The evaluation of DEIS: The lives and learning of urban primary school pupils, 2007-2016

Lauren Kavanagh & Susan Weir

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Executive Summary

This is the latest in a series of reports on the formal evaluation of the Delivering Equality of Opportunity In Schools (DEIS) programme at primary level. Since 2007, the Educational Research Centre (ERC) has been evaluating the School Support Programme (SSP) under DEIS on behalf of the Department of Education and Skills (DES). As part of the evaluation, large-scale assessment of the reading and mathematics achievement of pupils in a representative sample of urban SSP primary schools has been carried out four times. Previous evaluation reports have provided detailed information on the reading and mathematics performance outcomes of pupils attending urban SSP primary schools in 2007, 2010, 2013 and 2016 (Archer & Weir, 2011; Kavanagh, Weir & Moran, 2017; Weir & Denner, 2013). In conjunction with the administration of the achievement assessments, contextual information has been collected via questionnaires completed by pupils and their parents, and through pupil information forms completed by teachers. The primary aims of the present report are to use this information to provide a context in which achievement outcomes may be understood, as well as to provide information on important non-achievement outcomes.

At the beginning of the evaluation in 2007, the decision was made to assess the achievement of pupils at multiple grade levels (originally Second, Third and Sixth class, with Fifth class added in 2010) in a sample of 120 participating urban SSP schools. Large numbers of pupils were involved in each administration of testing. In 2007, approximately 11,000 pupils participated in testing, while approximately 16,000 pupils participated in testing in 2010, 2013 and 2016 after the addition of Fifth class as a target grade level. There have been increases in the average reading and mathematics scores of pupils on each successive testing occasion, at all grade levels involved in testing.

At the time they completed achievement tests, pupils also responded to questionnaires which sought information about their attitudes towards school, their educational expectations and aspirations, and about how they spend their free time. Teachers provided additional information about pupils, including their levels of attendance at school and whether they were in receipt of additional learning support for reading or mathematics. Parents of pupils in Second and Third class were also asked to complete questionnaires, providing information on pupils' home lives and on their own involvement with their children's education. This report presents findings from analyses of these contextual data and includes separate chapters on school, pupil, and parent and family characteristics and their respective relationships with pupil achievement. Trends over time are also considered (i.e., from 2007 to 2016). Where possible, comparisons are made between findings of the SSP evaluation and findings of the 2014 National Assessments of English Reading and Mathematics (NA '14) which were administered to nationally representative samples of Second and Sixth class pupils in primary schools in Ireland. The main findings for the current report are summarised in the following sections.

The Pupil and Achievement

Gender differences in achievement in 2016 were small, and were in favour of girls for reading at the more junior grade levels. No gender differences in reading achievement were observed at the higher grade levels. For mathematics, boys outperformed girls by a small margin at all grade levels, replicating a pattern that has been observed in all previous rounds of testing. A number of pupil

background characteristics were associated with achievement in 2016. Pupils whose families spoke a language other than English or Irish at home had lower average achievement in English reading than their peers (at all grade levels) and higher average mathematics achievement than their peers at all grades except Second class, where the difference was negligible. There were higher proportions of pupils with English as an additional language in 2016 than was the case at the beginning of the evaluation. The average reading and mathematics scores of Traveller pupils were considerably lower than those of non-Travellers, at all grade levels. The proportion of pupils identified as Travellers in urban SSP schools has changed little since 2007. Pupils who had attended preschool for two years had higher achievement than those who had attended for one year or not at all. Pupils receiving learning support for reading and mathematics had considerably lower average achievement than those not receiving such support. Engagement in some out-of-school activities was associated with higher achievement (e.g. reading a book at home for fun, membership of a music group such as a choir or orchestra), while others were associated with lower achievement (large amounts of time spent watching television or 'hanging out' with friends, membership of youth clubs). On the whole, large amounts of technology use and time spent online were associated with lower achievement, while moderate amounts were not.

When comparing findings from urban SSP pupils to pupils nationally in NA '14, some differences were noted. There was a slightly higher proportion of EAL pupils in the urban SSP sample in 2016 than in equivalent grades nationally in 2014. There were higher rates of learning support in urban SSP than the national sample of schools in NA '14. Urban SSP pupils were more likely to have televisions in their bedrooms, to have mobile phones/smartphones, to spend more than two hours per day watching television and to hardly ever or never read books at home for enjoyment than pupils nationally in NA '14. Each of these attributes/behaviours were associated with lower reading and mathematics achievement in both the SSP evaluation and the National Assessments.

Parent and Family Factors

A number of family background characteristics were associated with pupil achievement in 2016. Pupils who were from one-parent households, whose parents were not employed outside the home, and whose parents held medical cards had lower average achievement in reading and mathematics than their peers. Pupils whose parents had higher educational attainment had higher achievement, on average, in both reading and mathematics. Having more books in the home and having access to educational resources (e.g. educational games) at home were associated with higher achievement in both reading and mathematics. Parents who read books more frequently themselves had children with higher average reading scores than parents who read books less frequently; the converse was observed for magazine reading. Additionally, pupils who engaged in reading with someone at home with greater frequency had higher achievement than pupils who did so less frequently.

Overall, parents had high aspirations and expectations for their children's future educational attainment. Pupils whose parents had lower aspirations and expectations for them had lower achievement in both reading and mathematics. Nearly all parents agreed that there was support for children's learning (e.g. for homework, practising spellings, etc.) at home. Some forms of school-based parental involvement were found to be associated with higher pupil achievement (e.g. committee membership), while others were not (e.g. volunteering to go on class trips).

When comparing urban SSP pupils to pupils nationally in NA '14, some demographic differences were observed. As would be expected, there were higher rates of parental unemployment and medical card possession, and lower levels of parental educational attainment in the SSP sample

than nationally. Additionally, there was less access to home educational resources (e.g. books), and lower rates of parental school committee membership in the SSP sample than nationally in NA '14.

The School and Achievement

Pupils in urban SSP schools were more likely to attend single sex schools than pupils nationally and less likely to attend Irish-medium schools. There was some variation in achievement scores by gender composition, but no clear patterns of association across grade levels and domains were observed. School size was significantly associated with pupil achievement in 2016, with pupils in the largest one third of schools having significantly higher average achievement than pupils in the smallest third of schools, at all grade levels and in both domains. However, this was probably related to the larger size of schools in Band 2, in which disadvantage is less concentrated. Average school attendance was marginally higher in Band 2 schools than in Band 1 schools. Overall, average school attendance rates in SSP schools in 2016 were slightly lower than those nationally in 2014. School percentage attendance rate was significantly but weakly positively correlated with school-level achievement in reading and mathematics in 2016. Although the overall average reading and mathematics achievement of pupils at all grade levels in the sample schools increased at every testing occasion from 2007 to 2016, individual schools displayed different patterns of achievement change over this period. In order to explore school-level changes, schools were classified based on a) their pattern of achievement changes over each round of achievement testing (i.e. all increases in average scores, all decreases, or a mixed pattern of change), and b) the magnitude of any net changes over this period. Schools were much more likely to have experienced consistent increases than consistent decreases in average achievement since the introduction of the SSP, and were considerably more likely to have experienced net increases than net decreases over the period in question. No school-level characteristic was found to be reliably related to schools' changes in achievement over time.

Multilevel Analyses of Reading and Mathematics Achievement

Multilevel analyses of achievement in Third class revealed that, in 2016, 6% of the variance in reading achievement and 9% of the variance in mathematics achievement was between schools. Between-school variance decreased in both domains on every testing occasion since the introduction of DEIS. Given the low between-school variance, it is not surprising that very few school-level characteristics were significantly associated with achievement in either domain. At the pupil level, home background characteristics and home climate variables such as parents' employment status and number of books in the home were significantly associated with student achievement in both domains. Language of the home was significantly associated with student achievement in reading, but not in mathematics. Pupil attitudes were also significantly associated with achievement, with pupils who liked reading or mathematics and pupils who had high educational aspirations significantly outperforming their peers. Pupils whose parents had high expectations for their educational attainment and whose parents read frequently to them had significantly higher mean achievement scores than pupils whose parents did not. Smaller but still significant effects on achievement were found for a range of pupils' out-of-school activities, with reading books and playing sports more frequently associated with higher achievement and spending large amounts of time watching television associated with lower achievement. Overall, the model of reading achievement explained 30% of the total variance in reading achievement (60% of the between-school variance and 28% of the within school variance), and the model of mathematics achievement explained 27% of the total variance in mathematics achievement (48% of the between-school variance and 25% of the within school variance).

Conclusion

The finding that pupils who have participated in the SSP have demonstrated improved outcomes on four successive occasions and at all grade levels is very welcome. However, while the achievement gap may have reduced, the achievement of pupils in schools with concentrations of pupils from disadvantaged backgrounds is well below that of those in non-SSP schools. Analyses undertaken for the current report indicate that, of a wide range of variables considered, family poverty remains the largest determinant of educational outcomes. Although adding measures that have been identified as effective in addressing disadvantage to the existing suite of resources available to schools in the SSP is recommended (for example, quality preschool education), there are probably limits on what educational measures can achieve in relation to closing the achievement gap. It seems that until economic inequality is addressed, the achievement gap between children from poor backgrounds and their more affluent counterparts is likely to persist.

Chapter 1: **Introduction**

This is the latest in a series of reports on the formal evaluation of the Delivering Equality of Opportunity In Schools (DEIS) programme[1] in primary schools. Since 2007, the Educational Research Centre (ERC) has been evaluating the School Support Programme (SSP) under DEIS on behalf of the Department of Education and Skills (DES). The present report is solely concerned with the evaluation of the programme in participating urban primary schools. Using data from pupils, their parents, and their teachers, this report attempts to describe the achievements of pupils in urban SSP schools in the context of home, school, and other factors. While data are presented from four rounds of testing between 2007 and 2016, a major focus of the current report is to describe a model of reading achievement among Third class pupils in urban SSP schools in 2016. It is important to note that the evaluation has also included rural primary schools and post-primary schools, and a complete list of evaluation reports is available in Appendix 1 of this report and at www.erc.ie.

Recent evaluation findings

The most recent evaluation report (Kavanagh, Weir & Moran, 2017) described a variety of data collected from pupils and principals. Data collected from principals in focus groups and via questionnaires on their perceptions of the programme, and in particular the aspects of the programme which they perceived had led to improved pupil outcomes, were a major feature of that report. The report also described pupils' attitudes towards school and schoolwork, and their educational aspirations and expectations, as well as their achievements in reading and mathematics. The data were largely based on questionnaire and test data collected in 2016, but outcome data on pupils' attitudes and achievements on three previous occasions were also described for comparison purposes.

Tests have been administered to pupils at four grade levels (second, third, fifth and sixth) at three-year intervals beginning in 2007[2]. This allowed the performance of pupils at a particular grade level in 2007 - which for evaluation purposes may be regarded as baseline data - to be compared with their counterparts in 2010, 2013 and 2016. Results revealed that reading and mathematics achievements improved with each successive wave of testing at all four grade levels, and that much of the improvement between 2007 and 2016 was found among lower achievers. Results of the most recent round of testing in 2016 indicate that reading and mathematics achievements of pupils in primary schools in the SSP continued to improve. The average test scores achieved by pupils in 2016 were higher than those of their counterparts in previous years at all grade levels and in both reading and mathematics. Comparisons of test average scores in reading and mathematics data in 2013 (the most recent comparator) and 2016 revealed modest increases at all four grade levels at which the achievement tests were administered. These increases were slightly larger in mathematics than in reading. In relation to English reading, there was no change in the mean reading scores in either of the longitudinal cohorts (Second to Fifth class; Third to Sixth class) between 2013 and

1 For more information on the DEIS programme see http://www.education.ie/en/Schools-Colleges/Services/DEIS-Delivering-Equality-of-Opportunity-in-Schools-/DEIS-Supporting-Information/Supports-to-DEIS-Schools.html

2 The exception related to Fifth class which was added to the testing programme in 2010 to provide a second longitudinal cohort (Second to Fifth).

2016. In mathematics, there was an increase in the average score of the Second – Fifth longitudinal cohort from 2013 to 2016, but there was a decrease for the corresponding Third – Sixth cohort. As on all previous testing occasions, the 2016 average reading and mathematics scores of pupils in Band 1 schools were lower than those in Band 2 schools at all grade levels, reflecting greater levels of disadvantage in the former sample of schools. The data also revealed that average scores in Band 1 schools remain considerably below national norms, but the average scores of pupils in Band 2 schools approached or surpassed national norms in several instances, particularly in mathematics. The finding that pupils in Band 1 schools consistently had lower average test scores than those in Band 2 schools serves to validate the process used to identify schools for inclusion in the programme in 2005.[3]

School attendance is also an important pupil variable, and evaluation data indicate that average attendance improved on each testing occasion since 2007. Pupil attitudes were also assessed, and analysis revealed that the proportions of pupils reporting that they like school have increased substantially over that period at all grade levels. This suggests that the gains in mathematics and reading scores observed from 2007 to 2016 had not accrued at the expense of pupils' enjoyment of school. Similarly, pupils' educational aspirations (how far they would like to go in education) and expectations (how far they think they will actually go in education) have increased with each round of testing. However, there appears to be scope for further raising expectations, as a substantial gap remains between pupils' aspirations and their expectations.

Placing the findings in context

The analyses undertaken for the current report were carried out with a view to better understanding the achievements of pupils in urban SSP schools in 2016 in the context of home, school, and other factors. Data from a wide variety of sources including pupils themselves, their parents and their teachers will be among the data used to examine the impact of a wide range of factors on pupil outcomes.

