



**Growing Up  
in Ireland**  
National Longitudinal  
Study of Children



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## NON-PARENTAL CHILDCARE AND CHILD COGNITIVE OUTCOMES AT AGE 5

INFANT COHORT



REPORT 6



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## NON-PARENTAL CHILDCARE AND CHILD COGNITIVE OUTCOMES AT AGE 5:

Results from the Growing Up in Ireland Infant Cohort

Frances McGinnity, Helen Russell & Aisling Murray

December 2015

The views expressed in this report are those of the authors and do not necessarily reflect the views of the funders or of either of the two institutions involved in preparing the report.



An Roinn Leanaí  
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## TABLE OF CONTENTS

<b>LIST OF FIGURES AND TABLES</b>	<b>6</b>
<b>EXECUTIVE SUMMARY</b>	<b>8</b>
<b>CHAPTER 1: PREVIOUS RESEARCH, THE POLICY CONTEXT AND THE GROWING UP IN IRELAND STUDY</b>	<b>13</b>
1.1 Introduction	14
1.2 Factors influencing the use of non-parental childcare	15
1.3 Childcare and child cognitive outcomes – previous research	16
1.3.1 Longitudinal/cohort studies of childcare and early education influences on cognitive outcomes	17
1.3.2 Quantity of non-parental care and multiple care	19
1.3.3 Quality of childcare	20
1.3.4 Childcare outcomes for socially disadvantaged children: social class and migrant status	21
1.3.5 Other factors influencing children’s cognitive development	22
1.3.6 Evaluations of early education and childcare programmes in Ireland	23
1.4 Care of preschool children: the policy context in Ireland	24
1.4.1 Parenting and paid work	25
1.4.2 State support for non-parental care for preschool children	26
1.4.3 Recent developments in childcare policy and debates on quality	28
1.5 Data and methodology	31
1.5.1 About Growing Up in Ireland	31
1.5.2 Measures used in this report	31
1.5.3 Information on Free Preschool Year providers	35
<b>CHAPTER 2: NON-PARENTAL CARE AND EARLY EDUCATION IN THE FIRST FIVE YEARS</b>	<b>37</b>
2.1 Introduction	38
2.2 Non-parental care in the first three years	38
2.3 Participation in the Free Preschool Year (FPSY) and School Start	44
2.4 Conclusions	49
<b>CHAPTER 3: CHILDCARE AND COGNITIVE OUTCOMES</b>	<b>51</b>
3.1 Introduction	52
3.1.1 Bivariate relationship between childcare and cognitive outcomes	52
3.1.2 Modelling strategy	52
3.2 Vocabulary	53
3.2.1 Childcare	53
3.2.2 Other factors	54
3.3 Non-verbal reasoning	57
3.3.1 Childcare	57
3.3.2 Other factors	58
3.4 Duration and hours of childcare and vocabulary and non-verbal reasoning at five	60
3.5 Free Preschool Year centre characteristics and cognitive outcomes	62
3.6 Discussion	65



<b>CHAPTER 4: CHILDCARE AND COGNITIVE OUTCOMES BY LINGUISTIC BACKGROUND AND PRIMARY CAREGIVER'S EDUCATION</b>	<b>67</b>
4.1 Introduction	68
4.2 Childcare and cognitive outcomes by linguistic background	68
4.3 Childcare, cognitive outcomes and Primary Caregiver's education	72
4.4 Summary	74
<b>CHAPTER 5: CONCLUSIONS AND ISSUES FOR POLICY</b>	<b>75</b>
5.1 Early care and education in the first five years	76
5.2 Effects of non-parental childcare at age three on cognitive development at age five	76
5.3 The Free Preschool Year, starting school and cognitive development	78
5.4 Quality of care	80
5.5 Quality, price and policy	81
5.6 Avenues for further research	81
<b>REFERENCES</b>	<b>84</b>

## LIST OF TABLES

Table 1.1:	Preschool Quality Agenda	30
Table 1.2:	Comparison of scores on Naming Vocabulary and Picture Similarities tests (age 5 years) with later teacher rating of ability	33
Table 2.1:	Main type of childcare at nine months old and three years old	39
Table 2.2:	Any use of care type at three years	39
Table 2.3:	Hours of care among children in non-parental care at nine months and three years	40
Table 2.4:	Average number of children, adults and ratio of adults to children for three-year-olds in non-parental care	43
Table 2.5:	Percentage of children attending FPSY centres in receipt of higher capitation for qualified staff	46
Table 2.6:	Proportion of children with top-up hours at Free Preschool Year centre	47
Table 2.7:	Proportion of children by month of birth that had started school, by school starting age and family income	49
Table 3.1:	Linear regression model of vocabulary scores at five years	55
Table 3.2:	Linear regression model of non-verbal reasoning scores at five years	58
Table 3.3:	Linear regression models of vocabulary scores at age five years to include measures of longer hours in childcare at three years (more than 30 hours) and placement in non-parental care at age nine months	61
Table 3.4:	Models of non-verbal reasoning scores at age five years to include measures of longer hours in childcare at three years (more than 30 hours) and placement in non-parental care at age nine months	61
Table 3.5:	Models for association between Free Preschool Year characteristics and vocabulary at age five years	62
Table 3.6:	Linear regression models of the association of Free Preschool Year characteristics and the non-verbal reasoning measure at age five years	63
Table 3.7:	Models for effect of Free Preschool Year characteristics on the vocabulary measure at age five years (distinguishing private and community crèches)	64
Table 3.8:	Models for effect of Free Preschool Year characteristics on non-verbal reasoning at age five years (distinguishing private and community crèches)	64
Table 4.1:	Vocabulary scores at age five and childcare at three years for non-English-speaking and English-speaking children	70
Table 4.2:	Non-verbal reasoning at age five and childcare at age three for non-English-speaking and English-speaking children	71
Table 4.3:	Vocabulary scores at five and childcare by Primary Caregiver's education	72
Table 4.4:	Non-verbal reasoning scores at five and childcare by Primary Caregiver's education	73



## LIST OF FIGURES

Figure 1.1:	Net childcare costs in OECD countries for a dual-earner family with full-time earnings of 150 per cent of the average wage, 2012	27
Figure 1.2:	Net childcare costs in OECD countries for a sole-parent family with full-time earnings of 50 per cent of the average wage, 2012	27
Figure 2.1:	Main form of non-parental care by socio-economic status (SES) and family characteristics of children age three years	41
Figure 2.2:	Income quintile composition of care group type, children at age three years	42
Figure 2.3:	PCG education composition of care type, children at age three years	42
Figure 2.4:	Type of provider attended for Free Preschool Year	45
Figure 2.5:	Parents' assessments of quality of Free Preschool Year: distribution of responses	45
Figure 2.6:	Proportion of parents who would not have been able to send child to preschool without FPSY scheme	47
Figure 2.7:	Contrast of centre-based care at age three years with enrolment in the Free Preschool Year (FPSY) at age 5, by family social class	48
Figure 3.1:	Scores on cognitive tests at age five years according to childcare type at age three years	52
Figure 4.1:	Proportion of children in each childcare type at age three years by linguistic background	69



## EXECUTIVE SUMMARY

This report investigates the experience of non-parental care in early life and its association with children's cognitive development at age five using a large representative sample of children (circa 9,000) from the *Growing Up in Ireland* survey. This survey collected data on the same children in infancy in 2008/2009, at age three in 2011 and at age five in 2013. The report is written against a backdrop of international and policy debates on non-parental childcare, particularly centre-based childcare, and its potential impact on children's development.

The report addresses a number of questions. What do we know from the *Growing Up in Ireland* survey about the nature and extent of non-parental childcare in infancy and at age three, prior to participation in the Free Preschool Year? Do children who experienced different types of non-parental childcare at age three differ in terms of their vocabulary and non-verbal reasoning from those who have just experienced parental care? Does participation in different forms of childcare influence the change over time in vocabulary and non-verbal reasoning scores between ages three and five? Does the influence of non-parental care differ for advantaged and disadvantaged children? This report considers cognitive outcomes, though clearly socio-emotional outcomes are another important aspect of child development.

The report distinguishes between relative care (usually by a grandparent), non-relative care (typically a childminder) and centre-based care (e.g. crèche) as main non-parental care types at age three. The report also considers some aspects of the children's experience of the Free Preschool Year, a major policy initiative in recent years in the area of Early Care and Education in Ireland, using data collected in 2013 when the children were five.

## KEY FINDINGS

### Early Care and Education in the first five years

- There was an increase in the use of non-parental childcare between nine months, when 39% of children were in non-parental childcare, and three years, when half of the children were in non-parental childcare.
- For those in non-parental childcare, there was a shift towards centre-based care between nine months and three years. For infants, relative care dominated; for three-year-olds, centre-based care was the most common care type.
- Considering total hours for those in non-parental childcare, the majority of children were in childcare for less than 30 hours per week (63 per cent), with 37 per cent in childcare for 30 or more hours per week.
- By age five, almost all of the children in the study (96 per cent) had participated in the Free Preschool Year<sup>1</sup> (FPSY). This compares to a 27 per cent participation rate in centre-based care at age three. Just over one in five parents said they would not otherwise have been able to afford to send their child to preschool without the Free Preschool Year.

### Cognitive outcomes at age five and childcare at age three

- On average, children in non-parental childcare at age three record higher expressive vocabulary scores at age five than those in sole parental care, but after accounting for differences in child and family background characteristics, and home learning environment, there was no difference in vocabulary scores between the groups. This suggests selectivity into different care types – that is, the fact that children from different backgrounds attend different childcare types – contributes to differences in the average vocabulary scores.
- Looking at change over time in vocabulary scores between three and five, a modest positive effect was found for non-relative care (e.g. childminders), meaning that children in this type of care made more progress between the two time points than those in full-time parental care at age three.

- There was no association between childcare type at age three and non-verbal reasoning scores at five, or differential change in non-verbal reasoning scores between three and five, once family background, child characteristics and home learning environment were accounted for.
- None of the findings suggest a significant negative effect of non-parental childcare on either vocabulary or non-verbal reasoning at five for the full sample of children. On average, children attending different types of care at age three fared as well in terms of cognitive outcomes at age five as children in full-time parental care.

#### **Do hours and duration of care play a role?**

- Although we do not have a full care history for the children we can identify those who were early entrants to non-parental care from the survey at nine months. After accounting for other background and child characteristics, having been in non-parental childcare at nine months was not associated with vocabulary or non-verbal reasoning scores at five years, or change over time in these scores.
- However, being in non-parental childcare for 30 hours or more at age three, regardless of type, was associated with slightly lower vocabulary scores at five. For non-verbal reasoning, no effects of being in non-parental childcare for more than 30 hours were found.

#### **What are the other factors associated with cognitive development at five?**

- The effects of childcare on cognitive outcomes at five were very small or not statistically significant, after controlling for other factors. A wide range of other child and family characteristics play a greater role in children's cognitive outcomes than non-parental childcare. Children's birthweight, gender, number of older siblings, their socio-emotional development, their Primary Caregiver's age and education, household income, parenting practices, such as consistent parenting, and in particular home learning environment – measured by the number of books in the home and the learning activities parents engage with – play a more salient role in cognitive outcomes than their experience of non-parental childcare. Engagement with grandparents in a range of activities was also associated with higher vocabulary scores at age five.
- Children who had started school by age five have higher scores on both vocabulary and non-verbal reasoning than those who had not started school, though some of this effect may be related to the fact that children who have started school have more experience of activities similar to the vocabulary and reading tests used in the Growing Up in Ireland survey.
- Not surprisingly, children from non-English speaking backgrounds have much lower scores in expressive vocabulary in English at age five than children from English-speaking backgrounds. However, children from non-English speaking backgrounds have slightly higher scores on non-verbal reasoning. Expressive vocabulary in English is not an ideal measure of cognitive outcomes for children from non-English speaking backgrounds, though likely to be associated with subsequent educational experiences in Ireland.

#### **Do the effects of early education and childcare differ by linguistic background and Primary Caregiver's education?**

The report also investigates potential effects of non-parental childcare for children from different linguistic backgrounds (those who have English as a first language compared to those who do not) and children whose Primary Caregivers have lower secondary qualifications or less compared to children whose Primary Caregivers have Leaving Certificate qualifications or higher. Previous international research suggests that children from disadvantaged or minority language backgrounds may benefit more from non-parental childcare than their more advantaged peers (see Chapter 1), and there has been considerable policy interest in whether early care and education may ameliorate some of this disadvantage.

- Among children from non-English speaking backgrounds, there was a small positive effect of centre-based care at three on vocabulary at five, after controlling for all other factors.
- In contrast, for children from English-speaking backgrounds, there was a small negative effect of being

in centre-based care at three on vocabulary at five and there was a modest positive effect of relative care compared to parental care at three.

- Distinguishing children from English-speaking and non-English speaking backgrounds, there was no association between care type and non-verbal reasoning at age five, once child and family characteristics were controlled for.
- Distinguishing children from a lower educated background and a higher educated background, childcare type had no effect on outcomes at age five for either group, after controlling for other child and family characteristics.
- For children whose Primary Caregiver had Leaving Certificate qualifications or higher, there was a modest positive effect of relative and non-relative care on change in vocabulary scores between three and five compared to full-time parental care.

These findings do not take into account differences in the quality of care within care settings. While some measures of structural quality are available such as qualifications of carer and child to carer ratios, these are closely related to the type of care. For example, the average adult to child ratio for relative care or care by a childminder in the child's home is higher than in centre-based care. Moreover, the educational qualifications of grandparents are not easy to compare to those of centre-based carers or parents, given the extent of educational change across generations. Such differences would confound the effects of care type, which is the main focus of the study, therefore these measures were not included in the analyses.

The international literature suggests that quality of childcare matters for children's outcomes. The nature of the data mean that it cannot be ruled out that high-quality care at age three has a positive effect on cognitive outcomes and low-quality care has a negative effect but when these effects are combined they cancel each other out.

### The Free Preschool Year (FPSY) and cognitive outcomes

Because of the near universal take-up, the impact of participation in the FPSY scheme per se could not be assessed as there is no suitable comparison group of children in the *Growing Up in Ireland* who did not attend. Instead some characteristics of the centre where the child did the FPSY were examined. For circa 6,000 children there is information on whether the centre where the children did the FPSY received a higher capitation grant for having a graduate leader and whether the service was a private or community crèche.

- For non-verbal reasoning, children who did the Free Preschool Year in services with a graduate leader recorded slightly higher scores at age five than those who did the scheme in centres without a graduate leader, though the effect is only marginally statistically significant. On average, there was no such finding for vocabulary.
- There is also some indication that children who did the Free Preschool Year in a community crèche with a graduate leader had slightly higher vocabulary scores than those who did the Free Preschool Year in a community crèche without a graduate leader, though once again the effect is marginally statistically significant. This effect is not found for children who did the Free Preschool Year in a private crèche.
- The differences are very small, only marginally statistically significant and only two centre characteristics were included in the models. Ideally observational indicators of quality in centres where the children did the Free Preschool Year would be used in models of child cognitive outcomes.

### Methods and issues for future research and policy

The *Growing Up in Ireland* survey is a rich source of information on the lives of children, their families, and communities. First, it is a very large representative sample of young children in Ireland. Secondly, because of the longitudinal nature of the study we can examine the effects of early experiences, for example, of

non-parental childcare, on later outcomes. Thirdly, the study collects a huge amount of information on the children and their families and home environment. Particularly relevant for this study are the cognitive tests administered at age five. Fourthly, for this report we were able to match some information about the centres where the children attended the Free Preschool Year, allowing us to incorporate information from the centres into the models predicting cognitive outcomes.

It should be noted, however, that the *Growing Up in Ireland* survey is not primarily a survey of childcare providers, and the models in this report do not include information about the quality of non-parental childcare at three. There is a clear need for further investigation of the quality of childcare settings at national level in Ireland.

The conditions of employees and the value attached to care work in the Early Years sector are also central to the quality debate. There is growing attention to the qualifications of childcare workers but the issue of attracting and retaining graduates in this sector of the economy will be tied to working conditions, including factors such as pay, hours, security, autonomy and status. Further data collection on caring as an occupation would inform policy development in this area.

The international literature on parental assessments of childcare also highlights that parents may not always be good judges of childcare quality, particularly important aspects of quality that are difficult to observe such as sensitivity of staff to children's needs (Cryer et al., 2002). Parents as consumers often have insufficient knowledge to make an informed choice about childcare, and may continue to pay high prices for poor-quality care and education. Regular and accessible inspection reports on quality of childcare settings are of benefit to parents but are dependent upon the inspections measuring key aspects of process quality such as the learning opportunities available, and the nature of the interactions between staff and children.

A number of important themes have emerged from this report that would be interesting to investigate from both a policy and research perspective. The focus here was on cognitive outcomes, yet the international literature suggests that there may be important associations between children's socio-emotional development and type and quality of childcare. As presented in Chapter 3, aspects of socio-emotional development are associated with cognitive outcomes at age five. Further research could investigate the link between children's socio-emotional outcomes and childcare, child and family background using similar methodology.

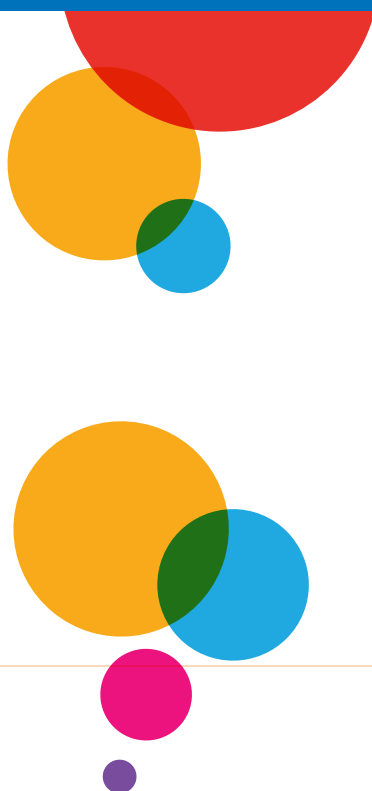
The study highlighted a range of child, family, socio-economic and institutional factors that influence children's cognitive outcomes at age five. An important issue is the extent to which such factors are associated with longer term developmental and educational outcomes. The value of an ongoing child cohort study like the *Growing Up in Ireland* for assessing the long-term effects of early life experiences will become increasingly evident as these five-year-olds are followed into later childhood, adolescence and adulthood.





# Chapter 1

PREVIOUS RESEARCH, THE POLICY CONTEXT  
AND THE GROWING UP IN IRELAND STUDY



## 1.1 INTRODUCTION

The potential impact on children's development of non-parental childcare at an early age has been the subject of much international debate (OECD, 2009). In Ireland, participation in non-parental childcare is an increasingly common experience for young children. Research on the *Growing Up in Ireland* Infant Cohort at age nine months found that two in every five infants (39 per cent) were in regular non-parental care and spent an average of 25 hours per week in such care (McGinnity et al, 2013). At three years of age, 58 per cent of the group were in regular non-parental childcare for an average of 23 hours per week (*Growing Up in Ireland*, 2011). Indeed recent policy changes endorse participation in formal childcare and early education for children aged three to four years through the Free Preschool Year.

The objective of the current study is to examine the effects of non-parental care in early life on cognitive development. Do children who experienced non-parental childcare differ in terms of cognitive development from those who have just experienced parental care? Wave 3 of the *Growing Up in Ireland* (Infant Cohort) study provides the opportunity to consider the influence of children's participation in non-parental care at nine months and three years on cognitive outcomes at age five.

Debates on childcare and its effects often focus on centre-based care, but the reality is more complex. The study encompasses all forms of regular non-parental care, including informal care by relatives or friends/neighbours, childminders in the child's or carer's home, and centre-based services such as crèches, play-groups, preschools and Montessori schools, and includes both paid and unpaid care. The term Early Childhood Care and Education (ECCE) is increasingly used in the literature to describe these services, and is particularly common in discussion of provisions for preschool children (aged three to six years). This term emphasises the importance of both the care and the educational components of services for children in the first years of their lives. Not all forms of non-parental care may include an explicit educational component, although more informal care may still include learning activities. Moreover, formal care settings may vary in their theoretical approach to early education; for example, Montessori, HighScope, Reggio Emilia.

The study considers two measures that capture different aspects of cognitive development: language and non-verbal reasoning that are age-appropriate. Why cognitive outcomes? Cognitive development is extremely important for future educational achievement and life outcomes such as employment, income and health. It also features strongly in arguments about the economic returns to childcare (Heckman, 2006). As will be evident from the discussion of previous research below, there is a very substantial literature on the influence of childcare and early education on cognitive development. The selection of one outcome domain is in part a means of identifying a manageable research question and producing a more coherent analysis. Even restricting the review to cognitive development introduces a wide diversity of measures and results. That is not to argue that social and emotional development is unimportant for children's educational outcomes or for other aspects of children's well-being and quality of life. Investigation of the influence of non-parental care on social and emotional development is planned for further research.

In this study, following best practice in longitudinal research into child development, the influence of factors at earlier waves on outcomes in subsequent waves is tested. In practice this means that the effects of participation in non-parental childcare at Wave 1 (nine months old) and Wave 2 (three years old) on cognitive outcomes in Wave 3, at five years old, are examined. Participation in the Free Preschool Year (FPSY) programme occurred after the Wave 2 interviews. The universal scheme was introduced at the same time throughout the country and had a very high take-up rate (the Department of Children and Youth Affairs estimated that 95 per cent of eligible children participated in the scheme; DCYA 2014). The high levels of participation mean that non-participants are highly selective and therefore there is no matched control group with whom to compare outcomes. Consequently, it was not possible to model the effects of participation in the scheme per se on cognitive outcomes. Nevertheless, some limited information on the



centres attended by a subset of the study children was provided by the Department of Children and Youth Affairs (DCYA), and the variation within the FPSY is used to test whether cognitive development differs for those attending different types of services (see Chapter 3 below).

It is worth noting at the outset of this study that there are multiple sources of influence on child development: genetic, familial, social, economic, psychological and institutional; non-parental childcare is only one small component. The multi-factorial nature of influences on child cognitive development is acknowledged in the statistical analyses of non-parental care in Chapters 3 and 4 of this report, which allows us to account for these additional influences and thus identify any additional association of outcomes with non-parental childcare.

This chapter is organised in the following manner. Section 1.2 summarises what is already known about the take-up of non-parental childcare, and the factors that influence the patterns of childcare use in Ireland and elsewhere is summarised. In section 1.3 the previous research exploring the relationship between non-parental care and cognitive outcomes is discussed. Section 1.4 describes the policy context in Ireland, while section 1.5 provides a description of the *Growing Up in Ireland* data and the methodology applied in this study.

## 1.2 FACTORS INFLUENCING THE USE OF NON-PARENTAL CHILDCARE

Research on the *Growing Up in Ireland* infants at nine months old (McGinnity et al, 2013) highlighted the complex range of interconnecting issues that influence the use of non-parental childcare and the type of care chosen. These include characteristics of the mothers such as education level, employment and social class; family factors such as the number of children, lone parenthood and family income; the Study Child's characteristics; broader neighbourhood factors such as access to services and support, and finally, the national policy setting. These factors may have a direct influence on childcare decisions or may operate indirectly through their effect on mother's return-to-work behaviour.

Take-up of non-parental childcare among the *Growing Up in Ireland* respondents at three years was examined by Byrne and O'Toole (2015). As in Wave 1 at nine months, take-up of non-parental care was strongly influenced by family work patterns and socio-economic factors. Non-parental care increased with household income and was highest in the professional classes. Take-up was also strongly linked to the Primary Caregiver's hours of paid work. Indeed, the association with hours was stronger at three years than at nine months. Taking these factors into account, parent's education had only a small additional effect, since education is strongly correlated with income, class and employment levels. Family structure also played a role: children of lone parents were more likely to be in non-parental care while those with siblings were less likely. The effect of lone parenthood on take-up appeared to be weaker at age three years than at nine months, though this difference was not formally tested. This is consistent with McGinnity et al's (2013) finding in the nine-month survey that lone mothers were more likely to have early returns to work.

Modelling the type of childcare chosen at three-years-old, Byrne and O'Toole (2015) found that professional and high income parents were more likely to use centre-based care relative to parental care. However when the analysis was confined to those using childcare, professional and high income parents were less likely to use centre-based care as opposed to other forms of care (relatives and non-relatives in own home or outside).

Similar factors have been identified in patterns of childcare use in countries where provision of childcare or preschool for a particular age group is not universal or well-subsidised. Indeed, socio-economic stratification in the uptake of non-parental care and early education tends to be greatest in countries where the private sector plays a greater part in childcare and early education services (see Gambaro et al, 2014).



For example, in the UK it has been found that parents who use centre-based care are more likely to come from a professional background and have a higher level of education and income (Roberts et al, 2010), while in the US, Hofferth et al (1996) also found that low-skilled women are more likely to use informal care. In the US, participation in centre-based care is significantly higher for the top income groups despite rising participation for all over the last two decades (Hofferth, 1996; Magnuson & Waldfogel, 2014).

The Childcare Survey in the UK provides some interesting insights into the factors that parents cite in their choice of childcare type (Bryson et al, 2012). Parents who used informal care (defined as relatives and non-relatives who are not registered childminders) were more likely to mention cost issues and factors relating to the provider's caring role, including: someone who would show the child affection; the carer would bring up the child the way they themselves would, and trust in the provider. Those choosing formal care were more likely to mention professional/reputation factors, convenience factors (including hours and reliability) and desire for the child to mix with other children. The finding that 44 per cent of those using informal childcare cited cost as the main reason for selecting this type of care highlights the extent to which parents' 'choice' can be constrained by resources and policy decisions. McGinnity et al (2013) showed that the availability of centre-based care also played a role for infants. Having a crèche locally meant infants were more likely to be in centre-based care than non-relative care, though it did not affect the choice between relative care and centre-based care. Infants living in rural areas, where crèche coverage is typically lower, were also less likely to be in centre-based care (McGinnity et al, 2013).<sup>2</sup>

The current study does not analyse this decision process but rather examines the effects of these 'choices' in relation to childcare in the early years. Why should this choice matter for children's outcomes? As the use of non-parental childcare is socially patterned, these characteristics need to be controlled within the model, so that as far as possible the independent influence of childcare (as opposed to, for example, income, parental education, linguistic background) is assessed. As an extreme illustrative example, if all children using centre-based care have Primary Caregivers with very high educational qualifications, it may be Primary Caregiver's education rather than the type of childcare that is influencing cognitive test scores. Not accounting for Primary Caregiver's education in this case would lead to the wrong conclusions about the link between childcare and outcomes. Therefore, family socio-economic circumstances are taken into account when analysing cognitive outcomes.

### 1.3 CHILDCARE AND CHILD COGNITIVE OUTCOMES – PREVIOUS RESEARCH

There is a large international literature on childcare and cognitive outcomes. The aim of this review is not to be comprehensive, but to give a flavour of key findings and research methods, and highlight findings relevant for the current study. Much of the early evidence on the relationship between childcare/early education and child development outcomes came from experimental studies in the US in which the outcomes of children participating in a programme were compared to a group of similar children who did not participate (for reviews, see Karoly et al, 2005 and Camilli et al, 2010). These reviews reported significant positive effects on cognitive outcomes for almost all of the programmes evaluated. The randomised design of such studies provides valuable evidence of the positive impact of these interventions, but they usually evaluate the impact of small-scale, intensive and targeted childcare programmes. Here the focus is on the results from large-scale longitudinal studies that are more similar to the *Growing Up in Ireland* study. This research examines child outcomes for large nationally representative samples of children that are followed from infancy (reviewed in section 1.3.1). The design of these studies provides robust evidence on the nature of the relationship between childcare/early education and subsequent outcomes for a wider range of childcare arrangements – evidence that can be generalised to the population from which the sample was drawn. Previous studies of Irish early childhood care and education (ECCE) interventions are also reviewed. Even in the literature on cognitive outcomes, there is considerable diversity in the methods used, the outcome measures, and when outcomes are observed (ranging from one year after the intervention to adulthood), which has consequences for the nature of the findings.



