

# GROWING UP IN SCOTLAND: Multiple Childcare Provision and its Effect on Child Outcomes

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**GROWING UP IN SCOTLAND:**  
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Effect on Child Outcomes

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# **GROWING UP IN SCOTLAND:** Multiple Childcare Provision and its Effect on Child Outcomes

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# Contents

<b>EXECUTIVE SUMMARY</b>	<b>v</b>
<b>1 INTRODUCTION</b>	<b>1</b>
<b>2 PREVALENCE OF CHILDCARE</b>	<b>5</b>
<b>2.1 Key findings</b>	<b>5</b>
<b>2.2 Use of any form of childcare</b>	<b>5</b>
<b>2.3 Number of different providers used</b>	<b>7</b>
<b>2.4 Characteristics of those who use multiple provision</b>	<b>9</b>
2.4.1 Family type	9
2.4.2 Maternal employment	11
2.4.3 Household employment and family type	12
2.4.4 Household income	12
2.4.5 Socio-economic classification (NS-SEC)	12
<b>2.5 Use of multiple provision over time</b>	<b>13</b>
2.5.1 Age 34 months compared with age 10 months	13
2.5.2 Number of providers at each sweep	14
<b>3 CHARACTERISTICS OF CHILDCARE PROVISION</b>	<b>17</b>
<b>3.1 Key findings</b>	<b>17</b>
<b>3.2 Number of hours and days</b>	<b>17</b>
<b>3.3 Types of provision</b>	<b>19</b>
3.3.1 Use of formal and informal childcare	19
3.3.2 Use of different provider types	22
<b>3.4 Time spent in different provider types</b>	<b>23</b>
<b>3.5 Cost of childcare</b>	<b>26</b>
<b>3.6 Ease of arranging, satisfaction with provision, preferences and choice</b>	<b>28</b>
<b>3.7 Parental views on work-life balance</b>	<b>28</b>

# GROWING UP IN SCOTLAND:

Use of multiple childcare provision amongst families with young children  
in Scotland and its effects on early child outcomes

<b>4</b>	<b>EFFECTS OF MULTIPLE CHILDCARE USE ON CHILD OUTCOMES</b>	<b>31</b>
4.1	Key findings	31
4.2	Cognitive development	32
4.2.1	Mean scores by use of childcare	32
4.2.2	Mean scores by number of childcare providers	35
4.2.3	Mean scores by mix of childcare provision	37
4.2.4	Mean scores by total hours of childcare per week	38
4.2.5	Examining the independent effect of childcare fragmentation on early cognitive development	39
4.3	Social, emotional and behavioural development	40
4.3.1	Mean scores by use of childcare	41
4.3.2	Mean scores by number of childcare providers	42
4.3.3	Mean scores by mix of childcare provision	43
4.3.4	Mean scores by total hours of childcare per week	43
4.3.5	Examining the association of multiple childcare provision on social and behavioural outcomes	44
<b>5</b>	<b>CONCLUSION</b>	<b>47</b>
	<b>REFERENCES</b>	<b>50</b>
	<b>APPENDIX A: REGRESSION TABLES</b>	<b>51</b>

This report uses data from the first three waves of the Growing Up in Scotland study (GUS) to explore families' experiences of using childcare for children under the age of 5 years old. The report focuses particularly on families' use of multiple childcare providers examining the nature and extent of multiple use and the potential effects of early multi-provider care on later child outcomes at age 34 months and 58 months.

#### *Prevalence of childcare*

- Most families use childcare in the early years and a sizeable minority of parents in both cohorts report using multiple childcare providers at each sweep.
- In the birth cohort, use of multiple providers increased as the child aged. At age 0-1, 27% of families using childcare used two providers and 4% used three or more. At age 2-3, 34% used two providers and 8% used three or more.
- Amongst the child cohort, peak use of multiple provision coincided with the child's attendance at their statutory pre-school place at age 3-4. At age 2-3, 32% of families using childcare used two providers and 7% used three or more. These figures rose to 39% and 20% respectively at age 3-4.
- Parental employment in itself, and in combination with family type, affects use of multiple providers. Households where the child's mother was employed are more likely to use multiple childcare providers than those where the mother is not employed. Lone parents where the parent works report higher use of multiple provision than do unemployed lone parents and couple families where both parents work.
- Use of multiple providers over time is fairly common. Amongst those who had ever used two or more providers, 72% in the child cohort and 65% in the birth cohort had done so at any two or more sweeps including 38% and 29% who reported use of two or more providers at all sweeps.

#### *Characteristics of childcare provision*

- Higher durations of weekly childcare are associated with use of more childcare providers. In the birth cohort at sweep 1, whereas 25% of those using childcare for between 9 and 16 hours per week receive that care from two or more providers, the same is true for 38% of those who use childcare for between 17 and 40 hours.
- At each sweep, the majority of children who have three or more childcare arrangements experience a mix of informal and formal provision in these arrangements with the proportion experiencing this mix increasing as the children age (in the birth cohort, 56% at sweep 1, 78% at sweep 2, 85% at sweep 3).
- Parents who use more than one provider are more likely to pay for at least some of their child's childcare than parents using one provider. This reflects the greater likelihood that multiple users will use formal provision which requires payment, unlike



# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

many informal arrangements which are 'cost free' to parents. However, parents using multiple providers do not necessarily incur higher childcare costs overall owing to the particular mix and duration of provision and use across all families.

- The data shows that the predominant pattern of multiple childcare provision can be summed up as 'Grandparents plus some other form of childcare'.

## *Parental responses to childcare arrangements*

- Levels of satisfaction with their main childcare provider, preferences for changing the main provider, and perceptions of the level of choice when choosing a childcare provider do not vary significantly amongst parents who use different numbers of childcare providers.
- There were no significant differences either between how easy users of one or multiple childcare providers had found it to arrange suitable childcare for the cohort child in the last year.

## *Effects of multiple childcare use on child outcomes*

- For the birth cohort, analysis was undertaken to explore the independent association between various features of childcare arrangements experienced at age 10 months on cognitive development at age 34 months whilst controlling for key socio-economic characteristics which are known to influence cognitive ability in the early years.
- The analysis shows that of the various childcare characteristics at age 10 months considered, only weekly duration of non-parental care had any statistically significant association with the child's cognitive ability at age 34 months after controlling for key family socio-economic and demographic factors; non-parental care of between 17 and 40 hours per week was found to have a significant positive impact on a child's knowledge of vocabulary specifically amongst girls.
- The characteristics of childcare arrangements in the first year of life which could be considered to describe 'childcare fragmentation' – exposure to multiple providers, a greater mix of provision, and less time with any single provider – do not impact positively or negatively on child cognitive development at age 34 months.
- For the child cohort, the association between childcare features at age 34 months and behavioral development at age 58 months was explored.
- The analysis showed that after controlling for key family characteristics such as parental education levels and parental employment, experiencing 40 hours or more of care per week at age 34 months was detrimental to children's behavioural outcomes as they approached their fifth birthday. Further analysis suggested this relationship

was significant particularly for girls and for children whose mothers were under 25 at the child's birth. No other childcare features were significant.

### *Conclusion*

The picture presented by the data of childcare use by parents of young children in Scotland does suggest a degree of 'childcare fragmentation'; use of multiple providers is fairly common, as is use of a combination of formal and informal provider types and using different providers for different durations of care. Furthermore, all of these arrangements do change over time for some families.

This complex pattern of childcare arrangement may suggest some cause for concern, however there is no data to suggest either that parents are particularly dissatisfied with their arrangements - parents who use different numbers of childcare providers were no more likely to be dissatisfied with their main childcare provider, nor to have a preferences for changing their main provider, or to perceive they had less choice when choosing childcare provider than did parents using just a single provider - nor that experiencing multiple provision or a mix of provision per se has any particular positive or negative impact on child cognitive or behavioural outcomes at 34 and 58 months.

In fact, children's experience of non-parental childcare in the early years appears to be generally beneficial to their cognitive development on the basis of the outcome measures used in GUS, although the effects are not large.

chapter  
INTRODUCTION



As part of the commitment of successive governments ‘to give every child in Scotland the best start in life (Scottish Government and COSLA, 2008; Scottish Executive, 2003; Scottish Executive, 2006) two of the central planks have been a major expansion of early years childcare provision and tax credits subsidising the costs of childcare. That commitment has resulted in a major increase in both demand for and supply of childcare in the last 10 years. Policy responses to increasing demand have improved the quality and availability of childcare. Most recently, the Scottish Government and the Convention of Scottish Local Authorities stated their joint early years policy position:

“We believe that investment in early years and early intervention can contribute to both economic and social objectives. Giving children the best start in life and improving the life chances of children, young people and families at risk will make a major contribution to delivering the solidarity and cohesion that we want to see in Scottish society.” (Scottish Government and COSLA 2008, p. 8)

In 2007, central and local government entered into a Concordat specifying their joint approach to policy development and moving from the previous situation where central government set the policy direction, with local government having the responsibility for implementation.

The early years childcare policy model that has evolved over the last decade is that of maternal care for the first year, supported by up to one year of maternity leave and, since April 2007, nine months of maternity pay, and a mixed economy of childcare, including informal, voluntary, private and statutory providers, and culminating in universal funded part time pre-school education for children aged 3 and 4. Further early intervention and support is offered to children from the most deprived backgrounds through Sure Start Scotland initiatives. In the most recent available Scottish Government statistics (Scottish Government, 2008), it is estimated that over 96% of 3 and 4 year olds eligible for free pre-school education were registered with local authority or partnership pre-school education centres, a greater level of take-up of nursery places for the under 5s than in England and Wales. Scotland made early moves to expand nursery provision and has sought to achieve an ambitious, comprehensive cross-sectoral integration of early years services. This expansion has undoubtedly increased the childcare choices available to parents. Nevertheless as the use of non-relatives of the child for some early years childcare has become the social norm in Scotland, it is important to assess the impact of these policies and patterns of provision, not least through robust evidence of the experience and views of users and to consider the issues these raise.

This report uses data from the Growing Up in Scotland study (GUS) to explore families’ experiences of using childcare for children under the age of five years old. GUS is an important longitudinal research project aimed at tracking the lives of two cohorts of

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Scottish children from the early years, through childhood and beyond. Its principal aim is to provide information to support policy-making, but it is also intended to be a broader resource that can be drawn on by academics, voluntary sector organisations and other interested parties. Focusing initially on a cohort of 5,217 children aged 0-1 years old (the birth cohort) and a cohort of 2,859 children aged 2-3 years old (the child cohort), the first wave of fieldwork began in April 2005 and annual data collection from both cohorts has been undertaken since that time.<sup>1</sup>

The study provides an unparalleled source of evidence to improve our understanding of early years childcare provision and use from the perspective of parents. For example, research has shown that many families use a patchwork of childcare arrangements, and it is not clear to what extent this reflects parental choice or a lack of services that can meet families' needs. Analysis of data from sweep 1 of GUS showed that 27% of parents of children aged 10 months, and 32% of parents of children aged 34 months used two childcare providers on a regular basis and that 4% and 7% respectively used three or more. The use of multiple childcare providers can result in myriad and complex childcare arrangements that is more supply than demand-led, that is, less a matter of parental choice and more of a reflection what services and support are available and affordable.

Much research has been conducted on the potential effects that early years childcare generally, and different childcare arrangements specifically, can have on children's social, emotional, cognitive and behavioural outcomes in later years. Many studies have found beneficial effects of pre-school education on children's later school attainment. The Effective Provision of Pre-School Education project (EPPE) has shown that children with no pre-school experience have poorer cognitive attainment, sociability and concentration when they start primary school than those who have some pre-school learning (Sylva *et al*, 2004). The National Institute of Child Health and Human Development (NICHD) Study of Early Child Care and Youth Development, an American research project, has shown that some school and/or centre-based care between the ages of six months and four and a half years has positive benefits for school children (NICHD Early Child Care Research Network, 2003). Furthermore, the longer term impact of pre-school education on UK children has been examined using data from the 1958 National Child Development Study which found that pre-compulsory education before the age of 5 led to consistently better test scores at age 7 with these advantages still present at age 11 and 16 (Goodman and Sianesi, 2005).

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1 Further information on the design, development and future of the project is available from the study website: [www.growingupinScotland.org.uk](http://www.growingupinScotland.org.uk)

Whilst extremely relevant, the focus of this research has generally been on the individual effects of children's experience of specific forms of childcare provision (such as group daycare or childminder care) for weekly or monthly durations at particular ages. Less research attention has been devoted to exploration of the potential effects of the use of multiple childcare arrangements at a given time, on child outcomes. This report will explore the phenomena of multiple childcare use using data from the first three sweeps of the Growing Up in Scotland study. After examining the nature and extent of multiple use, the potential effects of multi-provider care on child outcomes at age 34 months and 58 months is considered.

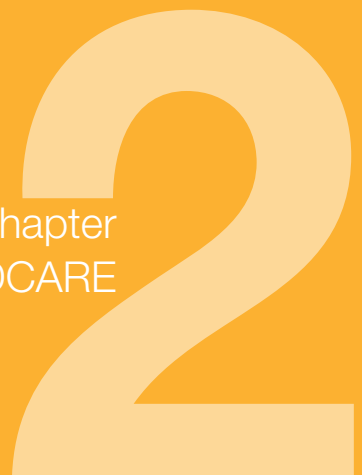
The findings in this report are in four sections which address the following broad questions:

1. What use of childcare is made by parents and how does this vary by the child's age and over time? Within that overall context, how prevalent is the use of multiple providers and how does that pattern vary according to family and household characteristics and over time?
2. How much and what types of childcare are used, and in what combinations? How much time do children spend with each childcare provider and in total? What is the cost of childcare?
3. How do parents assess the childcare provision they use? To what extent would they prefer alternative provision and how do these preferences vary by household and family characteristics? To what extent do parents consider their childcare arrangements support their work/life balance?
4. What are the effects of using multiple childcare providers on child outcomes?