There is an extensive international literature on the impact of home, school, and individual pupil factors on academic outcomes. There is also a wealth of relevant data from studies carried out in Ireland. For example, the most recent national assessments in Ireland identified a range of home background, school, and individual pupil factors that impacted on reading and mathematics outcomes (Kavanagh, Shiel & Gilleece, 2015). The findings were consistent with those of the international literature, and indicated, for example, that higher achievement is associated with higher socioeconomic status (SES) and parental educational level. Achievement was also found to be associated with family structure: pupils from lone-parent families and who had four or more siblings tended to have lower achievements than those from two-parent households and from homes with fewer siblings. Higher achievement was found among pupils whose homes provided a greater range of educational resources. In surveys, the number of books in the home is an often-used proxy for this 'educational home atmosphere' measure either alone or in combination with information on the family's reading habits and library use. In the national assessments, pupils from homes with more books and greater frequency of reading tended to have better achievement outcomes.

Achievement is also related to individual pupil characteristics. Positive attitudes towards school and reading (e.g., liking school and enjoying reading) and high educational aspirations (e.g., wanting

3 Schools with the highest assessed levels of disadvantage were assigned to Band 1 and those with lower levels were assigned to Band 2. For more detail on the 2005 identification process at primary level, see Archer & Sofroniou (2008).

to attend college or university) are related to better outcomes. Pupils' engagement in extracurricular activities is also related to achievement outcomes, with those who spend large amounts of time engaged in certain activities (e.g., using the internet, playing with friends) achieving lower scores than those who engaged in these in moderation. Access to technology is related to reading and mathematics scores, with pupils who have their own mobile or smartphone, or a television in their bedroom, achieving significantly lower test scores that those that did not.

A recent review of the literature aimed at identifying strategies that have been successful in addressing educational disadvantage identified a range of factors associated with positive student outcomes (Weir, Kavanagh, Kelleher & Moran, 2017). Many of the strategies identified as effective such as providing additional funding and staffing, a focus on literacy and numeracy, curriculum innovation, and parent involvement, and the provision of professional development activities for teachers, are already features of the SSP. Others, such as providing good quality preschool experience for the children who go on to attend primary schools in the SSP is not, although it was originally planned that it be provided as part of the programme. An item in the questionnaire for parents that asks whether their child attended preschool and for how long will be used to explore the relationship between attending preschool and later outcomes. The literature review also underscored the importance of levels and types of parental involvement for improved outcomes among pupils from disadvantaged backgrounds. While all schools in the SSP have access to the Home-School-Community-Liaison (HSCL) scheme which is designed to strengthen links between the school and home, the association between various types of parent involvement on pupil outcomes can be examined for the present report using items from the parent questionnaire.

Chapter 2:
The collection of data

This chapter outlines the methodology involved in the collection of data from pupils, their parents and their teachers in the spring of 2016. First, a description of the sample of schools and pupils involved in the 2016 phase of data collection is provided. This is followed by a description of the test and questionnaire instruments administered. The final section describes the procedures used to collect data.

The sample of schools and pupils

At the beginning of the evaluation in 2007, the decision was made to test pupils in a sample of the 340 participating urban SSP schools. A sample size of 120 schools was deemed necessary to provide reliable estimates of achievement at each grade level. The sampling frame was designed to represent different types of schools in the programme (e.g., large, medium and small schools; English-medium and Irish-medium schools)[4]. In 2007, a decision was made to test all pupils at each grade level, rather than a sample of pupils or classes. This was primarily to facilitate the longitudinal component of the study, maximising the chance of recapturing Second and Third class pupils when these pupils were in Fifth and Sixth class at the next round of testing. Of the original sample of 120 schools, 71 schools were in Band 1 and 49 were in Band 2. Two sample schools amalgamated between 2007 and 2010, and so 119 schools were involved in testing in 2010, and again in 2013. Between 2013 and 2016, a further school in the sample amalgamated with a non-SSP school and did not continue to provide test data. Therefore, of the initial 120 schools in the sample in 2007, 118 schools participated in the testing exercise in 2016, 70 of which were in Band 1 and 48 of which were in Band 2. Schools in the sample are a mix of junior, senior and vertical schools. In 2016, 98 schools had pupils at the Second class level, and 111 schools had Third, Fifth and Sixth class pupils.

Large numbers of pupils were involved in each administration of testing. Table 2.1 shows the total number of pupils in each grade level eligible for testing on the four successive testing occasions. In 2007, approximately 12,500 pupils were eligible for testing. From 2010 onwards, when Fifth class was added as a grade level, more than 17,000 pupils were eligible to complete the achievement testing. Table 2.2 shows the numbers of pupils who actually completed the testing on each occasion. In 2007, approximately 11,000 pupils participated in testing, while approximately 16,000 pupils participated in testing in 2010, 2013 and 2016.

Table 2.1: Numbers of pupils at each grade level in each testing cohort in 2007, 2010, 2013 and 2016

Grade level	2007	2010	2013	2016
Second class	3,599	3,717	3,356	3,616
Third class	4,544	4,657	4,636	4,580
Fifth class	-	4,628	4,683	4,370
Sixth class	4,434	4,597	4,511	4,506
All	12,577	17,599	17,186	17,072

4 For a more detailed explanation of the sampling design, see Weir and Archer (2011).

Table 2.2: Numbers of pupils5 at each grade level who completed testing in 2007, 2010, 2013 and 2016

Grade level	2007	2010	2013	2016
Second class	3,236	3,467	3,128	3,390
Third class	4,063	4,316	4,314	4,290
Fifth class	-	4,253	4,324	4,037
Sixth class	3,919	4,138	4,187	4,155
All	11,218	16,174	15,953	15,872

Absent and exempted pupils

Two groups of pupils did not participate in the achievement testing: those pupils who were absent on the day and those pupils who were exempted from testing by their teacher. Table 2.3 shows the percentages of pupils absent for the tests in each year, by grade level. It should be noted that levels of pupil absence fell from 10.8% in 2007 to 7.0% in 2016. These percentages also reflect the response rates for the pupil questionnaire which feature in the later chapters in this report.

Table 2.3: Percentages of pupils absent for testing at each grade level in 2007, 2010, 2013 and 2016

Grade level	2007	2010	2013	2016
Second class	10.1	6.7	6.8	6.2
Third class	10.6	7.3	6.9	6.3
Fifth class	-	8.1	7.7	7.6
Sixth class	11.6	10.0	7.2	7.8
All	10.8	8.0	7.2	7.0

Pupils could be exempted from testing by their teacher if they were diagnosed with a moderate to severe general learning disability, had a physical disability that would prevent them from participating, or their proficiency in English was at such a level that in the opinion of the teacher(s) they were unable to attempt the test. Table 2.4 shows the percentages of exempted pupils at each grade level for the four successive waves of testing. Teachers were advised that, when in doubt about whether or not to exempt a pupil, the default position was to include them. Levels of exemptions were low overall. They decreased between 2007 and 2010, and again between 2010 and 2013, and then increased marginally between 2013 and 2016.

Table 2.4: Percentages of pupils exempted from testing by their teachers at each grade level in 2007, 2010, 2013 and 2016

Grade level	2007	2010	2013	2016
Second class	2.3%	1.8%	0.8%	1.5%
Third class	1.7%	1.4%	0.8%	1.1%
Fifth class	-	1.9%	1.1%	1.2%
Sixth class	1.2%	1.1%	0.9%	0.9%
All	1.7%	1.5%	0.9%	1.1%

5 These numbers refer to pupils with reading test scores, but the numbers for mathematics are very similar.

Data sources

Instruments administered during data collection in the sample of schools

Five instruments were used in the collection of data. These were:

- The Drumcondra Sentence Reading Test (DSRT)
- A shortened version of the Drumcondra Primary Mathematics Test – Revised (DPMT-R)
- A Pupil Questionnaire
- A Parent Questionnaire
- A Pupil Information Form (for completion by teachers).

For each of the grade levels tested, a single test booklet was prepared containing the reading test, the mathematics test, and the pupil questionnaire. The content of these instruments is described below.

Reading Test

The Drumcondra Sentence Reading Test (DSRT), a test developed by the ERC for research purposes, was used to assess English reading. There are six levels of the DSRT, one for each grade level from First to Sixth class. Although there are two forms of the DSRT (A & B), only Form A was used to assess reading at Second, Third, Fifth and Sixth class levels in this study. The DSRT is a multiple-choice silent reading test. Pupils are asked to read 40 sentences, each of which has a word missing, and identify which one of four alternative words best completes a sentence.[6] At Level 2, pupils record their responses directly into their test booklet, while pupils taking Levels 3, 5 and 6 of the test use a separate machine-scorable answer sheet. The DSRT is a secure test, meaning pupils and teachers are not familiar with it. It is also a relatively short test to administer, taking approximately 35 minutes (including time for distributing materials and completing examples). The test has good reliability, with published reliabilities[7] of .93 at Second class, .92 at Third class, .89 at Fifth class, and .89 at Sixth class levels, respectively.

Mathematics Test

The Drumcondra Primary Mathematics Test-Revised (DPMT-R) is a standardised test developed by the ERC for use in primary schools. There are six levels of the test, to be used from First to Sixth class. Twenty-five items were selected from the 75 items of Form A of Levels 3, 5 and 6 of the DPMT-R to form the Third, Fifth and Sixth class tests used as part of the evaluation in SSP schools. Thirty items were chosen from Form A of Level 2 of the DPMT-R to form the test for Second class pupils. At each level, test items were chosen to achieve a balanced coverage of the mathematics curriculum in terms of content and process skills at each level. The shortened mathematics test takes approximately 50

6 For a more detailed account of the development of the DSRT, see Eivers, Shiel and Shortt (2004).

7 The reliability of a test provides an indication of the confidence one can place in a set of test results. The Kuder-Richard 20 (KR_{20}) reliability coefficient is reported as the measure of reliability in this report (for both the DSRT and the DPMT-R). KR_{20} coefficients provide a measure of the extent to which different parts of the test or different questions are measuring the same attribute. The calculation is based on the number of items in the test, the standard deviation of the total score, and the covariance of the items (ERC, 2006). Values of the KR_{20} coefficient range from 0 to 1. In general, a test should have a reliability of at least .7, and preferably closer to .9, to be considered useful (Aron & Aron, 1994).

minutes to administer and has reliabilities of .87, .87, .88, and .89 at Second, Third, Fifth, and Sixth class levels, respectively. For some items at Levels 5 and 6, pupils are allowed to use calculators (supplied by the ERC for use on the day). On the first testing occasion in 2007, Irish-medium schools were given the option of administering Irish language versions of the mathematics test but no school availed of this option. To maintain comparability over time, English-language versions were used in all schools on all subsequent testing occasions.

Pupil Questionnaire

An attempt to assess the relationship between achievement and pupil level factors has been a feature of the evaluation since 2007. While the choice of items has been informed by findings from the international and national literature described in brief earlier, some items in the evaluation of the SSP have been adapted from the questionnaires used in the national assessments so that direct comparisons are possible between a representative national sample in the national assessments and the SSP sample in which disadvantage is concentrated. Pupils at all four grade levels completed a questionnaire. Two versions of the questionnaire were designed. Third, Fifth, and Sixth class completed a 28-item questionnaire designed to elicit information on their attitudes to school, their scholastic self-evaluations, their leisure and reading activities, and their educational aspirations and expectations. The questionnaire for pupils in Second class was shorter and simpler, containing 12 items seeking information on pupils' self-evaluations, reading behaviour, leisure behaviour, and attitudes towards school. At all grade levels, questionnaire items and response options were read aloud to the pupils by the class teacher.

Many of the questionnaire items were used in each of the data collection exercises from 2007 onwards, and some items also featured in the national assessment of English reading and mathematics. This allows two kinds of comparison to take place, the first across cohorts in the SSP (e.g., comparing the attitudes of Sixth class in SSP schools in 2007 with Sixth class in SSP schools in 2016), and also a comparison with a nationally representative sample (e.g., comparing Sixth class nationally in 2014 with Sixth class in SSP schools in 2016). The 2016 questionnaires saw the introduction of a new set of items designed to reflect the increasing role of technology in the lives of schoolchildren. At Second class level, pupils were asked basic questions about their access to computers and mobile phones or smartphones, and the extent of their internet use. More detailed information was sought from pupils in Third, Fifth and Sixth class. While older pupils were also asked about their access to various forms of technology, they were asked to indicate the amount of time they spent daily engaging in various activities (e.g., streaming music or videos, playing electronic games, or communicating with friends online). In the questionnaire for pupils in Third, Fifth and Sixth class, several new items were introduced that sought to establish how involved pupils felt in the running of their schools. While pupils' responses to the new items could not be compared with those of previous cohorts, it was considered important to be able to take account of changes in the ways children spend their time and in how involved they felt in school life, and also to try to assess what impact those changes might have on other areas of their lives, including their achievements. Response rates for the pupil questionnaire were the same as those for the reading and mathematics tests, and ranged from 88.4% to 93.8% depending on year of testing and grade level (see Table 2.3). It is important to note that the response rate among Third class pupils in 2016 was 93.7%, as these data are used in the model of achievement described in Chapter 6.