### 1.3.1 LONGITUDINAL/COHORT STUDIES OF CHILDCARE AND EARLY EDUCATION INFLUENCES ON COGNITIVE OUTCOMES

Nationally representative longitudinal studies tend to include a variety of care types reflecting the diversity of care patterns observed in the study country. At the broadest level the contrast is made between formal versus informal childcare, but further distinctions have also been made in the type of care, such as relative/non-relative care, centre-based, and care-in-the-home. A key strength of these studies is that they follow children over time, allowing researchers to investigate the link between early experience of care and education and subsequent outcomes. In the UK, the Millennium Cohort Study (MCS) shares many of the same features and questions as the *Growing Up in Ireland* study and therefore provides a particularly useful comparison for the results outlined in the current report. Hansen and Hawkes (2009) examined the influence of participation in different forms of childcare at nine months with outcomes at age three. Two measures of cognitive outcomes were used: the vocabulary test of the British Ability Scales (BAS) and a School Readiness measure, also known as the Bracken scale. They found that formal group care at nine months old was positively associated with school readiness at three years old compared to all other forms of care (including parental care), while grandparent care had a positive effect on vocabulary compared to formal group care.<sup>3</sup> The analysis was restricted to children whose mothers were employed, which means that the study under-represents households who used no childcare.

Further MCS research (Hansen & Jones, 2010), examined cognitive development at five years old, and tested the effect of whether the child had ever received formal childcare up to age three. Formal childcare was found to have a very small positive influence on the BAS (overall score based on Naming Vocabulary, Picture Similarities and Pattern Construction), leading to a .07 increase of a standard deviation in test scores.<sup>4</sup> Formal childcare before age three also had a positive effect on children's *Foundation Stage Profiles*, which are teacher-reported achievement scores at the end of the first year of school. Formal childcare also significantly reduced the likelihood of being in the bottom 30 per cent of achievers on both measures. Hansen and Jones also conducted analysis on whether childcare was associated with change in scores from three to five years old. In these 'value-added models', formal childcare was not significant for BAS scores but had a significant positive effect on foundation-stage profile.

Côté et al (2013) also investigated childcare effects on cognitive development among the MCS children, using both Ordinary Least Squares (OLS) regression techniques and propensity score matching. They found that attending any childcare at nine months was positively associated with cognitive development at age three years, but only for children of mothers with low education.<sup>5</sup> Additionally, children who had attended centre-based care before the age of three for at least nine hours per week had higher cognitive development scores at age five years (combined BAS Naming Vocabulary, Picture Similarities and Pattern Construction) than those attending informal care.<sup>6,7</sup> Positive effects of centre-based care were also found for the Foundation Stage Profile results at age five, and these were stronger for children with less-educated mothers.

The Growing Up in Scotland (GUS) longitudinal study also found some positive associations between childcare and cognitive outcomes, but these were weak and only found for one of the scales used. Two of the BAS scales, Naming Vocabulary and Picture Similarities measures, were also used in the study (Bradshaw, 2014a, 2014b). Bradshaw found that children who had not attended any preschool showed a lower improvement on the Picture Similarities test between age three and age five than those who had attended a preschool attached to a school, while those who had attended a private nursery showed a greater improvement. No preschool effects were found for the vocabulary measure at age five either in overall scores or change in scores from age three.<sup>8</sup>

<sup>3</sup> Grandparent care led to a .19 increase of a standard deviation in vocabulary scores compared to formal childcare. The full model accounted for 12 per cent of variance in the vocabulary score and childcare type accounted for 1 per cent.

<sup>4</sup> This compares to an effect of .62 for "mother's ethnicity is Bangladeshi/Pakistani", which is the largest co-efficient. R-squared statistics were not reported and could not be obtained from the authors.

<sup>5</sup> At age three, only the vocabulary scale was used. The effect size (Cohen's D) was .27 for children of lower-educated mothers.

<sup>6</sup> Effect size .31.

<sup>7</sup> The models explain 19 per cent of variance in the BAS scores at age three; 18 per cent at age five, and 17 per cent at age seven (personal communication from Orla Doyle).

<sup>8</sup> The full models, including age three scores, explained 30 per cent of the variance in the naming vocabulary scores at age five and 13 per cent of the variance in the Picture Similarities scores.

In the US, the Study of Early Child Care and Youth Development (SECCYD), carried out by the National Institute of Child Health and Human Development (NICHD) has been used to examine the effects of early childcare (quantity, quality and type) on a range of social and cognitive outcomes. A detailed childcare history was collected, allowing an assessment of the quantity of childcare. This was combined with observational assessments of the quality of care at five time points. Quality was assessed using the Observational Record of the Caregiving Environment (ORCE).<sup>9</sup> Higher-quality childcare was related to school readiness and language development at age four and a half years (NICHD, 2002) and to maths and reading scores at eight years (NICHD, 2005). Greater exposure to centre-based care was associated with improved language skills and memory task performance but more problem behaviours at age four-and-a-half years, and better memory but more conflicted relationships with parents and teachers at age eight years (NICHD ECCRN 2004, 2006).

Belsky et al (2007) used the SECCYD to consider the longer-term effect of early childcare (up to age 4½ years) on children’s functioning at age 11/12 years. The study found that quality childcare measured by the ORCE, regardless of the childcare type, was associated with higher vocabulary scores in 5th grade. The positive effect on reading scores found at 54 months became non-significant as the child aged. The authors caution that the role of parenting on outcomes is much stronger and more consistent than the effect of childcare.

In contrast, research based on the Longitudinal Study of Australian Children (LSAC) found that vocabulary scores at age 4-5 years were lower among those who had attended non-parental care for more than 30 hours per week (Harrison et al, 2008). When hours were taken into account, the type of centre-based care had no significant effect. This is within a context where less than five per cent of the children had not attended any centre-based early childcare or education by age 4-5 years. Those who started non-parental care after age four had lower vocabulary scores. This suggests a puzzling contrasting effect for weekly exposure and exposure since birth. The researchers report that all the care/education variables together accounted for less than 1.4 per cent of the unique variance (Harrison et al, 2008, p141).

The *Growing Up in Ireland* study is the only large-scale national longitudinal survey of children in Ireland. A recent study by Byrne and O’Toole (2015) examined the effects of participation in childcare at nine months and three years on cognitive, socio-emotional and motor-skills development (measures of outcomes at nine months and three years were assessed). The measures of cognitive development used at nine months were from the Ages and Stages Questionnaire (ASQ-2) completed by parents; they assess whether children, for example, show some understanding of basic commands from their parents and are making first efforts to communicate (see Williams et al, 2010, for further details). At age three, the cognitive measures used were the BAS Naming Vocabulary test and the Picture Similarities (non-verbal reasoning) test, which are described in section 1.5 below. The links between childcare and outcomes were tested using regression models controlling for a wide range of relevant factors such as family structure, social class, income, parental education, parental employment and Primary Caregiver’s stress.

At nine months, the authors (Byrne & O’Toole, 2015) found infants in the care of a relative had higher scores for communication and personal/social development, while those in the care of a non-relative had significantly lower communication and problem-solving scores. Infants attending centre-based care had significantly lower communication and gross-motor scores than those in full-time parental care. However, as noted in McGinnity et al (2013), in the majority of cases the children had been in non-parental care for a very short period, and therefore it is not possible to attribute causal relationships. This analysis is also cross-sectional.

The authors also estimated cross-sectional models at age three. No effect of childcare setting, childcare

<sup>9</sup> At six, 15, and 24 months, five rating scales were used: sensitivity to child’s non-distress signals, stimulation of child’s development, positive regard toward child, detachment, and flatness of affect. At 36 months, two further scales were added: “fosters child’s exploration” and “intrusive”. At 54 months, four scales were used: sensitivity/responsivity, stimulation of cognitive development, intrusiveness, and detachment (NICHD, 2005).



hours or multiple childcare arrangements at age three was found for non-verbal reasoning. However, relative care at age three was associated with higher vocabulary scores at age three compared to parental care. Neither hours in care nor multiple care arrangements were associated with vocabulary scores. Childcare characteristics at age three were not found to be linked to socio-emotional outcomes (measured by the Strengths and Difficulties Questionnaire) or gross-motor skills, but participation in centre-based care was positively associated with fine-motor skills as was being in non-parental care for eight to 15 hours (compared to parental care). The effects of type, hours and multiple types of childcare were estimated in separate models so, for example, the results for hours of care did not take into account the type of childcare setting.

Switching to a longitudinal approach, the authors examined the effects of childcare type at age nine months on cognitive (and other) outcomes at age three years. They found that relative-based care at nine months was associated with higher vocabulary scores at three years old compared to full-time parental care, but no childcare effects were found for non-verbal reasoning (ibid, p265). The study also found that transitions from full-time parental care into centre-based care between nine months and three years had a positive impact on socio-emotional development and fine-motor skills, though no effect was found for earlier centre-based care except for a positive effect on gross-motor skills at three years old.

The Effective Provision of Preschool Education (EPPE) project in England falls between the national longitudinal studies and the smaller-scale interventions studies. The study focused only on centre-based preschool education but adopted a large sample (3,000 children in 141 centres) in order to compare outcomes across different types of preschool provision. The study was carried out in six local authority areas in England. An additional 200 children, not participating in any preschool, attending the same schools as the other children were included as a control group. The study began in 1997 and children's cognitive development was assessed at three years, at school entry, end of reception year, and end of years one and two (at six years old). The children were subsequently followed into late primary and secondary education. Cognitive outcomes were measured using the British Ability Scales. As a key focus in the current study is on how variation in the quality of childcare settings is associated with outcomes, the findings of the EPPE study are discussed below (section 1.3.3).

These studies identify a number of common themes that are relevant to child outcomes: quantity of care, quality of care, and differences in impact between social groups. These are discussed in the following sections.

### 1.3.2 QUANTITY OF NON-PARENTAL CARE AND MULTIPLE CARE

Quantity of childcare includes both the months and/or years of care that a child experiences and the duration of childcare in terms of hours per week. Much of the discussion on the effects of the hours of non-parental care relates to very young children (under the age of one year), and the focus has been on non-cognitive outcomes, such as attachment (Brooks-Gunn et al, 2002; Waldfogel et al, 2002; Sylva et al, 2003). Research based on the Early Childhood Longitudinal Study in the US (Loeb et al, 2007) found effects on cognitive development for both starting age and hours or months per year (for the year before the children started kindergarten school).

“The duration of centre-based care matters: the greatest academic benefits are found for those children who start at ages 2–3 rather than at younger or older ages; negative behavioural effects are greater the younger the start age. These patterns are found across the distributions of family income. The intensity of center-based care also matters: more hours per day lead to greater academic benefits, but increased behavioural consequences. However, these intensity effects depend on family income and race.”

This contrasts with the results from the NICHD Early Childcare, which found no link between quantity

of childcare and cognitive-language development at ages 54 months or eight years (NICHD, 2005). As noted above, the NICHD study collected much more detailed information on childcare history and hours of attendance than many other studies in which the childcare was observed only at interview and not between waves.

Other studies have found that multiple forms of care is significantly related to child outcomes; but the significant findings concern negative social-behavioural outcomes rather than cognitive development (Bradshaw & Wasoff, 2009; Morrissey, 2009; Bowes et al, 2003). No association between multiple care types and cognitive outcomes at age three was found among the *Growing Up in Ireland* children (Byrne & O'Toole, 2015). Experiencing multiple forms of care simultaneously was relatively uncommon at nine months – six per cent of all children were in two or more childcare arrangements (ibid, p97).

### 1.3.3 QUALITY OF CHILDCARE

There is a growing body of evidence that quality of care is an important determinant of whether childcare has a beneficial effect on child development. There is also increasing recognition that how the quality of care compares to the home learning environment may be an important factor in the influence of childcare on child cognitive outcomes. This issue is addressed further in section 1.3.6.

The quality of care encompasses both the structure and process (NICHD ECCRN, 2002). Structural features of the care setting include factors such as child-to-staff ratio, physical environment, and staff qualifications. These factors have the advantage of being easy to quantify and to regulate.

Process quality is more difficult to measure. Process quality indicators aim to describe and assess the content of the care itself, and the day-to-day experience of children in childcare, encompassing features such as sensitivity of staff to children's needs, child-caregiver interaction, and learning opportunities (Belsky et al, 2007; Sylva et al, 2004; NICHD ECCRN, 2000b). These process features are usually assessed using direct observations of care settings, which are rated using standardised scales.

The Effective Provision of Preschool Education project (EPPE study) in England used direct observations of care quality in childcare settings, using standardised rating scales. The positive effect of preschool at school entry stage was stronger for higher-quality centres. The researchers found that, at age 11, high-quality preschool was associated with lasting cognitive benefits, while low-quality childcare had no effect. The positive effect of process quality on a variety of cognitive development and other school readiness indicators was also found across four large-scale studies in the US (Keys et al, 2013).

Verbal interactions between carers and children are likely to be particularly relevant for language elements of cognitive development. Theories on language development, especially from an interactionist perspective, suggest that adults – particularly parents – have an important role in 'scaffolding' language development through the use of child-directed speech that is slightly more advanced than the level the child is currently at. According to Tamis-LeMonda and Rodriguez (2009), recent research results suggest that regular participation in learning activities such as shared book-reading, rich and responsive language interactions between caregiver and child, and the availability of age-appropriate learning material, are the most important for language development. Guided play with an adult may be particularly beneficial for language development (Weisberg et al, 2013). The NICHD study found that process quality, particularly language stimulation by the caregiver, was positively related to children's cognitive and linguistic abilities at 15, 24 and 36 months (NICHD ECCRN, 2000).

Turning to structural features of care quality, a review of the research found that child-to-adult ratios were consistently related to process quality and consequently to cognitive outcomes (Huntsman, 2008). Lower child-to-caregiver ratios were associated with better quality of care, assessed through observational rating



scales. Much of the literature cited relates to the US; the strong effect of ratios in the US context may reflect the fact that such ratios are widely divergent in the US. In Ireland and Europe, where ratios are specified in regulations, there is likely to be less variation on this dimension across childcare centres (see policy section 1.4 below). However, the association between lower child-to-staff ratios and process quality was also found in the Millennium Cohort Study in the UK (Roberts et al, 2010).

Evidence from the *Growing Up in Ireland* study, however, suggests that there are considerable differences across different care types, with much lower child-to-adult ratios in relative care (in carer's home) and non-relative care in the child's home (Byrne & O'Toole, 2015). Ratios in non-relative care in the carer's home were somewhat higher, and closer to those for centres (see Chapter 2 for more details). The quality of home-based care is much more infrequently assessed in the literature, and there is conflicting evidence on the effect of group size in home-based care settings (Huntsman, 2008). In the US, the NICHD suggests that home-based care arrangements have higher quality ratings than centre-based care in younger infants aged six and 18 months, but the difference was reduced by the time children were 36 months (NICHD, 2000b).

Other researchers highlight the relationship between the quality of care and the qualifications of staff (Oberhuemer, 2005; OECD, 2006; Burchinal et al, 2002). In her review of the literature, Huntsman (2008, p6) suggests that "the link between levels of caregiver education and/or specialised qualifications, process quality and child outcomes is perhaps the strongest in the research on quality". The EPPE study found preschool settings that had staff with higher qualifications had higher-quality scores and that their children made more progress (Sylva et al, 2003). In a recent UK evaluation of the Graduate Leader Fund,<sup>10</sup> using observational studies, researchers found that settings which gained a graduate leader made significant improvements in quality for preschool children (aged 30 months to five years) as compared with settings which did not. Gains were seen in overall quality and in a number of individual dimensions of practice, including: positive staff-child interactions; support for communication, language and literacy; reasoning/thinking skills and scientific understanding, and provision of a developmentally appropriate schedule (Mathers et al, 2011). Having a graduate leader had less impact on 'structural' aspects of quality, such as the physical environment.<sup>11</sup>

In the absence of observational data on child-caregiver interactions and learning opportunities, staff qualifications may act as a proxy for quality, at least in some settings. However, the use of staff qualifications as a proxy for quality may be more limited in informal home-based settings, particularly where the carer is a relative. Layzer and Goodson (2006) found that the correlation between caregiver's qualifications and process quality was less clear for home-based care (see also NICHD ECCRN, 2000b).

#### 1.3.4 CHILDCARE OUTCOMES FOR SOCIALLY DISADVANTAGED CHILDREN: SOCIAL CLASS AND MIGRANT STATUS

Research has also suggested that the developmental outcomes associated with childcare can vary for different groups of children (for reviews of this issue, see Melhuish, 2004; NESF, 2005; Philips & Lowenstein, 2011). Gambaro et al (2014) note that one of the clearest findings to emerge from research is that gains from childcare are largest for children in low-income or immigrant households, and those with less-educated parents. Many of the evaluation studies of targeted, centre-based early-years programmes provide evidence that is specific to disadvantaged children and children in lone-parent families (Karoly et al, 2005; Camilli et al, 2010).

However, the positive effects for disadvantaged children are not universal. For example, the Fragile Families Child Wellbeing Study in the US found no effect of centre-based care on vocabulary for disadvantaged children at 36 months (Peng & Robins, 2010) but did find that relative care was more beneficial than maternal care in the first year for children's language development. In the UK, Hansen and Hawkes (2009) found that the association between formal group care and school readiness was larger for some more

<sup>10</sup> The Graduate Leader Fund provides funding for those with at least level six qualifications (equivalent to Bachelor's degree level) or who have achieved Early Years Professional Status and lead child care services.

<sup>11</sup> Researchers also did not find any effects of having a graduate leader for those aged under three years, though this may be related to the much lower number of graduate leaders caring for this group.

advantaged groups – two-parent families and children with better-educated mothers, as well as for children living in households claiming benefits. In contrast, the positive effect of grandparent care on vocabulary was only present for children with better-educated mothers, those in two-parent families and those not on benefits (ibid, p230).

The relationship between childcare, disadvantage and developmental outcomes may be further complicated if the quality of care differs for socio-demographic groups. Within a segregated system of provision there is greater likelihood that those from advantaged backgrounds will receive better-quality care. Research in the Netherlands found that the children of parents with higher income and education appeared to attend childcare services with higher-quality emotional support, but there was no difference in instructional support (Akgündüz & Plantenga, 2014). In contrast, the Millennium Cohort Study (MCS) study in the UK found that that, while socially disadvantaged children were less likely to attend centre-based care, when they did they received better-quality care than their social advantaged peers (Roberts et al, 2010).

An increasing number of studies have highlighted the benefits of preschool education for the children of immigrants (Haskins & Tienda, 2011). This is particularly true if their home environment is characterised by low parental education and limited skills in the language of the host country. In Sweden, Fredriksson et al (2010) found that preschool attendance was associated with reduced gaps in the attainment of children of immigrants compared to native-born children. Similar results were found for Germany by Spieß et al (2003). The EPPE study in England found that children from ethnic minority groups and those from non-English-speaking households made greater progress during preschool than white UK children or native English speakers (Sammons et al, 2002).

Children from migrant families may also be less likely to participate in childcare and early education services. *Growing Up in Ireland* research (McGinnity et al, 2013) found that, while just over 50 per cent of children were in non-parental childcare at age three, the proportion was higher for the children of Western European mothers (57 per cent) and much lower for EU Eastern European and African children (around 35 per cent), falling to only one in four Asian children (25 per cent).

Chapter 4 examines whether the association between childcare and cognitive outcomes varies for children whose first language is English and those for whom it is not, as well as those whose mothers have lower and higher levels of education.

### 1.3.5 OTHER FACTORS INFLUENCING CHILDREN'S COGNITIVE DEVELOPMENT

In parallel with concerns about the quality of non-parental care, it is also recognised that children's home learning environment is not homogenous. As noted above, the contrast between the home learning environment and the childcare setting may lead to differential effects of preschool education. The EPPE study found that a positive home learning environment (e.g. reading to child, teaching songs, nursery rhymes, playing with letters and numbers, painting/drawing, etc) had a significant positive influence on children's cognitive progress. The study also found that home learning environment was not strongly correlated with family socio-economic status (SES) or mother's education (Sammons et al, 2002). This has led to the suggestion that the home learning environment can be a source of social resilience and an effective means of counteracting economic disadvantage (Washbrook & Waldfogel, 2011; Sylva et al, 2004).

Effects of non-parental care must also be disentangled from household income and parental resources (including education and social capital resources). The use of non-parental care is strongly linked to maternal employment status, which in turn contributes to household income. Moreover, maternal employment is reflective of mother's education and class background. A significant body of research has demonstrated that childhood poverty is detrimental to children's development in a wide variety of ways (see Cooper & Stewart, 2013 for a recent systematic review). It is also clear that the employment status of mothers and fathers is a key determinant of child poverty and deprivation risks (Russell et al, 2010; Watson et al, 2012a; Watson et al, 2012b).



Previous research has shown that aspects of the child's own temperament, particularly characteristics such as persistence, can be important for cognitive development and educational achievement (Mullola et al, 2010; Taylor, Christensen, Lawrence, Mitrou & Zubrick, 2013). Emotional and behavioural difficulties can also be a barrier to learning (Blair & Razza, 2007; Kristoffersen, Obel & Smith, 2015). Attributes such as inattention are especially disadvantageous in this respect (Grills-Taquechel, Fletcher, Vaughn, Denton & Taylor, 2013). The influence of these factors in the models was, therefore, tested. Parenting style and parental stress may also have an influence on child developmental outcomes, in particular socio-emotional outcomes (Assel et al, 2002; Prevatt, 2003) and factors such as school success (Conger & Donnellan, 2007). In summary, a substantial range of biological/genetic, community, family and individual characteristics have been identified in the literature as influencing children's cognitive outcomes, including maternal well-being, family stress, child learning difficulties/disability/health, siblings, and wider family support (see Hansen & Jones, 2010 for a recent summary). These factors are introduced as controls in our models in Chapters 3 and 4.

In his review of childcare influence on child outcomes, Melhuish (2004, p53) cautions:

"The effect sizes for childcare factors are about half that for family factors. However, family effects incorporate genetic factors. Hence, family and childcare effects are likely to be much more equivalent in terms of environmental influence than this comparison implies. Family factors and childcare quality covary, low-income families tending to have lowest quality care. The analysis strategy of most studies attributes variance to childcare factors only after family factor variance has been extracted. Where the two covary this will produce underestimates or conservative estimates of childcare effects."

### 1.3.6 EVALUATIONS OF EARLY EDUCATION AND CHILDCARE PROGRAMMES IN IRELAND

While the longitudinal studies described above provide the closest comparison for the current study of cognitive outcomes, evidence from evaluations of the specific early childhood care and education programmes in Ireland also provide useful context.

The evaluation literature in Ireland is relatively small and recent. In the late 1990s the first evaluations of the Early Start programme were published. Early Start provided centre-based preschool care for children in disadvantaged areas. The participants in the programme were not randomly selected but rather recruited through parents. Evaluations of cognitive outcomes have been conducted for the first two cohorts of participants (Education Research Centre, 1998; Kelly & Kellaghan, 1999) and later cohorts (Lewis, Shortt & Archer, 2011). The evaluation of the early cohort found no significant differences on cognitive and language tests between participants and non-participants drawn from the primary school classes that the programme participants attended. However, there were some significant differences in teacher ratings of the children's cognitive ability and other traits that are likely to be associated with educational achievement, such as concentration. The implementation of the programme was monitored by the evaluators, including factors such as enrolment and attendance, the nature and duration of classroom activities, staff and pupil interaction, and parental involvement. Shortcomings in the form of low attendance, difficulty reaching parents, insufficient emphasis on cognitive activity, and lack of curricular guidelines and in-service training for staff were identified. These issues were seen as the reason for the absence of a positive effect (Lewis et al, 2011), though shortcomings in the evaluation method also weaken the results.<sup>12</sup>

Evaluation of subsequent Early Start cohorts took place after improvements in the service (Lewis et al, 2011). Teacher assessments of language and cognitive skills (18 tasks for each dimension) were collected shortly after the children had entered primary school. The researchers found that those who had attended Early Start were scored more highly than non-participants. A total of 972 participants and 534 non-participants were included in the study. The models controlled for age, gender, whether the child was a non-native English-speaker and whether respondents had attended other forms of preschool. Interestingly, having

<sup>12</sup> The comparisons of the control group and the participants did not include controls for personal or family characteristics (only a split between whether the control group had received any other type of care) nor were there tests for any centre-specific effects.



attended other forms of preschool (outside the Early Start programme) also had a significant positive effect of a somewhat smaller magnitude, suggesting that the beneficial effects were not confined to the more intensive Early Start programme. A second set of teacher ratings was collected at the end of the second term in Junior Infants. Early Start participants again achieved higher mean ratings, but, when change over the two observations was examined, no significant effect of Early Start was found. No interactions between child characteristics and the programme effects were reported; therefore the results may conceal differences between sub-groups.

More recent policy interventions in Irish preschool provision have also received initial evaluations in terms of impact on child development. An evaluation of the National Early Years Access Initiative (NEYAI), a three-year programme to improve quality and outcomes in the Early Years sector, was recently published (McKeown et al, 2014a and 2014b). The programme consisted of the 11 area-based projects that aim to improve the quality of early education and care, as well as parenting and other family supports (see McKeown et al, 2014a and 2014b, for details). The evaluation focused on a sub-set of the children attending the 2012/13 Free Preschool Year (FPSY), and compared child outcomes in NEYAI schemes to those attending centres running the Síolta Quality Assurance Programme (QAP) (see below). There was no control group of children not participating in preschool, and the authors note that, because of the universal nature of the FPSY and the very high uptake, no such control is available. Nor was there a control group of centres where there was no additional intervention scheme. A total of 49 Early Years centres within the NEYAI schemes were surveyed in both waves and 21 centres in the Síolta QAP. A total of 448 children were present in both waves. The authors emphasise that it was not a representative sample of centres, staff or children in NEYAI, Síolta QAP or the FPSY. The NEYAI programme also included a number of projects to provide support for parents, none of which were evaluated.

The evaluation was implemented by comparing social/emotional and language/cognitive skills at the start of the Free Preschool Year programme and after seven months on the programme.<sup>13</sup> The authors found a significant increase in cognitive/language scores but pointed out that this may be due to natural growth. Comparing change across groups, they found that the significant gaps between groups (e.g. social class) at the outset “for the most part ... remained unchanged or widened during the following seven months on the programme” (McKeown et al, 2014a, p6). They found a narrowing gap in the socio-emotional skills of children from a non-English-speaking background, but the gap in language/cognitive skills remained unchanged. The study also found that the amount of time spent in centre-based care prior to the Free Preschool Year had a positive effect on the child’s progress during that year. No differences were found between NEYAI centres and the Síolta QAP centres.

## 1.4 CARE OF PRESCHOOL CHILDREN: THE POLICY CONTEXT IN IRELAND

For many infants, parental care is the dominant form of care in the early months of their life. State-provided leave entitlements can influence the duration of non-parental care in the first year. In addition, policies to support a combination of paid work and caring may influence the hours of work of the Primary Caregiver, and their ability to adapt their working hours to respond to their child’s needs. This can include the right to work part-time, or at least the right to request part-time work; flexible working hours, and paid time off when the child is sick. The policy landscape in these areas is outlined in section 1.4.1. Section 1.4.2 discusses state support for non-parental care. This includes a discussion of the backdrop to provision, in terms of guiding principles and debates, the balance between cash transfers and service provision, services for disadvantaged children, and the cost of childcare. The different providers of non-parental care and their characteristics and the regulations governing them are briefly outlined. Section 1.4.3 concludes with a look at more recent developments in childcare policy, including the Free Preschool Year, and outlines recent debates on quality of care. The focus is on provision up to the time of the end of Wave 3 of *Growing Up in Ireland* (early 2013), but policy changes since are also mentioned where relevant.



