) and the Families and Children Study (Lyon et al. 2007) Some studies look at fees charged, which may well differ from cost to parents if they are receiving tax credits, or where children are receiving childcare as part of the free entitlement, or where there are other forms of subsidy. The Daycare Trust conducts an annual Childcare Costs Survey, asking local authorities about typical costs of childcare in their area (Daycare Trust, 2009). Information on fees charged by full day care providers is also collected by Laing and Buisson (2009). In this chapter, we are concerned with the costs incurred by providers in delivering early years services and this data is collected in the Childcare and Early Years Providers Survey.

Detailed analysis of the costs of providing early years services are rare and cost-benefit studies of early years services are relatively few in number. A review of some cost-benefit analysis in this field is included in Melhuish (2004), who notes

that these studies tend to focus on interventions for children from disadvantaged backgrounds, rather than evaluations applicable for the general population. Melhuish points out that these studies have all demonstrated net gains as a result of such interventions, and would still do so even after introducing a considerable margin of error.

Some information on costs of childcare was included as part of the evaluation of the Neighbourhood Nurseries Initiative (NNI) (La Valle *et al.*, 2007). This focused on the costs to parents of childcare provided under the scheme and not on the costs to the provider in delivering the services. Data on the total cost of the scheme was not available, hence the authors used information on the benefits of the initiative and presented a range of scenarios to illustrate how much the scheme would have had to cost to break even, or to produce various rates of return. In this study, benefits were measured in terms of outcomes for parents, rather than for the children.

Research has also been carried out into the cost-effectiveness of Sure Start Local Programmes (SSLPs) (Meadows *et al.*, 2006). Located in disadvantaged areas, these programmes set out to provide a range of services for children and families, including childcare but also healthcare, support and advice for parents, outreach and home visiting services, among others (the exact combination of services provided differs among programmes).

The cost-effectiveness study investigates expenditure over the period 1999-2000 to 2003-04, comparing programmes based on their year of operation (i.e. comparing programmes in their third year of operation, regardless of the actual year in which they had started, adjusting for inflation). The analysis of Meadows *et al.*, (2006) focuses on the resources or inputs to the programme. The cost data is largely based on administrative information, mainly from programme accounts, but is supplemented with data from surveys and case studies.

Estimating expenditure for these programmes was particularly complex for a number of reasons, not least that each SSLP provides a variety of services, and that resources come from a range of sources in addition to Sure Start funding, some of which may be provided in kind. There were also difficulties in classifying expenditure to different types of activities, particularly as some could legitimately be classed under a number of different service headings, with different programmes making different choices.

While this work was focused on costs for programmes as a whole, rather than specifically for childcare, the study reveals a number of interesting findings and highlights important issues to bear in mind when conducting research into costs of providers. Smaller programmes were found to have higher costs per child with spending on 'non-service' costs, such as administration, approximately double per child in smaller programmes compared to larger SSLPs. However, expenditure tended to be greater for programmes located in the more disadvantaged areas.

Areas with a high concentration of ethnic minority families had lower average expenditure per child; however, programmes in these areas were typically larger in size; it is therefore suggested that their lower expenditure may be due to economies of scale, rather than the characteristics of the area.

Two-thirds of SSLPs benefited from financial assistance from other sources in addition to Sure Start funding. Approximately half of SSLPs benefited from use of free premises, belonging to other organisations (often clinics, libraries, schools), although most paid for office space. There were some differences in additional resources received depending on the type of agency leading the programme; those with a voluntary sector organisation or health trust leading were slightly more likely to receive additional funds than those with a local authority lead.

The difficulty in evaluating cost-effectiveness of early years services is highlighted by the recent evaluation of Sure Start Children's Centres by the National Audit Office (NAO, 2006). This was a study of 30 centres, using data on their finances and activity, as well as conducting interviews with both centre and local authority staff and parents. The NAO concluded that it was not feasible to draw conclusions about cost-effectiveness of centres at this point in time, as there is currently limited data available. Considerable variation between centres in their costs was found; and measuring costs was complicated by the fact that some centres receive certain services in kind.

Measuring the costs of early years services poses numerous problems, particularly for voluntary sector organisations, which are most likely to be receiving some services in kind, such as free use of premises. Cleveland and Krashinsky (2003) argue that cost estimates ought to take into account the value of such services at a rate that reflects what they would otherwise have cost to attain. Many providers may also have volunteer staff and their time may also need to be included in some way.

Within their recommendations, the NAO identified a need for centres and local authorities to improve their understanding of costs in order to increase the likelihood of funds being used more cost-effectively.

Labour costs are the most significant component of costs in providing early years services. In a study of costs of childcare by the General Accounting Office (GAO) in the US in 1999 (cited in Cleveland and Krashinsky, 2003), 75 per cent of costs were attributed to labour. Other studies have also reported a similar share. In the GAO study, the value of imputed rent accounted for 10 per cent of costs. Other costs included food, supplies, utilities and training.

In the 2005 Childcare and Early Years Providers Survey, Clemens et al. (2005) found similar figures for England; 82 per cent of costs were accounted for by labour in full day care providers, and 75 per cent for sessional providers in 2005.

Costs of premises were the second largest item of expenditure, although many providers were found to have free use of premises.

There are other ways in which the full costs of providing early years services are hidden and some providers may be able to offset some of the costs of providing services. This may be by charging for other areas of the business or within the maintained sector by sharing resources with schools. Other examples include owner-managers not taking salaries and bringing in food and equipment from home (Campbell-Barr, 2009).

There is also some concern over the business experience of providers and their ability to understand and manage the cost structure of their organisation. Local authorities felt that the voluntary sector were the most likely to suffer from lack of business experience (Campbell-Barr, 2009).

All of the above needs to be taken into consideration when comparing costs.

