Research in Social Stratification and Mobility 81 (2022) 100729

Contents lists available at ScienceDirect

Research in Social Stratification and Mobility

journal homepage: www.elsevier.com/locate/rssm

Understanding differences in children's reading ability by social origin and gender: The role of parental reading and pre- and primary school exposure in Ireland

Frances McGinnity [a,*], Patricia McMullin [b], Aisling Murray [a], Helen Russell [a], Emer Smyth [a]

[a] The Economic and Social Research Institute, Whitaker Square, Sir John Rogerson's Quay, Dublin 2, Ireland
[b] University of Turku, Assistentinkatu 7, Turku, Finland

ARTICLE INFO

Keywords:
Social origin
Gender
Parental reading
Education
Cognitive development

ABSTRACT

Given growing concerns about disadvantaged boys' achievement and disengagement from learning, this paper investigates differences in reading ability by gender and social origin. It uses data from the Growing Up in Ireland study to investigate how parents' approach to learning at home and children's exposure to early care and education contribute to these differences. We find that both children's gender and their family's social class influence their cognitive development between age 3 and age 9, though the effects are additive, with little variation in the gender gap across social class groups. Parents from more advantaged social classes read more to their 3-year-old children than other parents, yet by age 5, when most children have started primary school, these class differences in parental reading are much lower. Parental reading, ECCE participation and length of primary school exposure were found to facilitate language development and partly explain differences in reading scores at age 9, although strong direct effects of social class remained, even accounting for vocabulary score at age 3. The benefits from parental reading, ECCE and exposure to school are broadly similar for boys and girls, though there is some evidence that boys benefit more than girls from longer exposure to school.

1. Introduction

1.1. Overview

A large body of research has documented substantial gaps in cognitive and educational outcomes, including reading literacy, among children of different socio-economic backgrounds (Cooper & Stewart, 2020; Duncan et al., 2007; Schubert & Becker, 2010). Recent decades have seen higher levels of educational attainment among women than men across most Western countries (DiPrete & Buchmann, 2013), and growing concerns about disadvantaged boys' achievement and disengagement from learning (OECD, 2015), though fewer studies have looked at the interaction between gender and social background in shaping educational outcomes. To the extent that inequality accumulates across the life course, for example in cognitive achievement, experiences in the early years and varying levels of parental investment may have a particularly important role in understanding inequality in adult life-chances (Smeeding et al., 2011; Erola et al., 2016). For anyone concerned with understanding the mechanisms through which these cognitive gaps arise between children, the extent to which they are exposed to educationally-enhancing activities from an early age, either at home or outside the home (in early years and primary education), is of prime importance.

This paper uses a rich representative longitudinal study of children and their families, *Growing Up in Ireland*, to investigate social class and gender gaps in cognitive outcomes at age 9, and cognitive development between ages 3 and 9, using an explicitly intersectional approach. Children's home learning environment, and their preschool and primary school exposure are regarded as key mechanisms for the reproduction of inequality in the analyses presented. The focus here is on children's cognitive outcomes because of the long-established role of educational attainment in reproducing intergenerational inequality (Bukodi & Goldthorpe, 2013).

The Irish case is interesting because there has been a rapid increase in the acquisition of educational qualifications among adults in Ireland in the past 20 years and, somewhat unusually in a European context,

* Corresponding author.
E-mail addresses: fran.mcginnity@esri.ie (F. McGinnity), patricia.mcmullin@utu.fi (P. McMullin), aisling.murray@esri.ie (A. Murray), helen.russell@esri.ie (H. Russell), emer.smyth@esri.ie (E. Smyth).

https://doi.org/10.1016/j.rssm.2022.100729
Received 28 June 2021; Received in revised form 5 September 2022; Accepted 7 September 2022
Available online 9 September 2022

fertility is high and there is no educational or class gradient in fertility (Fahey & Curran, 2016). This means that in comparative terms, a high proportion of parents in Ireland are highly educated. The home learning environment has some distinctive features, with relatively high frequency of parents in Ireland reading to their children before and around the time they enter primary school. Ireland combines a high take-up of preschool provision for 3- to 4-year-olds with very highly differentiated access to (costly) care and education for younger children and infants. The flexibility in the timing of primary school start means that children of the same age will have had different lengths of exposure to the formal school system.

This paper first considers previous evidence of class and gender inequalities, and any interaction between the two, and the role of reading to young children, early formal childcare and exposure to primary school in understanding children's cognitive skills. It then briefly reviews the Irish policy context, before developing hypotheses about what we would expect in Ireland. The paper then describes the data source, a longitudinal study of children, and measures and methods used. The next section presents social class and gender differences in parental reading to children at age 3 and age 5. Statistical models are used to investigate the role of children's learning environment both at home and outside the home in explaining cognitive differences by class and gender. The discussion reflects on the paper's contribution, its limitations and its implications for policy.

1.2. Previous literature

1.2.1. Inequality by social origin and gender: intersectionality

To the extent that current labour markets reward skills and penalize low education, early skill gaps may have profound and long-term consequences for individuals, their labour market outcomes and their life-chances (Ermisch et al., 2012). While in the past, studies on the relationship between social origins and educational inequality have tended to focus more often on young people at later stages of their educational career, differences in cognitive development by social origin have been shown to occur at an early age, even before children start school (Sylva et al., 2010). Passaretta et al. (2022) find that a large proportion (50 – 80 %) of the positive effect of social origin (measured as parental education) on language skills measured at the end of primary school was already established before school start. Similarly, studies of gender differences in educational outcomes have tended to focus on older age-groups (see, for example, DiPrete & Buchmann, 2013), though gender differences in skill development have been evident even before school entry (DiPrete & Jennings, 2012; Hansen & Jones, 2010). With some notable exceptions, inequality in the early years have generally been researched in terms of social origin (Blossfeld et al., 2017), gender (DiPrete & Jennings, 2012) or ethnicity (Hoffmann, 2018) as separate dimensions. In contrast, this paper is specifically focused on how cognitive outcomes vary by *both* gender and social origin.

The concept of intersectionality was initially developed by Crenshaw (1989) as a critique of the notion that different dimensions of inequality were additive (that is, the gender gap was similar regardless of ethnicity). Instead, she argued that inequality was intersectional, with gender and race inextricably bound together in shaping Black women's experience of discrimination. More recently, there has been a growth in the use of this approach with large scale quantitative data. Strand (2014), for example, examines the complex interaction between gender, social class and ethnicity in shaping educational attainment at age 16 in the UK and argues for 'more nuanced accounts of educational success or failure' (p. 165). Using Programme for International Student Assessment (PISA) data, Ortiz-Gervasi (2020) found that the female advantage in terms of expectations of university graduation is higher for children of lower social origin. Among younger children (aged 5 years), Guhn et al., (2010) analyse intersectionality by gender, social origin and linguistic background (English, Punjabi, Cantonese) using a population-level dataset in British Columbia, Canada. They find girls obtain consistently higher developmental ratings[1] than boys, similar development scores between the three language groups and a flatter socio-economic gradient for Punjabi children than other groups. However, the differences between boys and girls do not vary significantly by social origin (Guhn et al., 2010). Entwisle et al., (2007) consider the interaction of gender and socio-economic status (measured as receipt of subsidized school meals[2]) using a longitudinal sample in Baltimore, Maryland, where students in a randomly selected panel were the same age and were followed from the beginning of the first grade. The authors found that boys' and girls' reading scores were at similar levels at grade 1, and that a gender gap (in favour of girls) emerges by grade 5, which is driven by significant differences between the poorest boys and girls – whereas boys and girls from higher income backgrounds still show similar reading skills. An intersectional approach is of value in the current paper, given the fact that cultural activities such as reading to young children are found to vary by both social class background and gender in the Irish context (Smyth, 2016). Furthermore, on average, girls tend to start primary school slightly earlier than boys in Ireland, resulting in differential exposure to formal schooling by age 9 (Smyth, 2018). In terms of later school achievement, upper secondary exam results in Ireland are found to vary significantly by both gender and social class background, with social class differences being larger in size than gender differences (Growing Up in Ireland Study Team, 2019).

Of course social origin is a multidimensional concept, with independent effects of family social class and parents' education (Erola et al., 2016; McMullin et al., 2020). Thus, it will be important to account for mother's education in understanding children's outcomes. Yet while maternal education is a key feature of the child's microsystem – as a characteristic of their primary caregiver – family social class as a measure of social capital or social origin potentially reflects a wider perspective on the context in which the child is developing.

This article not only documents the gender-class intersection in shaping educational outcomes but seeks to analyse the mechanisms underlying these inequalities. The following subsections outline the two main mechanisms of interest here: early home learning environment (especially reading to children) and participation in early years and primary education.

1.2.2. The role of home learning environment in cognitive achievement

An important concern in research on social inequality is how parents pass on advantage or disadvantage to their children (Smeeding et al., 2011). Karlson and Birkelund (2019) argue that the origins-education-destinations framework would benefit from factoring in the processes of early skill formation to better grasp the mechanisms through which education becomes a channel of social reproduction. Also varying levels of parental involvement or parental investment in children's learning is considered one pathway through which socio-economic factors influence child competencies (Erola et al., 2016; Foster et al., 2005). Studies have pointed to the direct role of financial resources in disparities in educational attainment through differences in family investments in educationally beneficial materials, experiences and services (Cooper & Stewart, 2020; Duncan et al., 1998) and/or through the influence of poverty-related psychological distress and marital conflict on child development (Conger & Donnellan, 2007).