### 1.4.1 PARENTING AND PAID WORK

Debates on child wellbeing highlight the role of maternity leave in incentivising maternal care in the early months (OECD, 2007). Both international and Irish research suggests that the timing of return to work is sensitive to national policy and provision (OECD, 2007; Russell et al, 2011; McGinnity et al, 2013). In Ireland the term maternity leave is used for leave directly related to pregnancy, childbirth and the first months of parenthood. Parental leave, which both parents are entitled to, is additional to this and can be taken until the child is eight years old.

All female employees who become pregnant while in employment in Ireland are entitled to take maternity leave after the birth of their infant, and have the right to return to the same job or to a job on a similar level. Those that satisfy certain qualifying conditions regarding employment<sup>14</sup> are entitled to receive payment from the State during all or part of this leave; this is known as paid maternity leave. Since April 2007, the duration of paid maternity leave is 26 weeks, and unpaid leave 16 weeks. At the time of the birth of the Study Children, there was no legal entitlement to paid paternity leave for fathers, although they could avail of unpaid parental leave.

The duration of total maternity leave provision in Ireland now compares well to other West European countries, though differences in parental leave provision mean the total period of paid leave available to mothers is much longer in most other countries (Moss, 2010, 2012). Parental leave is employment-protected leave of absence to allow employed parents to care for an infant or young child. The 1998 Parental Leave Act introduced a statutory entitlement for both parents to 14 weeks of unpaid parental leave per child. The EU Directive on which the Parental Leave Act is based allowed individual countries to decide whether this should be paid or unpaid; Ireland chose to have unpaid parental leave. This lack of payment means many parents cannot afford to avail of leave, and also that men are less likely to avail of it (see McGinnity et al, 2013 for take-up rates among fathers at nine months). A new directive on parental leave was implemented in Ireland in March 2013. This increases the amount of parental leave available for each child to 18 weeks and allows parents to take this leave until the child is eight years old.

While maternity leave may affect when and if a mother returns to work, the ability to vary working hours to take account of family demands may also influence both when and if women return to work. Such measures could include: the right for parents (or others) to reduce hours when caring for small children; flexible working time or flexi-time; job-sharing, and working from home. In Ireland there is no legislative right for parents to work part-time, as is the case in, for example, France, Germany, the Netherlands, Finland, Belgium and France (Gornick & Meyers, 2003), and in Britain for parents of small children. The closest de facto part-time work provision for parents in Ireland is parental leave, though whether this can be taken in the form of reduced hours or days per week, as opposed to in a continuous block of 18 weeks' leave, is at the discretion of the employer. The new directive on parental leave implemented in March 2013 provides a right for employees returning from parental leave to request flexible working and/or reduced hours for a set period of time, though how many parents actually avail of this is not clear.<sup>15</sup>

Changes in family leave and childcare provision should be seen against a backdrop of a remarkable growth in female employment accompanying the economic boom in Ireland (Russell et al, 2009; McGinnity et al, 2013). In 1992, the employment rate of women in Ireland was 37 per cent; by 2007 it was 61 per cent and had converged with the EU average, though as Russell et al (2009) noted, participation of mothers of young children (under five years) rose less than for mothers of older children (five to 15 years). Russell et al (2014) also noted that the onset of the recession brought the long-term rise in employment rates to an end. By 2012 the employment rate of women aged 15-64 was 55 per cent, though by Quarter 3, 2014 the employment rate had risen to 57 per cent (CSO, 2014a).

In Ireland, research has found very high rates of poverty among lone parents and their children. For

<sup>14</sup> To qualify for paid maternity leave (maternity benefit), the woman needs to (a) have been in insurable employment immediately before the first day of maternity leave and (b) satisfy certain social insurance (PRSI) contribution conditions in the year or years prior to birth.

<sup>15</sup> <http://www.irishstatutebook.ie/2013/en/si/0081.html>. Note this is a right to request: employers may simply say no.

example in 2013, it was estimated that 63 per cent of those living in one-parent households were suffering material deprivation, and over 30 per cent were at risk of income poverty (CSO, 2014b).<sup>16</sup> Lone mothers' participation in the labour market did not rise during the boom, in contrast to other mothers (Russell et al, 2009), and McGinnity et al (2014a) found very high rates of unemployment among lone parents during the recession (based on data from 2012). The costs of paid childcare for lone parents represent a very substantial proportion of their income (see section 1.4.2). Reforms to policy provision for lone parents have been on the policy agenda for some years now, and additional job search requirements have been introduced for lone parents (Murphy, 2008; Murphy et al, 2008). From July 2015 entitlement to the one-parent family payment ceases when the claimant's youngest child turns seven. Advocacy groups have criticised this change in the face of inadequate affordable after-school childcare provision.<sup>17</sup>

#### 1.4.2 STATE SUPPORT FOR NON-PARENTAL CARE FOR PRESCHOOL CHILDREN

There have been a number of competing objectives in State support for childcare in Ireland in the past 20 years. Significantly, the Government tried to steer a course that was neutral in terms of providing support for care in the home by parents and care outside the home (McGinnity et al, 2013). One example of this principle is that the Government's preferred policy instrument for supporting families has been direct cash payments to parents that have not been conditional on labour-market participation. As demand for financial support for childcare rose during the economic boom, from the early 1990s to 2007, the policy response was to increase direct cash payments with respect to children in the form of Child Benefit. On top of this, in 2006 an Early Childcare Supplement was introduced, though it was abolished in 2009. As the OECD (2007) argued, raising Child Benefit, which is paid regardless of whether or not parents are working, is a poorly targeted expenditure in terms of childcare, though it may have other objectives, such as contributing to meeting the cost of raising children and combating child poverty.

Another important element of policy in Ireland is that, as demand for childcare rose during the boom, much financial support was indirectly provided in the form of capital grants to encourage private and community sector provision. This is in contrast to many other northern and continental European countries where the emphasis is on State provision and regulation of services. Capital grants were available to both private and community sector services, and there was a massive expansion of childcare places between 2000 and 2010. Community sector services make up around 25 per cent of services and typically serve disadvantaged communities (Pobal, 2014). The Community Childcare Subvention (CCS) scheme subsidises approximately 25,000 places in participating community-based providers. The maximum subsidy is €95 per week, which is significantly lower than the costs of delivery. One problem with this scheme is that in some areas there are no community providers and therefore no access to this support for disadvantaged children (Start Strong, 2014). Another smaller scheme, the Childcare Education and Training Support (CETS) programme, offers some financial support for parents' participation in education or training schemes. CETS subsidises almost 2,500 places at any given time and there is a maximum price cap for parental contributions of €25 per week.

A number of targeted interventions directed at early childcare and education, literacy and classroom behaviour have been introduced in the last decade, supported by Atlantic Philanthropies and the Irish Government. The main programmes, in terms of scope and spending, are Young Ballymun, the Childhood Development Initiative (Tallaght) and Preparing for Life (Darndale) (see Paulsell & Pickens Jewell, 2012 for more details). These interventions are area-based and in disadvantaged urban areas of Dublin. The National Early Years Access Initiative (NEYAI) covers an additional 11 local projects (see section 1.3.6 above for a discussion of recent evaluations).

However, for the large majority of parents of children before they start preschool, there was and still is no financial support for childcare. Part-time provision introduced for preschool children aged three years, two months and over, in the form of the Free Preschool Year in 2010, is a notable exception to this, and

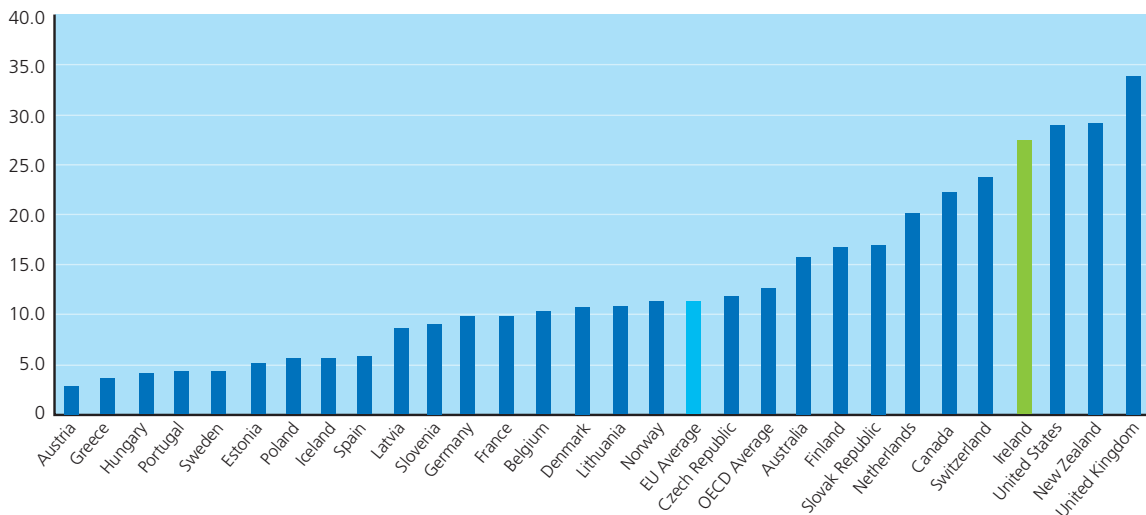
<sup>16</sup> Deprivation is measured as enforced lack of two or more items relating to food, clothing and heat; 'at risk of income poverty' is calculated as below 60 per cent of median household equivalised income. See CSO, 2014b for more details.

<sup>17</sup> <http://oireachtasdebates.oireachtas.ie/Debates%20Authoring/DebatesWebPack.nsf/committeetakes/EDJ2015021800002?opendocument#K00100>



is discussed below. The cost of childcare for families in Ireland is among the highest in the EU. Figure 1.1 presents the net childcare costs for a dual-earner family earning 150 per cent of the average wage and using full-time childcare arrangements in 2012. The costs amount to just over 27 per cent of the family’s net income in Ireland, compared to an OECD average of just over 12 per cent and an EU average of 11 per cent.

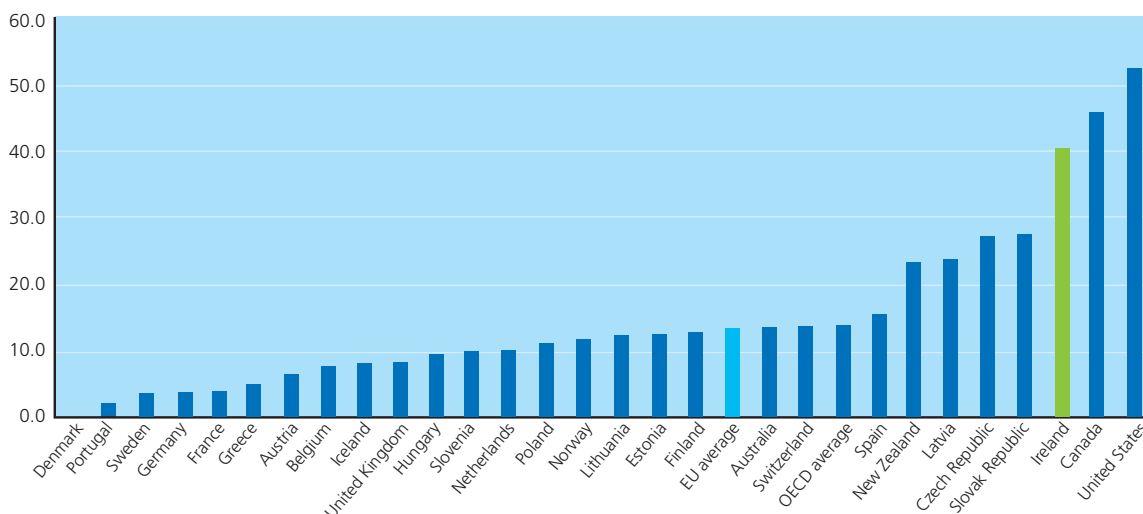
**Figure 1.1: Net childcare costs in OECD countries for a dual-earner family with full-time earnings of 150 per cent of the average wage, 2012**



Source: OECD (2014), OECD Family Database, OECD, Paris ([www.oecd.org/social/family/database](http://www.oecd.org/social/family/database)). Chart PF3.4.B, excluding Bulgaria, Israel, Japan, Korea, Luxembourg and Malta for reasons of space.

For a single-parent family, the net costs of childcare are even higher (see Figure 1.2). The OECD estimates that, for a single-parent family in 2012 where the parent is earning 50 per cent of the average wage, childcare costs represent 40 per cent of the family’s net income in Ireland.

**Figure 1.2: Net childcare costs in OECD countries for a sole-parent family with full-time earnings of 50 per cent of the average wage, 2012**



Source: OECD (2014), OECD Family Database, OECD, Paris ([www.oecd.org/social/family/database](http://www.oecd.org/social/family/database)). Chart PF3.4.C, excluding Bulgaria, Israel, Japan, Korea, Luxembourg and Malta for reasons of space.

An influential report by UNICEF rated 25 affluent countries on 10 benchmarks relating to the provision of early childhood education and care (ECCE) (UNICEF, 2008). Ireland came in joint last, achieving only one benchmark. There has been progress on some of these policy indicators since this report (see below), but state financial support for and investment in non-parental childcare in Ireland is still very low in the comparative context. Public investment in Ireland's preschool services amounts to less than 0.2% of GDP (Start Strong, 2015).<sup>18</sup> The average investment in OECD countries has recently increased to 0.8% of GDP (OECD, 2014).

The choice of childcare arrangement (parental, formal and/or informal care) is influenced by a wide range of factors, but affordability is one of the most influential. There is a wide network of paid carers who look after children in either the child's home (usually referred to as an 'au-pair' or 'nanny') or the carer's home (usually called childminders). Given the costs of formal care, it is hardly surprising that previous data show a high reliance on informal childcare arrangements in Ireland, particularly relatives. For example, in the first *Growing Up in Ireland* wave when the children were aged nine months, relatives provided the bulk of non-parental childcare (42 per cent), followed by non-relatives in a home-based setting (31 per cent), while only 27 per cent of care was in childcare centres (McGinnity et al, 2013). In Chapter 2, the type of care used when the children were aged three years is outlined.

Adult-to-child ratios are specified to range from 1:3 for children aged under one year in full-time daycare; 1:5 for one to two-year-olds; 1:6 for two to three-year-olds and 1:8 for children over three years old (Department of Health and Children, 2006). Ratios are somewhat higher for those participating in the Free Preschool Year (see below for details). Childminders may not look after more than five preschool children, including their own, or more than two children under 15 months old.

### 1.4.3 RECENT DEVELOPMENTS IN CHILDCARE POLICY AND DEBATES ON QUALITY

The introduction in January 2010 of the Free Preschool Year, which is available in the academic year preceding school entry, represents an important development in childcare policy. It replaced a universal cash supplement (Early Childcare Supplement) with an early care and education service, albeit for a limited number of hours. Children can start the scheme at any age between three years, two months and four years, seven months, and it is estimated that it now has around 95 per cent take-up. Children typically attend for 15 hours per week spread over 38 weeks per year, in line with school terms. This option must be made available at zero cost to parents. Parents may also choose to pay for additional or 'top up' hours at the same childcare setting if this option is offered by the childcare provider (see Chapter 2).

The Free Preschool Year scheme includes qualification requirements for carers, albeit at a low level, and only in relation to preschool leaders in the free preschool year; leaders are required to have at least a qualification at level five on the National Framework of Qualifications (NFQ).<sup>19</sup> A higher capitation fee is payable to preschool service providers where all the preschool leaders delivering the preschool service hold a nationally accredited major award in Early Childhood Care and Education at level seven on the NFQ (that is, an ordinary Bachelor's degree)<sup>20</sup> or equivalent, and have three years' experience working in the sector, and where all the preschool assistants in the service hold a relevant major award in childcare/early education at level five on the NFQ or its equivalent.<sup>21</sup> This has some parallels to the Graduate Leader Fund in the UK. With effect from September 2012, new staff ratios apply in respect of the preschool session element of services for service providers participating in the ECCE programme. The minimum number of preschool leaders and assistants in the Free Preschool Year service is as follows: up to 11 children: one preschool leader; 12-22 children: one preschool leader and one preschool assistant; 23-33 children: two preschool leaders and one preschool assistant; 34-44 children: two preschool leaders and two preschool assistants, and so on. The maximum group size permitted is 22 children per room.

<sup>18</sup> OECD (2014), OECD Family Database. The published OECD figure for Ireland (0.5%) includes the infant classes of primary schools (nearly 0.4% of GDP). Excluding this, preschool spending in Ireland is 0.16% of GDP.

<sup>19</sup> Higher qualifications are required from September 2015; see Box 1.1 below.

<sup>20</sup> See [www.nfq.ie](http://www.nfq.ie) for details of qualification levels.

<sup>21</sup> For further information see: [http://www.dcy.gov.ie/viewdoc.asp?fn=/documents/childcare/ECCE\\_July\\_013/ECCEGuidelines.htm#2.3](http://www.dcy.gov.ie/viewdoc.asp?fn=/documents/childcare/ECCE_July_013/ECCEGuidelines.htm#2.3)



Recent contributions on childcare policy in Ireland have highlighted the importance of the quality of care, the qualifications and the professionalisation of childcare work. For example, the Department of Education and Science published 'Developing the workforce in the early childhood care and education sector: Background discussion paper' in 2009, which highlighted the importance of quality, and the relationship between quality and staff qualifications (DES, 2009). This is consistent with international literature, discussed earlier in this chapter, which highlights the relationship between the qualifications of staff and the quality of service provision. Minimal qualification requirements were introduced with the Free Preschool Year, as noted above, and there is a financial incentive – in the form of a higher capitation grant – for childcare providers to employ a graduate leader in this scheme.

In the only recent Irish research study of its kind, Neylon (2014) undertook an observational assessment of 26 preschool centres in Ireland, applying the internationally recognised Early Childhood Environment Rating Scale (ECERS/E). The study combines observational data and discussion with the practitioner. Four categories were investigated: literacy, mathematics, science and environment, and diversity. Each category consists of a number of indicators or sub-scales, and these are rated by the observer as being 'inadequate', 'minimal', 'good' or 'excellent'. In the area of literacy, the average rating was 'minimal' on five of the six sub-scales; on the four mathematics sub-scales the average score was 'minimal'. The average on each of the five 'science' sub-scales failed to reach the 'minimal' standard; in the diversity category, the average score on the three sub-scales was 'inadequate'. For some of the items, it is possible that the observation window was too short, but the study raises concerns about the quality of provision in the sample 26 preschool services observed. Neylon (2014) was also critical of the inspection regime in Ireland, which relies on inspection by public health nurses rather than those with expertise in early childhood education and care, and which focuses on health and safety more than quality of instruction.

Analysis of the information contained in inspection reports was carried out in 2013 (Hanafin, 2014). Just over 3,000 inspection reports were included in the analysis. Hanafin found that the levels of non-compliance were highest in relation to management and staffing (46 per cent of services were non-compliant), safety measures (43 per cent), maintenance of records (35 per cent), premises and facilities (28 per cent), sanitary accommodation (25 per cent), and register of pre-school children (20 per cent). For 12 of the 27 regulations the non-compliance rate was below 10 per cent.

In early 2012, the Minister for Children and Youth Affairs announced that Ireland's first National Early Years Strategy for children aged 0-6 years would be developed during the course of 2012, and an expert advisory group was established. The report of the advisory group, 'Right from the Start', was published in autumn 2013 (DCYA, 2013). Two of the five main challenges that the advisory group highlighted for action over the next five years relate to early childhood care and education. First, they recommended that the National Early Years Strategy should ensure that investment in ECCE rises to 0.7 per cent of GDP in five years and to one per cent of GDP in 10 years. Secondly, they recommended enhancing the quality of ECCE through investment in training, mentoring and professionalisation of childcare workers, and higher standards, and, conditional on achieving higher standards, increasing free preschool provision entitlement from the child's third birthday until they enter primary school.

In May 2013, an RTE (the national broadcaster) 'Prime Time Investigates' documentary, 'A Breach of Trust', used footage by undercover investigators to document malpractice in a number of crèches in Ireland. The programme was particularly critical of the nature of regulation of centre-based care settings in Ireland, and caused considerable public debate. In June 2013, the then Minister for Children and Youth Affairs announced what she termed a "Preschool Quality Agenda" – a series of measures to address some of the failings highlighted by 'Prime Time Investigates'. The elements of the agenda are outlined in Table 1.1, and the most recent policy developments in the area are covered in Box 1.1.

**Table 1.1: Preschool Quality Agenda**

1	Increase the required qualification standards of childcare staff
2	Support implementation of Síolta* and Aistear,** including examining the establishment of nationwide mentoring supports
3	Implement new National Preschool Standards
4	Introduce registration of all childcare providers
5	Develop a more robust, consistent and regular inspection system
6	Publish inspection reports
7	Ensure action is taken in response to findings of non-compliance
8	Increase sanctions for non-compliant childcare providers

\* Síolta, the National Quality Framework

\*\* Aistear: the Early Childhood Curriculum Framework

**Box 1.1: Developments in childcare policy in Ireland since 2014**

Minimum qualification requirements for staff in the sector have recently been introduced. From September 2015 all staff in Early Years services will need to have full level five qualifications, and all Preschool (ECCE) Room Leaders will need a full level six qualification.<sup>22</sup> The Learner Fund 2014-2015, launched by the Department of Children and Youth Affairs (DCYA), will provide a training subsidy to assist existing staff working directly with children in registered Early Years services to attain these mandatory minimum qualifications. In 2014 a new National Early Years Quality Support Service was established to provide support for Early Years education and care practitioners in implementing the guidance contained in Síolta, the National Quality Framework, and Aistear, the Early Childhood Curriculum Framework.<sup>23</sup>

Evaluating progress on this agenda one year on, two leading academics on child development and ECCE were highly critical (Greene & Hayes, 2014). In relation to the qualifications of providers, they argued that, while the requirement for level-five qualification was an improvement, it set a very low bar; they noted that the qualification was “currently delivered by multiple providers, of varying quality and limited accountability, with some programmes solely online ... there is no system of external evaluation; and there is no mandated supervised placement of students”. In their article, ‘Rapid Change without Transformation’, Wolfe et al (2013) argued that, despite marked change in policy and provision in the past 20 years, a traditional policy paradigm remained, where the State’s role in service delivery was limited, the State was reluctant to intervene in family policy, and education was prioritised over care. Perhaps a more salient issue for the current report is the implications of policy for the lives of children themselves, a key focus of this report, bearing in mind that the fieldwork for the survey of five-year-olds was carried out in early 2013 and that any policy changes regarding preschool children since then will have had no effect on the *Growing Up in Ireland* cohort of children.

<sup>22</sup> See [www.nfq.ie](http://www.nfq.ie) for further details on the National Framework of Qualifications.

<sup>23</sup> <https://www.pobal.ie/News/Pages/EarlyYearsSupportService.aspx>



## 1.5 DATA AND METHODOLOGY

The following section summarises the key points about the *Growing Up in Ireland* study and the variables used in this report.

### 1.5.1 ABOUT GROWING UP IN IRELAND

#### Sampling and weighting of the Infant Cohort

For the Infant Cohort of the *Growing Up in Ireland* study, there was an initial sample of 11,134 children aged nine months at the time of the first interview (Wave 1) in 2007/2008. The sample was selected in a systematic random sample from the Child Benefit Register; further details are available in a separate publication (Thornton et al, 2013). The same participating children were revisited at age three years (Wave 2, Jan-Aug 2011) and again at age five years (Wave 3, Mar-Sep 2013), when the completed samples totalled 9,793 and 9,240 respectively.<sup>24</sup> A weight was created for the dataset such that the sample would be nationally representative of the relevant population (see Thornton et al, 2013 for further details on the creation of weights in *Growing Up in Ireland*). In this report, descriptive statistics are proportionally weighted but regression models are presented unweighted.<sup>25</sup>

#### Procedures and participants

Most information on the Study Infants was collected via a face-to-face interview with the child's Primary Caregiver in the family home. The spouse/partner of the Primary Caregiver was also interviewed if resident in the home as the Secondary Caregiver. In most cases, the Primary and Secondary Caregiver were the biological mother and father respectively. At Waves 2 and 3, the interviewer also directly administered a standardised cognitive assessment to the child in the home as part of the interview (more details on these tests are given below).

### 1.5.2 MEASURES USED IN THIS REPORT

The principal outcome measures in this report were the results of the cognitive tests at age five years (see below). Most of the predictor and control variables in the regression models were measured at age three years, with the exceptions of low birth-weight, school status and gender. In the following chapter, descriptive statistics are also provided for childcare use and school-start for the children at age five years.

#### Cognitive tests

The cognitive tests used in *Growing Up in Ireland* were the Picture Similarities and Naming Vocabulary scales from the British Ability Scales (BAS; Elliott, Smith & McCulloch, 1996), measuring non-verbal reasoning and expressive vocabulary respectively. The Picture Similarities test belongs to the 'Pictorial Reasoning Ability' cluster and Naming Vocabulary to the 'Verbal Ability' cluster.<sup>26</sup> One of the particularly beneficial features of the British Ability Scales is that the core sub-tests are individually interpretable: to assess the level of performance it is not necessary to complete all tests in the battery (Elliot et al, 1997). This makes it particularly suitable for collection in a time-restricted survey setting such as the *Growing Up in Ireland* study.

Both tests were administered in the home by the interviewer. All interviewers received detailed training on the implementation of the tests. In the Picture Similarities test, children were shown a page with four pictures and given a card with a fifth picture on it. The child was asked to match the picture on the card to one of the four pictures based on something they had in common (e.g. a sock with a foot, bird with a helicopter, although later items were more abstract). In the Naming Vocabulary test, the interviewer showed the child pictures (drawings rather than photographs) of everyday objects (e.g. a chair) and the child had to say the name of the object (in English). Only children whose Primary Caregiver judged them to have sufficient English attempted the vocabulary test; the Picture Similarities test required English only

<sup>24</sup> The five year sample includes a sub-sample of twins which is not included in the public access file, which contains 9,001 children.

<sup>25</sup> The weights in this sample are all relatively small; and the assumption is that the models will control for any factors associated with non-response. Estimating the models unweighted means no standard error correction is required.

<sup>26</sup> A cluster is the group of scales/measures that are thought to measure a particular aspect of ability within the entire battery that makes up the British Ability Scales. The 'pictorial reasoning' ability cluster is conceptualised as a measure of fluid intelligence involving the "perception of visual stimuli and their interpretation by means of information retrieved from long-term memory". In the full battery it is made up of the Picture Similarities test and another test called Early Number Concepts (not used in *Growing Up in Ireland*). In contrast, the 'verbal ability' cluster is thought to be a test of crystallised intelligence and measures "acquired verbal concepts and knowledge". The Naming Vocabulary test and another scale called Verbal Comprehension (not used in *Growing Up in Ireland*) together make up the verbal ability cluster. The full battery of the British Ability Scales also has a 'spatial ability' cluster but this is not assessed in *Growing Up in Ireland*.



to understand the instructions, as responses were given by gesture.

The non-verbal reasoning (Picture Similarities) test was administered first. Teaching was provided on the first two items of each test if the child got them wrong or failed to give an answer; no further feedback was provided after this. For both tests, the children's answers were recorded as correct or incorrect by the interviewer, using a software program that automatically determined the appropriate stopping point on the test. In the case of the vocabulary measure, reminder instructions were provided to the interviewer on-screen as to what constituted an acceptable answer; for the reasoning measure, a note of the correct card for each sequence was given.

The tests produce raw scores, which were transformed to standardised 'ability scores'; these were converted to t-scores, using the tables provided in the test manual. In *Growing Up in Ireland* at age five, the vocabulary score varied from 20 to 80 and had a mean of 54 and a standard deviation of 13 for the full sample of children with valid scores. For non-verbal reasoning at age five, the score varied from 20 to 80 and had a mean of 57 and a standard deviation of 11.<sup>27</sup> The same tests were completed at both ages three and five years, although different tables were used to convert to t-scores for the different ages.