All of the statistics have been weighted by a specially constructed weight to adjust for non-response and sample selection. Both weighted and unweighted sample sizes are given in each table. All analyses have been weighted and have had standard errors adjusted to take account of the cluster sampling.

chapter

PREVALENCE OF CHILDCARE



## 2.1 Key findings

- Most families use childcare in the early years and a sizeable minority of parents in both cohorts report using multiple childcare providers at each sweep.
- In the birth cohort, use of multiple providers increased as the child aged. At age 0-1, 27% of families using childcare used two providers and 4% used three or more. At age 2-3, 34% used two providers and 8% used three or more.
- Amongst the child cohort, peak use of multiple provision coincided with the child's attendance at their statutory pre-school place at age 3-4. At age 2-3, 32% of families using childcare used two providers and 7% used three or more. These figures rose to 39% and 20% respectively at age 3-4.
- Parental employment in itself, and in combination with family type, affects use of multiple providers. Households where the child's mother was employed are more likely to use multiple childcare providers than those where the mother is not employed. Lone parents where the parent works report higher use of multiple provision than do unemployed lone parents and couple families where both parents work.
- Use of multiple providers over time is fairly common. Amongst those who had ever used two or more providers, 72% in the child cohort and 65% in the birth cohort had done so at any two or more sweeps including 38% and 29% who reported use of two or more providers at all sweeps.

## 2.2 Use of any form of childcare

Both cohorts of children were born at a time when the National Childcare Strategy for Scotland had been in place for several years. At each sweep of fieldwork, parents are asked a range of questions about their use of childcare for the cohort child. These included the types of childcare used, including both formal and informal providers, their cost, the number of hours and days per week that childcare was used and the age at which childcare was first used for the child. At each sweep, a picture is created of the 'current' childcare provision being accessed at the time of the interview. However, data on arrangements collected at the previous sweep are 'fed-forward' into the current interview so that continuity and change of provision can be identified.



# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Most families use childcare in the early years. At each sweep, at least 60% of parents in each cohort reported using some form of childcare for the cohort child. In the birth cohort, use of childcare increased as the children aged, rising from 60% to 68% between sweeps 1 and 2, and up to 76% at sweep 3. In the child cohort, the pattern was somewhat different. The initial increase from 76% at sweep 1 (when the child cohort was the same age as the birth cohort at sweep 3) to 99% at sweep 2 is largely accounted for by the almost universal take-up of free pre-school provision amongst parents in the child cohort between these sweeps. The subsequent drop to 82% at sweep 3 is explained by the minority of children who had started school by the time of their sweep 3 interview, amongst whom childcare use was lower<sup>2</sup>.

Notably, the proportion of families in the birth cohort using childcare at sweep 3 is almost identical to the proportion in the child cohort at sweep 1 (76% in both cases) indicating that the proportion of parents of 2 to 3 year olds using childcare in Scotland has remained static between 2005/06 and 2007/08.

**Table 2.1 Use of any childcare by cohort and sweep**

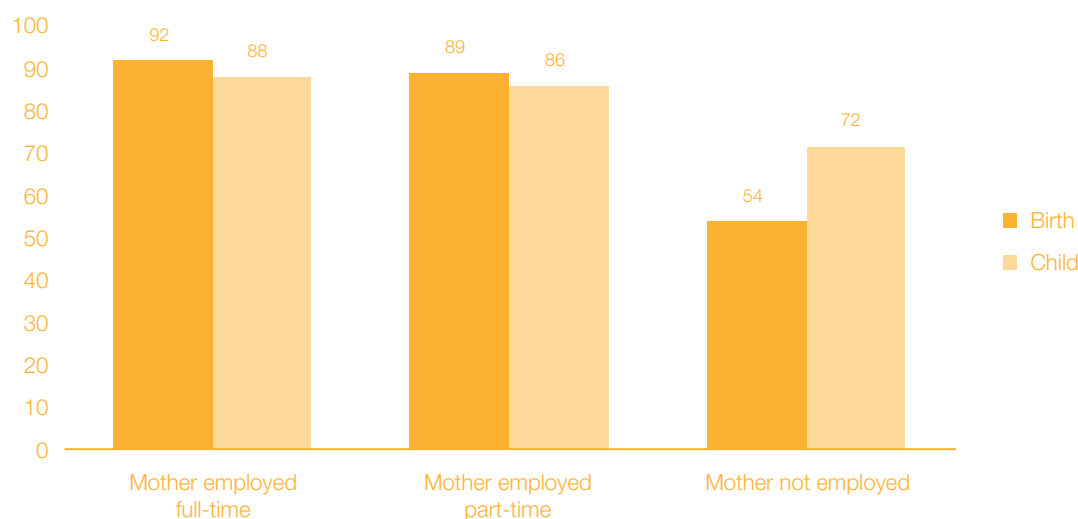
Cohort	% using childcare		
	Sweep 1	Sweep 2	Sweep 3
<b>Birth</b>	60	68	76
<i>Bases</i>			
<i>Weighted</i>	5216	4511	4193
<i>Unweighted</i>	5216	4511	4193
<b>Child</b>	76	99	82
<i>Bases</i>			
<i>Weighted</i>	2858	2500	2332
<i>Unweighted</i>	2858	2500	2332

Previous analysis of GUS data has demonstrated key differences in patterns of childcare use amongst families with different characteristics (Anderson *et al*, 2007, Bradshaw *et al*, 2008). Maternal employment, household income, area deprivation and area urban-rural classification are all significantly associated with variations in childcare use in both cohorts. These relationships continue at sweep 3. For example, in the birth cohort, 92% of families where the child's mother was working full-time were utilising some form of

2 35% of children in the child cohort had started school at the time of the sweep 3 interview. Amongst those families where the cohort child was at school, 50% were also using some form of childcare for the child compared with 91% of families where the child was not attending school.

childcare compared with 54% of families where the child's mother was not employed (see Figure 2-A), showing the central role of childcare to working mothers, especially those working full-time. Similar trends appear in the child cohort, although the differences are not quite as pronounced due to continued uptake of statutory pre-school provision.

**Figure 2-A Percentage using childcare at sweep 3 by cohort and maternal employment status**



Unweighted bases:

Birth cohort: Employed full-time = 642, Employed part-time = 2108, Not employed = 1422

Child cohort: Employed full-time = 409, Employed part-time = 1134, Not employed = 756

### 2.3 Number of different providers used

The type of childcare provision being used was chosen from a list of 18 different provider types covering both formal and informal provision. At every sweep, respondents reported details of each individual childcare provider that they were using including the provider type, and the number of hours and days per week each provider looked after the child.

A sizeable minority of parents in both cohorts report using multiple childcare providers. Figure 2-B and Figure 2-C display for each cohort, at each sweep and amongst those parents who use childcare, the proportions using one, two or three or more childcare providers. The trend in use of single and multiple childcare provision over time is different. As Figure 2-B demonstrates, use of multiple providers amongst parents in the birth cohort increased, and use of single provision decreased, as the child aged. At sweep 1, 69% of parents using childcare in the birth cohort used only one provider, 27% used two providers and 4% used three or more providers. At sweep 3, in contrast, 58% used a single provider, 34% used two providers and 8% used three or more providers. Trends

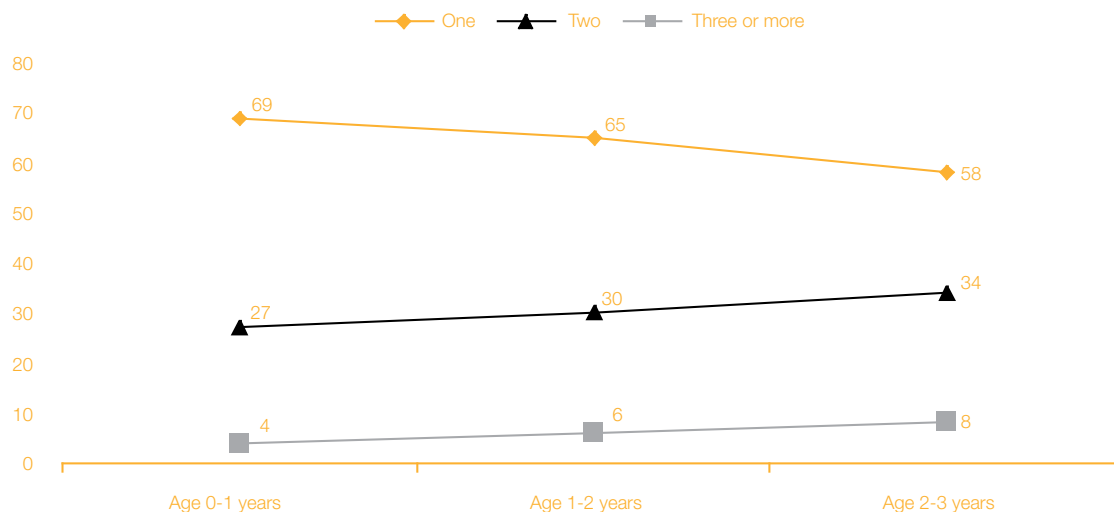
# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

amongst the child cohort are less linear. Between sweeps 1 and 2, use of a single provider drops considerably from 61% to 41% whereas use of three or more providers increases significantly from 5% to 20%. Multiple provision then drops between sweeps 2 and 3, with use of just a single provider increasing at the same time<sup>3</sup>. Again, the uptake of pre-school at age 3-4 contributes to this dramatic, but – for most – time-limited, increase in use of multiple providers suggesting that many parents simply ‘add’ their child’s pre-school place onto those arrangements which already exist.

Comparing the number of providers used by parents in the child cohort at sweep 1, and those in the birth cohort at sweep 3 (when they are both aged 2 to 3), there is no indication that multiple childcare use has either increased or decreased significantly amongst parents of 2-3 year olds between 2005/06 and 2007/08; about 40% of parents use multiple childcare providers at this age.

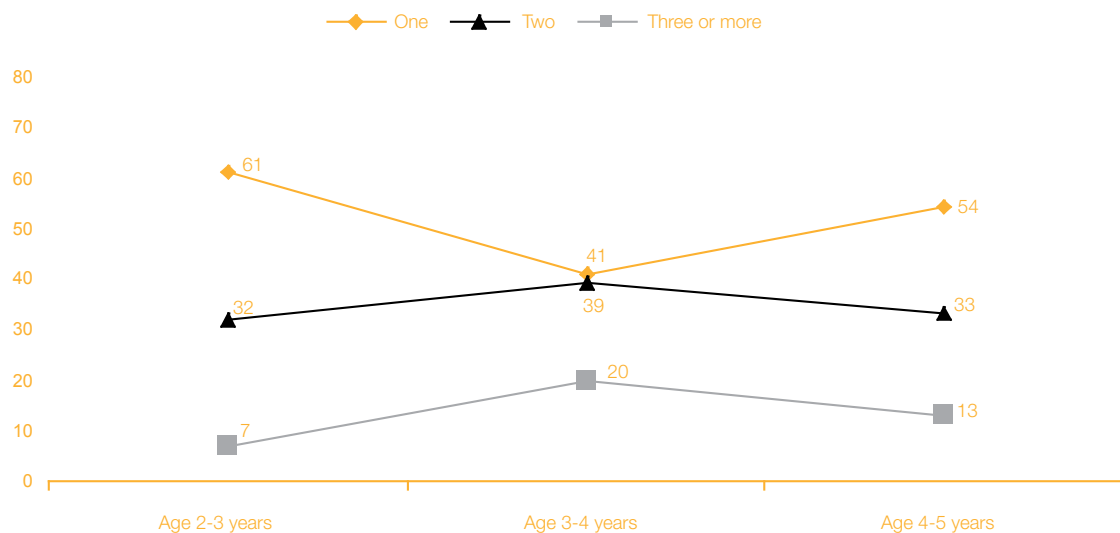
**Figure 2-B Percentage of childcare providers by sweep – birth cohort**



Unweighted bases – those using childcare: Age 0-1 = 3118, Age 1-2 = 3119, Age 2-3 = 3251

<sup>3</sup> Use of multiple provision in the child cohort drops even amongst those where the child is not attending school, 36% of whom use two providers at sweep 3, and 15% of whom use three or more.

Figure 2-C Percentage of childcare providers by sweep – child cohort



Unweighted bases – those using childcare: Age 2-3 = 2177, Age 3-4 = 2470, Age 4-5 = 1909

## 2.4 Characteristics of those who use multiple provision

Families using childcare in each cohort and at each sweep were compared across a range of socio-economic and demographic characteristics. For ease of interpretation, only the results from the birth cohort at sweep 3 are presented in Table 2.2 below. However, notable results at other sweeps, and in the child cohort, are referred to in the text.

### 2.4.1 Family type

Little difference was evident in the number of childcare providers being used by lone parents and those in couple families in either cohort or at any sweep. Only those differences observed at sweep 2 were statistically significant where lone parents were very slightly more likely to have been using multiple provision than were parents in couple families. For example, in the birth cohort, 40% of lone parents were using two or more providers compared with 34% of parents in couple families.