Parent Questionnaire

In 2007, questionnaires were distributed to parents/guardians of pupils in Second, Third and Sixth class (i.e. all grade levels at which the tests were administered). In 2010, 2013 and 2016, only parents/guardians of Second and Third class pupils were asked to complete a questionnaire. This was to avoid asking parents of Fifth and Sixth class pupils to complete a very similar questionnaire to that which they had completed three years earlier. As with those administered in 2007, 2010 and 2013, the questionnaire administered in 2016 was informed by the literature and included questions on topics such as home literacy activities, parents' aspirations and expectations for their child's educational attainment, the extent of parents' involvement in the child's education, and home/family background factors, such as medical card status, parents' educational attainment and occupational status, and the main language of the home. However, as was the case with the pupil questionnaire, 2016 saw the introduction of some new items to the questionnaire for parents. These new items were designed to examine in more detail the extent to which parents were involved in their child's school (e.g., by participating on school committees) and in their child's education (e.g., by helping with homework or by communicating with the child's teacher about their progress). As with the new items in the pupil questionnaire, it was hoped that parents' responses to these items could be used in better understanding the role of parent factors in pupil achievement.

The response rates for the parent questionnaire were somewhat lower than for other instruments, and ranged from a low of 71.0% for the parents of Second class pupils in 2013 to a high of 75.7% for the parents of pupils in Second class in 2016. Of most importance in the present study is the response rate of 73.4% among parents of Third class pupils in 2016, data from whom are used in the model of achievement presented in chapter 6. It should be noted that it is not unusual for response rates to parent questionnaires to be lower than for other instruments that are administered as part of school-based studies, and this is more likely to be problematic in the case of schools catering for large numbers of pupils from disadvantaged backgrounds such as those in the SSP[8].

Pupil Information Form

Teachers of participating classes were asked to provide some background information about pupils in their classes. For each individual pupil, teachers were asked to indicate whether the pupil was exempted from testing (and if so, why), to indicate the number of school days attended in the first quarter of the year, to indicate if he/she was a member of the Traveller community, lived in a home where the main language used was neither English nor Irish, was in receipt of learning support or resource teaching in English reading or mathematics, and whether he/she received additional language support for English (EAL). Response rates were very high among class teachers competing the pupil information form. They ranged from a low of 93.3% for Third class pupils in 2013 to 100% for both Second class pupils in 2013 and for Fifth class pupils in 2016. The pupil information form was completed by 99.6% of teachers for the Third class pupil cohort in 2016 (i.e., those whose data are used in Chapter 6 to build a model of achievement).

8 In some cases, the failure to complete a questionnaire may be a result of an oversight, or lack of time. For others, failure to complete questionnaires may be a matter of principle (e.g., they fail to see the educational relevance of the information requested, or they resent the perceived invasion of their privacy). In other cases, parents' own difficulties either with literacy or with English may make completing such questionnaires challenging. Research has shown that children of parents who do not complete questionnaires on their home background score more poorly on achievement tests than those who do complete them (see, for example, Eivers, Shiel & Shortt, 2004) suggesting that the parents for whom there are no background data tend to be from more disadvantaged backgrounds than those that have data.

Other data sources

Pupil database

Some school level data were available from a primary schools database provided by the DES. Data contained in that database relate to characteristics of schools such as gender composition, total enrolment, and medium of instruction. The first two of these variables were used in the analyses that examined the impact of school-level factors on achievement.

Principal questionnaire

In 2011, all 119 schools in the sample of schools that had provided test data were visited by members of the evaluation team or their representatives. Principals were interviewed and asked about the planning process in their school, progress towards targets in a variety of areas including literacy, numeracy, and parent involvement, as well as more general aspects of DEIS and its impact in their school. During those visits they were also asked to complete a short multiple choice questionnaire on their time-use, management style, school climate and organisation, and challenges faced in running their school. Questionnaires were returned by 97% of principals (115 of 119), and data generated by some of the items are used in the analyses undertaken for the present report to examine the influence of school factors on pupil outcomes.

Procedure

Principals of all 118 sample urban schools were contacted in early 2016 to formally seek their participation in the 2016 round of testing. All schools agreed to participate, representing a 100% response rate at school level as on all previous occasions. Schools supplied details (name, date of birth, teacher) of all pupils in participating grades using a specially designed template that was emailed to them. The ERC had already obtained details of Second and Third class pupils in these schools on the previous testing occasion in 2013, and it was expected that these pupils would comprise the majority of Fifth and Sixth class pupils in 2016. As such, the template for Fifth and Sixth class was prepopulated with these names and details, which schools were asked to update (removing any pupils who had left the school and adding the details for pupils who had enrolled in the school since 2013), as well as providing details for current Second and Third class pupils (about whom the ERC had no prior information). The collection of pupils' and class teachers' details allowed for the preparation of test materials in advance. It permitted, for example, the pre-labelling of test booklets with pupils' names, gender and birth-dates and reduced the administrative burden on teachers and schools on the day of testing.

In May of 2016, class teachers administered the reading and mathematics tests and pupil questionnaires to pupils in their classes. They also distributed parent questionnaires to all pupils who were asked to request their parents to compete it before returning it to the school. In advance of testing, teachers were sent a test administration pack, including a manual detailing instructions for the administration of the tests, the Pupil Information Form (as described above), and a pupil tracking form for use on the day of testing to track absences and exemptions. Teachers were also advised that a specially trained fieldworker would be present in the school to oversee testing and to assist with any issues that arose. The assigned fieldworker brought all additional materials with them on the day of testing (test booklets, answer sheets, calculators, pencils, parent questionnaires, and envelopes).

All fieldworkers who were recruited were retired principals or inspectors who had previous experience of overseeing test administration for the ERC, and most had acted as fieldworkers in previous rounds of testing associated with the evaluation. Fieldworkers attended briefing sessions to prepare them for their roles, liaised with the schools assigned to them in advance of testing, oversaw testing in these schools, returned all materials securely to the ERC, and attended a debriefing session to report back to the ERC on the test administration process. As part of the debriefing session, fieldworkers completed a questionnaire that asked about their experiences of the testing process. Fieldworkers reported high levels of satisfaction with testing procedures and were confident that test administration standards were adhered to throughout. Due to the large volume of data collected, coding, scoring and cleaning of data was carried out over the summer of 2016 and results for individual pupils were sent to schools in September.

Chapter 3:
The School and Achievement

This chapter describes characteristics of the schools in the urban SSP evaluation sample in 2016, including gender composition, school size, language of instruction and attendance rates. Associations between school-level characteristics and pupil achievement in reading and mathematics in 2016 are outlined. Comparisons are made to findings from the 2014 National Assessments of English Reading and Mathematics. The chapter additionally aims to address the question of why some schools have experienced consistent and/or large improvements in their mean reading and mathematics scores over the course of the SSP evaluation while others have not. A qualitative exploration of principals' perceptions of determinants of improvements in their schools was published in Kavanagh, Weir and Moran (2017). Here, quantitative methods are used in an attempt to profile those schools that have seen consistent or large average score increases in reading and mathematics from 2007 to 2016. The chapter concludes with a brief summary.

Gender Composition

A majority of urban SSP pupils in 2016 (59-64%, depending on grade level) attended mixed gender schools. At each grade level, 16-19% of pupils attended boys' schools and 19-22% attended girls' schools[9]. There was some variation in achievement scores by gender composition, but no clear patterns of association across grade levels were observed (see Table 3.1). At the Third and Fifth class levels, pupils in girls' schools had significantly higher mean reading scores than pupils in boys' schools and those in mixed schools; gender composition was unrelated to mathematics achievement at these grade levels. At Sixth class, pupils in girls' schools had higher mean reading and mathematics scores than pupils in mixed schools, but did not differ significantly in either domain from pupils in boys' schools. School gender composition was unrelated to reading and mathematics scores at the Second class level.

Nationally, in NA '14, 82% of Second class pupils and 78% of Sixth class pupils attended mixed schools, with slightly higher proportions of pupils attending girls' schools (10-12%) than boys' schools (7-10%). School gender composition was not significantly associated with achievement in reading or mathematics at either of the grade levels (Second and Sixth class) at which the national assessments were administered.

School Size

Schools were categorised based on enrolment size, such that one third was classified as 'small' (fewer than 190 pupils), one third as 'medium' (190-304 pupils) and a third as 'large' schools (305 or more pupils). pupil achievement varied significantly by school size category. At each grade level, pupils in the largest one third of schools had significantly higher average achievement in reading and mathematics than pupils in the smallest third of schools (Table 3.1). In the case of Third and Sixth

9 Schools that were mixed in the infants or junior classes but had girls only from Second to Sixth class were classified as girls' schools.

class, pupils in medium-sized schools also scored significantly higher in mathematics, on average, than in small schools. However, there was a significant association between school size category and DEIS band, $\chi^2(2) = 10.7$, $p = .005$, which may account for this finding. Half of Band 2 schools were classified as large, compared to 21% of Band 1 schools.

Nationally, in 2014, school size was not significantly associated with achievement in either domain at either grade level.

Medium of Instruction

A small minority (2-4%) of urban SSP pupils in the sample attended Irish-medium schools. Given the low numbers of pupils attending Irish-medium schools, significance testing was not carried out on differences between their mean scores and those of their English-medium counterparts.

Nationally, in NA '14, 8% of Sixth class pupils and 11% of Second class pupils attended Irish-medium schools. Although these pupils had higher mean English reading scores than their peers in other schools, the differences were not statistically significant.

Table 3.1: School characteristics and mean reading and mathematics scores, by grade level

		Second Class			Third Class			Fifth Class			Sixth Class		
		%	Reading	Maths	%	Reading	Maths	%	Reading	Maths	%	Reading	Maths
Gender Composition	Girls*	22.5	97.8	96.3	19.1	97.1	97.5	19.2	98.0	99.1	18.8	95.8	97.5
	Boys	17.7	97.1	97.5	16.2	**94.8**	98.8	16.5	**96.0**	97.6	18.5	95.1	97.0
	Mixed	59.8	97.7	97.4	64.7	**96.6**	98.7	64.3	**96.5**	97.8	62.7	**94.0**	**95.1**
Medium of Instruction	English	96.0	97.6	97.3	96.8	95.7	98.6	97.4	96.6	98.0	97.7	94.5	95.9
	Irish	4.0	97.4	93.5	3.2	98.2	94.9	2.6	99.9	96.7	2.3	96.4	96.6
School Size	Small (<190)*	20.6	96.2	95.3	18.0	94.2	95.5	17.2	94.7	95.2	17.8	92.2	93.6
	Medium (190-304)	29.5	97.2	96.3	31.5	**95.7**	**98.4**	31.7	95.8	**97.5**	30.4	**93.8**	**95.4**
	Large (>305)	49.9	**98.4**	**98.2**	50.5	**96.3**	**99.6**	51.2	**97.9**	**99.2**	51.8	**95.8**	**97.0**

Mean scores in bold differ significantly from those in the reference (*) category.

School Attendance Rates

Teachers were asked to indicate the number of days that each pupil in their class was in attendance at school in the first quarter of 2016, and for how many days the school was open during that period. From this information, average school percentage attendance rates were calculated. Overall, the average percentage attendance in schools in the sample was 92% (Table 3.2).

School attendance rate was significantly positively correlated with average school achievement at the Third, Fifth and Sixth class levels in both reading (r = .33, r = .37 and r = .24, respectively) and mathematics (r = .33, r = .34 and r = .28, respectively)

Average attendance rates were higher in Band 2 schools than Band 1 schools by about one percentage point.

Nationally, in NA '14, the average school attendance rate was 94% at both grade levels (Second and Sixth class). The average attendance rates in Band 1 and Band 2 schools that participated in NA '14 were 91% and 92%, respectively, and of urban non-DEIS schools was 94%.

School-level patterns of achievement change over time

As outlined in Chapter 1, the overall average reading and mathematics achievement of pupils at all grade levels in sample schools increased at every testing occasion from 2007 to 2016[10]. However, individual schools displayed different patterns of achievement change over this period. As shown in Table 3.2, no school showed consistent decreases in their average Second or Third class reading scores across testing occasions, and only one school experienced consistent decreases in average achievement at the Sixth class level. A quarter of schools experienced consistent increases in average Second or Third class reading from 2007 to 2016, and 16% of schools did so at the Sixth class levels.

Very small numbers of schools experienced consistent decreases in mathematics achievement across testing occasions from 2007 to 2016 (two schools at the Second and Third class levels, and one school at Sixth). Depending on grade level, 10-15% of schools in the sample experienced only increases in average mathematics scores from 2007 to 2016 (Table 3.3).

Table 3.2: Numbers and percentages of schools showing increases, decreases, and a mixed pattern of change in their average reading scores at each grade level from 2007 to 2016

	Second (n= 98)	Third (n=111)	Sixth (n=111)
All decreases	0 0%	0 0%	1 0.9%
Mixture	74 75.5%	73 74.8%	92 82.9%
All increases	24 24.5%	28 25.2%	18 16.2%

10 Fifth class is not included here as Fifth class pupils were only included in testing from 2010 onwards.

Table 3.3: Numbers and percentages of schools showing increases, decreases, and a mixed pattern of change in their average mathematics scores at each grade level from 2007 to 2016

	Second (n= 98)	Third (n=111)	Sixth (n=111)
All decreases	2 2%	2 1.8%	1 0.9%
Mixture	83 84.7%	98 88.3%	94 84.7%
All increases	13 13.3%	11 9.9%	16 14.4%

A series of chi-square and t-tests were performed in order to explore whether any school characteristics were significantly associated with patterns of achievement change[11]. None of the structural characteristics of schools tested (enrolment size, gender composition, medium of instruction) were significantly associated with achievement change pattern. In terms of compositional characteristics, neither DEIS status nor percentage of pupils whose parents were medical card holders were significantly related to pattern of achievement change from 2007 to 2016 in any instance. Additional variable characteristics of schools such as attendance rates and methods of organising learning support (i.e. the extent of in-class support versus withdrawal of pupils for class) were also examined and were also not significantly related to schools' patterns of achievement change in either domain at any grade level.