### Psychometrics

Both tests went through an extensive piloting period for *Growing Up in Ireland* (Murray, McCrory & Williams, 2014). In addition, both tests had previously been used in a similar environment by other cohort studies such as the Millennium Cohort Study and Growing Up in Scotland.

The test authors (Elliott et al, 1997) reported internal reliability of .86 and specificity of .40 for the vocabulary scale at ages 3.0 to 3.5 years, and comparable figures of .65 and .34 for ages 5.0 to 5.11. For the 'non-verbal reasoning' measure, they reported internal reliabilities of .82 and .81 at the early and later ages respectively, and specificities of .43 and .65. The inter-correlations with the overall General Conceptual Ability score were .77 and .75 respectively for the vocabulary and reasoning tests for ages 2.6 to 3.5 years; and .72 and .63 for ages 3.6 to 5:11 years. Test-retest reliability at age 3.6 to 4.5 years (after approximately one-month interval) was good for the Naming Vocabulary measure ( $r=.81$ ) but decidedly modest for non-verbal reasoning ( $r=.56$ ). For children aged 5.0 to 6.3 years, the corresponding figures were .89 for vocabulary and .63 for non-verbal reasoning.

Elliott et al (1997) also reported that the correlation between the vocabulary test and the Verbal IQ score on the Wechsler Preschool and Primary Scale of Intelligence – Revised (WPPSI-R) was .68 (.15 for the Performance, i.e. non-verbal, IQ), based on a sample of children aged between 3:6 and 5:10 years. Similarly, the correlations between the WPPSI-R Verbal and Performance IQs, and the non-verbal reasoning test were .52 and .47 respectively, suggesting that this measure was less specific to a particular ability than the vocabulary measure. Williams, Murray, McCrory and McNally (2013) noted that *Growing Up in Ireland* infants who had received low scores on measures of communication and problem-solving skills at nine months had lower scores on the vocabulary and non-verbal reasoning measures (respectively) at three years, although the gap was more marked for the vocabulary measure. By age five years in *Growing Up in Ireland*, the correlation between Wave 2 and Wave 3 scores (i.e. age 3 and 5) was .51 for the vocabulary measure and .30 for non-verbal reasoning (both statistically significant at the <1 per cent level).

When test scores for age five years were compared with later ratings of ability by the teacher, children who were described as 'average' had scored better on the corresponding test than those rated as 'below' or 'well below' average – but not as high as those children later rated as 'above' or 'well above' average. For example, as shown in Table 1.2, five-year-olds who were rated by their teacher as 'average' for speaking and listening in English had a mean score of 54.4 on the Naming Vocabulary measure (administered in the home some months previously) compared to a score of 60.8 for those rated as 'well above average' and



just 38.6 for those later described as ‘well below average’. Similar trends were evident when comparing vocabulary measures against teacher rating of ability in reading (English) and a comparison of non-verbal reasoning scores with teacher ratings of maths and science ability (also Table 1.2).

**Table 1.2: Comparison of scores on Naming Vocabulary and Picture Similarities tests (age 5 years) with later teacher rating of ability**

Teacher rating	Naming Vocabulary		Picture Similarities (non-verbal reasoning)	
	Speaking and listening in English	Reading in English	Science	Maths and numeracy
Well above average	60.8***	60.5***	61.3***	61.1***
Above average	58.4***	57.8***	60.6***	60.2***
Average	54.4	54.8	58.7	58.6
Below average	46.6***	50.1***	53.1***	54.5***
Well below average	38.6***	42.6***	49.0***	50.6***

\*\*\* Significantly different from ‘average’ children at  $p \leq .001$ ; analysed with one-way ANOVA with Bonferroni post-hoc tests

### Non-parental care

At age three years, Primary Caregivers were asked to provide details on non-parental care for the Study Child if used for at least eight hours per week on a regular basis. It was possible for Primary Caregivers to give information on more than one type of care, but the central classification in this report refers to the main type. **Main type of care** is categorised as care by a relative (e.g. grandparent or aunt/uncle), non-relative (childminder or au-pair/nanny) or centre (e.g. crèche) compared to parental care only.

Other characteristics of non-parental childcare used in this report are hours of care at three years (**more or less than 30 hours of non-parental care per week**), and whether there was any regular **non-parental care at Wave 1** (age nine months). Descriptive statistics for childcare use at age five years are categorised in the same way as for age three years.

### Child characteristics

Several variables associated with the child were included in the models, including **gender** and **low birth-weight** (defined as less than 2,500g). With the further exception of **school status** (whether child had started school by time of interview at age five years), the remaining child variables relate to age three years and are summarised below. Parents reported whether the child’s first language was **English** or another language. Two variables were created in relation to other children in the household: whether or not there was a **child the same age or older** than the Study Child in the household, and separately if a **younger child** had joined the household since Wave 1.

### The Strengths and Difficulties Questionnaire

Two sub-scales of the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) were used in the models for this report. The SDQ is a parent-report measure of a child’s behaviour that has been widely used in other cohort studies and elsewhere. The instrument produces scores for five sub-scales. The **hyperactivity/inattention** subscale (e.g. ‘child is constantly fidgeting and squirming’) and **peer problems** subscale (e.g. ‘child is rather solitary, tends to play alone’) are the two used here.<sup>28</sup> Scores on each sub-scale range between 0 and 10, with higher scores indicating more problems. Cronbach’s alpha was .66 on the hyperactivity/inattention sub-scale but a more modest .43 for the peer problems.

<sup>28</sup> Only sub-scales that made a statistically significant contribution to the final model were retained. Other child characteristics (at three years) which were investigated in the course of developing the model, but were excluded as they did not reach statistical significance for either measure in the final model, were: child’s health status; persistent, sociable or reactive temperament; emotional, conduct and pro-social sub-scales of the Strengths and Difficulties Questionnaire; parental warmth and parental hostility.

### Parental and household characteristics

All the parental and household variables refer to measurements at Wave 2, when the Study Child was three years old, including the Primary Caregiver's age in years and whether or not s/he had a resident spouse/partner. Other variables are summarised below:

#### Primary Caregiver's education

Educational attainment was based on the highest qualification obtained. These were grouped into lower secondary or less, upper secondary (e.g. Leaving Certificate), non-degree (e.g. certificate or diploma level) and degree-level or above.

#### Household income

Primary Caregivers provided an exact figure or best-guess estimate of household income (net of tax, PRSI, etc). This figure was then equivalised depending on the number of adults and children in the household, and divided into quintiles, with the highest (fifth) quintile being the wealthiest families. An additional dummy was created to cover cases where income information was not available.

#### Consistent parenting

Consistent parenting was measured using a five-item sub-scale developed by the Longitudinal Study of Australian Children. It included items such as 'how often does the Study Child get away with things that you feel should have been punished?' The score represents the average of all items, so possible scores range between one and five, with higher scores indicating greater consistency. This report used the consistency measure for the Primary Caregiver. Cronbach's alpha for this sub-scale at age three years was .69.

#### Parental stress experienced by Primary Caregiver

In *Growing Up in Ireland*, parental stress was measured using a six-item stressors sub-scale taken from the Parental Stress Scale (Berry & Jones, 1995), which included statements about stress, worry and financial burden (in relation to the child). An example of one of the items is 'caring for my child sometimes takes more time and energy than I have to give'. Higher scores indicate higher levels of stress. These items were self-completed by the Primary Caregiver on a separate supplemental questionnaire. Cronbach's alpha for this sub-scale at age three years was .77.

#### Home learning environment

The following variables were also recorded at Wave 2, when the Study Child was three years old. They are used here as indicators of the level of cognitive stimulation available to the child in his or her home, and, to some extent, the attitudes of parents to early learning opportunities.

#### Engagement in learning activities at home

The Primary Caregiver was asked on how many days per week someone at home engaged in different play and learning activities with the Study Child, from 0 to 7 days (i.e. every day). There were six activities, as follows: reading to the child; helping child learn the alphabet; learn numbers or counting; learn songs, poems or nursery rhymes; play games such as board games or jigsaws; art activities such as painting and modelling clay.<sup>29</sup> The answers to each activity were summed to give a possible total for **home learning activities** of between 0 and 42. The internal consistency of these items was good, with a Cronbach's alpha of .70.

#### Number of books in the home

The Primary Caregiver estimated the number of children's books available to the Study Child in the home as falling into a category of 'none', 'less than 10', '10 to 20', '21 to 30' or 'more than 30'. For this analysis, the two lowest categories were merged into a single 'none or less than 10' category due to the small number of families reporting no children's books at all.



### Grandparental involvement

Primary Caregivers reported on the frequency of contact between grandparents and the three-year-old Study Child; specifically how often grandparents babysat, had the child to stay overnight, took him/her out, and helped the child with letters and numbers. Frequency for each activity was indicated on a six-point scale that ranged from 'never' to 'every day or almost every day', which was recoded as 0 to 5.<sup>30</sup> The responses for the four items were then added together to give a total score of between 0 and 20. Internal consistency was very good, with Cronbach's alpha of .83.

### 1.5.3 INFORMATION ON FREE PRESCHOOL YEAR PROVIDERS

At the time of the household interview at age five years, parents of children who had participated in the Free Preschool Year (FPSY) scheme were asked for their permission to link with the official records kept on the preschool the Study Child had attended. These records are based on returns made by participating centres to the Department of Children and Youth Affairs (DCYA) in order to claim monies owing from the scheme.

For the purpose of this report, a dataset containing the information from preschools attended by *Growing Up in Ireland* children was provided to the Study Team by the DCYA<sup>31</sup> who matched it to the *Growing Up in Ireland* data for relevant individuals. In total, it was possible to match FPSY data for 6,586 *Growing Up in Ireland* children, which represents 78 per cent of the *Growing Up in Ireland* children who participated in the FPSY scheme. All analyses using information on the centres are based on these children. Checks confirmed that the children for whom centre information was available were very similar to those for whom the information was unavailable, in terms of income quintile, number of children in the household, linguistic background and whether the child had started school. Centre information was slightly less likely to be available for children living in one-parent households with two or more children and whose Primary Caregivers had lower education, but differences were small.<sup>32</sup>

Two variables from this dataset were used in this report. These were: (a) whether the preschool claimed a higher rate of capitation fee and (b) whether the preschool was community-based or a privately run enterprise. The higher rate of capitation fee is payable to centres where all the leaders on the scheme are graduates with a degree in childhood or early education and have at least three years' experience working in the childcare sector, and where all the assistants have a major award in childcare or early education of at least level five on the National Framework for Qualifications.

<sup>30</sup> Where Primary Caregivers said the child was not in regular contact with any grandparents (and hence were not asked the various activity questions), an answer of 'never' was recorded for each grandparent activity.

<sup>31</sup> The Study Team thanks the DCYA for their assistance in collating these data.

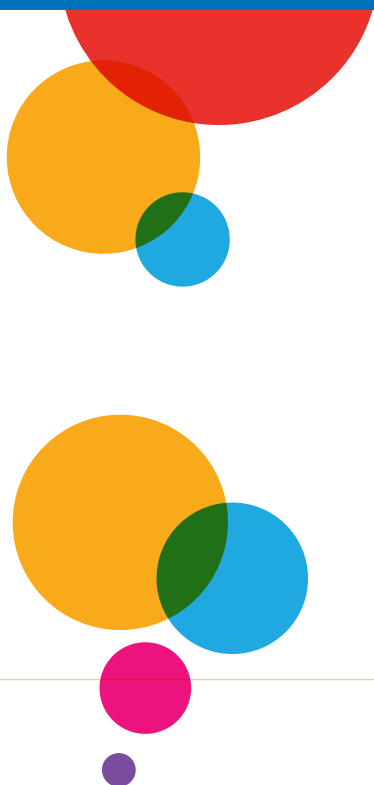
<sup>32</sup> In no case did the proportion of the group for whom information was available drop below 70 per cent. Information is available from the authors on request.





# Chapter 2

NON-PARENTAL CARE AND EARLY  
EDUCATION IN THE FIRST FIVE YEARS



## 2.1 INTRODUCTION

Use of non-parental childcare in Ireland has much increased in the last twenty years, mirroring a very rapid increase in female labour-market participation. There have also been substantial changes in public attitudes and policy towards educational and care services for preschool children, as outlined in the previous chapter. Yet as is clear from the previous research in Ireland and elsewhere, the use of non-parental childcare is still strongly socially patterned, as is the type of childcare used (see Chapter 1). The nature of provision is also highly variable across countries, and is shaped by policy decisions on the role of the family, the market, the not-for-profit sector and the State in providing care and early education. In this context, it is important to outline the extent and nature of non-parental care experienced by the children in the *Growing Up in Ireland* study in the early years of life. The chapter begins with a description of non-parental care at nine months and at three years; because the association between these experiences and later outcomes is explored in Chapter 3. In section 2.3 below, information from the Wave 3 survey at age 5, is used to examine the take-up of the Free Pre School Year (FPSY) and to examine patterns of school start. Additional information on the centre (i.e. administrative data not directly collected as part of *Growing Up in Ireland*) where the children undertook the FPSY is also described.

## 2.2 NON-PARENTAL CARE IN THE FIRST THREE YEARS

The use of non-parental care and the choice of childcare setting at nine months were examined in detail by McGinnity et al (2013). Information on the situation at age three was presented in the main report on 'Development from Birth to Three Years' (Williams et al, 2013), and further analysis is included in Byrne and O'Toole (2015).

At nine months, the Primary Caregiver was asked if the Study Child was regularly cared for each week by someone other than themselves or the resident partner. No lower hours limit was included in the definition of regular care at nine months, but less than 10 per cent of the children in childcare received fewer than eight hours care per week (see Table 2.1 below). At age three, the Primary Caregiver was asked if the child was being cared for by someone else for at least eight hours per week.

### TYPE OF CARE

Overall, 39 per cent of children were in regular non-parental childcare at nine months, and this figure rose to 50 per cent at three years. Between the nine-month and three-year interviews, Ireland entered a deep recession, with the unemployment rate rising from five per cent in early 2008 to 14 per cent in early 2011. The recession and labour-market contraction are likely to have dampened demand for non-parental childcare, meaning that change was less than it might have been without the economic crash. At nine months, the most common form of main care was care by a relative; combining those cared for in the relative's home and the child's home, relative care was the main form of care for 42 per cent of nine-month-olds in care. A total of 30 per cent were cared for by a non-relative and a further 27 per cent were in centre-based care.

While the increase in non-parental care between nine months and three years was not dramatic, there was a distinct shift in the type of care used. Centre-based care had become the main form of care for more than half of the children, compared to only 27 per cent at nine months. The proportion of children in non-parental care looked after by relatives and non-relatives declined to 23 per cent in both cases, with the drop in relative care being sharpest. The proportion of all children receiving non-relative care remained stable.



Table 2.1: Main type of childcare at nine months old and three years old

	Nine months		Three years	
	All %	Those using childcare%	All %	Those using childcare%
Parental care	61.0	-	50.3	-
Relative in child's home	5.5	14.2	3.2	6.5
Relative in their home	10.7	27.6	8.2	16.5
Non-relative child's home	3.2	8.3	3.7	7.3
Non-relative in their home	8.6	22.1	8.0	16.1
Centre-based care	10.5	26.8	26.6	53.5
Other	0.4	1.0	0.1	0.1
<i>Total in non-parental care</i>	39.0		49.7	
	100.0	100.0	100.0	100.0
N	11,134	4,338	9,793	4,867

Note: Main childcare type was self-defined by Primary Caregivers. The figures at three years are limited to those who were in non-parental care for at least eight hours per week. There is no lower hourly limit for childcare at nine months.

Experience of centre-based care was more common than the figures on main care suggest. A further six per cent of children in non-parental care spent some time in a childcare centre even though this was not their main form of care. This means that 60 per cent of three-year-olds in childcare, or 30 per cent of all three-year-olds, received some centre-based care (Table 2.2). Similarly, 14 per cent of all three-year-olds received some relative care on a regular basis, and 13 per cent received care from a non-relative.

Overall, 14 per cent of children in non-parental care at age three were in multiple forms of care. This is an increase from the proportion observed at nine months, when six per cent were in two or more childcare arrangements. In an analysis of the factors influencing multiple care types, Byrne and O'Toole (2015) found that, at nine months, lone parents and those with only one child were also more likely to use multiple forms of care. Those from non-manual or skilled manual backgrounds were less likely to use multiple care forms than the professional/managerial class. At three years, the authors found that higher income predicted multiple care use, while having siblings and lone parenthood decreased the likelihood (ibid, Table A.7). The Primary Caregiver's working hours did not affect multiple care at three years, but working households were found to be less likely to use multiple care types than workless households. This unexpected result may arise because of collinearity between the predictors.

Table 2.2: Any use of care type at three years

	% of all three-year-olds <sup>1</sup>	% of those in non-parental care <sup>1</sup>
Relative in child's home	4.2	8.4
Relative in their home	10.4	20.9
Non-relative in child's home	4.2	8.5
Non-relative in their home	8.5	17.2
Centre-based	29.7	59.8
Other	0.3	0.6
<i>% Using multiple forms</i>	7.2	14.4
N	9793	4925

<sup>1</sup> Percentages sum to more than 100 per cent because multiple answers were permitted.



Most relative care was provided by grandparents, predominantly grandmothers. Grandparents provided 76 per cent of relative care at nine months and 74 per cent at three years. Non-relative care was provided by au-pairs, friend/neighbours and ‘childminders’. The latter group was the most common, with childminders accounting for 53 per cent of non-relative carers at nine months and 74 per cent at three years.

It is also important to note that there is considerable movement between the care groups across the first two waves of the survey. Overall, one-third of the children had experienced a change in their main care type. A total of 27 per cent of those in non-parental care at nine months were in parental care at three years. Among those in parental care as infants, 35 per cent had moved into non-parental care by age three. Those using relative care at nine months were the most likely to have changed their care type: 61 per cent of the group were no longer in relative care at age three. Moreover, even those who had not changed care type may have experienced a change in carer or childcare centre.

### HOURS OF CARE

Some of the literature outlined in Chapter 1 indicated that the amount of time spent in childcare may be an important moderator of the relationship between care and subsequent developmental outcomes. The average time spent in the main care setting at nine months was 24.8 hours (Table 2.3), and the average for total non-parental care was 26.3 hours. The mean time in care decreased somewhat at three years, with a mean of 23.4 hours in main care and 25 hours in total care, despite the fact that very low hours were excluded from the figures at age three. There was a corresponding decrease in the proportion of the children in care for more than 40 hours per week: from 22 per cent of all those in care at nine months to 18 per cent at three years. Hours of care are strongly associated with the employment levels in the household, with longer hours of paid work associated with greater time spent in non-parental care (McGinnity et al, 2013; Byrne & O’Toole, 2015).

**Table 2.3: Hours of care among children in non-parental care at nine months and three years**

	Nine months		Three years	
	Main care %	Total care %	Main care %	Total care %
1<8hrs	9.0	7.9	0.6	0.1
8 to 15 hrs	18.4	16.7	29.7	26.1
16 to 19 hrs	8.1	7.1	12.0	11.2
20 to 29 hrs	26.3	24.9	26.7	26.7
30 to 39 hrs	18.8	21.1	15.8	17.6
40 hrs or more	19.4	22.3	15.3	18.4
	100.0	100.0	100.0	100.0
<i>N</i>	4313	4313	4856	4856
<b>Mean hours</b>	24.8	26.3	23.4	25

There is also an association between type of main care and average hours of care, but this alters as the child ages. At nine months, the longest hours per week were recorded for those in centre-based care, with a mean of 29 hours. At three years, non-relative care in the child’s own home was the form of care associated with the longest hours (28 hours per week), while the shortest hours were recorded for those in centre-based care (22 hours). This is likely to be due to the increased use of preschool care at age three.

### NON-PARENTAL CARE AT AGE THREE AND SOCIO-ECONOMIC AND FAMILY CHARACTERISTICS

As outlined in Chapter 1, the use of non-parental care and the type of care adopted is strongly patterned by socio-economic and family characteristics. These same factors are also influential in child cognitive



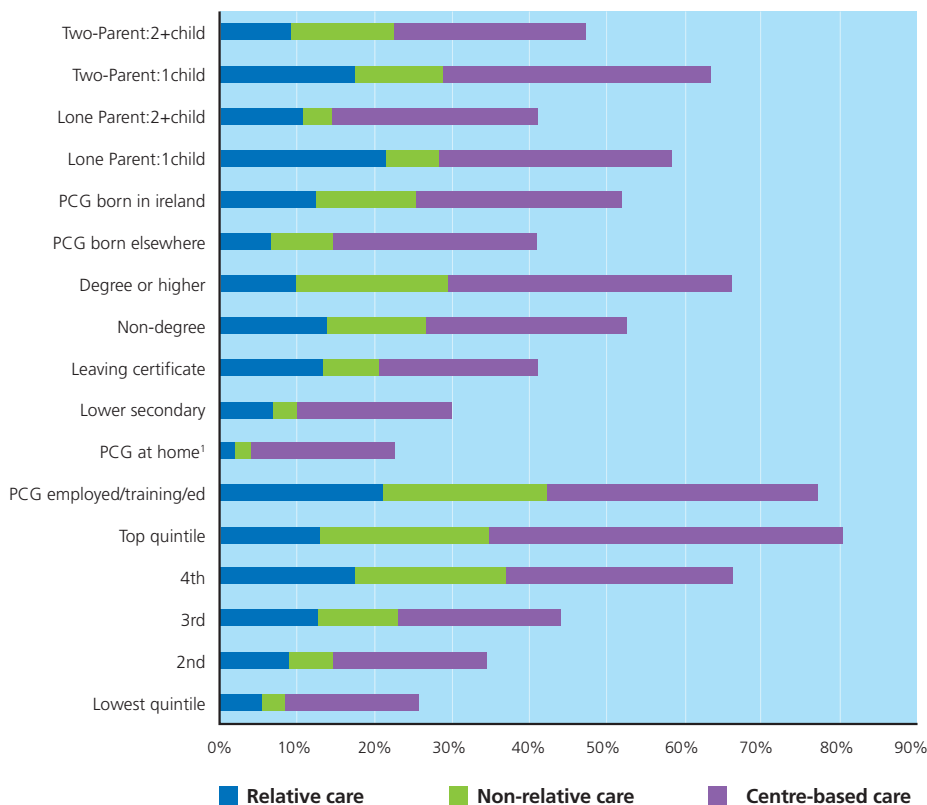
development. Therefore, it is worth describing the nature of the link between non-parental care and key indicators of the children’s social, economic and family circumstances. Full modelling of take-up of non-parental care amongst the Study Families at Wave 2 (age three) was undertaken in Byrne and O’Toole (2015), and their findings are reported where relevant.

The total length of the bars in Figure 2.1 indicates the proportion of children within the group that are in regular non-parental care, while the shading within the bars illustrates the proportion within each care type. Family composition, measured by lone parenthood and number of children, influenced both the take-up of care and the type of care used. Non-parental care was more common among families where the Primary Caregiver was born in Ireland (52 per cent) than among those born abroad (41 per cent). However, by migrant status there was little difference in the use of centre-based care. There was a significant difference in the proportions of migrants and non-migrants that used relative and non-relative care.

As noted already, there is a very strong relationship between the Primary Caregiver’s level of education and the use of non-parental care; 66 per cent of those with degree-level education used non-parental care compared to 30 per cent of those who had not completed the Leaving Certificate. This is linked to employment levels but is found to persist even when employment status is held constant (Byrne & O’Toole, 2015). Among those who used non-parental care, centre-based care was the most common choice among the highest and lowest educated group. A very similar pattern is observed by income quintile.

While non-parental care was much more common in families where the Primary Caregiver was at work or involved in full-time education or training, the overlap was not complete. In over a fifth of cases where the Primary Caregiver was at home, the Study Child was in regular non-parental care. A similar proportion of working parents (23 per cent) managed without any non-parental care.

**Figure 2.1: Main form of non-parental care by socio-economic status (SES) and family characteristics of children age three years**

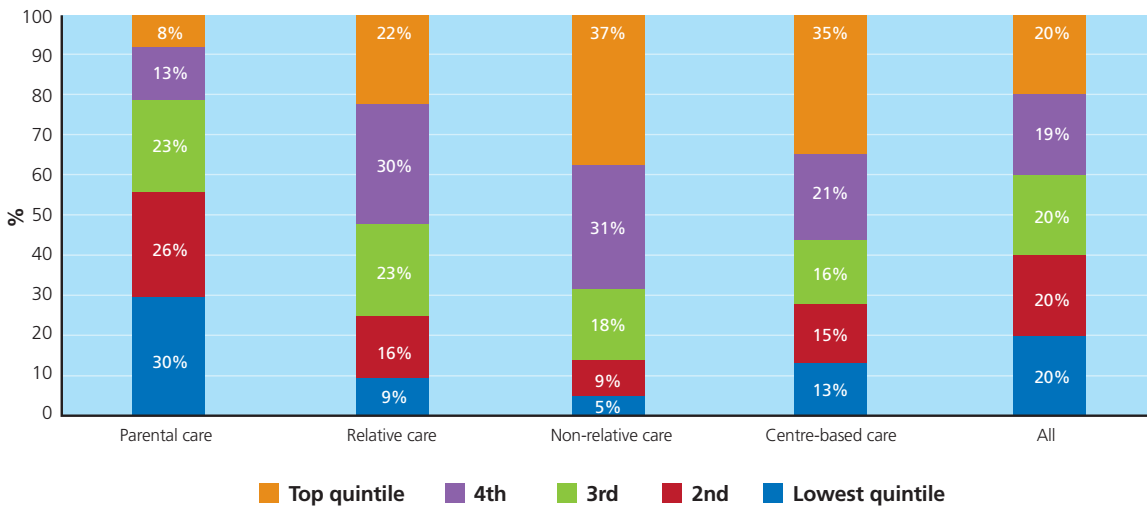


<sup>1</sup> PCG = Primary Caregiver. ‘PCG at home’ includes those who were caring in the home, unemployed, on career break, on maternity leave, or engaged in part-time studies.

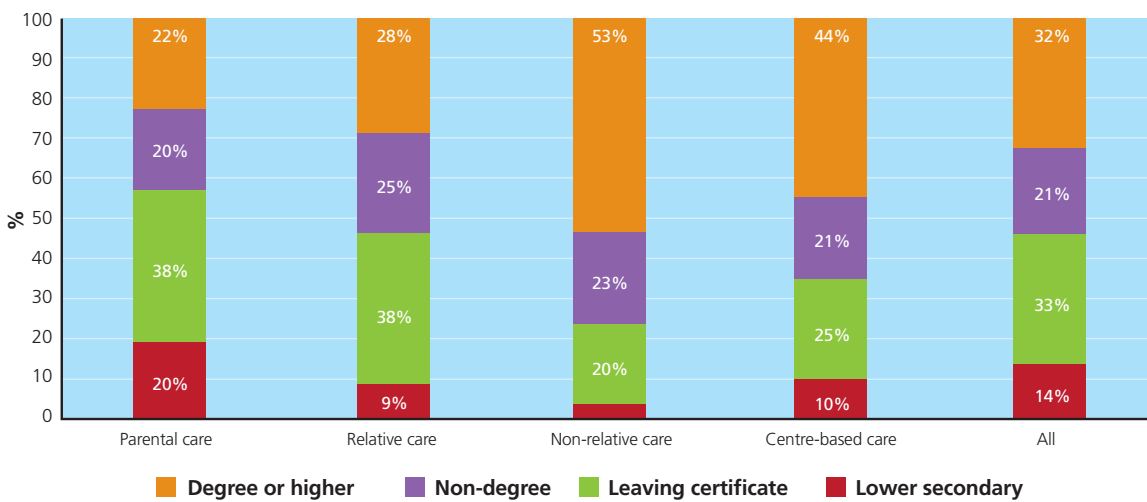
An alternative way to consider these relationships is to examine the composition of the children in different care settings. This provides a context for understanding the groups involved when discussing the outcomes related to the care type. Focusing first on income level, Figure 2.2 shows that children in non-relative care were the most advantaged group; almost 70 per cent of these children fall into the top two income deciles. Those in centre-based care were also advantaged, as children from the top income quintile are over-represented. However, it is also noticeable that children located in the bottom income quintile constitute 13 per cent of this group, greater than in either of the other two forms of non-parental care.

