The Economic and Social Review, Vol. 47, No. 4, Winter, 2016, pp. 543-575

Determinants and Effects of School Age Childcare on Children's Cognitive and Socio-Emotional Outcomes at Age 13

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Abstract: Little is known about the determinants or the influence of childcare arrangements for school age children in the Irish context. Using longitudinal data from Wave 1 and Wave 2 of the *Growing Up in Ireland* (GUI) child cohort study, this paper examines the factors associated with participation in non-parental after-school care in middle childhood and examines the influence of such care settings on children's outcomes at age 13. The findings show that participation in the type of after-school clubs captured by the GUI data (largely paid care in a group setting) is supporting children with specific educational needs and those with limited family support, as well as being strongly associated with maternal employment and high household income. Cognitive and socio-emotional outcomes at thirteen years are best explained by child, family, school and parental characteristics rather than direct effects of the type of out-of-school care arrangement held at age nine.

I INTRODUCTION

Despite the voluminous literature on the effects of pre-school childhood care and education on outcomes for infants, children and their families (see for example McGinnity *et al.,* 2015; Byrne and O'Toole, 2015; McKeown *et al.,* 2015; McGinnity *et al.,* 2013, GUI, 2011a, 2011b), little empirical research exists in the Irish context concerning the characteristics of families and children who

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Acknowledgments: This paper arose from an ongoing unfunded research study of the social lives of children. I wish to gratefully acknowledge participants at the GUI annual conference 2015 who commented on an earlier version of this paper, as well as the two anonymous reviewers for their constructive and insightful comments. The paper also benefited greatly from inputs from the Editors of this Special Issue – Helen Russell and Richard Layte – and colleagues at Maynooth University Departments of Sociology and Education.

participate in different types of out-of-school/after-school care arrangements,[1] or on the effects of such settings on children's outcomes. While the current debate revolves mainly around supply side factors, the characteristics of families and children who participate in different types of care arrangements for school age children have rarely been studied in the Irish context, nor have scholars paid much attention to the consequences of after-school care settings on socio-emotional and academic/cognitive outcomes of children. To some extent, the issue of the childcare of school age children has been over-shadowed by the dominance of the "early intervention" discourse and rationale for early investment (see Heckman, 2006).

In a context of increasing but limited public expenditure to support childcare for school age children, it is important to address this gap in the research literature. Over the last decade, concern has been expressed at the limited state provision of after-school childcare for children and families living in Ireland (see for example Inter-Departmental Working Group, 2015; Barry, 2011; Hennessey and Donnelly, 2005; Fahey, 1998). Calls have been put forward by advocacy groups and research has highlighted the need for greater investment in the after-school sector, to provide high quality, affordable care as a key mechanism to contribute to the reduction of child poverty and to facilitate labour market participation among parents, particularly mothers (Barnardos and StartStrong, 2012; Fahey and Russell, 2006; NESF, 2005; National Women's Council of Ireland, 2005). More recently after-school childcare has become a prominent policy issue, featuring in the 2016 Programme for Government, while the Inter-Departmental Working Group (2015) has also made its recommendations around the future investment of childcare in Ireland.[2] Public expenditure has primarily been oriented towards the development of after-school care facilities in designated geographical areas of disadvantage, and more recently the Government has pledged €3 million to develop after-school services in school buildings. In previous budgets, the number of after-school places has increased and increasingly public after-school care schemes have been opened up to private providers.

This paper builds on the work by Byrne and O'Toole (2015) which considered the uptake and influence of after-school childcare arrangements on child wellbeing using cross-sectional data from Wave 1 of the GUI Child study. The authors reported that after-school childcare arrangements had little influence on children's reading and mathematics scores at age nine, and

[1] The terms "after-school care", "out-of-school care" and "care of school age children" are used interchangeably throughout this paper.

[2] The 2016 Programme for Government indicates that community groups and private providers will be invited to tender to use school facilities, outside school hours, for childcare purposes, including after-school care.

identified a negative association between attending group-based after-school care settings (after-school programme/club) and children's socio-emotional outcomes. This paper now draws on longitudinal data from Wave 1 and Wave 2 of the GUI child cohort to consider the short-term effects of after-school childcare arrangements at age nine on academic and socio-economic outcomes at age thirteen. Specifically, it addresses the following research questions:

- What types of after-school settings do children participate in, and how does the uptake of non-parental childcare among school age children differ as children move through middle childhood?
- What are the characteristics of children and families who use after-school clubs at age 9 and at age 13?
- Are there any short-term effects of after-school care arrangements at age 9 on children's cognitive and socio-economic outcomes at age 13?

II AFTER-SCHOOL CHILDCARE PROVISION IN THE REPUBLIC OF IRELAND

In the Irish context, care services for school age children are largely informal childcare services based on family and community systems or on the private marketplace. Published data from the *Growing Up in Ireland* (GUI) study suggest that the strongest role is played by the family – as families become more reliant on parental care as school age children grow older, and the school day becomes longer.[3] That is, at age five, 64 per cent of the infant cohort (who had started primary school) was cared for at home by a parent after school, while at age 9, the percentage of primary school children cared for at home by a parent after school had increased to 77 per cent (Inter-Departmental Working Group 2015). Data from the GUI also suggest that formal after-school childcare settings (clubs, programmes) are used substantially less than other forms of informal childcare (relative or non-relative care) for school age children. Furthermore, there has been little change in the uptake of non-parental after-school childcare between 2002 and 2008/09 (Byrne and O'Toole, 2015).

Currently, it is difficult to ascertain formal capacity in the sector relating to after-school services, although there is some evidence to suggest that provision is increasing, from 783 providers of after-school care in 2013 to 942 providers in 2014 (Pobal, 2015). In all 34 per cent of childcare providers offered after-school care within their facilities, and in 2014, 17.7 per cent of all childcare

[3] The primary school day officially lasts 5 hours and 40 minutes, although younger children (5-7) may well experience a shorter day for the first two years. For post-primary schools (second level), the school day is longer and the minimum number of hours instruction per day is 6.

places comprise after-school care (age 6-14), an increase from 13.8 per cent in 2013 (Pobal, 2015). Access to public after-school childcare is provided through a range of targeted state subsidised childcare schemes directed towards welfare recipients accessing training and employment, as well as programmes targeted by area disadvantage.[4] While the total number of state subsidised after-school places is difficult to locate, the After-School Child Care (ASCC) scheme supported 300-500 after-school places at a cost of €1,323,000 in 2015 (Inter-Departmental Working Group, 2015 :74). Private provision of after-school care also exists, with a lower share of private providers offering after-school care compared to community-based services – 29.8 per cent compared to 44 per cent respectively (Pobal, 2015). However, the Pobal survey of providers suggests that the majority of after-school childcare services were delivered by private providers in 2014 – 575 private providers compared to 367 services provided by community-based services.