## **6.2 Analysis of costs of providing early years services**

The Childcare and Early Years Providers survey series started in 1998, and has been carried out in 2001 and 2003, and annually from 2005. The 2008 report has been published (Phillips et al., 2009); but the most recent data currently available are from the 2007 survey and this is what we use in the following analysis.

There have been a number of changes to the survey over time. In 1998 and 2001, this was the Childcare Workforce Survey. In 2002/03, the survey was extended to cover early years settings as well, becoming the Childcare and Early Years workforce survey. Since 2005, the survey has been known as the Childcare and Early Years Providers Survey, when it was extended to collect more information on costs and on recruitment and training issues. There has also been some change in the topics covered in the survey over time and to the types of providers included.

The survey has collected details of costs faced by providers, although the nature and extent of this information has changed over time. Information is also available on provider type, allowing us to explore costs by different provider types, and by whether providers are profit-making or not. There is a considerable degree of non-response on costs questions in the survey, and hence some caution is needed when considering the following analysis. Responses were given by the senior manager in the workplace. Below we explore outgoings, wage costs and rent costs for providers in some detail.

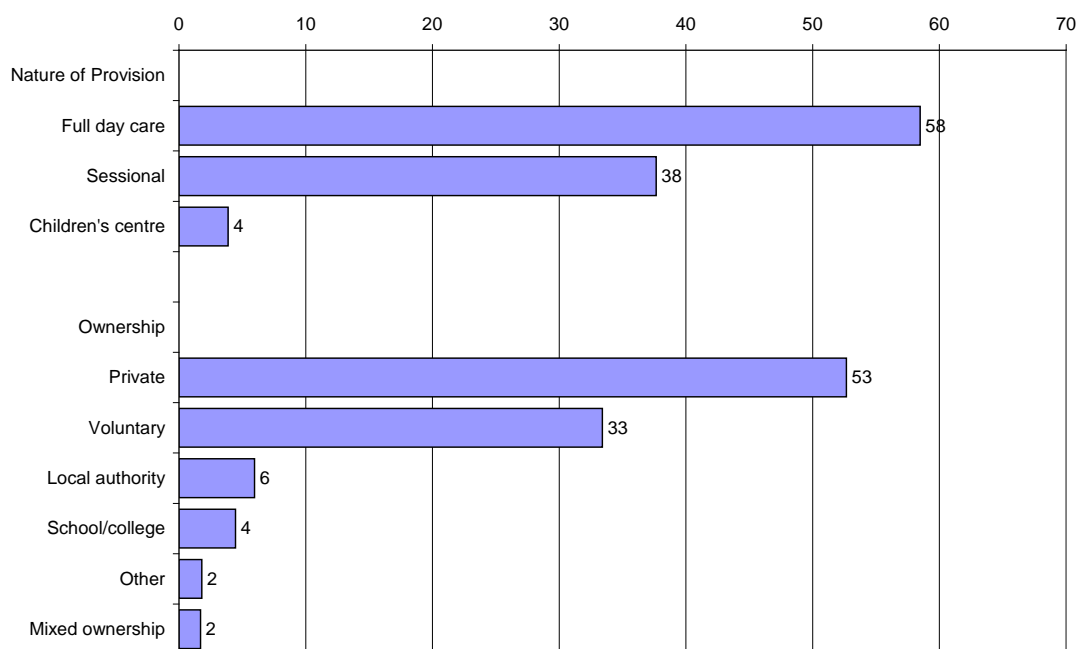
Our analysis is based on 1,634 providers. We consider only those childcare providers that were offering full day care provision, full day care in Children's Centres and sessional care providers (i.e. we exclude out of school providers and

childminders). Excluded from our analysis are some providers in the survey who were not asked about information on outgoings, wages and rent.

### 6.2.1 Ownership and nature of provision

Figure 6.1 shows the characteristics of the providers in our sample in terms of the nature of provision and ownership. More than half the providers (58%) offered full day care, with a further four per cent offering full day care in Children's Centres. The remaining 38 per cent of providers offered sessional care. In terms of ownership, more than half were in the private sector (53%) and a third were in the voluntary sector (33%). The remainder were largely maintained sector either local authority owned (6%) or in a school or college (4%).

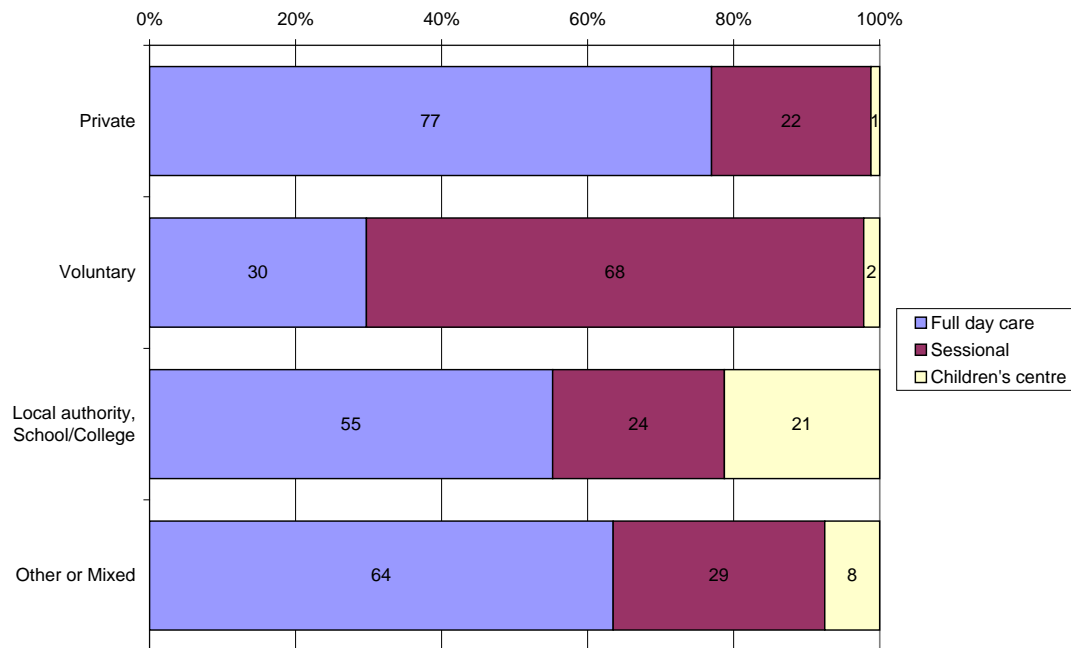
**Figure 6.1 Characteristics of Early years Providers**