There is also substantial variation in the educational composition of those using different care types (Figure 2.3). The educational profile of those using non-relative care is most distinctive: over half of this group have degree-level education compared to 32 per cent of all parents of three-year-olds.

**Figure 2.2: Income quintile composition of care group type, children at age three years**



**Figure 2.3: PCG education composition of care type, children at age three years**





### CHARACTERISTICS OF CARE SETTINGS

As the discussion in Chapter 1 highlighted, the structural aspects of care quality are more easily measured, while process quality, which covers the nature of the interactions and relationships between carers and children, is best assessed through detailed observation of the care setting. This was clearly not possible within the design and resources of the *Growing Up in Ireland* survey, which is a national sample of a cohort of children, rather than a sample of care settings, and the number of different care settings is almost equal to the number of children in receipt of non-parental care. Information on structural measures of quality and parental assessments of process quality were collected in the Primary Caregiver's interview, and these are discussed below. Additionally, postal questionnaires were sent to other care providers at nine months and three years. The data for the children at nine months has been coded, and was analysed in earlier work (McGinnity et al, 2013).

The ratio of carers to children is commonly used as a structural measure of childcare quality, and it is prominent in the features of childcare that are regulated and inspected. Information on the number of children that were looked after in the room where the child was cared for was collected from the Primary Caregiver. The Primary Caregiver also supplied information on the number of adults who supervised the children in the room. It is likely that, in the case of centre-based care, there will be some error in the parents' estimates of size of the class group and to a lesser extent the number of carers. This was likely to be a greater problem in larger childcare centres with multiple class groups. The number of children in relative and non-relative care should be easier for parents to report as these typically involve much fewer children. Table 2.4 presents the figures on centre-based care ratios and relative/non-relative care outside the child's own home, taken from Byrne and O'Toole (2015). The question on child and carer numbers was not asked for children being cared for in their own home. Therefore, to provide a comparable figure, the number of children aged 13 years or younger in the household was calculated and it was assumed that there was only one relative or non-relative carer in the child's home.<sup>33</sup>

The figures show that the highest ratios occurred for those in centre-based care where each adult cared for an average of 4.9 children. The lowest ratio is observed for children cared for in a relative's home (1:1.5), followed by children cared for by a relative in the child's home where each carer is responsible for an average of two children. Ratios for children in non-relative care were somewhat higher, regardless of whether the care took place in the child or carer's home.

**Table 2.4: Average number of children, adults and ratio of adults to children for three-year-olds in non-parental care**

	Mean N of children	Mean N of adults	Ratio carers: children
Relative in child's home	2.1 <sup>1</sup>	1	1:2.1
Relative in their home	1.9	1.3	1:1.5
Non-relative in child's home	2.6 <sup>1</sup>	1	1:2.6
Non-relative in their home	3.3	1.2	1:2.8
Centre-based care	10.7	2.3	1:4.9

Adapted from Byrne and O'Toole, 2015.

<sup>1</sup> For children cared for in their own home, the number of children aged 13 or younger in the household was calculated. It was assumed that there was only one carer present.

<sup>33</sup> Thirteen years is used as the cut-off because at this age the vast majority of children will have entered the secondary school system, which involves longer school days. There is no legal definition of the age at which a child can be left unsupervised in Ireland.

Further indicators on structural quality were included in questionnaires sent to the care providers when the children were nine months old and three years old. At the nine-month survey, approximately 46 per cent of carers responded to this survey: 72 per cent of centre-based carers and 41 per cent of home-based carers.<sup>34</sup> McGinnity et al (2013) present some details of the survey results. The qualifications of the carer were strongly correlated with the care type. For example, among relatives providing care, 84 per cent had no formal childcare qualification, compared to 55 per cent of non-relative carers and only two per cent of centre-based carers.

In terms of 'practice features', 83 per cent of centre-based carers reported that infants spent no time watching TV compared with 53 per cent of home-based carers. In contrast, home-based carers were significantly more likely to report that they always got the chance to talk to the infant on a one-to-one basis during the day (68.8 per cent) than centre-based carers (47 per cent). It should be noted that, in care settings, children were interacting with more than one adult, and in some cases it was the director who completed the survey. Childcare centres also had greater resources for play and learning than home-based settings, although typically these would be shared by more children. Just under half of home-based carers reported that they had fewer than 10 books, compared to 14 per cent of centre-based carers.

### 2.3 PARTICIPATION IN THE FREE PRESCHOOL YEAR (FPSY) AND SCHOOL START

The Free Preschool Year programme (officially the Early Childhood Care and Education Scheme) was introduced in January 2010 shortly before the data-collection phase for the three-year survey (December 2010-August 2011). Children are entitled to enter the scheme at any age between three years, two months and four years, seven months. At the Wave 2 interview, when the children were aged 36 months, parents were asked about their intention to avail of the scheme. The vast majority of parents reported that they intended to do so (92 per cent), three per cent were unsure and only two per cent indicated that they would not be availing of the scheme (Williams et al, 2013). A further three per cent said that their child was currently participating. It is possible that these children were attending the care centres that provided the scheme, and there was some uncertainty among parents about the starting date of the programme.<sup>35</sup>

At the Wave 3 interview at five years, it was found that 96 per cent of the children had attended care centres under the Free Preschool Year. This represents a very large increase in the proportion of children experiencing non-parental care in general and centre-based care in particular; only 50 per cent of the children had been in non-parental care at age three. The reasons given for not availing of the FPSY given by those parents who did not do so included:

- The child had a place in a centre that did not run the scheme or that was funded under another scheme (33 per cent).
- The child had additional special educational needs (18 per cent).
- The hours or location did not suit (12 per cent).
- The child had started primary school (2 per cent).
- The parent preferred not to send the child to preschool (19 per cent).

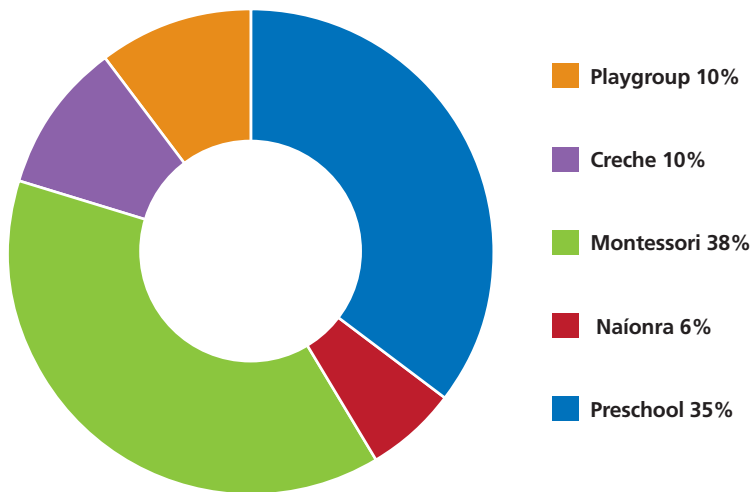
Figure 2.4 shows the breakdown between the types of service providers. Montessori implies the use of a specific curriculum approach and provider training, but colloquially the terms Montessori, crèche and preschool are used interchangeably. Indeed, in the Pobal survey of care providers in receipt of government funding, a significant proportion place themselves in more than one of these categories (Pobal, 2012). Crèches are more likely to provide full-time services, while the play-group and preschool category are more likely to provide sessional places. Naíonraí ("nurseries" in Irish) offer childcare and early education through the Irish language.

<sup>34</sup> Since the characteristics of the families and the children were very similar for respondents and non-respondents, no additional weighting was necessary (McGinnity et al, 2013).

<sup>35</sup> Given that a small number of interviews were conducted in September 2011 or later, it is also possible that some of these children were attending care centres under the scheme.

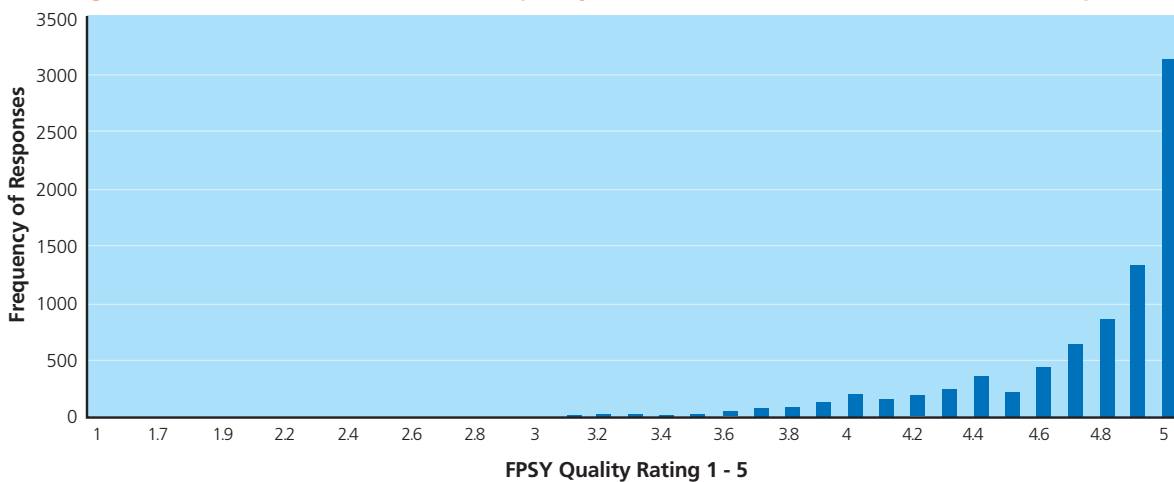


Figure 2.4: Type of provider attended for Free Preschool Year



Parents were asked a series of questions on their perception of the quality of care provided in the preschool setting, covering issues such as the range of activities, facilities, interaction between carers and children, communication with parents, and child health and safety. Parents’ evaluations of preschool quality were very positive. The answers to all 17 items were combined into a single score ranging from zero to five; 64 per cent of respondents scored 4.8 or above (see Figure 2.5). In fact, 39 per cent of respondents rated quality at five (i.e. they gave the providers a perfect score on all 17 dimensions) (Figure 2.5). This result is consistent with previous international findings which show that parents’ evaluations of childcare quality are upwardly biased (Cryer & Burchinal, 1997; Cryer et al, 2002). Cryer et al (2002) note that, in the US, parents generally record high levels of satisfaction with childcare even when provision is of a poor standard. Comparing the ratings of parents and independent, trained observers, Cryer and Burchinal (1997) found that parents consistently gave substantially higher ratings. The discrepancy was particularly acute for features that were not easily observable such as carers’ language use with children and was narrower for easily observed factors such as facilities. Parents also gave higher ratings on items that they had ranked as important (e.g. child health and safety). The finding of parents’ over-estimation of care quality was replicated in a comparative German-US study (Cryer et al, 2002). The difficulty parents face in judging care quality has been identified as a reason why market mechanisms alone cannot deliver higher care quality, since parents as consumers have insufficient knowledge to make an informed choice (Gambaro et al, 2014; Cryer & Burchinal, 1997).

Figure 2.5: Parents’ assessments of quality of Free Preschool Year: distribution of responses



Given the skewed nature of the parental reports, additional information on the care settings the children attended for the FPSY, which was provided by the DCYA, was used. The data could be matched to the *Growing Up in Ireland* survey for 6,586 of the children, which represents 78 per cent of those who participated in the FPSY scheme (see Chapter 1 for more details and a discussion of representativeness). The information for centres reflects the situation for the year in which the Study Child took part in the Free Preschool Year scheme (2011/2012). The information available includes whether the centre was a private or community provider and whether the provider was in receipt of the higher capitation grant for qualified staff.<sup>36</sup>

Among those children for whom additional centre information is available (78 per cent) for the FPSY, 28 per cent were attending community-based services and 72 per cent were in private services (Table 2.5). Among the services attended, 19 per cent were in receipt of the higher capitation rate for qualified staff.<sup>37</sup> Receipt of the higher capitation allowance was somewhat more common among the private providers compared to the community providers (Table 2.5). However, as the unit of analysis is children rather than centres, this cannot be extrapolated to the proportion of private and community centres receiving the higher allowance. National figures from Pobal for 2011 (Pobal, 2012) show that 78 per cent of all staff in the private centres and 74 per cent of staff in community-based centres had NFQ qualifications of level five or higher.<sup>38</sup>

**Table 2.5: Percentage of children attending FPSY centres in receipt of higher capitation for qualified staff**

	Community-based	Private centre	All
Regular capitation	86.1	79.0	81.0
Higher capitation	13.9	21.0	19.0
	100.0	100.0	100.0
Weighted N	1764	4591	6355
% Community/private	27.8	72.2	100.0

Notes: The difference between community and private providers is significant at the .01 level. The unit of analysis is children rather than centres.

Some of the centres running the FPSY also supply full-time or ‘wrap-around’ services. Additional hours are paid for by the parents; through the Community Childcare Subvention (CCS) for some low-income families, or through the Childcare Employment and Training Support scheme (CETS) for main carers who are participating in an eligible government training or employment scheme (see Chapter 1). The rules of the FPSY scheme specify that there should be no obligation for parents to access extra hours of care in order to gain a preschool place at the centre. All respondents who availed of the scheme were asked if they had used top-up hours and about the number of additional hours the Study Child attended. Three-quarters of participants attended for only the 15 hours per week provided by the scheme (see Table 2.6). One-quarter of the children attended for more than 15 hours per week, and the majority of this group attended for between 16 and 30 hours.

<sup>36</sup> A higher capitation grant is received if all preschool leaders for the FPSY have a Bachelor’s degree-level qualification in childhood/early education and all preschool assistants have a relevant qualification at NFQ level 5.

<sup>37</sup> Figures from the DCYA data show that the proportion of services receiving the higher capitation increased significantly between 2011 and 2013.

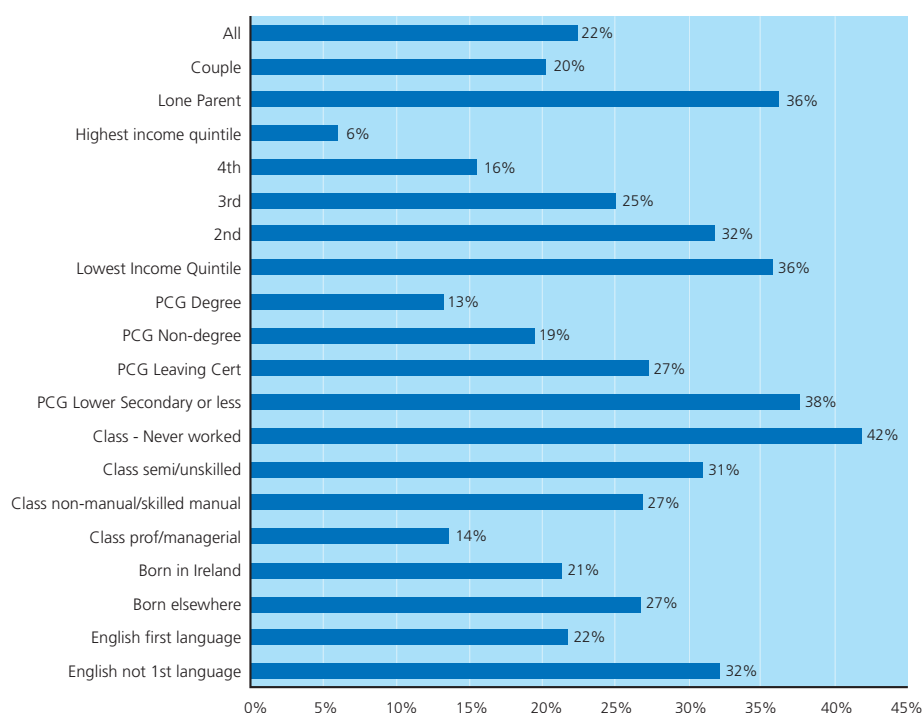
<sup>38</sup> Note that the survey was carried out among only those in receipt of government subsidies for FPSY (or ECCE as it is officially termed), CCS or CETS, and there was an 11 per cent item non-response rate for the qualification questions.

**Table 2.6: Proportion of children with top-up hours at Free Preschool Year centre**

		%	N
No top-up	(15 hours)	75.9	6269
Top-up	(>15 hours)	24.1	1986
	16-19.9 hrs	6.8	560
	20 - 29.9 hrs	9.6	789
	30-39.9 hrs	4.1	341
	40 hrs plus	3.6	296
Total		100.0	8255 <sup>1</sup>

<sup>1</sup> Excludes 11 cases where information on number of extra hours was missing and 385 cases where the child did not attend the FPSY.

Parents who availed of the Free Preschool Scheme (96 per cent) were asked whether they would have been able to send their child to preschool had this policy not been in place. Just over one in five parents reported that they would not have been in a position to send their child to preschool without the FPSY. Investigating the results by socio-demographic characteristics suggests that the FPSY opened up access to disadvantaged groups who would not otherwise have received early education and care (see Figure 2.6). For example, around one-third of parents in the bottom two income quintiles reported that they would not have been able to send their child to preschool without the FPSY scheme. This compares to six per cent of the top income quintile group. This pattern can also be observed for social class, parental education and lone parenthood, where a higher proportion of the disadvantaged group were enabled to attend. Similarly, 32 per cent of children whose first language was not English would not have received preschool education without the FPSY scheme, compared to 22 per cent of English speakers. As mentioned above, some disadvantaged groups are entitled to additional or alternative childcare supports such as the CCS or CETS but these schemes support a much smaller number of places and do not cover the full cost of care in many cases (Start Strong, 2014).

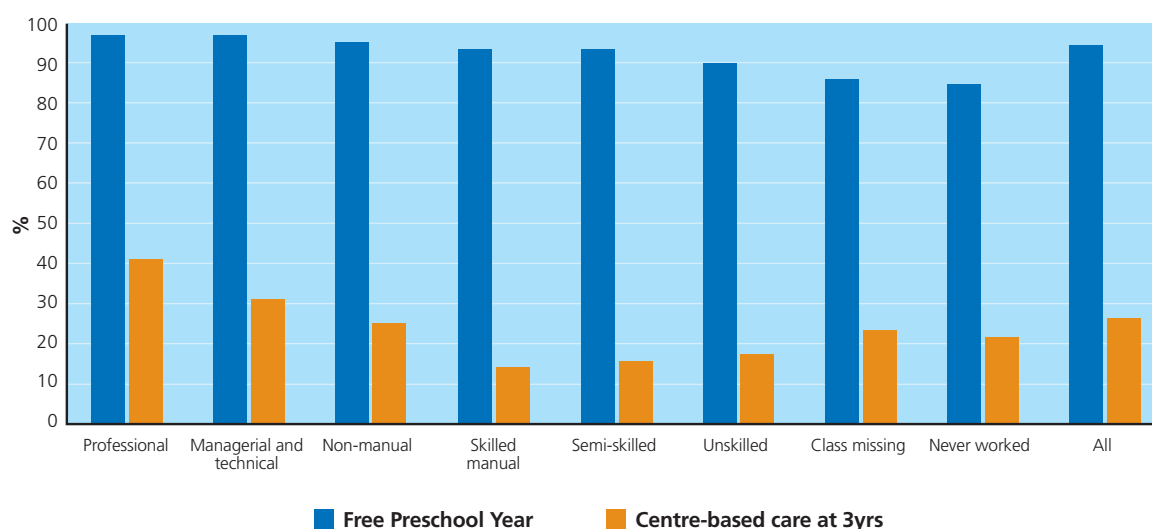
**Figure 2.6: Proportion of parents who would not have been able to send child to preschool without FPSY scheme**

Sociodemographic characteristics measured at Wave 2.  
The differences between the sub-groups are all significant at the .005 level (chi-square test).



A comparison of the number of children in centre-based care at age three years and who availed of the FPSY scheme by age five demonstrates the effectiveness of the scheme in broadening access to early childhood education. Figure 2.7 shows that by age five there had been a sharp increase in the number of children experiencing centre-based care and education, and this is especially noticeable for the lower-middle social class groups. The children of families in these groups may have previously been caught between being unable to afford centre-based care but still being above the threshold to avail of subsidised crèche places. It has been argued by some commentators (e.g. Ackerman & Barnett, 2005) that bridging the gap in early education, and consequently school-readiness, for middle-income families has been under-addressed as a policy issue given the large number of children involved (relative to children in very disadvantaged circumstances).

**Figure 2.7: Contrast of centre-based care at age three years with enrolment in the Free Preschool Year (FPSY) at age five, by family social class**



### SCHOOL START

Primary schools in Ireland enrol pupils from four years of age; therefore almost 72 per cent of the sample had already started school by the time they were interviewed shortly after their fifth birthday in Wave 3 (fielded between March and September 2013). The great majority of children that had started school entered in September 2012 (96 per cent); the other four per cent began after this date, including two per cent who started in September 2013 and were also interviewed in that month.

School participation is strongly linked to the child’s birth month. Almost all of the children born in December 2007 started school in September 2012, and this fell to only 34 per cent of children born in June 2008 (see Table 2.7). Taking age into account, school start is also influenced by family income. Children from lower-income backgrounds were more likely to have started school when they were aged between four years, three months and four years, five months. This pattern may be related to the cost of accessing preschool/early education for children outside the FPSY age threshold, compared to school places funded by the State. Participation in school may influence the outcome measures of cognitive development. First, those who have entered the school system will have received formal instruction with graduate teachers. Moreover, the tasks involved in the cognitive tests may be more familiar to the children that have started school. Therefore, school start is included as a control in the models in the following chapters.



**Table 2.7: Proportion of children by month of birth that had started school, by school starting age and family income**

	Month of birth						
	Dec '07	Jan '08	Feb '08	Mar '08	Apr '08	May '08	June '08
Age in Sept 2012 (yr:mths)	(4:9)	(4:8)	(4:7)	(4:6)	(4:5)	(4:4)	(4:3)
Started school Sept 2012	98%	93%	92%	80%	70%	47%	34%
<b>Family income</b>	<i>Percentage of children who had started school</i>						
Quintile One (Low)	98%	96%	94%	77%	76%	62%	52%
Quintile Two	99%	92%	92%	83%	75%	49%	37%
Quintile Three	99%	89%	94%	85%	69%	46%	32%
Quintile Four	98%	96%	92%	76%	61%	44%	29%
Quintile Five (High)	96%	97%	87%	84%	65%	38%	24%

Source: Growing Up in Ireland 2013, Key Findings Report.

## 2.4 CONCLUSIONS

The results presented here show that there was a significant increase in the proportion of children in non-parental care, from 39 per cent to 50 per cent, when they were aged three. There was also a marked shift towards centre-based care for those in non-parental care. At nine months, relative care was the most common main form of care but by age three centre-based care had become the dominant form. It seems probable that without the Free Preschool Year the proportion of children in non-parental care would have hovered around 50-60 per cent; indeed, among those children who were not in school at five years of age, 57 per cent were in non-parental care.

Average hours of non-parental care decreased somewhat as the children aged; this is likely to be associated with the increased use of part-time (sessional) preschool places among three-year-olds. This is not solely accounted for by the Free Preschool Year, as the vast majority of children were too young to have started the scheme at the time of the three-year interview. It is also clear that there was a good deal of movement between care types at an individual level. Overall, a third of children changed their main care type between waves, including moves from parental care to non-parental care and vice versa. This does not include changes of care provider within the same care type.

Use and type of non-parental care was strongly associated with family and child characteristics. At age three, the children in non-relative care were the most advantaged group in terms of income and family educational background. Centre-based care was more likely to include those from the most advantaged and the most disadvantaged groups compared to other forms of non-parental care; however, the most disadvantaged groups were still under-represented in centre-based care at this age, since they were far more likely to be in full-time parental care.

The results suggest that the Free Preschool Year has opened up access to centre-based care for more disadvantaged children. Overall, 96 per cent of the children had attended the FPSY and one-quarter of parents said they would have been unable to send their child to preschool in the absence of the scheme. Over a third of lone parents, parents in the lowest income quintile and parents from a non-English-speaking background reported that they would have been unable to send their child to preschool in the absence of the scheme.

These findings are consistent with recent cross-national research which concluded that free universal preschool provision is the most effective way to achieve high enrolment rates and to ensure that low-income children gain access to high-quality care (Gambaro et al, 2014). This was also the conclusion reached by the OECD in their analysis of childcare and early education across 20 countries (OECD, 2006).

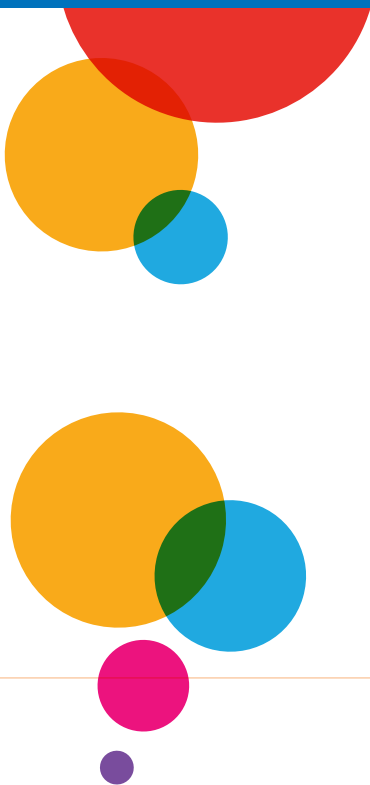
The figures on age of starting school suggest that children from lower-income backgrounds tend to start earlier than those from higher-income households. This pattern may be related to the cost of accessing preschool/early education for children outside of the FPSY scheme, compared to school places funded by the State.

The following chapter analyses whether the patterns of participation in non-parental childcare in the early years of life have any implications for the children's cognitive outcomes at age five.



# Chapter 3

CHILDCARE AND COGNITIVE OUTCOMES



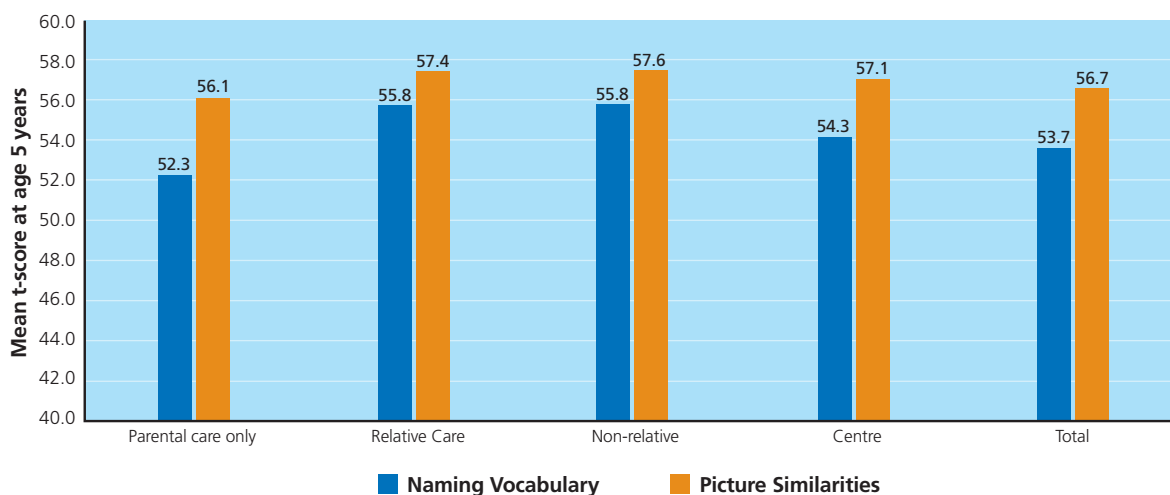
### 3.1 INTRODUCTION

This chapter uses three waves of the *Growing Up in Ireland* Infant Cohort data to investigate whether non-parental care at age three years has any impact on cognitive outcomes at age five years. The cognitive outcomes are measured in terms of expressive vocabulary and non-verbal reasoning, and a modelling strategy is used which allows for the control of a wide range of other important child, parental and home environment factors.