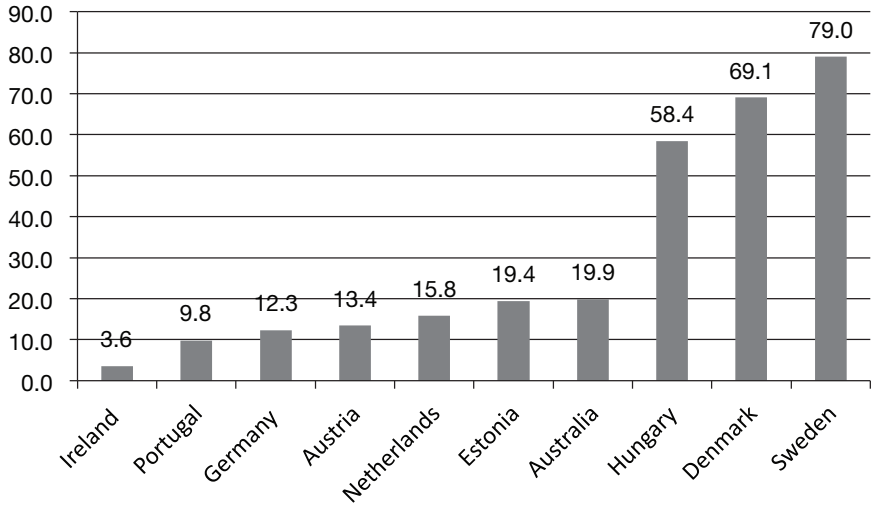
It is, however, well established that investment in after-school childcare services has been historically underdeveloped in Ireland (Russell *et al*., 2009; McGinnity *et al.*, 2015). As a result, the sector has been described as fragmented, costly for working parents, a barrier for mothers who want to return to work and unregulated with regard to the formal requirements for the qualification of staff.

In comparative perspective, Ireland fares very poorly compared to other European countries in the provision of state-supported after-school childcare. Figure 1 illustrates that there is considerable divergence across European countries (OECD, 2015). Enrolment rates in state-supported after-school care services for nine-year-olds in Scandinavian countries are particularly high – 69.1 per cent in Norway and 79 per cent in Denmark, and are viewed as an integral part of the care and education system for all children.[5] Unlike in some other institutional contexts, there is no national policy, or legislative framework for the after-school sector in Ireland, and service provision has been described as ad hoc, expensive, unregulated, often unavailable and varying in quality standards. The level of training and qualifications varies significantly among staff and there is a heavy reliance on volunteers and fundraising. In

[4] These state targeted childcare programmes include the Community Childcare Subvention (CCS), the Childcare Education & Training Support (CETS) Scheme, After-School Child Care (ASCC) Scheme, Community Employment Childcare (ECE) Scheme, and Community Employment After-school Childcare (CEAS) Scheme. Eligibility for these schemes is determined by the Department of Education, Education and Training Boards, SOLAS and the Department of Social Protection. In all, there are currently 871 community/voluntary services and 1,138 private services in contract to provide one or more of these schemes (Direct communication with DCYA, October 2016).

[5] Comparable data on enrolment rates in state supported after-school services for children living in Ireland were not published by OECD for Ireland. In Figure 1, the overall share of 9-year-olds attending (any) after-school clubs regularly based on GUI data have been included.

Figure 1: *Percentage of Children Aged 9 Enrolled in Out-of-School-Hours (State Provided) Care Services 2011*



Source: OECD Family Database, Data for Ireland based on GUI using a different definition.

comparison, Ireland is defined as a country with a high unmet demand for out-of-school childcare services, with considerable waiting lists for publicly subsidised after-school care. As a result, Ireland has been classified as a country whereby childcare for children outside and around school term time is viewed as a private rather than public responsibility, and classified at the lower end of quality of after-school childcare provision (Plantenga and Remery, 2009; 2013). Pobal data suggest that demand and supply patterns are very much linked to the nature of provision. In 2014, 12.6 per cent of children on waiting lists for childcare services that were over-subscribed, were waiting for a school age care service (555 children). The demand for after-school places tended to be greater for community-based services than private providers (Inter-Departmental Working Group, 2015; Pobal, 2015). While it was evident that some services have waiting lists, others have a considerable amount of vacancies. Pobal data suggest that nationally, 17.1 per cent of all after-school services have vacancies, with the majority of vacancies being reported by private providers (65 per cent).

III LITERATURE REVIEW

Despite the voluminous sociology and education literatures on formal schooling and education, much less attention has focused on academic and learning opportunities outside of school time, or on children's out-of-school lives.

Academic experiences undertaken in a structured or unstructured setting outside of school hours can be important sources of educational inequality, particularly given that these opportunities are more likely to be available to students of higher socioeconomic status (Park *et al.*, 2016). In the Irish context, research studies have examined the uptake of non-academic activities outside of formal schooling, such as sports and cultural activities, and researchers have examined both the factors that influence participation, and the consequences of participation in these activities for student educational engagement (see Smyth, 2016; McCoy *et al.*, 2012a; McCoy *et al.*, 2012b). These studies reveal clear differences and inequalities in children's out-of-school lives along the lines of gender, social class, migrant status, disability/special educational need and locality. Furthermore, they highlight the influence that participation has on both positive school engagement and academic achievement. However, despite this voluminous literature to date, few studies in the Irish context have considered specifically the case of after-school childcare (for exceptions see Smyth *et al*., 2015; Byrne and O'Toole, 2015, Barry, 2011, Hennessy and Donnelly, 2005).

Drawing from the body of research that has been conducted in other institutional contexts, the key factors influencing after-school childcare choices are maternal employment, degree of household economic disadvantage, and children's ages (see for example Hand and Baxter, 2013 in Australia; Brandon and Hofferth, 2003; Capizzano *et al.*, 2000 in the US). These studies also report that households make decisions around the different types of after-school childcare arrangements depending on family resources, such as availability of appropriate caregivers, with particular implications for lone parents. In the US, after-school programmes were used relatively less in the Brandon and Hofferth study than other forms of informal childcare for schoolchildren, which they argued was associated with the inability of after-school programmes to meet the hours of childcare needed by full-time working mothers. As a result, school-based childcare programmes were more likely to be used by parents who work part-time than by parents who work full-time. However, findings differ substantially across institutional contexts. In contrast, in Australia, where the supply of school based after-school care has grown substantially (Cartmel and Hayes, 2016), participation in school based/centre based after-school childcare is strongly associated with maternal working hours – the odds of participation increasing as work intensity increases – while mothers in temporary, self-employment or with atypical work schedules (such as shift work) were less likely to use school based/centre based childcare (Hand and Baxter, 2013).

With regard to the determinants of participating in an after-school club at age 9 in the Irish context, individual child characteristics are likely to play a role. However, given the limited provision of after-school care, it is unclear whether children with specific pedagogical needs (e.g. special educational needs, language requirements) are more likely to successfully secure suitable after-school clubs. It is however, likely that both parental resources and access to community-based after-school services play key roles. It is expected that parents with greater levels of financial resources will secure after-school services on the private market at all ages (Hypothesis 1a), and that parents with greater reliance on the state for income support will secure after-school services through community-care schemes, but for younger children only, given the limited supply (Hypothesis 1b). Secondly, school effects are likely to play a role, and it is expected that young people who attend schools with greater shares of disadvantaged students or students with high levels of pedagogical difficulties are more likely to attend after-school clubs, given that many after-school clubs are targeted towards disadvantaged student cohorts (Hypothesis 1c).

In terms of outcomes from participation in after-school childcare programmes, a review of the international literature indicates that research findings are often inconsistent and site dependent with regard to the impact on young people's academic and socio-emotional outcomes (see for example Scott-Little *et al.*, 2002; Lauer *et al*., 2006 in the US). There is, however, some evidence to suggest that disadvantaged students may benefit most from participation. Posner and Vandell Lowe (1994) found in their research in a disadvantaged city in the US that children who regularly participated in formal after-school programmes had higher levels of academic performance than those who were in regular parental or informal after-school care. O'Donnell and Kirkner (2014) in the US found that participants in a community-based out-of-school programme had significantly higher English-language, Art and Mathematics standardised test scores and fewer absences than the control group. In their study, active programme participants had significantly higher academic grade-point averages (GPAs) and Mathematics test scores as well as higher total GPA. In a meta-analysis of 35 studies published from 1986 to 2003 on the effectiveness of out of-school programmes on reading and Mathematics performance in the United States, Lauer *et al*., (2006) conclude that out-of-school programmes can have positive effects on the academic achievement (reading and Mathematics outcomes) of at-risk students. With regard to socio-emotional outcomes, the literature is more limited. There is, however, some evidence to suggest that after-school programmes can support young people in building positive attitudes to school, improve within-school behaviour and are beneficial for students regardless of socioeconomic background (Posner and Vandell Lowe, 1994).