Social class effects on early cognitive development may operate by influencing attitudes and parenting behaviour, for example, beliefs and expectations regarding child development. Lareau (2002) argues for the

[1] In the instrument used, teachers rate children's developmental status as reflected in their school readiness on five developmental domains: (i) physical health and wellbeing (13 items), (ii) social competence (26 items), (iii) emotional maturity (28 items), (iv) language and cognitive development (26 items), and (v) communication skills and general knowledge (8 items).

[2] Children from families with incomes that were less than 1.85 times the federal poverty level were eligible for subsidies.

existence of social class differences in the 'logic of childrearing'. She observes a coherent pattern in middle-class families that she terms 'concerted cultivation'. This cultural orientation requires parents' active involvement in the development of children's skills and talents, while working-class parents adopt a nurturing style that focuses on keeping their child safe and values, "the accomplishment of natural growth". In keeping with this thesis, highly educated mothers are found to spend more time in active care and developmentally appropriate activities than less-educated mothers (Kalil et al., 2012). Maternal time dedication (measured as care hours) is associated with children attending the more prestigious academic track in Germany and long-term time investment by highly educated mothers is particularly influential when it occurs in early childhood (Cordero-Coma & Esping-Andersen, 2018).

A key finding from a longitudinal study of children's development, the EPPE study, is that the quality of the home learning environment is more important for cognitive development than parental income, social class or even education: what parents do is more important than who they are (Sylva et al., 2004). Mikus et al., (2021) argue that concerted cultivation is likely to be visible already in early childhood. Using the National Educational Panel Study (NEPS) data, they examine differences in concerted cultivation by parental SES and its impact on math and reasoning skills of 5-year-olds in Germany. They find that parents with a high SES are more likely to enrol their young children in organized leisure activities and to read to them daily. However, this concerted cultivation only moderately contributes to children's cognitive development as only music participation explains some of the background-specific differences in maths and reasoning skills.

However, the issue of whether the impact of social background is fully explained by the quality of the home learning environment has been highly contested. Several studies (see, for example, Sullivan et al., 2013; Washbrook et al., 2014) have found that structural inequalities are evident even taking into account parental practices. Furthermore, several commentators have critiqued the focus on what parents 'do', arguing that it shifts attention to 'blaming' the parents rather than focusing on reducing broader inequalities (Gillies et al., 2017; Hartas, 2014). Empirical studies also highlight that the quantity and quality of a child's linguistic environment (number of words or sentences per hour/day; sentence complexity, lexical diversity etc.) are closely related to parental SES and children's verbal abilities (Hart & Risley, 1995; Hoff, 2003). This underlines the importance of controlling for children's family background, as well as home learning activities.

McMullin et al. (2020), using earlier waves of Growing Up in Ireland data, find that the influence of a range of parent-child activities at age 3 on children's vocabulary score at age 5 varies by different measures of social origin. While parental education captures the association between social origin and vocabulary score to some extent better than income or class, the influence of social class and income differs by levels of home learning activities, with a higher level of home learning activities compensating somewhat for lower levels of income or a lower social class category.

Parental activities with children are also gendered from a young age (Smyth, 2016). Cheadle and Amato (2011) found that, all else being equal, girls experienced more concerted cultivation (in the form of parental school involvement and participation in extracurricular activities) than boys. These early differences have been found to at least partly explain adult gender differences in highbrow cultural participation (Christin, 2012). Authors have also argued that gender differences in parenting may vary by social origin, with greater gender differences found at the highest socioeconomic levels (Warner & Milkie, 2013). However, studies have tended to neglect the potential link between gendered home learning patterns and later gender differences in educational attainment, a lacuna addressed here.

Activities with a high amount of language input are considered especially effective at increasing early literacy skills in young children. This paper focuses on reading to children as the key dimension of home learning environment. A number of mechanisms have been proposed as to how reading to children enhances their vocabulary development (Klein & Kogan, 2013). First, through stories, children learn new words not used in everyday interactions. Second, children's knowledge of story structures and listening comprehension is enhanced. Thirdly, reading aloud is considered a form of print exposure. Thus, other aspects of literacy skills, such as letter recognition, may be supported by reading storybooks to children. In addition to the direct effect on children's literacy skills, it is argued that children who are read to frequently in their early childhood will become more enthusiastic readers themselves, and the more they read, the better their literacy skills. Klein and Kogan (2013) find a high frequency of reading to children in early childhood positively affects their own reading behaviour at the end of primary school.

1.2.3. Early childcare and education

From a policy perspective, early education and childcare (ECCE), as well as formal education, are viewed as possible levers for reducing inequalities. Attending high quality formal ECCE between the ages of 3 and 5 have consistently been shown to enhance children's academic, cognitive and educational outcomes (Kulic et al., 2019). Additionally, an equalizing effect on cognitive outcomes has been observed for those from disadvantaged backgrounds attending high quality ECCE (see Burger, 2010, for a review), although the magnitude of the association is moderate (Blossfeld et al., 2017). Furthermore, those who are most likely to benefit (those from more disadvantaged backgrounds) are potentially least likely to attend preschool, given that there is a social class gradient in who attends high quality ECCE (Kulic et al., 2019). Less attention has been given to variations by gender but a meta-analysis by Magnuson et al. (2016) indicates similar benefits from ECCE participation for girls and boys in terms of cognitive achievement but more advantages for boys in relation to other outcomes such as reducing the incidence of grade retention.

Another stream of research considers schools as potentially equalizing social inequality in achievement. Proponents of this view argue that this happens because school exposes children to more similar environments than the ones they would experience in the out-of-school counterfactual, that is, in their home environments (Raudenbush & Eschmann, 2015). One methodological challenge is that (at least in most Western countries) all children attend school, so it is difficult to establish a counterfactual and test its effect. Some studies have used the summer break to explore social class differences in cognitive development in a period without formal schooling (Alexander et al., 2007). Other studies, such as Passaretta and Skopek (2020), exploit random variation in both test days and school start to measure the impact of exposure to school on learning outcomes (vocabulary, grammar, maths and science) in Germany. They find clear benefits to first-grade exposure for all children, but no implications for social inequality in learning. The Irish case is interesting in this regard as school start is early in comparative terms – around age 4 or 5 years.

In regard to gender differences, in a classic of sociological literature, Willis (1981) argued that working for academic success is in conflict with adolescent ideas about masculinity, specifically, working-class white male identities. Legewie and DiPrete (2012) maintain that the school environment channels conceptions of masculinity in peer culture, fostering or inhibiting boys' development of anti-school attitudes and behaviour. These works concentrate on the influence of the classroom context on adolescents' engagement. The influence of peer culture may be less pertinent at primary school level and school exposure could benefit disadvantaged children more, yet even at this stage the benefits of the school experience may differ for boys and girls. Teachers can treat boys and girls differently and have been found to develop more adversarial relationships with children from working-class backgrounds (Smyth, 2018). Other research suggests, however, that schools may have an equalizing effect, narrowing the gap in test scores between boys and girls (Downey et al., 2022). This all suggests that the effect of exposure to school may have a different impact on girls and boys, and on children

Table 1
Descriptive table of key variables.

Variable	Categories	% or Mean (weighted)
Reading score age 9 years		98.9
Reading score age 9 girls		99.4
Reading score age 9 boys		98.4
Gender	Girls	49.1 %
Social Class* Gender	Professional/girls	21.9 %
	Professional/boys	24.9 %
	Non-manual/girls	9.8 %
	Non-manual/boys	9.2 %
	Manual/girls	13.8 %
	Manual/boys	13.5 %
	Never employed/girls	3.5 %
	Never employed/boys	3.2 %
Mother's education	Lower Secondary or less	15.6 %
	Upper Secondary or equivalent	32.4 %
	Non-degree	21.7 %
	Degree or higher	30.3 %
Mother's age w2 (age 3)	Under 30	21.2 %
	30–39	62.7 %
	40 or more	16.1 %
Family structure (at age 9)	One-parent family	14 %
Financial difficulties (at age 9)		12 %
Language (at age 9)	English as second language	2.3 %
Child's school year-group (age 9)	4th year of school	8.4 %
	5th year of school	66.3 %
	6th year of school	25.2 %
	Missing	0.2 %
Centre-based care at 3 years		26.8 %
Children's books in the home age 3	< 10 books	7.0 %
	10–20 books	20.2 %
	21–30 books	18.7 %
	> 30	54.2 %
Reading to child score	3 years	8.0
	5 years	8.7
T-score for Naming Vocabulary at 3		51.0
Weight N		6911
Unweighted N		6916

Notes: based on final N in models estimated, which excludes those missing on any covariates.

from different social class backgrounds.

1.3. Ireland as a context for inequalities in child cognitive development

Ireland represents an interesting case-study for examining the role of the institutional context in shaping inequalities in child cognitive development for three main reasons: the nature of provision for pre-school care and education, the nature of the home learning environment and the flexibility afforded parents in relation to the timing of school start. A significant policy shift came in Ireland in January 2010 with the introduction of a universal scheme for a single academic year of part-time preschool attendance. Approximately 96 per cent of the eligible population accessed the free pre-school year, with high levels of participation across all social groups and both genders (Murray et al., 2016). The sample of children analysed in this article was the first cohort to avail of the scheme so that almost all had some exposure to centre-based care and education before starting school. However, provision for these children at younger ages was largely reliant on private provision, with Irish childcare costs, relative to household income, being among the highest in the OECD (McGinnity et al., 2015). Not surprisingly then, at age 3, children from managerial and professional backgrounds were more likely to experience non-parental, especially centre-based, care on a regular basis than children from other class backgrounds (McGinnity et al., 2015; Murray et al., 2016). For the children analysed here, all will have experienced at least one year of part-time preschool, potentially helping to narrow the gap in early cognitive development for more disadvantaged groups. However, to the extent that non-parental care, especially centre-based care, among those aged 3 or younger affects cognitive development, patterns would be expected to be differentiated by social class (but not gender).

