

GROWING UP IN SCOTLAND: Characteristics of pre-school provision and their association with child outcomes



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St Andrew's House
Edinburgh
EH1 3DG

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Authors: Paul Bradshaw, Gemma Lewis and Tracey Hughes

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ScotCen Social Research
73 Lothian Road
Edinburgh EH3 9AW
T 0131 228 2167
www.scotcen.org.uk

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Responsibility for the opinions expressed in this report, and for all interpretation of the data, lies solely with the authors.

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EXECUTIVE SUMMARY

Introduction

Growing Up in Scotland (GUS) is a large-scale longitudinal research project aimed at tracking the lives of several cohorts of Scottish children from the early years, through childhood and beyond. The aim of this report is to use data from GUS, combined with administrative data provided by the Care Inspectorate and Education Scotland, to provide a detailed understanding of the characteristics of pre-school provision in Scotland and how it is experienced by children who live in different areas and who have different social background characteristics. Furthermore, the report seeks to explore the association between the characteristics of the pre-school setting a child attends and their cognitive and social development between ages three and five.

Note that the report does not compare the outcomes of children who attended pre-school provision with those who did not attend. It is concerned only with children who attended some pre-school provision and does not allow us to explore the impact of pre-school provision per se. Instead the focus is on the impact of different characteristics of this provision.

At three and four years of age, all children in Scotland are currently entitled to receive a minimum of 475 hours of pre-school education per year. As of August 2014, the Scottish Government will further increase the statutory entitlement to 600 hours. Given that upwards of 90% of children eligible for a pre-school place take it up, this place offers an important opportunity to address inequalities in cognitive and social development ahead of children's entry to school.

This report uses data from children and families in the first birth cohort who were born in 2004/2005. In the age four survey (data collected in 2008/2009), parents were asked to provide the name and address of the pre-school provider the child was attending. This information has been used to link the survey data with administrative data from 2007 to 2010 held by the Care Inspectorate and Education Scotland on establishments registered to provide pre-school education. These data were used to address the following questions.

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What does pre-school education look like for children in Scotland and how does this vary for children with different socio-economic characteristics and who live in different areas?

The vast majority of children in Scotland take up their statutory pre-school entitlement. The data included here shows that in 2008/2009, 93% of children aged three to four years old were receiving pre-school education in some form. Children from more and less deprived areas and those from higher and lower income households were equally as likely to be attending pre-school. However, some small differences in attendance were seen according to area urban-rural characteristics and family type. Children living in remote or accessible rural areas were more likely to attend pre-school provision than those living in large urban areas (96% compared with 91%). In addition, children living in couple households were more likely to attend than those in lone parent households (93% compared with 88%).

There is a great deal of variation in the characteristics of the different pre-school settings that children attend in Scotland. Most obviously the settings vary in their funding and 'management' arrangements. 58% of parents reported that their child attended a local authority (LA) primary school nursery class, 20% attended another type of LA pre-school setting (such as a stand-alone nursery or family centre), 14% of children attended a private provider and 8% a voluntary provider.

This fundamental distinction is often associated with a range of other differences in the characteristics of the settings children experience in terms of the size, age range catered for and, crucially, the quality of the care and education being provided. In particular, children attending private providers were found to be significantly less likely to experience higher quality provision. Just 16% of children attending a private pre-school setting had a provider who scored five or six against all four Care Inspectorate quality themes compared with 37% of children who attended a LA primary school nursery class.

Children with different socio-economic characteristics show some small differences in the type of pre-school provision they attend and the number of hours for which they attend. For example, whilst nursery classes in LA primary schools are the dominant provider for children in all income groups, they are less likely to be attended by children in the highest income quintile than by those in the lowest income quintile (67% compared with 47%). In contrast, use of private settings increase with income – just 7% of children from households in the lowest income group attended a private provider compared with 24% of children from households in the highest income group. These differences largely reflect the different childcare needs of couple families with both parents employed.

There was no significant systematic difference in the quality of pre-school settings that more and less advantaged children attended. In other words, for example, children from higher income households or whose parents had higher qualifications were no more likely than those from lower income households or whose parents had lower qualifications to attend a higher quality pre-school setting.

What is the status of children’s cognitive and social development at age three and how has this changed by age five? How does each of these vary for children from different backgrounds and for children attending different pre-school settings?

Cognitive ability was measured using two assessments: the naming vocabulary and picture similarities subtests of the British Ability Scales Second Edition (BASII). These measure language development and problem-solving skills respectively. Social, emotional and behavioural development was assessed using the Strengths and Difficulties Questionnaire (Goodman, 1997).

Children in more advantaged circumstances – whether measured by household income, parental level of education or socio-economic classification – had higher average cognitive ability on both measures at ages three and five than children in more disadvantaged circumstances.

The vast majority of children were not reported to have any social, emotional or behavioural difficulties at ages four, five and six. However, using various measures of social background, and at each age point, the proportion of children with moderate or severe difficulties increased according to increasing levels of disadvantage.

At the beginning of their statutory pre-school entitlement, on average, children who attended LA primary school nursery classes were more likely to have higher social development difficulties and lower cognitive ability than children who attended private providers. These differences largely occur because a greater proportion of children who use private providers are from more advantaged circumstances where social difficulty levels are known to be lower and cognitive ability levels higher.

In contrast, again using a measure taken around the time children start their pre-school entitlement, those who attended settings with high and mixed quality ratings were not significantly different in terms of their social and cognitive development. Thus, on average, higher quality pre-school settings do not appear to be consistently catering for children with better or poorer developmental status on entry.

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Is there any relationship between the characteristics of the pre-school setting that a child attends and the change in their cognitive or social development?

Of the various pre-school characteristics considered – type of provision, quality of provision, weekly duration of attendance, the size of the pre-school setting and having attended a nursery or playgroup setting prior to starting pre-school entitlement – only the grading on the Care Inspectorate’s theme of ‘care and support’ was found to be associated with the assessed child outcomes, after controlling for differences in children’s backgrounds.

Attending a pre-school setting with a higher care and support grade was statistically significantly associated with better vocabulary ability at age five. This association held after controlling for all other pre-school characteristics and differences in children’s social background and demographic characteristics. This means that children who attended providers with a higher care and support grade were more likely to show higher vocabulary skills by age five, irrespective of their skills at age three and their social characteristics.

Furthermore, the positive effects of attending a provider with a higher care and support grade appeared to be similar for children with different social backgrounds and who attended different provider types. In other words, more disadvantaged children did not appear to benefit more from settings which had higher care and support scores and attending a private setting with a high care and support grade was not any more beneficial than attending a similarly graded primary school nursery class.

Conclusion

These findings have a number of important implications for the delivery of early childhood education and care in Scotland.

The benefits of pre-school education can be shared across families regardless of their socio-economic status. Indeed, there were no significant systematic differences in the average quality of pre-school settings that more and less socially advantaged children attended. Neither were there differences in the quality of settings attended by children with different levels of social and cognitive development. This is an important and encouraging finding. Nevertheless, given the known socio-economic variations in the **types** of provision used by different children and the known differences in their developmental ability on entry to pre-school, some shift in the balance to further improve the quality of provision accessible to children most in need may be beneficial in reducing inequalities between the most and least advantaged.

The variations in quality of provision by provider type may reflect, at least in part, differences in staff qualifications – an important feature in quality – and variations in the types and quality of interactions between staff and children as a result. The data considered for this report did not allow exploration of differences in staff qualifications according to provider type or quality. However, given the important link between staff qualifications and quality of provision, it is important to ensure that access to staff with complementary skills and higher level qualifications is available for children in all pre-school settings.

The number of hours a child attended pre-school per week was not associated with the child's social or cognitive development at age five. This is not an unexpected finding as other research has shown similar results (Sylva et al, 2004). The findings here suggest that the imminent increase in pre-school entitlement due in August 2014 is unlikely to have either a direct positive or detrimental impact on child outcomes. There may be some benefits from the increase in statutory pre-school hours through increased opportunities for both parents to work or to pursue further and higher education. However, the increased hours of entitlement alone are limited in allowing parents to take up work and education opportunities. To maximise the opportunity for parents, it is crucial that the entitlement is delivered flexibly to suit typical patterns of employment and education.

The emergence of quality as the key characteristic of pre-school provision associated with child outcomes is not surprising. This finding echoes that from other research on the relationship between early childcare and education experiences and child outcomes and underlines the importance of retaining quality – as well as improving flexibility – as pre-school educational entitlement expands. In terms of improving early vocabulary – a key predictor of later attainment – the most important quality measure has been shown to be 'care and support'. The lack of association with Education Scotland quality indicator (QIs) and child outcomes is potentially a statistical effect from the lower number of cases with Education Scotland QI data available. However, it is also possible that the focus on the behaviours, interactions and experiences assessed under the Care Inspectorate care and support theme are closer to those important for the specific child development measures included here and measured during the early and pre-school period by the Growing Up in Scotland Study (GUS).

What has been shown here is that aspects of pre-school settings that are routinely inspected are associated with child outcomes. If these can be measured routinely, it also suggests they can be improved. Indeed, part of the process following on from inspections requires that settings take steps to improve aspects of their provision. Therefore it seems feasible that this aspect of quality could be improved across all settings if the necessary support is provided and the provider is committed to improving.

It is worth noting that the size of the effects of pre-school quality on child outcomes is quite small. Nevertheless, it appears that attending high quality pre-school provision will benefit children in terms of their vocabulary ability which may, in turn, help reduce known socio-economic inequalities in this and other developmental outcomes. However, it will not by itself eradicate these inequalities. As well as early childhood education and care, children's exposure to learning at home is important in helping them achieve better outcomes. Yet with almost universal attendance at statutory pre-school provision amongst eligible children in Scotland, these settings undoubtedly present an important opportunity to make a significant and long-term difference to many children's lives.

INTRODUCTION

1.1 Background

The aim of this report is to use data from the Growing Up in Scotland (GUS) study combined with administrative data provided by the Care Inspectorate and Education Scotland to provide a detailed understanding of the characteristics of pre-school provision in Scotland and how it is experienced by children who live in different areas and who have different social background characteristics. Furthermore, the report seeks to explore the association between the characteristics of the pre-school setting a child attends and their cognitive and social development. The report does **not** compare the outcomes of children who attended pre-school provision with those who did not attend.

At three and four years of age, all children in Scotland are currently entitled to receive a minimum of 475 hours of pre-school education per year. This annual entitlement is set out in the *The Standards in Scotland's Schools Etc Act 2000* through which local authorities (LAs) have a duty to secure a pre-school education place for all three and four year-olds whose parents want one. The statutory entitlement was introduced in Scotland in April 2002, initially as 412.5 hours per year. The increase to 475 hours was introduced in 2007 (Kidner, 2011). As explained in section 1.2, this entitlement is set to increase further as a result of *The Children and Young People (Scotland) Act 2014*.

Pre-school education is delivered through a range of providers including nursery classes attached to LA primary schools, LA nurseries and family centres, private nurseries and not for profit community and voluntary playgroups and pre-schools. These providers vary not only in their funding and management structures but also in a range of other respects including staff qualifications and characteristics, the age of children they cater for and numbers of children attending (Nauman et al, 2013).

Previous research from GUS (Bradshaw and Tipping, 2010; Bromley, 2009; Bradshaw, 2011) demonstrated often stark inequalities at age three in children's cognitive ability and their social, emotional and behavioural development according to social background. Children from more disadvantaged circumstances, whether measured via parental level of education, household income or area deprivation, are considerably more likely to have lower cognitive ability and higher social development difficulties than children from more advantaged circumstances. Given that upwards of 90%¹ of children eligible for a pre-school place take it up, this place offers an important opportunity to start addressing these inequalities ahead of children's entry to school. Indeed, previous analysis of GUS data has shown some associations between the characteristics of childcare and pre-school provision children experience and more positive early outcomes. For example, compared with those who

¹ The actual figure varies depending on the source of the data. GUS data suggests 92% of children were attending in 2008/2009 when aged between three and four. Scottish Government statistics for 2013 indicate that 101.5% of eligible children were registered for the ante-pre-school or pre-school year of pre-school education. The figure is higher than 100% because children who register at two centres are double counted.

attended pre-school provision at a LA primary school nursery class, those children who attended a private nursery showed greater improvement in their problem-solving ability between ages three and five, after controlling for differences in social background (Bradshaw, 2011). In addition, compared with those who received fewer than eight hours, girls who received between 17 and 40 hours of non-parental care per week at age 10 months were more likely to have a higher vocabulary ability at age 34 months, again, after controlling for social background differences (Bradshaw and Wasoff, 2009).

A range of other research, most notably in the UK that was produced by the Effective Provision of Pre-school Education (EPPE) project (Melhuish et al, 2008), has shown that children in high quality provision prior to starting school achieved higher literacy and numeracy levels than those in low quality settings or who did not experience pre-school. In addition, various other UK studies have shown that pre-school attendance had greater positive impacts on disadvantaged children – measured through household income, socio-economic status, lone parenthood, immigrant status or risk of developing learning difficulties – than it did on their more advantaged peers (Sylva et al, 2004; Apps et al, 2012; George et al, 2012).

Further research (Gambaro et al, 2013) suggests that, in England, quality of provision – as assessed by Ofsted inspections – varies systematically according to area characteristics; children from more deprived areas receive lower quality provision. In addition, this research found that children with different background characteristics, on average, experience different quality of care because of differences in the nature of the settings more and less advantaged parents have available to them (either because of variations in accessibility and/or ability to pay for services) and choose to use. In contrast, results from the Quality of Childcare Settings in the Millennium Cohort Study found that the quality of settings – as measured using the Early Childhood Environment Ratings Scales – attended by children from more disadvantaged backgrounds was higher than in those attended by children from more advantaged backgrounds. This emerged because children from poorer families tended to access state-funded provision attached to schools, where higher quality was generally observed (Mathers, Sylva and Joshi, 2007).

Some information on the availability and characteristics of pre-school education in Scotland is available from statistical publications. Comprehensive figures on pre-school provision in Scotland are produced annually by the Scottish Government as part of the *Summary Statistics for Schools* series, and formerly (prior to 2010) as part of the *Pre-school and childcare statistics* series. These statistical bulletins, and accompanying tables, provide details of the number of children registering for pre-school education, the proportion of pre-school provision delivered in LA or partnership settings and the proportion of children with access to a teacher (Scottish Government, 2013). In addition, the Care Inspectorate provides some details of pre-school education as part of their annual *Childcare Statistics* publication (Care Inspectorate, 2013).

However, research on the characteristics of pre-school settings in Scotland and, in particular, on differences in the nature of pre-school settings attended by children with different background circumstances, and on the relationship between the characteristics of pre-school settings and child outcomes, is limited. Recent research by Education Scotland has

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explored some of these issues (Education Scotland, 2012). This project explored the range of qualifications held by pre-school staff in Scotland and how this was related to children's learning experiences – as reported through Education Scotland inspection reports. The research found that high quality experiences for children were closely related to the qualifications of staff. Settings which had access to higher qualified staff, particularly teachers (if they had a background in early years methodology) or staff with specific early childhood qualifications – such as the BA in Childhood Practice – were more likely to offer higher quality learning experiences. The best experiences for children were found where there was a range of staff with complementary skills and higher level qualifications.

This report seeks to use data from the GUS study, linked to administrative data from the Care Inspectorate and Education Scotland, to provide evidence on a number of issues which previously haven't been considered for Scottish children and the provision of pre-school education in Scotland:

- How do the characteristics of pre-school provision attended by children living in different areas and who have different socio-economic characteristics vary?
- What is the relationship between the 'quality' of the pre-school setting and a child's developmental outcomes?
- Are there specific aspects of pre-school provision which appear to be more beneficial for positive cognitive and social development?
- Do children with certain background characteristics benefit more from pre-school settings with specific qualities?

1.2 Policy context

As noted earlier, the annual entitlement to pre-school education for three and four year-olds in Scotland is set out in the *Standards in Scotland's Schools Etc Act 2000* through which local authorities have a duty to secure a pre-school education place for all three and four year-olds whose parents want one, from the term following a child's third birthday. Initially introduced in April 2002 with an annual entitlement of 412.5 hours, this was increased to 475 hours in 2007. These hours are, for the most part, delivered at 12.5 hours per week – usually over five days – over 38 weeks, though some variation does exist. Depending on their date of birth, children also vary in the total entitlement they receive before starting school. For example, children turning three in March will receive two full years of pre-school provision. In contrast, those turning three in January or February may only receive a little over one year of provision.²

As of August 2014, the entitlement will move to cover both early learning and childcare and the Scottish Government will further increase the statutory entitlement, under *The Children and Young People (Scotland) Act 2014*, to 600 hours. This entitlement will also be extended

² For example, children who turned three in March 2007 would have been eligible to start their pre-school entitlement in August 2007. They would attend the provision from then until they started school in August 2009 thus receiving two full years of entitlement. Children who turned three in January 2007 would start their pre-school entitlement in around April 2007. Although for these children there is a right to defer school starting age and access another year of funded pre-school education, these children would be eligible to start school in August 2008 having received only a little over one year of pre-school entitlement.

to the most vulnerable two year-olds (those who are looked after, under a kinship order, or with a parent appointed guardian) and those in workless households amounting to 15% of two year-olds. From August 2015, the entitlement will extend to two year-old children who would be eligible for free school meals therefore opening it up to around 27% of all two year-olds living in Scotland. *The Children and Young People (Scotland) Act 2004* also contains provisions to increase the flexibility of the funded entitlement, by introducing a requirement for local authorities to regularly consult with representative populations of parents on the patterns of early learning and childcare which would best meet their needs, and to reconfigure their services over time towards meeting those needs.