#### 3.1.1 BIVARIATE RELATIONSHIP BETWEEN CHILDCARE AND COGNITIVE OUTCOMES

Figure 3.1 compares the t-scores for the vocabulary and non-verbal reasoning tests (at age five years) according to childcare type at age three. This graph suggests that children experiencing regular non-parental care in any of the main categories tended to have higher scores on the cognitive tests, although the differences were less marked for the non-verbal reasoning scores (Picture Similarities) than for Naming Vocabulary.

Figure 3.1: Scores on cognitive tests at age five years according to childcare type at age three years



The remainder of this chapter investigates whether these differences in cognitive scores by childcare type relative to parental care are statistically significant, and if they remain so when controls are added for a range of other important variables.

#### 3.1.2 MODELLING STRATEGY

Two OLS regressions were used to examine the relationship between childcare type at three years and scores on each of the cognitive tests (Naming Vocabulary and non-verbal reasoning) at five years of age. Further details on all of the variables are provided in Chapter 1 (section 1.5). All predictors and covariates were recorded at three years (Wave 2) except for birth-weight (Wave 1) and school-start (Wave 3). As the main variable of interest, childcare type at three years was entered into the first block of the model (**Model 1** in Tables 3.1 and 3.2). This was followed by the other variables, in this sequence:

- **Model 2 – Child characteristics:**<sup>39</sup> birth-weight; sex; younger/older children in the household; English as first language; hyperactivity/inattention; peer problems
- **Model 3 – Parental and household characteristics:**<sup>40</sup> Primary Caregiver’s education, age, parental stress, and consistent parenting; resident spouse/partner of Primary Caregiver; equalised household income

<sup>39</sup> Other child characteristics (at three years) were investigated in the course of developing the model but were excluded as they did not reach statistical significance for either measure in the final model. These were: child’s health status; persistent, sociable or reactive temperament; emotional, conduct and prosocial sub-scales of the Strengths and Difficulties Questionnaire.

<sup>40</sup> The parenting style measures of warmth and hostility (of the Primary Caregiver) were also considered but later excluded as they did not reach statistical significance for either outcome in the final model.

- **Model 4 – Home learning environment:** total score for home learning activities; number of books in the home; grandparental involvement
- **Model 5 – School-start:** Study Child had already started school by the time of the five-year interview

The final stage in the modelling was to add the child's score on the same test at age three years (Model 6). This serves to illustrate the change in scores between Wave 2 and Wave 3. The principal research questions were whether attending one of the three main forms of childcare at age three years (relative, non-relative or centre-based) affects cognitive development two years later; and if any observed effects would be robust to control for other child, parental and home factors.

All of the statistical models estimated in this report are linear regression models, as the cognitive test scores are measured as a scale. The mean of the vocabulary score is 54, but clearly scores will vary according to the characteristics of the children. The models allow us to isolate the effect of certain characteristics (such as childcare experience) while also accounting for others (such as family background). For each factor of interest, the vocabulary scores of children with certain characteristics are compared to a reference group. For example, the scores of children in relative care at age three are compared to those of children in sole parental care. A coefficient estimate for relative care of three, for example, indicates that on average, and depending what else is controlled for in the model, children in relative care score three points higher on the vocabulary score than those looked after solely by a parent. Conversely, if this coefficient estimate were minus three, this indicates that children in relative care score on average three points lower than children in parental care. An additional piece of information for each estimate is whether this result is statistically significant; that is, can we be sure that this is robust and generalisable to the whole population given the size of the groups and the distribution? This is indicated by stars in the tables: three stars indicates a higher level of confidence in the results than two or one, and 'no stars' suggests that the result may have been caused by chance and is not so robust. Finally, the R-square statistic of the total model is the total variance explained, and gives a sense of how good all the information included about the children in each model (characteristics, family background, care situation, home learning, etc) is at allowing us to predict their vocabulary at five. The way the models are set up, successive models add more information, so we would expect the R-squared or variance explained to increase with each one, which it does (see Table 3.1, final row).

Further models were estimated which included all the variables detailed above, plus, in the first instance, total hours in main childcare at age three years and whether or not there had been regular non-parental care at age nine months. In the second instance, the additional variables were instead two characteristics of the centres in which the children had undertaken the Free Preschool Year: receipt of higher capitation grant and whether community-based or a private enterprise (see Chapter 1 for information on this scheme).

## 3.2 VOCABULARY

### 3.2.1 CHILDCARE

In Model 1, when the three types of childcare (at age three years) were compared to just parental care, all three showed a positive effect on the Naming Vocabulary test scores at age five years (see Table 3.1), although the childcare variables explain less than one per cent of the variance in the scores (indicated by the adjusted R-square value for Model 1). Children in relative and non-relative care had vocabulary scores just over three points higher than those in parental care only. In Model 1, those in centre-based care had scores just over 1.5 points higher, but this last value was reduced to non-significance in Model 2 when the child's characteristics were controlled for. Similarly, the advantage associated with non-relative care was attenuated by the further addition of parental and household characteristics, including education and income in Model 3. The advantage for vocabulary scores of relative care became statistically non-significant

in the next stage (Model 4) with the addition of measures of the home learning environment that included engaging the child in learning activities, the number of books in the home and wider grandparental involvement.

Childcare type remained insignificant when school-start was controlled for in Model 5, although non-relative care did re-emerge as significant at the five per cent level in the final model with the inclusion of the child's vocabulary test scores from age three. This model suggests that non-relative care was associated with greater increases in vocabulary scores between age three and age five than parental care only. The associated increase in scores was modest, however, at less than one point. At the Model 5 stage, variance explanation was 16 per cent. This increased to 31 per cent when previous vocabulary scores were added, since a child's vocabulary score at age five is strongly associated with their vocabulary score at age three. These findings suggest that the positive bivariate relationship between non-parental care and vocabulary scores, shown in Figure 3.1, is for the most part explained by the fact that children in non-parental care tend to have other child and family characteristics positively associated with vocabulary scores (see Chapter 2), rather than this being a direct effect of the childcare they attended. The models also highlight the possible gains for vocabulary associated with family members engaging the child in activities and perhaps one-to-one conversation more generally – given that the advantage of relative care was not attenuated until the inclusion of measures of the home learning environment and grandparental involvement.

### 3.2.2 OTHER FACTORS

Although their primary functions were as covariates of childcare choice, there were some interesting relationships between the other measured variables and vocabulary test scores at age five years. Apart from low birth-weight and whether the child had started school by age five, all other factors were measured at three years old; and the model discussed is the penultimate model (before the addition of earlier test scores in Model 6) unless otherwise noted.

The most influential child characteristic was whether the child's first language at three years old was English. Even though children did not attempt the test if the Primary Caregiver felt they had insufficient knowledge of the language, among those who did, having English as a second language was associated with a much lower score on the vocabulary test. Measured in terms of either the unstandardised or standardised (not shown) coefficients, it was the single biggest factor in any of the models of vocabulary (apart from the child's previous test scores in Model 6).

**Table 3.1: Linear regression model of vocabulary scores at five years***All other variables measured at age three years (Wave 2) unless otherwise indicated. N= 7,966.*

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
		Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
	(Constant)	53.30***	41.35***	32.30***	29.90***	28.32***	15.97***
<b>Childcare</b>							
Childcare type (ref: none)	Relative	3.05***	1.78***	1.33**	0.83	0.78	0.69
	Non-relative	3.02***	1.79***	0.31	0.36	0.38	0.82*
	Centre	1.59***	0.41	-0.47	-0.39	-0.55	-0.11
<b>Child characteristics</b>							
Birth-weight (ref: normal birth-weight)	Low birth weight		-1.50**	-1.44*	-1.45*	-1.39*	-0.85
Sex (ref: male)	Female		0.90***	1.07***	0.77**	0.64*	-0.49*
Younger children	Number of younger siblings at 3 yrs		0.03	-0.30	-0.22	-0.17	0.02
Same age or older children	Number of other children same age or older at 3 years		-1.36***	-1.27***	-1.10***	-1.09***	-0.53***
Child's first language (ref: Other)	English		16.39***	16.02***	14.65***	14.74***	9.68***
Child's behaviour	SDQ Hyperactivity sub-scale		-0.51***	-0.30***	-0.23***	-0.22**	-0.06
	SDQ Peer problems sub-scale		-0.41***	-0.27**	-0.20*	-0.20*	-0.07
<b>Maternal and household characteristics</b>							
PCG Education (ref: degree or higher)	Lower secondary or less			-2.15***	-1.17*	-1.23*	-0.34
	Upper secondary			-1.23***	-0.85*	-0.87*	-0.40
	Certificate/ diploma			-0.31	-0.21	-0.19	0.11
PCG age	Age of PCG			0.12***	0.15***	0.16***	0.12***
PCG stress	PCG parental stress score			0.02	0.04	0.04	0.02
PCG consistency	PCG consistent parenting style score			1.27***	0.96***	0.97***	0.68***
Spouse/partner (ref: none)	Resident spouse/partner of PCG			1.09*	1.01*	1.09*	0.38
Household income quintile (ref: highest quintile)	1st (lowest)			-1.61***	-1.11*	-1.20*	-0.56
	2nd			-1.15*	-0.74	-0.81	-0.24
	3rd			-0.67	-0.47	-0.54	-0.12
	4th			0.12	0.19	0.15	0.27
	Income missing			-1.67**	-1.47*	-1.46*	-1.22*



		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
		Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
<b>Home learning environment</b>							
Learning activities	Combined total of days spent on learning activities in the home				0.09***	0.08***	0.03*
Number of books in the home (ref: more than 30)	None or fewer than 10				-3.96***	-4.21***	-1.82**
	Between 10 and 20				-2.38***	-2.48***	-1.29***
	Between 21 and 30				-0.87*	-0.91**	-0.25
Contact with grandparents	Combined total of frequency of contact with grandparent				0.17***	0.17***	0.09***
<b>School start by age 5 years</b>							
School start (ref: not started)	Child has started school by age 5 years (Wave 3)					1.72**	1.50***
<b>Test score at 3 years</b>							
Vocabulary score	Naming vocabulary t-score at 3 years						0.41***
Adjusted R-squared		.01	.12	.14	.16	.16	.31

Key to models: Model 1: Childcare (at 3 years) only; Model 2: Add child characteristics (at 3 years, except birth-weight); Model 3: Add maternal and household characteristics (at 3 years); Model 4: Add home learning environment measures (at 3 years); Model 5: Add school start by time of age 5 years interview; Model 6: Add vocabulary test t-scores at age 3 years. Coeff is short for regression coefficient. \*p≤.05, \*\*p≤.01, \*\*\*p≤.001

While English-language skills are crucial for both social interaction and learning in English-language environments, poorer performance in a test of expressive vocabulary in English by children whose first language is not English does not imply that the overall language skills of these children are poor. Research has shown that bilingual children tend to have a smaller vocabulary in each language than monolingual children in their language (Bialystok, 2006). Bilingual children’s language development follows a different course to that of monolingual children, and tests suitable for monolingual children may not be appropriate to fully assess the language ability of bilingual children (Dufresne & Masny, 2006). To get a true picture of the language development of bilingual children, it would be necessary to conduct further tests of linguistic ability, which was beyond the scope of the *Growing Up in Ireland* study.

Other trends noted in terms of child characteristics (in Model 5, Table 3.1) were the negative effects of low birth-weight, having an older or same-aged child in the household, and problems with hyperactivity/inattention or getting on with peers. Girls tended to do better on vocabulary than boys. There did not seem to be a negative effect of having a younger sibling, but there was a negative effect of having one or more older sibling(s). This may reflect findings elsewhere that first-born children have somewhat larger vocabularies, and Primary Caregivers may have less language input with their later-born children (review by Tamis-leMonda & Rodriguez, 2009).

Lower vocabulary scores were associated with lower levels of educational attainment by the Primary Caregiver (i.e. Leaving Certificate or less), and household income in the bottom two quintiles. Protective effects were observed for increasing age of the Primary Caregiver, his/her use of ‘consistent’ parenting and the presence of a resident spouse or partner. Parenting stress was not a significant predictor, at least not

independently of other factors. Child, parental and family characteristics jointly explained an additional 13 per cent of variation in vocabulary scores.<sup>41</sup>

All three indicators of the home learning environment were important positive predictors of the child's vocabulary score: home learning activities (reading, board games, etc); number of books in the home, and contact with grandparents. Of particular note was the clear linear association between number of books in the home and vocabulary scores; there was a significant negative effect of having any fewer than 30 children's books in the home, and a marked effect in homes with fewer than 10. The inclusion of these variables in Model 4 – particularly the inclusion of grandparent involvement – markedly reduced the coefficient observed for relative care; whereas it had been significantly positive beforehand, at this stage it was non-significant (although still positive). This could mean either that grandparents are more likely to engage the children in home learning activities or that spending time with other caring adults is generally advantageous for young children, perhaps through greater opportunities for conversation and one-to-one play interactions. Many of the children had started school by the time of the Wave 3 interview at age five years (see Chapter 2). There was an advantage to having already started school in terms of performance on the vocabulary test, even after including previous performance at age three, which effectively measures change over time in cognitive performance between three and five years. However, it is unclear whether this is due to accelerated learning with a teacher in the classroom environment or just that children become more accustomed to tasks similar to those included in the cognitive tests as part of schoolwork.

### 3.3 NON-VERBAL REASONING

#### 3.3.1 CHILDCARE

As vocabulary is just one element of cognitive development, children's scores on a non-verbal reasoning test are also considered. This involved matching pictures based on what the items had in common (see Chapter 1 for further details). As noted in section 1.5, this is not a comprehensive measure of non-verbal skills such as through a full psychological assessment, but has been used in a number of other studies similar to *Growing Up in Ireland*.

As observed in the models for vocabulary, all three childcare types were associated with higher non-verbal reasoning test score relative to parental care only in the first model; but the positive effect of centre-based care was reduced to insignificance when child characteristics were added in Model 2 (Table 3.2). The effects of relative and non-relative care were not robust to the inclusion of parental and household characteristics in Model 3, and childcare remained insignificant for all of the remaining models.

The main differences between the relationship of childcare type to the non-verbal reasoning score, compared to that observed for vocabulary, were, first, that even in Model 1 the level of variance explanation for the former was much less: for all care types the change in score was less than two (less than one for centre-based care) and with an adjusted R-squared of just .002; secondly, the significant positive effect of each care type was removed after the inclusion of child, parental and household characteristics – and before the measures of the home learning environment. Variance explanation had reached three per cent by Model 5 and increased to 10 per cent after the inclusion of the three-year score. The variance explanation of Model 6 is low, given the typical stability in such skills over time (that is, a child who has a high score at three would be expected to also have a high score at five), but low explanatory power has also been found in other studies with this measure among children in a similar age range (see section 1.5 above; Hawkes & Joshi, 2011; Bradshaw, 2014a, 2014b). These models suggest that the likely explanation for the bivariate association between non-verbal reasoning scores and childcare is related to child and family characteristics associated with childcare choice, rather than an effect of childcare on non-verbal reasoning per se. Also, we shall see, activities with the child and grandparental involvement were less important for the non-verbal reasoning scores than for vocabulary.

<sup>41</sup> The explanatory power of child and family characteristics are presented jointly because the variance explained depends on the order in which these sets of variables are added. Furthermore, some of the characteristics may arguably be defined as both child and family characteristics (e.g. first language).

### 3.3.2 OTHER FACTORS

This section summarises the trends for the other variables in relation to scores on the non-verbal reasoning test. As before, these were recorded at age three years (apart from birth-weight and school-start) and, unless otherwise stated, the discussion refers to Model 5 (before the inclusion of age three year scores).

While not having English as a first language was associated with substantial disadvantage for expressive English vocabulary, this was not the case for the non-verbal reasoning test. Children from a non-English-speaking background have higher scores than English speakers (see Table 3.2). This is consistent with research on bilingual children aged between the ages of four and eight, which found that bilingual children perform better on non-verbal reasoning tests than comparable monolingual children (Bialystok, 2006). Other child characteristics of equal or greater importance were disadvantages associated with being male, living with older or same-aged children, and scoring higher on the behavioural measures of hyperactivity/inattention and peer problems. Low birth-weight was also associated with lower scores.

As with the vocabulary measures, lower Primary Caregiver education is associated with lower non-verbal reasoning scores, while consistent parenting and a resident spouse or partner are associated with higher scores. There was no significant association between Primary Caregiver stress (as before) but neither was there any association between non-verbal reasoning and income or Primary Caregiver's age. Adding parental and household characteristics explained only an extra one per cent of the variance in non-verbal reasoning scores.

**Table 3.2: Linear regression model of non-verbal reasoning scores at five years**

*All other variables measured at age three years (Wave 2) unless otherwise indicated. N=8,239.*

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
		Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
		56.57**	59.69**	58.02**	59.19**	58.10**	43.43**
<b>Childcare</b>							
Childcare type (ref: none)	Relative	1.02**	0.78*	0.45	0.49	0.46	0.52
	Non-relative	1.41***	1.09**	0.33	0.32	0.34	0.49
	Centre-based	0.83**	0.45	0.04	0.04	-0.07	0.05
<b>Child characteristics</b>							
Birth-weight	Low birth weight		-1.63**	-1.56**	-1.48**	-1.45**	-0.98
Sex (ref: male)	Female		1.03***	1.13***	1.07***	0.98***	0.50*
Younger children	Number of younger children joining between 9 months and 3 years		0.21	-0.10	-0.10	-0.07	0.14
Same age or older children	Number of other children same age or older at 3 years		-0.67***	-0.60***	-0.62***	-0.62***	-0.43***
First language (ref: Other)	English		-1.16**	-1.28**	-1.53***	-1.49**	-1.25**
Child's behaviour	SDQ Hyperactivity sub-scale		-0.41***	-0.29***	-0.27***	-0.27***	-0.16**
	SDQ Peer problems sub-scale		-0.41***	-0.32***	-0.30***	-0.30***	-0.18*
<b>Maternal and household characteristics</b>							
PCG education (ref: degree or higher)	Lower secondary or less			-1.51**	-1.06*	-1.11*	-0.61
	Upper secondary			-1.12***	-0.92**	-0.94**	-0.67*

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
		Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
	Certificate/ diploma			-0.34	-0.27	-0.26	-0.12
PCG age	Age of PCG			0.00	-0.01	-0.00	0.01
PCG stress	PCG parental stress score			-0.05	-0.05	-0.05	-0.04
PCG consistency	PCG consistent parenting style score			0.48**	0.38*	0.39*	0.27
Spouse/partner (ref: none)	Resident spouse/ partner of PCG			1.14**	1.00*	1.05**	0.72
Household income quintile (ref: highest quintile)	1st (lowest)			-0.74	-0.57	-0.64	-0.42
	2nd			-0.40	-0.27	-0.31	-0.17
	3rd			-0.14	-0.07	-0.12	-0.14
	4th			0.35	0.38	0.36	0.37
	Income missing			-0.68	-0.59	-0.59	-0.15
<b>Home learning environment</b>							
Learning activities	Combined total of days spent on learning activities in the home				0.01	0.00	-0.02
Number of books in the home (ref: more than 30)	None or fewer than 10				-1.78***	-1.95***	-0.95
	Between 10 and 20				-1.32***	-1.39***	-0.97**
	Between 21 and 30				-0.70*	-0.73*	-0.53
Contact with grandparents	Combined total of frequency of contact with grandparent				-0.01	-0.01	-0.01
<b>School start by age 5 years</b>							
(ref: not started)	Child has started school by age 5 years (Wave 3)					1.23***	1.15***
<b>Test score at 3 years</b>							
Picture Similarities score at 3 years	Picture Similarities t-score at 3 years						0.27***
Adjusted R-squared		.002	.02	.03	.03	.03	.10

Key to models: Model 1: Childcare (at three years) only; Model 2: Add child characteristics (at three years, except birth-weight); Model 3: Add maternal and household characteristics (at three years); Model 4: Add home learning environment measures (at three years); Model 5: Add school start by time of age five years interview; Model 6: Add non-verbal reasoning test t-scores at age three years. \*p≤.05, \*\*p≤.01, \*\*\*p≤.001

In terms of home learning environment, there was a significant, and linear, association between fewer books in the home and lower non-verbal reasoning scores. Somewhat surprisingly, there was no significant effect of either home learning activities or grandparental involvement – at least not independently of the ‘books in the home’ measure. The addition of home-learning environment characteristics did not improve the fit of the model.

Children who had already started school did significantly better on the non-verbal reasoning test. As already discussed, however, there are competing explanations for this effect, including that children with experience of formal learning may ‘perform’ better in test situations. Again, there is no improvement in model fit, indicated by the low R-squared. This suggests that, even after including all the information about the children, there is still low explanation of the variance of the non-verbal reasoning score. There is a highly significant relationship between the child’s score at three and their score at five on the non-verbal reasoning test, and the variance explained rises when their score on this test at age three was added in Model 6.

### 3.4 DURATION AND HOURS OF CHILDCARE AND VOCABULARY AND NON-VERBAL REASONING AT FIVE

Given debates in the literature about the potential impact of long hours of non-parental childcare and of starting non-parental childcare at a young age (discussed in Chapter 1), additional models were estimated, which included categorical variables measuring whether or not the child typically had more than 30 hours of care per week in the main care type (at three years of age), and if he or she had also been in regular non-parental care at age nine months (Wave 1). Note that children who were in non-parental care at both waves may not have been with the same care provider, nor were they necessarily in continuous care between the two waves, nor did they necessarily have the same care type or combination of care type.<sup>42</sup>

The results of these models are shown in Tables 3.3 and 3.4. For both the non-verbal reasoning and naming vocabulary tests, there is a significant positive effect of having also been in some form of non-parental care at nine months, when the only other variables in the model are type and frequency of childcare at age three years. However, this positive effect is not robust to the inclusion of all the other control variables from the main model at the second stage for either cognitive measure – and remains so with the inclusion of previous test scores.

There is a slightly different pattern for the effects of exceeding a cut-off of 30 hours per week of main childcare at age three years, although again there are no remaining significant effects by the final model. For the non-verbal reasoning measure, there was an initial positive effect for longer hours, but this did not remain after the additional child, family, household and environmental variables were entered at stage two. In contrast, on the vocabulary measure a slight negative effect of longer hours emerged with the inclusion of those control variables. After accounting for childcare type, other child and family background characteristics, home learning and whether or not the child had started school, having been in non-parental childcare for more than 30 hours per week at age three is associated with somewhat lower vocabulary scores at age five compared to being in parental care at age three.

<sup>42</sup> There are no detailed childcare histories in the Growing Up in Ireland dataset.

**Table 3.3: Linear regression models of vocabulary scores at age five years to include measures of longer hours in childcare at three years (more than 30 hours) and placement in non-parental care at age nine months<sup>43</sup>**

		Model 1: Childcare variables	Model 2: Add other main model characteristics (see notes)	Model 3: Add test score at age 3 yrs
		Coefficient	Coefficient	Coefficient
	(Constant)	52.92***	28.47***	16.12***
<b>Childcare</b>				
Childcare type at age three years (ref: none)	Relative	2.36***	0.89	0.80
	Non-relative	2.22***	0.56	0.98*
	Centre	1.09**	-0.43	-0.01
Amount of care age three years (ref: fewer than 30 hours or none)	More than 30 hours per week	-0.06	-0.81*	-0.46
Non-parental care at age nine months (ref: none)	In regular childcare at age nine months	1.68***	0.39	0.07
Adjusted R-squared		0.01	0.16	0.31

Notes: In Model 2, 'other main model characteristics' refer to all those included in Model 5 in Tables 3.1 and 3.2, namely child characteristics, maternal and household characteristics, home learning environment and having started school by age five. \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

**Table 3.4: Models of non-verbal reasoning scores at age five years to include measures of longer hours in childcare at three years (more than 30 hours) and placement in non-parental care at age nine months**

		Model 1: Childcare variables	Model 2: Add other main model characteristics (see notes)	Model 3: Add test score at age 3 yrs
		Coefficient	Coefficient	Coefficient
	(Constant)	56.38***	57.85***	43.22***
<b>Childcare</b>				
Childcare type at age three years (ref: none)	Relative	0.43	0.25	0.34
	Non-relative	0.64	0.07	0.24
	Centre	0.34	-0.22	-0.09
Amount of care age three years (ref: fewer than 30 hours or none)	More than 30 hours per week	0.70*	0.23	0.22
Non-parental care at age nine months (ref: none)	In regular childcare at age nine months	0.83**	0.45	0.39
Adjusted R-squared		0.004	0.03	0.10

Notes: In Model 2, 'other main model characteristics' refer to all those included in Model 5 in Tables 3.1 and 3.2, namely child characteristics, maternal and household characteristics, home learning environment and having started school by age five. \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

<sup>43</sup> Full model results available from the authors on request.

### 3.5 FREE PRESCHOOL YEAR CENTRE CHARACTERISTICS AND COGNITIVE OUTCOMES

An interesting aspect of this cohort is that nearly all of the children had, or will have, completed a year of centre-based care under the universal Free Preschool Year initiative. As almost all children participated in the scheme (96 per cent) and non-attendance is highly selective, it is not valid to model the effect of attendance *per se*; instead, the focus is on differences between the centres that the children went to. Using the data available on the centre where the child attended the Free Preschool Year (described in Chapter 1), an initial set of models examining the effect of two aspects of the centres was estimated. These two characteristics were: (a) whether or not the centre was in receipt of a higher capitation fee (reflective of whether the centre had a leader who had a graduate qualification in early childhood care and education<sup>44</sup>) and (b) whether the centre was community-based or a private enterprise. Ideally, all staff qualifications in the centre would be included, but this information was not available for the year when the child participated in the scheme.

As noted in section 1.5, the following analysis is based on a somewhat smaller group of children for whom there is data on the Free Preschool Year, not the full sample of *Growing Up in Ireland* children at age five. The first set of models look at both characteristics of centres (Tables 3.5 and 3.6); further models examine whether the effect of being in a centre receiving the higher capitation grant varies according to whether the child attended a community or a private crèche.

**Table 3.5: Models for association between Free Preschool Year characteristics and vocabulary at age five years (n = 5939)**

	Model 1: FPSY centre characteristics	Model 2: Add other main model characteristics	Model 3: Add test score at age 3 years
	Coefficient	Coefficient	Coefficient
Constant	53.99***	28.57***	17.61***
<b>FPSY centre characteristics</b>			
FPSY graduate leader/ higher capitation	0.35	0.16	0.15
Private centre (ref: community centre)	0.83*	-0.32	-0.47
Adjusted R-squared	.001	.16	.31

Notes: In Model 2, ‘other main model characteristics’ refer to all those included in Model 5 in Tables 3.1 and 3.2, namely care situation at 3 years, child characteristics, maternal and family background characteristics, home learning environment and having started school by age five. \*p≤.05, \*\*p≤.01, \*\*\*p≤.001

These models are shown in Tables 3.5 (vocabulary) and 3.6 (non-verbal). In each table Model 1 just includes centre characteristics, Model 2 includes all other model controls and Model 3 adds test scores at age three. Table 3.5 shows no significant effect of receiving a higher capitation grant on vocabulary scores at five years in any of the models. In Model 1 we see a modest positive association between vocabulary and having attended a privately run centre, but Model 2 shows that this is explained by the characteristics of the child and their family background. After controls no significant effect of attending the Free Preschool Year in a private crèche is found.