Source: Childcare and Early Years Providers Survey, 2007

Figure 6.2 shows how ownership and nature of provision are related. It indicates that private sector providers are more likely to offer full day care (77%) than voluntary sector providers (30%) and maintained sector providers (55%). Voluntary sector providers typically offer sessional provision (68% of voluntary providers offer sessional care), whilst Children's Centres are typically in local authority or school/college owned providers (21% of local authority or school/college providers were Children's Centres compared with 2% of voluntary sector and 1% of private sector providers).

**Figure 6.2 Ownership by nature of provision**

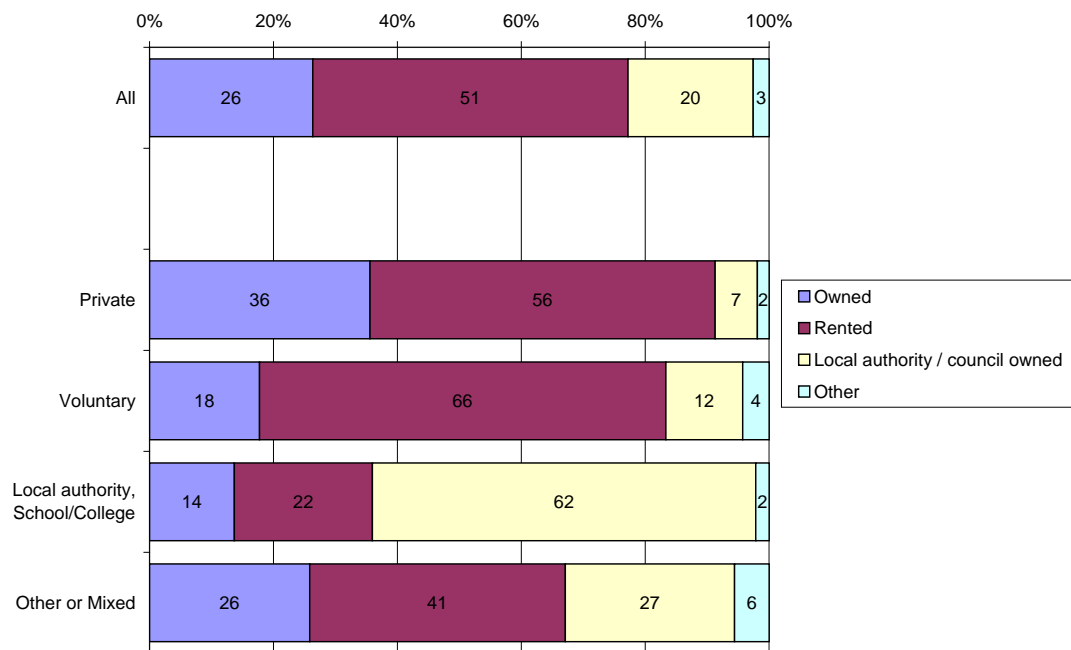


Source: Childcare and Early Years Providers Survey, 2007

### 6.2.2 Ownership of premises

We have previously noted the importance of ownership of the premises in terms of costs of delivering services and Figure 6.3 shows how ownership varies by sector of provider. Roughly half the premises were rented with voluntary (66%) and private sector (56%) providers most likely to rent their premises. Not surprisingly, most local authority, school or college owned providers used local authority owned premises (62%) whilst other providers were much less likely to have local authority owned premises. Private sector providers (36%) were at least twice as likely to own the premises, compared with voluntary sector providers (18%) and local authority, schools or college providers (14%). Thus we might expect that this ownership might involve some hidden costs relative to providers who have to rent premises.

**Figure 6.3 Ownership of premises by sector of provider**



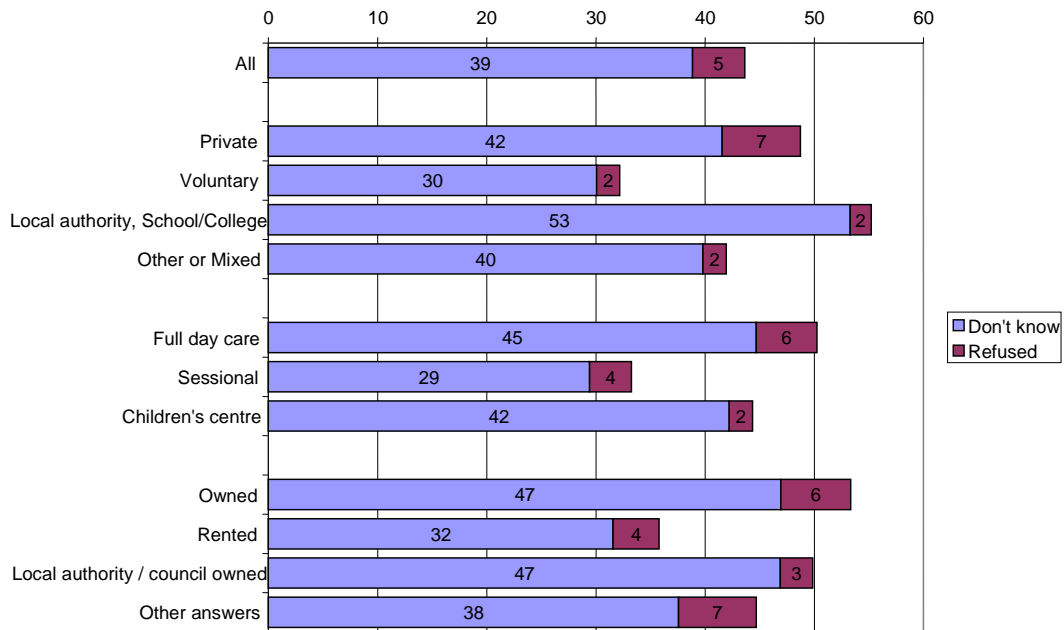
Source: Childcare and Early Years Providers Survey, 2007