In the Irish context, Costello *et al.* (2000) report an improvement in the level of school attendance for disadvantaged participants in a programme that included a range of in-school provisions as well as after-school activities. Murphy (2001) and Richie (1999) reported teachers' views that children had benefited from participating in after-school clubs targeted in geographic areas of disadvantage. Limited by a small sample size, the study by Hennessey and Donnelly (2005) revealed no evidence to suggest that children attending group based after-school arrangements performed better than similar children who did not attend group based after-school care. Rather, parents and children were reported to derive substantial social benefits from participation. That is, both parents and children placed a high value on participation, and parents valued the social opportunities (peace of mind, safety) and educational value (assistance with homework) that children derive from attending.

There is little known about "inside the black box" of after-school settings in the Irish context, and measures indicating the quality of after-school programmes/clubs are not captured in the GUI data. There is some evidence from the US to suggest that that the quality of the after-school programme can influence attainment and behaviour. In a longitudinal study which examined associations between three after-school programme quality features (positive staff-child relations, available activities, programming flexibility) and child developmental outcomes; Pierce *et al*., (2010) find that positive staff–child relations in the programmes were positively associated with children's reading and Mathematics grades, and social skills. Furthermore, the availability of a diverse array of age-appropriate activities at the programmes was positively associated with children's Mathematics grades and classroom work habits. These findings were also replicated by Kataoka and Lowe Vandell (2013) in their study of older youth.

The national and international literature also places emphasis on the content of after-school programmes, for young people's engagement. Children's enjoyment of after-school activities was also considered by the Irish study conducted by Hennessy and Donnelly (2005). The older children in their study (aged 10-12) mentioned the importance of the after-school project for spending time with their friends – an aspect of after-school life that was not mentioned by the younger age group (aged 6-8). Research studies report higher levels of student engagement in programmes that offer sports activities and arts enrichment activities and low levels of engagement while completing homework during programmes. In an in-depth study of the types of activities that are undertaken at a range of after-school programmes in the US, young people reported being more engaged in activities involving both adults and peers than activities with peers only (Shernoff and Lowe Vandell, 2007 in the US).

With regard to the effects of participating in an after-school club at age 9 on outcomes at age 13, from an ecological systems perspective (see

Bronfenbrenner, 1979; Bronfenbrenner *et al.*, 1998) opportunities for learning and development provided by after-school programmes would enhance and be conducive to the promotion of cognitive and socio-emotional development. However, cultural analysts, and the processes of social reproduction (Bourdieu, 1973) and concerted cultivation (Lareau, 2003) have also been central to our understanding of how inequalities arise in access to opportunities outside of school time that may promote or inhibit academic or social development. As a result it is likely that young people's cognitive outcomes at age 13 are largely influenced by the dominant role of individual, family and primary caregiver characteristics, rather than participation in after-school settings (Hypothesis 2a). With regard to young people's socio-economic outcomes, it is expected that a greater level of difficulty at age 9 is associated with a greater level of difficulty at age 13 (Hypothesis 2b), and that the influence of the family and in particular relationship with the primary caregiver exerts a stronger influence than after-school settings at age 9 (Hypothesis 2c).

IV METHODOLOGY AND DATA

4.1 *Data*

Much of the literature in the area of after-school childcare and children's outcomes in Ireland has relied on small samples, or cross-sectional data. This paper draws on longitudinal data from two waves of the GUI study, a nationally representative study of children living in Ireland. In 2007/2008, GUI interviewed 8,578 nine-year-old children, their parents and their teachers on a wide range of topics. Wave 2 took place in 2011/12 when the children were aged 13 and included 7,423 of the children who had participated in Wave 1. Questionnaires were successfully completed with approximately 91 per cent of the target sample for Wave 2 (Quail *et al*., 2014). The sample design was based on a two-stage selection process in which the school was the primary sampling unit with the children within schools being the secondary units. Further details on the study are available in Smyth *et al*. (2010).

Both GUI waves collected information on the type of after-school care that children typically attend. The wording and response categories are shown in Table 1, which result in a number of issues regarding how after-school care settings are conceptualised in this paper. Firstly, there is substantial variation in the wording of the question relating to school age childcare between both waves. While Wave 1 questions asked more broadly about "out-of-school care" during term-time, Wave 2 asks about a more limited snapshot between "the time they finish school and 6pm in the evening". Secondly, the range of care options is more limited in Wave 2 than in Wave 1. Wave 1 offers a diverse range of care options relative to Wave 2. Finally, it is not possible to distinguish

Table 1: *Wording of Questions Relating to After-school Care Settings, Wave 1 and Wave 2*

	Wave 1	*Wave 2*
Question	Looking at Card J2, what is the MAIN type of out-of-school care, if any, that you CURRENTLY use during term time for the Study Child. In other words, who is he/she with on a regular basis, outside of holiday periods and weekends [Int: Tick 1 box only]	On a typical weekday, who, if anyone, minds <child> between the time they finish school and 6pm in the evening? (Tick one only; if more than one indicate the type of care where <child> spends MOST time or is the most frequently used)
Response Categories	1. Child minded at home by me or resident partner 2. Looking after him/herself or cared for by a sibling 3. Child minded by non-resident partner 4. Unpaid relative (or family friend) in your own home 5. Unpaid relative (or family friend) in his/her own home 6. Paid relative (or family friend) in your own home 7. Paid relative (or family friend) in his/her own home 8. Paid childminder in your own home 9. Paid childminder in his/her own home 10. Au Pair / Nanny 11. Paid after-school care in group setting 12. Homework club 13. After-school activity-based facility 14. Special needs facility 15. Activity Camps (sport recreation arts/crafts etc) 16. Other (specify)	1. They come home and take care of themselves 2. Minded at home by an older sibling 3. Minded at home by you or your spouse/partner 4. Minded at home by a relative 5. Minded at home by another adult (not a relative) 6. Attend an after-school programme/club 7. Hang out with friends 8. Other (please specify)
Providers	Includes mix of both community-based and private after-school care providers, but not possible to distinguish from each other.	Includes mix of both community-based and private after-school care providers, but not possible to distinguish from each other.

Table 1: *Wording of Questions Relating to After-school Care Settings, Wave 1 and Wave 2 (Contd.)*

	Wave 1	*Wave 2*
Definition of After-school club	• "Paid after-school care in group setting" • "Homework club" • "After-school activity-based facility"	• "Attend an after-school programme/club"

between community-based and private provider after-school services in either wave.[6] As a result, there are implications for the conceptualisation of after-school care settings that are used in this paper. Wave 1 offers a diverse range of specialised activities to include "Paid after-school care in group setting", "Homework club", "After-school activity-based facility".[7] For the purpose of this paper, these activities are defined as "after-school programmes/clubs". By Wave 2, the response category relating to formal after-school options is limited to "Attend an after-school programme/club". Furthermore, because both questions capture the typical form of childcare, the estimates of participation in after-school clubs presented here are likely to represent an under-estimation of lower amounts of time spent in such facilities (for example, two days per week).