The Scottish Government not only sees this as part of its ambition for Scotland to be the best place for children to grow up, but it is also a feature of the Government's move to shift the balance of public services towards early intervention and prevention (Scottish Government, 2007; Scottish Government, 2008). The development of the 3-5 curriculum in the late 1990s, followed by the inclusion of the pre-school years within Curriculum for Excellence, emphasises the approach to pre-school and later life education as not just individual and separate stages, but as a whole process (Kidner, 2011).

However, as a result of the Scottish Government's commitment to the Early Years, some concerns have been raised over the sustainability of early learning and childcare provision as well as the expectations on partnership providers, such as private and voluntary sector pre-school services. For example, the higher demands placed on pre-school services due to the need to provide increased hours may impact more in remote and rural communities where there are likely to be fewer pre-school options. Since December 2011, all managers of services involving daycare of children – which includes pre-school settings – are expected to hold, or be working towards, relevant qualifications at a SCQF level 9 (Education Scotland, 2012). For voluntary services, often run and managed by parents, this may be viewed as an additional challenge.

In *Guidance on pre-school teacher deployment* (2009) the Scottish Government set out how they hoped to achieve their aim of providing access to a teacher for all pre-school children. This commitment was reinforced in a Concordat with COSLA and, along with the requirement on managers within daycare of children settings to obtain or be working towards requirement for an SCQF level 9 qualification, is part of the Scottish Government's wider aim to support and develop the early learning and childcare workforce. The Early Years Framework identifies that a knowledgeable, skilful and well-qualified workforce is a key factor in improving quality, a factor evidenced elsewhere (Mathers, Singler and Karemaker, 2012). Other studies, such as that undertaken by Education Scotland previously mentioned, have also identified that the qualifications of pre-school staff – and particularly having teachers with early years skills, staff with a degree such as Childhood Practice and a mix of skills in the workforce – are key factors in determining the quality of provision (Education Scotland, 2012; HMIE, 2007). In addition, whilst conducted at a time when very few staff other than teachers would have been degree-qualified in a relevant field, research using the EPPE study nevertheless highlighted the importance of teachers in pre-school provision in ensuring greater positive later life outcomes (Sylva et al, 2004). However, at present, there continues to be variation across pre-school settings at least in access to teachers.

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The *Child Poverty Strategy* (Scottish Government, 2011) recognised that financial pressures, as a result of pressures on budgets, may disrupt the progress being made within the Early Years and limit the impact that pre-school services can have on the later stages of a child's life. In addition, it has been acknowledged that there are a number of factors out with the sphere of education that influence a child's development, and thus impact on later life, including household income, parenting approaches, peer contact and health and development (Bradshaw and Tipping, 2010).

In order to maintain and improve standards in pre-school provision, Education Scotland carries out inspections and produces reports on the quality of education on an agreed representative sample of settings. These inspections are carried out in line with their *Principles of Inspection and Review* and focus on the quality of children's learning and achievement – with a particular focus on the development of skills and understanding in literacy, numeracy, health and well-being. The quality indicators (QIs) in *The Child at the Centre* (HMIE, 2007) and Education Scotland Inspection Advice Notes set out the evaluation criteria against which settings are assessed. Inspection reports are published on the Education Scotland website. The reports provide each pre-school setting with an evaluation on each of five QIs: improvement in performance; children's experiences; meeting learning needs; the curriculum and improvement through self-evaluation. Further details on the QIs are provided in section 2.8.

The Care Inspectorate regulates pre-school services by inspecting them against different criteria – mainly, the *National Care Standards* (Scottish Government, 2005). These Standards reflect the rights of children, as set out in United Nations Convention on the Rights of the Child (UNCRC), with the main principles, and pre-school users possessing a right to: dignity; privacy; choice; safety; realising potential; and equality and diversity. In doing so they seek to ensure that services are “doing everything they should to protect children and keep them safe” (Care Inspectorate, 2014). The National Care Standards also require the Care Inspectorate to take into account local and national guidance which would include Curriculum for Excellence and guidance contained in *Pre-birth to Three: Positive Outcomes for Scotland's Children and Families* (Learning and Teaching Scotland, 2010). As well as routine inspections, the Care Inspectorate also has the duty to investigate complaints or take enforcement action. Pre-school services receive a minimum frequency of inspection, based upon previous performance and risk assessment, and when inspected, are graded against four quality themes: care and support; environment; staffing; and management and leadership. Further details on these themes are provided in section 2.8.

In addition to the differing criteria used for inspection, the key difference between Education Scotland and Care Inspectorate inspections are that the latter inspects **all** services which provide daycare of children, including – but not restricted to – those which offer pre-school education, to assess care and welfare issues (as identified above). In contrast, within the Early Years, Education Scotland inspections are focused on Early Years centres and nursery classes providing pre-school education, as part of a wider programme to evaluate “the quality of learning and teaching in Scottish schools and education services” (Education Scotland, 2014). In addition, inspections by the Care Inspectorate alone are unannounced, whereas those undertaken by Education Scotland, or Education Scotland and the Care

Inspectorate together, are announced two to three weeks in advance. The representative sample of settings inspected by Education Scotland are agreed with the Care Inspectorate in advance to avoid issues of over-inspection and many inspections are now shared – involving both organisations.

Early learning and childcare continue to be topics of intense debate in Scotland. This is reflected in the recent formation of the Childcare Alliance – a network of partners from civic society and business who are seeking to identify practical and sustainable ways of organising, delivering and funding quality childcare.³ The remit of the Alliance is being taken forward by the Commission for Childcare Reform who are examining how childcare is organised, funded and delivered in Scotland. Both strands of work are being led by Children in Scotland.

1.3 About the Growing Up in Scotland study

Commissioned in 2003 by the then Scottish Executive Education Department, and managed by ScotCen Social Research (ScotCen), GUS is a large-scale longitudinal research project aimed at tracking the lives of several cohorts of Scottish children from the early years, through childhood and beyond. Underpinned by a wide-ranging purpose, the principal aim of the study is to provide information to support policy-making in Scotland, but it is also intended to be a broader resource that can be drawn on by academics, voluntary sector organisations, practitioners and other interested parties.

The report uses data collected from children and families in the first birth cohort of the GUS study (BC1), mainly at around age four (sweep four collected in 2008/2009) but also draws on data collected at earlier and later ages. In the age four survey, parents were asked to provide the name and address of the pre-school education provider the child was attending. This information was used to link the survey data with a range of administrative data on registered providers of pre-school education collected by the Care Inspectorate and Education Scotland – including details of the provider type, staff and quality ratings. Further details on the Care Inspectorate and Education Scotland data and the linkage process are provided below.

Given that the survey data was collected in 2008/2009, this report does not provide a **current** profile of the pattern of pre-school education provision in Scotland. Data currently being collected from the GUS second birth cohort (BC2, born in 2010/2011 and currently aged three to four years old) will, in time, provide a more up-to-date profile and allow us to explore if the pattern of pre-school use has changed between 2008/2009 and 2014. However, using the greater range of data available on children in BC1 allows the exploration of relationships between the characteristics of pre-school provision and developmental outcomes at the start of primary school.

³ See http://www.childreninscotland.org.uk/docs/ChildcareCommissionLaunchEvent-SummaryReport_001.pdf for a summary report from the Commission launch event.

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1.4 Administrative data on settings providing pre-school education

1.4.1 Care Inspectorate data

The Care Inspectorate regulates care services for children and adults in Scotland. This includes a wide range of services for children and young people, such as fostering, adoption and residential care along with childminding and day care of children services. This latter category includes all settings which provide pre-school education.

The administrative data on pre-school settings used in this report are produced using information from Care Inspectorate annual returns alongside data from inspection reports. The Care Inspectorate requires (under the *Public Services Reform (Scotland) Act 2010*, section 53(6)), all providers that are registered with them to complete and submit an annual return in order to provide the information needed to help plan and carry out inspections effectively. The annual returns are collected primarily to assist with inspection purposes for individual services, however the data collected can also be aggregated up to produce summary tables and to provide a statistical overview of these services.

Submissions of annual returns are generally high. For example, 95% of services providing day care of children registered at 31 December 2011 submitted a return for the previous calendar year.

Details of the Care Inspectorate inspection regime have been detailed above. Data on the grades awarded following inspection are held electronically and published on the Care Inspectorate website. Linked by a unique case number, information on quality ratings can be combined with data from the annual returns.

Children in BC1 were born between 1 June 2004 and 31 July 2005. As such, the first children eligible to attend their statutory pre-school place would have done so from the autumn term of 2007. These children would have continued to attend, for the most part, until June 2009 before starting school in autumn 2009. However, across the cohort as a whole, children would have started pre-school provision sometime between August 2007 and August 2008 and would have potentially attended up to June 2010. During this time, some children may have moved between providers or received their pre-school education entitlement from two providers. It is not possible to identify which children did so. In addition, some settings closed or merged or moved and new settings were established and registered.

Details of the pre-school attended by the child were collected as part of the fourth sweep of data collection, undertaken between April 2008 and June 2009. At that time, cohort children were aged just under four years old. To reflect the full period of attendance for all children in the cohort, Care Inspectorate data was requested covering the entire period from 2007 to 2010. Where data on a single provider was available for multiple years, for example, quality ratings from multiple inspections, an average figure was calculated.

At the time pre-school details were collected, 3691 children (92%) were attending pre-school provision. All parents in these cases provided some name and address details for the pre-school setting attended by the child. It was not possible to identify children who attended more than one provider. This data was linked to Care Inspectorate administrative details using a list of daycare of children services that were operating at any point between 1 August 2007 and 30 August 2010 through a combination of automated and manual case-by-case matching. Pre-school details provided by parents were successfully matched to Care Inspectorate service information for 3658 children (99%). This corresponded to 1296 pre-school centres meaning that, on average, each centre was attended by two to three children in BC1. Grades on quality themes from Care Inspectorate inspections were available for between 2878 and 3013⁴ children.

1.4.2 Education Scotland data

Education Scotland is the national body in Scotland responsible for supporting quality and improvement in learning and teaching across the full range of education services from early years through to further education. Inspections and reviews, formerly the role of HM Inspectorate of Education, are central parts of the approach to quality improvement in Scottish education.

Information about the Education Scotland inspection regime has already been provided. Data on the evaluations awarded following inspection are held electronically and published on the Education Scotland website as part of the individual inspection reports. Information held by the Care Inspectorate on the 1296 linked pre-school settings attended by GUS children was provided to Education Scotland in order that they could be matched and QI data could be appended. 1244 (96%) settings were successfully matched to Education Scotland data. However, as Education Scotland only takes a representative sample of pre-school settings for inspection, QI data was only available for 664 settings. Within this, QI data within the valid date range (i.e. from inspections carried out during the period GUS children were likely to have been attending the settings – 2007 to 2010) was available for only 415 settings (32%). When merged back into the GUS child-level dataset, this meant Education Scotland QI data on their pre-school setting was provided for 1086 children – 29% of all children attending pre-school provision.

Analysis of the characteristics of children for whom Education Scotland QI data was available indicated they were broadly representative of the full cohort. There were no statistically significant differences in availability of Education Scotland QI data by household income, parental education, area deprivation or area urban rural characteristics. Note, however, that having a lower number of cases with valid information reduces the likelihood of finding statistically significant results when using these data.

4 The number varies according to the specific QI.

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1.5 Presentation of results

Unless otherwise stated, only statistically significant differences (between subgroups) are commented on in the text. This is true at the 95% confidence limit; in other words, we can be 95% certain that the difference observed is not due to chance.

All tables and graphs have a descriptive and numerical base showing the population or population sub-group examined in it. While all results have been calculated using weighted data, the bases shown provide the unweighted counts. It should therefore be noted that the results and bases presented cannot be used to calculate how many respondents gave a certain answer.

Further details on the analysis and interpretation of the results can be found in the technical appendix which will be published separately and accessible via the GUS website <http://growingupinScotland.org.uk/>.

WHAT DOES PRE-SCHOOL EDUCATION LOOK LIKE FOR CHILDREN IN SCOTLAND?

2.1 Introduction

This section presents findings from analysis of questions from the age four GUS survey on whether the child was attending pre-school, the pattern of hours and days attended, satisfaction with provision used, perceptions of choice in selecting a pre-school setting and preference for a change in provider. Care Inspectorate and Education Scotland administrative data has been analysed to provide a description of the type of provision, the number of children who use the service and quality grades from inspections. The analysis in this report only includes pre-school services managed by the local authority (LA) and private or voluntary services provided in partnership with the LA.

The analysis explores how pre-school experience varies according to key demographic and socio-economic characteristics of the child and family including household income, parental education, area deprivation and area urban-rural characteristics.

2.2 Key findings

- At age four, nine in 10 children living in Scotland attend pre-school provision (92%). 96% of children living in remote or accessible rural areas attended a pre-school, compared with 91% of children living in large urban areas. There were no notable differences by household income and area deprivation.
- 58% of parents reported that their child attended a LA primary school nursery class, 20% attended another type of LA pre-school setting (such as a stand-alone nursery or family centre), 14% of children attended a private provider and 8% a voluntary provider.
- Whilst nursery classes in LA primary schools are the dominant provider for children in all income groups, they are less likely to be attended by children in the highest income quintile than by those in the lowest income quintile. In contrast, use of private settings increase with income.
- Compared with children living in large urban areas, those living in rural areas are more likely to attend nursery classes attached to primary schools and less likely to attend other LA and private nurseries.
- Including all time spent at the provider, and not necessarily just their funded place, 38% of children attend pre-school for 12.5 hours per week, whilst 24% attend for more than 10 hours but less than 12.5 hours and a further 7% attend for less than 10 hours per week. 14% of children attend for more than 12.5 hours per week but equal to or less than 15 hours and 17% attending pre-school for greater than 15 hours per week.

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- On average, on all but one of the Care Inspectorate and Education Scotland QIs, pre-school settings were graded or evaluated between good and very good.⁵ It is highly unusual for a child to attend a provider with a grade or evaluation of unsatisfactory or weak in any indicator. Indeed, only around 10% of children attend a setting which has been scored below good on a Care Inspectorate quality theme.
- In relation to Care Inspectorate quality themes, grades are highest against care and support and lowest in relation to staffing. Whilst 67% of children attend a provider with a grade of very good or excellent for care and support, 44% attend a provider with a comparable grade for staffing.
- The highest Education Scotland evaluations were in relation to children's experiences and the lowest were associated with improvement through self-evaluation. 51% of children attended provision which was evaluated at very good or excellent for children's experiences, compared with 32% whose provider had a similar evaluation for improvement through self-evaluation.
- Using the Care Inspectorate data, 32% of children attended a pre-school setting which scored either very good or excellent in each of the four quality themes. The proportion doing the same using the Education Scotland data was lower with 20% of children attending a setting evaluated at either very good or excellent in each of the five areas.
- Children attending LA provision were those most likely to experience higher quality care and education (i.e. where all quality ratings are graded or evaluated very good or excellent on each Care Inspectorate theme or Education Scotland QI). For example, 37% of children who attended a primary school nursery class had a provider graded very good or excellent on each Care Inspectorate quality theme compared with 16% of children attending a private provider.
- There were no statistically significant differences in the Education Scotland or Care Inspectorate average evaluations or grades according to differences in children's household income, parental education and area deprivation levels.

⁵ For both sets of indicators, and for each indicator or 'theme', a provider can be given a score of between one and six, with six being the highest score. The values equate to the following descriptive terms: 1 = unsatisfactory; 2 = weak; 3 = satisfactory (Education Scotland)/adequate (Care Inspectorate); 4 = good; 5 = very good and 6 = excellent.

2.3 Attendance at pre-school provision

At age four, nine in 10 children living in Scotland attend pre-school provision (92%). However, there are variations in attendance levels according to some demographic and socio-economic characteristics.

Table 2.1 Attendance at pre-school provision by area urban-rural characteristics

	% of children attending
All	92
Area urban-rural characteristic	
Remote rural	96
Accessible rural	96
Small remote towns	95
Small accessible towns	95
Other urban	95
Large urban	91
<i>Base: all BC1 families</i>	3993

As shown in Table 2.1, those children living in rural geographical locations are more likely to attend a pre-school than those who live in large urban areas. For example, 96% of children living in remote or accessible rural areas attended a pre-school, compared with 91% of children living in large urban areas. In addition, children living in couple family households were more likely to attend a pre-school than those who lived in a lone parent household (93% compared with 88%). There were no notable differences by household income and area deprivation.