### 6.2.3 Whether reported cost information in the survey

One of the biggest problems with the cost information in the survey is that many providers either refuse to provide any information or don't know the information. The survey asks about total outgoings, total wage costs and rent. Refusing to provide information on these issues is a problem for analysis of the data, but is not uncommon in large surveys asking for sensitive information. Given this non-response we need to be cautious when interpreting the analysis of costs. What is more of a concern is the large number of organisations that don't know this information. This may be because they genuinely don't know their costs or it could be a polite way to say that they refuse to provide details of their costs. Figures 6.4 to 6.6 show the percentages of respondents who refused to report their costs or reported that they did not know their costs by the characteristics of the providers outlined above.

Overall, five per cent of providers refused to give information on total outgoings and 39 per cent of providers reported that they did not know their total outgoings. Thus almost half the providers did not give information on the total costs of delivering early years services. The percentages are slightly lower for wage costs (4% and 34%) and rent (14% and 26%). This is a huge problem for our analysis, but more importantly may indicate that a large proportion of providers themselves have little idea about how much it costs them to deliver these services.

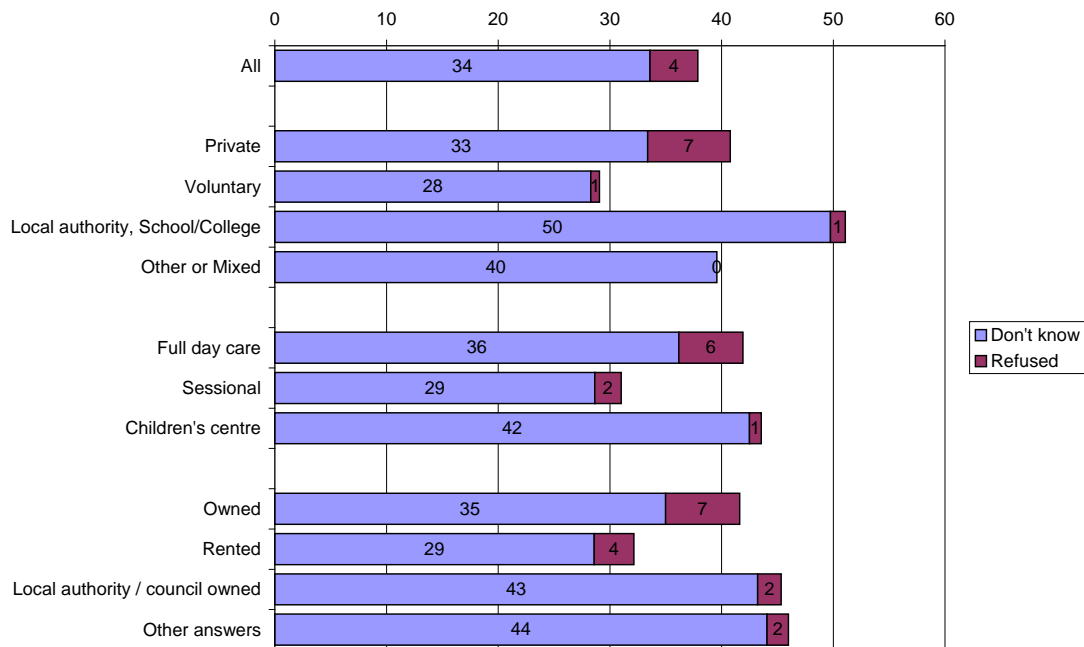
**Figure 6.4 Percentage of providers who refuse or don't know total outgoings by provider characteristics**



Source:

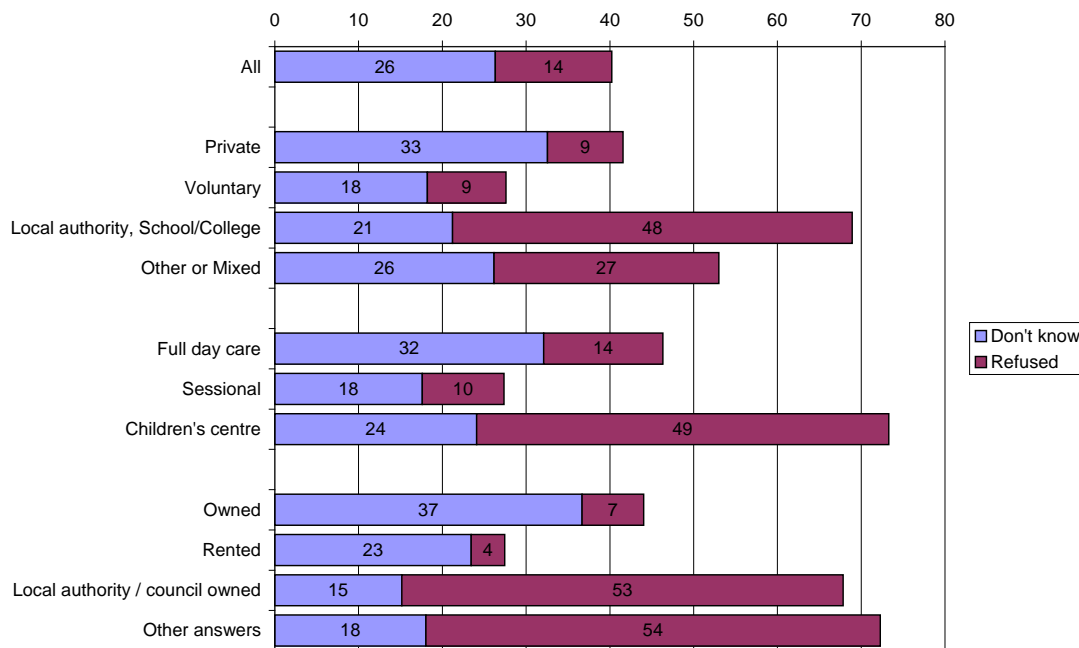
Childcare and Early Years Providers Survey, 2007