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

**Table 2.2 Selected family characteristics by number of childcare providers used at age 2-3 (birth cohort)**

Row percentages	No. of providers used at sweep 3			Bases	
Family characteristic	1	2	3 or more	Weighted	Unweighted
<b>Family type NS</b>					
Lone parent	59	34	8	612	506
Couple family	58	34	8	2582	2745
<b>Maternal employment ***</b>					
Full-time	52	37	11	533	548
Part-time	54	38	9	1602	1633
Not employed	73	23	4	584	560
<b>Household employment and family type ***</b>					
Lone parent in paid work for more than 16 hours	49	39	12	314	280
Lone parent unemployed or working less than 16 hours	68	28	4	298	226
Couple family both mother and partner working more than 16 hours	53	38	10	1665	1807
Couple family either mother or partner working more than 16 hours	69	27	5	828	863
Couple family both mother and partner unemployed or working less than 16 hours	70	23	7	84	70
<b>Household income<sup>4</sup> ***</b>					
Bottom Quintile (<£11,250)	66	29	5	554	454
2nd Quintile (>=£11,250 < £17,916)	60	32	8	606	582
3rd Quintile (>=£17,916 < £25,000)	58	35	8	582	607

4 This figure is for 'equivalised' income. The income that a household needs to attain a given standard of living will depend on its size and composition. For example, a couple with dependent children will need a higher income than a single person with no children to attain the same material living standards. "Equivalisation" means adjusting a household's income for size and composition so that we can look at the incomes of all households on a comparable basis.

Row percentages	No. of providers used at sweep 3			Bases	
Family characteristic	1	2	3 or more	Weighted	Unweighted
4th Quintile ( $\geq$ £25,000 < £37,500)	54	38	8	677	747
Top Quintile ( $\geq$ £37,500)	55	37	10	582	668
<b>Household NS-SEC<sup>5</sup> ***</b>					
Managerial and professional	57	35	8	1726	1907
Intermediate occupations	54	35	11	476	465
Small employers and own account workers	59	32	9	193	193
Lower supervisory and technical	63	31	6	240	231
Semi-routine and routine	64	30	6	514	426

\*\*\*Differences significant at less than .001

## 2.4.2 Maternal employment

At each sweep of GUS, between 50% and 60% of mothers in each cohort were employed. Maternal employment has already been shown to be associated with greater childcare use; households where the child's mother was employed were significantly more likely to use childcare than households where the mother was not working. Maternal employment was also associated with the number of childcare providers used; those families where the child's mother was employed were more likely to use multiple providers with little distinction according to whether employment was full or part-time. As illustrated in the table, for example, in the birth cohort at sweep 3, 37% of families using childcare where the child's mother was employed full-time used 2 providers compared with 23% where the child's mother was not employed.

In order to explore further any potential differences by maternal employment analysis was undertaken of the number of weekly hours the child's mother worked. Differences in average maternal weekly hours worked between families using different numbers of childcare providers were not statistically significant indicating that the number of hours worked in a week appeared to have little impact on the likelihood of using multiple providers.

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

## 2.4.3 Household employment and family type

As shown in Table 2.2, the variable describing household employment and family type creates five categories based on the particular mix of family type and employment patterns in the household. At each sweep, lone parents who are in paid work for 16 or more hours per week are the childcare users most likely to be using multiple providers. This trend exists in both cohorts. For example, in the child cohort at sweep 2, 36% of lone parents in employment for at least 16 hours a week and who used childcare used three or more providers compared with 16% of lone parents who did not work or worked less than 16 hours and 26% of parents in couple families where both adults worked.

## 2.4.4 Household income

Whilst variations in the number of childcare providers by household income is significant at all sweeps, the differences are small. It is largest in the child cohort where parents in the higher income brackets are more likely to use multiple childcare providers, but the relationship between level of income and number of providers is not a simple linear one such as that suggested by the birth cohort data in Table 2.2. In both cohorts, any differences are more likely due to variations in employment patterns and working hours than level of income *per se*.

## 2.4.5 Socio-economic classification (NS-SEC)

There are only small social class differences in the proportions of parents using multiple childcare providers. Where there are differences, they are difficult to interpret and suggest that it is more likely to be differences in employment patterns, rather than social class differences that account for variations in the use of multiple childcare providers. For example, variations by NS-SEC are significant at sweep 2 where there are some differences in both cohorts; managerial/professional and intermediate households are more likely to use multiple provision than households in other categories. Whilst lower supervisory households are almost as likely as managerial/professional and intermediate households to use a single provider, they are *just* as likely to use three or more providers. The complex and relatively small differences by NS-SEC suggest that use of multiple childcare provision is more closely related to the employment patterns in the household and the number of hours worked than it is about the actual type of employment.

Indeed, further statistical analysis that controlled for these various factors showed that, of the variables considered above, only maternal employment status was significantly and independently associated with use of multiple childcare providers<sup>5</sup>. However, the model

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5 The dependent variable in the model was whether the family used two or more childcare providers or not. Independent variables included: Mother's employment status, family type, household NS-SEC, household annual income, area deprivation and area urban-rural classification.

used accounted for only 1% of the variance in use of multiple childcare provision in the birth cohort and 5% in child cohort indicating that a complex range of factors beyond employment, income and family type affect whether or not a particular family draws on multiple childcare provision.

## 2.5 Use of multiple provision over time

### 2.5.1 Age 34 months compared with age 10 months

A strength of the longitudinal analysis that is possible in Growing up in Scotland is that we can examine childcare use over time as children get older and family circumstances change. By comparing the number of childcare arrangements in place at sweep 3 with the number in place at sweep 1, we can get some understanding of the change or continuity of provision over time. The data in Table 2.3 indicates that at sweep 3, in the birth cohort, 82% of those using only one childcare provider had only been using one provider at sweep 1, indicating little change amongst this group. However, there is more change evident in the patterns of multiple childcare use over time; 80% of parents in both cohorts using three or more providers at sweep 3 used fewer providers at sweep 1.

**Table 2.3** Number of childcare providers used at sweep 3 by cohort and number of childcare providers used at sweep 1 (expressed as column percentage)

No. of providers used at sweep 1	No. of providers used at sweep 3		
	1	2	3 or more
<b>Birth</b>			
1	82	56	31
2	16	40	49
3 or more	2	4	20
<i>Bases</i>			
<i>Weighted</i>	1167	833	213
<i>Unweighted</i>	1184	871	222
<b>Child</b>			
1	67	59	33
2	29	35	47
3 or more	4.4	6.1	20
<i>Bases</i>			
<i>Weighted</i>	730	552	218
<i>Unweighted</i>	752	564	223



# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

## 2.5.2 Number of providers at each sweep

Use of multiple providers over time is fairly common. Amongst those who had ever used two or more providers – that is 48% of childcare users in the birth cohort and 69% in the child cohort – 72% in the child cohort and 65% in the birth cohort had done so at any two or more sweeps including 37% and 29% who reported use of two or more providers at all sweeps.

**Table 2.4** Patterns of use of two or more childcare providers by cohort (expressed as column percentage)

Pattern of use	Cohort	
	Birth	Child
Used at sw1 only	7	5
Used at sw2 only	4	17
Used at sw3 only	24	6
Used at sw1 and sw2 only	8	15
Used at sw2 and sw3 only	17	27
Used at sw1 and sw3 only'	4	2
Used at all sweeps	37	29
<i>Bases (all those who ever used two or more childcare providers)</i>		
<i>Weighted</i>	1252	1218
<i>Unweighted</i>	1293	1244

**Table 2.5** Patterns of use of three or more childcare providers by cohort  
(expressed as column percentage)

Pattern of use	Cohort	
	Birth	Child
Used at sw1 only	12	6
Used at sw2 only	12	44
Used at sw3 only	38	13
Used at sw1 and sw2 only	5	7
Used at sw2 and sw3 only	18	22
Used at sw1 and sw3 only	1	1
Used at all sweeps	13	8
<i>Bases (all those who ever used three or more childcare providers)</i>		
<i>Weighted</i>	300	503
<i>Unweighted</i>	305	509

Use of three or more providers over time is less common. Amongst those who had ever used three or more providers (that is 10% of childcare users in the birth cohort and 26% in the child cohort), 64% in the birth cohort and 63% in the child cohort had done so at only one sweep, 24% and 30% at any two sweeps, and only 13% and 8% reported use of three or more providers at all sweeps.

Use of two or more providers is a more common and enduring pattern; to use three or more providers is more temporary perhaps to 'fill a gap' or to accommodate a temporary change in circumstances in the household – e.g. unavailability of a regular care provider resulting in use of multiple other providers to fill the gap.

CHARACTERISTICS OF CHILDCARE PROVISION

chapter

3

In this section, we look at how much time children spend with different childcare providers and in total. We also consider how much and what types of childcare are used, and in what combinations. Finally we examine the cost of childcare.

### 3.1 Key findings

- Higher durations of weekly childcare are associated with use of more childcare providers. In the birth cohort at sweep 1, whereas 25% of those using childcare for between 9 and 16 hours per week receive that care from two or more providers, the same is true for 38% of those who use childcare for between 17 and 40 hours.
- Longer durations do not always necessitate multiple provision and neither do shorter durations necessarily result in single provision. In some cases, families using short durations of weekly childcare rely on several providers and those with longer durations use only a single provider.
- At each sweep, the majority of children who have three or more childcare arrangements experience a mix of informal and formal provision in these arrangements with the proportion experiencing this mix increasing as the children age (in the birth cohort, 56% at sweep 1, 78% at sweep 2, 85% at sweep 3).
- Parents who use more than one provider are more likely to pay for at least some of their child's childcare than parents using one provider. This reflects the greater likelihood that multiple users will use formal provision which requires payment, unlike many informal arrangements which are 'cost free' to parents. However, parents using multiple providers do not necessarily incur higher childcare costs overall owing to the particular mix and duration of provision and use across all families.
- Levels of satisfaction with their main childcare provider, preferences for changing the main provider, and perceptions of the level of choice when choosing a childcare provider do not vary significantly amongst parents who use different numbers of childcare providers.
- There were no significant differences either between how easy users of one or multiple childcare providers had found it to arrange suitable childcare for the cohort child in the last year.

### 3.2 Number of hours and days

Table 3.1 shows, for sweep 1, the number of childcare providers used by families according to the length of time each week the cohort child is looked after by other people. The data shows quite clearly that, as may be expected, higher durations of weekly childcare are associated with use of more childcare providers. For example, in the birth cohort, whereas 25% of those using childcare for between 9 and 16 hours per week receive that care from two or more providers, the same is true for 38% of those who use childcare for between 17 and 40 hours. Patterns are similar at both sweeps 2 and 3.

# GROWING UP IN SCOTLAND:

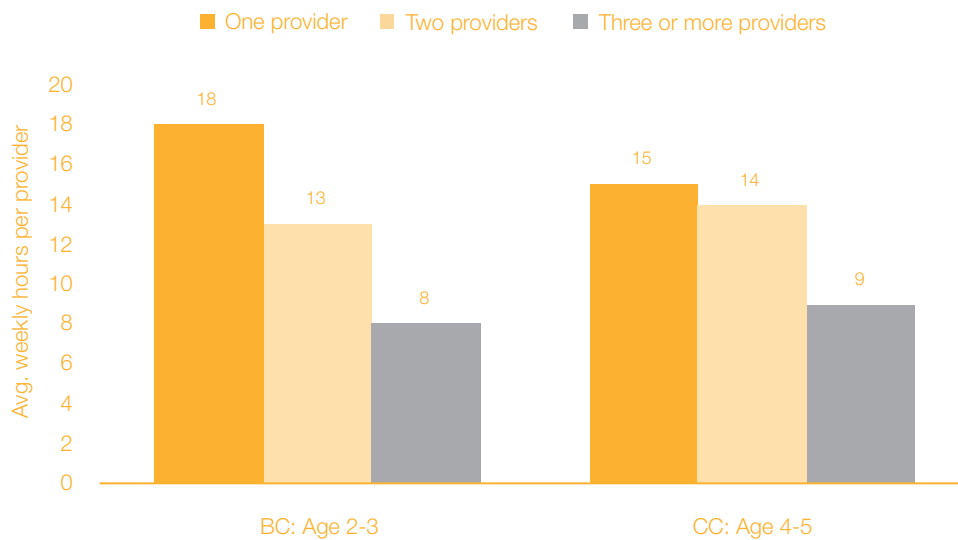
Multiple Childcare Provision and its Effect on Child Outcomes

**Table 3.1 Sweep 1: Number of childcare providers used by number of hours per week child is looked after by someone else and cohort expressed as column percentage**

Cohort and number of providers	Total hours per week child is looked after by someone else			
	Up to 8	9 to 16	17 to 40	More than 40
<b>Birth</b>				
1	85	76	61	46
2	14	23	33	37
3 or more	1	2	5	17
<i>Bases</i>				
<i>Birth cohort - Weighted</i>	696	640	1547	220
<i>Birth cohort - Unweighted</i>	691	636	1571	217
<b>Child</b>				
1	85	67	52	29
2	14	29	39	54
3 or more	1	4	9	16
<i>Bases</i>				
<i>Child cohort - Weighted</i>	491	431	1056	183
<i>Child cohort - Unweighted</i>	501	429	1065	179

Whilst there is a relationship between duration of care and number of providers, longer durations do not always necessitate multiple provision. The data in Table 3.1 indicate that many respondents who use multiple providers use each provider for only a small length of time every week. For example, at sweep 1, 23% of those in the birth cohort who use between 9 and 16 hours of childcare per week split this time between two providers. In fact, the average length of time that a child spends with any single childcare provider decreases significantly as the number of providers increases. For example, at sweep 3, in the birth cohort, children who were cared for by just one childcare provider spent an average of 17.5 hours per week in their care, this reduced to 13.4 hours per provider for those with two arrangements, and 8.2 hours per provider for those with three or more arrangements (Figure 3-A). Spending a shorter amount of time with any single provider, and with many different providers may have implications for the child's adjustment to the care environment and relationship with the carer which may subsequently impact on child outcomes.