Irish children typically start formal primary school, which is free, at a relatively early age compared to those in other countries. While they are not legally obliged to start until they are 6 years old, the majority start by or at 5 years of age (Murray et al., 2016). In many other European countries, under 6 s are in pre-school settings, and in fact OECD statistics on early years spending typically include spending for 4- and 5-year-olds in infant classes in primary school (Murray et al., 2016). In contrast to participation in formal childcare at age 3, school start by age 5 for children in the Growing Up in Ireland study was highest among disadvantaged groups (Smyth, 2018). Smyth (2018) also found that girls start school an average of one month younger than boys. The result of these patterns is that children of a similar age (as in our sample) will have different periods of school exposure, with girls and those from more disadvantaged backgrounds having spent longer, on average, in the schooling system. This school exposure may therefore have partly attenuated pre-school inequalities in cognitive development (see Downey & Condron, 2016).

There are potential cultural differences in the home learning environment which may affect child outcomes. The frequency with which parents read to their children has been found to vary across countries (Araújo & Costa, 2015). Data from the international Trends in Mathematics and Science Study (TIMSS) indicate that, among primary schoolchildren, parents in Ireland are reported as having above average levels of support for pupil achievement and commitment to ensuring that pupils are ready to learn (Clerkin et al., 2020). Similarly, the number of children's books in the home in Ireland is above the TIMSS average. Retrospective reports indicated higher than average parental involvement in early literacy and numeracy activities (such as reading and counting) in Ireland (Clerkin et al., 2020). Evidence from PISA similarly shows that parents in Ireland reported above-average frequencies of reading to their children on primary school entry and at age 10; this pattern applied to parents across educational levels (PISA database, own analyses). On this basis, higher parent-child reading levels in Ireland may mean that reading plays a less strong role in mediating class differences than in other national settings.

1.4. Summary of research hypotheses

On the basis of international research findings and the specificities of the Irish context, we hypothesize the following regarding cognitive outcomes at age 9 and how these are related to social origin, gender, and exposure to parental reading, early care and education and primary school:

- H1: We expect class differences in cognitive outcomes will not be the same for boys and girls, with boys from working-class/never employed households expected to have the poorest outcomes.
- H2a: Parents' reading to children will vary by social class and gender, with higher frequency of parental reading to children from professional/managerial backgrounds than other class backgrounds, and more frequent parental reading to young girls than boys.
- H2b: Parental reading activity will help explain some of the class and gender differences found but this mediating role may not be as marked as heretofore found, given high rates of parental engagement overall in home learning in Ireland.
- H3: Participation in early care and education at 3 will have a positive effect on cognitive outcomes and may help explain some class (but not gender) differences.
- H4: Exposure to school will help attenuate preschool inequalities in cognitive development by social class but will reinforce gender differences (in favour of girls).

A key assumption of the approach taken in this paper is that the patterns found are not driven by class-based differences in genetic factors which may not be modifiable through education or parental engagement (Plomin & Spinath, 2002). An investigation of the interaction between genetics and behaviour is not possible with the data used. However, the analyses control for cognitive development at age 3 as an additional check, a measure which will take account of both innate factors and early development.

2. Growing Up in Ireland data and measurement

2.1. Participants

Participants were members of the Growing Up in Ireland (GUI) Cohort '08 (formerly known as the Infant Cohort). The cohort members were recruited, with their primary caregivers (PCGs) (usually the biological mother, and hereafter referred to collectively as "mothers"), when they were infants. The sample was nationally representative and based on a stratified random sample (for further details see McNamara et al., 2019). Data were collected during household interviews with the first one conducted when the members were 9 months old in 2008/9. Subsequent interviews took place at ages 3, 5 and 9 years (with a short postal survey at 7/8 years, not utilized here). There were 11,134 child participants in the first wave at 9 months and 8032 of these subsequently took part at age 9 years. A detailed description of the design, instrumentation and procedures for each wave are available from the GUI website (www.growingup.ie). A reduced sample of 6922 (unweighted) took part in all four waves and had data for all variables used in this analysis of data. Analyses are weighted to take account of initial non-response and inter-wave attrition (see McNamara et al., 2020).[3] In addition, the characteristics associated with attrition (such as family status, social class and maternal education) are included in the models presented. Characteristics of the sample are provided in Table 1.

2.2. Measures

All information, apart from the cognitive tests, was collected from the mother as part of their household interview. A detailed description of measures is given below, with distributions for each in Table 1.

Reading (age 9 years): Reading was used as the measure of cognitive ability at age 9. The test was based on the national curriculum and multiple choice in format. Children took different forms of the test depending on their year group in school. This difference is adjusted by using a logit score which takes account of complexity and correct answers. The score was standardized to have a mean of 100 and a standard deviation of 15.

Language: Mother indicated that the child's first language at age 9 was not English.

Mother's education: Education is based on the highest qualification achieved ranging from lower secondary or less to degree or higher degree.

Mother's age: Age is divided into three categories: under 30, 30–39 and 40 or older. Ireland typically has a low proportion of births to young mothers and a very small proportion of births were to mothers under 20.[4]

Social class: Social class is based on the occupation of the mother and their resident spouse/partner (where relevant) as recorded at age 3 years. The higher category of the two is assigned as the family's social class. For this analysis, in cases where a household did not have an assigned social class at Wave 2 (age 3) but did have one at the previous wave, this was fed-forward to Wave 2. The original eight categories were condensed to four for this analysis as follows: professional/managerial,[5] non-manual, skilled/semi-skilled/unskilled manual,[6] and finally households for which no social class can be determined, typically where neither parent is economically active and has no recent record of employment. This group is called 'never employed' for simplicity. Workless households, that is households where no adults are working, are a significant phenomenon in Ireland and children from these households are significantly disadvantaged in terms of poverty and life chances (OECD, 2017; Maître et al., 2021).[7]

Family structure: A one- or two-parent family at age 9 years.

Financial stress: The mother was asked a single question on how easy or difficult they found it to make ends meet. They chose one of six options ranging from 'with great difficulty' to 'very easily' which have been condensed to a binary variable of the two greatest 'difficult' categories versus the rest (i.e. 'some difficulty' or easier). The age 9 years response was used in this analysis.[8]

Home Learning Environment (HLE): Rather than look at the full array of parenting activities, the analyses focus on reading since it has been found to be the activity most predictive of children's cognitive development (Hartas, 2015). The mother was asked about the frequency of reading to the child. At age 3 years, the question referred to 'how many days per week' *someone at home read* to the child. At age 5 years, there was a similar question but it referred to 'how often' on a five-point scale from 'never' to 'everyday' the mother read to the child.[9] Both measures were rescaled to run from 0 to 10.

Number of children's books in the home: The mother indicated how many children's books were available to the child in the home (including library books). They chose one of five categories ranging from 'None' to 'More than 30′. Given the very small number who said 'none', the bottom two categories were combined into one 'less than 10′ group for this analysis. The variable recorded at age 3 years was used here.

Centre-based care: When this cohort were aged 3 years, there was almost no State financial help with the cost of childcare, although they were eligible to avail of a new universal scheme of one year's worth of early childhood education the following year. This variable recorded whether the child was already in regular centre-based care at the age of 3 (and hence likely to have started early education before the rest of the cohort).

School exposure: Measured as which class level the children are currently at in school, ranging from fourth year to sixth year in primary education. Children's fourth year of school is called 'second class' in Ireland; their fifth year is 'third class' and their sixth year is 'fourth class'.

Vocabulary (age 3 years): Interviewers administered the Naming Vocabulary test from the British Abilities Scales battery (Elliott et al.,

[3] McNamara et al. (2020) find that while attrition is more common among disadvantaged families, the applied weights rebalanced the distribution to within half a percentage point of the target.

[4] In the year in which the GUI cohorts was born (2008), 3 per cent of all births were to mothers under 20. See https://www.cso.ie/en/media/csoie/releasespublications/documents/vitalstats/2008/annualreport2008.pdf.

[5] The 'Professional/managerial' social class category is sometimes referred to as 'professional' for brevity.

[6] Tests indicate almost no difference in outcomes for children from skilled and unskilled manual backgrounds, so these groups are combined and referred to as 'manual' for brevity.

[7] Further investigation reveals that over half of this group of mothers (51 per cent) were under age 30, compared to 19 per cent of the whole sample, and 51 were lone parents when the child was 9, compared to 11 per cent of all mothers at age 9.

[8] The child's family structure and experience of financial stress are also tested at earlier ages, with the results very similar (available from the authors on request).

[9] Fathers of the 5-year-olds were also asked how often they read to the child but this variable is not used here in order to retain children from lone-parent families in the analysis. Mothers were more likely to read to 5-year-olds every day than fathers (65% compared with 36%); the frequency of reading by parents had a correlation of 0.3.