It should be noted that while this manner of classifying schools allows consideration of whether increases or decreases in mean scores have been consistent over time, it does not take into account the magnitude of any change in average achievement. It was therefore decided to also classify schools in a manner that did consider the size of school-level achievement over the course of the SSP evaluation. In a previous evaluation report, Archer and Weir (2011) used a benchmark of six raw score points to represent a large change (increase or decrease) in reading achievement, as this equated to just over two-thirds of a standard deviation at the Second and Third class levels and approximately three quarters of a standard deviation at the Sixth class level. Here, this criterion is also adopted as indicative of a large change in average reading scores.

As shown in Table 3.4, over one in five schools (21%) had an increase in average reading achievement of six raw score points (i.e. six additional correct responses on a 40-item test) or more at the Second class level from 2007 to 2016. No school experienced a decrease of equivalent magnitude over the same period. For Third and Sixth class, the corresponding proportions experiencing large achievement gains were 17% and 11%, respectively. The modal category at each grade level was an increase of 3 to 6 raw score points. Regardless of grade level, less than 4% of schools experienced a net decrease of three or more raw score points from 2007 to 2016.

11 Due to the very small numbers of schools who experienced all decreases in average achievement, the 'all decreases' and 'mixture of increases and decreases' categories were combined.

Table 3.4: Percentages of schools showing increases and decreases of varying magnitude in average raw reading scores from 2007 to 2016

	Second (n= 98)	Third (n=112)	Sixth (n=111)
Increase > 6	21.4	17.0	10.8
Increase 3-6	40.8	42.0	30.6
Increase between 0 and 3	27.6	29.5	37.8
Decrease between 0 and 3	8.2	8.9	17.1
Decrease 3-6	2.0	2.7	2.7
Decrease > 6	0.0	0.0	0.9
Total	100	100	100

For mathematics, where fewer items were administered and the standard deviation was smaller, a change of four raw score points, or approximately two-thirds of a standard deviation at each grade level, was taken as indicating meaningful change (as in Archer & Weir, 2011). At the Second and Third class levels, 17-18% of schools experienced increases of this magnitude over the course of the SSP evaluation, with 1-2% of schools experiencing equivalent decreases over this period (Table 3.5). The modal category at Second and Third class was an increase of 2-4 points in average mathematics achievement (33% at both grade levels), while at Sixth class, 23% experienced this magnitude of increase, compared to 26% of schools who fell into the increase of two or fewer raw score points.

Table 3.5: Percentages of schools showing increases and decreases of varying magnitude in average raw mathematics scores from 2007 to 2016

	Second (n= 98)	Third (n=112)	Sixth (n=111)
Increase > 4	17.3	18.0	27.3
Increase 2-4	32.7	33.0	22.7
Increase between 0 and 2	27.6	27.7	25.5
Decrease between 0 and 2	17.3	13.4	14.5
Decrease 2-4	3.1	6.3	7.3
Decrease > 4	2.0	0.9	14.5

Also of interest was whether there were significant associations between school characteristics and membership of these categories. Given the small counts in some cells, data were recoded prior to significance testing, such that a school was classified as either having had a net increase of six score points or more in reading or mathematics achievement at a particular grade level, or not having had such an increase. In most cases, school characteristics were not significantly associated with whether a school had experienced a large increase in average achievement. Exceptions were difficult to interpret due to their inconsistency across grades. For example, DEIS status was significantly

associated with having had a large increase in average mathematics achievement at Third class (29% of Band 1 schools experienced an increase of four or more raw score points, compared to just 4% of Band 2 schools; χ^2 (1) = 10.6, p < .001), but not with having had a large increase in mathematics at Second or Sixth class, and not at any grade level in reading. Similarly, the average attendance rate of schools who experienced a large increase in Second class reading was significantly higher than that of other schools, $t(91)=2.4$, $p=.02$, but at the Sixth class level, the attendance rate of schools who had experienced large improvement in mathematics was significantly ***lower*** than that of other schools, $t(108)= -2.3$; $p = .03$. What is clear is that there are no school-level characteristics on which data were available which are clearly and consistently related to whether a school has a) experienced consistent increases in average achievement across testing occasions or b) a large net increase in average achievement across the period of the SSP evaluation.

Summary

This chapter examined attributes of schools in the urban SSP evaluation sample and explored their associations with pupil achievement in 2016, and with school-level changes in achievement over time. Pupils in urban SSP schools are more likely to attend single sex schools than pupils nationally and are less likely to attend Irish-medium schools. School size was significantly associated with pupil achievement in 2016, with pupils in the largest one third of schools having significantly higher average achievement than pupils in the smallest third of schools, at all grade levels and in both domains, although this was probably related to the larger size of schools in Band 2, in which disadvantage is less concentrated. Average school attendance was marginally higher in Band 2 schools than in Band 1 schools. Overall, average school attendance rates in SSP schools in 2016 were slightly lower than those nationally in 2014. School percentage attendance rate was significantly but weakly positively correlated with school-level achievement in reading and mathematics in 2016. Schools were classified based on a) their pattern of achievement changes over each round of achievement testing and b) the magnitude of any net change over this period. Schools were much more likely to have experienced consistent increases than consistent decreases in average achievement since the introduction of the SSP, and were considerably more likely to have experienced net increases than net decreases over the period in question. No school-level characteristic was found to be reliably related to schools' changes in achievement over time.

Chapter 4:
The Pupil and Achievement

This chapter describes individual attributes of pupils in urban SSP schools who participated in the achievement testing conducted in May 2016, and considers achievement outcomes in English reading and mathematics in light of these attributes. Data are drawn primarily from responses to pupil questionnaires administered to Second, Third, Fifth and Sixth class pupils in conjunction with the achievement testing. As noted in Chapter 2, Third, Fifth and Sixth class pupils completed the same questionnaire. A different questionnaire was administered to Second class pupils; this questionnaire contained items that were simpler and more straightforward (typically containing fewer response options, for example), and contained fewer items than the questionnaire for pupils in higher grades. Additional sources of data include the parent questionnaire administered to parents/guardians of Second and Third class pupils, and information provided about individual pupils on a Pupil Information Form completed by class teachers.

This chapter has five main sections. First, gender differences in achievement are considered. Second, a number of background characteristics of urban SSP pupils are outlined. Third, pupils' receipt of additional support for learning is considered. The fourth section deals with levels of pupil engagement in out-of-school activities. Finally, pupils' access to and use of technology at home is described.[12]

Throughout the chapter, pupil attributes and behaviours are related to achievement. Where available, trends from the first collection of pupil data as part of the evaluation in 2007 are presented. Additionally, as there is some overlap in the instruments used to collect data in urban SSP primary schools in 2016 and those used in the most recent round of national assessments of English reading and mathematics in primary schools (carried out in 2014), it is possible to compare urban SSP pupils (in 2016) with pupils nationally (in 2014) on a number of the characteristics described in this chapter.

Achievement and Gender

In 2016, as in all previous rounds of testing, approximately half of pupils at each grade level were female. In relation to reading achievement, gender differences in favour of girls were observed at the lower grade levels; these differences can be characterised as small at both the Second class (d=.11) and Third class (d=.16) levels. At the Fifth and Sixth class levels, there were no discernible gender differences in reading achievement (Table 4.1). In relation to mathematics achievement in 2016, males had higher average scores than females at all four grade levels. The magnitude of the gap between the mean mathematics scores of boys and girls was small at each grade level (Cohen's d values ranging from .04 at Fifth class to .10 at Second class).

12 Note that pupils' attitudes towards school, reading and mathematics, as well as their educational aspirations and expectations were also assessed by the pupil questionnaires administered in 2016. These findings were outlined in a previous evaluation report (see Kavanagh, Weir & Moran, 2017).

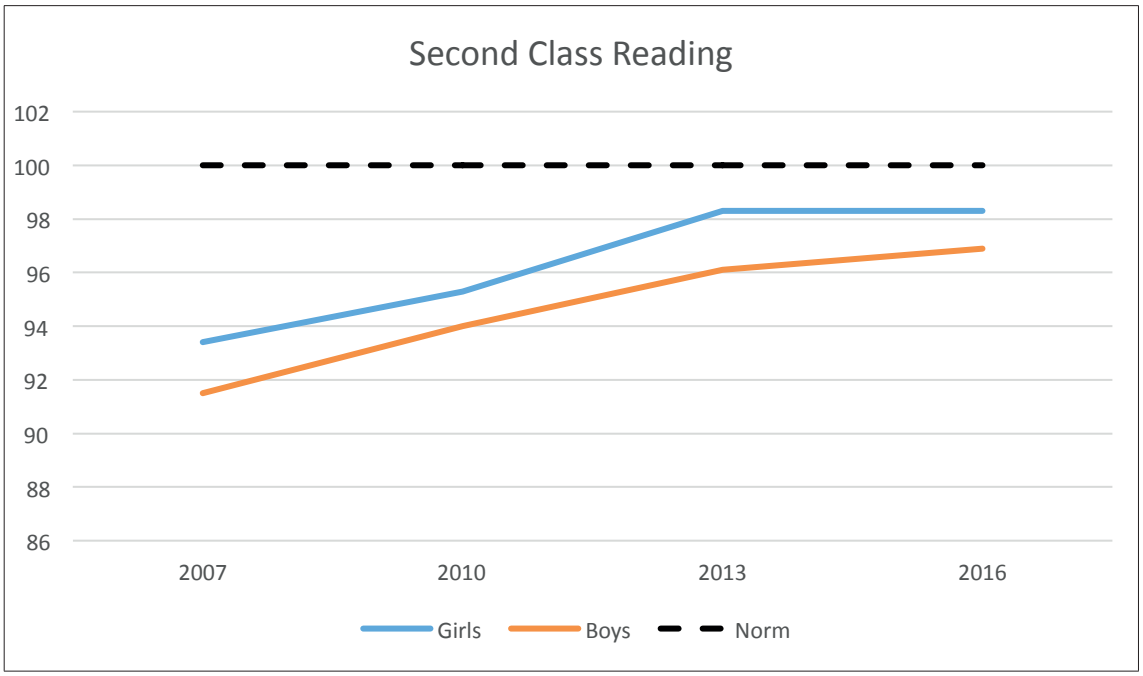
Table 4.1: Gender and mean reading and mathematics scores, by grade level[13]

		Second Class (*n*=3690)			Third Class (*n*=4647)		
		%	Reading	Maths	%	Reading	Maths
Gender	Female*	52.0	98.3	96.5	50.1	96.8	97.9
	Male	48.0	96.9	97.9	49.9	94.7	99.0
		Fifth Class (*n*=4443)			Sixth Class (*n*=4577)		
		%	Reading	Maths	%	Reading	Maths
Gender	Female*	50.8	97.0	97.5	49.4	94.6	95.3
	Male	49.2	96.5	98.5	50.6	94.6	96.5

Mean scores in **bold** differ significantly from those in the reference (*) category.

The following set of figures show mean reading and mathematics standard scores for 2007, 2010, 2013 and 2016, by gender. As shown in Figures 4.1 and 4.2, small gender differences in reading achievement were observed across all four rounds of testing at the Second and Third class levels. At both of these grade levels, differences were in favour of girls. The magnitude of the gender gaps in mean reading scores have remained reasonably stable over time at both Second and Third class.

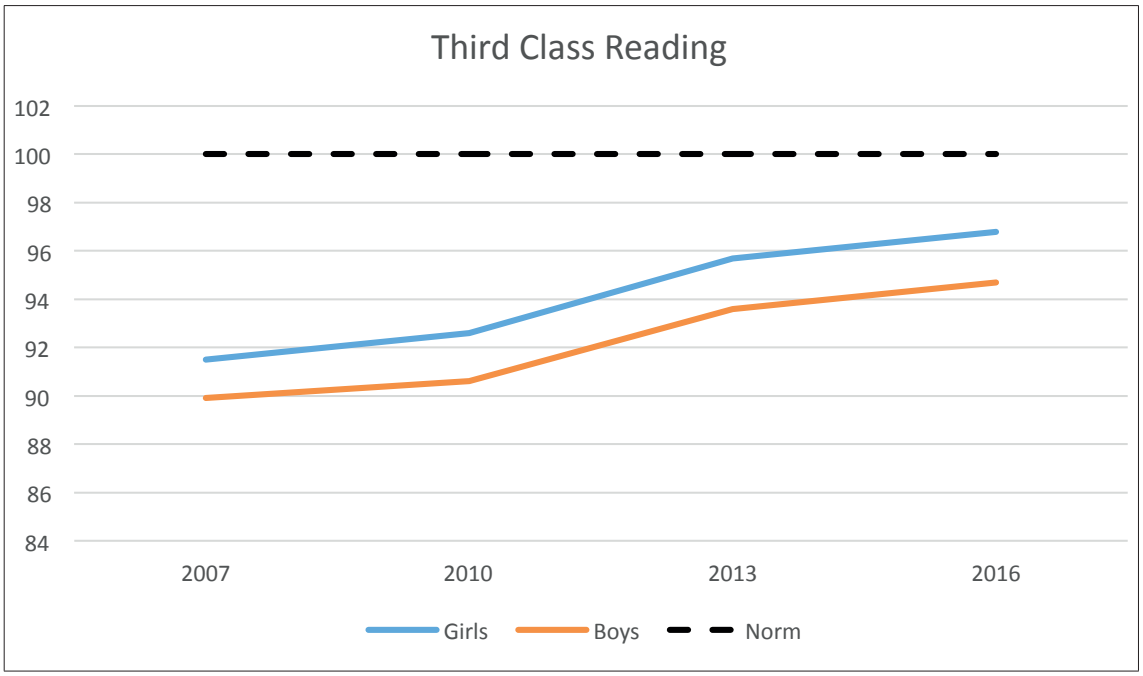
Figure 4.1. Mean reading standard scores of Second class pupils in 2007, 2010, 2013, and 2016, by gender[14]



13 Significance tests are not reported here due to the non-independence of the observations (due to the clustering of students within schools). See Chapter 6 for a more detailed explanation of this and for statistical analyses that take appropriate account of the clustered nature of the data.