**Figure 3-A Average weekly hours spent in each childcare provider by number of providers used at sweep 3 by cohort**



Unweighted bases – those using childcare: Birth cohort = 3222, Child cohort = 1881

### 3.3 Types of provision

#### 3.3.1 Use of formal and informal childcare

The types of childcare provision used at each sweep was analysed to examine the relationship between number of providers and the mix of formal and informal provision being used. Each respondent was classified at each sweep according to whether they used only informal care (specifically, that provided by grandparents, other relatives, ex-spouse or partner, or a friend or neighbour), only formal care (including private and local authority nurseries, childminders, playgroups and family centres) or a mixture of both. The results are detailed in Table 3.2.

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

**Table 3.2 Mix of formal and informal childcare provision by number of childcare providers used and sweep – birth cohort only**

	No. of childcare providers (% using each childcare type)		
	1	2	3 or more
<b>Sweep 1</b>			
Informal only	65	50	43
Formal only	35	4	1
Mixture of both	N/A	46	56
<i>Bases</i>			
<i>Weighted</i>	2121	842	127
<i>Unweighted</i>	2131	845	128
<b>Sweep 2</b>			
Informal only	54	37	22
Formal only	46	5	1
Mixture of both	N/A	58.0	78.0
<i>Bases</i>			
<i>Weighted</i>	1974	904	177
<i>Unweighted</i>	2000	917	181
<b>Sweep 3</b>			
Informal only	36	21	11
Formal only	64	12	4
Mixture of both	N/A	67	85
<i>Bases</i>			
<i>Weighted</i>	1847	1071	254
<i>Unweighted</i>	1861	1106	262

As may be expected those being looked after by a greater number of providers were more likely to experience a mix of both formal and informal care, and this effect becomes more pronounced over time. At each sweep, the majority of children who have three or more childcare arrangements experience both informal and formal provision in these arrangements with the proportion increasing as the children age (56% at sweep 1, 78% at sweep 2, 85% at sweep 3). Children with multiple providers are also more likely than those with only one provider to experience formal childcare at an earlier age. At sweep 1, 50% of those with two childcare arrangements and 57% of those with three or more arrangements have at least one arrangement with a formal provider. However, multiple provision does not always involve an element of formal care in the mix; for example, at sweep 1 for around two-fifths of children with 3 or more childcare arrangements each of those arrangements was with an informal carer who may be a grandparent, another relative, or a friend of the child's parent. The size of this group reduces as the child gets older, and at sweep 3, only 10% of those with three or more arrangements have only informal care.

Further analysis was undertaken of cases where two or more childcare providers were used at all sweeps to look at what packaging of childcare was used and how it changed over time. The type of provision used was examined at each sweep to explore the extent to which multiple childcare over the long term is provided by the same or different types of providers. The results are detailed in Table 3.3. The data demonstrates that most children who have had multiple childcare arrangements at all sweeps have been cared for by a combination of formal and informal providers at each sweep. A significant minority in each cohort (25% in the birth cohort, 29% in the child cohort) have also had only multiple informal care at at least one sweep and a mixture of formal and informal care at other sweeps. Furthermore, one-fifth of children in the birth cohort who had two or more providers at each sweep have only ever been looked after in informal arrangements.



# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

**Table 3.3 Mix of formal and informal provision used over time by cohort**

Types of childcare used over sweeps 1 to 3	Cohort (%)	
	Birth	Child
Informal provision only at at least one sweep and mix of formal and informal at at least one sweep	25	29
Formal provision only at at least one sweep and mix of formal and informal at at least one sweep	2	11
Informal provision only at all sweeps	21	0.0
Formal provision only at all sweeps	2	5
Mix of formal and informal provision at all sweeps	49	55
<i>Bases (all cases where two or more childcare providers were used at every sweep)</i>		
<i>Weighted</i>	454	348
<i>Unweighted</i>	482	358

### 3.3.2 Use of different provider types

To explore the particular mix of childcare provision being utilised, analysis was restricted to those families who were using two childcare providers at sweep 1 and the different combinations of provision were then identified. To allow for easier identification and interpretation, the 19 provider types were grouped into seven broader categories – grandparents, other informal, nursery, childminder, playgroup, family centre, and other formal. Overall, 22 different childcare combinations were identified. However, around six combinations accounted for over around 90% of arrangements in the birth cohort and almost 80% in the child cohort. The principal combinations for each cohort, and the proportion of those using two providers who reported each particular combination, are set out in Table 3.4.

**Table 3.4** Combination of childcare providers amongst those using two providers at sweep 1 by cohort

Combination of provision	Cohort (% of those using two childcare providers)	
	Birth	Child
Grandparents and other informal provider	30	11
Grandparents and nursery	28	36
Grandparents only	15	6
Grandparents and childminder	10	5
Other informal and nursery	4	7
Grandparents and playgroup	1	13
Other combinations	11	22
<i>Bases (those using two childcare providers at sweep 1)</i>		
<i>Weighted</i>	848	702
<i>Unweighted</i>	851	711

The data shows that the predominant pattern of multiple childcare provision can be summed up as ‘Grandparents Plus’. This is true of over 80% of the birth cohort and over 70% of the child cohort at sweep 1. Grandparents feature prominently in the combinations, as they also do amongst single providers. The dominant combination at age 0-1 is grandparents and some other informal provider – that is either another relative, or a friend or neighbour – followed closely by grandparents and nursery care which is the most common combination at 2-3 years. There is considerably more variation in the combinations at age 2-3 than age 0-1 as indicated by the 22% who reported other combinations amongst the older group compared with 11% in the younger group.

### 3.4 Time spent in different provider types

Further analysis was carried out to explore how long children spent with each provider, and how this varied by the number of providers used. The results are detailed in Table 3.5 and Table 3.6.

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

**Table 3.5** Average number of hours per week child is looked after by an informal childcare provider by number of childcare providers used, sweep and cohort

Sweep and Cohort	No. of childcare providers (Mean hours in informal care per week)		
	1	2	3 or more
<b>Sweep 1</b>			
Birth	11	16	24
Child	7	14	17
<i>Bases</i>			
<i>Birth cohort - Weighted</i>	2135	843	127
<i>Birth cohort - Unweighted</i>	1313	702	149
<i>Child cohort - Weighted</i>	2144	846	128
<i>Child cohort - Unweighted</i>	1316	711	150
<b>Sweep 2</b>			
Birth	9	16	16
Child	<1	10	15
<i>Bases</i>			
<i>Birth cohort - Weighted</i>	1993	908	177
<i>Birth cohort - Unweighted</i>	2994	1873	678
<i>Child cohort - Weighted</i>	1002	965	501
<i>Child cohort - Unweighted</i>	999	966	505
<b>Sweep 3</b>			
Birth	6	14	16
Child	3	12	15
<i>Bases</i>			
<i>Birth cohort - Weighted</i>	1862	1077	255
<i>Birth cohort - Unweighted</i>	1876	1112	263
<i>Child cohort - Weighted</i>	1026	634	239
<i>Child cohort - Unweighted</i>	1025	642	242

**Table 3.6** Average number of hours per week child is looked after by a formal childcare provider by number of childcare providers used, sweep and cohort

Sweep and Cohort	No. of childcare providers (Mean hours in formal care per week)		
	1	2	3 or more
<b>Sweep 1</b>			
Birth	8	11	15
Child	11	16	19
<i>Bases</i>			
<i>Birth cohort - Weighted</i>	2135	843	127
<i>Birth cohort - Unweighted</i>	2144	846	128
<i>Child cohort - Weighted</i>	1313	702	149
<i>Child cohort - Unweighted</i>	1316	711	150
<b>Sweep 2</b>			
Birth	9	11	9
Child	11	13	13
<i>Bases</i>			
<i>Birth cohort - Weighted</i>	1993	908	177
<i>Birth cohort - Unweighted</i>	2017	921	181
<i>Child cohort - Weighted</i>	1002	965	501
<i>Child cohort - Unweighted</i>	999	966	505
<b>Sweep 3</b>			
Birth	11	12	9
Child	10	13	11
<i>Bases</i>			
<i>Birth cohort - Weighted</i>	1862	1077	255
<i>Birth cohort - Unweighted</i>	1026	634	239
<i>Child cohort - Weighted</i>	1876	1112	263
<i>Child cohort - Unweighted</i>	1025	642	242

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

The longer hours of childcare used by children with multiple childcare providers is due more to longer hours spent in informal, rather than formal, care and are largest in both cohorts at sweep 1 (ages 10-12 months and 34-36 months). At sweep 1, in both cohorts, as the number of providers increases, so does the average weekly duration of time spent in formal and informal care. Overall, in each sweep and in both cohorts, informal care predominates amongst users of multiple childcare providers, who spent two to three times as many hours in informal care each week as they did in formal care.

## 3.5 Cost of childcare

Parents who use more than one provider are more likely to pay for at least some of their child's childcare than parents using one provider. This reflects the greater likelihood that multiple users will use formal provision which requires payment, unlike many informal arrangements which are 'cost free' to parents. As the data in Table 3.7 indicates, at all sweeps and for both cohorts, a lower proportion of parents using one provider than those using multiple providers pay something for childcare.

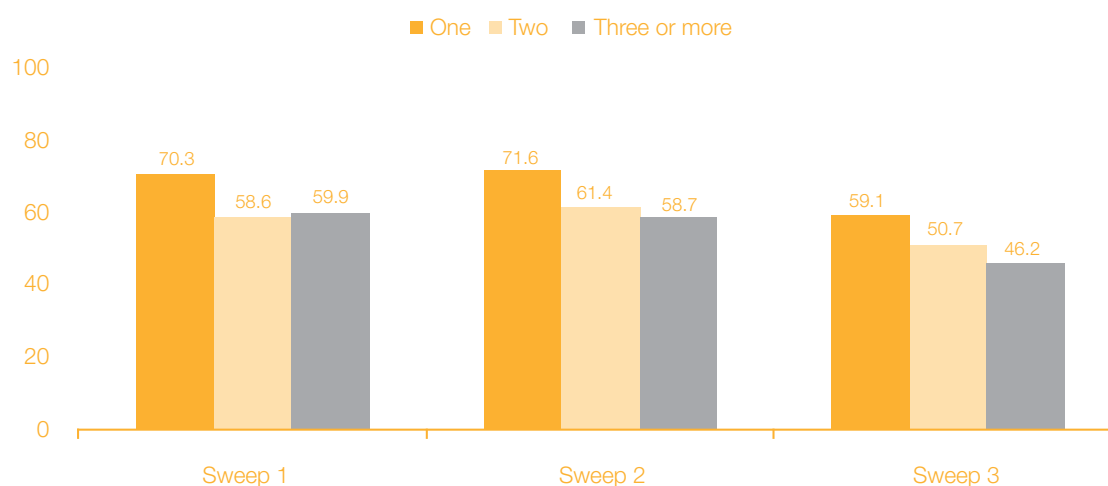
**Table 3.7 Percentage paying something toward childcare for cohort child by number of providers, sweep and cohort**

	No. of childcare providers (% paying something towards childcare)		
	1	2	3 or more
<b>Sweep 1</b>			
Birth	43	56	55
Child	57	73	76
<i>Bases</i>			
<i>Weighted</i>	1059	340	37
<i>Unweighted</i>	1073	343	38
<b>Sweep 2</b>			
Birth	46	59	74
Child	34	51	55
<i>Bases</i>			
<i>Weighted</i>	1112	420	79
<i>Unweighted</i>	1131	436	81

	No. of childcare providers (% paying something towards childcare)		
	1	2	3 or more
<b>Sweep 3</b>			
Birth	59	73	86
Child	43	57	70
<i>Bases</i>			
<i>Weighted</i>	1258	623	137
<i>Unweighted</i>	1288	663	146

Whilst it might be thought that parents who use a greater number of childcare providers may also pay more for childcare on average, the data suggests that the reverse is true and the relationship between the number of providers and the cost of childcare is complex. At all sweeps, the average weekly amount that parents in the birth cohort pay for childcare decreases as the number of childcare providers increases (see Figure 3-B). In the child cohort, cost is higher amongst multiple users than single users at sweep 3, but lower at both sweeps 1 and 2. It appears that the particular mix of formal and informal care, and the specific durations for which the different arrangements are used may be more important in determining cost than the number of providers alone.

**Figure 3-B Average cost of childcare (£) per week by number of providers – birth cohort only**



Unweighted bases – those paying for childcare: Sweep 1 = 1354, Sweep 2 = 1681, Sweep 3 = 2252

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

The perceived difficulty of meeting childcare costs did not vary by the number of childcare providers used. At each sweep, those parents who paid something towards care for the cohort child were asked how easy they found it to pay given their wider financial circumstances. There were no significant differences in the responses from parents using a single childcare providers when compared with those using multiple provision at either sweep or in either cohort. Overall, parents were most likely to report that they found it very or fairly easy to pay for their childcare given their family income.

## 3.6 Ease of arranging, satisfaction with provision, preferences and choice

If parents used more than one childcare provider, they were asked to state which was the main childcare provider. This was usually considered to be the carer who provided most care for the child on a weekly basis. Comparing parents who use different numbers of childcare providers, we find there are no significant differences between them in levels of satisfaction with the main provider, preferences for changing the main childcare provider, or perceptions of the level of choice when choosing a childcare provider. Since these particular questions were asked about the *main* childcare provider, they do not necessarily measure the respondent's satisfaction, preferences and choice in relation to their wider childcare situation.

There were no significant differences either between how easy users of one or multiple childcare providers had found it to arrange suitable childcare for the cohort child in the last year (it was very or fairly easy for 75% to 85% of all groups in both cohorts at sweep 2 and 3). At sweeps 2 and 3, those respondents who reported arranging childcare to be fairly or very difficult were asked why they had found it to be so. The main reasons cited were related to a lack of childcare places locally and the prohibitive cost of childcare. Reasons given were compared between parents using different numbers of childcare providers. The analysis found that there were no differences between the types of difficulties reported by parents using a single childcare provider compared with those reported by parents using multiple providers.