<sup>44</sup> Centres providing the Free Preschool Year can apply for the higher capitation fee “where all the Pre-school leaders in the sessional service room hold a bachelor degree in childhood/early education (minimum of Level 7 on the NFQ or equivalent) and have 3 years’ experience working in the sector, and where all the Pre-school assistants in the service, hold a relevant major award in childcare/early education at level 5 on the NFQ or its equivalent.” <http://www.dcy.gov.ie/viewdoc.asp?fn=/documents/childcare/GuidetotheProgrammeAdministrativeProceduresforServiceProvidersandParents.htm>

**Table 3.6: Linear regression models of the association of Free Preschool Year characteristics and the non-verbal reasoning measure at age five years (n = 6137)**

	Model 1: FPSY centre characteristics	Model 2: Add other main model characteristics	Model 3: Add test score at age 3 years
	Coefficient	Coefficient	Coefficient
Constant	57.03***	58.69***	44.42***
<b>FPSY centre characteristics</b>			
In receipt of higher capitation grant (ref: not in receipt)	0.65	0.62	0.55
Private centre (ref: community centre)	0.27	-0.41	-0.53
Adjusted R-squared	.00	.04	.10

Notes: In Model 2, 'other main model characteristics' refer to all those included in Model 5 in Tables 3.1 and 3.2, namely care situation at age 3, child characteristics, maternal and household characteristics, home learning environment and having started school by age five.  
\* $p \leq .05$ , \*\* $p \leq .01$ , \*\*\* $p \leq .001$

Table 3.6 presents results from the model of non-verbal reasoning. Model 1 shows a small positive association between non-verbal reasoning and having attended a centre that received the higher capitation grant, though the effect is only marginally statistically significant ( $p=0.06$ ). This effect remains after adding all the other controls for child's background, family characteristics and home learning environment (Model 2). The positive association between having a graduate leader in the centre where the child did the FPSY and change over time is somewhat smaller and not significant (Model 3). This is consistent with findings from the UK where an analogous scheme is in place. Mathers et al (2011) found that centres with a graduate leader were of higher quality, measured using observational studies. They found greater gains in children's outcomes in centres with a graduate leader (ibid). Regarding the association between attending a private or community crèche and non-verbal reasoning at age five, no difference between centre types is found. As in earlier models of non-verbal reasoning presented in this chapter, the variance explained is very low.

Does the association between cognitive outcomes and a centre receiving a higher capitation grant vary between community and private centres? Table 3.7 presents model results for vocabulary. Model 2 in Table 3.7 shows that children who did the FPSY in community crèches that received the higher capitation grant scored, on average, 1.39 points higher on the vocabulary measure at age five than children attending a community crèche that did not receive that grant. The association is only marginally statistically significant ( $p=0.08$ ) given the small numbers involved. Interestingly, the association is also found in the model of change over time (Model 3): these children also experienced a slightly greater increase in their vocabulary scores between age three and age five than their peers attending community crèches without a graduate leader.

Table 3.7 also shows that the positive association between having a graduate leader and vocabulary at age five is not found in private crèches. No effect is found here of there being a graduate leader in the centre where the child did the Free Preschool Year on vocabulary at age five or on change over time in vocabulary between ages three and five (Model 3).



**Table 3.7: Models for effect of Free Preschool Year characteristics on the vocabulary measure at age five years (distinguishing private and community crèches)**

	<b>Model 1: Capitation</b>	<b>Model 2: Add other main model characteristics</b>	<b>Model 3: Add test score at age 3 years</b>
	Coefficient	Coefficient	Coefficient
<b>Community crèche (N=1593)</b>			
Constant	53.84***	27.92***	17.79***
<i>FPSY centre characteristics</i>			
In receipt of higher capitation grant (ref: not in receipt)	1.37	1.39	1.24
Adjusted R-squared	0.001	0.16	0.31
<b>Private crèche (N=4346)</b>			
Constant	54.88***	28.45***	16.93***
<i>FPSY centre characteristics</i>			
In receipt of higher capitation grant (ref: not in receipt)	0.06	-0.12	-0.11
Adjusted R-squared	.000	.16	.31

Notes: In Model 2, ‘other main model characteristics’ refer to all those included in Model 5 in Tables 3.1 and 3.2, namely care situation at age 3, child characteristics, maternal and household characteristics, home learning environment and having started school and care by age five. \*p<.05, \*\*p<.01, \*\*\*p<.001

Table 3.8 presents the model findings for non-verbal reasoning. The findings suggest slightly higher reasoning scores for children who did the Free Preschool Year in centres that received a higher capitation grant. Model 2, after background characteristics, shows that this is true of both community and private crèches, though the effect on non-verbal reasoning scores at age five is small, and not statistically significant. The effect of receiving the higher capitation grant on change over time (Model 3) is not statistically significant for either type of centre.

**Table 3.8: Models for effect of Free Preschool Year characteristics on non-verbal reasoning at age five years (distinguishing private and community crèches)**

	<b>Model 1: Capitation</b>	<b>Model 2: Add other main model characteristics</b>	<b>Model 3: Add test score at age 3 years</b>
	Coefficient	Coefficient	Coefficient
<b>Community crèche (N=1644)</b>			
Constant	57.08***	63.11***	48.46***
<i>FPSY centre characteristics</i>			
In receipt of higher capitation grant (ref: not in receipt)	0.29	0.79	1.05
Adjusted R-squared	0.00	0.06	0.14
<b>Private crèche (N=4493)</b>			
Constant	57.28***	56.60***	42.44***
<i>FPSY centre characteristics</i>			
In receipt of higher capitation grant (ref: not in receipt)	0.74*	0.64	0.49
Adjusted R-squared	.001	.03	.09

Notes: In Model 2, ‘other main model characteristics’ refer to all those included in Model 5 in Tables 3.1 and 3.2, namely care situation at age 3, child characteristics, maternal and household characteristics, home learning environment and having started school by age five. \*p<.05, \*\*p<.01, \*\*\*p<.001

### 3.6 DISCUSSION

The main models (sections 3.2 and 3.3) looked at the effect of childcare type at age three years on cognitive scores at age five years, with controls for a wide range of child, parental, family and home characteristics – and in the final model also included the child’s score on the same test when they were three years old. While both measures of cognitive development (naming vocabulary and non-verbal reasoning) at five years were slightly higher for children in non-parental care at age three years (Figure 3.1), no care-type advantage emerged as robust to controls for other child, parental and home characteristics. The only exception to this was the very modest re-emergence of a positive effect for non-relative care on vocabulary after the inclusion of previous vocabulary scores.

Apart from this, the strongest association between care type and later cognitive outcomes was the positive effect of relative care on vocabulary, which was robust to child, parental and household characteristics. However, once the set of home learning factors that included a measure of wider grandparental involvement was included, relative-care was no longer statistically significant. This finding has echoes in results from other studies, including the Millennium Cohort Study which found a positive effect of grandparental care at nine months on vocabulary at age three years compared to centre-based care (Hansen & Hawkes, 2009); those authors suggested that grandparents may compensate for fewer physical activities with more verbal interactions. The finding that contact with grandparents more generally (not just from regular care provision) is positive for language development suggests that grandparental interaction and support is advantageous for vocabulary development for children in all forms of care.

Part of the explanation for the association between relative carers and vocabulary may also lie in the much lower ratios/fewer children per carer, on average, among relative carers compared to centre-based carers (shown in Chapter 2). Regarding three-year-olds, Table 2.4 shows, for example, that for carers looking after children in the carer’s home, the ratio of adults to children was 1:1.5 for relatives, compared to just under 1:5 for centre-based carers. The fact that the findings are just for vocabulary and not for reasoning suggests that one-to-one interaction and conversation with an adult at age three may be more salient for vocabulary than other aspects of cognitive development.

One of the more surprising findings from these analyses was the low level of variance explanation in the non-verbal reasoning model. Although the initial model with just childcare type indicated an advantage for non-parental over parental care, the adjusted R-squared was only .002 (or 0.02 per cent). This contrasts with one per cent for the same stage in the vocabulary modelling. The biggest contributor to variance explanation for non-verbal reasoning, apart from previous scores, was the child’s own characteristics – but, again, at just under two per cent, this was still well below that seen for the same stage of the vocabulary model (an additional 11 per cent). This may be due to the fact that having English as a first language was a major driver of vocabulary scores but much less important for non-verbal reasoning, where responses were given by gestures. While these are established measures of verbal and non-verbal cognitive skills, both measures are sub-tests and not comprehensive measures of cognitive development; comprehensive assessments were not possible in a survey of this nature (see section 1.5 for further details).

There were two sub-sets of further models that incorporated additional variables into the main model outline. The first looked at the effect of longer hours in care, and also previous childcare at age nine months (section 3.4). Overall, there was no effect of having been in care at nine months for either measure of cognitive development when other factors were taken into account. Being in non-parental care of any type for 30 hours or more at age three is associated with slightly lower vocabulary scores at age five, though there is no association with hours of care and the non-verbal reasoning score at five years old.

The second sub-set of models took a preliminary look at the effect of two characteristics of the centres in which the children completed the Free Preschool Year (section 3.6). These models found evidence of a

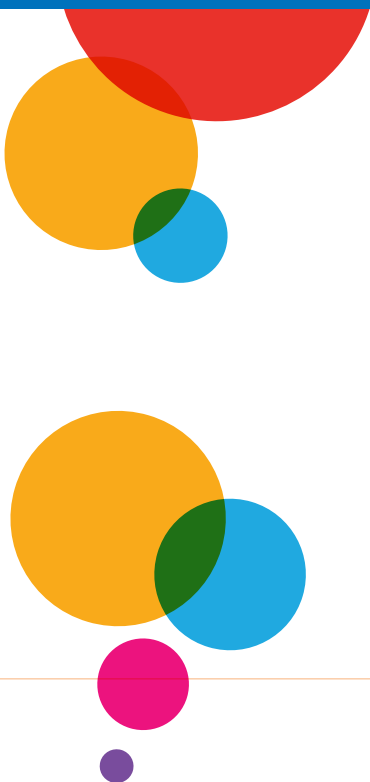
very small positive effect of having a graduate staff member (as measured by qualification for the higher capitation fee) on non-verbal reasoning, though it is just marginally statistically significant, and there is no effect on vocabulary scores for the full sample. Distinguishing between community and private crèches, the models found that, for children who attended the Free Preschool Year in community crèches, there is a modest effect of having better qualified staff on vocabulary scores. This is not found in private crèches. These effects are small, and in some cases only marginally statistically significant, but seem to indicate slightly better cognitive outcomes for children in centres receiving the higher capitation grant.

The positive association between vocabulary and non-verbal reasoning and starting school could also relate to higher qualifications of educators in the primary school sector, as all teachers have graduate qualifications; although obviously there are other valid explanations, including the possibility that children with better language skills may be considered ready for school, and enrolled earlier.



# Chapter 4

CHILDCARE AND COGNITIVE OUTCOMES  
BY LINGUISTIC BACKGROUND AND  
PRIMARY CAREGIVER'S EDUCATION



## 4.1 INTRODUCTION

An important element in the debate on childcare and child outcomes concerns the differential impact of childcare on children with different characteristics, as discussed in Chapter 1. One of the clearest findings to emerge from research is that gains from non-parental childcare are often largest for children from low-income or immigrant households and those with less-educated parents (Gambaro et al, 2014). If this is the case, non-parental childcare may have a role to play in reducing inequality. This chapter investigates this issue for Ireland, by estimating the models for vocabulary and non-verbal reasoning from the previous chapter separately for specific groups. The first part of the chapter looks at children from non-English-speaking backgrounds and English-speaking backgrounds. The second focuses on Primary Caregiver's education, distinguishing Primary Caregivers with less than upper secondary education (Leaving Certificate level) from those with Leaving Certificate qualifications or above. Given the intergenerational transfer of cognitive resources, it might be expected that cognitive achievement and factors affecting it may differ according to Primary Caregiver's education. There are clearly many other groups that could be focused on, but this would be beyond the scope of the chapter. The key question is: does the impact of childcare at three years old vary for different groups of children?

## 4.2 CHILDCARE AND COGNITIVE OUTCOMES BY LINGUISTIC BACKGROUND

Since Ireland does not have a long history of immigration by non-Irish nationals, there is not a significant population of second-generation migrants, or a body of literature on academic achievement by linguistic background. The available data suggest that, for older children, linguistic background is a key factor in understanding achievement scores. McGinnity et al (2012), using data from the Programme for International Student Assessment (PISA), show that, for 15-year-olds in 2009, the children of migrants from non-English-speaking backgrounds have significantly lower mean scores on both English and Maths achievement tests. The children of migrants from English-speaking backgrounds do not differ in Maths or English reading achievement from their Irish peers. A more recent PISA study from 2012 shows a smaller gap in English reading between Irish 15-year-olds and those from non-English-speaking backgrounds, but it is still significant (McGinnity et al, 2014b). Differences in academic performance are also evident at primary school level; the children of migrants from non-English-speaking backgrounds tended to have lower mean scores, particularly in English reading tests (McGinnity et al, 2012, using *Growing Up in Ireland* data; see also Eivers et al, 2010, using the national assessments of English and Mathematics, 2009).

Given these differences and their potential impact on educational achievement and future occupational status, is there a role for early care and education in reducing this gap? As outlined in Chapter 1, international studies have tended to find a positive effect of preschool education for children of migrants (e.g. Fredriksson et al, 2010; Haskins & Tienda, 2011). Recent work in Ireland shows that, where the children of non-Irish mothers use non-parental childcare, it is more likely to be centre-based care than relative care or non-relative care (McGinnity et al, 2014b). The substantially lower rate of relative care is almost certainly linked to the fact that many non-Irish nationals do not have any relatives living in Ireland. The somewhat lower rate of non-relative care, most of which involves childminders, may be related to the very informal way in which carers are matched to children requiring care in Ireland. County childcare committees in theory have lists of registered or notified childminders, but a very small proportion of childminders are registered, and most childminders are matched to children via informal connections that may require greater integration into local networks than finding a local crèche/centre-based care setting.<sup>45</sup>

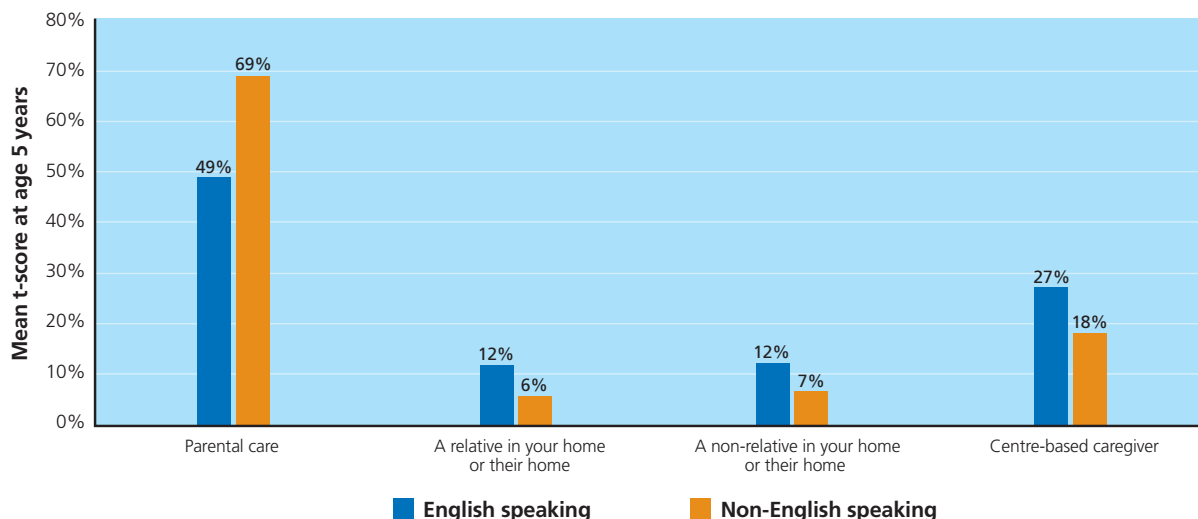
Given differences in achievement by linguistic background, this chapter focuses on children's linguistic background, as opposed to whether they are from a migrant background per se. In the survey, the parent reported that the child's first language was either English or another language. A total of eight per cent of the Study Children in the sample did not have English as their first language. Figure 4.1 shows the

<sup>45</sup> For example, the current number of 'notified' (i.e. regulated) childminders in Ireland is 154. <https://www.kildarestreet.com/debates/?id=2015-07-08a.16&s=pre+school#g21>. The total estimated number of childminders for preschool children is 20,000; see <http://www.dcy.gov.ie/documents/earlyyears/20150722IDGReportonEarlyYrsInvestmentReport.pdf>, p69.



proportion of children in each care type according to whether the children's first language was English or another language.

Figure 4.1: Proportion of children in each childcare type at age three years by linguistic background



In Chapter 3, a very strong association between linguistic background and English vocabulary scores is shown. Children from an English-speaking background scored on average around 15 points higher on the vocabulary measure than children whose native language was not English, controlling for all other characteristics (Table 3.1). As discussed in Chapter 3, the scores reflect their expressive vocabulary in English. These children may have good language skills in their first language but this is not recorded in the *Growing Up in Ireland* vocabulary test at age five (Dufresne & Masny, 2006). Table 4.1 presents the findings for vocabulary, with coefficients for non-English-speaking children above, and English-speaking children below. Three models for each group are presented. Model 1 has childcare type only; Model 2 has all child characteristics and family characteristics, as well as home learning environment, grandparental involvement and whether the child has started school; Model 3 adds scores at age three, which effectively models change over time in vocabulary scores. Measurement of these characteristics is described in Chapter 1. A substantial number of children from non-English-speaking backgrounds did not complete the vocabulary test at age three; therefore the number of cases included in the change-over-time model (Model 3) is much lower than for Models 1 and 2, which include all children who did the test at age five. The tables only present regression coefficients for care type at age three, as this is the main focus of interest.

**Table 4.1: Vocabulary scores at age five and childcare at three years for non-English-speaking and English-speaking children**

		Model 1 (care type only)	Model 2 (add child & family & school-start)	Model 3 (add test scores at age 3 years) (see notes)
<b>Non-English-speaking</b>				
	Constant	34.62***	13.24*	5.54
Childcare type: ref parental care	Relative care (n=43) <sup>46</sup>	0.66	-1.56	### <sup>47</sup>
	Non-relative care (n=53)	1.53	0.07	0.56
	Centre care (n=135)	3.36*	2.25	1.98
Adjusted R-squared		.01	.14	.28
N of children		682	682	399
<b>English-speaking</b>				
	Constant	54.22***	44.77***	26.68***
Childcare type: ref parental care	Relative care (n=899)	2.50***	0.89*	0.74
	Non-relative care (n=1069)	2.39***	0.39	0.88*
	Centre care (n=2185)	1.16***	-0.67*	-0.18
Adjusted R-squared		.01	.09	.25
N of children		7670	7670	7567

Notes: Model 1 has childcare type only; Model 2 has all child characteristics (birth-weight, sex, place in family, behaviour) and family characteristics, home learning environment and grandparental involvement, and whether the child has started school; Model 3 adds the child's score at age 3.<sup>48</sup> Around 40 per cent of non-English-speaking children did not complete the vocabulary test at age 3, which is why the models are estimated separately and the number of cases is lower for Model 3. See Chapter 1 for further details of measurement and Chapter 3 for models. p<0.1, \*p<.05, \*\*p<.01, \*\*\*p<.001.

For vocabulary scores, the first model shows no association between relative or non-relative care and vocabulary for non-English speakers, but a significant association between centre-based care and vocabulary for this group. This is consistent with international findings. When child and family characteristics are added, this association is still large, but becomes non-significant. However, given the size of the effect (2.25 points higher for those in centre-based care rather than parental care), and the fact that the group is small, it is interpreted as evidence of positive association between centre-based care at three and vocabulary outcomes at five. The coefficient is reduced when information on the child's score at age three is added, but the same interpretation applies. Relative care, by contrast, is not associated with higher vocabulary scores for non-English-speaking children. In fact, relative care is associated with slightly lower scores on vocabulary than parental care, though this is not significant, and the proportion of non-English-speaking children in relative care is low (see Figure 4.1). This could be because relatives of non-English-speaking children are likely to be non-English-speaking themselves and may speak to the children in their native language. However, verifying this would require further research.

For children whose first language is English, the impact of childcare on vocabulary is rather different. In the first model there is a positive association between all care types and vocabulary scores, though the association is stronger for home-based care types (relatives and non-relatives). In Model 2, which adds child and family characteristics, only the positive association with relative care remains statistically significant. English-speaking children have somewhat higher vocabulary scores if cared for regularly by a relative, in addition to their parents, controlling for all other factors likely to affect vocabulary. By contrast in this model, centre-based care is now negatively associated with vocabulary: English-speaking children in

<sup>46</sup> All N for childcare type refer to sample size for Models 1 and 2 only.

<sup>47</sup> Cell size insufficient to report.

<sup>48</sup> Full model results available from authors on request.



centre-based care tend to have slightly lower vocabulary scores than children who were in parental care at three years. In Model 3, we find a small positive association of both relative and non-relative care on change in vocabulary between three and five; centre-based care is not associated with change over time in vocabulary.

These findings suggest that the positive effect of relative care found in Chapter 3 is particularly for English-speaking children; centre-based care is not so beneficial for this group. By contrast, centre-based care seems to have a modest positive effect on English vocabulary for children from non-English-speaking backgrounds. Table 4.2 presents the results for non-verbal reasoning. It is useful to note that, while strong effects of language background on vocabulary at age five years in Chapter 3 were found, no such effects were found for the non-verbal reasoning test. In fact, children from non-English-speaking backgrounds had slightly higher scores on this measure. Did the effects of care type differ for the two language groups? For non-English-speaking children, both non-relative care and centre-based care were associated with slightly higher non-verbal reasoning scores than parental care only in Model 1, though the effect for non-relative care was not significant. By Model 2, the positive association with centre-based care was not significant, but once again it was moderate, not small, in size.

**Table 4.2: Non-verbal reasoning at age five and childcare at age three for non-English-speaking and English-speaking children**

		Model 1 (care type only)	Model 2 (add child & family & school-start)	Model 3 (add test scores at age 3 years)
<b>Non-English-speaking</b>				
	Constant	56.99***	57.31***	46.57***
Childcare type: ref parental care	Relative care (n=46) <sup>49</sup>	1.60	0.63	1.12
	Non-relative care (n=56)	2.16	0.77	1.02
	Centre care (n=137)	2.09*	1.41	1.64
Adjusted R-squared		.004	.06	.08
N of children		714	714	650
<b>English-speaking</b>				
	Constant	56.43***	56.78***	41.75***
Childcare type: ref parental care	Relative care (n=899)	1.06**	0.41	0.47
	Non-relative care (n=1068)	1.42***	0.23	0.44
	Centre care (n=2184)	0.80**	-0.24	-0.05
Adjusted R-squared		.002	.03	.10
N of children		7669	7669	7589

Notes: Model 1 has childcare type only; Model 2 has all child characteristics (birth-weight, sex, place in family, first language, behaviour) and family characteristics (Primary Caregiver's education, age, parental stress, parenting style, spouse, household income) as well as home learning environment and grandparental involvement, and whether the child has started school; Model 3 adds the child's score at age 3. \*p≤.05, \*\*p≤.01, \*\*\*p≤.001.

For English-speaking children there are modest positive effects of all non-parental care types vis-a-vis parental care in Model 1, but all become small and non-significant once child and family background characteristics were controlled for. For English-speaking children then, care type at three years of age is not associated with non-verbal reasoning scores at five years, or change over time in these scores between ages three and five. This is similar to what was found for the overall sample in Chapter 3.

<sup>49</sup> N for care type refers to sample size for Models 1 and 2 only.



### 4.3 CHILDCARE, COGNITIVE OUTCOMES AND PRIMARY CAREGIVER’S EDUCATION

Many evaluations of childcare, particularly in the United States but also in Europe, have found that the children of low-income and low-educated mothers gain more from childcare, particularly centre-based care (Gambaro et al, 2014; Ruhm & Waldfogel, 2012; see section 1.3 above). The idea is that early care and education compensate to some extent for the lower resources of the parents. Findings from the Millennium Cohort study in the UK (Hansen & Hawkes, 2009) are more mixed. They found that the association between centre-based care and school-readiness was larger for some more advantaged groups – two-parent families and children with better-educated mothers – but also for children living in households claiming benefits. The positive effect of grandparent care on vocabulary was only present for children with better-educated mothers, those in two-parent families and those not on benefits (ibid, p230).

Given rises in the educational level of younger cohorts in Ireland, particularly among women, a small minority of Primary Caregivers had left school before completing upper secondary education (eight per cent at the *Growing Up in Ireland* Wave 2 survey). This group is analysed separately as the children of low-educated Primary Caregivers, and the remaining 92 per cent of children whose Primary Caregivers have upper secondary (Leaving Cert) qualifications or above (post Leaving Cert qualifications or university degrees). Figure 2.1 in Chapter 2 shows that the overall proportion of children in non-parental childcare at three years is strongly related to education, with around two-thirds of the children of highly educated Primary Caregivers (degree or higher) in non-parental childcare, compared to one-third of those whose Primary Caregivers had lower secondary qualifications. Childcare type also varies by education for those who use non-parental care, with centre-based care the most common choice among the highest and lowest education groups. For those with Leaving Certificate qualifications, a similar proportion (around half) used home-based care (relatives and non-relatives) and centre-based care (see Chapter 2).

**Table 4.3: Vocabulary scores at five and childcare by Primary Caregiver’s education**

		Model 1 (care type only)	Model 2 (add child & family & school-start)	Model 3 (add test scores at age 3 years)
<b>Lower education (lower secondary or below, n=639)</b>				
	Constant	50.20***	19.52***	9.34
Childcare type: ref parental care	Relative care (n=44)	3.19	0.38	0.68
	Non-relative care <sup>50</sup>	###	###	###
	Centre care (n=122)	1.58	-0.04	0.33
Adjusted R-squared		.003	.17	.28
<b>Higher education (upper secondary and above; n=7327)</b>				
	Constant	53.74***	28.46***	16.38***
Childcare type: ref parental care	Relative care (n=872)	2.76***	0.79	0.68
	Non-relative care (n=1074)	2.63***	0.44	0.82*
	Centre care (n=2136)	1.33***	-0.54	-0.13
Adjusted R-squared		.01	.16	.31

Notes: Model 1 has childcare type only; Model 2 has all child characteristics (birth-weight, sex, place in family, first language, behaviour) and family characteristics (Primary Caregiver’s education, age, parental stress, parenting style, spouse, household income) as well as home learning environment and grandparental involvement, and whether the child has started school; Model 3 adds the child’s score at age 3. \*p≤.05, \*\*p≤.01, \*\*\*p≤.001.



For children of Primary Caregivers with lower secondary educational qualifications, the first model (Table 4.3) shows that there is no significant effect of any form of non-parental care at age three, compared to children in full-time parental care, on vocabulary at age five. Adding vocabulary scores at age three (Model 3) does not affect this pattern of results for childcare. There is no evidence of a positive association between non-parental childcare and vocabulary at age five for the children of low-educated Primary Caregivers in this sample.

For the children of Primary Caregivers with upper secondary education or higher, it was found that all forms of non-parental care at age three years had a significant small positive association with vocabulary scores at age five, but these effects did not remain statistically significant once child and other family characteristics were held constant in Model 2. Interestingly, in Model 3, home-based care types, relative care and non-relative care are associated with slightly higher increases in vocabulary between ages three and five than sole parental care, though the coefficients were not statistically significant. This echoes the finding from Hansen and Hawkes (2009) that the children of more highly educated Primary Caregivers show vocabulary gains from home-based care, albeit grandparental childcare in their study using the Millenium Cohort Study. This effect is not found for children in centre-based care.