2.4 Provider type

In Scotland, statutory pre-school education for three and four year-olds is delivered either by local authorities or by 'partner' providers, who receive funding from the LA to provide pre-school places. The majority of LA provision is delivered via nursery classes attached to LA primary schools. However, local authorities also provide pre-school education in a range of other settings including stand-alone nursery schools, family and early childhood centres. Partner providers are usually either commercially-operated, 'private' nurseries – who offer daycare for children from birth or nursery classes at independent schools – or voluntary or not for profit settings including community playgroups. All provider types discussed here are either LA managed or partner providers.

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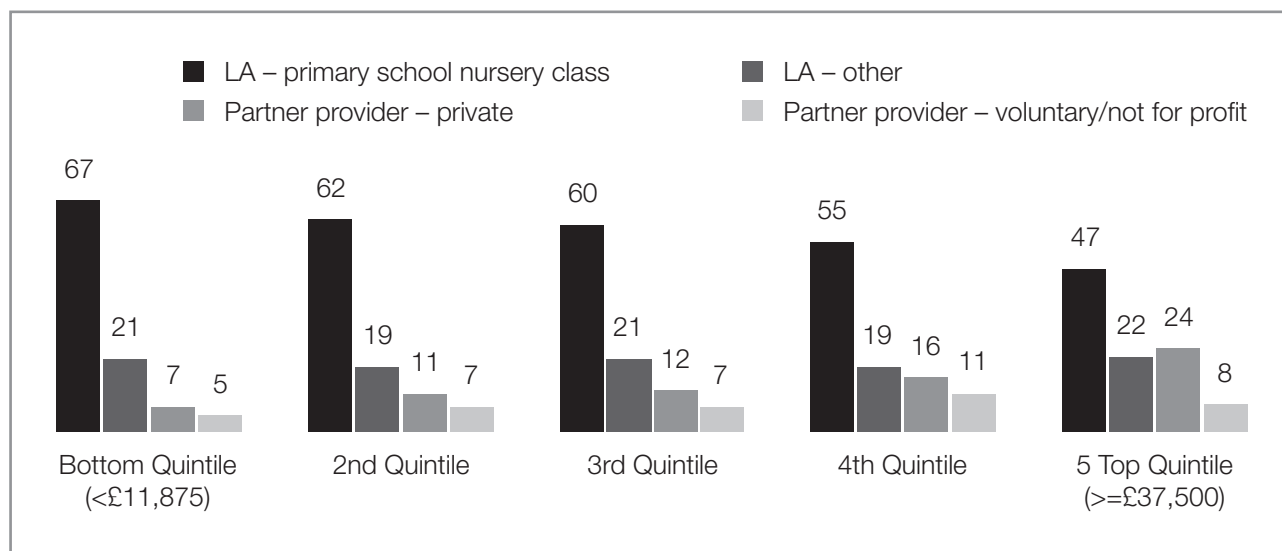
According to the Scottish Government Pre-school and Childcare Statistics 2009⁶ bulletin (Scottish Government, 2009) 56% of pre-school centres were LA managed, 39% were partner providers offering places funded by the LA and the remainder (c5%) were neither – presumably being independent or voluntary settings with no LA funded provision, though no further information is provided on these settings.

Table 2.2 Type of pre-school provider attended by children in BC1

Provider type	% of children attending
Local authority – nursery class attached to primary school	58
Local authority – other	20
Partner provider – private	14
Partner provider – voluntary/not for profit	8
<i>Base: all BC2 families</i>	3414

Table 2.2 summarises data obtained in the GUS study and shows that 78% of parents reported that their child attended a LA managed pre-school setting including 58% who received pre-school education via a LA primary school nursery class and 20% who attended another type of LA pre-school setting. 14% of children attended a private provider and 8% a voluntary provider.

Figure 2.1 Type of pre-school provider attended by household equivalised income (quintiles)



Bases: Bottom Quintile = 646, 2nd Quintile = 625, 3rd Quintile = 678, 4th Quintile = 668, 5th Quintile = 628

⁶ The 2009 statistics were gathered in January 2009. This falls firmly within the period during which the equivalent GUS survey data was collected and when most children in the GUS BC1 were attending pre-school provision and as a result was considered to be the most suitable comparator.

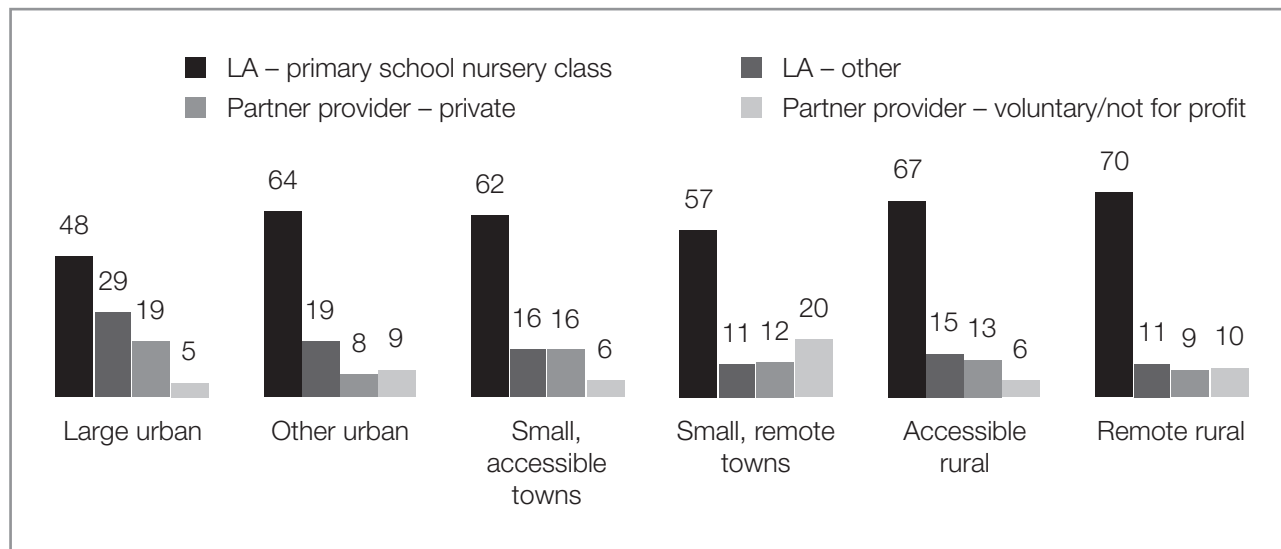
The type of pre-school provider children attended varied according to their social background, as demonstrated in Figure 2.1. As the graph shows, whilst nursery classes in LA primary schools are the dominant provider for children in all income groups, they are less likely to be attended by children in the highest income quintile than by those in the lowest income quintile. Indeed, use of this provision decreases as income increases. In contrast, use of private settings increase with income. Whilst only 7% of children in the lowest income group attend a private nursery, the same is true for 24% of children in the highest income group. Similar patterns were observed according to differences in parental level of education and area deprivation.

Such variations may be partly explained by differences in the availability of provision in different areas, but there is no evidence readily available to examine this. Variations in parental employment patterns amongst children in these groups will also play a part. Those children from families with higher incomes, whose parents have higher qualifications and who live in less deprived areas are more likely to have a parent employed full-time or to have both parents working. For example, at age four, 73% of children in the highest income group lived in a couple family where both parents worked at least 16 hours per week compared with 10% of children in the lowest income group. The demands of work require that these parents have a greater need for more flexible, 'wraparound' care as part of their child's pre-school provision. Such arrangements permit, for example, the child to be dropped off earlier and picked up later than the nominal start and finish times of the pre-school session. This flexibility allows parent to travel to work for 9am or earlier and to work a longer day than would otherwise be possible. Private nurseries, who often provide a range of daycare services for children across a wide age range, are more likely to offer this level of flexibility as standard than LA primary school nursery classes, though other LA providers do offer more flexible and extended placements. In addition, many private nurseries will also permit the statutory pre-school provision of 12.5 hours to be combined and delivered consecutively over two or three days (though still in 2.5 hour blocks, e.g. one in the morning and one the same afternoon), rather than the programme of five morning **or** afternoon sessions of 2.5 hours which is routinely delivered in LA primary school nursery classes.

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Figure 2.2 Type of pre-school provider attended by area urban-rural characteristics



Bases: Large urban = 1129; Other urban = 1113; Small, accessible towns = 363; Small, remote towns = 110; Accessible rural = 475; Remote rural = 224

The urban-rural characteristics of the child’s local area are also associated with the type of pre-school provision attended, as shown in Figure 2.2. Compared with children living in large urban areas, those living in rural areas are more likely to attend nursery classes attached to primary schools and less likely to attend other LA and private nurseries. For example, whilst 19% of children living in large urban areas attended pre-school at a private nursery, the same was true for 13% of children living in accessible rural areas, and 9% living in remote rural areas.

In this instance, the variation is less exclusively related to differences in parental employment patterns and more likely to also reflect differences in the demand and supply of private nursery provision in rural areas. With a less dense population such ventures may be less commercially viable.

2.5 Size and age range

Administrative data held by the Care Inspectorate provides information on both the size of the pre-school provider – in terms of the number of registered places⁷ and number of children who attend – and the age range of children registered.

⁷ Note that these figures incorporate the number of places for all areas of the service which are registered with the Care Inspectorate, not just those receiving pre-school education. For LA primary school nursery classes, this will be restricted to the children attending nursery class. However, for LA nursery schools and partnership settings children receiving other care are included in the figures.

2.5.1 Number of registered places

On average, children attended a pre-school provider which had 50 registered places and around 70 registered service users.⁸ These figures varied considerably: 11% of children attended a pre-school setting with up to 20 registered places, 38% attended a setting with between 21 and 40 places, 26% attended a provider with between 41 and 60 places, and 25% attended a setting with more than 60 places (see Table 2.3).

Table 2.3 Average number of registered places 2007 to 2010 by pre-school type and area characteristics

		Average number of registered places 2007 to 2010				Bases
		Up to 20	21 to 40	41 to 60	Over 60	
All	%	11	38	26	25	3428
Provider type						
LA – primary school nursery class	%	12	47	28	14	1992
LA – other	%	6	21	26	47	682
Private provider	%	10	21	25	44	475
Voluntary provider	%	23	45	20	12	265
Area deprivation (quintiles)						
Least deprived	%	9	34	29	27	750
2	%	17	44	21	18	755
3	%	14	44	25	18	736
4	%	11	39	28	22	576
Most deprived	%	5	29	30	36	633
Urban-rural classification						
Large urban	%	4	30	31	35	1139
Other urban	%	7	37	31	24	1135
Small, accessible towns	%	12	46	20	22	364
Small, remote towns	%	33	52	9	5	110
Accessible rural	%	25	49	14	12	477
Remote rural	%	40	43	15	2	225

⁸ Several users may share a single 'place', for example, attending at different times over the course of a week.

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Pre-school size varied according to provider type and area characteristics. Nursery classes attached to primary schools tended to be medium in size. Amongst children who attended such providers, most attended settings that had either 21 to 40 (47%) or 41 to 60 (28%) places. Other LA providers and private nurseries were generally bigger with 47% and 44% of children who used these providers in settings with 60 or more places. Voluntary partnership settings were the smallest. 23% of children using these providers attended settings that had fewer than 21 places compared with 12% who attended primary school nursery classes, 10% who attended private nurseries and 6% who attended other LA settings.

As may be expected, variations by area urban-rural characteristics reflect differences in population density. Children living in remote and rural areas are considerably more likely than those in urban areas and accessible towns to attend smaller pre-school settings.

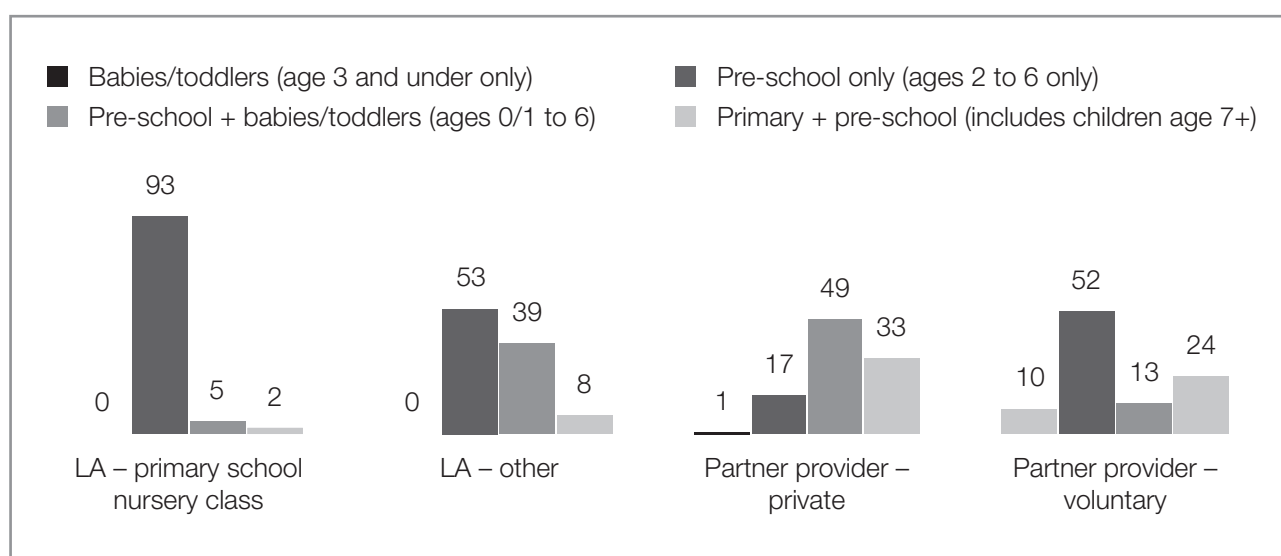
Children living in areas in the most deprived quintile were most likely to attend settings providing for large numbers of children, and least likely to attend smaller settings. 36% attended a provider with 60 or more registered places and 5% attended a provider with up to 20 places. However, size does not increase incrementally with deprivation. Children living in areas in the least deprived quintile were only slightly less likely to attend larger providers; 27% attended a setting with 60 or more places. These similarities reflect the more prominent use of certain larger provider types amongst families living in the most and least deprived areas. Children living in areas in the most deprived quintiles were more likely than those in other areas to attend other LA providers (29% compared with 17% in least deprived quintile) whilst those living in areas in the least deprived quintile were more likely to attend private settings (21% compared with around 10% in the two most deprived quintiles). As shown in Table 2.3, other LA settings and private providers are more likely to cater for larger numbers of children.

2.5.2 Age range of users

Care Inspectorate data on ages of children using the pre-school service only includes those parts of the service which are subject to regulation by the Care Inspectorate. In primary schools, this means only the nursery classes. As such, the age range of other children attending the school is not collected. It is obvious however, that all of these settings are catering for children of primary school age to some extent. Thus for primary school nursery classes, the age data slightly misrepresents the full age range of children attending the school as a whole.

All other providers potentially offer additional childcare services meaning information is collected on a wider range of children. Figure 2.3 illustrates how the age range of children using those parts of the service under the jurisdiction of the Care Inspectorate varies according to provider type. As the graph shows, other than nursery classes in primary schools, most other pre-school settings also cater for children outside of the pre-school age range. For example, 39% of children attending other LA providers and 49% of those attending private nurseries attended settings which provided care for children aged from birth to six years. Voluntary partner providers, in particular, are more likely to cater for younger children.

Figure 2.3 Age range of children attending by type of pre-school provider



Bases: LA primary school nursery class = 1992, LA other = 681, Partner - private = 474, Partner - voluntary = 255

2.6 Choosing a pre-school provider

2.6.1 Reasons for choosing provider

The most common reason given by parents for selecting a pre-school provider was due to its location. Six in 10 (58%) parents gave the pre-school being close to their home or being in a convenient location as their main reason. Convenience was also related to the second most common response option. Three in ten (31%) parents enrolled their child with a pre-school provider based upon other children in the family already attending the school to which the nursery class was attached.

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Table 2.4 Main reasons for choosing pre-school provider by pre-school provider

		Pre-school provider				
		All	LA – primary school nursery class	LA – other	Partner provider – private	Partner provider – voluntary
Nearer home/in a convenient location	%	58	60	57	47	58
Other children in the family go to the primary school to which the nursery is attached	%	31	39	22	15	27
Provides better quality of education than other providers	%	23	22	25	23	23
To secure a place in the school of choice	%	22	32	10	6	16
Provides better quality of staff than other providers	%	17	13	21	22	23
Child's friends were also going to this provider	%	16	17	13	14	19
Offers better facilities than other providers	%	16	12	22	23	14
Child was already at this provider for childcare	%	15	4	21	50	19
Local Education Authority/ School policy/admission arrangements	%	12	16	10	3	10
The only place/provider available	%	8	8	9	7	9
Other	%	9	7	13	13	13
<i>Base</i>		<i>3414</i>	<i>1991</i>	<i>682</i>	<i>475</i>	<i>263</i>

The reason for selecting a child's pre-school provider varied by provider, as demonstrated in Table 2.4. Parents using a nursery class at a LA primary school were more likely than parents using other providers to say they were doing so because they wished to secure a place in a school of their own choice⁹ or because they were restricted by school or LA admission arrangements. For example, 32% of parents selected their child's pre-school in order to secure a place in the school of their choice, whilst those using private providers were less likely to give this as a reason (6%).