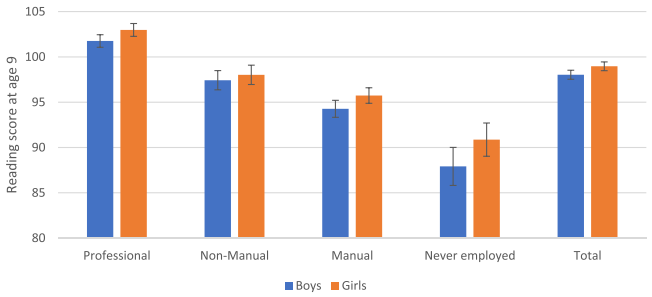

Fig. 1. Reading scores at age 9 by social class background and gender
Source: Own calculation from GUI data, weighted. N = 7226.

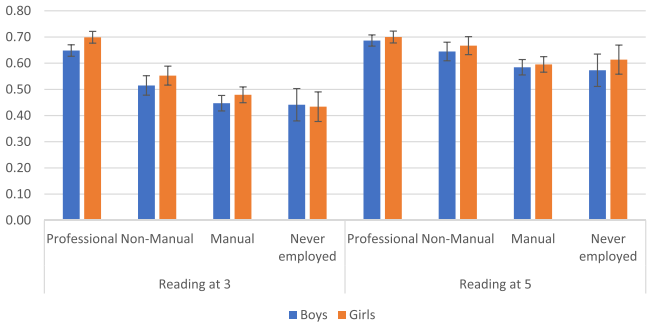

Fig. 2. Proportion of children being read to at home every day at age 3 and 5 by social class background and gender.
Source: Own calculation from GUI data. Notes: N = 7505 at age 3 and 7501 at age 5. Analyses includes wave 2 and 3 and excludes missing on parental reading frequency in each wave separately. At age 3 the question on frequency of reading to the child referred to 'someone in the house'; at age 5 it referred to the primary caregiver (typically the mother). Confidence intervals for reading to boys and girls at age three for the professional/managerial social class do not overlap.

1997) to children in the home. The test is a measure of expressive rather than receptive vocabulary, with scores adjusted for the child's age (Williams et al., 2019). This measure was added to the final model to assess cognitive development over the period of 3–9 years of age.

3. Results

3.1. Reading scores at age 9 by social class background and gender

Fig. 1 shows mean reading scores at age 9 broken down by social class background and gender. There is a clear social class gradient for both girls and boys. Girls have slightly higher reading scores within classes than boys. The exception is the never employed group, where there is a larger gender gap in reading scores, though it fails to reach statistical significance as the group is small and confidence intervals large (see Fig. 1).

3.2. Differences in reading to children by social class and gender

To what extent do any gender and social class differences in children's skills reflect variation in their exposure to the home learning environment? Fig. 2 shows some gender differences in reading practices within social class groups at age 3. There is a small gender gap at age 3 in favour of girls in all socioeconomic groups, but these differences are only statistically significant for the children from professional/managerial backgrounds. When their children are aged three, parents from professional/managerial backgrounds are more likely to read every day to their daughters than their sons. By age 5, girls are more likely to be read to than boys in all groups, but the gender differences are very small and not statistically significant for any social class group.

In contrast, variation in reading across social class groups at age 3 is relatively large, with the professional and non-manual classes reporting higher levels of engagement. By the age of 5, the gap between social class groups substantially narrows; girls in the never employed group see the greatest increase in the proportion being read to daily (18 percentage points) but generally the catch-up is greatest for boys. Nevertheless, both social class and gender differences remain at this age.

While the reasons for this pattern cannot be established definitively, previous research has shown that parents of the children in this cohort adjust their home-learning activities to school start, with an increase in the frequency of reading to the child and a reduction in sports/physical activity and educational visits (Smyth, 2016). It is likely therefore that earlier home-learning activities are more driven by the (perceived) interest of the child, and thus more gendered, while at the age of 5, parents place a greater emphasis on supporting both sons and daughters to adjust to school. After their children start school, parents from more disadvantaged social class backgrounds may also feel the need to support their child's learning (or be responding to teacher expectations in this regard) and thus change their behaviour, which explains much lower social class differences in parental reading at age 5 (see Fig. 2). There is of course a ceiling to the amount of time parents from higher social classes can spend with their children, and this may narrow the social class gap in engagement.

What about social class variation in the experience of school and preschool? Previous research on GUI Cohort '08 has shown a strong social gradient in centre-based care attendance, with 34 per cent of children from professional/managerial backgrounds attending, compared to 16 per cent of working-class children (McGinnity et al., 2015).[10] There was also social class variation in age of starting school among GUI Cohort '08, at least for younger children. Prior analysis of the GUI data showed that almost all of the oldest children in the study (who were 4 years, 9 months in September 2012) started school that month. In contrast, only 34 % of the youngest children in the study (aged 4 years, 3 months that month) started that year. Starting school at this comparatively young age was much more common for children in the lowest income quintile (52 %) than the highest (23 %, Growing Up in Ireland Study Team (2013)). This suggests that wealthier parents were more likely to delay school start for another year if their child was relatively young.

3.3. Do social class differences in reading vary by gender?

Table 2 presents a series of nested OLS models which document the scale of gender and social class differences in reading score at age 9 and the extent to which these differences are mediated by reading, children's books in the home, preschool and school exposure. Model 1 focuses on gender and social origin differences, Model 2 adds mother's education, mother's age, language spoken, family structure and financial stress in order to assess the influence of social class net of other family background factors. Model 3 adds preschool learning activities: age 3 reading, children's books in the home and centre-based care at age 3. Model 4 adds reading at age 5 and school year group, and Model 5 includes vocabulary score at age 3.

As can be seen from Model 1 in Table 2, girls in the professional/managerial group have slightly higher reading scores than boys in this group (by 1.14 points), and this difference is statistically significant. As observed in Fig. 1, there is a sharp social class gradient, with the lowest scores among those from the never employed group (a gap of 14.22 with those in the professional group). None of the interaction terms between gender and social class are statistically significant. However, the size of

[10] Children from the most disadvantaged class background, never employed, actually had higher rates of centre-based care attendance, around 20 per cent, likely related to subsidized care provision for the most disadvantaged.

Table 2
Series of OLS regression models of reading score at age 9 years (unstandardized regression coefficients).

	Model 1	Model 2	Model 3	Model 4	Model 5
	Gender, class, gender* class	M1 + mother's education, mother's age, language, family structure, financial stress (at 9)	M2 + age 3 reading, centre-based care, children's books in the home	M3 + age 5 reading, school year group	M4 + vocabulary score at age 3
Gender (ref: Boys)					
Girls	1.138**	1.244**	1.004*	0.826	-0.182
Class (ref: Professionals)					
Non-manual	-4.488***	-1.524*	-1.118	-1.252	-0.813
Manual	-7.237***	-3.099***	-2.344***	-2.289***	-1.875**
Never-employed	-14.223***	-7.934***	-7.020***	-7.134***	-6.474***
Class by Gender					
Non-manual *Girls	-0.342	-0.700	-0.809	-0.905	-1.210
Manual*Girls	0.492	0.168	0.033	-0.104	-0.180
Never-employed*Girls	3.123	3.105	3.046	2.392	3.206
Reading to child at age 3 (scale 0–10)			0.560***	0.485***	0.315***
Centre-based care at age 3 (Ref: no centre-based care)			0.759	0.591	0.841*
Children's books in the home at age 3 (ref: more than 30)					
<10 books			-1.834*	-2.010**	0.140
10–20 books			-2.705***	-2.743***	-1.819***
21–30 books			-0.939	-1.032*	-0.763
Reading to child at age 5 (scale 0–10)				0.367***	0.339***
Childs school year-group (Ref. 5th year in school)					
4th year in school				-4.395***	-4.097***
6th year in school				2.635***	2.314***
Missing school year				0.560	-0.785
T-score Naming Vocabulary					0.328***
Constant	101.966***	103.857***	99.096***	96.433***	80.676***
R-squared	0.067	0.105	0.123	0.140	0.204

Notes: *** p < .01, ** p < .05, * p < .1. Models 2–5 control for mother's age, mother's education level, English as a second language at age 9, family structure age 9, and financial stress age 9. School exposure: depending on time of interview, those in their fourth year in school, for example, would have had between three and four years of school exposure. See Appendix Table A1 for the full model. Model weighted, unweighted N = 6916.