4.2 *Dependent Variables*

A number of dependent variables are used in the analysis, and these can be classified into two groups. The first group of dependent variables will focus on participation in after-school childcare using dummy variables to indicate participation in after-school clubs/programmes at age 9 and at age 13.

The second set of dependent variables then focus on the student outcomes in question: that is, socio-emotional and cognitive outcomes at age thirteen. The GUI team adopted the Strengths and Difficulties questionnaire (SDQ) (Goodman, 1997) to measure children's socio-emotional adjustment. The SDQ is a brief (25-item) measure of the pro-social behaviour and psychopathology of children aged three to 16 years that can be completed by parents, teachers, or

[6] Based on data drawn from the Annual Survey of Early Years Services, conducted by Pobal, the average fee is greater for private after-school care services than community after-school care services: €85 compared to €64 respectively. The average fee is also greater for private breakfast club services than community breakfast club services (Inter-Departmental Working Group, 2015).
[7] As shown in Table 1, a distinction is not made as to whether the "after-school activity based facility" is in-school or outside school. However, it would seem that those participating in an "after-school activity based facility" are also participating largely in homework club and sport/fitness club outside of school hours.

children/youths themselves. For Wave 2 of GUI, the primary caregiver reported on the Strengths and Difficulties Questionnaire (Thornton *et al*., 2016).

Drumcondra Reasoning Tests were used as a measure of cognitive skill development in Wave 2 (as opposed to mathematics achievement tests used in Wave 1). At 13 years, each study child was given a maximum of 25 minutes to complete the test (Thornton *et al*., 2016). The DRT comprise Verbal Reasoning and Numerical Ability sub-tests designed by the Educational Research Centre in Dublin (ERC, 2007) and are based on the Irish school curriculum. A reduced version of the full DRT was designed by the Educational Research Centre for use in the *Growing Up in Ireland* study and contained 20 Verbal Reasoning questions and 20 Numerical Ability questions (Thornton *et al*., 2016).

4.3 *Independent Variables*

The selection of independent variables in the regression models is based on their theoretical and empirical relevance, availability in the dataset, but also the presence of a statistically significant association between each individual variable and the dependent variable at the bivariate level. All predictors and covariates were recorded at nine years, unless otherwise stated. A summary of the independent variables used in the analyses are presented in Table 2, and represent characteristics relating to the child, the socio-economic circumstances of the family, school-level variables capturing school characteristics, as well as characteristics of the Primary Care Giver (PCG). School level variables are derived from information provided in the Principal questionnaire, and these variables relate to the characteristics of the student intake of the school that the study child had attended at age 9. The final sample size is 6,471, as a result of missing data on a range of variables.

4.4 *Analytic Strategy*

A binary logistic regression approach is adopted to consider the characteristics of children that participate in after-school clubs/programmes versus any other type of after-school care arrangement including parental care, at age 9 and at age 13. When modelling participation the analyses follows a step-wise procedure beginning with child characteristics, followed by household socio-economic characteristics in step two, school level variables in step three, and characteristics relating to the primary caregiver in step four.

OLS linear regression models are used to examine the relationship between the type of after-school childcare used at 9 years old and scores on the Strengths and Difficulties Questionnaire (total SDQ score) at 13 years of age; and to consider the influence of after-school care settings used at 9 years old on cognitive outcomes at 13 years of age. When modelling the cognitive and socio-emotional outcomes, after-school childcare type, as the main variable of interest

Table 2: *Summary of Variables Used in the Analyses (unweighted)*

	Mean	*Std. Dev*
Dependent Variables		
SDQ Score	6.28	4.79
Numeric Ability	.005	.890
1 if participated in after-school club at age 9, 0 otherwise	.035	.185
1 if participated in after-school club at age 13, 0 otherwise	.019	.138
Independent Variables		
1 if male, 0 female	.476	.499
1 if born outside Ireland, 0 if born in Ireland	.101	.302
1 if diagnosed with SEN by age 9, 0 if otherwise	.053	.225
1 if less than 20 children's books in the home, 0 if more	.214	.410
1 if PCG works 1-15 hours per week, 0 otherwise	.054	.226
1 if PCG works 16-40 hours per week, 0 otherwise	.513	.499
1 if PCG works 41+ hours per week, 0 otherwise	.031	.173
1 if lone parent, 0 otherwise	.099	.299
1 if no family living locally, 0 otherwise	.217	.412
1 if living in urban area, 0 otherwise	.442	.496
1 if household income is highest quintile, 0 otherwise	.265	.441
1 if household income is in second highest quintile, 0 otherwise	.225	.418
1 if household income is in middle quintile, 0 otherwise	.191	.393
1 if family is classified as professional/managerial, 0 otherwise	.557	.496
1 if PCG has lower secondary or lower education level, 0 otherwise	.145	.353
1 if PCG has third-level education (non-degree), 0 otherwise	.250	.433
1 if PCG has higher education (undergrad/postgrad), 0 otherwise	.284	.451
1 if family is living in rental accommodation, 0 otherwise	.124	.330
1 if household relies on welfare for 75-100% of income, 0 otherwise	.039	.193
School Characteristics		
1 if school is large/very large, 0 otherwise	.290	.454
1 if principal indicates the school has a fair/good/excellent after-school facility, 0 otherwise	.524	.499
1 if school reports >10% chronic non-attendance, 0 otherwise	.237	.425
1 if school reports high intake of students with emotional or behavioural issues, 0 otherwise	.767	.422
1 if school reports high intake of students with literacy problems, 0 otherwise	.390	.487
1 if school reports high intake of students with numeracy problems, 0 otherwise	.453	.497
PCG Characteristics		
Level of conflict with PCG	21.6	8.35
Age of PCG	39.9	5.17
Total Depression Score (PCG)	1.99	3.20
N = 6,471		

at nine years, is typically entered into the first block of the model, followed by other variables, in this sequence:

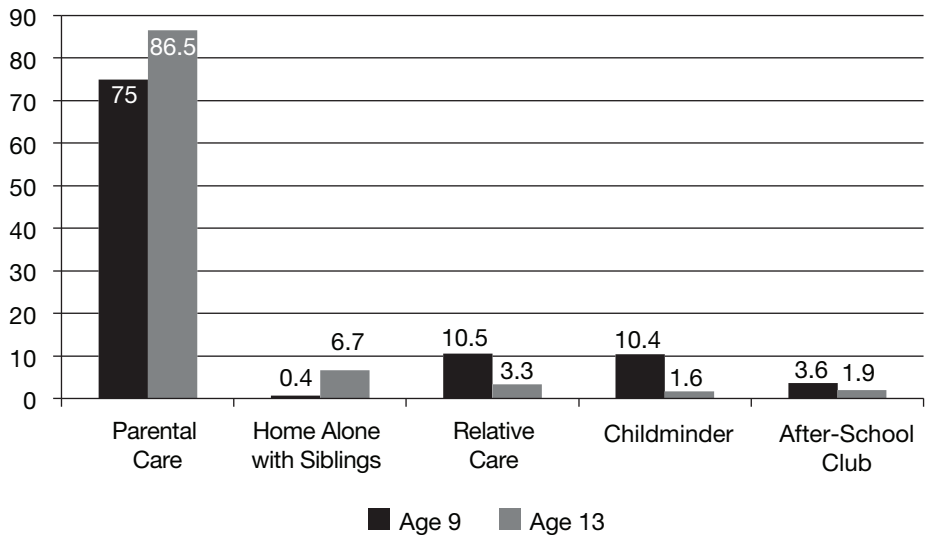
- Model 2: Child characteristics
- Model 3: Household socio-economic characteristics
- Model 4: School level characteristics
- Model 5: PCG characteristics

The final stage in the modelling includes the child's score on the appropriate test at nine years (Model 6). In the case of the SDQ measure, this serves to illustrate the change in scores between Wave 1 and Wave 2. In the case of the numeric ability outcome, the child's score on a standardised Mathematics test at age nine years cannot be used to indicate a change or development in numeric ability; however it is included as a measure of prior attainment at age nine (Twisk, 2003).