**Figure 6.5 Percentage of providers who refuse or don't know total salary costs by provider characteristics**



Source: Childcare and Early Years Providers Survey, 2007

**Figure 6.6 Percentage of providers who refuse or don't know rent costs by provider characteristics**



Source: Childcare and Early Years Providers Survey, 2007

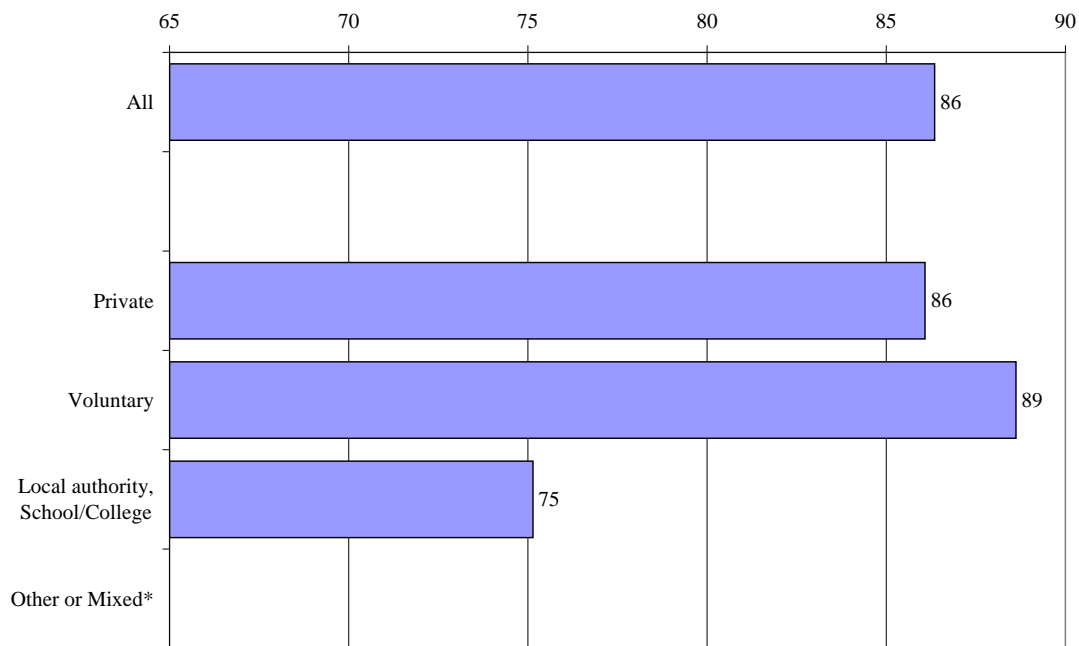
Looking at these charts in more detail indicates that local authority, school or college owned providers were the most likely not to report their total outgoings (53%) and wage costs (50%) and the most likely to refuse to provide information on rent (48%). Voluntary sector providers were the least likely to report that they don't know all of these items, but even for these providers 30% reported that they did not know total outgoings, 28% wage costs and 18% rent.

#### 6.2.4 Rent paid

First we consider the data on total rent for providers. From Figure 6.6 we know that we have data on total rent for 60 per cent of providers. Figure 6.7 shows that the vast majority of these providers (86%) pay some rent. The percentage is similar for private (86%) and voluntary sector (89%) providers, but lower for those providers owned by local authorities, schools or colleges (75%). This is due to ownership of the premises and no rent is paid when the properties are owned by the provider.

In terms of measuring costs to providers, this is an example of hidden costs that relates to all types of provider where the ownership of premises has some value and costs that are not identified by measuring the amount of rent paid. Looking at the amount of rent paid per year (Figure 6.8) it is more than three times higher for private sector providers than other providers, which may reflect that private sector providers are paying a market rent whilst other providers are getting some rent subsidy, again a potential area of hidden costs.

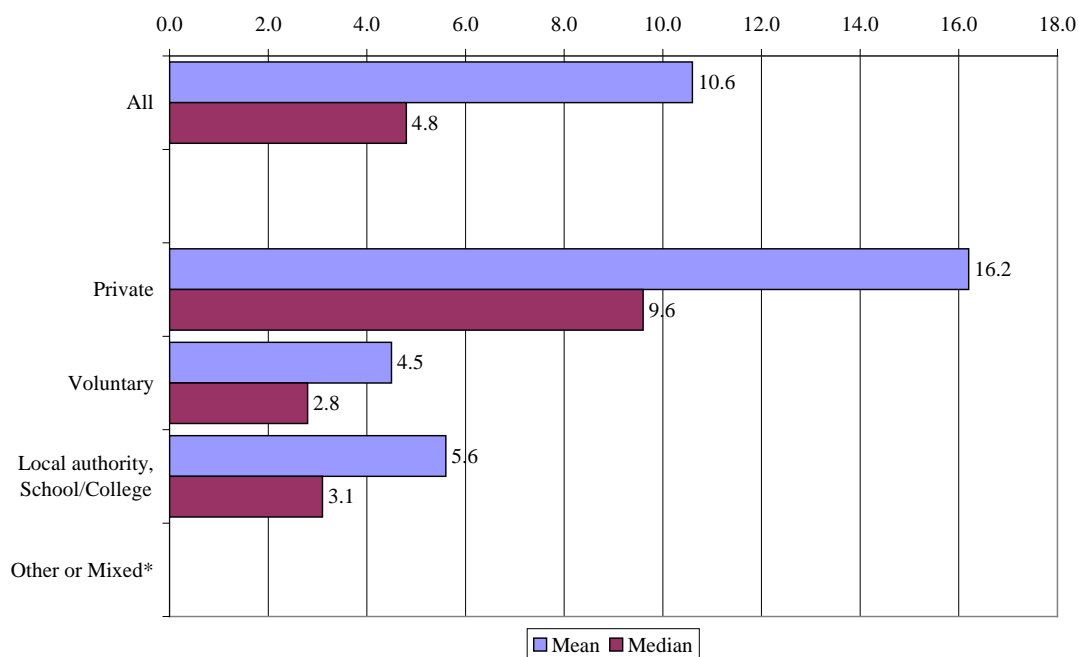
**Figure 6.7 Percentage of providers who pay rent**