14 The age of the test norms should be borne in mind when interpreting these mean scores. The DSRT was standardised in 2002 and the DPMT-R was standardised in 2006. The norms developed for these tests can now be considered old. Given documented increases in English reading and mathematics achievement nationally, it is likely that these tests now overestimate pupil achievement (Shiel et al., 2014). The DPMT has been redeveloped and will be standardised in 2018.

Figure 4.2. Mean reading standard scores of Third class pupils in 2007, 2010, 2013, and 2016, by gender



In contrast, there were no notable gender differences in reading achievement observed across the three rounds of testing for which there are Fifth class data (Figure 4.3), nor across the four years for which there are Sixth class data (Figure 4.4).

Figure 4.3. Mean reading standard scores of Fifth class pupils in 2007, 2010, 2013, and 2016, by gender

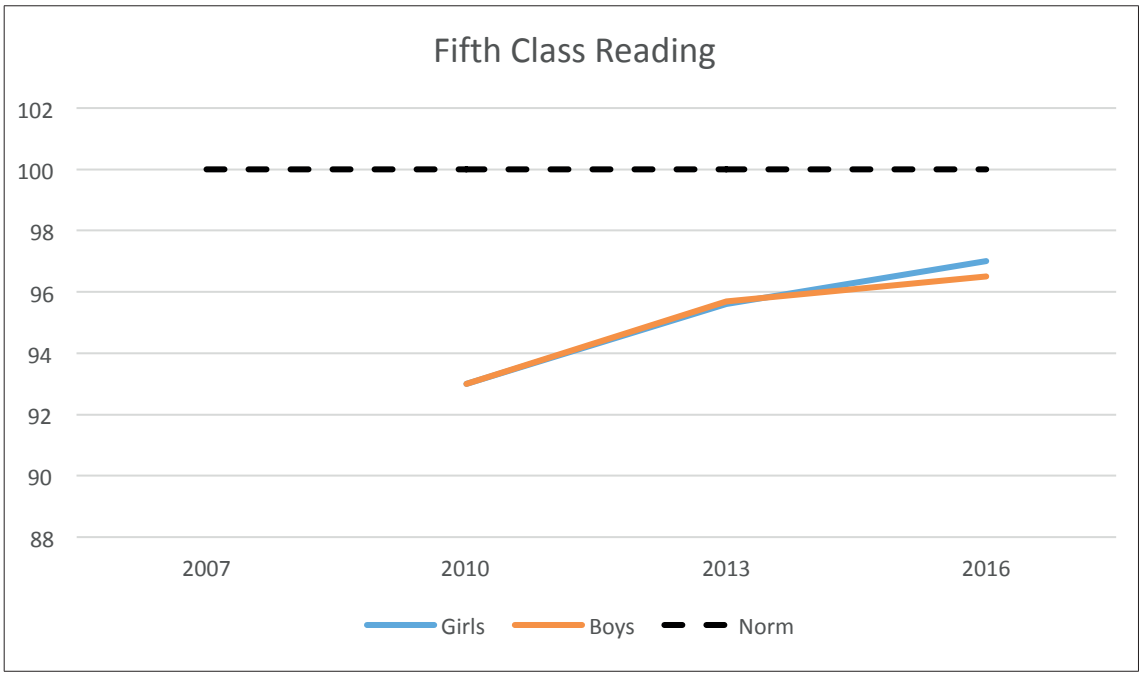
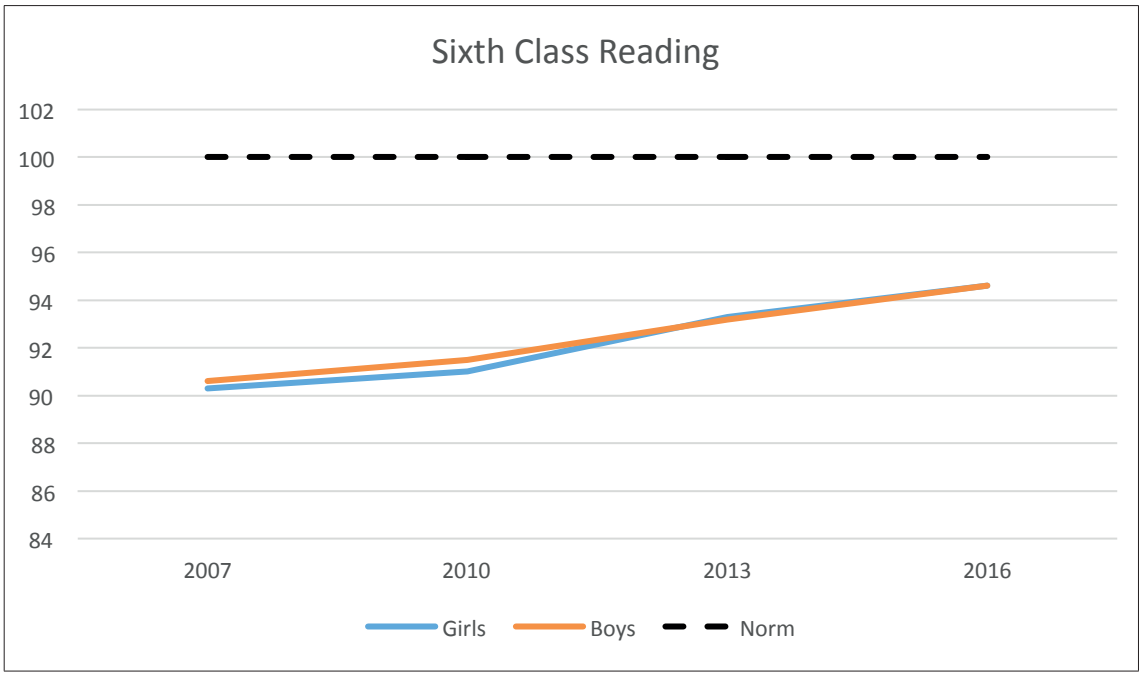


Figure 4.4. Mean reading standard scores of Sixth class pupils in 2007, 2010, 2013, and 2016, by gender



Small gender differences in mathematics performance were observed at all grade levels in each of the four years in which the tests were administered. In all cases, males outperformed females. At the higher grade levels, the gender gap was somewhat narrower in 2016 than it was in 2007 (Figures 4.7 and 4.8), while it appears to have widened at Second class (Figure 4.5), and to have remained stable at Third (Figure 4.6).

Figure 4.5. Mean mathematics standard scores of Second class pupils in 2007, 2010, 2013, and 2016, by gender

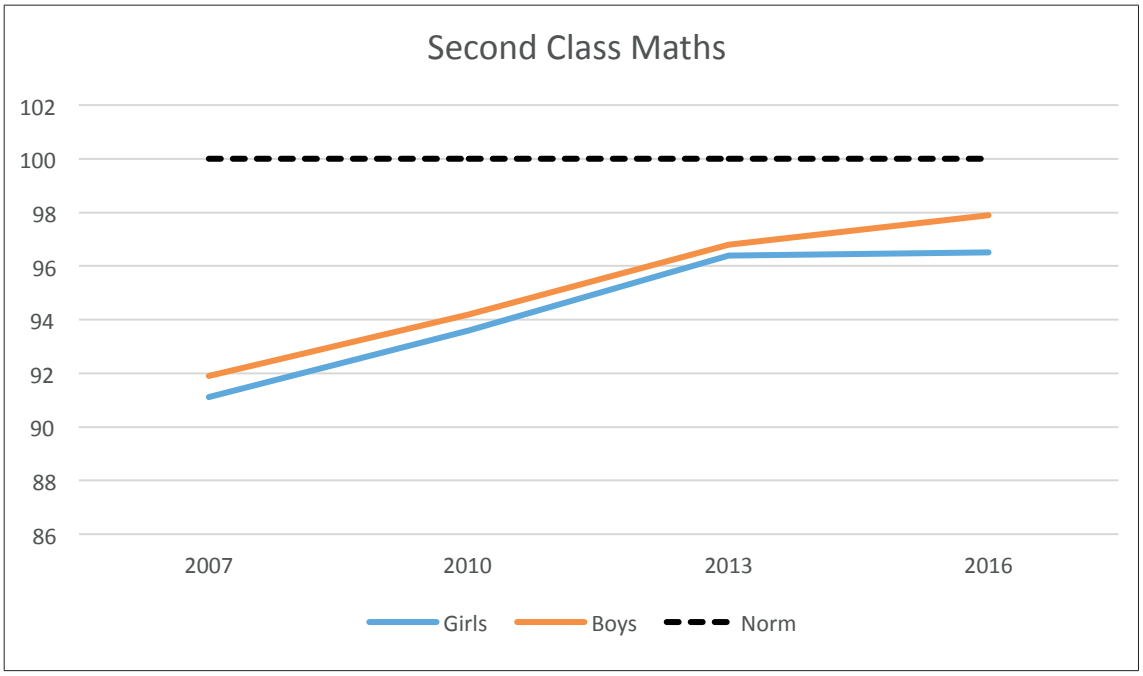


Figure 4.6. Mean mathematics standard scores of Third class pupils in 2007, 2010, 2013, and 2016, by gender

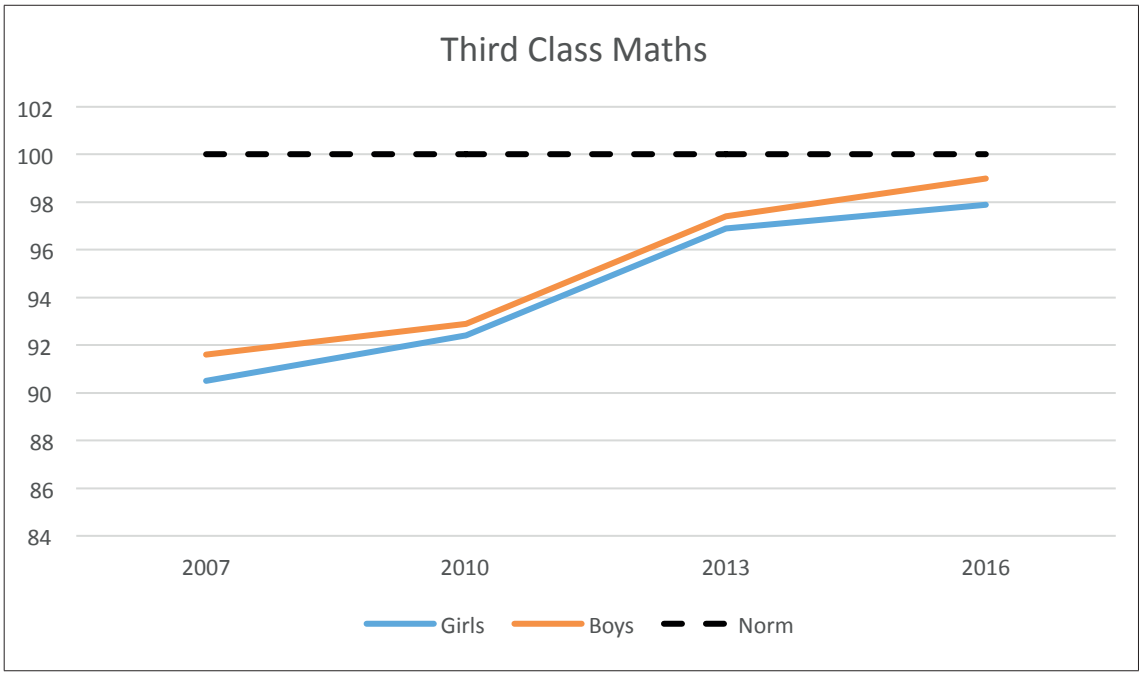


Figure 4.7. Mean mathematics standard scores of Fifth class pupils in 2007, 2010, 2013, and 2016, by gender