The most common reason parents gave for selecting a private provider for their child's pre-school was that the child already attended for childcare (50%). This reflects the greater use of this provider amongst higher income families shown earlier. In these cases, both parents are more likely to be employed and thus to have required childcare prior to the child's enrolment at pre-school. Parents in the lowest household income quintile were the least likely to offer this as a reason for selecting the pre-school provider (10%), whilst there was an increase amongst each quintile, those in the top quintile the most likely to give this as a reason (25%). A similar, but smaller, association was found by area deprivation level. Parents living in the least deprived areas were more likely than those living in the most deprived areas to say their child already attended this provider for childcare (20% and 15% respectively).

Whilst there were no differences across provider type for those who were likely to select a pre-school based on a perceived view that quality of education would be better, there were differences by quality of staff and facilities. Compared to parents using a primary school nursery, parents using other LA nurseries, private or voluntary providers were more likely to cite higher quality staff and facilities as reasons why they chose the provider. For example, 13% of parents using LA primary school nursery classes said they selected their provider because of the better quality of staff compared with 22% of those who opted for private pre-school providers.

2.6.2 Perception of choice

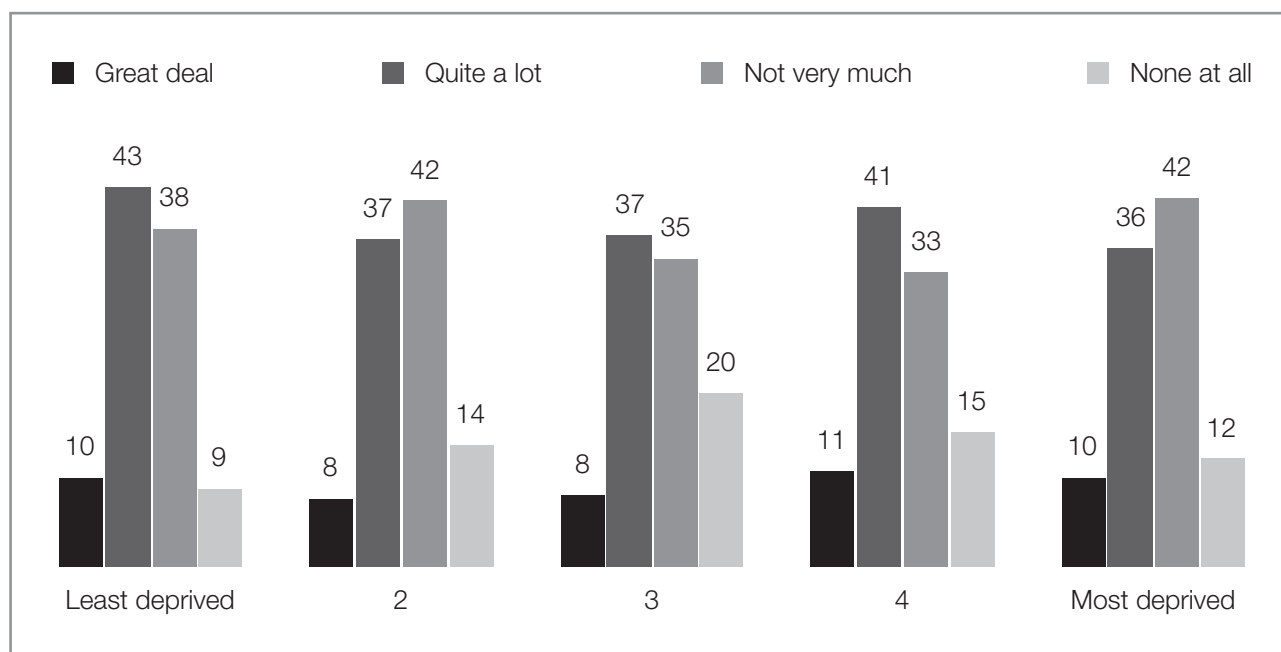
Parents were just as likely to perceive they had limited choice as they were to believe they had a lot of choice. 48% of parents would say they had a great deal/quite a lot of choice when selecting their child's pre-school provider with 52% likely to say they did not have very much choice or none at all.

⁹ Note that whilst this might have been parents' intention or perception it is unlikely to actually have any impact on school admission as this is dealt with under different legislation and LA guidance.

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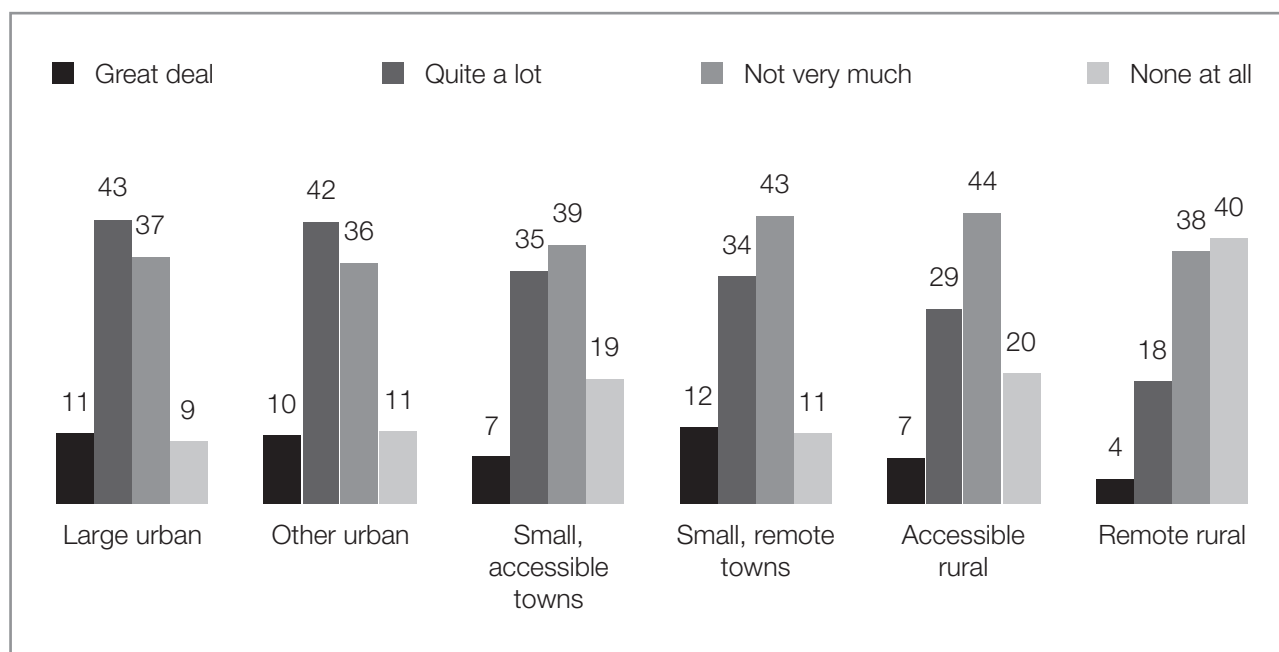
Figure 2.4 Perception of choice of pre-school provider by area deprivation (quintiles)



Base: Least deprived = 787, 2nd Quintile = 777, 3rd Quintile = 768, 4th Quintile = 599, Most deprived = 668

Area deprivation was associated with the level of choice parents perceived when selecting their child's pre-school provider although differences were not huge, as shown in Figure 2.4. Parents living in areas in the least deprived quintile reported having greater choice than those living in the most deprived areas. The difference was mainly in the proportion who felt they had 'quite a lot' of choice. 43% of parents living in the least deprived areas gave this response compared with 36% of parents living in the most deprived areas. However, perceived choice did not necessarily decrease in a linear way as area deprivation increased. Parents living in areas in the fourth quintile (that is the second most deprived group of areas) reported having greater choice than those living in areas in the less deprived second and third quintiles. This may reflect the different wraparound childcare needs of parents. Those in less deprived areas, who are more likely to be employed, require affordable nurseries with longer and more flexible hours, thus limiting their perceived level of choice.

Figure 2.5 Perception of choice of pre-school provider by urban-rural characteristics (quintiles)



Bases: Large urban = 1200, Other urban = 1174, Small, accessible towns = 381, Small, remote towns = 114, Accessible rural = 493, Remote rural = 237

As may be expected, the urban-rural characteristics of the family's local area were strongly associated with perceptions of choice. In particular, parents living in remote rural areas were less likely to believe they had quite a lot of choice than parents living in all other areas. For example, four in 10 (40%) of those parents living in remote rural areas would say they had no choice at all, compared with only one in 10 (9%) of those living in large urban areas. In general, perception of choice tends to decrease as accessibility decreases. As shown in Figure 2.5, 20% of those living in accessible rural locations felt they had no choice at all, compared to 11% of those in small remote towns.

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2.7 Patterns of use and associated costs

2.7.1 Days child attends pre-school

The majority of children (77%) attended their pre-school provision on five days each week. Only one in four children attended pre-school less than five days per week: 9% attended four days per week, 11% three days per week, and 3% one to two days per week (see Table 2.5).

Table 2.5 Number of days child attends pre-school

		Number of days per week				Bases
		1-2	3	4	5	
All	%	3	11	9	77	3687
Provider type						
LA – primary school nursery class	%	2	5	8	85	1991
LA – other	%	4	16	7	73	681
Private provider	%	8	28	15	49	474
Voluntary provider	%	3	12	13	72	265
Household income						
Bottom Quintile (<£11,875)	%	1	4	6	89	704
2nd Quintile	%	1	9	9	80	677
3rd Quintile	%	4	12	8	76	733
4th Quintile	%	4	13	10	73	714
Top Quintile (>=£37,500)	%	7	16	15	62	676

The number of days per week a child attended pre-school varied according to provider type and household and area characteristics. Children who attended nursery classes attached to primary schools were those most likely to attend five days per week, with 85% doing so. Children attending other providers were less likely to attend five days per week, with 49% of those attending private nurseries likely to do so. Children attending private pre-school settings were more likely than those attending other providers to attend three or four days per week. For example, 28% of children attended a private nursery three days per week compared with 5% of children attending nursery classes at LA primary schools.

As noted in the discussion, private providers allow parents the option to use their entitlement as credit against full days. Analysis above showed that use of private provision was higher in higher income households and that higher income households are more likely to have two working parents, one of whom may only work part-time, for example for just two or three days per week. These parents may therefore prefer to condense their pre-school entitlement

to better cover these working days.¹⁰ The data show that children who live in households with higher incomes are less likely to attend pre-school provision five days per week, compared with children in lower household income quintiles (89% in the lowest income quintile and 62% in the highest income quintile). Clearly not all parents in higher income households choose to condense their hours. Those who require additional childcare will use alternative care, often grandparents, childminders or other nurseries.

2.7.2 Hours per week child attends pre-school

Children in Scotland currently receive 12.5 hours of statutory pre-school provision. However data collected from families in Birth Cohort 1 reveals that, when accounting for all of the time a child spends at their pre-school provider, on average, this was likely to be 14 hours per week – 1.5 hours more than the statutory pre-school provision of 12.5 hours. The majority of children (69%) attend pre-school for 12.5 hours per week or less (Table 2.6): 38% attend pre-school for 12.5 hours, whilst 24% attend for more than 10 hours but less than 12.5 hours and a further 7% attend for less than 10 hours per week. This results in 14% of children attending pre-school more than 12.5 hours per week but equal to or less than 15 hours and 17% attending pre-school for greater than 15 hours per week.

Table 2.6 Number of hours child attends pre-school provision per week, by provider type

		Number of hours per week					Bases
		Less than 10	> 10 but < 12.5	12.5	> 12.5 but <=15	> 15	
All	%	7	24	38	14	17	3687
Provider type							
LA – primary school nursery class	%	6	30	46	14	4	1991
LA – other	%	7	20	29	16	28	681
Partner provider – private	%	5	10	19	12	53	474
Partner provider – voluntary/not for profit	%	12	27	34	9	18	265

As shown in Table 2.6, children attending LA primary school nursery classes were the most likely to attend pre-school provision for the statutory entitlement of 12.5 hours (46% children compared with 29% children in other LA settings, 19% in private settings, and 34% attending voluntary providers).

¹⁰ That is, parents access more than one of these sessions each day. These hours are almost exclusively still offered as blocks of 2.5 hours, generally one in the morning and one in the afternoon. It is generally not possible, for example, for parents to use the full 12.5 hours over two days.

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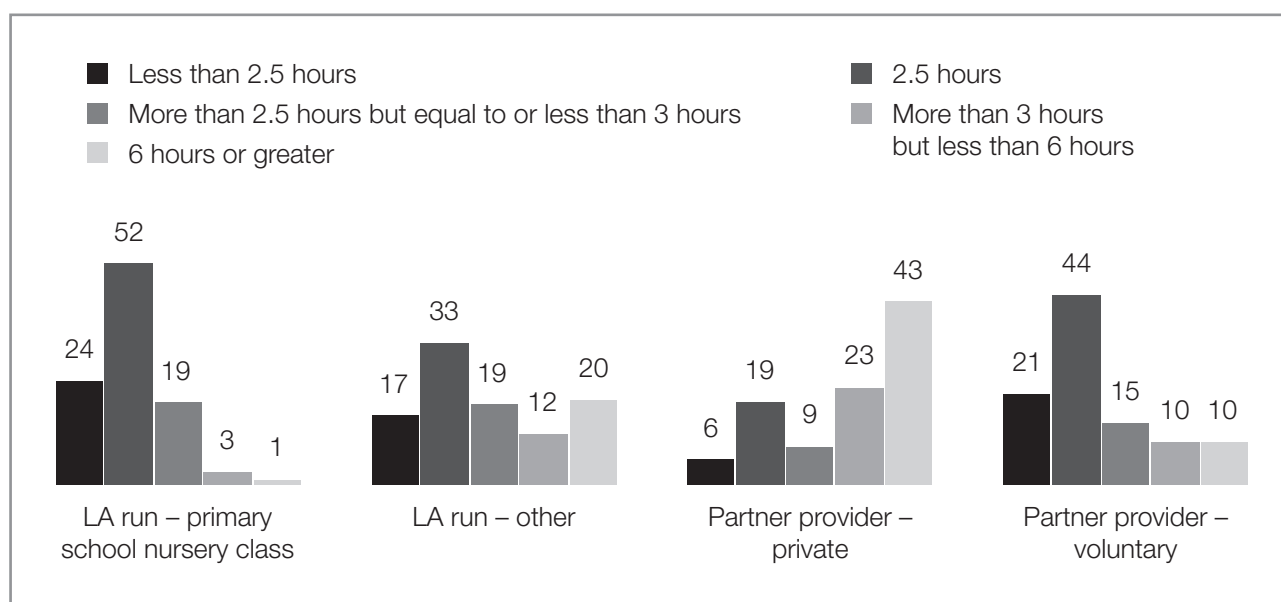
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In contrast, children who attend private pre-school providers were most likely to attend their pre-school provider for more than 15 hours per week. For example, 53% of children at private providers attended for more than 15 hours per week compared with 4% at LA primary school nursery classes.

2.7.3 Average hours per day child attends pre-school

As mentioned in section 2.7.1, on average, children who attended pre-school for fewer days, one to two days per week, were more likely than those who attended five days per week to attend for greater than six hours per day. For example, 56% of children who attend their pre-school provider one to two days per week attend on average for six hours or more compared with only 6% of children who attend for five days per week.

Figure 2.6 Average hours child attends pre-school per day by pre-school provider



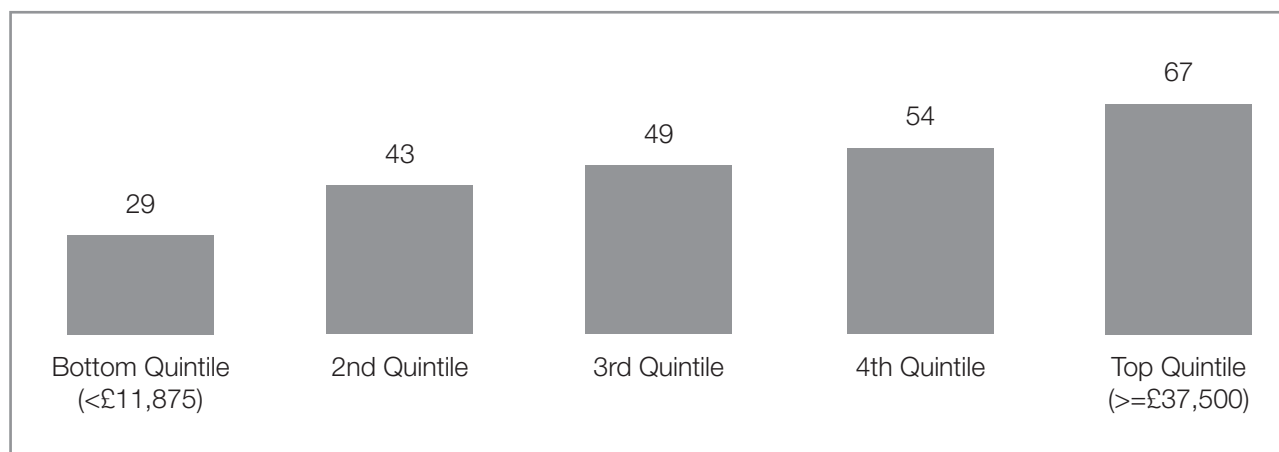
Bases: LA run – primary school nursery class = 1991; LA run – other = 681; Partner provider – private = 474; Partner provider – voluntary/not for profit = 265

Children attending private settings are the most likely to attend their provision for longer periods on the days that they attend, as shown in Figure 2.6. For example, 43% of children who attend a private provider attended pre-school, on average, for six hours per day. However, parents who use LA primary school nursery classes were the most likely to use their provider for the statutory entitlement of 2.5 hours. 52% of parents use this provider for an average of 2.5 hours per day compared with 19% of parents using a private provider. Parents using private providers are more likely to use their child’s pre-school for longer sessions over fewer days as a result of the greater flexibility that private pre-school providers offer.