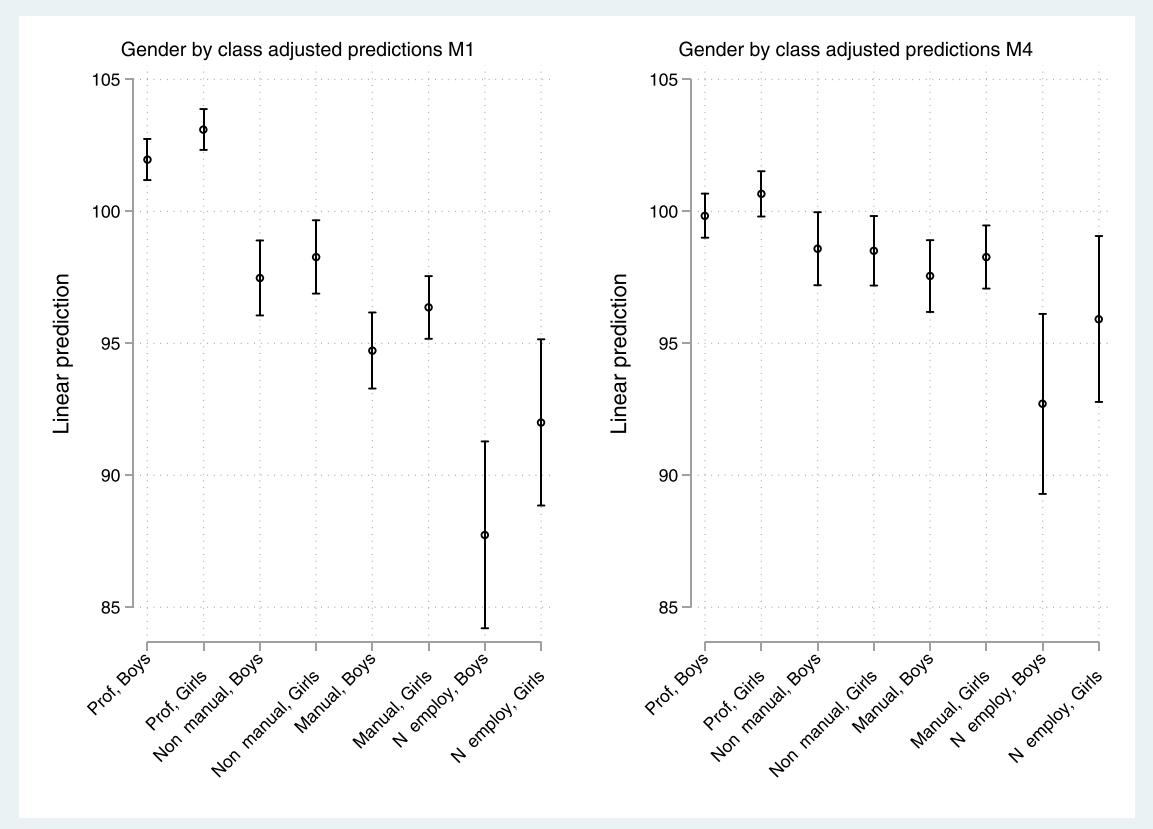

Fig. 3. Predicted gender and class differences (Models 1 and 4).

the never-employed*female coefficient, indicating that never employed girls score around 3 points higher than boys in this group, suggests there is a gender gap in this group, but the lack of statistical power in this small group makes it impossible to draw firm conclusions. We therefore reject our first hypothesis that class differences in cognitive outcomes vary for boys and girls overall. Social class differences, though not gender differences, are reduced once mother's education was controlled (compare Models 1 and 2, Table 2). As mothers in lower social class families tend to have lower educational levels, this partly accounts for the disadvantage shown in their children's reading scores. Though even after other controls such as mother's age, if English was the child's second language, family structure, and perceived financial difficulty; social class differences are maintained.

3.4. The role of home learning environment (HLE), preschool and primary school exposure in explaining the cognitive differences by class and gender

The third model (M3, Table 2) added variables related to the home learning environment prior to school (at age 3), specifically, the frequency of parental reading at age 3 and the number of children's books in the home. The model also controlled for preschool exposure. Having fewer than 20 children's books in the home at age 3 was associated with a lower reading score at age 9 years, more so for those who had access to between 10 and 20 children's books (with a gap of 2.7 points). Conversely, parental reading to children at 3 years was associated with an increase in 9-year reading scores, giving some support for hypothesis 2b. In this model, contrary to hypothesis 3, no significant variation is found in the relationship between participation in centre-based care at age 3 and later reading scores.

The HLE was found to only partially mediate the gender and social class differences described above. The gender gap reduces from 1.2 to 1 point while the gap between professional and never employed groups reduces from 7.9 to 7 points. The difference between professional and non-manual groups is found to be related to different home learning environments. Nonetheless, significant variation by both class and gender remains, providing support to hypothesis 2b which proposed that high rates of engagement in Ireland will mean that HLE does not play a strong mediating role.

The fourth model (M4) controlled for parental reading at age 5 and for school exposure. Even after accounting for reading at age 3, reading at age 5 is still associated with higher reading scores at age 9. Those with longer school exposure (that is in their sixth year at school, about one quarter of children) had higher reading scores at age 9, on average 2.7 points higher. The small group of children who had started school later[11] and had less school exposure had lower scores – 4.4 points lower than the reference category of children in their fifth year of school (about two thirds of the sample, see Table 1). We cannot discount the possibility that parents may send their children to school at an older age where they are seen as less 'school ready' in terms of their cognitive development. However, controlling for vocabulary score at 3 should, at least in part, help adjust for this pattern (Model 5 in Table 2); it is evident that the size of the gap for those in their fourth year of school remains significant and large, taking account of prior cognitive test scores, suggesting an important role for the length of school exposure. Hypotheses 3 and 4 are supported, with stronger effects from school exposure than pre-school experience.

Fig. 3 presents predicted reading scores for boys and girls based on Model 1 in Table 2, which includes just the social class and gender

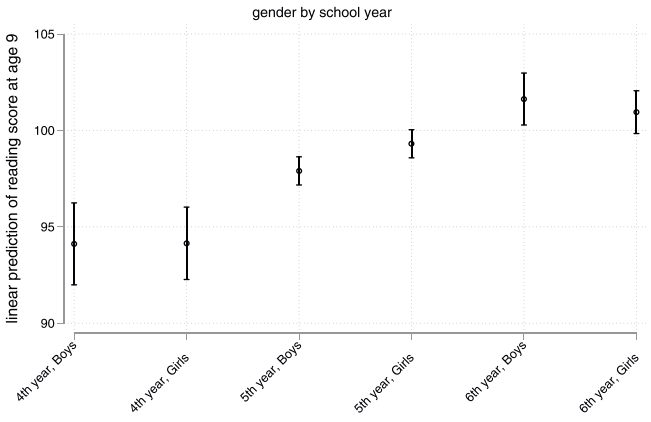

Fig. 4. Does the effect of exposure to school differ for boys and girls?.

interactions (Model 1 in Fig. 3), and Model 4 in Table 2 with all the controls but without age 3 vocabulary score (Model 4 in Fig. 3). While for Model 1 we see large social class differences in predicted reading scores, in Model 4, the social class differences are much reduced – specifically differences between the reading scores of children from professional, non-manual and manual social class backgrounds – indicating the importance of other background characteristics, and home and formal learning exposure, in understanding social class differences in reading scores. Interestingly, adding school exposure means the difference between never employed girls and never employed boys is reduced to 2.4 points (Table 2, Model 4), though disadvantaged boys still stand out in terms of reading scores in Fig. 3. Do disadvantaged boys benefit from school exposure more than disadvantaged girls? We investigate this further below.

The final model (M5) added the child's previous score on a measure of vocabulary at age 3 years. As expected, this variable was a highly significant predictor of the child's score on the reading test at age 9 years. Even accounting for earlier vocabulary skills, the gap between the most disadvantaged children and less advantaged children is still significant. This suggests that for children with similar vocabulary skills at age 3, children from the most disadvantaged group have lower scores at 9 than their more advantaged peers, indicating that their cognitive development in terms of language is also slower between 3 and 9.

The effects of HLE (parental reading and children's books in the home) are reduced compared to the earlier models, but it is important to note that they also have a positive direct effect on skill development between age 3 and age 9. Having participated in centre-based care at 3 years and, in particular, longer school exposure are also associated with greater progress in terms of language skills between age 3 and age 9.

In sum, reading skills at age 9 particularly reflect social class: overall gender differences are small, and only statistically significant for children from professional/managerial backgrounds. Social class differences in reading scores are reduced by accounting for home learning, and centre-based care and school exposure, but a strong direct effect of social class background remains, even net of other aspects of family background (such as mother's education). These direct effects remain evident even when taking account of vocabulary test scores at age 3, indicating that more advantaged groups make greater progress between ages 3 and 9, as well as having higher absolute scores. The models indicate it is for the small, most disadvantaged group where social class effects do differ by gender: while not statistically significant, never employed boys have even lower scores than girls in this group.

3.5. Does the role of home learning environment and school exposure differ by social class and gender?

The models in Table 2 assume that the effects of home learning environment (and other variables) are similar for girls and boys. Further

[11] Around 16 per cent of children in 'fourth year' reported at age 5 that they had started school, suggesting they may have repeated a year. Once an additional control is added to the model to account for this, the difference between those in fourth year and fifth year is reduced to 3 points (results available from the authors).

analyses looked at the interaction model between gender and parental reading behaviour, centre-based care and school year group (Fig. 4) (full results in Appendix Table A2). The interaction between parental reading and gender was small in effect size and not significant, indicating boys and girls benefit in a similar way from reading. There are some indications that preschool learning in the form of centre-based care is more beneficial for boys, though the interaction terms is not statistically significant (Table A2). Longer exposure to formal education (as measured by being in the sixth year of schooling) does benefit boys more than girls (Fig. 4 and Table A2). Expressed in a different way, this implies boys who started school earlier have higher reading scores at age 9. For both boys and girls, those in the fourth year of school, because they started school later, have lower scores, most likely because of lower exposure to complex reading materials at school.

4. Discussion

This paper investigates inequalities in cognitive outcomes among children in Ireland using a rich, representative, longitudinal study of children, Growing Up in Ireland. The paper considers inequality in literacy skills by both social class and gender, how these evolve over time, and the role of both the home learning environment and formal learning environments (formal preschool care/education and primary school) in shaping these inequalities.

Contrary to expectations, the analyses point to no clear advantage in taking an intersectional approach, with gender and social class emerging as having distinct influences on the development of children's cognitive skills, so Hypothesis 1 is rejected. Reading skills at age 9 in Ireland vary by both gender and social class, with a particularly large gap between children from professional social classes and those from a background where neither parent has ever had a job. Within all social classes, girls have slightly higher reading scores than boys. The gender gap is similar across social class groups, though is larger for the small, most marginalized group. Thus, boys from jobless households emerge as a particular risk group for poor educational attainment in middle childhood.