V FINDINGS

5.1 *Participation in After-school Clubs at Age 9*

Figure 2: *Distribution of Different Types of Childcare, Age 9 and Age 13*



Source: GUI Child Cohort, Wave 1 and Wave 2, Children present at both waves.

At age nine, just 3.6 per cent of children were attending after-school clubs regularly (Figure 2). Among this group, almost three-quarters (73 per cent) participated regularly in a paid after-school care in a group setting, 18 per cent were in an after-school activity based facility, and 8 per cent were in homework clubs. Participation among nine-year-olds in after-school clubs (and particularly homework clubs) is very low, given that 53 per cent of school principals indicated that they have good after-school facilities (see Table 2).

To examine the factors influencing the decision to use an after-school club, a logistic regression model was estimated with the categorical binary dependent variable having a value of "1" if the study child was in an after-school club or "0" if in any other after-school setting including parental care. Table 3 presents the results of the binary logistics regression, which reveal the complexities surrounding the provision of after-school clubs, given their mix of private and public funding, diverse orientations and provision of targeted state subsidised childcare schemes.

Table 3 shows that the work intensity of the PCG, family structure, household income, the education level of the PCG, and the level of dependency on welfare payments for household income each are salient characteristics associated with after-school care. Participation in after-school clubs is closely associated with the work intensity of the primary caregiver and family support systems. That is, the children of PCGs who work full time, including those who work intensive hours, are more likely to participate in an after-school club/programme at age 9 than the children of PCGs who are not in employment. Family structure also matters, as the children of lone parent families are 1.5 times more likely to participate in an after-school club (Model 4). This may be as a result of the limited familial resources that some lone parents may experience. Those without local family support or regular contact with grandparents are also more likely to participate in an after-school club. Attending an after-school programme is also associated with household income. Children living in high income households are more likely to use after-school clubs, reflecting issues relating to cost. Children living in families with a high level of dependency on social provision for household income, and those living in rental accommodation, exhibit greater access to after-school clubs relative to alternative after-school care arrangements at age nine, reflecting targeted access to state subsidised childcare schemes (see also Brandon and Hofferth, 2003).

School characteristics also matter: children attending larger schools are more likely to attend an after-school club relative to those in smaller schools, perhaps reflecting the greater likelihood of teachers/external providers to offer after-school group activities in these schools. While there was a significant association at the bivariate level between participation in an after-school club

Table 3: *Results of Binary Logistic Regression Model of the Factors Associated with Participation in After-school Club at Age 9 (Odds Ratios)*

	(1) Child Variables	*(2) Household Variables*	*(3) School Variables*	*(4) PCG Variables*
Male	1.02	1.03	1.01	1.02
Ref: Female				
Born outside Ireland	1.69**	1.31	1.33	1.32
Ref: Born in Ireland				
Diagnosed with SEN by age 9	2.02**	2.05**	2.07**	1.84*
Ref: No SEN Diagnosis				
Less than 20 books in home		0.76	0.77	0.77
Ref: >20 books in the home				
PCG works 1-15 hours		1.50	1.51	1.58
PCG works 16-40 hours		3.37***	3.44***	3.52***
PCG works 41+ hours		4.65***	4.65***	4.71***
Ref: PCG not in employment				
Lone parent family		1.58*	1.62*	1.56*
Ref: Dual family				
No family living locally		1.49**	1.47*	1.45*
Ref: family living locally				
Living in an urban area		1.19	0.93	0.92
Ref: living in a rural area				
Highest Income Quintile		2.01***	1.95**	1.94**
2nd Highest Income Quintile		1.19	1.17	1.15
Middle Income Quintile		0.68	0.70	0.69
Ref: Lower Income Quintiles				
Professional/Managerial class		1.11	1.08	1.08
PCG Primary Education or Less		1.09	1.16	1.16
PCG Third-Level Education		1.08	1.12	1.12
PCG Higher Education		1.38	1.41	1.43
Ref: PCG Second Level Education				
Living in rental accommodation		1.54	1.63*	1.60*
Ref: living in owner-occupied				
High income dependency from welfare		2.24*	2.20*	2.14*
Ref: Income < 75% from welfare				
Large/very large schools (360 pupils+)			1.81***	1.80***
Ref: Smaller schools				
Fair/Good/Excellent AS facilities			1.30	1.29
Ref: Poor after-school facilities				
>11% pupils missed 20 days or more			0.66*	0.67*
Ref: <11% pupils missed 20 days+				
Low incidence of students EBD			1.05	1.06
Level of conflict with PCG				1.03***
N	6,471	6,471	6,471	6,471
R^2	0.007	0.080	0.092	0.098

Exponentiated coefficients; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

and primary school principals reporting after-school facilities in their school as "fair/good/excellent", in the multivariate model this factor did not emerge as significant. However, children attending schools with high levels of non-attendance among the student population were less likely to participate in after-school clubs.[8] Furthermore, the children of primary caregivers who reported higher levels of child-parent conflict also have a higher likelihood of attending an after-school club.

Table 3 also indicates that children who have been diagnosed by a professional with a(ny) special educational need by age nine are 1.8 times more likely to participate in an after-school club. This may well reflect the need for parents and guardians of children with special educational needs to seek out suitable after-school activities. Research from the UK indicates that after-school care provision enables parents to address the particularly acute challenge of juggling economic activity with caring for children with SEN (Millar and Ridge, 2001), and that these services provide valuable "time out" for parents, children and their siblings (Smith and Barker, 1999) whilst also providing enjoyable social interaction with children (Davis, 2001). Comparative studies also indicate that many parents would like their child who has been diagnosed with a special educational need to spend more hours participating in after-school care, but are often limited by funding, or over-subscription of good quality after-school childcare arrangements. It would seem that participation in the type of after-school programmes/clubs captured by the GUI data (largely paid after-school care in a group setting) is supporting children with specific needs and limited family support, as well as being strongly associated with maternal employment and high household income.

5.2 *Participation in After-school Clubs at Age 13*

By age thirteen, just under 2 per cent of children were attending after-school clubs regularly. Clearly, a longer school day lowers the demand for extensive hours of after-care. Table 4 provides the results of a logistic regression model to examine the characteristics of children and families attending an after-school club versus any other type of after-school care including parental care at age 13. In doing so, the data allow a consideration of how patterns of participation change between age 9 and age 13.

By age thirteen, fewer variables predict after-school club attendance, and patterns of participation differ considerably. While maternal employment (employment of PCG) was a strong influence on participation in formal after-

[8] Other school level variables pertaining to the degree of literacy and numeracy difficulties in the school, or the DEIS status of the school did not result in a significant association at the bivariate level, and so were not included in this model.