2.7.4 *Using pre-school provider for childcare other than funded pre-school place*

If a child attended a pre-school setting which was not attached to a LA primary school nursery class, parents were asked whether or not they used the provider for childcare other than the funded pre-school place, of which almost half of parents did (49%).

Figure 2.7 Use of pre-school provider for further childcare by household income



Base: 1446

As would be expected, variation was noted according to socio-economic and area characteristics, such as household income, area of deprivation and parents' education level. Parents in higher income households were more likely than those in lower income households to use their pre-school provider for further childcare compared with those in lower income households: 67% in the top income quintile and 29% in the lowest income quintile. The area in which families lived was also associated with using the child's pre-school setting for further childcare. Just over two in five parents (42%) living in the most deprived areas were likely to do so compared with three in five, (61%), of parents residing in the least deprived areas.

2.7.5 *Fees paid to pre-school providers for childcare or other services*

At the time of data collection, all children aged three and four in Scotland were entitled to 12.5 hours per week of funded pre-school education. However, as shown in section 2.7.4, many parents use their child's pre-school provider for care beyond this statutory entitlement. In such cases and in others – for example to pay for snacks – parents may have to make some payment to their child's pre-school provider.

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Almost one in four parents (23%) paid some fees to their child's pre-school provider – with variation by area and socio-economic characteristics. Household income was associated with whether or not fees were paid to a pre-school provider. Compared with parents in the highest income quintile, those in the lowest income quintile were less likely to pay any fees (34% and 15% respectively) with the proportion that paid fees increasing as household income increased.

30% of parents living in large urban areas and 21% living in other urban areas paid some fees to their child's pre-school provider. Unsurprisingly, parents in small remote towns and remote rural areas, who reported less choice of pre-school and were less likely to have access to, and use, private provision which is most likely to offer the sort of wraparound care which attracts a fee, were less likely to pay fees. Only 9% of parents in remote rural areas and 14% in small remote towns paid something towards their child's pre-school.

For those who paid something towards their child's pre-school place, the average fee was £208 per week. However, this varied considerably. For example, 19% of parents who paid some fees (4% of all parents using pre-school) paid more than £400 per week whilst 31% paid up to £50 per week. As illustrated in Table 2.7, unsurprisingly, the amount paid towards the child's pre-school varies by provider type and socio-economic characteristics. Parents whose children attend LA primary school nursery classes tend to pay the lowest fees: 74% pay between £0 and £50 compared with 36% of those whose child attends other LA provision, 30% who use a voluntary provider, and only 7% for those using a private provider. In contrast to this, parents whose children attend partner providers tended to pay the highest fees. For example, 29% of parents whose child attends a private provider and 23% whose attend a voluntary provider pay more than £400 per week. This most likely reflects the greater number of weekly hours these settings are used by parents, as shown earlier, rather than simply more expensive costs.

Table 2.7 Average weekly fees paid towards child's pre-school by provider type and household income

		Fees paid for pre-school per week					Bases
		£0-50	£51-100	£101-200	£201-400	>£400	
All	%	31	13	14	23	19	846
Provider type							
LA – primary school nursery class	%	74	13	4	5	4	155
LA – other	%	36	14	16	19	14	226
Partner provider – private	%	7	12	17	36	29	310
Partner provider – voluntary/not for profit	%	30	15	7	25	23	65
Household income							
Bottom Quintile (<£11,875)	%	59	8	13	11	9	114
2nd Quintile	%	43	14	12	13	18	141
3rd Quintile	%	30	16	15	20	19	143
4th Quintile	%	24	15	16	28	17	179
Top Quintile (>=£37,500)	%	10	11	13	37	29	224
Area deprivation (quintiles)							
Least deprived	%	20	10	15	31	24	232
2nd Quintile	%	24	16	14	26	19	171
3rd Quintile	%	24	15	16	22	22	163
4th Quintile	%	46	10	10	17	17	117
Most deprived	%	43	13	14	15	14	163

Parents on lower incomes, and living in more deprived areas paid less towards their child's pre-school on average than those on higher incomes and living in less deprived areas. For example, one in six (59%) parents in the lowest income households paid up to £50 per week, compared with one in 10 (10%) parents in the highest income group. Similarly, 11% of parents in the lowest household income quintile paid between £201 and £400 per week compared with 37% of those parents living in higher income households. A similar pattern can be seen by area of deprivation (as shown in Table 2.7) and household education levels.

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2.8 Quality ratings

As noted in the introduction, following inspection of pre-school settings both the Care Inspectorate and Education Scotland assess the quality of the service provided. The Care Inspectorate assesses care against four quality themes which each have accompanying quality statements, as shown in Table 2.8.

Table 2.8 Care Inspectorate Quality Themes and accompanying Quality Statements

Quality themes	Quality statement
Quality of care and support	<ul style="list-style-type: none">• We ensure that parents and families participate in assessing and improving the quality of care and support provided by the service.• We enable service users to make individual choices and ensure that every service user can be supported to achieve their potential.• We ensure that service users' health and wellbeing needs are met.• We use a range of communication methods to ensure we meet the needs of service users.
Quality of environment	<ul style="list-style-type: none">• We ensure service users and carers participate in assessing and improving the quality of the environment within the service.• We make sure that the environment is safe and service users are protected.• The environment allows service users to have as positive a quality of life as possible.• The accommodation and resources are suitable for the needs of the service users.
Quality of staffing	<ul style="list-style-type: none">• We ensure that service users and carers participate in assessing and improving the quality of staffing in the service.• We are confident that our staff have been recruited, and inducted, in a safe and robust manner to protect service users and staff.• We have a professional, trained and motivated workforce which operates to National Care Standards, legislation and best practice.• We ensure that everyone working in the service has an ethos of respect towards service users and each other.

Quality themes	Quality statement
Quality of management and leadership	<ul style="list-style-type: none"> • We ensure that service users and carers participate in assessing and improving the quality of the management and leadership of the service. • We involve our workforce in determining the direction and future objectives of the service. • To encourage good quality care, we promote leadership values throughout the workforce. • We use quality assurance systems and processes which involve service users, carers, staff and stakeholders to assess the quality of service we provide.

In the course of its inspections of pre-school settings, Education Scotland evaluates specific aspects of provision using five quality indicators (QIs), three of which feed into the Scottish Government's National Performance Framework. The data for three QIs (improvements in performance, children's experiences and meeting learning needs), in relation to LA primary school nursery classes, is an evaluation for the nursery class only whereas the other two QIs reflect evaluations for the whole school provision. Comparisons between nursery class QI data and other nursery data are therefore not wholly like with like. Also, expectations for the first three QIs have remained constant since they were introduced (they are used to inform progress on the National Performance Framework) whilst the last two have been revised over time to reflect increased expectations. As such what was evaluated as 'excellent' (and sector leading) in 2007 for 'the curriculum' or 'improvement through self-evaluation' is unlikely to still be considered so. A summary of the QIs is provided in Table 2.9.¹¹

¹¹ Further information on the Education Scotland QIs can be found in the guidance document *The Child at the Centre* (HMIE, 2007).

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Table 2.9 Education Scotland QIs and accompanying themes

Quality indicator	Themes
Improvement in performance	<ul style="list-style-type: none"> • Children’s progress • Overall quality of children’s achievement • Impact of the centre improvement plan
Children’s experiences	<ul style="list-style-type: none"> • The extent to which children are motivated and actively involved in their own learning
Meeting learning needs	<ul style="list-style-type: none"> • Learning opportunities, tasks, activities and resources • Identification of learning needs • The roles of staff • Meeting and implementing the requirements of legislation
The curriculum	<ul style="list-style-type: none"> • The rationale and design of the curriculum • The development of the curriculum • Programmes • Transitions
Improvement through self-evaluation	<ul style="list-style-type: none"> • Commitment to self-evaluation • Management of self-evaluation • Centre improvement

For each indicator or ‘theme’, a provider can be given an evaluation or grade of between one and six, with six being the highest. The values equate to the following descriptive terms: 1 = unsatisfactory; 2 = weak; 3 = satisfactory (Education Scotland)/adequate (Care Inspectorate); 4 = good; 5 = very good and 6 = excellent.

Table 2.10 provides a summary of the proportion of children attending pre-school settings with specific grades or evaluations in the various quality themes or QIs. On average, in any Care Inspectorate quality theme and in all but one Education Scotland QI, pre-school settings are graded or evaluated between good and very good. It is highly unusual for a child to attend a provider with a grade or evaluation of unsatisfactory or weak in any theme or QI. Indeed, only around 10% of children attend a setting which has been graded below good on a Care Inspectorate quality theme.¹²

In relation to Care Inspectorate quality themes, grades are highest against care and support and lowest in relation to staffing. Whilst 67% of children attend a provider with a grade of very good or excellent for care and support, 44% attend a provider with a comparable grade for staffing. The highest Education Scotland evaluations were in relation to children’s

¹² Many LAs use a certain level of grading as criteria for partnership.

experiences and the lowest were associated with improvement through self-evaluation. 51% of children attended provision which was evaluated as very good or excellent for children's experiences, compared with 32% whose provider had a similar evaluation for improvement through self-evaluation.

Table 2.10 Percentage of children attending a pre-school setting during 2007 to 2010 with specific quality ratings

		% of children attending settings with a grade/evaluation of...						Bases
		1/ Unsatisfactory	2/ Weak	3/ Satisfactory or Average	4/ Good	5/ Very good	6/ Excellent	
Care Inspectorate quality theme								
Care and support	%	<1	1	4	28	58	9	3013
Environment	%	<1	1	7	36	52	4	2904
Staffing	%	<1	2	7	46	41	3	2997
Management and leadership	%	<1	1	9	38	48	4	2887
Education Scotland quality indicator								
Improvement in performance	%	<1	3	11	42	37	6	1086
Children's experiences	%	<1	1	8	40	41	10	1086
Meeting learning needs	%	<1	3	15	40	31	10	1086
The curriculum	%	<1	1	13	46	34	5	1086
Improvement through self-evaluation	%	<1	11	21	35	26	6	1085

Pre-school settings with higher grades or evaluations in one theme or QI tend to also score high on the other themes or QIs. The figures in Table 2.11 and Table 2.12 demonstrate the strength of the relationship between grades in each theme or evaluations in each QI using correlation analysis. The closer the figure is to one, the stronger the relationship between the two grades or evaluations.

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Table 2.11 Correlations between grades on Care Inspectorate quality themes*

	Care and support	Environment	Staffing	Management and leadership
Care and support	–	.700	.556	.660
<i>Bases</i>	3013	2903	2996	2887
Environment	.700	–	.568	.669
<i>Bases</i>	2903	2904	2887	2884
Staffing	.556	.568	–	.709
<i>Bases</i>	2996	2887	2997	2881
Management and leadership	.660	.669	.709	–
<i>Bases</i>	2887	2884	2881	2887

*All correlations were significant at the $p < 0.01$ level

All of the grades and evaluations are statistically significantly associated with each other and the relationships are reasonably strong. Stronger relationships are seen between Education Scotland evaluations than Care Inspectorate grades suggesting, perhaps, greater links between the different areas inspected than is the case for the Care Inspectorate. The strongest associations are seen between improvement in performance, children's experiences and meeting learning needs (See Table 2.12, each inter-relationship showing a correlation of between .808 and .816). This indicates that centres evaluated highly on improvement in performance were also likely to be evaluated highly on children's experiences and meeting learning needs and may reflect that the expectations for these QIs has remained constant since their introduction in 2007. For Care Inspectorate grades (Table 2.11), the strongest relationship is between staffing and management and leadership grades (.709). A similarly close relationship is also evident between care and support and environment (.700).

Table 2.12 Correlations between evaluations on Education Scotland QIs*

	Improvement in performance	Children's experiences	Meeting learning needs	The curriculum	Self-evaluation
Improvement in performance	–	.816	.808	.716	.689
<i>Bases</i>	1086	1086	1086	1086	1086
Children's experiences	.816	–	.809	.620	.556
<i>Bases</i>	1086	1086	1086	1086	1086
Meeting learning needs	.808	.809	–	.650	.653
<i>Bases</i>	1086	1086	1086	1086	1086
The curriculum	.716	.620	.650	–	.708
<i>Bases</i>	1086	1086	1086	1086	1086
Improvement through self-evaluation	.689	.556	.653	.708	–
<i>Bases</i>	1085	1085	1085	1085	1085

*All correlations were significant at the $p < 0.01$ level

Whilst grades across the themes and evaluations on the QIs are closely related, having a high grade or evaluation in one theme or QI does not always mean that the setting has been assessed similarly high in other areas. Using the Care Inspectorate data, 32% of children attended a pre-school setting which was graded either five or six in each of the four themes. The proportion doing the same using the Education Scotland data was lower with 20% of children attending a setting evaluated as either five or six in each of the five QIs. For both sets of data, such settings may be considered to be providing the highest quality of pre-school care or education. The remaining children attended a provider who was allocated a greater range of grades over the four themes or five QIs, some of which may have been five or six. Using both Care Inspectorate or Education Scotland grades, only 4% of children attended a setting which was graded or evaluated less than four (i.e. average/satisfactory or less) in all themes or QIs.

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The quality of provision children experienced varied to some extent based on the type of provider they were attending and where they lived. The data in Table 2.13 indicate that children attending LA provision were those most likely to experience higher quality care or education. For Care Inspectorate grades, this was in relation to primary school nursery classes. 37% of children who attended this type of setting had a provider graded five or six in each quality theme compared with 16% of children attending a private provider. For Education Scotland QIs, consistently higher evaluations were most likely for other LA providers.

Table 2.13 Average Care Inspectorate and Education Scotland grading and proportion of children attending a provider with all grades or evaluations equalling 5 or 6, by provider type

	Provider type				All providers
	LA – primary school nursery class	LA – other	Private providers	Voluntary providers	
Care Inspectorate quality theme – average grade (SE)*					
Care and support	4.8 (0.02)	4.8 (0.05)	4.4 (0.05)	4.6 (0.08)	4.7 (0.03)
Environment	4.7 (0.03)	4.6 (0.05)	4.2 (0.05)	4.4 (0.08)	4.5 (0.02)
Staffing	4.5 (0.03)	4.5 (0.05)	4.1 (0.05)	4.4 (0.09)	4.4 (0.03)
Management and leadership	4.6 (0.03)	4.5 (0.05)	4.1 (0.05)	4.3 (0.09)	4.5 (0.03)
% attending provider with high grades	37	33	16	29	32
<i>Bases</i>	1643	560	428	212	2878
Education Scotland quality indicator – average evaluation (SE)					
Improvement in performance	4.3 (0.07)	4.5 (0.13)	4.0 (0.08)	4.3 (0.11)	4.3 (0.06)
Children’s experiences	4.5 (0.07)	4.7 (0.12)	4.1 (0.07)	4.6 (0.12)	4.5 (0.06)
Meeting learning needs	4.3 (0.07)	4.6 (0.16)	3.9 (0.08)	4.2 (0.14)	4.3 (0.07)
The curriculum	4.2 (0.07)	4.6 (0.10)	4.0 (0.07)	4.2 (0.10)	4.3 (0.06)
Improvement through self-evaluation	4.0 (0.09)	4.2 (0.14)	3.4 (0.11)	3.7 (0.17)	3.9 (0.07)
% attending provider with high grades	16	41	3	23	20
<i>Bases</i>	573	260	178	73	1085

SE = standard error of the mean

There were no statistically significant differences in the Education Scotland or Care Inspectorate average or 'mean' quality grades of settings attended according to differences in children's household income, parental education and area deprivation levels.¹³ However, some statistically significant differences were observed by area urban-rural characteristics (Table 2.14). As indicated in the table, mean quality grades for each theme/indicator did not vary by urban-rural characteristics. However, looking at the Care Inspectorate data shows that children living in remote areas were less likely than those living in other areas to attend a provider with **consistently** high grades in each theme. 20% of children living in remote areas attended a provider with high grades on all themes compared with 37% in accessible rural areas. The best quality of care was most likely to be experienced by children living in other urban and accessible rural areas. In contrast, the Education Scotland data suggests that children living in accessible rural areas were least likely to attend a provider with high evaluations on each QI. Just 7% did so compared with 25% of children living in large urban areas.