We do find differences in parental reading to children by social class, with higher frequency or reading by parents from professional backgrounds, in support of hypothesis 2a. Somewhat surprisingly, social class differences in parental reading practices are considerably smaller at age 5, when most children in Ireland have started school. Differences in reading scores at age 9 are only partly explained by differences in the parental reading practices children are exposed to at age 3 and (to a lesser extent) at age 5. Being read to at age 3 is associated with better reading ability at age 9. Having more children's books in the home at age 3 is also associated with higher vocabulary scores at age 9. The fact that both measures together affect cognitive development suggest both structural and process measures of the child's home learning environment are important.

Longer exposure to school is linked to higher reading test scores while having attended centre-based care at age 3 has a positive influence only when school exposure is taken into account, supporting Hypotheses 3. It appears that boys benefited more than girls from the 'formal' learning activities provided by primary education. Particularly for very disadvantaged boys, who have particularly low reading scores at age 9, this may offer some potential for supporting their cognitive development, though the precise mechanisms through which this operates would require further examination. There are also some indications that boys benefited more than girls from greater frequency of home learning activities at age 5 years, both in terms of reading scores at age 9 and vocabulary development between age 3 and 9, though differences are small in size and not statistically significant.

There are some limitations of this analysis. There are no indicators of the quality of centre-based care and education in these data, and previous research suggests that it is typically only high-quality care that enhances children's cognitive outcomes (Kulic et al., 2019). Social class and gender influences may operate through differences in school environments that are not captured here; these may include the nature of the interaction between teachers and children, the quality of the school and the socio-economic composition of the school. Another potential limitation is the measure of home learning environment used. Parents' reading to their child may be superior to simply measuring the availability of children's books in the home, which may not actually be engaged with. However, parental reports of reading to children may be influenced by social desirability bias, and number of children's books in the home much less so. Using both should help counteract the weakness of the other, though neither measure captures the 'quality' of that environment, in terms of complexity/appropriateness of reading material or the quality of verbal interactions. Hoff (2003) finds that parental SES shapes the functions to which language is put, the complexity of speech and the breadth of vocabulary used, so it is likely that parent-child verbal interactions will be more complex for children from more advantaged social class backgrounds.

Nonetheless, the findings indicate a strong direct effect of social class on reading test scores, even after accounting for home learning environment and formal early care and education, and also when taking account of vocabulary test scores at age 3. Thus, more advantaged groups make greater progress between 3 and 9 years of age as well as having higher absolute scores. These results are in keeping with researchers who have emphasized that who parents are rather than what they do is a key driver of educational inequality (see Sullivan et al., 2013; Hartas, 2015).

Adding maternal education to the models reduced, but did not fully account for, observed differences in language scores by family social class. The extent to which a mother might translate beliefs arising from her own educational attainment into parenting practices may be affected by such things as spousal attitudes, work commitments, and influence from parents and peers in their own network – potentially better reflected by their social class categorization.

A recent analysis (for the Deaton Review on Early Childhood Inequalities) used a decomposition analysis to examine the relative contribution of different environmental factors – plus genetic endowment – to a child's cognitive development at age 3 (Cattan et al., 2022). With a total of just over 20% of variance in cognitive development explained by their model, by far the largest explanatory factor (9 %) was 'educational environment' with genetic endowment contributing less than 2 %. The variables used to measure 'educational environment' were maternal education, maternal language skills, home learning activities and formal childcare in the early years. Interestingly, a contrast with a similar decomposition analysis for emotional and behavioural difficulties at age 3, showed that both 'educational environment' and 'child characteristics' (sex, ethnicity and first-born status) explained proportionally more variance in cognitive development (Cattan et al., 2022; Fig. 15, p.35).

Returning to the results of the current study, the findings suggest that while reading to children is clearly beneficial for cognitive outcomes, social class differences in parental reading explain only a small part of the social class gap. In addition, more disadvantaged families in Ireland appear quite responsive to school start in reading behaviour, which may be prompted by the schools themselves or a cultural response – a sense that as formal learning has begun, parents need to support this. This implies schools, and indeed preschools, can provide an important function in encouraging parents to engage with their child's learning at home. These findings also suggest that it may be helpful for policymakers to consider ways of supporting and educating all parents in how to enrich the educational potential of individual homes (such as schemes to improve access to suitable children's books and providing advice to parents on the importance of reading to children), though social variation in the home learning environment is modest in comparison with other contexts (Smyth & Duta, 2022). This is consistent with current Irish government proposals to facilitate greater parental involvement in children's learning in Ireland, though how effectively these proposals are implemented will be crucial to their success, and given the evidence

in this paper, some emphasis also needs to be given to the importance of reading to young boys, as well as girls.

Of course, the home learning environment is just one element of a complex range of factors that influence the link between social origin, gender and cognitive outcomes. Parental physical and mental health, financial resources, housing quality, their support networks and resilience, all of which vary by social class, will also influence their ability to provide a supportive home learning environment. In that sense, measures to reduce social inequality more broadly (for example through the tax/benefit system) may ultimately have more of an impact in reducing the social class differences found in reading ability at 9 than measures to promote parental engagement.

Ethical Statement

This manuscript uses secondary data collected from human participants as part of the Growing Up in Ireland study. Details relating to consent and ethical procedures for the study are described in the various technical documents associated with the datasets, as follows:

Thornton, M., Williams, J., McCrory, C., Murray, A. & Quail, A. (2013). Growing Up in Ireland: Design, instrumentation and procedures for the Infant Cohort at wave one (9 months). (Infant Cohort Technical Report No. 2). Dublin: ESRI/TCD/DCYA.

McCrory, C., Williams, J., Murray, A. Quail, A., & Thornton, M. (2013). Growing Up in Ireland: Design, instrumentation and procedures for the Infant Cohort at wave two (3 years). (Infant Technical Report No 3). Dublin: ESRI/TCD/DCYA.

Williams, J., Thornton, M. Murray, A. & Quail, A. (2019). Growing Up in Ireland: Design, instrumentation and procedures for Cohort '08 at wave three (5 years). (Technical series No. 2019 – 2). Dublin: ESRI/TCD/DCYA.

McNamara, E., Murray, A. & Williams, J. (2019). Growing Up in Ireland: Design, instrumentation and procedures (including summary literature review, pilot report and findings) for Cohort '08 at wave four (7/8 years). (Technical Series No. 2019–3). Dublin: ESRI/TCD/DCYA.

McNamara, E., O'Mahony, D. & Murray, A. (2020). Growing Up in Ireland: Design, instrumentation and procedures for Cohort '08 of Growing Up in Ireland at 9 years old (Wave 5). (Technical Series No. 2020–1). Dublin: ESRI/TCD/DCYA.

Funding

This research has been supported with the Academy of Finland Flagship grant (decision number: 320162). The Growing Up in Ireland study, from which the data in this manuscript come, is funded by the Government of Ireland through the Department of Children, Equality, Disability, Integration and Youth with a contribution in some phases from the Atlantic Philanthropies.

Declaration of Competing Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article. Two of the authors, Aisling Murray and Emer Smyth, work on the Growing Up in Ireland study from which the data are derived.

Acknowledgements

Growing Up in Ireland (GUI) is the national longitudinal study of children. It is funded by the Department of Children, Equality, Disability, Integration and Youth. The study is managed and overseen by the Department in association with the Central Statistics Office. It is carried out by a consortium of researchers led by the Economic and Social Research Institute (ESRI) and Trinity College Dublin (TCD).

Appendix. Table A1

	(1)	(2)	(3)	(4)	(5)
	Model 1	Model 2	Model 3	Model 4	Model 5
VARIABLES	Gender, class, gender* class	M1 + mother's education, mother's age, language, family structure, financial stress (at 9)	M2 + age 3 reading, centre-based care, books in the home	M3 + age 5 reading, school year group	M4 + vocabulary score at age 3
Non-manual	-4.488***	-1.524*	-1.118	-1.252	-0.813
	(0.826)	(0.827)	(0.820)	(0.819)	(0.804)
Manual	-7.237***	-3.099***	-2.344***	-2.289***	-1.875**
	(0.836)	(0.840)	(0.841)	(0.826)	(0.798)
Never-employed	-14.223***	-7.934***	-7.020***	-7.134***	-6.474***
	(1.849)	(1.835)	(1.842)	(1.828)	(1.844)
Girls	1.138**	1.244**	1.004*	0.826	-0.182
	(0.560)	(0.541)	(0.537)	(0.534)	(0.517)
Non-manual *Girls	-0.342	-0.700	-0.809	-0.905	-1.210
	(1.158)	(1.130)	(1.118)	(1.111)	(1.059)
Manual*Girls	0.492	0.168	0.033	-0.104	-0.180
	(1.105)	(1.085)	(1.080)	(1.065)	(1.022)
Never-employed*Girls	3.123	3.105	3.046	2.392	3.206
	(2.481)	(2.420)	(2.410)	(2.397)	(2.371)
Mother Lower Secondary		-8.262***	-6.647***	-6.445***	-5.682***
		(0.934)	(0.936)	(0.924)	(0.876)
Mother Upper Secondary (or equiv.)		-4.536***	-3.599***	-3.530***	-3.149***
		(0.562)	(0.565)	(0.561)	(0.544)
Mother Non-Degree		-2.516***	-2.041***	-2.021***	-1.952***
		(0.521)	(0.523)	(0.519)	(0.504)
Mother's age 18–29		-2.332***	-2.099***	-2.180***	-1.914***
		(0.683)	(0.680)	(0.671)	(0.650)
Mother's age 40+		1.495***	1.318**	1.454***	1.577***
		(0.543)	(0.533)	(0.527)	(0.501)
English child's second language		-6.978***	-5.988***	-6.286***	-2.065*
		(1.175)	(1.236)	(1.214)	(1.166)