## 3.7 Parental views on work-life balance

A set of attitudinal questions on the respondents' views of their work-life balance were included at sweep 1 and sweep 2. The questions differed slightly at each sweep. Questions in sweep 1 were directed specifically at the balance between the availability and affordability of childcare and its impact on the extent to which the respondent worked, did not work or would like to work longer hours. Separate questions were thus asked of those who were in full or part-time employment, and those who were unemployed. At sweep 2, the questions were less specific and explored working parents' feelings about the effect of their employment on the children, and the extent to which having to work impacts on spending time with their family and vice versa.

No statistically significant differences in attitudes towards employment and childcare were evident between respondents using different numbers of childcare providers at any sweep or in any cohort. The similarity in attitudes may be due in part to the high degree of socio-economic and demographic similarity between single and multiple childcare users.



chapter  
EFFECTS OF MULTIPLE CHILDCARE USE ON  
CHILD OUTCOMES

4

A key objective of the Scottish Government early years policy, as articulated in *Getting it right for every child* and *Early Years and Early Intervention* (2008) is to improve child outcomes. The vast majority of the existing research literature on the impact of childcare and early years education on child outcomes has focussed on outcomes within two broad developmental areas: language and cognitive development; and social, behavioural and emotional development. Using data from the two cohorts of Growing Up in Scotland, it is possible to explore outcomes in the pre-school years in each of these areas. For the birth cohort, information is available on cognitive ability at age 34 months whereas for the child cohort, data on social, emotional and behavioural development is available at ages 46 months and 58 months.

#### 4.1 Key findings

- For the birth cohort, analysis was undertaken to explore the independent association between various features of childcare arrangements experienced at age 10 months on cognitive development at age 34 months whilst controlling for key socio-economic characteristics which are known to influence cognitive ability in the early years.
- Of the various childcare characteristics at age 10 months considered, only weekly duration of non-parental care had any statistically significant association with the child's cognitive ability at age 34 months after controlling for key family socio-economic and demographic factors; non-parental care of between 17 and 40 hours per week was found to have a significant positive impact on a child's knowledge of vocabulary specifically amongst girls.
- The characteristics of childcare arrangements in the first year of life which could be considered to describe 'childcare fragmentation' – exposure to multiple providers, a greater mix of provision, and less time with any single provider – do not impact positively or negatively on child cognitive development at age 34 months.
- For the child cohort, the association between childcare features at age 34 months and behavioural development at age 58 months was explored.
- After controlling for key family characteristics such as parental education levels and parental employment, experiencing 40 hours or more of care per week at age 34 months was detrimental to children's behavioural outcomes as they approached their fifth birthday. Further analysis suggested this relationship was significant particularly for girls and for children whose mothers were under 25 at the child's birth. No other childcare features were significant.

## 4.2 Cognitive development

Cognitive ability in the birth cohort was measured at age 34 months by two assessments: the naming vocabulary and picture similarities subtests of the British Ability Scales (BAS). Each subtest is part of a cognitive assessment battery designed for children aged between 3 and 17 years (Elliott, 1983). The assessments are individually administered.

Naming vocabulary requires the child to name a series of pictures of everyday items and assesses the expressive language ability of children. In the picture similarities assessments children are shown a row of four pictures on a page. They are asked to place a free-standing card with a fifth picture underneath the picture with which the card shares a similar element or concept. Picture similarities measures a child's problem solving ability. There are 36 items in total in the naming vocabulary assessment and 33 items in the picture similarities, however the number of items asked to each child is dependent on their performance. For example, one of the criteria for terminating the naming vocabulary assessment is if five successive items are answered incorrectly.

The analysis used normative BAS scores, derived from the standard BAS tables and defined with reference to the standardisation samples used in developing the assessments. An increase in either scale denotes an increase in cognitive ability.

Initial analysis explored the difference in average scores across key sub-groups defined according to various childcare arrangements and situations that have been defined in sections 2 and 3 above. Subsequent analysis then considered the independent effect of various childcare factors at age 10 months on cognitive outcomes at age 34 months whilst controlling for key socio-economic characteristics which are known to influence cognitive ability in the early years.

### 4.2.1 Mean scores by use of childcare

Initial analysis examined the differences in average ability scores on both scales according to whether or not the child experienced any form or duration of non-parental care at each wave of data collection. The results are detailed in Table 4.1

**Table 4.1 Average cognitive ability scores by use of childcare at each wave of data collected**

<i>Do you currently get help with childcare for child on a regular basis?</i>	Mean score	<i>Bases</i>	
	Picture similarities***	<i>Weighted</i>	<i>Unweighted</i>
Sweep 1: Age 0-1 years			
Yes	54	2345	2401
No	52	1506	1481
Sweep 2: Age 1-2 years			
Yes	55	2636	2702
No	51	1215	1180
Sweep 3: Age 2-3 years			
Yes	55	2939	3012
No	50	912	870
<b>Naming vocabulary***</b>			
Sweep 1: Age 0-1 years			
Yes	72	2385	2442
No	69	1534	1507
Sweep 2: Age 1-2 years			
Yes	72	2637	2703
No	68	1218	1181
Sweep 3: Age 2-3 years			
Yes	72	2992	3065
No	67	927	884

\*\*\*Differences significant at less than .001

The data indicates that those children who had experienced regular non-parental care at any sweep had, on average, higher ability scores on both measures at age 34 months than those children who were 'home-reared', although the average differences are small.

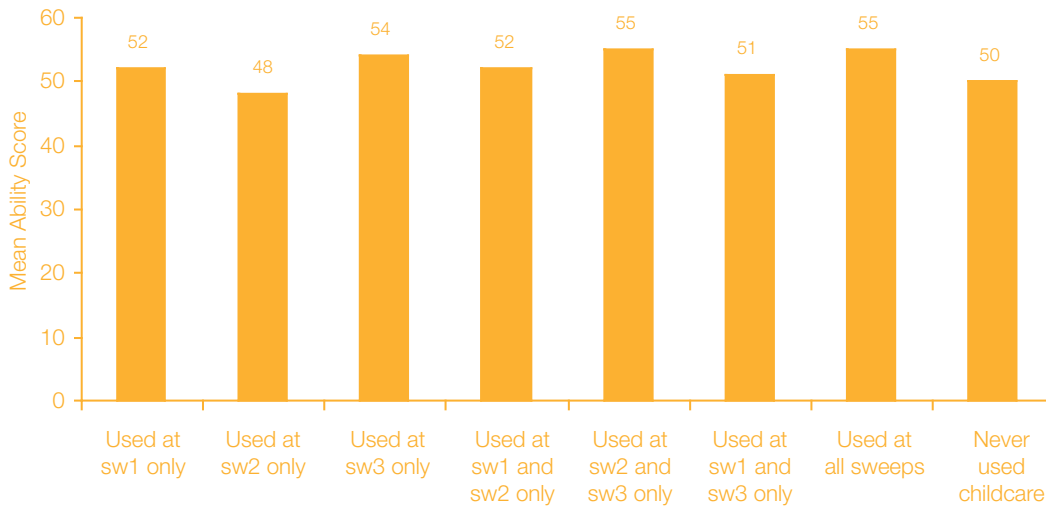
To investigate the potential effect of long-term experience of non-parental care, ability scores were compared according to the pattern of childcare reported over the period 0-3 years (Figure 4-A). The results indicate that those children who were in non-parental

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

care consistently over the three year period showed the highest average scores on both scales and those children who had not been placed in any childcare arrangements during that time showed the lowest average scores. Thus, on the basis of the measures used and this analysis, childcare use is supportive, on average, of children’s cognitive development. More detailed analysis is carried out later in the chapter (section 4.2.5) which controls for other factors such as family characteristics which are known to be correlated with cognitive outcomes.

**Figure 4-A Average naming vocabulary ability score at 34 months by pattern of ‘any’ childcare use between 0-3 years**



Unweighted base: use of childcare at any single sweep = 3949

### 4.2.2 Mean scores by number of childcare providers

We now turn to whether there is any relationship between the use of multiple childcare providers and children's cognitive development. Average ability scores were compared for children who received their care from different numbers of providers at age 0-1.

**Table 4.2 Average cognitive ability scores at age 34 months by number of childcare providers in use at age 10 months**

Number of childcare providers being used	Mean score	Bases	
	Picture similarities***	Weighted	Unweighted
<b>Sweep 1: Age 0-1 years</b>			
No childcare	52	1509	1484
1	54	1597	1634
2	55	639	657
3 or more	55	107	107
	Naming vocabulary***		
<b>Sweep 1: Age 0-1 years</b>			
0	69	1536	1510
1	72	1622	1660
2	72	653	671
3 or more	73	107	108

\*\*\*Differences significant at less than .001

Whilst in the separate tests, the difference in average score between those with no childcare and those with any childcare is significant, there is no significant difference in cognitive ability at age 34 months between children who are cared for by different numbers of childcare providers in their first year. This data would suggest, therefore, that experience of multiple childcare provision in the first year of life has no, or little, detectable impact on child cognitive development by age 34 months. Although not shown in the table, further analysis confirms the results are similar according to which age point childcare provision is assessed. That is, there are no statistically significant differences in average cognitive ability scores between children who receive non-parental care from a single or multiple providers at either age 22 or 34 months.

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Again, to explore any potential effect of long-term experience of multiple childcare provision, more detailed patterns of childcare use were mapped out for the period 0-3 years. This identified at which points children were looked after by two or more providers as detailed in Table 2.4. No significant differences were detected in mean scores on the picture similarities assessment according to patterns of multiple childcare use in the child's first three years (Table 4.3). However, differences in naming vocabulary scores were significant; those children who had experienced non-parental care by two or more providers at all ages showed the highest mean score. They were closely followed by children who were cared for by two or more providers at age 34 months. Children who experienced intermittent multiple care, at age 10 months and again at age 34 months, had the lowest average scores. From this we can conclude that the use of multiple childcare providers does not have an adverse impact on children's cognitive development, and in some circumstances, it has marginally beneficial effects.

**Table 4.3 Average cognitive ability scores at age 34 months by patterns of use of two or more childcare providers**

<i>When used two or more childcare providers</i>	Mean score	<i>Bases</i>	
	Picture similarities	<i>Weighted</i>	<i>Unweighted</i>
Used at sw1 only	56	81	81
Used at sw2 only	56	47	47
Used at sw3 only	55	277	293
Used at sw1 and sw2 only	53	89	87
Used at sw2 and sw3 only	55	193	201
Used at sw1 and sw3 only	54	47	45
Used at all sweeps	56	442	469
	Naming vocabulary**		
Used at sw1 only	70	80	81
Used at sw2 only	74	47	47
Used at sw3 only	75	278	294
Used at sw1 and sw2 only	70	90	88
Used at sw2 and sw3 only	70	192	201
Used at sw1 and sw3 only	66	47	45
Used at all sweeps	75	442	468

\*\*Differences significant at less than .01

### 4.2.3 Mean scores by mix of childcare provision

We may also ask what are the consequences for children's cognitive development of care by different types of providers differentiated by whether formal or informal or group or individual care. Mean scores on both assessments were compared according to the informal/formal characteristics of provision in place for children at age 10 months.

The results in Table 4.4 show that those children who experienced a mix of formal and informal childcare at age 10 months, on average, scored slightly higher on each assessment than did children who experienced only formal or informal care. However, the difference in naming vocabulary scores between those who experienced only formal care and those in mixed care is extremely small. Again, these results should be treated with caution as the differences are small and the analysis does not control for family characteristics. Previous analysis has shown that there are key differences in the family characteristics of those who use different types of care. For example, lone parents, younger mothers and those on low incomes are considerably more likely to use informal care alone, thus the children in this group will be distinct in a number of important background factors likely to affect their cognitive development at this stage.

**Table 4.4 Average cognitive ability scores at age 34 months by formal/informal characteristics of childcare at age 10 months**

<i>Formal or informal nature of childcare provision at age 10 months</i>	Mean score	<i>Bases</i>	
	Picture similarities***	<i>Weighted</i>	<i>Unweighted</i>
No childcare	52	1506	1481
Informal only	54	1407	1380
Formal only	56	570	625
Mix of formal and informal	56	355	383
	Naming vocabulary***		
No childcare	69	1534	1507
Informal only	71	1428	1404
Formal only	74	581	635
Mix of formal and informal	75	363	390

\*\*\*Differences significant at less than .001



# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

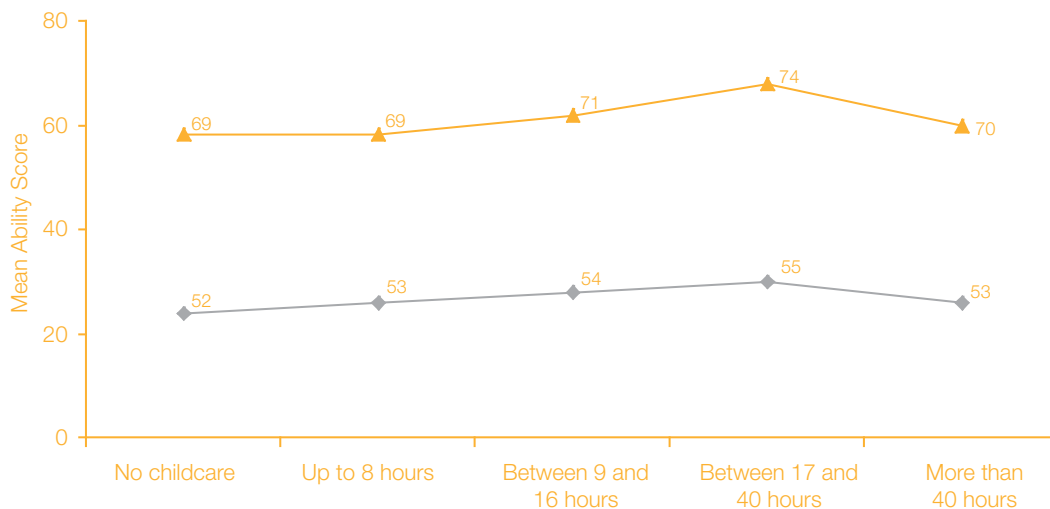
## 4.2.4 Mean scores by total hours of childcare per week

Data in section 3.2 above illustrated that children who were cared for by more than one childcare provider were more likely to spend longer periods in non-parental care per week. Average ability scores were compared according to the duration of weekly childcare experienced at age 10 months.