13 Given that LA managed provision tends to be reported as higher quality and an earlier finding indicated that children from more disadvantaged backgrounds were more likely to attend LA provision, this finding may seem unusual. We may have expected more disadvantaged children to be more likely to experience higher quality. However, it appears that there are enough children in advantaged circumstances also attending higher quality settings (but across a wider range of provider types) to ensure that quality of provision accessed is similar for children in all social groups.

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Table 2.14 Average grading and proportion of children attending a provider with all grades or evaluations equalling five or six, by provider type and area urban-rural characteristics*

	Area urban-rural characteristic				
	Large urban	Other urban	Small, accessible towns	Small, remote towns and remote rural	Accessible rural
Care Inspectorate quality theme – mean grade (SE)					
Care and support	4.7 (0.05)	4.7 (0.04)	4.8 (0.07)	4.6 (0.09)	4.8 (0.04)
Environment	4.5 (0.04)	4.6 (0.04)	4.5 (0.04)	4.5 (0.07)	4.7 (0.05)
Staffing	4.3 (0.04)	4.5 (0.05)	4.4 (0.09)	4.3 (0.07)	4.4 (0.05)
Management and leadership	4.5 (0.04)	4.5 (0.04)	4.5 (0.06)	4.3 (0.07)	4.5 (0.04)
% attending provider with high grades	28	39	28	20	37
<i>Bases</i>	986	1010	281	304	432
Education Scotland quality indicator – mean evaluation (SE)					
Improvement in performance	4.3 (0.12)	4.3 (0.08)	4.3 (0.10)	4.3 (0.13)	4.2 (0.09)
Children’s experiences	4.5 (0.10)	4.5 (0.09)	4.4 (0.16)	4.4 (0.10)	4.4 (0.09)
Meeting learning needs	4.3 (0.13)	4.3 (0.09)	4.2 (0.17)	4.2 (0.13)	4.1 (0.09)
The curriculum	4.4 (0.11)	4.2 (0.07)	4.3 (0.08)	4.3 (0.11)	4.1 (0.09)
Improvement through self-evaluation	4.0 (0.14)	4.0 (0.11)	3.7 (0.16)	3.7 (0.23)	3.7 (0.12)
% attending provider with high grades	25	21	22	12	7
<i>Bases</i>	356	367	151	87	125

*Due to small base sizes in the Education Scotland QI data for small, remote towns and remote rural areas, these categories were combined for this analysis

Only differences in Care Inspectorate staffing mean grades by urban-rural classification were statistically significant ($p < 0.05$). Difference in % with high grades or evaluations were significant at $p < .05$

CHILDREN'S COGNITIVE AND SOCIAL DEVELOPMENT AT AGES THREE AND FIVE

3.1 Introduction

This chapter focuses on the status of children's cognitive and social development at age three, explores how this has changed by age five and examines variation amongst children with different social background characteristics and who attend pre-school providers with different characteristics. GUS data on children's cognitive and social development at ages three and five have previously been analysed and the results published in several reports (Bradshaw, 2011; Bradshaw & Tipping, 2010; Bromley, 2009). These analyses include an examination of the circumstances and experiences which contribute to change in the cognitive ability of children in lower (and higher) socio-economic groups in the pre-school period. This chapter will therefore provide a summary of these data, indicating broad average levels of cognitive ability and social difficulties, describing how these levels change during the pre-school period and highlighting variations according to key demographic and socioeconomic characteristics including: annual equivalised household income, socio-economic status¹⁴ and parental educational qualifications.¹⁵

3.2 Methods

Cognitive ability was measured using two assessments: the naming vocabulary and picture similarities subtests of the British Ability Scales Second Edition (BASII). These two assessments measure language development and problem-solving skills respectively. Each subtest is part of a cognitive assessment battery designed for children aged between two years and six months and 17 years and 11 months. The assessments are individually administered.

Different sets of items are asked to children at different ages. To remedy the problem of comparability of test scores across different sets of items, raw scores are converted into ability scores. Ability scores are a transformation of the raw scores, taking into account the specific set of items which the cohort members were presented with. Children in the birth cohort have been asked to complete the same assessments at two different sweeps of data collection: sweep three, when they were almost three years old (34 months) and sweep five, when they were almost five years old (58 months).

¹⁴ Measured using the National Statistics Socio-Economic Classification (NS-SEC) and taken at household level; the highest classification amongst all parents in the household.

¹⁵ Measured as the highest educational qualification achieved by any of the child's parents who are resident in the household.

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Social, emotional and behavioural development was assessed using the Strengths and Difficulties Questionnaire (Goodman, 1997). The Strengths and Difficulties Questionnaire (SDQ) is a brief behavioural screening questionnaire designed for use with three to 16 year-olds. The scale includes 25 questions which are used to measure five aspects of child development: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and pro-social behaviour. A score is calculated for each of these domains, as well as an overall 'difficulties' score which is generated by summing the scores from all the scales except pro-social. For all scales, except pro-social where the reverse is true, a higher score indicates greater evidence of difficulties. Data were obtained via parental report, normally the mother, in the computer assisted self-completion module of the interview.

3.3 Summary of key findings

- As may be expected, cognitive ability scores at age five tend to be higher across the board than scores at age three.
- Children in more advantaged circumstances – whether measured by household income, parental level of education or socio-economic classification – on average had higher ability at both age points than children in more disadvantaged circumstances.
- Between ages four and six children tended to show a developmental decrease in problems as reported on the total difficulties scale, conduct and peer problems scales and an increase in emotional problems and pro-social behaviour scores. Mean hyperactivity scores increased between ages four and five then decreased by age six. Scores on the total difficulties scale also decreased slightly as children got older.
- At age four, children who attended local authority (LA) primary school nursery classes had higher average scores on the hyperactivity and total difficulty scales of the SDQ, suggesting a higher level of difficulties than those who attended private nurseries.
- Average vocabulary scores at age three were significantly lower for children attending LA settings than for those attending private providers.
- Both of these differences are largely explained by a greater proportion of children who use private providers being from more advantaged circumstances where difficulty levels are known to be lower and cognitive ability levels higher.
- Around the time children **start** their pre-school entitlement there were no statistically significant differences in average social or cognitive development scores according to the quality of pre-school care. In other words, children who attend pre-school establishments with high and mixed quality ratings are not significantly different, in terms of their social and cognitive development, at the beginning of their statutory pre-school entitlement.

3.4 Cognitive ability

Table 3.1 shows mean cognitive ability scores as assessed by the problem-solving and naming vocabulary sub-scales of the BASII.

Table 3.1 Cognitive development at age three and five

	Mean ability scores			
	Problem-solving		Vocabulary	
	Age 3	Age 5	Age 3	Age 5
Mean ability score (SE)	53.7 (0.3)	82.7 (0.3)	71.4 (0.2)	109.0 (0.3)
<i>Bases – cases which also have age 4 data</i>	3685	3631	3668	3633

Results on both the problem-solving and ability scales show a developmentally appropriate increase for children during the pre-school period and up to the age of primary school entry. As may be expected, ability scores at age five tend to be higher across the board than scores at age three.

Considerable analyses has already been undertaken with this cohort, of how these scores vary – at age three and age five – according to children's background characteristics (Bradshaw, 2011; Bromley, 2009). These analyses showed that children in more advantaged circumstances – whether measured by household income, parental level of education or socio-economic classification – on average had higher ability at both age points than children in more disadvantaged circumstances. For example, at age three, children living in households with an annual income in the top quintile score on average 0.25 standard deviations above the mean whereas children living in households with an annual income in the bottom quintile score 0.43 standard deviations below the mean. The gap in vocabulary ability between those children in the lower and upper education groups widened between ages three and five whereas the difference in vocabulary ability between children in the lowest and highest income groups reduced slightly and the difference by social class did not change. The gap in problem-solving ability by parental education and social class narrowed whilst differences in problem-solving ability by income level widened.

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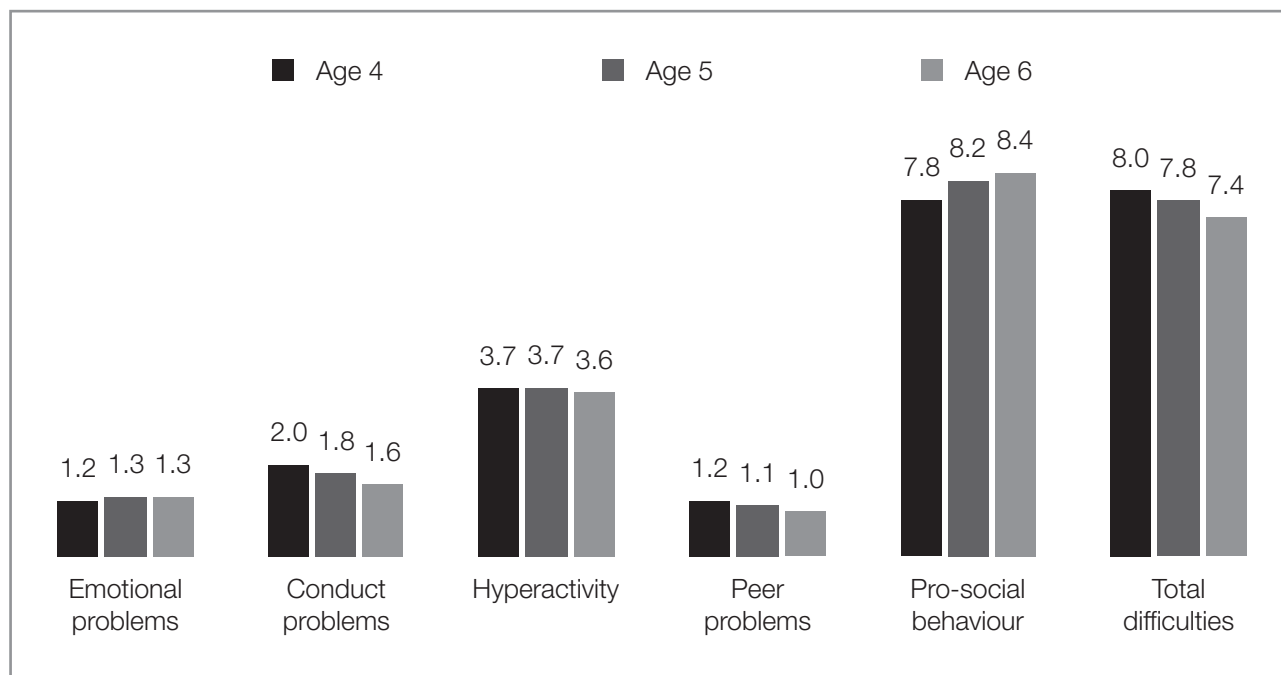
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3.5 Social, emotional and behavioural development

Scoring information for the SDQ provides a useful, although acknowledgedly rough and ready, method through which individual scores on each of the scales can be classified as normal, moderate or severe. The parameters for each classification are slightly different on each of the scales and are detailed in the technical appendix.

Figure 3.1 shows the mean scores (and standard deviations) for each of the SDQ subscales at ages four, five and six years for all children. Across the subscales, children tended to show a developmental decrease in problems as reported on the conduct and peer problems scales and an increase in emotional problems and pro-social behaviour scores. Mean hyperactivity scores increased between ages four and five then decreased by age six. Scores on the total difficulties scale also decreased slightly as children got older.

Figure 3.1 Average social, emotional and behaviour scores; ages four, five and six



Bases – cases which also have age 4 data: age 4 = 3941, age 5 = 3695; age 6 = 3509

Detailed analyses of changes in social, emotional and behavioural development using SDQ scores has previously been undertaken using the GUS child cohort (Bradshaw and Tipping, 2009). Replicating those analyses with the birth cohort showed very similar results. The vast majority of children do not present with any social, emotional or behavioural difficulties, as measured on the SDQ, at ages four, five and six. On all of the scales except conduct problems, over 80% of children scored within the normal range. For conduct problems, greater than 70% of all children scored within the normal range.

Conduct problems were most prevalent among children of each age group and emotional symptoms least prevalent, in line with psychiatric literature which shows that emotional problems tend to emerge later in development, around the time of puberty. The proportion of children classed as having conduct and peer problems within the moderate to severe range decreased between the ages of four and six. The proportion of children with scores outside of the normal range for prosocial behaviour decreased over time whereas hyperactivity problems and total difficulty scores remained relatively stable and emotional symptoms showed an increasing pattern.

For each of the three social background variables, socio-economic classification, household income and parent education and across each age group, the proportion of children scoring within the borderline and severe range increased according to increasing levels of disadvantage.

3.6 Pre-school characteristics and children's social and cognitive development scores

Further analyses were undertaken to test whether the average child development 'baseline' scores for social development (assessed at age four) and cognitive development (assessed at age three) vary according to the characteristics of the pre-school setting children attended. More specifically, differences were explored in relation to children who attended:

- different provider types
- providers with different quality ratings

These results give an indication of how level the playing the field is (in addition to the previous analyses on variation in social and cognitive scores according to social background) on entry to pre-school.

3.6.1 Differences by pre-school type

Table 3.2 shows the mean SDQ subscale scores at age four for children who attended different pre-school provider types. Small but statistically significant differences were found between children who attended LA nurseries (either attached to primary schools or other LA settings) and private providers on emotional problems, hyperactivity, peer problems and total difficulty scores. Children who attended LA primary school nursery classes had higher average scores, suggesting a higher level of difficulties, than those who attended private nurseries. There were no significant differences for any of the other social development scales.

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Table 3.2 Children's social, emotional and behaviour scores by provider type; age four

Provider type	Mean (SE) scores			
	LA – primary school nursery class	LA – other	Partner provider – private	Partner provider – voluntary
Emotional problems*	1.2 (0.04)	1.3 (0.06)	1.0 (0.06)	1.1 (0.08)
Conduct problems	2.0 (0.04)	2.0 (0.06)	1.8 (0.06)	1.8 (0.08)
Hyperactivity*	3.7 (0.05)	3.8 (0.11)	3.5 (0.10)	3.3 (0.13)
Peer problems**	1.2 (0.04)	1.3 (0.06)	0.9 (0.06)	1.1 (0.08)
Pro-social behaviour	7.8 (0.04)	7.8 (0.08)	8.0 (0.07)	7.9 (0.10)
Total difficulties**	8.1 (0.12)	8.3 (0.22)	7.3 (0.20)	7.2 (0.23)
<i>Bases</i>	1967	673	472	259

* $p < .05$, ** $p < .01$

Table 3.3 shows the mean cognitive ability scores – problem-solving and vocabulary – for children attending each type of provider. On both measures, average scores were statistically significantly lower for children attending LA settings than for those attending partner providers.

The lower average levels of social and behavioural difficulties and higher average cognitive ability for children attending private providers compared with those attending LA settings is largely explained by differences in the social backgrounds of these children. Information provided in section 2.4 showed that private settings are significantly more likely to be attended by children from higher income households; these children are also more likely to have parents with higher levels of educational qualifications. We know from prior GUS analysis discussed in the previous section, that children from higher income households and with more educated parents tend to have higher cognitive ability and lower social and behavioural difficulties.

Table 3.3 Children's mean cognitive development z-scores at age three by provider type

Provider type	Mean (SE) scores			
	LA – primary school nursery class	LA – other	Partner provider – private	Partner provider – voluntary
Problem-solving*	53.6 (0.50)	52.9 (0.78)	55.6 (0.77)	56.0 (1.05)
Vocabulary*	71.5 (0.68)	70.1 (0.73)	74.2 (1.07)	72.5 (1.43)
<i>Base</i>	1817	619	435	242

* $p < .05$

3.6.2 Differences by pre-school quality

Table 3.4 shows children's social development scores according to the grades their pre-school setting received across the Care Inspectorate quality themes. As noted earlier, 'high' quality settings were those who received a grade of very good or excellent in each theme whilst 'mixed' quality settings achieved a mix of scores across the four themes, some of which may have been very good or excellent.

Around the time children **started** their pre-school entitlement there were no statistically significant differences in average social or cognitive development scores according to the quality of pre-school care. In other words, children who attend pre-school establishments with high and mixed quality ratings were not significantly different, in terms of their social and cognitive development, at the beginning of their statutory pre-school entitlement. Equivalent analysis was undertaken using the Education Scotland quality indicators (QIs) with similar results.

Table 3.4 Mean social, emotional and behaviour scores at age four by grades on Care Inspectorate quality themes

SDQ subscale	Mean (SE) scores			
	High quality rating across all measures		Mixed quality rating across all measures	
Emotional problems	1.2	(0.06)	1.2	(0.04)
Conduct problems	2.0	(0.05)	2.0	(0.03)
Hyperactivity	3.7	(0.07)	3.7	(0.05)
Peer problems	1.1	(0.05)	1.2	(0.03)
Pro-social behaviour	7.9	(0.06)	7.8	(0.04)
Total difficulties	8.0	(0.16)	8.0	(0.12)
<i>Base</i>	894		1900	

Table 3.5 shows children's mean cognitive development scores at age three again according to the grades their pre-school setting received across the Care Inspectorate quality themes. Although mean problem-solving and vocabulary scores were higher in the higher quality providers, these differences were not statistically significant. The same pattern was observed using Education Scotland QIs.