(*continued on next page*)

(*continued*)

	(1)	(2)	(3)	(4)	(5)
	Model 1	Model 2	Model 3	Model 4	Model 5
One-parent family at age 9		-0.213	0.087	-0.297	0.036
		(0.790)	(0.781)	(0.777)	(0.750)
Financial difficulty at age 9		-1.952**	-1.939**	-1.823**	-1.865**
		(0.798)	(0.790)	(0.787)	(0.747)
Reading to child at age 3 (scale 0–10)			0.560***	0.485***	0.315***
			(0.090)	(0.093)	(0.089)
Centre based care at age 3 (ref. notb/centre-based)			0.759	0.591	0.841*
			(0.517)	(0.514)	(0.495)
Children's books <10			-1.834*	-2.010**	0.140
			(1.029)	(1.004)	(1.003)
10–20 children's books			-2.705***	-2.743***	-1.819***
			(0.656)	(0.651)	(0.629)
21–30 children's books			-0.939	-1.032*	-0.763
			(0.584)	(0.583)	(0.555)
Reading to child at age 5				0.367***	0.339***
				(0.111)	(0.109)
4th year in school				-4.395***	-4.097***
				(0.795)	(0.757)
6th year in school				2.635***	2.314***
				(0.518)	(0.495)
Missing school year				0.560	-0.785
				(4.097)	(3.968)
T-score Naming Vocabulary					0.328***
					(0.018)
Constant	101.966***	103.857***	99.096***	96.433***	80.676***
	(0.398)	(0.445)	(0.953)	(1.289)	(1.453)
Observations	6916	6916	6916	6916	6916
R-squared	0.067	0.105	0.123	0.140	0.204

Notes: Robust standard errors in parentheses. * p<.1, ** p<.05, *** p<.01

Appendix

see Table A2.

Table A2
Interaction between gender, parental reading, centre-based care and school year group.

	Reading*gender		Centre-based care*gender		School year group*gender	
	a	b	c	d	e	f
	Without 3 year vocab.	With 3 year vocab.	Without 3 year vocab.	With 3 year vocab.	Without 3 year vocab.	With 3 year vocab.
Female	0.41	0.42	1.28**	0.293	1.38**	0.40
Reading at age 3	0.47***	0.32***				
Reading at 3*female	0.04	-0.02				
Reading at age 5	0.36**	0.37**				
Reading at 5*female	0.006	-0.053				
Centre-based care			1.23	1.52**		
Centre*female			-1.31	-1.39		
School year group:						
4th school year					-3.79***	-3.45***
4th year*female					-1.38	-1.47
6th school year					3.73***	3.43***
6th year*female					-2.09**	-2.14**
R squared	0.14	0.20	0.14	0.21	0.14	0.21

Notes: *p<.1, **p<.05, ***p<.01. All interaction models are weighted and include the same basic controls (mother's age, mother's education level, English as a second language at age 9, family structure age 9, and financial stress age 9) as used in the main models presented in Table 2. Models a-d include the same number of cases (N = 6916) as the main models presented in Table 2. Models e-f exclude missing cases for school year (N = 6901)

References

Alexander, K. L., Entwisle, D. R., & Olson, L. S. (2007). Summer learning and its implications. *New Directions for Youth Development, 2007*(114), 11–32. https://doi.org/10.1002/yd.210

Araújo, L., & Costa, P. (2015). Home book reading and reading achievement in EU countries: The progress in international reading literacy study 2011 (PIRLS). *Educational Research and Evaluation, 21*(5–6), 422–438. https://doi.org/10.1080/13803611.2015.1111803

Blossfeld, H. P., Kulic, N., Skopek, J., & Triventi, M. (2017). *Childcare, early education and social inequality: An international perspective*. Cheltenham: Edward Elgar. https://doi.org/10.4337/9781786432094

Bukodi, E., & Goldthorpe, J. H. (2013). Decomposing 'social origins': The effects of parents' class, status, and education on the educational attainment of their children. *European Sociological Review, 29*(5), 1024–1039. https://doi.org/10.1093/esr/jcs079

Burger, K. (2010). How does early childhood care and education affect cognitive development? An international review of the effects of early interventions for children from different social backgrounds. *Early Childhood Research Quarterly, 25*(2), 140–165. https://doi.org/10.1016/j.ecresq.2009.11.001

Cattan, S., Fitzsimons, E., Goodman, A., Phimister, A., Ploubidis, G.B.& Wertz, J. , (2022). Early childhood and inequalities. IFS Deaton Review of Inequalities.