**Table 4.4: Non-verbal reasoning scores at five and childcare by Primary Caregiver's education**

		Model 1 (care type only)	Model 2 (add child & family & school-start)	Model 3 (add test scores at age 3 years)
<b>Lower education (lower secondary or below, n=647)</b>				
	Constant	54.36***	50.53***	37.58***
Childcare type: ref parental care	Relative care (n=43)	1.15	0.41	1.11
	Non-relative care <sup>51</sup>	###	###	###
	Centre care (n=122)	2.03	1.56	1.63
Adjusted R-squared		.003	.01	.11
<b>Higher education (upper secondary and above; n=7592)</b>				
	Constant	56.87***	57.78***	43.04***
Childcare type: ref parental care	Relative care (n=893)	0.82*	0.45	0.47
	Non-relative care (n=1087)	1.20***	0.49	0.59
	Centre care (n=2177)	0.59*	-0.03	-0.01
Adjusted R-squared		-.001	.03	.10

Notes: Model 1 has childcare type only; Model 2 has all child characteristics (birth-weight, sex, place in family, first language, behaviour) and family characteristics (Primary Caregiver's education, age, parental stress, parenting style, spouse, household income) as well as home learning environment and grandparental involvement, and whether the child has started school; Model 3 adds the child's score at age 3. \*p≤.05, \*\*p≤.01, \*\*\*p≤.001.

Turning to non-verbal reasoning, there is initial evidence of a positive effect of centre-based care for the children of low-educated Primary Caregivers, as one would expect from previous literature from other countries, but this effect is not robust to controls for child characteristics and family background. There are some indications of a negative effect of non-relative care on non-verbal reasoning, but the group is very small and the effects are not significant in any of the models. For the children of highly educated Primary Caregivers, there were no significant effects of childcare at age three once controls were added, nor was there any effect of care type on change over time.

<sup>51</sup> Cell size insufficient to report.

#### 4.4 SUMMARY

This chapter looked primarily at whether specific sub-groups of children would derive more or less benefit from non-parental childcare at age three years, as evidenced by their scores on two measures of cognitive development when they were five years old. The sub-groups were (a) those who did or did not speak English as their first language and (b) those whose Primary Caregiver had less than Leaving Certificate qualifications or Leaving Certificate and above. There is some evidence of a beneficial effect of centre-based care at age three for children from non-English-speaking backgrounds. In the first model, for each cognitive measure (vocabulary and non-verbal reasoning) – which looked at the effect of non-parental care at three years on its own – there was a significant positive effect of centre-based care compared to parental care only, but not for either relative or non-relative care. Even though the statistical significance level dropped below the five per cent threshold in subsequent models, when control variables were added, the direction of the coefficients remained in favour of centre-based care on both measures, and would likely have remained significant if the number of children in this particular grouping had been higher. It has been observed elsewhere in the *Growing Up in Ireland* data that use of non-parental care by migrants is less than that by English-speakers (McGinnity et al, 2014b), which may be somewhat unfortunate given that these children appear to derive the most benefit. McGinnity et al (2014b) argue that lower participation in non-parental care by migrants is likely to be linked to the high cost of childcare in Ireland, for those who do not have a relative available to care for their children.

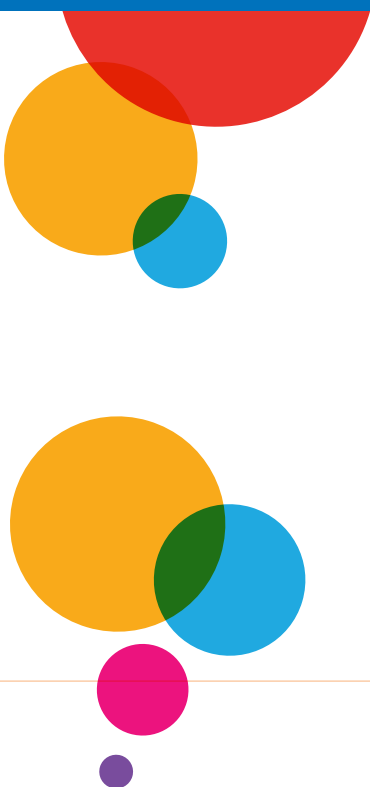
In contrast, for the native English-speaking majority, there was a small positive association between improvements in vocabulary between age three and five years and home-based care – by relatives, typically grandparents, or non-relatives such as childminders. In fact, a small negative effect of centre-based care on vocabulary at age five emerged for English-speaking children when other child and family characteristics were controlled for. By the final stage of the non-verbal reasoning model, which included controls, there were no remaining significant effects in either direction.

In general, there were low or no associations between care type at three years for the children of low-educated and high-educated Primary Caregivers. For children whose Primary Caregivers had lower education attainment (lower secondary or less), any form of non-parental care had an initial positive effect on vocabulary – but all childcare effects were attenuated by the addition of child, family and home variables. With regard to the measure of non-verbal reasoning, there is no significant association between non-parental care and non-verbal reasoning for the children of low-educated Primary Caregivers. For the children of more highly educated Primary Caregivers, there is an association between childcare and change over time in vocabulary scores (with home-based carers being associated with slightly higher vocabulary gains), but no association with childcare at age three and non-verbal reasoning.



# Chapter 5

CONCLUSIONS AND ISSUES FOR POLICY



## 5.1 EARLY CARE AND EDUCATION IN THE FIRST FIVE YEARS

Chapter 2 in this report considered the extent and nature of non-parental care and education experienced by children in the *Growing Up in Ireland* survey in the early years of life, using data from the Infant Cohort at age nine months, three years and five years. There was a marked increase in the use of non-parental childcare between nine months, when 39 per cent of infants were in non-parental care, and age three, when half of the children (50 per cent) were in non-parental care.

For those in non-parental childcare, there was a marked shift towards centre-based care. For infants at nine months, relative care, usually by grandparents, was the most common care type; by age three, centre-based care had become the dominant form. Average hours of care decreased somewhat between nine months and three years, which is likely to be associated with the use of part-time ('sessional') preschool places among three-year-olds. Counting total hours in childcare at age three, the majority of children were in non-parental childcare for less than 30 hours per week (63 per cent); just over one-third attended for 30 hours a week or more.

There are no detailed childcare histories in the *Growing Up in Ireland* survey, but the evidence available suggests considerable mobility between childcare arrangements between the waves. For example, one-third of children had experienced a change in their main care type between age nine months and age three years. Young children's needs change rapidly in the early years, parents' employment patterns also change, and in addition many of these children would have acquired a new sibling or moved house. Further analysis and more detailed data would be required to investigate factors associated with changes in care arrangements. The models estimated in the report include whether or not the child was in non-parental care at nine months.<sup>52</sup>

The results from Chapter 2 suggest that the Free Preschool Year (FPSY), the most important policy initiative in this area in recent decades, has opened up access to centre-based care for more disadvantaged children. Take-up of the scheme was immediate and very high. It was introduced in January 2010, yet by the Wave 3 interview in early 2013, 96 per cent of the children in this study had availed of the FPSY. One-quarter of parents said they would have been unable to send their child to preschool in the absence of the scheme; the figure rose to over a third among children from disadvantaged backgrounds. Indeed, expansion in access is likely to have been even greater than these parental reports suggest. At age three, before the children became eligible for the scheme, 27 per cent of all children were attending centre-based care,<sup>53</sup> and 17 per cent of children in the lowest income decile. These findings are consistent with cross-national research which concluded that free universal preschool provision is the most effective way to achieve high enrolment rates and to ensure that middle to low-income children gain access to centre-based care (Gambaro et al, 2014).

## 5.2 EFFECTS OF NON-PARENTAL CHILDCARE AT AGE THREE ON COGNITIVE DEVELOPMENT AT AGE FIVE

The main focus of this report was the potential impact of non-parental childcare at age three years on cognitive outcomes at age five. This was investigated using two measures of cognitive outcomes, one vocabulary test and one non-verbal reasoning test. Models of the association between childcare type at three years of age and cognitive scores were estimated; these models successively added factors likely to influence cognitive outcomes: child characteristics, family background, home learning environment, and whether the child had started school. In a final step, models were estimated that effectively measured the change in the cognitive test scores between three and five years, or the 'value added'. In each case the type of non-parental childcare attended was assessed against the counterfactual of being in sole parental care. Chapter 3 presented the model results for all children in the *Growing Up in Ireland* sample at age five. The

<sup>52</sup> Initial analyses found that the type of care at nine months was not significant in the models, so all forms of care were combined into one category.

<sup>53</sup> This figure refers to main care; the figure is slightly higher (30 per cent) if secondary care arrangements are also included.



modest positive association of centre-based care at age three and vocabulary at five was not statistically significant once child characteristics had been added. The positive association was somewhat larger for non-relative care, but was also insignificant when child and family characteristics were added. This suggests that differential selection into care types by socio-economic background and family composition accounts for the initial positive correlation between centre-based and non-relative care and vocabulary. A positive association for vocabulary with relative care compared to parental care was found until home learning environment, and in particular grandparental activities, were added. Of all three care types then, the strongest association with vocabulary at five years was for those in relative care at age three. Looking at change over time in vocabulary scores between ages three and five in the model which added scores at age three, a modest positive effect was found for non-relative care only, meaning that children in non-relative care made more progress than those in sole parental care between the two time points. No significant effects of other non-parental care types on change over time in vocabulary were found.

The pattern was similar for non-verbal reasoning scores, but the initial association with non-parental care was more modest. The positive association with centre-based care became non-significant once child characteristics were added. For non-relative and relative care, the initial positive association with non-verbal reasoning scores became statistically insignificant when child characteristics and family background factors were held constant. There was no association between care type and change in non-verbal reasoning scores over time. Overall, the non-verbal reasoning model has lower explanatory power than the vocabulary model; that is, the factors included do a better job of explaining vocabulary scores than non-verbal reasoning scores. However, it should be noted that the explanatory power of both models is low before the inclusion of the cognitive scores at three years.

Do hours and duration of care play a role in the association between childcare and cognitive outcomes? After accounting for other background characteristics, having been in non-parental childcare as an infant (at nine months) is not associated with vocabulary scores at five years, or change over time in vocabulary scores. However, being in non-parental childcare for 30 hours per week or more at age three, regardless of type, is associated with slightly lower vocabulary scores at age five. For non-verbal reasoning, no effects of early entry to non-parental childcare (by nine months) or hours of non-parental childcare at age three were found.

Chapter 4 estimated the same models for two sub-groups: children from an English-speaking and a non-English-speaking background, and children whose Primary Caregivers had lower secondary education or less compared to those with Leaving Certificate qualifications or above. For children from non-English-speaking backgrounds, there was a small positive effect of centre-based care at age three on vocabulary at age five, after controlling for all other factors, though the group is small. For children from English-speaking backgrounds, there was a small negative effect of centre-based care on vocabulary at age five, but no effect of centre-based care on change over time in vocabulary scores. There was a very small positive effect of home-based care – both relative and non-relative care – compared to parental care at age three on change over time in vocabulary for children from English-speaking backgrounds. For children of both English-speaking and non-English-speaking backgrounds, there was no effect of care type on non-verbal reasoning once background characteristics were controlled for.

Considering the impact of childcare for children from different education educational backgrounds, there were no significant effects of care type on vocabulary scores for those from a lower-educated background (Primary Caregiver with lower secondary education or less) or from a higher-educated background (Primary Caregiver with Leaving Certificate qualifications or higher), once the full range of background characteristics were controlled for. There was a modest positive effect of home-based care – particularly non-relative care – compared to sole parental care on vocabulary score change between ages three and five.

The implications of these findings should be considered with caution. In general, the effects of non-parental childcare at age three on cognitive outcomes at five are either very small or non-significant, after taking other relevant factors into account. This is not inconsistent with international findings (Melhuish, 2004). The variance explained by childcare in the models is also low. This is suggestive of several points. First, these models do not include information about the quality of non-parental childcare received at age three, so the possibility cannot be ruled out that high-quality care has a positive effect on cognitive outcomes and low quality has a negative effect, and that these effects combined produce no effect (the issue of quality is taken up below). Second, vocabulary is a very widely used measure of cognitive ability and the scales in this report have been used in other studies, particularly in the UK (Millennium Cohort Study, Growing Up in Scotland). However, they do not give as rounded a picture of the child's cognitive development as a complete battery of assessments administered by an experienced professional such as an educational psychologist. Third, the models found that a number of characteristics of the child, family background and home environment are likely to be more important over time than the type of non-parental care, if any. This is both plausible and consistent with international research in the area (see Chapter 1). Most children, even those in non-parental childcare, have spent most of their waking hours in their home with one of their parents. Their Primary Caregiver's age and education, household income, siblings and in particular home learning environment are therefore likely to play a more salient role in cognitive outcomes than their experience of non-parental childcare. There may be other aspects of the child and family not recorded that also play a role. In particular, genetic factors are likely to influence cognitive outcomes. This report uses well-established and widely used statistical modelling techniques, but estimates of childcare effects net of all the family background characteristics may be conservative if, for example, poor quality of childcare is associated with a disadvantaged home environment, and the latter is measured but not the former (see Melhuish, 2004).

A potentially important overlap arises in the case of interactions with other caring relatives, at least for vocabulary, as regular contact with grandparents remained a significantly positive influence, and the trend for a positive effect of relative care was only reduced when grandparent contact was included. These results suggest that one-to-one interactions with caring adults other than parents can be an important source of additional language support even outside the context of 'regular childcare'. This has echoes in other research which suggests that negative effects of low parental education appear to be mediated through a poorer home learning environment, and that improvements in the latter can counter the former (Washbrook & Waldfogel, 2011; Sylva et al, 2004); as Sylva et al put it, "what parents do is more important than what parents are" (pii).

Interactions with caregivers and peers outside the immediate family may be especially important for children whose first language is not English. Children who did not speak English as their first language did much worse on the vocabulary measure in the main models (Chapter 3), and in the sub-group analysis (Chapter 4) there was some suggestion that they derive more benefit from centre-based care than their English-speaking peers with regard to both measures. This is consistent with international research, which indicates that gains to preschool care and education are often greatest for immigrant children (Gambaro et al, 2014). As noted in Chapters 3 and 4, for these children the vocabulary scores measure ability in their second language (English); they may score better in their first language. It is interesting in this regard that the models show that, for non-verbal reasoning at age five, children whose first language is not English score higher than native English speakers.

### 5.3 THE FREE PRESCHOOL YEAR, STARTING SCHOOL AND COGNITIVE DEVELOPMENT

Due to the almost universal take-up of the Free Preschool Year (FPSY) scheme, it was not possible to assess its impact on cognitive outcomes, as there was no suitable group of children with whom to compare participants. If the scheme had been introduced in some areas before others, for example, the overall effect



could have been examined by comparing the group of children who participated with those who did not. However, this was not the case and, as take-up was so high across the population, estimating whether there was an effect on cognitive outcomes of introducing the scheme was not possible.

The impact of variations in the characteristics of services the children attended was analysed; that is, whether they did the FPSY in a community or private crèche and whether the centre they attended received a higher capitation grant for having a graduate leader in the service. Children who attended the FPSY in services with a graduate leader recorded slightly higher non-verbal reasoning scores at age five than those who availed of the scheme in centres without a graduate leader, though the effect is only marginally statistically significant. For the full sample there was no effect on vocabulary scores of having a graduate leader in the service. Distinguishing between community and private crèches, children who attended the FPSY in community crèches with a graduate leader had slightly higher vocabulary scores at age five than peers in community crèches without a graduate leader, though the effect is only marginally statistically significant. This effect was not found for private crèches.

There are some early indications, then, that having a graduate leader may be associated with some small cognitive gains for the full sample, on average. However, the analysis of the FPSY centre characteristics is limited; further measures of centre characteristics, such as the qualifications of all staff, or, ideally, observational indicators of quality in centres would provide more robust indicators. In addition, there was considerable flux in centres in this time period, with a rapidly increasing proportion of centres qualifying for the higher capitation grant over the period. This means that centres may have acquired graduates during the year, for example, which was not picked up by the measures used.

An interesting, though complex, finding in relation to both cognitive measures was the significant positive effect of having started school. Being in school remained significant, even in the very final 'change over time' models that included children's earlier scores on the same test. The simpler possible explanations for this effect include (a) that children with more advanced skills were more likely to be enrolled early and (b) that tasks completed as part of schoolwork meant that these children had more practice in engaging in activities like the BAS tests used in *Growing Up in Ireland*.

However, it is also possible that children make more progress in the school environment where they are instructed by more qualified staff within a structured curriculum. This hypothesis finds some support in the preliminary analysis of the impact of the centres where the children completed their Free Preschool Year; there was a very small positive effect on children's non-verbal reasoning if the centre had staff sufficiently qualified to earn the higher rate of capitation from the scheme. From a research perspective, the fact that the Free Preschool Year scheme had near-universal take-up muddies the waters for this cohort considerably; it could be argued that participation in the FPSY has improved school-readiness among children generally so that, when they do start school, they are better able to capitalise on it.

Starting school was not the main focus of this report, however, so before drawing policy implications, one would need to investigate in detail which children start school earlier, and crucially whether these effects on cognitive outcomes are transitory or maintained; that is, whether later starters 'catch up' or even subsequently outperform their peers. Alexander (2010) discusses how, if formal reading instruction is started earlier, children do better in reading tests initially, but if they are followed up at 11 or 12 they do not differ from those who have learned informally, and starting formal instruction too early may have a damaging effect on motivation, particularly for boys. In the UK there is also evidence of a 'birth date effect' whereby the youngest children in the year group perform at a lower level than their classmates, and that while the effect diminishes with age, it persists until GCSE (age 16) (Sykes et al, 2009).

The figures on age of starting school suggest that children from lower-income backgrounds tend to start



earlier than those from higher-income households. This pattern may be related to the cost of accessing preschool/early education for children outside the FPSY age thresholds compared to school places funded by the State.

#### 5.4 QUALITY OF CARE

The international literature has highlighted the importance of quality of care for beneficial outcomes for children. The absence in this study of significant effects for participation in different types of childcare, early education, and duration of childcare may be due in part to the lack of robust measures of care quality in *Growing Up in Ireland* (as in most other national longitudinal studies). While information on the structural characteristics of care arrangements, such as staff qualifications and carer-to-child ratios, can be assessed using survey techniques, process indicators of quality, such as the warmth of interaction between carer and child, the extent to which the child is listened to or given a chance to express their feelings, are much more difficult to measure. The literature suggests that, ideally, observational methods be used to assess process quality.

The picture is further complicated when comparing quality over a range of different care types, including relatives, childminders and centre-based providers. Studies of care quality are typically confined to comparisons within the more formal centre-based sector. When the broader range of care arrangements used by parents is considered, we are no longer comparing like with like.

Home-based care, particularly relative care, tends to involve a much smaller ratio of children to adults. Relatives looking after children in their own home have an average ratio of one adult to 1.5 children, compared to one adult to 2.8 children for non-relative carers in the carer's home and one adult to almost five children for centre-based carers.<sup>54</sup> This in turn is associated with greater opportunity for one-to-one interaction with the child. However, McGinnity et al (2013) found that, compared to centre-based carers, home-based carers are much less likely to have childcare or early-education qualifications, and tend to have fewer educational resources such as toys and books, and that children in home-based settings are more likely to spend time on passive activities, such as watching television. It is also possible that unmeasured characteristics, such as the warmth of the relationship between child and carer, disciplinary style and consistency, opportunities for learning, etc, differ between childcare types. Interaction with other children is also an important dimension of variance between care settings, and wider peer socialisation is often viewed by parents as an advantage of centre-based preschool care. Different non-parental childcare settings may affect children's socio-emotional development in various ways, which in turn may be linked to children's learning and cognitive achievement (see Chapter 3 for some evidence of the impact of socio-emotional development on cognitive outcomes at age five). An obvious next step in this area would be to estimate the effects of childcare on socio-emotional development (see section 5.6 below).

Yet because key characteristics are so distinctive across care types, it was not possible to measure these effects alongside those of care-type itself. Qualifications are typically regarded as an effective proxy for quality in centre-based care, but their effectiveness for home-based care is less clear (Layzer & Goodson, 2006). Where it was possible to examine structural characteristics to a very limited extent within the FPSY centre-based care providers, the evidence suggests that higher levels of staff qualifications (as proxied by receipt of the higher capitation fee) are associated with slightly higher non-verbal reasoning scores at age five, controlling for a wide range of family and child characteristics, though the effects are very small and only marginally statistically significant. This finding is supportive of research from the UK, which found that preschool children attending centres with a graduate leader showed greater cognitive gains than those attending centres without a graduate leader (Mathers et al, 2011).



## 5.5 QUALITY, PRICE AND POLICY

There are ongoing concerns about the quality of childcare available in Ireland and the cost of these services to parents. Policy must therefore address the difficult task of improving standards while making quality care affordable and accessible, within the context of restricted resources and a high government deficit.

The issue of quality of provision has become an increasing focus of childcare and early-education policy in Ireland. A number of significant developments have taken place such as the introduction of Aistear and Síolta, and commitments under the Preschool Quality Agenda (see section 1.4.3 and Table 1.1) and recommendations of the Expert Advisory Group on the Early Years Strategy (see Chapter 2). However, the evidence suggests there are still significant shortcomings that need to be addressed. The current inspection regime has been criticised as under-resourced and relying on inspection personnel who do not have the requisite training or background in early education and care. In addition to the existing inspection regime, new Early Years Education-focused inspections of the Free Preschool Year are being introduced in autumn 2015 on a pilot basis.<sup>55</sup>

Qualification requirements for childcare workers in Ireland are very low according to international comparisons (Eurydice/Eurostat, 2014) and compared to educators in the primary school sector (McKeown et al, 2014a), a feature that is not unconnected to the low level of pay and status accorded to workers in this sector. A significant proportion of staff in the childcare sector (13 per cent in 2011) are participants in government employment schemes: Community Employment, the Jobs Initiative or the Community Service Programme (Pobal 2012).<sup>56</sup> This figure is even higher among community-based providers, where staff participating in these schemes accounted for 23 per cent of all staff. A further four per cent of staff in the Early Years sector were unpaid volunteers. The latest Pobal survey also showed a high level of staff turnover in the sector (Pobal, 2014).

Issues of quality of care are also related to the funding mechanism. The OECD review of childcare across 20 countries concluded that ensuring quality of service is best served by direct public funding of services rather than indirect funding through subsidies or tax credits to parents. The review suggests that “direct public funding of services brings, in the majority of countries reviewed, more effective control, advantages of scale, better national quality, more effective training for educators and a higher degree of equity in access and participation than consumer subsidy models” (OECD, 2006, p114)

The issue of the mix between state provision, not-for-profit and commercial provision in the childcare sector was examined in the comparative study of eight countries by Gambaro et al (2014). They suggest that “quality can be high in the private sector but this comes through regulation and tighter standards (which are likely to reduce profitability), not through pressure of competition, which is likely to be dominated by price” (ibid, p237-8). The shift to a competitive childcare market in the Netherlands was found to be associated with a decline in quality of provision; those authors argued that this arose because it was difficult for parents as consumers to discern quality differences between providers. The study found that in Norway high-quality care was delivered in the not-for-profit and commercial sector, but this was achieved through strong quality requirements, price and profit limits and high levels of state subsidies rather than through free market competition.

## 5.6 AVENUES FOR FURTHER RESEARCH

A number of important themes have emerged from this report that would be interesting to investigate from both a policy and research perspective. The focus here was on cognitive outcomes, yet the international literature suggests that there may be important associations between children’s socio-emotional development and type and quality of childcare. As presented in Chapter 3, aspects of socio-emotional

<sup>55</sup> <https://www.education.ie/en/Press-Events/Press-Releases/2015-Press-Releases/PR2015-05-26.html>

<sup>56</sup> Note that the Pobal survey is only sent to facilities in receipt of government funding, either through capital grants or programmes such as the FPSY, CETS or CCS. In 2011 this accounted for 4,363 services, of which 78 per cent responded.

development (in particular hyperactivity and peer problems) are associated with cognitive outcomes (both vocabulary and non-verbal reasoning) at age five. Further research could investigate the link between socio-emotional outcomes and childcare, child and family background using similar methodology. It could also consider whether the effect of early care and education and socio-emotional outcomes vary for disadvantaged children.

The initial hypothesis included a number of child and parent characteristics as possible moderators of the relationship between early care, education and cognitive development, but these were later excluded as they did not contribute any additional variance explanation to the model. Future work could examine these variables in more detail, and not in relation to non-parental childcare per se. In particular, the parenting characteristics of warmth and hostility tended to be skewed towards high warmth and low hostility for most parents, which is encouraging in terms of child well-being, but means they have a low likelihood of explaining variation in children's cognitive development given that they themselves showed low variance. It is possible that a future investigation of this issue could identify parents with high hostility and low warmth, and categorise parents into a dichotomous variable of normal versus 'emotionally deficient' parenting. In terms of the lack of effect of the child's temperament characteristics, again it is possible that future analysis could seek to identify children with particularly poor persistence, for example, rather than considering it as a linear/continuous variable. Alternatively, it may be that the interaction between temperament and cognition only really comes to the fore when the child starts formal schooling, and his or her ability to regulate emotions and behaviour becomes more critical for determining academic achievement than in the home or preschool environment.

The *Growing Up in Ireland* survey is an incredibly rich source of information on the lives of children, their family and communities, which is focused on child development outcomes. It is not primarily a survey of childcare providers. While the Study provides an opportunity to examine childcare in a broad perspective, there is a need for further data on childcare from focused surveys in order to investigate childcare settings. There are significant gaps in quantitative data on the early-years sector. The last childcare census was carried out in 1999/2000 before many of the recent policy developments, and could usefully be revisited, perhaps drawing on existing administrative data. The annual Pobal survey of providers supplies valuable information on the childcare providers in receipt of government funding. While the introduction of the FPSY scheme means that an increasing proportion of centres are covered, there is little information available on private providers who are not in receipt of government support. The data and knowledge gap is even greater in the case of childminders, and relative and non-relative carers who care for children in home-based settings. Indeed *Growing Up in Ireland* is one of the few sources of national data on this sector, which is randomly generated rather than coming from a sub-set of providers who are registered or belong to a carers' organisation. A first step would be to use the information from the carer surveys about qualifications and activities, to see if these are linked to quality of care and cognitive or behavioural outcomes.

Given debates on quality in both the literature and policy debates in Ireland, there is also a need for detailed observational studies of care provision both for centre-based and other care types at a national level. The EPPE study in England demonstrates the value of such studies but also highlights how labour-intensive this research methodology is likely to be. The conditions of employees in the Early Years sector are also central to the quality debate. There is growing attention to the qualifications of childcare workers, but the issue of attracting and retaining graduates in this sector of the economy will be tied to working conditions, including factors such as pay, hours, security, autonomy, professionalisation and status. Further data collection and research on carers as employees would inform policy development in this area.

The international literature on the topic also highlights that parents may not always be good judges of childcare quality, particularly important aspects of quality that are difficult to observe (Cryer et al, 2002). Parents as consumers often have insufficient knowledge to make an informed choice about childcare; detailed observational studies and published reports on quality of childcare settings would also be of benefit to parents.



This study highlighted a range of child, family, socio-economic and institutional factors that influence children's cognitive outcomes at age five. A key issue from both a child development and a policy perspective is the extent to which such factors are associated with longer-term developmental outcomes. For example, does the positive effect of starting school early persist over time, or do later starters catch up or indeed surpass the early starters in subsequent years? Another pertinent question is: are the class and family background differences in cognitive achievement found in this report maintained, or does the gap narrow or widen as the children get older, and what factors are associated with this? The value of an ongoing child cohort study such as *Growing Up in Ireland* for assessing the long-term effects of early life experiences will become increasingly evident as these five-year-olds are followed into later childhood, adolescence and adulthood.

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