\* indicates too few observations for a reliable estimate

Source: Childcare and Early Years Providers Survey, 2007

**Figure 6.8 Amount of rent paid per year (£000s)**



\* indicates too few observations for a reliable estimate

Source: Childcare and Early Years Providers Survey, 2007

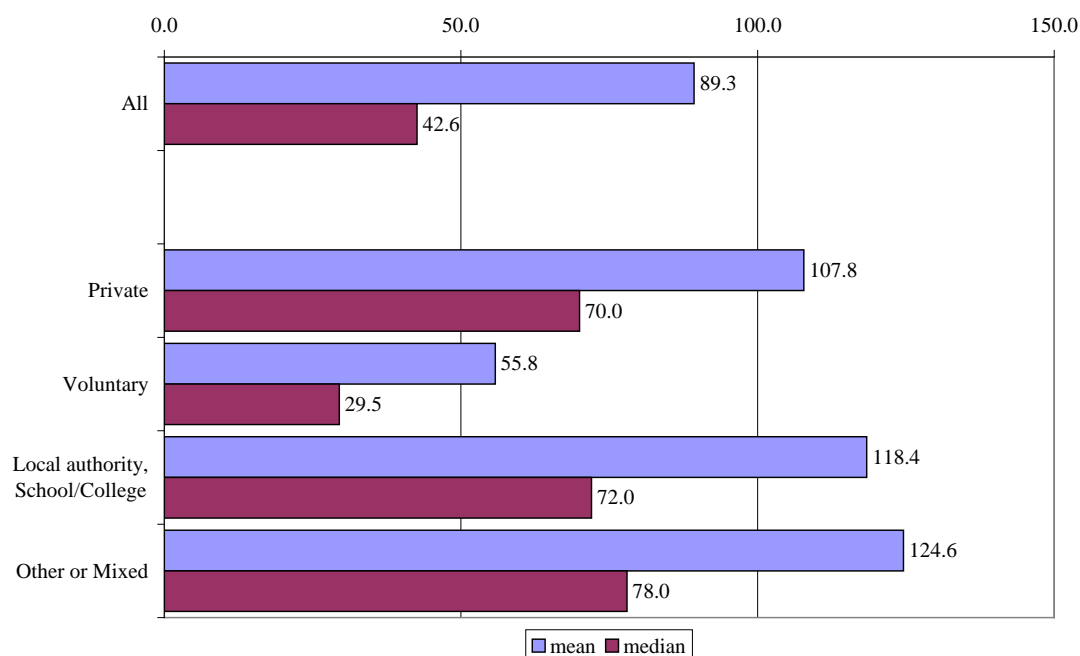
### 6.2.5 Total wage costs

The data on wages paid is highly variable and includes some extremely high values as is evident from the differences between the mean and median values.

We exclude some outlier values from our analysis and do this by looking at total annual wage costs per child in each setting. The mean value for total annual wage costs per child was £2,227 with median £1,230. A small number (15) of settings reported a figure for total wage costs per child above £10,000 and we exclude these settings from our analysis, this reduces the mean and median total wage costs per child to £1,815 and £1,204.

Figure 6.9 plots average total annual wage costs by provider type. Overall the average total wage costs were £89,300 with some variation by sector of provider such that total wage costs in the voluntary sector were lower than other sectors reflecting that they had on average fewer children in the setting and a higher proportion of unpaid staff.