The results (shown in Figure 4-B) suggest that, to a degree, a greater duration of weekly non-parental care at age 10 months leads to greater cognitive ability at age 34 months; those children who spent between 17 and 40 hours in non-parental care at 10 months showed the highest average scores on both assessments. However, experiencing more than 40 hours of childcare appeared to be detrimental for cognitive development as those children had lower average scores than their peers in the 17 to 40 group.

This analysis does not particularly account for the use of multiple childcare providers as the majority of children at age 10 months were looked after by a single provider. However, section 3.2 noted that, for children with multiple childcare providers, duration of care in any single care environment was lower than for children with just a single provider. To explore, in simple terms, whether having more or less time in a single care environment appeared to have any effect on cognitive development average ability scores were compared according to the number of hours per week the child spent with each childcare provider (Table 4.5).

**Figure 4-B Mean cognitive ability scores at 34 months by total weekly duration of childcare at 10 months**



**Table 4.5** Average cognitive ability scores at age 34 months by average number of hours in the care of each childcare provider at age 10 months

Average number of hours per provider	Mean score	Bases	
	Picture similarities	Weighted	Unweighted
Less than 10 hours	53	724	725
Between 10 and 20 hours	55	808	830
20 hours or more	55	806	838
	Naming vocabulary***		
Less than 10 hours	70	740	740
Between 10 and 20 hours	72	819	841
20 hours or more	74	820	853

\*\*\*Differences significant at less than .001

There were no statistically significant differences in scores on the picture similarities assessment according to the average weekly time spent with *each* childcare provider. However, on the naming vocabulary assessment children with higher average durations per provider showed higher average scores which may suggest that multiple childcare provision where only a small amount of time is spent with a greater number of childcare providers, is less beneficial to early cognitive development than is a longer time with a single or fewer providers.

#### 4.2.5 Examining the independent effect of childcare fragmentation on early cognitive development

Previous research on child cognitive development has identified a number of key individual and family characteristics which impact on children's early attainment and could therefore affect their cognitive scores at age 34 months. As well as the child's gender, these also include poverty and socio-economic factors, parental education, family circumstances and marital breakdown and ethnicity. Previous analysis of GUS data, as noted earlier, has shown that patterns in use of childcare, the type of provision used, and, to a lesser extent, the number of providers used, also vary significantly according to many of these characteristics. Thus, in the outcome analysis undertaken thus far it is difficult to establish whether it is features of childcare use which are impacting on child cognitive development or the particular socio-economic and demographic characteristics of the families and children who are most likely to experience multiple and varied childcare provision.

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Therefore, to more clearly identify any potential impact of the various features of childcare, linear regression analysis was undertaken which allows the individual effect of childcare variables on cognitive scores to be considered whilst controlling for key family characteristics. Explanatory factors considered in combination in the analysis included: the child's gender, the highest parental educational qualification in the household, the highest parental socio-economic classification in the household, the level of household income, parental employment status, lone parent status and ethnicity. These were considered alongside those childcare characteristics at age 10 months shown to be significant in the previous analysis including: number of childcare providers, informal/formal mix of childcare provision, total weekly duration of non-parental care (hours) and average number of weekly hours per provider.

The regression analysis showed that of the various childcare characteristics at age 10 months considered, only weekly duration of non-parental care had any statistically significant association with the child's cognitive ability at age 34 months after controlling for key family socio-economic and demographic factors<sup>6</sup>. Non-parental care of between 17 and 40 hours per week was found to have a significant positive impact on a child's knowledge of vocabulary. Indeed, further sub-group analysis suggested that this effect was restricted to girls only<sup>7</sup>. This suggests that, on the whole, the characteristics of childcare arrangements in the first year of life which we have considered to describe 'childcare fragmentation' – exposure to multiple providers, a greater mix of provision, and less time with any single provider – do not impact positively or negatively on child cognitive development at age 34 months.

## 4.3 Social, emotional and behavioural development

Social, emotional and behavioural development was measured in the child cohort at age 58 months (sweep 3) by administration of the Strengths and Difficulties Questionnaire (Goodman, 1997).

The Strengths and Difficulties Questionnaire (SDQ) is a brief behavioural screening questionnaire designed for use with 3-16 year olds. The scale includes 25 questions which are used to measure five aspects of the child's development: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and pro-social behaviour. A score is calculated for each domain, as well as an overall 'difficulties' score which is generated by summing the scores from all the scales except pro-social. For all scales, except pro-social where the reverse is true, a higher score indicates greater evidence of difficulties. The data was obtained via parental report, normally the mother, in the computer assisted self-completion module of the sweep 3 interview.

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6 See Table A.1 in Appendix A

7 See Tables A.2 and A.3 in Appendix A

The analytical approach used was similar to that applied to the cognitive data. Initially, differences in average scores on each of the five sub-scales and on the overall difficulties score were explored across key sub-groups defined according to various childcare arrangements and situations. Further analysis then considered the independent effect of various childcare factors at age 34 months on SDQ scores at age 58 months whilst controlling for key socio-economic characteristics which are known to influence social development in the early years.

### 4.3.1 Mean scores by use of childcare

Initial analysis explored the differences in scores on all scales at age 58 months according to whether or not the child experienced any form or duration of non-parental care at age 34 months. The results are detailed in Table 4.6.

On this very simple examination, experience of childcare at age 34 months appears to have no bearing on developmental scores at age 58 months. The average scores returned on all of the scales amongst children in each group are almost identical.

**Table 4.6 Average SDQ composite and difficulty scores at age 58 months by use of childcare at each wave of data collection**

SDQ scale	Whether childcare was being used for cohort child	
	Sw1	
	Yes	No
Emotional symptoms	1.4	1.4
Conduct problems	1.9	2.0
Hyper-activity	3.6	3.7
Peer-problems*	1.1	1.3
<b>Total difficulties score</b>	8.0	8.5
Pro-social score	8.1	8.1
<i>Bases</i>		
<i>Weighted</i>	1719	524
<i>Unweighted</i>	1769	478

\*Differences significant at less than .05

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

SDQ scores were also compared according to the pattern of childcare reported over the period 3-5 years (sweeps 1 to 3). The results indicate no statistically significant differences in behaviour scores between children who had experienced non-parental care at any single sweep and those who had experienced non-parental care at two or three sweeps.

## 4.3.2 Mean scores by number of childcare providers

We now consider whether there is any relationship between the use of multiple childcare providers and children’s behavioural development. Average SDQ scores at 58 months were compared for children who received their care from different numbers of providers at ages 34, 46 and 58 months (Table 4.7).

**Table 4.7 Average SDQ composite and difficulty scores by number of childcare providers being used at each sweep**

SDQ scale	Child’s age and number of childcare providers being used									
	34 months (Sw1)				46 months (Sw2)			58 months (Sw3)		
	0	1	2	3+	1	2	3+	1	2	3+
Emotional symptoms	1.4	1.4	1.4	1.2	1.3	1.4	1.3	1.3	1.3	1.4
Conduct problems	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0
Hyper-activity	3.7	3.6	3.6	3.5	3.6	3.7	3.7	3.6	3.6	3.8
Peer-problems	1.3	1.1	1.1	1.2	1.1	1.2	1.1	1.2	1.1	1.0
<b>Total difficulties score</b>	8.5	8.0	8.0	7.8	8.0	8.2	8.1	8.1	8.1	8.2
Pro-social score	8.1	8.1	8.1	8.2	8.2	8.1	8.1	8.1	7.9	8.3
<i>Bases</i>										
<i>Weighted</i>	524	1034	564	121	868	875	473	986	615	234
<i>Unweighted</i>	478	1060	584	125	870	879	473	987	624	237

No statistically significant differences were observed in the scores of children who experienced non-parental care from different numbers of providers at any age. This suggests, therefore, that experience of multiple childcare provision at age 2-3, 3-4 or 4-5 years has no, or little, detectable impact on child social, emotional or behavioural development by age 58 months. Looking at data across the three time points, the cumulative experience of multiple provision did not appear to be important either. There were no significant differences in average scores between those children who had never experienced care from three or more providers in the period considered, those who had experienced it only at one sweep, and those who had experienced it at more than one sweep.

### 4.3.3 Mean scores by mix of childcare provision

As with cognitive development, it is worth considering the possible consequences for children's social development of care by different types of providers differentiated by whether formal or informal in nature. Mean scores on the various scales were compared according to the informal/formal characteristics of provision in place for children at age 34 months (Table 4.8). No statistically significant differences were observed.

**Table 4.8 Average SDQ scores at age 58 months by formal/informal characteristics of childcare at age 34 months**

SDQ scale	Formal or informal nature of childcare provision at age 34 months			
	No childcare	Formal only	Informal only	Mix of formal and informal
Emotional symptoms	1.4	1.4	1.4	1.3
Conduct problems	2.0	1.9	1.9	1.9
Hyper-activity	3.7	3.7	3.6	3.6
Peer-problems	1.3	1.2	1.1	1.0
<b>Total difficulties score</b>	8.5	8.2	8.0	7.8
Pro-social score	8.1	8.1	8.1	8.2
<i>Bases</i>				
<i>Weighted</i>	524	524	707	482
<i>Unweighted</i>	478	525	742	495

### 4.3.4 Mean scores by total hours of childcare per week

Average SDQ scores were compared according to the duration of weekly childcare experienced at age 34 months (Table 4.9). Differences in scores on the emotional symptoms, conduct problems, hyperactivity and total difficulties scales were statistically significant. The data shows a similar pattern to that observed in the cognitive data above where those children who experience extremely long durations of weekly care are distinct. In this instance, children who had 40 or more hours of non-parental care at age 34 months had higher average scores on all scales suggesting they exhibited more problematic behaviour at age 58 months than did children with shorter durations of care or who had no childcare at all. Furthermore, as with the cognitive data, durations of non-parental care of between 17 and 40 hours per week appear to be most beneficial for social development with children in this group having the lowest average difficulty scores.

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

**Table 4.9 Average SDQ scores at age 58 months by weekly hours in childcare at age 34 months**

SDQ scale	Number of hours in childcare per week at age 34 months				
	No childcare	0 to 8 hours	9 to 16 hours	17 to 40 hours	More than 40 hours
Emotional symptoms*	1.4	1.5	1.4	1.2	1.8
Conduct problems*	2.0	1.9	1.8	1.9	2.3
Hyper-activity*	3.8	3.6	3.6	3.6	4.3
Peer-problems	1.3	1.1	1.2	1.0	1.3
<b>Total difficulties score**</b>	8.5	8.1	8.0	7.7	9.7
Pro-social score	8.1	8.1	8.0	8.2	8.0
<i>Bases</i>					
<i>Weighted</i>	527	397	334	843	143
<i>Unweighted</i>	480	410	340	878	139

\*Differences significant at less than .05

\*\*Differences significant at less than .01

## 4.3.5 Examining the association of multiple childcare provision on social and behavioural outcomes

The previous analysis has shown that children’s experience of non-parental care via multiple providers at age 34 months bears little positive or negative impact on their social and behavioural outcomes at age 58 months. Indeed, of the various childcare characteristics considered at age 34 months, only weekly duration of care was statistically significant; children who experienced more than 40 hours of non-parental care per week scored higher on a number of individual SDQ scales as well as the overall difficulties scale. This suggests that these children exhibit more problematic behaviour at age 58 months than their peers who experienced shorter periods of weekly non-parental care.

As discussed in relation to cognitive outcomes, previous research identifies a range of key individual and family characteristics which impact on children's early development and which could affect their behaviour at age 58 months. Further analysis was undertaken to test whether the relationship between long durations of care at age 34 months and more problematic behaviour at 58 months persisted when these characteristics are controlled for. The analysis showed that even after controlling for key family characteristics such as parental education levels and parental employment, experiencing 40 hours or more of care per week at age 34 months was detrimental to children's behavioural outcomes as they approached their fifth birthday<sup>8</sup>.

It may be possible that this relationship between childcare duration and child outcomes differs for different groups. To test this, the full specification model was run separately for different groups of children based on the child's gender, parental education, family type, maternal age at the child's birth and level of household income. The analysis found that the relationship between duration of weekly childcare and more negative behavioural outcomes is significant particularly for girls<sup>9</sup> and for children whose mothers were under 25 at the child's birth<sup>10</sup>. The former finding is interesting in particular because, in general and across numerous research studies, girls tend to score lower on the SDQ than do boys, suggesting they exhibit fewer difficulties. Further examination of these associations is beyond the scope of this paper, but it may be assumed that differences in the precise characteristics of the care experienced by the different groups of children may provide some explanation, particularly for those children with younger mothers whose care is usually informal in nature.