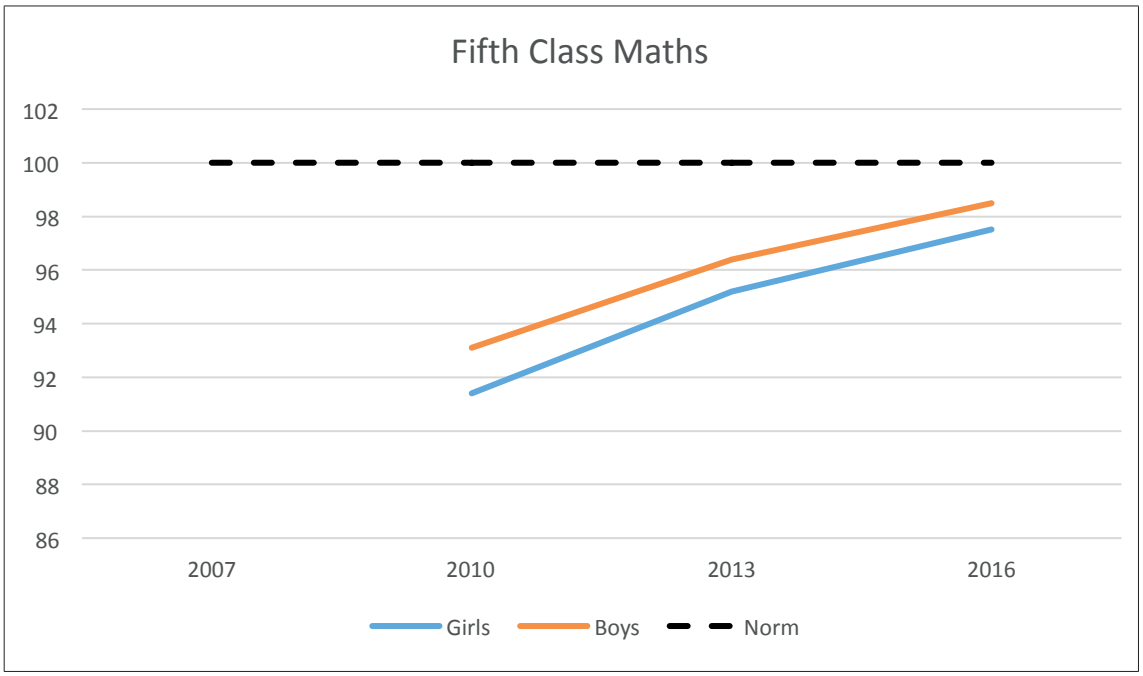
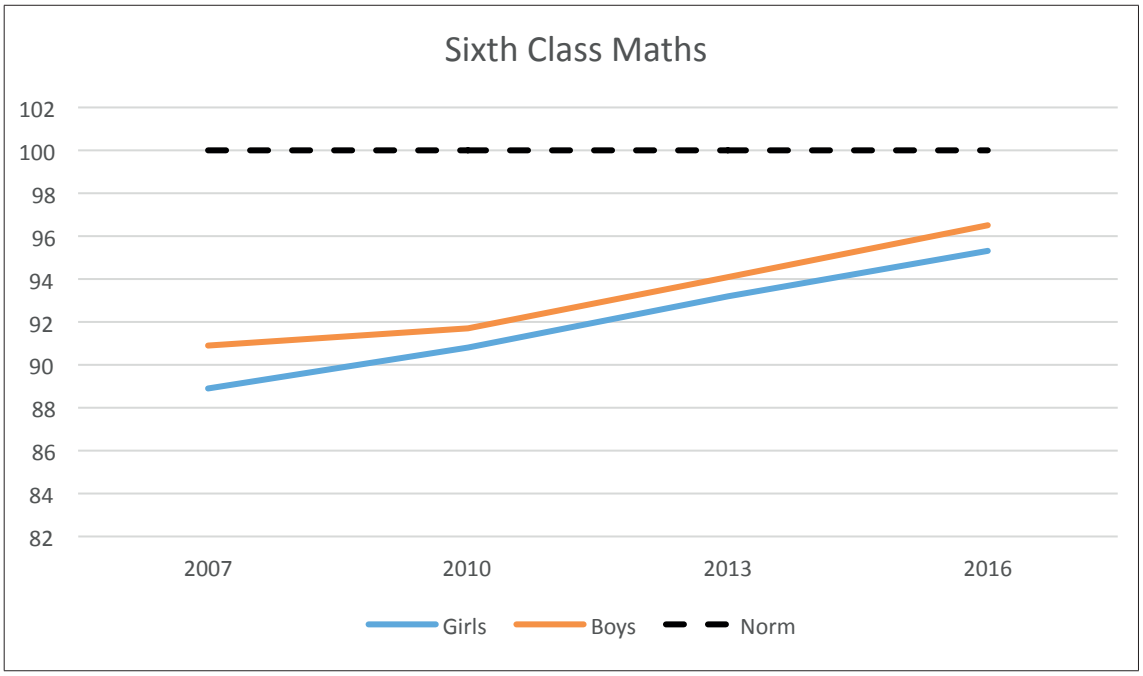


Figure 4.8. Mean mathematics standard scores of Sixth class pupils in 2007, 2010, 2013, and 2016, by gender



Achievement and Pupil Background Characteristics

Class teachers were asked to complete a Pupil Information Form which asked for some basic background information on pupils in participating classes.

Language of the Home

Teachers indicated for each pupil in their classes whether a language other than English or Irish was the main language used in his/her home. Table 4.3 presents the proportions of pupils participating in each round of testing from 2007 to 2016 whose families spoke a language other than English or Irish at home. As shown in the table, there were approximately twice as many additional language speakers at each grade level in 2016 as there were in 2007.

Table 4.2: Percentages of pupils who speak a language other than English/Irish at home, by grade level and year

Grade level	2007	2010	2013	2016
2nd class	9.2	17.1	15.0	16.8
3rd class	7.8	14.2	14.8	16.0
5th class	--	10.8	13.8	13.0
6th class	5.8	8.8	11.8	14.0

In 2016, percentages of pupils whose families spoke a language other than English or Irish at home ranged from 13% (Fifth class) to 17% (Second class). These pupils had lower average reading achievement than pupils who spoke only English and/or Irish at home, with gaps in mean scores ranging from two to five standard score points. The differences in average reading achievement between these subgroups of pupils was smallest at Sixth class (Table 4.3). There was little difference

in the mean mathematics scores of those Second class pupils who spoke only English/Irish at home and those who spoke a different language. At all other grade levels, those who spoke a language other than English/Irish at home outperformed their peers who did not, with observed gaps in average mathematics scores in the region of 3-4 standard score points.

Table 4.3: Home language and mean reading and mathematics scores, by grade level

		Second Class (*n*= 3667)			Third Class (*n*= 4647)		
		%	Reading	Maths	%	Reading	Maths
Language other than English/Irish	Yes	16.8	94.0	97.5	16.0	92.1	101.1
	No	82.5	98.3	97.1	84.0	96.4	98.0
		Fifth Class (*n*= 4445)			Sixth Class (*n*= 4582)		
		%	Reading	Maths	%	Reading	Maths
Language other than English/Irish	Yes	13.0	92.6	100.9	14.0	93.3	99.4
	No	87.0	97.3	97.5	86.0	94.8	95.3

In 2016, similar proportions of pupils in Band 1 (14-16%, depending on grade level) and Band 2 (12-18%) schools were identified by their teachers as coming from homes where a language other than English or Irish was spoken.

In the 2014 National Assessments of English Reading and Mathematics (NA '14), which were administered to nationally representative samples of Second and Sixth class pupils, 14% of Second class pupils and 12% of Sixth class pupils were from homes where a language other than English or Irish was spoken.

Achievement of Travellers and non-Travellers

At all four grade levels at which the achievement tests and questionnaires were administered, approximately 4% of pupils in 2016 were identified as members of the Traveller community by their teachers. As shown in Table 4.5, the proportion of Travellers attending urban SSP sample schools has changed little since 2007.

Table 4.5: Percentages of pupils who are Travellers, by grade level and year

Grade level	2007	2010	2013	2016
2nd class	4.2	3.7	3.9	4.3
3rd class	4.1	4.2	4.0	4.4
5th class	--	4.0	3.9	3.6
6th class	4.1	4.0	3.8	3.8

Pupils from the Traveller community in the sample had lower average achievement in both reading and mathematics than their non-Traveller peers, with gaps in average scores ranging from 10 points (Second class mathematics) to over 14 points (Fifth class reading and mathematics; Table 4.4).[15]

15 The mean scores of pupils from the Traveller community should be interpreted with caution given that the numbers of pupils involved are very small and that Traveller pupils were not explicitly sampled to be representative of the population.

Table 4.4: Membership of the Traveller community and mean reading and mathematics scores, by grade level

		Second Class (*n*= 3367)			Third Class (*n*= 4647)		
		%	Reading	Maths	%	Reading	Maths
Member of the Traveller community	No	95.7	98.0	97.6	95.6	96.2	98.9
	Yes	4.3	86.1	87.6	4.4	85.1	87.8
		Fifth Class (*n*= 4445)			Sixth Class (*n*= 4582)		
		%	Reading	Maths	%	Reading	Maths
Member of the Traveller community	No	96.4	97.1	98.4	96.2	95.0	96.3
	Yes	3.6	82.6	84.2	3.8	83.2	83.0

In 2016, similar proportions of pupils in Band 1 (4-5%, depending on grade level) and Band 2 (3-4%) schools were Travellers.

As equivalent information on Traveller ethnicity was not collected in the 2014 National Assessments, comparisons with the findings of that study are not possible in this instance.

Preschool Attendance

Parents of Second and Third class pupils were asked to indicate whether their children had attended preschool and, if so, for how long. The vast majority of pupils in Second class (93%) and Third class (92%) in 2016 had attended preschool. Lowest mean reading and mathematics scores were those of pupils who had not attended preschool. Differences in mean scores between pupils who attended preschool for one year and two years were small (1-2 points) and in favour of those who attended for two years, with the exception of mathematics scores at Sixth class, where there was no difference (Table 4.6). As this question was not asked on previous testing occasions, it is not possible to examine trends in preschool attendance among urban SSP pupils over time.

Table 4.6: Pupils' preschool attendance and mean reading and mathematics scores, by grade level

	Second Class (*n*= 2546)			Third Class (*n*= 3126)		
	%	Reading	Maths	%	Reading	Maths
Attended preschool for one year	55.7	98.4	97.7	53.7	97.1	100.4
Attended preschool for two years	37.1	99.8	99.4	38.4	98.0	100.3
Did not attend preschool	7.2	93.6	94.6	7.9	91.3	95.8
Total	100	98.6	98.1	100	97.0	100.0

Learning Support

Class teachers were asked to indicate whether each pupil received additional support for English reading, mathematics, or for English as an additional language (EAL).

Learning Support for English

At Second class, one in five pupils (20%) received learning support (LS) for English reading. Similar proportions received learning support for reading at the Third, Fifth and Sixth class levels (19%, 20% and 19%, respectively). At all four grade levels, higher proportions of boys received learning support for English reading than did girls (Table 4.7).

Table 4.7: Percentages of pupils in receipt of learning support for English reading in 2016, by grade level and gender

	Second (*n*= 3667)	Third (*n*= 4647)	Fifth (*n*= 4445)	Sixth (*n*=4582)
% boys accessing LS for reading	20.5	20.9	22.0	20.6
% girls accessing LS for reading	19.7	17.0	18.2	17.8
% all pupils accessing LS for reading	20.1	18.9	20.1	19.3

In NA '14, 13% of Second class pupils and 13% of Sixth class pupils nationally were estimated to be in receipt of learning support/resource teaching for English. At both grade levels in NA '14, boys were also more likely to receive such support than were girls (Kavanagh, Shiel & Gilleece, 2015).

Similar proportions of Band 1 and Band 2 pupils were in receipt of learning support for English reading, although the proportions were higher in Band 1 schools at all four grade levels (Table 4.8).

Table 4.8: Percentages of pupils in receipt of learning support for English reading in 2016, by grade level and DEIS band

	Second (*n*= 3667)	Third (*n*= 4647)	Fifth (*n*= 4445)	Sixth (*n*=4582)
% B1 pupils accessing LS for reading	20.6	20.2	22.0	19.5
% B2 pupils accessing LS for reading	19.5	17.2	17.7	19.1
% all pupils accessing LS for reading	20.1	18.9	20.1	19.3

The average reading scores of pupils in receipt of learning support for reading were considerably below those of pupils not receiving support, with gaps in the region of 15-16 standard score points, depending on grade level (Table 4.9).This indicates that, on the whole, learning support for reading in urban SSP schools is being provided to those pupils who need it most. Differences between the mean reading scores of boys and girls receiving learning support for reading were very small (less than one standard score point at all grade levels except Second class, where the difference was two points).

Table 4.9: Mean reading scores of girls, boys and all pupils receiving learning support for English reading, by grade level

		Second (*n*= 3667)			Third (*n*= 4647)		
		Girls	**Boys**	**All**	**Girls**	**Boys**	**All**
LS for reading	No	86.2	84.3	85.3	99.5	97.9	82.3
	Yes	101.1	100.1	100.6	82.5	82.1	98.7
		Fifth (*n*= 4445)			**Sixth (*n*= 4582)**		
		Girls	**Boys**	**All**	**Girls**	**Boys**	**All**
LS for reading	No	84.3	84.0	99.7	97.1	97.8	97.4
	Yes	99.6	99.9	84.1	83.4	82.4	82.9

The average reading scores of pupils in receipt of learning support in Band 1 schools were lower than their counterparts in Band 2 schools at all grade levels (Table 4.10), with gaps ranging from one point (Third class) to five points (Second class).

Table 4.10: Mean reading scores of Band 1 and Band 2 pupils receiving learning support for English reading, by grade level

		Second (*n*= 3667)			Third (*n*= 4647)		
		Band 1	**Band 2**	**All**	**Band 1**	**Band 2**	**All**
LS for reading	No	83.0	87.8	85.3	81.8	83.0	82.3
	Yes	99.1	102.2	100.6	97.2	100.6	98.7
		Fifth (*n*= 4445)			**Sixth (*n*= 4582)**		
		Band 1	**Band 2**	**All**	**Band 1**	**Band 2**	**All**
LS for reading	No	82.6	86.5	84.1	82.7	84.3	82.9
	Yes	97.9	101.9	99.7	95.2	100.0	97.4

Learning Support for Mathematics

Overall, fewer pupils at each grade level received learning support for mathematics than for reading. Similar proportions of boys and girls were in receipt of learning support for mathematics. At Second class, girls were slightly more likely to receive such support than boys, but the opposite was the case at each of the other grade levels (Table 4.11).