Table 4: *Results of Binary Logistic Regression Model of the Factors Associated with Participation in After-school Club at Age 13 (Odds Ratios)*

	(1) Child Variables	*(2) Household Variables*	*(3) School Variables*	*(4) PCG Variables*	*(5) After-school Age 9*
Male	1.07	1.04	1.06	1.05	1.05
Ref: Female					
Born outside Ireland	2.12**	2.02**	1.97**	2.05**	2.03**
Ref: Born in Ireland					
PCG works 1-15 hours		0.52	0.52	0.53	0.51
PCG works 16-40 hours		1.39	1.35	1.40	1.12
PCG works 41+ hours		1.21	1.20	1.23	0.91
Ref: PCG not in employment					
Professional/Managerial Class		0.79	0.80	0.77	0.77
Ref: All other social class groups					
Highest Income Quintile		2.39**	2.49**	2.49**	2.34**
2nd Highest Income Quintile		1.76	1.81*	1.82*	1.82*
Middle Income Quintile		1.25	1.27	1.28	1.36
Ref: Lower Income Quintiles					
PCG Primary Education or Less		0.42	0.39	0.40	0.40
PCG Third Level Education (non-degree)		1.49	1.51	1.54	1.52
PCG Higher Education		1.55	1.62	1.55	1.46
Ref: PCG Second Level Education					
Low level of literacy problems in school			0.92	0.89	0.88
Ref: Greater than 10% students					
Low level of numeracy problems in school			0.57	0.57	0.57
Ref: Greater than 10% students					
PCG Age				1.04*	1.04*
Level of Conflict with PCG				1.03*	1.02*
After-school Club at Age 9					3.54***
Relative Care at Age 9					1.22
Childminder at Age 9					1.70*
Ref: Full parental care at age 9					
N	6,471	6,471	6,471	6,471	6,471
R^2	0.007	0.041	0.05	0.057	0.070

Exponentiated coefficients: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

school clubs at age 9, it no longer predicts participation at age 13. This may well reflect the flexibility that a longer school day affords parents to fit work into school hours. It would seem that participation is more strongly determined by cost, as those from the highest income households continue to be more likely to attend an after-school club at age 13 relative to those in lower income households. However, some other characteristics of the primary caregiver continue to matter given that the children of those who experienced higher level of child-parent conflict at age 9 continue to be more likely to attend an after-school club at age 13, as are the children of older parents. While country of birth did not emerge as a predictor of participation at age 9, thirteen-year-olds who were born outside Ireland are more likely to attend an after-school club at age 13, perhaps reflecting the greater necessity of after-school childcare for those with limited family support, or supporting children with specific pedagogical needs. Finally, those who previously attended an after-school club at age nine were now also more likely to attend an after-school club at age 13, as were those who were in the care of a childminder at that stage.

5.3 *Socio-Emotional Outcomes*

At the bivariate level, there was a statistically significant association between the type of after-school childcare arrangement used at age 9 and scores on the Strengths and Difficulties Questionnaire (total score) at age 13, and so an Ordinary Least Squares (OLS) linear regression model was used to examine the relationship (Table 5). The dominant research questions being addressed in this model are whether after-school childcare settings at age nine influence socio-emotional outcomes at age 13; and if any observed effects of childcare would be robust to control for other child, home, school and parental factors.

As in previous models, all predictors and covariates were recorded at nine years, unless otherwise stated. As the main variable of interest, type of after-school childcare arrangement at nine years was entered into the first block of the model (Model 1 in Table 5). The final stage in the modelling was to add the child's score on the same SDQ test at age nine years (Model 6). This serves to illustrate the change in scores between Wave 1 and Wave 2.

In Model 1, when the different type of after-school care settings (at age nine) were compared to parental care, children who attended an after-school club at age nine were more likely to have higher average scores, representing greater levels of difficulties, all else being equal, while those in the care of a childminder were more likely to have lower average scores.

In Model 2, the effect of attending an after-school club was reduced but remained significant when characteristics of children (gender, SEN, birthweight) that are associated with SDQ are taken into account. Nine-year-olds in the after-school care of a childminder continued to be more likely to have

Table 5: *Results of Linear Regression Model of Total Strength and Difficulties Score at 13 Years*

	(1) After-school Care age 9	*(2) Child Variables*	*(3) Household Variables*	*(4) School Variables*	*(5) PCG Variables*	*(6) SDQ Score Age 9*
After-school Club	0.90**	0.67*	0.83**	0.86**	0.36	0.25
	(0.32)	(0.32)	(0.31)	(0.31)	(0.28)	(0.25)
Relative care	0.35	0.37*	0.30	0.28	0.27	0.16
	(0.19)	(0.19)	(0.20)	(0.19)	(0.18)	(0.16)
Childminder	–0.49*	–0.40*	0.08	0.11	0.00	0.04
Ref: Parental care	(0.19)	(0.19)	(0.20)	(0.20)	(0.18)	(0.16)
Male		0.37**	0.43***	0.43***	0.53***	0.28**
Ref: Female		(0.12)	(0.12)	(0.12)	(0.10)	(0.09)
Diagnosed with SEN by age 9		4.23***	4.10***	4.06***	3.16***	1.52***
Ref: No SEN Diagnosis		(0.26)	(0.25)	(0.25)	(0.23)	(0.21)
Birth Weight		–0.62***	–0.46***	–0.45***	–0.36***	–0.27***
		(0.10)	(0.10)	(0.10)	(0.09)	(0.08)
Less than 20 books in home			0.11	0.09	–0.03	–0.04
Ref: >20 books in the home			(0.14)	(0.14)	(0.13)	(0.12)
PCG works 1-15 hours			–0.34	–0.36	–0.14	–0.20
			(0.26)	(0.26)	(0.24)	(0.21)
PCG works 16-40 hours			–0.00	–0.03	0.12	0.01
			(0.14)	(0.14)	(0.12)	(0.11)
PCG works 41+ hours			0.25	0.26	0.39	0.17
Ref: PCG not in employment			(0.35)	(0.35)	(0.31)	(0.28)
Lone parent family			0.78***	0.78***	0.37	0.18
Ref: Dual family			(0.22)	(0.22)	(0.19)	(0.18)
Living in an urban area			0.40***	0.39**	0.26*	0.36***
Ref: living in a rural area			(0.12)	(0.12)	(0.11)	(0.10)

Table 5: *Results of Linear Regression Model of Total Strength and Difficulties Score at 13 Years (Contd.)*

	(1) After-school Care age 9	*(2) Child Variables*	*(3) Household Variables*	*(4) School Variables*	*(5) PCG Variables*	*(6) SDQ Score Age 9*
Highest Income Quintile			–0.18	–0.13	–0.15	–0.01
			(0.15)	(0.15)	(0.14)	(0.12)
2nd Highest Income Quintile			0.12	0.12	0.17	0.17
			(0.17)	(0.17)	(0.16)	(0.14)
Middle Income Quintile			0.15	0.16	0.03	0.03
Ref: Lower Income Quintiles			(0.16)	(0.16)	(0.14)	(0.13)
Professional/Managerial class			–0.25	–0.21	–0.15	–0.07
Ref: All other social class groups			(0.14)	(0.14)	(0.12)	(0.11)
PCG Primary Education or Less			0.75***	0.64***	0.62***	0.22
			(0.18)	(0.19)	(0.17)	(0.15)
PCG Third-Level Education			–0.24	–0.23	–0.26	–0.19
			(0.15)	(0.15)	(0.14)	(0.13)
PCG Higher Education			–0.84***	-0.80***	-0.72***	-0.26*
Ref: PCG Second Level Education			(0.16)	(0.16)	(0.15)	(0.13)
Living in rental accommodation			1.29***	1.14***	0.43*	0.29
Ref: living in owner-occupied			(0.20)	(0.20)	(0.18)	(0.17)
High income dependency from welfare			0.62	0.50	0.23	–0.02
Ref: Income < 75% from welfare			(0.33)	(0.33)	(0.30)	(0.27)
DEIS school				0.70***	0.40*	0.14
Ref: Non-DEIS school				(0.18)	(0.16)	(0.15)
Fair/ Good/Excellent After-school facilities				–0.02	–0.09	–0.04
Ref: Poor after-school facilities				(0.12)	(0.11)	(0.10)