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8 Table A.4, Appendix A

9 See Tables A.5 and A.6 in Appendix A

10 See Tables A.7 and A.8 in Appendix A



chapter  
CONCLUSION

# 5

The major expansion of early years childcare provision and the introduction of tax credits to subsidise the costs of formal childcare over the last decade has transformed the early years childcare landscape and consequently, the early years experiences of children in Scotland. The young children who are at the heart of Growing up in Scotland are growing up in a world in which the Childcare Strategy for Scotland (1998) has been in place for several years, and in which early years childcare is more socialised than in previous generations. Children in Scotland now have a high likelihood of experiencing some non-parental care during the early years. Over the three sweeps of GUS, we have been able to trace the use of non-parental childcare by both the birth cohort, from age 10 months to age 34 months, and the child cohort from age 34 months to 58 months, giving a picture of childcare use over the whole of the pre-school years.

To set this report in context, an earlier report on childcare, based on sweep 1 of GUS (Anderson *et al*, 2007), found that the majority of children in both cohorts were using childcare regularly at the time of interview: nearly two thirds of the birth cohort and three quarters of the child cohort. The use of childcare was closely linked to parental, especially maternal, employment, which was commonplace in both cohorts. Despite the major expansion in formal childcare provision across Scotland, informal care was more commonly used than formal care, particularly by families on low incomes and lone parent families. Grandparents were, by far, the most common childcare providers, providing care for two thirds of the birth cohort and half of the toddler cohort receiving childcare.

A key finding of the 2007 report was the large minority of children in sweep 1, nearly one third, using multiple childcare providers (28% with two providers, 3% with three or more). Since a major policy objective of the Childcare Strategy for Scotland was for childcare to support giving every child the best possible start in life, the important policy question arises as to the impact of childcare and the use of multiple childcare providers on children's development. Therefore the particular focus of this report is 'childcare fragmentation' arising from the use of multiple childcare providers.

A sizeable minority of parents in both cohorts report using multiple childcare providers, and this use increased over time reflecting broader changes in family circumstances such as family composition or parental employment patterns which impact on individual childcare needs. In the birth cohort, a larger proportion of families used multiple childcare providers in sweep 3 than in sweep 1: 34% used two providers and 8% used three or more providers. In the child cohort, the use of multiple childcare providers increased from 39% to 59% of families using childcare between sweeps 1 and 2. For this group over the same period, the use of three or more providers increased from 5% to 20%. Although the use of multiple providers drops for the child cohort between sweeps 2 and 3, this is likely to be at least partly due to some children having started primary school at sweep 3. The use of multiple childcare providers did not vary by family type, or social class, but did

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

vary by household income to a small extent and by whether there was a non-working adult in the household. Maternal employment, whether full time or part time, is associated with higher levels of use of multiple childcare providers.

The particular childcare mix used by an individual family is dependent on parental preferences as well as the availability, accessibility and affordability of different types of care. Previous research from the EPPE study, for example (Sylva *et al*, 2004), has shown that experiencing different durations and types of childcare in the early years can have different effects on child development. Thus consideration of the mix of formal and informal provision experienced by children with multiple providers, as well as the time they spend in childcare is important. Children who experience multiple provision spend longer in childcare on average in a typical week than do children cared for by a single provider. However, further analysis of how this varies shows that there is a rather more complex relationship between the duration of childcare and the number of providers used. In terms of types of provision, those with multiple providers at all sweeps used mainly a combination of formal and informal provision. Indeed children with multiple providers are more likely than those with only one provider to experience formal childcare at an earlier age. Only about one fifth of children in the birth cohort using multiple childcare providers at all sweeps have had only informal care. While the overall pattern over time is complex, what characterises the informal element in the childcare package for a large majority of families (80% of the birth cohort and over 70% of the child cohort) is grandparental care, and the overall package can be summarised as 'Grandparents Plus'. Children using a mix of formal and informal childcare spent more time in informal care, about two to three times as many hours as in formal care.

Families using multiple childcare providers were also more likely to pay for at least some childcare than those using single providers, reflecting their increased use of formal care compared to single provider users. However, parents' perceptions about the difficulty of meeting childcare costs did not vary by the number of childcare providers used.

The improvement of child outcomes is a key objective of Government childcare policies. Using the three sweeps of GUS, we have considered some short and some medium-term outcomes of multiple childcare use that can be measured in the early years. Of course, there will be other outcomes that can only be measured when children have begun school and beyond. The outcomes on which we have measurements in GUS sweep 3 are on children's cognitive development, and their social, emotional and behavioural development.

We found a small but statistically significant benefit of childcare on children's cognitive development, based on assessments measuring knowledge of vocabulary and problem solving ability, although the simple analysis carried out did not fully control for other family characteristics. Birth cohort children who had experienced regular non-parental care at

any sweep had, on average, higher ability scores on both measures at age 34 months than those children who were solely 'home-reared'. Furthermore, those spending longer hours in non-parental care, up to 40 hours per week, tended to have higher cognitive scores than those in childcare for shorter average periods. Despite these differences, further analysis indicated that the characteristics and patterns of non-parental care at 10 months related to childcare fragmentation, as we have defined them for this report, are not statistically significantly associated with cognitive outcomes at age 34 months.

Social and behavioural outcomes at age 58 months were measured using the Strengths and Difficulties questionnaire. The results of the analysis suggest that characteristics of fragmented non-parental care at age 34 months have no impact on children's social and behavioural development at age 58 months. In the initial analysis, only weekly duration of non-parental care was found to have a statistically significant association with children's social and behavioural development. Specifically, long periods of weekly care of 40 or more were shown to have a negative impact on children's social and behavioural outcomes. This effect remained after controlling for key parental and household socio-economic characteristics and was shown to effect, in particular, girls and children with younger mothers. Notably, only a very small proportion of children experienced this duration of weekly care.

Thus, the picture of childcare use by families with young children in Scotland is complex. Many families draw on a number of providers to meet their regular childcare needs and the particular combination of providers used may be a result of parental preferences, local availability, affordability or a combination of all of these elements. Further, the longitudinal data shows that for many families childcare arrangements vary over time with changes in numbers and types of providers used, and in the child's weekly duration in care being fairly common. As a result, the picture presented by the data does suggest a degree of 'childcare fragmentation'. However, there is no data to suggest either that parents are particularly dissatisfied with their arrangements nor that experiencing multiple provision or a mix of provision per se has any particular positive or negative impact on child cognitive or behavioural outcomes at 34 and 58 months. In fact, children's experience of non-parental childcare in the early years appears to be generally beneficial to their cognitive development, although the effects are not large.

The negative outcomes associated with longer durations in childcare are similar to those found in other research (NNI Research Team, 2007; Sylva *et al*, 2004; Belsky *et al*, 2007). The more detailed explanations behind this result are beyond the scope of this report, however previous research would suggest that prolonged exposure to specific childcare environments (for example, group versus individual care) and the differences in the quality of formal childcare provision are important contributors. Such conjectures could be explored with further analysis which, in future years, could also examine the persistence of these effects as children move into primary school.

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

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## Appendix A Regression Tables

**Table A.1** Linear regression exploring the association between selected childcare and socio-economic characteristics, and score on the naming vocabulary assessment – birth cohort

Variable	Category	Co-efficient	Significance	95% C.I.	
Duration of weekly non-parental care at age 10 months	(up to 8 hours)				
	9 to 17 hours	0.01	0.90	-0.12	0.14
	17 to 40 hours	0.12	0.05	0.00	0.24
	More than 40 hours	-0.05	0.58	-0.24	0.13
	<i>Testparm</i> <sup>12</sup>		0.02		
Child's gender	(Male)				
	Female	0.36	< 0.01	0.28	0.43
	<i>Testparm</i>		< 0.01		
Highest parental educational qualification	(Degree or equivalent)				
	Vocational qualification below degree	-0.13	0.03	-0.25	-0.01
	Higher grade or equivalent	-0.14	0.28	-0.40	0.12
	Standard grade or equivalent	-0.27	< 0.01	-0.44	-0.09
	No qualifications	-0.40	< 0.01	-0.66	-0.14
	<i>Testparm</i>		0.02		
Household NS-SEC	(Managerial/professional)				
	Intermediate occupations	-0.25	< 0.01	-0.42	-0.09
	Small employers/own account workers	-0.14	0.08	-0.31	0.02
	Lower supervisory and technical	-0.13	0.16	-0.30	0.05
	Semi-routine and routine	0.09	0.73	-0.43	0.62
	Never worked and long-term unemployed	-0.25	< 0.01	-0.42	-0.09
	<i>Testparm</i>		0.07		

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Variable	Category	Co-efficient	Significance	95% C.I.	
Parental employment	(At least one parent/ carer in full-time work)				
	At least one parent/ carer in part-time work	0.05	0.50	-0.09	0.19
	No parent/carer working	-0.21	0.06	-0.43	0.01
	<i>Testparm</i>		0.05		
Family type	(Lone parent)				
	Couple family	0.07	0.37	-0.09	0.23
	<i>Testparm</i>		0.37		
Equivalised annual household income	(Bottom quintile (< £11,250))				
	2nd quintile (>=£11,250 < £17,916)	0.15	0.10	-0.03	0.33
	3rd quintile (>=£17,916 < £25,000)	0.22	0.02	0.03	0.40
	4th quintile (>=£25,000 < £37,500)	0.24	0.03	0.03	0.44
	5th quintile (>=£37,500)	0.26	0.03	0.03	0.50
<i>Testparm</i>		0.24			
Respondent ethnicity	(White)				
	Other ethnicity	-0.58	< 0.01	-0.95	-0.21
	<i>Testparm</i>		< 0.01		

Number of cases included = 2388

12 The *testparm* command tests the association of the overall categorical variable with the outcome measure. It tests the deviation from the null hypothesis, i.e. how much all the differences deviate from 0 in a single test. If  $p < 0.05$  then we can say the predictor variable is significantly associated with the outcome variable

**Table A.2** Linear regression exploring the association between selected childcare and socio-economic characteristics, and score on the naming vocabulary assessment – birth cohort, boys only

Variable	Category	Co-efficient	Significance	95% C.I.	
Duration of weekly non-parental care at age 10 months	(up to 8 hours)				
	9 to 17 hours	0.06	0.52	-0.12	0.24
	17 to 40 hours	0.10	0.31	-0.09	0.28
	More than 40 hours	-0.14	0.30	-0.40	0.12
	<i>Testparm</i>		0.26		
Highest parental educational qualification	(Degree or equivalent)				
	Vocational qualification below degree	-0.01	0.92	-0.18	0.16
	Higher grade or equivalent	-0.14	0.37	-0.44	0.16
	Standard grade or equivalent	-0.16	0.18	-0.40	0.08
	No qualifications	-0.27	0.19	-0.67	0.14
<i>Testparm</i>		0.36			
Household NS-SEC	(Managerial/professional)				
	Intermediate occupations	-0.39	0.01	-0.70	-0.08
	Small employers/own account workers	-0.27	0.05	-0.53	0.00
	Lower supervisory and technical	-0.26	0.07	-0.54	0.02
	Semi-routine and routine	0.17	0.53	-0.37	0.72
	Never worked and long-term unemployed	-0.39	0.01	-0.70	-0.08
<i>Testparm</i>		0.02			



# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Variable	Category	Co-efficient	Significance	95% C.I.	
Parental employment	(At least one parent/ carer in full-time work)				
	At least one parent/ carer in part-time work	0.06	0.63	-0.17	0.29
	No parent/carer working	-0.19	0.33	-0.56	0.19
	<i>Testparm</i>		<i>0.31</i>		
Family type	(Lone parent)				
	Couple family	0.11	0.41	-0.15	0.37
	<i>Testparm</i>		<i>0.41</i>		
Equivalised annual household income	(Bottom quintile (< £11,250))				
	2nd quintile (>=£11,250 < £17,916)	0.09	0.53	-0.20	0.38
	3rd quintile (>=£17,916 < £25,000)	0.19	0.20	-0.10	0.48
	4th quintile (>=£25,000 < £37,500)	0.15	0.34	-0.16	0.45
	5th quintile (>=£37,500)	0.27	0.13	-0.08	0.62
	<i>Testparm</i>		<i>0.51</i>		
Respondent ethnicity	(White)				
	Other ethnicity	-0.47	0.05	-0.94	0.01
	<i>Testparm</i>		<i>0.05</i>		

Number of cases included = 1221

**Table A.3** Linear regression exploring the association between selected childcare and socio-economic characteristics, and score on the naming vocabulary assessment – birth cohort, girls only

Variable	Category	Co-efficient	Significance	95% C.I.	
Duration of weekly non-parental care at age 10 months	(up to 8 hours)				
	9 to 17 hours	-0.05	0.54	-0.22	0.12
	17 to 40 hours	0.15	0.03	0.02	0.29
	More than 40 hours	0.04	0.67	-0.16	0.25
	<i>Testparm</i>		0.02		
Highest parental educational qualification	(Degree or equivalent)				
	Vocational qualification below degree	-0.25	< 0.01	-0.39	-0.10
	Higher grade or equivalent	-0.13	0.50	-0.50	0.24
	Standard grade or equivalent	-0.40	< 0.01	-0.64	-0.16
	No qualifications	-0.57	< 0.01	-0.91	-0.23
<i>Testparm</i>		< 0.01			
Household NS-SEC	(Managerial/professional)				
	Intermediate occupations	-0.12	0.36	-0.38	0.14
	Small employers/own account workers	-0.04	0.74	-0.25	0.18
	Lower supervisory and technical	0.01	0.93	-0.21	0.23
	Semi-routine and routine	-0.21	0.67	-1.19	0.77
Parental employment	Never worked and long-term unemployed	-0.12	0.36	-0.38	0.14
	<i>Testparm</i>		0.94		
	(At least one parent/carer in full-time work)				
Parental employment	At least one parent/carer in part-time work	0.04	0.66	-0.15	0.23
	No parent/carer working	-0.15	0.32	-0.46	0.15
	<i>Testparm</i>		0.36		