Table 4.11: Percentages of pupils in receipt of learning support for mathematics in 2016, by grade level and gender

	Second (*n*= 3667)	Third (*n*= 4647)	Fifth (*n*= 4445)	Sixth (*n*=4582)
% boys accessing LS for maths	17.0	16.4	17.9	16.9
% girls accessing LS for maths	18.7	15.6	15.1	14.1
% all pupils accessing LS for maths	17.9	16.0	16.5	15.5

In NA '14, 9% of Second class pupils and 9% of Sixth class pupils nationally were estimated to receive learning support/resource teaching for mathematics. At both grade levels, girls were slightly more likely to receive such support than were boys (Kavanagh, Shiel & Gilleece, 2015).

In relation to DEIS band, with the exception of Second class (where there is little difference), higher proportions of pupils in Band 1 schools received learning support for mathematics than pupils in Band 2 schools (Table 4.12).

Table 4.12: Percentages of pupils in receipt of learning support for mathematics in 2016, by grade level and DEIS band

	Second (*n*= 3667)	Third (*n*= 4647)	Fifth (*n*= 4445)	Sixth (*n*=4582)
% B1 accessing LS for maths	17.5	17.4	18.0	16.9
% B2 accessing LS for maths	18.2	14.3	14.6	13.9
% all pupils accessing LS for maths	17.9	16.0	16.5	15.5

The average mathematics scores of pupils in receipt of learning support for maths were much lower than pupils who were not. Gaps ranged from 13 (Second class) to 20 (Third class) standard score points (Table 4.13), suggesting that, on the whole, learning support for mathematics is being provided in urban SSP schools to those pupils who are lowest-achieving in mathematics. Differences between the mean mathematics scores of boys and girls receiving learning support for mathematics were very small (approximately one standard score point or less at all grade levels).

Table 4.13: Mean mathematics scores of girls, boys and all pupils receiving learning support for mathematics, by grade level

		Second (*n*= 3667)			Third (*n*= 4647)		
		Girls	Boys	All	Girls	Boys	All
LS for maths	No	86.5	86.3	86.4	81.3	82.2	81.8
	Yes	98.7	100.3	99.5	100.8	102.3	101.5
		Fifth (*n*= 4445)			Sixth (*n*= 4582)		
		Girls	Boys	All	Girls	Boys	All
LS for maths	No	83.0	82.2	82.6	80.0	81.2	80.7
	Yes	100.0	102.0	100.9	97.8	99.5	98.6

The average mathematics scores of Band 1 pupils in receipt of learning support for mathematics were lower than pupils receiving such support in Band 2 schools (Table 4.14), with score point gaps ranging from one (Third class) to five (Second class).

Table 4.14: Mean mathematics scores of Band 1 and Band 2 pupils receiving learning support for mathematics, by grade level

		Second (*n*= 3667)			Third (*n*= 4647)		
		Band 1	**Band 2**	**All**	**Band 1**	**Band 2**	**All**
LS for maths	No	84.2	88.7	86.4	81.2	82.6	81.8
	Yes	97.3	101.8	99.5	100.0	103.3	101.5
		Fifth (*n*= 4445)			**Sixth (*n*= 4582)**		
		Band 1	**Band 2**	**All**	**Band 1**	**Band 2**	**All**
LS for maths	No	81.6	84.2	82.6	80.0	81.7	80.7
	Yes	99.0	103.2	100.9	96.1	101.5	98.6

Language Support

Class teachers were asked to indicate whether each pupil was in receipt of EAL support. Percentages receiving such support ranged from 4-6%, depending on grade level (Table 4.15), with similar proportions of boys and girls accessing such support (the gender gap is largest at Third class, in favour of boys).

In NA '14, it was estimated that 2% of Second class pupils and 2% of Sixth class pupils received language support, indicating that rates of EAL support are 2-3 times higher in urban SSP schools in the evaluation sample than in primary schools nationally.

Table 4.15: Percentages of pupils in receipt of EAL support for English reading in 2016, by grade level and gender

	Second (*n*= 3667)	Third (*n*= 4647)	Fifth (*n*= 4445)	Sixth (*n*=4582)
% boys accessing EAL support	5.6	5.8	3.7	4.3
% girls accessing EAL support	6.0	3.3	3.9	3.1
% all pupils accessing EAL support	5.8	4.6	3.8	3.8

In relation to DEIS band, higher proportions of pupils in Band 1 school were in receipt of EAL support than in Band 2 schools (Table 4.16), but in both bands, higher proportions of pupils were found to access additional language support than pupils nationally in NA '14.

Table 4.16: Percentages of pupils in receipt of EAL support for English reading in 2016, by grade level and DEIS band

	Second (*n*= 3667)	Third (*n*= 4647)	Fifth (*n*= 4445)	Sixth (*n*=4582)
% B1 pupils accessing EAL support	6.0	5.5	4.2	4.7
% B2 pupils accessing EAL support	5.7	3.5	3.2	2.6
% all pupils accessing EAL support	5.8	4.6	3.8	3.8

Pupils at all grade levels who were in receipt of EAL support had lower average English reading and mathematics scores than their counterparts not receiving such support (Table 4.17). Gaps in mean scores were considerably larger for reading (12-13 points, depending on grade level) than for mathematics (4-6 points).

Table 4.17: Mean reading and mathematics scores of pupils receiving EAL support, by grade level

		Second (*n*= 3667)		Third (*n*= 4647)	
		Reading	**Maths**	**Reading**	**Maths**
EAL support	No	98.2	97.5	96.2	98.7
	Yes	86.6	92.0	84.5	93.5
		Fifth (*n*= 4445)		**Sixth (*n*= 4582)**	
		Reading	**Maths**	**Reading**	**Maths**
EAL support	No	97.1	98.1	95.0	96.1
	Yes	84.5	93.9	83.4	90.3

Out-of-School Activities

Pupils were asked to indicate the frequency with which they engaged in a range of activities outside of school time.

Pupils in Third, Fifth and Sixth class were asked about the frequency with which they read books at home for fun. Frequency of book reading varied by grade level. Pupils in Third class were more likely to read a book every day or almost every day at home (more than one in three) than Fifth class pupils (one in four), who were in turn more likely to do so than Sixth class pupils (one in five). Pupils who read books most days had higher mean reading and mathematics scores than pupils who read less frequently. It is notable that between 22% (Third class) and 26% (Fifth class) of pupils 'hardly ever or never' read books at home. These pupils had lower average achievement in both reading and mathematics than pupils who read books with greater frequency (Table 4.18).

Nationally, 43% of Sixth class pupils in NA '14 read stories or novels every day or almost every day at home, while 16% hardly ever did so (Kavanagh, Shiel & Gilleece, 2015).

Table 4.18: Frequency of reading books at home for fun and mean reading and mathematics scores, by grade level

	Third Class (*n*= 4247)			Fifth Class (*n* = 4011)			Sixth Class (*n*=4445)		
	%	**Reading**	**Maths**	**%**	**Reading**	**Maths**	**%**	**Reading**	**Maths**
Every day or almost every day	35.6	98.6	100.5	26.2	102.2	102.2	19.0	102.0	102.3
Once or twice a week	26.3	95.4	98.3	25.3	95.6	97.2	20.1	95.6	96.9
A few times a month	26.6	94.9	98.7	23.0	95.6	98.1	26.2	93.8	95.5
Hardly ever/never	21.5	92.4	95.7	25.5	93.3	94.5	24.8	90.6	92.1
Total	100	95.8	98.6	100	96.7	98.0	100	94.6	95.9

Pupils were also asked about the frequency with which they read magazines or comics. Pupils were more likely to say that they hardly ever or never read magazines or comics (44-47% of pupils selected this response option) than they were for books. In contrast to book reading, there was no clear association between frequency of reading magazines/comics and pupil achievement. For example, the average reading score of Fifth class pupils who read magazines/comics once or twice a week (97 points) was the same as that of pupils who did so a few times a month and that of pupils who hardly ever or never did so (Table 4.19). At Third and Sixth class, the lowest mean reading and mathematics scores were those of pupils who read comics/magazines every day or almost every day. At Sixth class, there was very little variation in average scores between those who read magazines/comics with varying degrees of frequency, particularly in relation to reading scores.

Table 4.19: Frequency of reading comics and magazines at home for fun and mean reading and mathematics scores, by grade level

	Third Class (*n*=4244)			Fifth Class (*n*=4012)			Sixth Class (*n*=4137)		
	%	Reading	Maths	%	Reading	Maths	%	Reading	Maths
Every day or almost every day	12.0	92.8	94.2	8.4	95.1	94.0	7.4	95.3	93.8
Once or twice a week	20.9	95.1	97.5	21.0	96.8	97.5	21.5	94.0	94.8
A few times a month	20.2	97.5	100.4	26.4	97.0	98.8	27.3	94.3	96.3
Hardly ever/never	47.0	96.3	99.4	44.1	96.8	98.5	43.8	95.0	96.7
Total	100	95.9	98.6	100	96.7	98.0	100	94.6	95.9

Third to Sixth class pupils were asked to indicate the frequency with which they played sports outside of school hours. Approximately half of pupils at each grade level (48%-52%) played sports every day or almost every day, making this the most common frequency at each of the three grade levels. Those pupils who played sport with moderate frequency (once/twice a week, a few times a month) tended to have higher average reading and mathematics scores than pupils who did so every day or almost every day, and higher than those who never did so, although the differences in average scores were small (Table 4.20). A minority of pupils (7-10%) of pupils at each grade level indicated that they hardly ever or never played sports outside of school hours.

Table 4.20: Frequency of playing sports outside of school hours and mean reading and mathematics scores, by grade level

	Third Class (*n*=4209)			Fifth Class (*n*=3998)			Sixth Class (*n*=4140)		
	%	Reading	Maths	%	Reading	Maths	%	Reading	Maths
Every day or almost every day	51.7	96.0	97.9	48.5	96.2	96.5	48.3	93.6	94.0
Once or twice a week	29.6	96.5	100.1	27.4	96.7	100.4	32.2	94.8	98.0
A few times a month	8.1	95.3	102.4	6.9	98.5	102.1	9.0	96.8	101.2
Hardly ever/never	10.6	94.0	98.2	7.1	98.6	98.7	10.4	96.5	97.8
Total	100	95.9	98.7	100	96.7	98.0	100	94.6	95.9

Pupils were asked to indicate how frequently they spent time 'hanging out' with friends outside of school hours. A majority (59-64%) indicated that they did so every day or almost every day. A small minority of pupils at each grade (7-10%) hardly ever did so. Pupils who spent time with friends outside of school with moderate frequency had higher average reading and mathematics scores than pupils who did so most days and pupils who rarely if ever did so (Table 4.21).

Table 4.21: Frequency of 'hanging out' with friends outside of school hours and mean reading and mathematics scores, by grade level

	Third Class (*n*=4198)			Fifth Class (*n*=3977)			Sixth Class (*n*=4119)		
	%	Reading	Maths	%	Reading	Maths	%	Reading	Maths
Every day or almost every day	64.3	95.4	98.2	61.7	94.8	96.4	59.1	92.4	94.8
Once or twice a week	18.3	97.0	100.4	21.4	99.8	100.4	23.9	97.3	98.7
A few times a month	8.0	98.8	102.6	9.4	100.9	102.1	10.1	99.6	101.6
Hardly ever/never	9.3	95.4	98.6	7.5	98.7	98.8	6.9	96.4	98.5
Total	100	95.9	99.0	100	96.8	98.0	100	94.6	96.6

Third to Sixth class pupils were also asked about their television watching habits. Just over a third of Third class pupils (35%) of pupils watched television for an hour or less on school days (Table 4.22), making this the most common duration of television watching for Third class pupils. At Fifth and Sixth class the most common amount of time spent watching television was one to two hours per day (35-36% of pupils). At Third class, nearly one in five pupils (19%) watched television for four or more hours per day on a school day; at Fifth and Sixth class, 14% of pupils did so. Pupils watching television for four or more hours per day have lower mean reading and mathematics scores than pupils who spend less time watching television.

A similar question was asked of Sixth class pupils in NA '14, although the four response options offered were slightly different in that study (No time/less than an hour/1-2 hours/more than 2 hours). Nationally, 41% of Sixth class pupils spent less than an hour watching television daily, compared to 26% of Sixth class pupils in urban SSP schools. Only 15% of Sixth class pupils nationally watched television for more than two hours, compared to 39% of urban SSP pupils.[16]

Table 4.22: Time spent watching television on school days and mean reading and mathematics scores, by grade level

	Third Class (*n*=4249)			Fifth Class (*n*=4017)			Sixth Class (*n*=4140)		
	%	Reading	Maths	%	Reading	Maths	%	Reading	Maths
0-1 hours	34.7	96.3	99.0	27.9	96.1	97.0	25.6	94.1	97.2
1-2 hours	29.8	96.9	100.7	35.0	97.6	99.0	35.9	94.5	97.3
2-4 hours	16.3	96.0	99.7	23.0	97.5	99.2	24.8	95.7	97.4
4 hours +	19.3	93.0	95.3	14.2	94.5	95.4	13.7	93.2	92.7
Total	100	95.8	98.9	100	96.7	94.6	100	94.6	96.7

16 That different response options to this item were offered across the two studies may have influenced pupil responses to some degree, and this should be borne in mind when comparing findings across studies.

Pupils were asked whether they were members of a series of different clubs and hobby groups. Membership of some groups or clubs varied by grade level. Older pupils were more likely to be members of youth clubs and online social networks, while younger pupils were more likely to be scouts/guides or to be involved in a dance or drama group. Membership of sports groups remained constant over the different grade levels, at 54-55% of pupils. Pupils who were members of youth clubs (15% - 28%) and homework clubs (17% - 23%) had lower average achievement in reading and mathematics than those who were not, at all three grade levels. In contrast, pupils who were members of musical groups such as a bands/choirs/orchestras had higher average scores in both domains than pupils who were not, at all grade levels (Table 4.23).