Available online https://ifs.org.uk/inequality/wp-content/uploads/2022/06/Early-childhood-inequalities-IFS-Deaton-Review-2.pdf. Accessed 24 June 2022.
Cheadle, J. E., & Amato, P. R. (2011). A quantitative assessment of Lareau's qualitative conclusions about class, race and parenting. *Journal of Family Issues, 32*(5), 679–706. https://doi.org/10.1177/0192513×10386305
Christin, A. (2012). Gender and highbrow cultural participation in the United States. *Poetics, 40*(5), 423–443. https://doi.org/10.1016/j.poetic.2012.07.003
Clerkin, A., Perkins, R. & Chubb, E. , (2020). The home learning environment in Ireland: Insights from TIMSS 2015. Dublin: Educational Research Centre. Retrieved from https://www.erc.ie/wp-content/uploads/2020/11/Home-Report-Online-FINAL.pdf 17 February 2021.
Conger, R., & Donnellan, M. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology, 58*, 175–199. https://doi.org/10.1146/annurev.psych.58.110405.085551
Cooper, K., & Stewart, K. (2020). Does household income affect children's outcomes? a systematic review of the evidence. *Child Indicators Research, 14*, 981–1005.
Cordero-Coma, J., & Esping-Andersen, G. (2018). Parental time dedication and children's education. An analysis of West Germany. *Research in Social Stratification and Mobility, 55*, 1–12. https://doi.org/10.1016/j.rssm.2018.03.006
Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *University of Chicago Legal Forum*, 139–167.
DiPrete, T. A., & Buchmann, C. (2013). *The rise of women: The growing gender gap in education and what it means for American schools*. New York: Russell Sage Foundation.
DiPrete, T. A., & Jennings, J. L. (2012). Social and behavioral skills and the gender gap in early educational achievement. *Social Science Research, 41*(1), 1–15. https://doi.org/10.1016/j.ssresearch.2011.09.001
Downey, D. B., & Condron, D. J. (2016). Fifty years since the Coleman report: Rethinking the relationship between schools and inequality. *Sociology of Education, 89*(3), 207–220. https://doi.org/10.1177/0038040716651676
Downey, D. B., Kuhfeld, M., & van Hek, M. (2022). Schools as a relatively standardizing institution: The case of gender gaps in cognitive skills. *Sociology of Education*. https://doi.org/10.1177/00380407211070319
Duncan, G. J., Ludwig, J., & Magnuson, K. A. (2007). Reducing poverty through preschool interventions. *Future of Children, 17*(2), 143–160. https://doi.org/10.1353/foc.2007.0015
Duncan, G. J., Yeung, W. J., Brooks-Gunn, J., & Smith, J. R. (1998). How much does childhood poverty affect the life chances of children. *American Sociological Review, 63*(3), 406–423. https://doi.org/10.2307/2657556
Elliott, C. D., Smith, P., & McCulloch,, K. (1997). *British ability scales second edition (BAS II): Technical manual*. London: NFER-Nelson.
Entwisle, D. R., Alexander, K. L., & Olson, L. S. (2007). Early schooling: The handicap of being poor and male. *Sociology of Education, 80*, 114–138. https://doi.org/10.1177/003804070708000202
Ermisch,, J., Jantti, M., & Smeeding, T. M. (2012). *From parents to children: The intergenerational transmission of advantage*. New York: Russell Sage Foundation.
Erola, J., Jalonen, S., & Lehti, H. (2016). Parental education, class and income over early life course and children's achievement. *Research in Social Stratification and Mobility, 44*, 33–43. https://doi.org/10.1016/j.rssm.2016.01.003
Fahey, T., & Curran, M. (2016). Children and families, then & now. In J. Williams, E. Nixon, E. Smyth, & D. Watson (Eds.), *Cherishing all the children equally?* Dublin: Oaktree Press.
Foster, M. A., Lambert, R., Abbott-Shim, M., McCarty, F., & Franze, S. (2005). A model of home learning environment and social risk factors in relation to children's emergent literacy and social outcomes. *Early Childhood Research Quarterly, 20*, 13–36. https://doi.org/10.1016/j.ecresq.2005.01.006
Gillies, V., Edwards, R, & Horsley, N. (2017). *Challenging the politics of early intervention: who's 'saving' children and why*. Bristol: Policy Press.
Growing Up in Ireland, (2013). Key Findings: Infant Cohort (at 5 Years): No. 1: Transitions to School Among Five-Year-Olds. Dublin: ESRI/DCYA.
Growing Up in Ireland Study Team, (2019). Key findings: Cohort '98 at 20 years old in 2018/19, Education, training and employment (No.4). Dublin: ESRI/TCD/DCYA.
Guhn, M., Gadermann, A. M., Hertzman, C., & Zumbo, B. D. (2010). Children's development in Kindergarten: a multilevel, population-based analysis of ESL and gender effects on socioeconomic gradients. *Child Indicators Research, 3*, 183–203. https://doi.org/10.1007/s12187-009-9053-7
Hansen, K., & Jones, E. M. (2010). Age 5 cognitive development in England. *Child Indicators Research, 3*, 105–126. https://doi.org/10.1007/s12187-009-9055-5
Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore: Paul H Brookes Publishing.
Hartas, D. (2015). Parenting for social mobility? Home learning, parental warmth, class and educational outcomes. *Journal of Education Policy, 30*(1), 21–38. https://doi.org/10.1080/02680939.2014.893016
Hartas, D. (2014). *Parenting, family policy and children's well-being in an unequal society: a new culture war for parents*. Dordrecht: Springer.
Hoff, E. (2003). Causes and consequences of SES-related differences in parent-to-child speech. In M. H. Bornstein, & R. H. Bradley (Eds.), *Socioeconomic status, parenting, and child development* (pp. 147–160). Lawrence Erlbaum Associates Publishers.
Hoffmann, N. I. (2018). Cognitive achievement of children of immigrants: Evidence from the millennium cohort study and the 1970 British cohort study. *British Educational Research Journal, 44*(6), 1005–1028. https://doi.org/10.1002/berj.3476
Kalil, A., Ryan, R., & Corey, M. (2012). Diverging destinies: Maternal education and the developmental gradient in time with children. *Demography, 49*(4), 1361–1383. https://doi.org/10.1007/s13524-012-0129-5
Karlson, K. B., & Birkelund, J. F. (2019). Education as a mediator of the association between origins and destinations: The role of early skills. *Research in Social Stratification and Mobility, 64*, Article 100436. https://doi.org/10.1016/j.rssm.2019.100436
Klein, O., & Kogan, I. (2013). Does reading to children enhance their educational success? Short- and long-term effects of reading to children in early childhood on their language abilities, reading behaviour, and school marks. *Child Indicators Research, 6*, 321–344. https://doi.org/10.1007/s12187-012-9174-2
Kulic, N., Skopek, J., Triventi, M., & Blossfeld, H.-P. (2019). Social background and children's cognitive skills: The role of early childhood education and care in a cross-national perspective. *Annual Review of Sociology, 45*(1), 557–579. https://doi.org/10.1146/annurev-soc-073018-022401
Lareau, A. (2002). Invisible inequality: Social class and childrearing in black families and white families. *American Sociological Review, 67*(5), 747–776. https://doi.org/10.2307/3088916
Legewie, J., & DiPrete, T. A. (2012). School context and the gender gap in educational achievement. *American Sociological Review, 77*(3), 463–485. https://doi.org/10.1177/0003122412440802
Magnuson, K. A., Kelchen, R., Duncan, G. J., Schindler, H. S., Shager, H., & Yoshikawa, H. (2016). Do the effects of early childhood education programs differ by gender? A meta-analysis. *Early Childhood Research Quarterly, 36*, 521–536. https://doi.org/10.1016/j.ecresq.2015.12.021
Maître, B., Russell, H., & Smyth, E. (2021). The dynamics of child poverty in Ireland: Evidence from the Growing Up in Ireland survey. In *, 121. ESRI Research Series*. Dublin: Economic and Social Research Institute. https://doi.org/10.26504/rs121.
McGinnity, F., Russell, H., & Murray, A. (2015). *Non-Parental Childcare and Child Cognitive Outcomes at Age 5*. Dublin: The Stationery Office.
McMullin, P., McGinnity, F., Murray, A., & Russell, H. (2020). What you do versus who you are: home learning activities, social origin and cognitive skills among young children in Ireland. *European Sociological Review.*. https://doi.org/10.1093/esr/jcaa012
McNamara, E., Murray, A., & Williams, J. (2019). Growing Up in Ireland. *Longitudinal and Life Course Studies, 10*(4), 531–546. https://doi.org/10.1332/175795919×15699445254797
McNamara, E., O'Mahony, D. & Murray, A. , (2020). Growing Up in Ireland: Design, instrumentation and procedures for Cohort '08 of Growing Up in Ireland at 9-years-old (Wave 5). (Technical Series No. 2020–1). Dublin: ESRI/TCD/DCYA.
Mikus, K., Tieben, N., & Schober, P. S. (2021). Concerted cultivation in early childhood and social inequalities in cognitive skills: Evidence from a German panel study. *Research in Social Stratification and Mobility, 72*, Article 100547. https://doi.org/10.1016/j.rssm.2020.100547
Murray, A., McGinnity, F., & Russell, H. (2016). Inequalities in access to early care and education in Ireland. In J. Williams, E. Nixon, E. Smyth, & D. Watson (Eds.), *Cherishing all the children equally?* Dublin: Oaktree Press.
OECD , (2015), The ABC of Gender Equality in Education: Aptitude, Behaviour, Confidence, PISA, OECD Publishing, Paris, https://doi.org/10.1787/9789264229945-en.
OECD, (2017). Faces of joblessness in Ireland: Main results and policy inventory. Available (online) www.oecd.org/els/soc/faces-of-joblessness.htm.
Ortiz-Gervasi, L. (2020). What shape great expectations? Gender and social-origin effects on expectation of university graduation. *Research in Social Stratification and Mobility, 69*, Article 100527. https://doi.org/10.1016/j.rssm.2020.100527
Passaretta, G. & Skopek, J. , (2020). Does schooling decrease social inequality in early achievement? Discussion paper on SocArXiv, 12 Oct. 2020. Retrieved 17 Feb. 2021. https://doi.org/10.31235/osf.io/6hvd8.
Passaretta, G., Skopek, J., & van Huizen, T. (2022). Is social inequality in school-age achievement generated before or during schooling? A European perspective. *European Sociological Review*, 1–17. https://doi.org/10.1093/esr/jcac005
Plomin, R., & Spinath, F. (2002). Genetics and general cognitive ability (g). *Trends in Cognitive Sciences, 6*(4), 169–176. https://doi.org/10.1016/S1364-6613(00)01853-2
Raudenbush, S. W., & Eschmann, R. D. (2015). Does schooling increase or reduce social inequality. *Annual Review of Sociology, 41*, 443–470. https://doi.org/10.1146/annurev-soc-071913-043406
Schubert, F., & Becker, R. (2010). Social inequality of reading literacy. A longitudinal analysis with cross-sectional data of PIRLS 2001 and PISA 2000 utilizing the pair wise matching procedure. *Research in Social Stratification and Mobility, 28*(1), 109–133. https://doi.org/10.1016/j.rssm.2009.12.007
Smeeding, T., Erikson, R., & Jantti, M. (2011). *Persistence, privilege, and parenting: The comparative study of intergenerational mobility*. New York: Russell Sage Foundation.
Smyth, E. (2016). *Arts and Cultural Participation among Children and Young People: Insights from the Growing Up in Ireland Study*. Dublin: The Arts Council/ESRI.
Smyth, E. (2018). *The Transition to Primary Education: Insights from the Growing Up in Ireland Study*. Dublin: ESRI.
Smyth, E., & Duta, A. (2022). Inequalities in children's skills on primary school entry in Ireland and Scotland: do home learning environment and early childhood childcare explain these differences? *Longitudinal and Life Course Studies*. https://doi.org/10.1332/175795921X16591139653249
Strand, S. (2014). Ethnicity, gender, social class and achievement gaps at age 16: Intersectionality and 'Getting it' for the white working class. *Research Papers in Education, 29*(2), 131–171. https://doi.org/10.1080/02671522.2013.767370
Sullivan, A., Ketende, S., & Joshi, H. (2013). Social class and inequalities in early cognitive scores. *Sociology, 47*(6), 1187–1206. https://doi.org/10.1177/0038038512461861
Sylva, K., Melhuish, E., Sammons, P., Siraj, I., & Taggart, B. (2010). *Early childhood matters: Evidence from the effective pre-school and primary education project*. Oxford, UK: Routledge. https://doi.org/10.4324/9780203862063

Sylva, K., Melhuish, E., Sammons, P., Siraj-Blatchford, I., & Taggart, B. (2004). *The effective provision of pre-school education (EPPE) project: Final report*. London: DfES/ Institute of Education, University of London.

Warner, C. H., & Milkie, M. A. (2013). Cultivating gendered talents? The intersection of race, class and gender in the concerted cultivation of U.S. Elementary School Students. In M. H. Kohlman, D. B. Krieg, & B. J. Dickerson (Eds.), *Notions of family: Intersectional perspectives, Volume 17 of advances in gender research* (pp. 1–28). Bingley, UK: Emerald. https://doi.org/10.1108/S1529-2126(2013)0000017004.

Washbrook, E., Gregg, P., & Propper, C. (2014). A decomposition analysis of the relationship between parental income and multiple child outcomes. *Journal of the Royal Statistical Society Series A (Statistics in Society)*, 757–782. https://doi.org/10.1111/rssa.12074

Williams, J., Thornton, M. Murray, A. & Quail, A. (2019). Growing Up in Ireland: Design, instrumentation and procedures for Cohort '08 at wave three (5 years) (Technical series No. 2019 – 2) Dublin: ESRI/TCD/DCYA.

Willis, P. (1981). *Learning to labor: How working-class kids get working class jobs*. New York: Columbia University Press.