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Variable	Category	Co-efficient	Significance	95% C.I.	
Family type	(Lone parent)				
	Couple family	0.07	0.40	-0.10	0.24
	<i>Testparm</i>		0.40		
Equivalised annual household income	(Bottom quintile (< £11,250))				
	2nd quintile (>=£11,250 < £17,916)	0.23	0.01	0.06	0.41
	3rd quintile (>=£17,916 < £25,000)	0.26	0.01	0.07	0.45
	4th quintile (>=£25,000 < £37,500)	0.34	< 0.01	0.12	0.56
	5th quintile (>=£37,500)	0.27	0.02	0.04	0.49
	<i>Testparm</i>		0.03		
Respondent ethnicity	(White)				
	Other ethnicity	-0.72	< 0.01	-1.18	-0.26
	<i>Testparm</i>		< 0.01		

Number of cases included = 1167

**Table A.4** Linear regression exploring the association between selected childcare and socio-economic characteristics, and total difficulties score – child cohort

Variable	Category	Co-efficient	Significance	95% C.I.	
Duration of weekly non-parental care at age 34 months	(up to 8 hours)				
	9 to 17 hours	0.02	0.97	-0.73	0.76
	17 to 40 hours	0.10	0.73	-0.50	0.71
	More than 40 hours	1.90	< 0.01	0.86	2.93
	<i>Testparm</i>		<0.01		
Child's gender	(Male)				
	Female	-0.96	< 0.01	-1.41	-0.51
	<i>Testparm</i>		<0.01		
Highest parental educational qualification	(Degree or equivalent)				
	Vocational qualification below degree	1.12	< 0.01	0.56	1.68
	Higher grade or equivalent	0.81	0.11	-0.19	1.81
	Standard grade or equivalent	1.43	< 0.01	0.49	2.38
	No qualifications	2.99	< 0.01	1.53	4.44
<i>Testparm</i>		<0.01			
Household NS-SEC	(Managerial/professional)				
	Intermediate occupations	0.07	0.87	-0.74	0.87
	Small employers/own account workers	-0.49	0.33	-1.49	0.51
	Lower supervisory and technical	0.83	0.17	-0.36	2.02
	Semi-routine and routine	0.60	0.10	-0.11	1.30
	Never worked and long-term unemployed	0.41	0.81	-3.03	3.85
<i>Testparm</i>		0.46			

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Variable	Category	Co-efficient	Significance	95% C.I.	
Parental employment	(At least one parent/ carer in full-time work)				
	At least one parent/ carer in part-time work	1.11	0.02	0.19	2.03
	No parent/carer working	1.65	0.02	0.22	3.07
	<i>Testparm</i>		0.06		
Family type	(Lone parent)				
	Couple family	0.23	0.63	-0.72	1.19
	<i>Testparm</i>		0.59		
Equivalised annual household income	(Bottom quintile (< £11,250))				
	2nd quintile (>=£11,250 < £17,916)	-0.56	0.25	-1.51	0.40
	3rd quintile (>=£17,916 < £25,000)	-1.02	0.07	-2.10	0.07
	4th quintile (>=£25,000 < £37,500)	-1.38	0.01	-2.44	-0.31
	5th quintile (>=£37,500)	-1.46	0.01	-2.53	-0.39
	<i>Testparm</i>		0.06		
Respondent ethnicity	(White)				
	Other ethnicity	-0.08	0.89	-1.32	1.15
	<i>Testparm</i>		0.87		

Number of cases included = 1673

**Table A.5** Linear regression exploring the association between selected childcare and socio-economic characteristics, and total difficulties score – child cohort, boys only

Variable	Category	Co-efficient	Significance	95% C.I.	
Duration of weekly non-parental care at age 34 months	(up to 8 hours)				
	9 to 17 hours	0.02	0.98	-1.13	1.16
	17 to 40 hours	0.42	0.35	-0.48	1.33
	More than 40 hours	1.37	0.05	0.03	2.71
	<i>Testparm</i>		<i>0.17</i>		
Highest parental educational qualification	(Degree or equivalent)				
	Vocational qualification below degree	1.35	< 0.01	0.55	2.14
	Higher grade or equivalent	1.29	0.10	-0.23	2.82
	Standard grade or equivalent	1.94	0.01	0.61	3.27
	No qualifications	3.48	< 0.01	1.30	5.66
<i>Testparm</i>		<i>&lt;0.01</i>			
Household NS-SEC	(Managerial/professional)				
	Intermediate occupations	0.20	0.74	-1.02	1.42
	Small employers/own account workers	-1.60	0.02	-2.93	-0.26
	Lower supervisory and technical	0.54	0.51	-1.08	2.15
	Semi-routine and routine	0.11	0.87	-1.14	1.35
	Never worked and long-term unemployed	-2.52	0.20	-6.43	1.40
<i>Testparm</i>		<i>0.12</i>			
Parental employment	(At least one parent/carer in full-time work)				
	At least one parent/carer in part-time work	0.52	0.51	-1.05	2.09
	No parent/carer working	2.11	0.08	-0.22	4.44
	<i>Testparm</i>		<i>0.21</i>		

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Variable	Category	Co-efficient	Significance	95% C.I.	
Family type	(Lone parent)				
	Couple family	0.01	0.99	-1.55	1.58
	<i>Testparm</i>		0.99		
Equivalised annual household income	(Bottom quintile (< £11,250))				
	2nd quintile (>=£11,250 < £17,916)	-0.55	0.49	-2.13	1.04
	3rd quintile (>=£17,916 < £25,000)	-1.09	0.15	-2.57	0.39
	4th quintile (>=£25,000 < £37,500)	-2.06	0.01	-3.53	-0.59
	5th quintile (>=£37,500)	-1.73	0.04	-3.33	-0.12
	<i>Testparm</i>		0.04		
Respondent ethnicity	(White)				
	Other ethnicity	-1.31	0.08	-2.78	0.17
	<i>Testparm</i>		0.08		

Number of cases included = 858

**Table A.6** Linear regression exploring the association between selected childcare and socio-economic characteristics, and total difficulties score – child cohort, girls only

Variable	Category	Co-efficient	Significance	95% C.I.	
Duration of weekly non-parental care at age 34 months	(up to 8 hours)				
	9 to 17 hours	0.15	0.78	-0.92	1.21
	17 to 40 hours	-0.14	0.74	-0.95	0.68
	More than 40 hours	2.33	< 0.01	0.77	3.88
	<i>Testparm</i>		0.02		
Highest parental educational qualification	(Degree or equivalent)				
	Vocational qualification below degree	0.75	0.05	0.00	1.50
	Higher grade or equivalent	0.39	0.55	-0.90	1.67
	Standard grade or equivalent	0.97	0.12	-0.24	2.18
	No qualifications	2.44	0.01	0.57	4.31
	<i>Testparm</i>		0.09		
Household NS-SEC	(Managerial/professional)				
	Intermediate occupations	-0.21	0.70	-1.27	0.86
	Small employers/own account workers	0.35	0.66	-1.25	1.95
	Lower supervisory and technical	1.09	0.11	-0.25	2.43
	Semi-routine and routine	0.88	0.12	-0.24	2.00
	Never worked and long-term unemployed	3.61	0.09	-0.53	7.74
	<i>Testparm</i>		0.32		
Parental employment	(At least one parent/carer in full-time work)				
	At least one parent/carer in part-time work	1.30	0.05	0.02	2.59
	No parent/carer working	0.43	0.63	-1.37	2.24
	<i>Testparm</i>		0.14		



# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Variable	Category	Odds ratio	Significance	95% C.I.	
Family type	(Lone parent)				
	Couple family	0.39	0.55	-0.89	1.67
	<i>Testparm</i>		0.55		
Equivalised annual household income	(Bottom quintile (< £11,250))				
	2nd quintile (>=£11,250 < £17,916)	-0.55	0.31	-1.62	0.51
	3rd quintile (>=£17,916 < £25,000)	-0.97	0.13	-2.25	0.30
	4th quintile (>=£25,000 < £37,500)	-0.72	0.30	-2.09	0.66
	5th quintile (>=£37,500)	-1.18	0.07	-2.43	0.07
	<i>Testparm</i>		0.35		
Respondent ethnicity	(White)				
	Other ethnicity	1.29	0.21	-0.73	3.32
	<i>Testparm</i>		0.21		

Number of cases included = 815

**Table A.7** Linear regression exploring the association between selected childcare and socio-economic characteristics, and total difficulties score – child cohort, children with mothers aged under 25 at the child’s birth

Variable	Category	Co-efficient	Significance	95% C.I.	
Duration of weekly non-parental care at age 34 months	(up to 8 hours)				
	9 to 17 hours	-0.53	0.62	-2.70	1.63
	17 to 40 hours	-0.89	0.23	-2.37	0.58
	More than 40 hours	2.49	0.02	0.39	4.59
	<i>Testparm</i>		< 0.01		
Child’s gender	(Male)				
	Female	-1.21	0.04	-2.37	-0.05
	<i>Testparm</i>		0.04		
Highest parental educational qualification	(Degree or equivalent)				
	Vocational qualification below degree	-0.49	0.69	-2.90	1.93
	Higher grade or equivalent	0.01	1.00	-3.46	3.48
	Standard grade or equivalent	-0.87	0.52	-3.57	1.84
	No qualifications	1.85	0.28	-1.56	5.27
<i>Testparm</i>		0.17			
Household NS-SEC	(Managerial/professional)				
	Intermediate occupations	0.36	0.70	-1.48	2.20
	Small employers/own account workers	-0.70	0.59	-3.28	1.88
	Lower supervisory and technical	1.41	0.09	-0.20	3.02
	Semi-routine and routine	1.51	0.03	0.16	2.87
	Never worked and long-term unemployed	1.03	0.64	-3.37	5.43
<i>Testparm</i>		0.12			

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Variable	Category	Odds ratio	Significance	95% C.I.	
Parental employment	(At least one parent/ carer in full-time work)				
	At least one parent/ carer in part-time work	0.19	0.83	-1.54	1.92
	No parent/carer working	0.57	0.64	-1.83	2.98
	<i>Testparm</i>		0.89		
Family type	(Lone parent)				
	Couple family	0.54	0.47	-0.95	2.04
	<i>Testparm</i>		0.47		
Equivalised annual household income	(Bottom quintile (< £11,250))				
	2nd quintile (>=£11,250 < £17,916)	-0.35	0.66	-1.90	1.20
	3rd quintile (>=£17,916 < £25,000)	-0.87	0.36	-2.76	1.02
	4th quintile (>=£25,000 < £37,500)	-2.13	0.09	-4.57	0.31
	5th quintile (>=£37,500)	-1.61	0.24	-4.33	1.11
	<i>Testparm</i>		0.47		
Respondent ethnicity	(White)				
	Other ethnicity	-0.33	0.89	-5.18	4.51
	<i>Testparm</i>		0.89		

Number of cases included = 308

**Table A.8** Linear regression exploring the association between selected childcare and socio-economic characteristics, and total difficulties score – child cohort, children with mothers aged 25 or older at the child’s birth

Variable	Category	Co-efficient	Significance	95% C.I.	
Duration of weekly non-parental care at age 34 months	(up to 8 hours)				
	9 to 17 hours	0.14	0.70	-0.58	0.87
	17 to 40 hours	0.34	0.26	-0.26	0.93
	More than 40 hours	1.22	0.05	0.03	2.40
	<i>Testparm</i>		0.23		
Child’s gender	(Male)				
	Female	-0.91	< 0.01	-1.42	-0.40
	<i>Testparm</i>		< 0.01		
Highest parental educational qualification	(Degree or equivalent)				
	Vocational qualification below degree	1.25	< 0.01	0.60	1.89
	Higher grade or equivalent	0.40	0.43	-0.61	1.41
	Standard grade or equivalent	2.15	< 0.01	0.84	3.45
	No qualifications	2.68	0.01	0.76	4.60
<i>Testparm</i>		< 0.01			
Household NS-SEC	(Managerial/professional)				
	Intermediate occupations	-0.01	0.98	-0.86	0.84
	Small employers/own account workers	-0.46	0.44	-1.64	0.72
	Lower supervisory and technical	0.07	0.92	-1.40	1.55
	Semi-routine and routine	0.01	0.98	-1.30	1.32
	Never worked and long-term unemployed	-1.16	0.62	-5.80	3.48
<i>Testparm</i>		0.98			

# GROWING UP IN SCOTLAND:

Multiple Childcare Provision and its Effect on Child Outcomes

Variable	Category	Co-efficient	Significance	95% C.I.	
Parental employment	(At least one parent/ carer in full-time work)				
	At least one parent/ carer in part-time work	1.16	0.11	-0.25	2.56
	No parent/carer working	1.87	0.07	-0.12	3.85
	<i>Testparm</i>		0.08		
Family type	(Lone parent)				
	Couple family	0.00	1.00	-1.44	1.43
	<i>Testparm</i>		0.99		
Equivalised annual household income	(Bottom quintile (< £11,250))				
	2nd quintile (>=£11,250 < £17,916)	-0.59	0.37	-1.88	0.70
	3rd quintile (>=£17,916 < £25,000)	-0.95	0.14	-2.21	0.31
	4th quintile (>=£25,000 < £37,500)	-1.15	0.07	-2.39	0.10
	5th quintile (>=£37,500)	-1.32	0.04	-2.61	-0.04
	<i>Testparm</i>		0.27		
Respondent ethnicity	(White)				
	Other ethnicity	0.17	0.82	-1.30	1.64
	<i>Testparm</i>		0.81		

Number of cases included = 1344



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