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Table 3.5 Mean cognitive development scores at age three by grades on Care Inspectorate quality themes

Ability	Mean (SE) scores			
	High quality rating across all measures		Mixed quality rating across all measures	
Problem-solving	54.4	(0.53)	53.4	(0.49)
Vocabulary	72.2	(0.75)	71.5	(0.58)
<i>Base</i>	820		1740	

3.6.3 Differences by number of hours, size of the setting and previous nursery use

Variations in children’s developmental status were also considered according to differences in the number of hours they attended pre-school per week, the size of the pre-school setting and whether or not the child had attended nursery or playgroup prior to starting pre-school.

Table 3.6 shows children’s total difficulty scores according to the number of hours they attended pre-school per week. There were no significant differences in mean total difficulty scores according to the weekly duration of pre-school. Neither were any statistically significant differences found in the subscale scores.

Table 3.6 Children’s social, emotional and behaviour scores by weekly duration of pre-school; age four

SDQ scale	Weekly duration				
	Less than 10 hours	More than 10 but less than 12.5	12.5 hours	More than 12.5 but less than 16	16 hours or more
Mean total difficulties score (SE)	7.7 (0.24)	8.1 (0.18)	8.1 (0.15)	8.0 (0.22)	7.6 (0.17)
<i>Bases</i>	268	880	1361	497	634

Mean cognitive development scores at age three for children with different weekly hours of pre-school are shown in Table 3.7. There were small but statistically significant differences in both scores. Children who attended for less than 10 hours and those who attended for 16 hours or more tended to have higher scores on both tests at than those who attended for between 10 and 15 hours.

Table 3.7 Children's cognitive development scores by weekly duration of pre-school; age three

Cognitive development score	Weekly duration				
	Less than 10 hours	More than 10 but less than 12.5	12.5 hours	More than 12.5 but less than 16	16 hours or more
Mean problem-solving ability score (SE)**	55.8 (0.81)	53.2 (0.79)	52.8 (0.65)	53.7 (0.78)	56.0 (0.65)
Mean vocabulary ability score (SE)*	74.6 (1.17)	71.0 (0.90)	71.0 (0.75)	70.9 (0.86)	73.0 (0.86)
<i>Bases</i>	254	814	1258	455	579

* $p < .05$, ** $p < .01$

Some small but statistically significant differences were observed in terms of children's social or cognitive development scores according to whether or not they had attended a nursery or playgroup childcare setting between birth and starting their pre-school entitlement. In relation to scores on the peer problems scale; children who had previously attended nursery or playgroup had a lower average score at age four than children who had not (1.1 compared with 1.3), meaning that they were less likely to be experiencing peer problems. In addition, those children who had previously attended nursery or playgroup had higher cognitive ability scores than those who had not (Table 3.8). Note that, at this stage, this analysis does not control for differences in the social background characteristics of children who did and did not experience nursery or playgroup prior to attending pre-school provision. Previous GUS research (Bradshaw and Wasoff, 2009) has shown significant differences in the characteristics of children more likely to experience these types of non-parental care in early life – they are more likely to come from more advantaged backgrounds. This may therefore explain the higher average cognitive scores and lower social difficulties amongst these children. Indeed, analysis undertaken in the next chapter, which controls for differences in the children's social background, does not find an independent relationship between previous nursery use and child outcomes. This suggests that the relationship between previous nursery use and child outcomes is explained by the more advantaged characteristics of children more likely to have attended nursery or playgroup before starting their pre-school entitlement.

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Table 3.8 Mean cognitive development scores at age three by whether attended nursery or playgroup prior to starting pre-school entitlement

Ability	Mean (SE) scores	
	Not previously attended nursery or playgroup	Had previously attended nursery or playgroup
Problem-solving***	52.2 (0.48)	55.2 (0.43)
Vocabulary***	69.6 (0.69)	73.2 (0.49)
Base	1779	1842

$p < .001$

The size of the pre-school establishment children attended was not associated in any way with their baseline social development or problem-solving scores. However, in the simple bivariate analysis, one statistically significant difference was noted in relation to vocabulary in that children attending the smallest settings (up to 20 registered users) had a slightly higher average score than those attending all other settings (0.8 compared with 0.7). Again, whilst the difference is statistically significant, it is very small. Furthermore, analysis undertaken in the next chapter which controls for differences in the social characteristics of children attending smaller and larger settings does not find any independent relationship between size of setting and social or cognitive development.

CHARACTERISTICS OF PRE-SCHOOL PROVISION AND CHILDREN'S COGNITIVE AND SOCIAL DEVELOPMENT

This aim of this chapter is to investigate the relationship between characteristics of the pre-school provision children attend and the change in their cognitive and social development. In this chapter we examine whether there are particular aspects of pre-school provision which appear to be more beneficial for positive cognitive and social development. We explore whether children with certain background characteristics benefit more from pre-school provision generally, or from pre-school provision with certain qualities.

Specifically, we examine whether there are statistically significant associations between characteristics of the child's experience of pre-school provision assessed at age four and change in their:

- Problem-solving scores between ages three and five assessed using the British ability scales (described in more detail in chapter 2).
- Vocabulary ability between ages three and five assessed using the British ability scales.
- Social development scores between ages four and five assessed using the strength and difficulties questionnaire (also described in greater detail in chapter 2).

The characteristics of pre-school experience assessed include the type of provision, the size of the pre-school setting, the weekly duration received and the quality of care and education as measured by the Education Scotland and Care Inspectorate quality indicators (QIs). Associations with children's previous experience of nursery and playgroup care were also explored.

Multivariate regression analysis was used to determine which pre-school characteristics were independently associated with changes in children's developmental outcomes when holding other, potentially confounding, characteristics constant (see Table 4.1). These potential confounders were: children's developmental outcome scores at age three, social background characteristics (annual equivalised household income, parental level of education and socio-economic classification) and all other pre-school characteristics. This allowed us to test whether there were distinct effects of pre-school type and quality on later cognitive and social development outcomes irrespective of children's initial ability, their social background and other characteristics of the pre-school environment. The stages of the regression model are explained in Table 4.1. Separate regression models were run for each pre-school quality indicator and each pre-school type (compared to LA primary school nursery classes).

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Table 4.1 Summary of variables and steps in regression analysis

Dependent/outcome variable: vocabulary score, problem-solving score or social development score at age five			
Explanatory variables			
Step 1	Step 2	Step 3**	Final model
Pre-school quality score*, type of pre-school or other pre-school characteristic	Pre-school quality or type of pre-school	Pre-school quality or type of pre-school	Pre-school quality or type of pre-school
	Vocabulary, problem-solving score at age three or social development score at age four	Vocabulary, problem-solving score at age three or social development score at age four	Vocabulary, problem-solving score at age three or social development score at age four
		Social background and demographic variables: household income, parental education, socio-economic status, gender and ethnicity	Social background and demographic variables: household income, parental education, socio-economic status, gender and ethnicity
			Pre-school type/quality/other characteristic (depending on which variable entered in Step 1)*

*A separate model was run for each pre-school quality indicator. For pre-school type, local authority (LA) nurseries were the reference category and other LA providers and private providers were compared to this in separate regression models.

**Steps 3 and 4 of the analysis were only run when the association between the explanatory variable of interest (e.g. type of pre-school provider) and the outcome variable (e.g. vocabulary ability score) were statistically significant in the prior step.

Regression analysis allows the association between an explanatory variable (such as pre-school type) and an outcome variable (such as behavioural difficulties) to be explored whilst controlling for other variables which may affect behavioural difficulties (such as gender). All factors were analysed together using a single multiple linear regression model. The same model was run separately for each developmental outcome measure. Thus the analysis identifies which characteristics are statistically significantly related to (or 'associated with') a child's outcome score. We first present results for the effect of pre-school type on children's problem-solving, vocabulary and social development. These analyses were run whilst controlling for children's initial scores on each developmental indicator. We next present the same analyses for the effects of pre-school quality on children's development, again whilst controlling for their initial ability. We also summarise results for the association of weekly duration of pre-school attendance, size of the pre-school establishment and whether or not the child attended nursery or playgroup before starting their pre-school entitlement. The subsequent section examines the effects on these models after controlling for key differences in social background which have been shown to be related to children's development: parent education, household income and socio-economic status.

The results are presented as beta statistics (b) with accompanying p values, indicating the level of statistical significance. The beta statistic ranges from -1 to 1 and provides an indication of the strength and 'direction' of an association between variables. A beta value above zero indicates a positive relationship between the two variables being examined in that as the level of one variable (e.g. the quality rating of the pre-school) increases, the level of the other variable (e.g. vocabulary ability) increases proportionally. A negative beta value indicates an 'inverse' relationship in that as the level of one variable increases, the level of the other decreases. The p values range from 0 to 1 and indicate whether an association is of a sufficient magnitude to warrant 'statistical significance.' A p value that is less than .05 indicates that the presence of an association between two variables (the magnitude of which is indicated by the strength of the beta value) is not likely to be due to 'chance' and is likely to represent a 'true' effect.

Only summary results are presented here. Full model output with accompanying bases is provided in the technical appendix.

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4.1 Summary of key findings

- After controlling for differences in children's background characteristics, there were no significant effects of the **type** of pre-school establishment children attended on change in their vocabulary scores.
- In terms of pre-school quality, the provider's care and support grade **was** significantly associated with children's vocabulary scores at age five, after controlling for ability at age three and differences in social background and demographic characteristics. This means that children who attended providers with a higher care and support grade were more likely to show higher vocabulary skills by age five, irrespective of their skills at age three and their social characteristics.
- No other QIs nor any other pre-school or early childcare characteristics considered – weekly duration of pre-school, the size of the pre-school setting and having attended a nursery or playgroup setting **prior** to starting pre-school entitlement – were independently associated with vocabulary scores.
- Neither the type of pre-school attended, the quality measures nor any of the other pre-school or early childcare characteristics considered were independently associated with change in children's problem-solving scores.
- Pre-school type, measures of quality, size of setting, weekly duration and attendance at a nursery or playgroup prior to starting pre-school entitlement were not significantly associated with change in children's social development between ages three and five.

4.2 The effects of pre-school type on children's cognitive and social developmental outcomes

4.2.1 Pre-school type and children's cognitive development

As seen in the simple bivariate associations in the previous chapter, pre-school type was significantly associated with children's problem-solving ability. Specifically, children who attended a partner provider were more likely than those who attended a LA primary school nursery class to show greater problem-solving ability at age five. Further analysis reveals that this effect remained significant after children's initial problem-solving scores at age three were added to the model (private: $b=.06$, $p<.05$; voluntary $b=.05$, $p<.05$; see Table 4.2). This might imply that whether children attend a LA nursery or a partnership nursery affects their later problem-solving scores irrespective of their initial ability level.

However, the significant positive effect of partner providers versus LA nurseries on children's problem-solving ability did not remain after controlling for social background factors. This suggests that it is the particular characteristics of children who attend these settings – more likely to be from more advantaged backgrounds than those who attend primary school nursery classes – which are driving the association. There is no evidence from this current analysis of an independent association between attending a private nursery and a change in problem-solving ability.

This finding is in contrast to that found in earlier, similar analysis undertaken on GUS data (Bradshaw, 2011). In that analysis, the positive association between attending a private pre-school setting and problem-solving ability at age five remained after controlling for social background and a range of other factors. However, the variables and models used are not identical. The earlier analysis used a parent report measure of provider type rather than the likely more accurate measure provided by the Care Inspectorate data used here. The combination of background explanatory variables is also different.

The type of pre-school children were attending had no predictive effect on their vocabulary ability assessed at age five.

4.2.2 Pre-school type and children's social development

The bivariate associations in the previous chapter revealed that there was a significant effect of private provision versus LA primary school provision on children's total difficulty scores at age five ($b=-.05$, $p<.05$). This indicates that, compared with children who attended LA primary school nursery classes, those attending private providers were less likely to have social, emotional and behavioural difficulties. However this effect did not remain after controlling for baseline total difficulty scores ($b=-.01$, $p=0.7$; see Table 4.2). This reflects findings shown earlier that, on average, children attending LA primary school nursery classes have higher difficulty levels than those attending private providers. The type of pre-school that children attend has no independent effect on their social development.

Since the total difficulties scale of the SDQ examines a composite of quite different measures, effects of pre-school type were also tested separately for the peer and conduct problems scales of the SDQ. These scales were selected because peer and conduct problems are likely to emerge earlier in development than emotional problems and inclusion of the emotional problems scale could therefore have been dampening effects of pre-school characteristics. However, no significant effects were detected between pre-school type and either peer or conduct problems.

4.3 The effects of pre-school quality on children's cognitive and social developmental outcomes

4.3.1 Pre-school quality and children's cognitive development

None of the Education Scotland or Care Inspectorate pre-school quality measures were significantly associated with children's problem-solving scores at age five (Table 4.2). However, there was a significant positive association between Care Inspectorate care and support grade and children's vocabulary ability scores at age five ($b=.05$, $p<.05$). This indicates that children who attended pre-school settings assessed as providing higher quality care in relation to the care and support theme showed greater improvements in their vocabulary ability than children who attended settings with poorer care and support grades. This effect remained significant after adjusting for baseline vocabulary scores ($b=.05$, $p<.05$; Table 4.2) suggesting that children who made more progress in vocabulary ability may have done so partly because of attending a high quality care and support pre-school environment.

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The effect of pre-school care and support grade on children's vocabulary ability scores also remained significant after controlling for social background factors ($b=.05$, $p<.05$).

There was also a significant positive effect of average staffing grade on children's vocabulary ability. However this did not remain after controlling for baseline vocabulary score ($b=.02$, $p=.15$; Table 4.2). This suggests that the care and support measure is more closely related to children's vocabulary scores than the other measures of pre-school quality assessed.

4.3.2 *Pre-school quality and children's social development*

In the bivariate analysis, a number of associations were found between the quality measures and the SDQ scores. Amongst the Education Scotland QI evaluations, meeting learning needs and the curriculum were each 'borderline' significant – that is the significance values of the bivariate association with the total difficulties score was only a little over the 0.05 level. For the curriculum evaluation, this borderline association remained after age four scores were added (Table 4.2). Improvement in performance evaluation was associated with total difficulties at age five, but the effect was not statistically significant after age four difficulty scores were added ($b=-.24$, $p=.07$).

Amongst Care Inspectorate grades only care and support was statistically significantly associated with children's total difficulty scores at age five. This effect remained after controlling for difficulties at age four ($b=-.02$, $p<.05$; Table 4.2) indicating that children who attended settings with higher care and support grades were more likely to see a decrease in their total difficulties score by age five. However, the effect did not remain after social background characteristics were added, suggesting that the relationship had more to do with variations in social development amongst children from different social backgrounds who attended settings with different care and support grades.

Effects of pre-school quality were also tested separately for the peer and conduct problems scales of the SDQ. As noted earlier, these scales were selected because peer and conduct problems are likely to emerge earlier in development than emotional problems and inclusion of the emotional problems scale could therefore have been dampening effects of pre-school characteristics. There were no significant effects detected for peer problems but similar results were found for conduct problems as for total difficulties. Children who attended settings with higher grades on the Care Inspectorate care and support theme were more likely to see a decrease in their conduct difficulties by age five. Again, however, the effect did not remain after social background characteristics were added to the model.

No statistically significant associations were found between any of the evaluations on the Education Scotland QIs and peer or conduct problems.

Table 4.2 Associations between pre-school characteristics and children's developmental outcomes at age five (controlling for cognitive ability at age three/ total difficulties at age four)

	Cognitive		Social
	Problem-solving	Vocabulary	Total difficulties
Pre-school type (reference group: LA primary school nursery class)			
LA other	b=.03, p=.17	b=-.01, p=.57	b=.02, p=.25
Private	b=.06, p<.05	b=-.01, p=.75	b=-.01, p=.70
Voluntary/community	b=.05, p<.05	b=.01, p=.50	b=-.02, p=.28
Care Inspectorate quality theme grade			
Care and support	b=-.02, p=.31	b=.05, p<.05	b=-.02, p<.05
Environment	b=-.02, p=.30	b=.02, p=.19	b=-.01, p=.65
Staffing	b=.01, p=.46	b=.02, p=.15	b=-.01, p=.69
Management and leadership	b=.02, p=.30	b=.03, p=.11	b=-.01, p=.58
Inspection grade mix	b=.01, p=.55	b=.01, p=.55	b=-.06, p=.80
Education Scotland quality indicator grade			
Improvement in performance	b=-.03, p=.58	b=.02, p=.67	b=-.24, p=.07
Children's experiences	b<-.01, p=.99	b=.01, p=.87	b=-.16, p=.26
Meeting learning needs	b=-.02, p=.68	b<.01, p=.94	b=-.19, p=.12
The curriculum	b=-.08, p=.18	b=.03, p=.47	b=-.25, p=.06
Improvement through self-evaluation	b=-.05, p=.09	b=.01, p=.81	b=-.16, p=.12

4.4 The effects of other pre-school characteristics on children's cognitive and social developmental outcomes

Neither weekly duration of pre-school nor the size of the pre-school setting was significantly associated with children's social or cognitive development at age five (Table 4.3). In previous GUS analysis (Bradshaw and Wasoff, 2009), associations were found between weekly duration of non-parental care and vocabulary ability at age three. The two types of analyses are too distinct to draw comparison and it is not surprising that there is a difference in the effect of non-parental care – which covered the full range and mix of formal and informal childcare – at 10 months on an earlier developmental stage when compared with a specific type of care and education setting at a later developmental stage.