Table 5: *Results of Linear Regression Model of Total Strength and Difficulties Score at 13 Years (Contd.)*

	(1) After-school Care age 9	*(2) Child Variables*	*(3) Household Variables*	*(4) School Variables*	*(5) PCG Variables*	*(6) SDQ Score Age 9*
>11% pupils missed 20 days or more				0.12	0.14	0.01
Ref: <11% pupils missed 20 days+				(0.14)	(0.12)	(0.11)
Low incidence of students SEBD				–0.25	–0.22	–0.22
Ref: >11% students with SEBD				(0.15)	(0.14)	(0.12)
Low level of literacy problems in school				–0.22	–0.13	–0.04
Ref: Greater than 10% students				(0.20)	(0.18)	(0.16)
Low level of numeracy problems in school				–0.09	–0.13	–0.22
Ref: Greater than 10% students				(0.20)	(0.18)	(0.16)
PCG Age					–0.08***	–0.04***
					(0.01)	(0.01)
Level of conflict with PCG					0.22***	0.08***
					(0.01)	(0.01)
Total Depression Score, PCG					0.13***	0.06***
					(0.02)	(0.02)
SDQ score, Age 9						0.47***
						(0.01)
Constant	6.27***	8.05***	7.29***	7.49***	5.52***	3.39***
	(0.07)	(0.36)	(0.38)	(0.40)	(0.58)	(0.53)
N	6,471	6,471	6,471	6,471	6,471	6,453
R^2	0.003	0.051	0.094	0.098	0.273	0.408

Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

lower average scores, representing lower levels of difficulties. In Model 3 when family characteristics are controlled for, this last value was reduced to non-significance. However, the effect of attending an after-school club at age 9 remains significant. This effect also persists when characteristics of the student body attending the school at age 9 are taken into account (Model 4). The addition of characteristics pertaining to the primary caregiver in Model 5 means that the after-school club effect was reduced to non-significance, and remains so in Model 6. These findings suggest that outcomes on the Strengths and Difficulties questionnaire at 13 years are better explained by other child, family, school and PCG characteristics rather than direct effects of the type of after-school care they attended.

While the focus of interest was on the influence of the different types of after-school care settings, some other interesting findings emerged. Males, and those who were diagnosed with a special educational need by the age of nine were more likely to have higher average scores, representing greater levels of difficulties, and these findings were consistent across each of the six models. A greater level of difficulty at age 13 was associated with living in an urban area, higher levels of child-parent conflict, and higher PCG depression scores. A lower level of difficulty at age 13 was associated with higher birth weight, having a parent with a high level of education (undergraduate or postgraduate degree), and having older parents. Higher levels of difficulty (higher SDQ sores) at age 9 are associated with a greater level of difficulty at age 13, all else being equal. While a number of characteristics of the school that the child attended at age 9 were related to SDQ scores at the bivariate level, these factors did not emerge as significant. Models 4 and 5 indicated that children attending DEIS schools – schools with a high concentration of social disadvantage – experience greater levels of difficulty at age 13; however, when SDQ scores at age 9 were included in the model, the effect was reduced to non-significance.

5.3 *Numeric Ability*

At the bivariate level, there was a statistically significant association between the type of after-school care used at nine years old and scores on the Drumcondra Reasoning Tests (DRT) with regard to Numeric Ability, but this was not the case with regard to the Verbal Reasoning test. Outcome models were run for verbal reasoning but they showed no association even before controls were included (these models are available from the author). As a result, the multivariate analyses presented below include only numeric ability as an outcome. Table 6 employs a linear regression OLS methodology to consider the average characteristics associated with numeric ability. In doing so, the focus is on whether after-school childcare settings at age nine years influence numeric ability three years later; and if any observed effects of childcare would be robust

Table 6: *Results of Linear Regression Model of Numeric Ability Score at 13 Years*

	(1) After-school Care age 9	*(2) Child Variables*	*(3) Household Variables*	*(4) School Variables*	*(5) PCG Variables*	*(6) Math Score Age 9*
After-school Club	0.13*	0.15**	0.09	0.08	0.10	0.08
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)
Relative Care	–0.08*	–0.09**	–0.07	–0.06	–0.04	–0.03
	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)
Childminder	0.17***	0.16***	0.05	0.04	0.04	0.02
Ref: Parental Care	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)
Male		0.25***	0.26***	0.25***	0.25***	0.19***
Ref: Female		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Birth weight		0.10***	0.07***	0.07***	0.06***	0.02
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
SEN Diagnosed by Age 9		–0.61***	–0.59***	–0.58***	–0.56***	–0.25***
Ref: No SEN Diagnosis by age 9		(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
Child never liked Mathematics		–0.28***	–0.28***	–0.28***	–0.26***	–0.17***
Ref: Sometimes/always likes Mathematics		(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
Few books in the home (<20)			–0.19***	–0.18***	–0.18***	–0.10***
Ref: 20+ books in the home			(0.03)	(0.03)	(0.03)	(0.02)
PCG works 1-15 hours			0.09	0.09*	0.09	0.06
			(0.05)	(0.05)	(0.05)	(0.04)
PCG works 16-40 hours			–0.00	0.00	–0.00	0.01
			(0.02)	(0.02)	(0.02)	(0.02)
PCG works 41+ hours			0.05	0.04	0.03	0.07
Ref: PCG not in employment			(0.06)	(0.06)	(0.06)	(0.05)

Table 6: *Results of Linear Regression Model of Numeric Ability Score at 13 Years (Contd.)*

	(1) After-school Care age 9	*(2) Child Variables*	*(3) Household Variables*	*(4) School Variables*	*(5) PCG Variables*	*(6) Math Score Age 9*
Lone parent family			–0.06	–0.05	–0.03	–0.05
Ref: Dual family			(0.04)	(0.04)	(0.04)	(0.03)
No family living locally			0.12***	0.11***	0.10***	0.08***
Ref: family living locally			(0.03)	(0.03)	(0.03)	(0.02)
Highest Income Quintile			0.10***	0.08**	0.08**	0.04
			(0.03)	(0.03)	(0.03)	(0.02)
2nd Highest Income Quintile			–0.04	–0.04	–0.04	–0.03
			(0.03)	(0.03)	(0.03)	(0.03)
Middle Income Quintile			–0.08**	–0.08**	–0.07*	–0.06*
Ref: Lower Income Quintiles			(0.03)	(0.03)	(0.03)	(0.03)
Professional/Managerial class			0.19***	0.17***	0.16***	0.08***
Ref: All other social class groups			(0.02)	(0.02)	(0.02)	(0.02)
Living in rental accommodation			–0.26***	–0.20***	–0.14***	–0.07*
Ref: living in owner-occupied			(0.04)	(0.04)	(0.04)	(0.03)
High income dependency from welfare			–0.21***	–0.18**	–0.17**	–0.11*
Ref: Income < 75% from welfare			(0.06)	(0.06)	(0.06)	(0.05)
Fair/Good/Excellent After-school facilities				–0.04	–0.03	–0.06***
Ref: Poor after-school facilities				(0.02)	(0.02)	(0.02)
DEIS school				–0.19***	–0.17***	–0.10***
Ref: non DEIS school				(0.03)	(0.03)	(0.03)
>11% pupils missed 20 days or more				–0.06*	–0.05*	–0.03
Ref: <11% pupils missed 20 days+				(0.02)	(0.02)	(0.02)