**Figure 6.9 Average Total Annual Wage Costs (£)**



Source: Childcare and Early Years Providers Survey, 2007

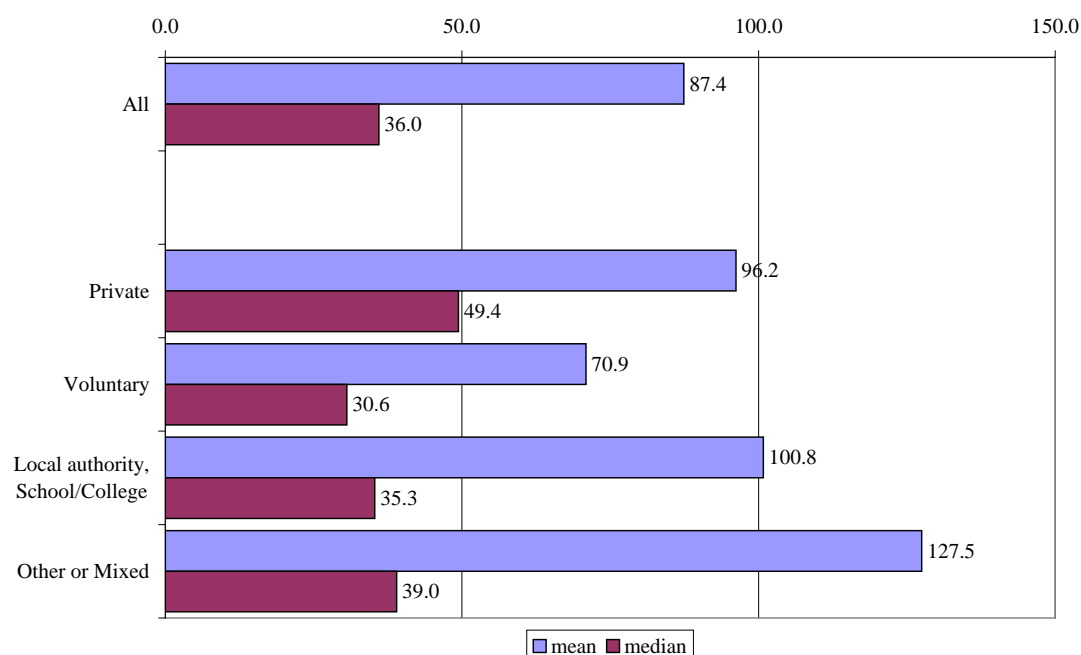
### 6.2.6 Total annual outgoings

Similar to wages we find some obvious outlier values in the reported values for total annual outgoings. We exclude some outlier values from our analysis and this time we consider total outgoings per child in each setting. The mean value for total wage costs per child was £1,890 with median £970. These numbers do not relate to the wage costs figures reported in the preceding section in that they are reported for a different sample of providers and there were no restrictions in the reporting of data to ensure that total annual outgoings were more than total wage costs. For a minority of providers reported total wage costs exceed reported total outgoings. Nevertheless taking the reported data on outgoings at face value we find that 20 settings reported a figure for total outgoings costs per child above

£10,000 and we exclude these settings from our analysis. This reduces the mean and median of total outgoings to £1,511 and £955 respectively.

Figure 6.10 plots average total annual outgoings by provider type. Overall the average total wage costs were £87,400 with some variation by sector of provider such that again average total outgoings in the voluntary sector were lower than other sectors, mainly because there wage costs were lower.

**Figure 6.10 Average Total Annual Outgoings**



Source: Childcare and Early Years Providers Survey, 2007

### 6.2.7 Multivariate analysis of outgoings, wage costs and rent

The above analysis highlights differences by sector in average total outgoings, wage costs and rent, but not included in the analysis are other factors that determine provider costs. These factors include: the size of provider (total number of children and staff); managers qualifications, the proportion of staff who were unpaid; the proportion of staff with different qualification levels; the proportion of children with special educational needs and from minority ethnic backgrounds; whether the providers cater for children with different age groups: under two and over five; the region of the provider, whether it was in a deprived area; and whether the population density was high, medium or low.

Table 6.1 shows the results from ordinary least squares estimates controlling for all the above factors including sector of provider. The models show that once controlling for all the other factors rent is still significantly lower in the voluntary sector relative to the private sector by around £2,500. For other providers or mixed ownership providers the rent was even lower, more than £7,000 lower than private sector providers.

Public sector providers had much higher wage costs even taking into account the numbers of staff, the proportion who were paid and the qualification levels of these paid staff. Differences between other provider types were not significant. In terms of total annual outgoings, none of the sector differences were statistically significant, indicating that once we take these other factors into consideration the total reported cost of delivering early years services did not vary significantly by sector. This means that our analysis suggests that there is no strong evidence that providers in different sectors have any strong cost advantage in delivering early years services. However, the data comes with large health warnings particularly concerning the extent of non-response in the survey.

Briefly considering some of the other characteristics of providers we note that all costs increased with the number of children, the number of staff and the proportion of paid staff, as we would expect. However, manager qualifications had no impact on costs at all. Sessional providers had lower costs than full day care providers, whilst Children Centres had much higher wage costs, but not higher outgoings which may reflect that they typically have better qualified staff, but were less likely to pay rent.

Catering for younger children at the setting also increased costs and outgoings were lower in areas with lower population densities. One counterintuitive result was that rent and wage costs were lower where there were a higher proportion of children with Special Educational Needs. Typically children with Special Educational Needs are in smaller settings, so this may in part be related to the size of the setting.

**Table 6.1 OLS estimates of the determinants of Rent, Wage costs and Total Outgoings**

	Rent	Wage Costs	Outgoings
<b>Sector (private)</b>			
Voluntary	-2,592*** (918)	4,407 (4,416)	-124 (6,645)
Maintained	-3,316* (1,867)	17,540** (7,266)	-6,129 (11,535)
Other / Mixed	-7,361*** (2,369)	15,538 (10,184)	11,247 (15,384)
<b>Nature of provision (Full day care)</b>			
Sessional	-3,311*** (962)	-25,715*** (4,570)	-20,802*** (7,212)
Children's Centre	-5,622 (3,531)	42,235*** (12,329)	1,983 (18,496)
<b>Size of setting</b>			
Total number of children	34** (14)	252*** (64)	447*** (104)
Total number of staff	695*** (95)	6,780*** (393)	6,287*** (623)
<b>Staff characteristics</b>			
Proportion of paid staff	10,539*** (2,472)	96,001*** (12,285)	84,996*** (18,458)
Proportion of paid staff with qualifications at level 3 to 5	2,948 (2,229)	7,591 (9,703)	12,389 (15,205)
Proportion of paid staff with qualifications at level 6 to 8	9,938** (4,622)	21,259 (20,745)	18,194 (32,517)
<b>Manager Qualifications (less than level 4)</b>			
Level 4	212 (1,157)	2,387 (5,265)	-3 (8,162)
Levels 5-8	-545 (1,122)	745 (5,071)	-12,596 (7,853)
Other	-837 (1,858)	-5,314 (9,313)	-14,756 (14,017)
<b>Proportion of children:</b>			
From Minority ethnic groups	-2,369 (2,143)	12,632 (10,226)	30,441* (15,585)
With Special Educational Needs	-14,419** (6,325)	-64,314*** (23,190)	-7,040 (32,429)
<b>Whether children of other ages catered for</b>			
Less than 2	307*** (33)	913*** (145)	1,081*** (237)
5 or more	24 (32)	11 (138)	-202 (207)
<b>Area characteristics</b>			
In top 30% most deprived areas	891 (996)	8,000* (4,662)	6,264 (7,192)
<b>Population density (high)</b>			
Low	-774 (1,080)	1,940 (5,092)	-17,232** (7,923)
Medium	509 (1,105)	218 (5,035)	-20,475*** (7,850)
<b>Constant</b>	-9,608*** (3,345)	-110,613*** (15,596)	-94,430*** (24,577)
Observations	780	974	886
Adjusted R-squared	0.489	0.640	0.440