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There was a significant effect of the child having previously attended nursery or playgroup on their problem-solving ability at age five. This effect remained significant after adjusting for baseline problem-solving scores ($b=.09$, $p<.05$; Table 4.3). This suggests that children who had previously attended playgroup or nursery showed greater improvements in their problem-solving ability than children who had no such prior experience. However, the effect did not remain after differences in social background were accounted for suggesting that the effect was driven by differences in the social background characteristics of children who did and did not have prior experience of nursery or playgroup settings.

Table 4.3 Associations between pre-school characteristics and children’s developmental outcomes at age 5 (controlling for cognitive ability at age 3/ total difficulties at age 4)

	Cognitive		Social
	Problem-solving	Vocabulary	Total difficulties
Weekly duration of pre-school (reference group: 12.5 hours)			
Less than 10 hours	$b=-.01$, $p=.91$	$b=.09$, $p=.20$	$b=-.39$, $p=.10$
More than 10 but less than 12.5	$b=.03$, $p=.58$	$b=.01$, $p=.77$	$b=.05$, $p=.79$
More than 12.5 but less than 16	$b=.03$, $p=.69$	$b=-.04$, $p=.43$	$b=-.02$, $p=.91$
16 hours or more	$b=.07$, $p=.25$	$b=.01$, $p=.82$	$b=-.02$, $p=.93$
Size of pre-school setting (reference group: between 20 and 40 registered places)			
Up to 20 places	$b=-.06$, $p=.43$	$b=.01$, $p=.86$	$b=-.16$, $p=.39$
41 to 60 places	$b=.00$, $p=.94$	$b=.03$, $p=.40$	$b=.07$, $p=.67$
60 places or more	$b=-.01$, $p=.87$	$b=-.02$, $p=.61$	$b=.10$, $p=.53$
Prior attendance at nursery or playgroup (reference group: no previous attendance)			
Some attendance before age 3	$b=.09$, $p<.05$	$b=.01$, $p=.79$	$b=-.08$, $p=.55$

4.5 Do the significant effects of pre-school quality on outcomes vary for children with different social backgrounds?

The analysis in the previous chapter has identified that a pre-school setting’s Care Inspectorate care and support grade was significantly and independently associated with vocabulary score at age five. It is possible though, given the difference in circumstances and experiences of children from different social backgrounds, that the relationship between these variables varies for children with different characteristics. Indeed, previous research on the relationship between pre-school characteristics and child outcomes has indicated different effects for children from different backgrounds and abilities. Various UK studies have shown that pre-school attendance had greater positive impacts on disadvantaged children – measured through household income, socio-economic status, lone parenthood, immigrant status or risk of developing learning difficulties – than it did on their more advantaged peers (Sylva et al, 2004; Apps et al, 2012; George et al, 2012).

The final analytical stage addressed in this section examines in more detail whether the effect of the care and support grade varies according to a child's social background. This analysis will indicate, for example, whether attending a pre-school with a high care and support grade is more beneficial to children whose parents have a lower level of education or those whose parents are more highly educated or whether there is no difference in the effect. In this way, it is possible to identify whether cognitive and social development among children from the various educational groups is affected in different ways by different pre-school characteristics and thus assess the extent to which the targeted delivery of certain pre-school services may be useful.

Potential differences in the relationship between the care and support grade and vocabulary ability were examined for children whose parents had different educational backgrounds. Parent education had emerged as the social background variable most strongly associated with developmental ability. Children whose parents had higher qualifications were more likely to have higher vocabulary scores ($b=.07$, $p<.05$).

The analysis involved entering an 'interaction term' – between level of parent education and care and support grade – into the model. The interaction was not significant suggesting that the positive association between the quality of pre-school care and support and vocabulary ability is similar for children whose parents have different levels of education. In short, a high quality setting – as measured by the Care Inspectorate care and support grade – improves the vocabulary of children irrespective of their background.

4.5.1 Additional interaction analyses

In addition to exploring the model that had previously been shown to be significant, we tested models where none of the pre-school characteristics were significant but where there was a significant effect of one or more of the social background variables. This was to examine whether the effects of pre-school type or quality may have been restricted to one or more of the different social background groups. In other words, whether the models were hiding an effect that was experienced by only a particular group of children.

We tested whether there was an interaction between pre-school type and each of the social background characteristics, and pre-school quality and each of the social background characteristics in the final model for each development outcome. No significant interaction effects were detected meaning that the original models were not hiding differences for particular socio-economic groups.

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4.6 Pre-school type or pre-school quality? Full models testing the combined effect of pre-school characteristics

The descriptive analysis indicated that the quality of pre-school provision varies, to some extent, between different providers. It is feasible, therefore, that the relationships seen between Care Inspectorate care and support grade and vocabulary ability occur because of these variations.

In this section we examine full regression models that simultaneously test the effects of pre-school characteristics including type of provision, quality ratings, weekly duration, size of setting and previous experience of nursery or playgroup care. These models were run only for the associations that were previously shown to be significant namely: pre-school care and support grade and children's vocabulary ability.

The effect of pre-school care and support quality on children's vocabulary scores was tested alongside all other pre-school characteristics whilst controlling for children's initial vocabulary ability at age three and social background and demographic characteristics.¹⁶ In this overall model, the effect of the quality measure of care and support on children's vocabulary scores remained significant whereas the effect of all other pre-school characteristics were not significant. This suggests that, after controlling for differences in a child's social circumstances, irrespective of the type of provision and the hours they attend, if the setting is deemed to be delivering better quality care in the theme of care and support, this leads to improvements in children's vocabulary.

¹⁶ As well as household income, parental education level and socio-economic classification, mother's ethnicity, child's sex, area deprivation level and area urban-rural classification were added to these models.

This report has provided a comprehensive and unique insight into the experience of pre-school provision for children in Scotland. What is immediately clear, and reflects estimates provided by administrative data, is that the vast majority of children in Scotland take up their statutory pre-school entitlement. The data included here show that in 2008/2009, 92% of children aged three to four years old were receiving pre-school education in some form. What is also clear is that there is a great deal of variation in the characteristics of the different pre-school settings that children attend in Scotland. Most obviously the settings vary in their funding and 'management' arrangements with pre-school provision delivered primarily through four provider types – local authority (LA) primary school nursery classes, other LA provision, private nurseries and voluntary or community run settings. This fundamental distinction is often associated with a range of other differences in the characteristics of the settings children experience in terms of the size, age range catered for and, crucially, the quality of the care and education being provided. Children attending private providers were found to be significantly less likely to experience higher quality provision.

Children with different socio-economic characteristics show some small differences in the type of pre-school provision they attend and the number of hours for which they attend. However, these differences largely reflect variations in the type of provision available in urban and rural areas and the different childcare needs of couple families with both parents employed.

Given differences in use of certain provider types amongst children with different background characteristics and variations in the average quality levels of different provider types, we may have expected children from more disadvantaged backgrounds to have a greater chance of accessing higher quality settings. These children are more likely to use LA provision than more advantaged children and this provision attracts the highest quality scores. Private providers are more often used by more advantaged families but have lower average quality scores. However, there was no significant systematic difference in the quality of pre-school settings that more and less advantaged children attend. Neither does this logic necessarily follow in relation to remote rural areas. Whilst children in these areas are more likely to attend a primary school nursery class, they are less likely to experience higher quality care.

Although pre-school type was associated with quality of care and education provision, it was not independently associated with either cognitive or social development. Indeed, of the various characteristics of pre-school provision considered only selected measures of quality were found to be associated with child outcomes. Attending a pre-school setting with a higher grade on the Care Inspectorate theme of care and support grade was consistently and significantly associated with a positive change in vocabulary development. This association held after controlling for all other pre-school characteristics and differences in children's social background and demographic characteristics. In addition, there did not appear to be any differential effects for children with different social backgrounds. In other words, more disadvantaged children did not appear to benefit more from settings which had

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higher care and support scores. Given that pre-school provider type was controlled for, it also appears that a high care and support graded private setting is not any more beneficial than a high care and support graded primary school nursery class.

These findings have a number of important implications for the delivery of early childhood education and care in Scotland.

Other than lower attendance amongst children in lone parent families compared with those in couple families – a finding which may warrant some further research to explore why – children in disadvantaged circumstances are no less likely to take up their pre-school entitlement than those living in more advantaged circumstances. This, together with the evidence that the impact of high quality pre-school provision – as measured by the Care Inspectorate care and support grade – does not vary depending on the socio-economic status of the child, means that the benefits of pre-school education can be shared across families regardless of socio-economic status.

Although private nurseries tend to have lower quality ratings than LA nurseries, type of pre-school provider does not have an independent and significant impact on child development outcomes. This seems at odds with the findings that care and support grade is significantly associated with a positive changes in development. We may assume that because the care and support grade of LA primary school nurseries is consistently higher than that for private providers, that children attending primary school nursery classes would show a greater improvement in their vocabulary ability. To explain this apparent anomaly, it is important to remember that the analysis has shown that there are some socio-economic differences in the type of pre-school children attend. Children attending private pre-school provision are more likely to be from households with a higher income, more highly educated parents and live in the least deprived areas. Earlier analysis of GUS data (Bradshaw, 2011; Bromley, 2009) showed that children from these more advantaged backgrounds have better development outcomes even before they begin their pre-school education and that these better outcomes can be explained, in part, by differences in their experience of a rich, home learning environment. For many of the children attending private nurseries, the experiences that they have at home will make important contributions to their development. It is also possible that the social mix of children attending a pre-school establishment will have some impact on the child's development (over and above the impact of the education and care they receive there). Mixing, in the pre-school years, with children who have good cognitive ability is likely to be beneficial to a child – although our analysis is not able to show whether this is the case.

LA provision attracts higher quality scores than private provision. The analysis has also shown that LA settings are catering for children who, on entry, are more likely to have social, emotional and behavioural problems and less developed vocabulary skills than children attending private providers. It is reassuring therefore, that these settings attract higher quality ratings. However, given the known socio-economic variations in the types of provision used by different children and the known differences in their developmental ability on entry to pre-school, some further improvement of the quality of provision accessible to children most in need may be beneficial in reducing inequalities between the most and least advantaged.

The variations in quality of provision by provider type may reflect, at least in part, differences in staff qualifications – an important feature in quality – and variations in the types and quality of interactions between staff and children as a result. Research by Education Scotland (2012) found that settings which had access to higher qualified staff, particularly teachers with a background in early years methodology or staff with specific early childhood qualifications – such as the BA in Childhood Practice – were more likely to offer higher quality learning experiences. In addition, evidence from the EPPE study found that settings where staff had higher qualifications showed higher quality and their children made more progress (Sylva et al, 2004). The data considered for this report did not allow exploration of differences in staff qualifications according to provider type. However, Scottish Government pre-school and childcare statistics for 2009 – the year children in which GUS BC1 are most likely to have been attending pre-school provision – show that access to a registered teacher under a regular arrangement varied significantly from 93% amongst LA centres to just 32% of partnership centres. Statistics on staff in pre-school settings with other relevant qualifications are not routinely published. However, in the limited data that is available the variations are less stark. Amongst the 338 pre-school centres inspected between 2010 and 2012 and included in the Education Scotland *Making a difference* research, 27% of LA establishments had one member of staff with the BA in Childhood Practice compared with 23% of partnership centres. The most recent statistics available – from 2013 – indicate a decrease in access to a registered teacher for both types of provision, but also that there is still a significant difference between them; 84% of LA managed settings and 24% of partnership settings had access to a registered teacher under a regular arrangement. Without any routine publication of staff qualification data it is difficult to comment further on the full extent or impact of these changes in the qualifications of the workforce. Given the important link between staff qualifications and quality of provision, it is important to ensure that access to staff with complementary skills and higher level qualifications is available for children in all pre-school settings.

The number of hours a child attended pre-school per week was not associated with the child's social or cognitive development at age five. This is not an unexpected finding as other research has shown similar results. In the EPPE study, for example, full-time attendance at pre-school provision led to no greater gains for children than part-time provision (Sylva et al, 2004), though some research has found total 'duration' of pre-school provision (in months and years rather than hours per week) to be associated with child outcomes (Butt et al, 2007) The findings here suggest that the imminent increase in pre-school entitlement due in August 2014 is unlikely to have either a direct positive or detrimental impact on child outcomes. There may be some benefits from the increase in statutory hours of pre-school provision through increased opportunities for both parents to work or to pursue further and higher education. This in turn could result in indirect benefits for child development. Higher parental education and employment levels and higher household incomes have been associated with advantages in child development, for example, through an improved home learning environment and parent-child activities. However, the increased hours of entitlement alone are limited in allowing parents to take up work and education opportunities. Rolled out in the dominant pattern of pre-school delivery, the increase equates to an extra 30 minutes of pre-school provision per day. To maximise the opportunity for parents, it is crucial that the entitlement is delivered flexibly to suit typical patterns of employment and education.

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Appending it to the existing dominant pattern of pre-school attendance in the dominant provider – i.e. five mornings or afternoons per week in a LA primary school nursery class – is not likely to have much impact in this respect.

The emergence of quality as the key characteristic of pre-school provision associated with child outcomes is not surprising. This finding echoes that from other research on the relationship between early childcare and education experiences and child outcomes which has demonstrated the significant impact such experiences can have on a broad range of child outcomes (see Burger, 2010 for a review). At a basic level, evidence shows that as compared to no experience of centre-based care or pre-school education, children with any experience tend to have improved language and cognitive skills (Sylva, 2009; Butt et al, 2007; Magnuson et al, 2010). In terms of the statutory pre-school provision, the EPPE study (Sylva et al, 2009) found that quality of provision is the key factor associated with making the greatest impact on intellectual and cognitive development – a finding echoed in US-based research (Butt et al, 2007).

Amongst the Care Inspectorate themes, the care and support grade was consistently and significantly associated with child development. None of the individual Education Scotland QIs were associated with child outcomes. These findings underline the importance of retaining quality – as well as improving flexibility – as pre-school educational entitlement expands. In terms of improving early vocabulary – a key predictor of later attainment – the most important quality measure has been shown to be care and support rather than any of the Education Scotland measures of quality of educational provision. The lack of association between measures of educational quality and child cognitive outcomes is potentially a statistical effect from the lower number of cases with Education Scotland QI data available. If more data were available, for example numbers similar to that for which there is Care Inspectorate data, some associations between the Education Scotland QI evaluations and child outcomes may have been found. However, it is also possible that the focus of the behaviours, interactions and experiences assessed under the Care Inspectorate care and support theme are closer to those important for the specific child development measures included here and measured during the early and pre-school period.

Notwithstanding these differences, it has been shown here that aspects of pre-school settings that are routinely inspected are associated with child outcomes. If these can be measured routinely, it also suggests they can be improved. Indeed, part of the process following on from inspections requires that settings take steps to improve aspects of their provision. Indeed, recent statistics published by Education Scotland show that in the National Performance Framework Indicator measuring quality of pre-school provision, there has been a statistically significant increase in the proportion of pre-school centres evaluated as very good or better (Education Scotland, 2014). Therefore it seems feasible that care and support (the aspect of quality that has been shown to be consistently and significantly associated with child development) could be improved across all settings if the necessary support is provided and the setting is committed to improvement. Indeed, with further consideration it may be possible to tailor the aspects of pre-school provision falling under this theme to more benefit children who need extra support.

It is worth noting that the size of the effects of pre-school quality on child outcomes is quite small. Nevertheless, it appears that consistent and universal access to high quality pre-school provision will benefit children in terms of their vocabulary ability and social and behavioural development. This will help reduce the significant socio-economic inequalities in these outcomes that have been shown in previous GUS reports, and in a range of other evidence. However, it will not by itself eradicate them. As well as early childhood education and care, children's exposure to learning at home is also important in helping them achieve better outcomes. Previous GUS analysis (Bradshaw, 2011; Bromley, 2009), and a range of other sources (Siraj-Blatchford & Siraj-Blatchford, 2009) have shown that children who experience a richer home-learning environment show improvements in their cognitive and social development. However, achieving behaviour change in parents is a challenging process. Whilst ensuring greater access to high quality pre-school provision is also a challenging aim, it is easier for Governments to facilitate and legislate for. In addition, with almost universal attendance at statutory pre-school provision amongst eligible children in Scotland, attendance at these settings presents an important opportunity to make a significant and long-term difference to many children's lives.

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