Table 6: *Results of Linear Regression Model of Numeric Ability Score at 13 Years (Contd.)*

	(1) After-school Care age 9	*(2) Child Variables*	*(3) Household Variables*	*(4) School Variables*	*(5) PCG Variables*	*(6) Math Score Age 9*
Low level of literacy problems in school				0.05	0.04	0.03
Ref: Greater than 10% students				(0.04)	(0.04)	(0.03)
Low level numeracy problems in school				0.08*	0.08*	0.06
Ref: Greater than 10% students				(0.04)	(0.04)	(0.03)
PCG Age					0.01***	0.01**
					(0.00)	(0.00)
Level of Conflict with PCG					–0.01***	–0.00**
					(0.00)	(0.00)
Total Depression Score PCG					–0.01	–0.00
Ref: living in owner-occupied					(0.00)	(0.00)
Mathematics Score Age 9						0.47***
						(0.01)
Constant	–0.01	–0.41***	–0.36***	–0.34***	–0.66***	0.00
	(0.01)	(0.07)	(0.07)	(0.07)	(0.11)	(0.10)
N	6,471	6,471	6,471	6,471	6,471	6,471
R^2	0.006	0.064	0.128	0.140	0.149	0.344

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

to control for other child, home, school and parental factors. As before, a stepwise approach was taken.

In Model 1, when the different types of after-school care settings at age nine were compared to parental care, those in the after-school care of a child-minder, and those in after-school clubs were more likely to have higher average scores, representing higher numeric ability at age 13, all else being equal. Children who were in the after-school care of a relative at age 9 had significantly lower average scores, representing low numeric ability. These effects hold when known individual characteristics are taken into account (gender, birthweight, diagnosis of SEN by age 9, child's attitudes toward Mathematics). However the values were reduced to non-significance in Model 3 when the socio-economic characteristics of the family are taken into account. These findings suggest that outcomes on the numeric ability aptitude test at thirteen years are best explained by other child and family and school characteristics rather than direct effects of the type of after-school care they attended when aged nine.

As before, while the focus of interest was on the influence of the different types of after-school care settings, some other interesting findings emerged. In terms of individual characteristics, gender, birthweight, diagnosis of a special educational need, and attitudes toward Mathematics emerged as significant explanatory factors in explaining variation in scores on the numeric ability aptitude test. While a single measure for SEN is used in this paper, based on diagnosis of any category of special educational need; Maître *et al.* (2016) find that students with general learning/intellectual and emotional/behavioural disabilities are faring less well on this numeric ability measure than other groups of young people at age thirteen.

There is a clear influence on the numeric ability aptitude test scores at age 13 of the socio-economic circumstances of families when children are age 9. Lower scores were associated with fewer books in the home, lower income families and living in rental accommodation, all else being equal. Children living in professional and managerial families, as well as those living in a family with limited contact with extended family, are faring considerably better on this measure than other groups of young people at age thirteen. In terms of school characteristics, those attending a DEIS school were significantly more likely to have lower scores on average, while those attending schools with low levels of literacy problems among the student intake were significantly more likely to have higher scores on average. Finally, in terms of characteristics of the primary caregiver, higher average scores were evident among those whose primary caregiver had obtained Higher Education (undergraduate or postgraduate), while lower average scores were evident among older primary caregivers, all else being equal.

VI CONCLUSION

It is becoming increasingly clear that locating childcare during non-school hours and paying for it are important issues to parents of school age children, just as they are to parents of pre-school children. This paper sought to address two substantial gaps in the childcare literature in Ireland in terms of analysis of (i) the factors that influence decision-making around different after-school childcare arrangements; and (ii) the effects of participation for child development, in particular for cognitive and socio-emotional outcomes. The findings reported in this paper contribute to narrowing these gaps in our knowledge and help improve our understanding of the provision of after-school childcare.

The paper outlined how Ireland fares very poorly compared to other European countries in the provision of state-supported after-school childcare. A snapshot of the main childcare arrangements for school age children reveals that there is a substantial reliance on parental and informal childcare for children across the different stages of childhood. As children age, they are increasingly more likely to be in the care of a parent after school hours. The limited uptake of formal after-school childcare in general may well be linked to the observation by Brandon and Hofferth (2003) in the US that many after-school programmes are unable to meet the hours of childcare required by parents. It may also be the case that parents configure their working hours to coincide with school hours.

An examination of the factors that influence participation in after-school clubs/programmes at age nine reveals the complexities surrounding the provision of after-school clubs, given their mix of private and public funding, the provision of targeted state subsidised childcare schemes and diverse orientations of after-school clubs and activities. It would seem that participation in the type of after-school programmes/clubs captured by the GUI data (largely paid after-school care in a group setting) is supporting children with specific educational needs and those with limited family support, as well as being strongly associated with maternal employment and high household income. It is likely that these patterns provide evidence to support the observation by Barry (2011) that households that are most dependent on social welfare provision depend on publicly subsidised childcare which is of limited availability, while middle and higher income families pay high costs on the private market. The use of after-school clubs/programmes at age thirteen continues to be socially stratified, as higher income families are more likely to use this form of after-school care than lower income families.

A key objective of the paper was to improve our understanding of whether the use of after-school clubs or indeed any other type of after-school childcare

(including parental care) at age nine years has an influence on cognitive and socio-emotional outcomes by age thirteen, and if any observed effects of childcare would be robust to control for other child, home, school and parental factors. The results indicate that cognitive and socio-emotional outcomes at thirteen years are best explained by child, family, school and parental characteristics rather than direct effects of the type of after-school care arrangement held at age nine. The lack of influence of after-school care on children's outcomes may be linked to current critiques of after-school service provision, including low levels of provision and the variation in the delivery of after-school services. It is also wise to consider that the lack of influence of after-school care on children's outcomes may be linked to the small numbers of children participating in what has been defined as "after-school clubs" in this study.

The findings from this research should however, be contextualised within the types of formal after-school childcare captured by the *Growing Up in Ireland* study: almost three-quarters of nine-year-olds were attending a group based paid after-school care setting, 18 per cent participated in an after-school activity based facility, and 8 per cent were in homework clubs. A limitation of the GUI is that it does not provide more refined information pertaining to the type of formal after-school provision, in order to differentiate between the different providers (public versus private) and pedagogical orientations and goals of different after-school clubs and programmes. The findings from this paper contribute to our knowledge about the out-of-school lives of children. While on the one hand, participation in cultural extra-curricular after-school results in positive outcomes for student educational engagement and achievement (see Smyth, 2016; McCoy *et al.*, 2012a; McCoy *et al.*, 2012b), on the other, participation in after-school clubs seems to derive less benefits. It would seem that selection into both types of after-school activities differ quite substantially, and that they are playing a different role.

This paper goes some way in addressing the dearth of research on children's after-school care arrangements. However, further research is required to shed light on the aspects of after-school care arrangements that have the ability to promote outcomes for children and families. Further research in this area should also take into account that the after-school care of school age children can involve several different after-school arrangements in a single week, or within the same afternoon (see for example Capizzano *et al*., 2000). Finally, there is also a need for researchers and policymakers to identify potential data sources to provide empirical evidence on the effects of after-school care provision as a policy to promote mothers' employment and foster gender equality in labour supply (see for example Felfe *et al.*, 2016). This is essential given the current policy direction in this area.

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