Note regional dummies included; Standard errors in parentheses; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; Source: Childcare and Early Years Providers Survey, 2007

## 7. Summary and Conclusions

The main aim of our analysis was to see whether data collected on a regular basis on the quality of early years education as measured by Ofsted inspection judgements could predict outcomes for children, measured by the FSP, within two years of being observed in an early years setting. We also compared a range of quality measures and analysed data on the costs of providing early years services.

### **Relationship between quality measures, including Ofsted ratings**

First we compared Ofsted inspection judgements with other measures collected on a less regular basis, but nevertheless widely used in academic research. This was for a sample of 301 settings where we had detailed information about some of the children attending and their families in 2005. This analysis showed positive correlations between Ofsted's regulatory inspection judgements and quality measured by ECERS-E, ECERS-R and the CIS positive relationships subscale. However, these correlations were always weak, ranging from 0.15 to 0.27. Correlations between all of the other quality measures were much stronger; ranging from 0.55 to 0.69.

These low correlations may be because Ofsted rates settings in terms of achieving minimum standards, whilst the other measures just rate the quality of aspects of the service provided, but it remains somewhat surprising that Ofsted ratings were not more highly correlated with these quality indicators.

### **Relationship between outcomes and attendance/characteristics of service**

For a large sample of children (more than 9,000), who were eligible for some free early years education, we found only weak relationships between the characteristics of the service provided or the nature of attendance and outcomes for children in terms of their FSP assessment. However, this analysis did not capture anything about the quality of early years education attended. The main result from this analysis was that children who started in early years education before age three did better on the FSP assessment than children who started when they were aged four or more.

### **Relationship between outcomes and quality of service**

For a much smaller number of children (a little more than 500) we had very detailed information on the nature of the service they attended, including the range of measures of the quality of service discussed above. However, this data was such that all the children were attending early years education at age three. Here our analysis showed that none of our quality indicators were significant

predictors of child outcomes as measured by total FSP scores. However, when we considered other child outcome measures, again ones that are widely considered in academic research, we were able to demonstrate a positive relationship between quality and outcomes for some of these measures, although Ofsted inspection judgements did not predict any of our outcome measures.

For one particular outcome measure, the naming vocabulary assessment from the British Ability Scales, there were higher scores for children where the quality of the service was higher, with quality measured by the mean score of ECERS-E scales. Furthermore, when considering the separate rating scales underpinning ECERS-E, we found that it was the literacy scale that predicted better naming vocabulary scores.

In addition, when we considered outcome measures related to social or behavioural development we found ECERS-E to be a good predictor of development. This time we found that children who attended settings where the ECERS-E Mathematics scale was higher scored lower in terms of the number of difficulties their parents or guardians reported from a Strengths and Difficulties Questionnaire. Similarly, children who attended settings where the ECERS-E Mathematics subscale was higher scored higher in terms of the outcome measure relating to pro-social behaviour, again as reported by their parents or guardians from a Strengths and Difficulties Questionnaire.

### **Sector of provider**

We also considered differences by the sector of the provider and here we found no significant difference between early years providers in different sectors in terms of total FSP scores. However, for the naming vocabulary measure, children who attended maintained sector providers performed better than children who attended private or voluntary sector providers. There was no difference between providers in the private and voluntary sectors.

For the difficulties score measure, there were no differences by the sector of the provider, but for the pro-social behaviour measure we found a significantly poorer outcome for children who attended maintained sector providers compared with those who attended private or voluntary sector providers. Again, there was no difference between providers in the private and voluntary sectors.

This suggests that maintained sector providers lead children to perform better in more cognitive measures, like the naming vocabulary assessment, but when it comes to social development measures, children perform better when they attend private or voluntary sector providers.

### **Provider costs**

Our analysis of costs of providing these services is hampered by the availability of data. We note from existing literature a number of issues related to hidden or

masked costs. These include services in kind, which is particularly relevant for voluntary sector providers, cross-subsidisation of costs, for example where providers share premises with schools or other businesses and other practices, for example where owner managers forego a salary.

Our analysis of the Childcare and Early Years Provider Survey in 2007 suffers from a very large degree of non-reporting of cost information. Most of this is due to a lack of knowledge from the respondent, who is the senior manager of the setting. We find that 39 per cent of respondents did not know the settings total outgoings, 34 per cent did not know total wage costs and 26 per cent did not know rent costs.

Payment of rent was less common for local authority owned or school/college providers, highlighting that these providers may have some hidden costs of delivering the services they offer. Furthermore where rent was payable, it was more than three times more costly for private sector providers than for other providers, again highlighting hidden costs.

Our regression analysis indicated no sector differences in total outgoings, but maintained sector providers had higher wage costs reflecting the higher qualification levels in the sector. Voluntary sector providers who did pay rent had lower costs, reflecting some subsidy of these costs.

Overall, however, it is the inability of providers to report cost data that is the biggest problem in trying to analyse costs or providing early years services and in conducting value for money comparisons.

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