Table 4.23: Membership of clubs and groups and mean reading and mathematics scores, by grade level

		Third Class			Fifth Class			Sixth Class		
		%	Reading	Maths	%	Reading	Maths	%	Reading	Maths
Sports club	Yes	54.4	95.7	99.1	54.6	96.9	98.9	54.1	94.6	96.9
	No	45.6	96.0	98.2	45.4	96.6	97.2	45.9	94.6	95.0
An online social network	Yes	46.5	96.1	99.1	69.4	96.8	98.2	81.1	95.0	96.4
	No	53.5	95.7	98.4	30.6	96.5	97.7	18.9	93.0	94.3
Dance or drama group	Yes	26.4	96.1	97.5	22.3	96.2	97.4	16.7	94.5	95.0
	No	73.6	95.8	99.1	77.7	96.9	98.3	83.3	94.6	96.2
Homework club	Yes	23.2	92.1	93.4	19.6	93.0	93.0	17.1	91.0	92.1
	No	76.8	96.9	100.1	80.4	97.6	99.3	82.9	95.4	96.8
Band/choir/ orchestra	Yes	20.4	97.2	99.7	25.3	99.2	100.1	18.7	97.8	98.8
	No	79.6	95.5	98.4	74.7	96.0	97.4	81.3	93.9	95.3
Youth club	Yes	15.3	91.9	94.0	23.3	94.2	94.7	27.7	92.0	92.7
	No	84.7	96.5	99.4	76.7	97.5	99.0	72.3	95.6	97.2
Scouts/Guides	Yes	12.8	93.0	94.6	7.7	97.5	97.5	5.5	95.4	95.4
	No	87.2	96.2	99.2	92.3	96.7	98.2	94.5	94.6	96.0

Second class pupils were also asked about their engagement in out-of-school activities. Pupils at this grade level were asked to indicate whether they engaged in a series of leisure activities 'most days', 'some days' or 'never'. Over half of Second class pupils (55%) played sports on most days, and a third went to clubs or activities most days. While 39% of Second class pupils read a book for fun on most days, over a quarter (26%) indicated that they never did so.

For most of the activities listed, pupils who engaged in the activities with moderate frequency (i.e., on 'some days') had higher mean reading and mathematics scores than pupils who did so most days and pupils who never did so (Table 4.24). The exception to this pattern was reading a book for fun, although the lowest average scores were those of pupil who never read books for fun outside of school hours

Table 4.24: Frequency of various leisure activities (before or after school) and mean reading and mathematics scores, Second class

		Second class		
		%	Reading	Maths
Watch TV, videos, DVDs	Most days	50.6	98.0	97.6
	Some days	40.6	98.8	98.6
	Never	8.8	95.6	94.9
Play sports	Most days	55.3	97.4	97.5
	Some days	31.5	99.4	98.6
	Never	13.2	96.4	94.9
Go to activities or clubs	Most days	33.4	96.7	95.8
	Some days	30.1	99.5	99.9
	Never	36.5	97.6	97.2
Read a book for fun	Most days	38.8	98.1	97.0
	Some days	35.4	98.7	99.1
	Never	25.8	96.4	96.0
Play with friends	Most days	67.1	97.1	96.7
	Some days	25.6	99.7	99.4
	Never	7.3	97.8	97.9
Play by yourself	Most days	32.9	97.7	96.7
	Some days	35.7	99.7	100.2
	Never	31.5	95.9	95.2

Nationally, Second class pupils engaged in some of these out-of-school activities with similar frequency to Second class pupils in urban SSP schools. For example, while 55% of Second class pupils in urban SSP schools played sports on most days, 52% of Second class pupils in NA '14 did so. Similarly, while 33% of Second class pupils in urban SSP schools went to clubs/activities most days, 30% of Second class pupils nationally did so. A higher proportion of Second class pupils in urban SSP schools played with friends most days (67%) than did so nationally (58%). Also, urban SSP pupils were more likely to watch television/videos/DVDs most days (51%) than Second class pupils nationally (40%). Additionally, Second class pupils nationally were less likely to say that they never read a book for fun (15%) than Second class pupils in urban SSP schools (26%).

Technology Access and Usage

Pupils at all grade levels were asked about their access to technology at home. The vast majority of pupils at each grade level (93-95%) had a computer or tablet at home. These pupils had higher average achievement in reading and mathematics than the small minorities of pupils who did not (Table 4.25). Approximately two thirds of pupils at each grade level had a television in their bedrooms. These pupils had lower mean reading and mathematics scores than the minorities of pupils at each grade level who did not. The proportion of pupils owning a mobile phone or smartphone increased with grade level, with just over half (54%) of Second class pupils possessing such a phone, compared to 92% of Sixth class pupils. At all grade levels, pupils who did not own a mobile phone/smartphone had higher mean reading and mathematics scores than pupils who owned phones. Similar gaps were found between those pupils who owned personal music players and those who did not, although the proportions of pupils owning such devices did not depend on grade level (56-57% at each grade).

Similar proportions of urban SSP pupils had access to a computer at home as pupils nationally (95% of Second class pupils and 97% of Sixth class pupils in NA ’14). Despite being more socioeconomically disadvantaged on average than pupils nationally, urban SSP were considerably more likely to have a television in their bedrooms than were pupils nationally (43 - 48% in NA ’14, versus 64-68% in urban SSP schools). In both studies, having a television in the bedroom was associated with lower achievement in both reading and mathematics. While one third of Second class pupils nationally had a mobile phone/smartphone, 54% of Second class pupils in urban SSP schools did. In NA ’14, Second class pupils who owned a mobile/smartphone had lower average reading and mathematics scores than their peers who did not. At Sixth class, where the vast majority (93%) owned phones, no significant relationships with achievement were found.

Table 4.25: Technology at home and mean reading and mathematics scores, by grade level

		Second Class			Third Class			Fifth Class			Sixth Class		
		%	Reading	Maths	%	Reading	Maths	%	Reading	Maths	%	Reading	Maths
Computer or tablet	Yes	92.6	98.2	97.9	93.3	96.1	99.0	95.4	96.7	98.2	95.3	94.7	96.1
	No	7.4	93.0	91.2	6.7	92.3	92.9	4.6	97.0	93.8	4.7	92.5	92.4
Pupil has TV in bedroom	Yes	64.4	96.4	95.8	67.6	94.7	96.9	67.3	95.2	95.7	67.5	93.1	94.0
	No	35.6	100.0	100.0	32.4	98.2	102.0	32.7	99.8	102.9	32.5	99.8	100.0
Pupil owns mobile/ smartphone	Yes	54.1	96.5	95.8	64.3	94.5	97.1	82.7	96.1	97.3	91.7	94.4	95.8
	No	45.9	99.2	98.1	35.7	98.3	101.2	17.3	99.5	101.5	8.3	97.0	96.9
Pupil owns personal music player	Yes	56.7	97.2	96.8	57.1	94.5	97.3	57.4	96.1	96.4	56.4	94.4	94.7
	No	43.3	98.5	98.2	42.9	98.3	100.3	42.6	99.5	100.3	42.6	97.0	97.6

Third to Sixth class pupils were asked about the amount of time they spend on a range of online activities on a typical school day. For some activities, the amount of time spent varied by grade level. For example, 43% of Third class pupils spent no time messaging their friends online, compared to 26% of Fifth class pupils and 18% of Sixth class pupils (Table 4.26). In contrast, Sixth class pupils were more likely to say that they spent no time playing games on a device such as a phone (24%) than Fifth class pupils (17%) or Third class pupils (16%).

For all activities, at all grade levels, for both reading and mathematics, lowest average achievement was observed among pupils who spent four or more hours engaging in that activity. For some of the activities listed, proportions of pupils spending four or more hours on that activity each day were low. For example, just 7-13% of pupils indicated that they spent four or more hours streaming television or films daily. However, in other cases, substantial minorities spent this amount of time on online activities. For example, 26% of Third class pupils spent 4 or more hours streaming videos on an average day, 23% spent four or more hours playing electronic games on a device such as a phone, and 24% spent four or more hours per day playing games on a computer or console. For several of the listed activities (messaging friends, playing on a games console, streaming videos), there was little if any difference between the average achievement of pupils who spent up to an hour per day on that activity and those who spent no time on it. Taken together, these findings indicate that while large amounts of technology use are associated with lower achievement in both reading and mathematics, moderate amounts are not.

Table 4.26: Time spent on various online activities on school days and mean reading and mathematics scores, by grade level

		Third Class			Fifth Class			Sixth Class		
		%	Reading	Maths	%	Reading	Maths	%	Reading	Maths
Messaging friends	No time	43.3	97.1	100.7	26.3	98.7	100.1	17.5	96.9	98.3
	Up to 1 hour	22.8	97.7	101.1	29.0	98.6	100.5	25.5	96.0	98.3
	1-2 hours	12.0	96.0	98.9	18.4	96.5	97.9	21.0	94.5	95.6
	2-4 hours	8.5	93.7	95.3	13.2	94.1	95.2	19.1	93.7	95.0
	More than 4 hours	13.5	90.2	90.1	13.1	91.8	91.6	16.8	91.3	91.4
Streaming music	No time	37.5	97.4	100.7	32.6	99.5	101.0	25.2	99.5	99.2
	Up to 1 hour	26.9	97.7	101.3	30.3	97.2	99.3	30.2	97.2	97.0
	1-2 hours	13.2	94.0	97.1	16.0	95.5	97.1	18.0	95.5	94.6
	2-4 hours	9.7	93.8	95.9	11.0	94.7	94.8	14.6	94.7	93.6
	More than 4 hours	12.7	91.6	91.4	10.0	91.2	91.0	12.1	92.2	91.4
Streaming TV/movies	No time	27.8	97.3	100.8	30.4	100.2	101.9	31.6	97.4	99.5
	Up to 1 hour	26.9	97.7	100.9	27.3	97.0	98.4	25.0	95.0	96.8
	1-2 hours	19.5	96.7	99.4	21.6	95.7	97.8	22.4	92.9	94.7
	2-4 hours	12.5	93.3	96.1	12.2	93.7	94.1	13.7	92.2	92.3
	More than 4 hours	13.3	90.3	91.1	8.4	90.7	90.1	7.4	91.3	88.5
Streaming videos	No time	16.6	96.4	99.8	12.6	96.6	98.9	12.3	93.3	96.1
	Up to 1 hour	23.6	97.5	101.2	26.2	97.6	99.8	28.2	94.4	97.0
	1-2 hours	19.1	97.0	100.8	23.7	97.7	99.2	23.7	95.7	97.9
	2-4 hours	15.2	96.4	98.7	19.1	96.5	98.4	20.6	95.6	95.6
	More than 4 hours	25.5	93.0	94.4	18.5	94.8	93.6	15.3	93.1	91.4
Playing electronic games on devices (e.g. on phone, tablet)	No time	15.5	96.1	99.5	17.0	100.7	102.1	23.5	97.3	99.1
	Up to 1 hour	30.4	98.1	101.4	32.8	98.3	100.1	30.8	96.0	98.1
	1-2 hours	17.4	96.6	100.2	19.1	95.8	97.6	17.3	93.7	95.2
	2-4 hours	13.9	95.7	98.2	14.7	94.9	95.1	13.8	92.5	93.0
	More than 4 hours	22.8	92.4	93.9	16.4	92.4	93.0	14.6	90.5	90.0
Play computer games on a console	No time	33.4	97.2	99.7	37.0	97.7	99.7	41.0	95.7	97.3
	Up to 1 hour	19.1	97.7	101.2	18.6	97.1	98.8	18.5	94.7	96.1
	1-2 hours	12.2	96.4	100.6	15.2	97.1	98.7	14.4	94.6	97.1
	2-4 hours	11.7	95.8	98.8	13.9	96.4	97.2	13.4	94.3	95.8
	More than 4 hours	23.6	92.3	94.3	15.3	93.9	93.2	12.6	91.3	90.0

Second class pupils were asked to indicate whether they engaged in various activities 'most days', 'some days' or 'never'. Approximately half of Second class pupils played games on a device on most days, 44% played games on a computer or console most days, and 58% used the Internet at home most days. There was little variation in achievement by frequency of technology use. For mathematics, highest average scores were those of pupils who engaged in each activity on 'some days', although the gaps between the mean score of these pupils and the mean scores of other pupils were small.

Table 4.27: Frequency of technology use (before or after school) and mean reading and mathematics scores, Second class

		Second class		
		%	Reading	Maths
Play electronic games on a device	Most days	50.6	97.3	96.5
	Some days	29.9	99.2	100.0
	Never	19.5	98.0	97.5
Play games on a computer/games console	Most days	44.4	96.4	95.7
	Some days	29.1	99.2	99.9
	Never	26.6	99.4	98.4
Use the Internet	Most days	58.1	97.9	97.0
	Some days	27.3	98.3	98.9
	Never	14.6	96.8	97.0

Summary

Gender differences in achievement in 2016 were small, and in favour of girls for reading at the Second and Third class levels. No gender differences in reading achievement were observed at the higher grade levels. For mathematics, boys outperformed girls by a small margin at all grade levels, replicating a pattern that has been observed at all previous rounds of testing. A number of pupil background characteristics were associated with achievement in 2016. Pupils whose families spoke a language other than English or Irish at home had lower average achievement in English reading than their peers (at all grade levels) and higher average mathematics achievement than their peers at all grades except Second class, where the difference was negligible. There were higher proportions of EAL pupils in 2016 than was the case at the beginning of the evaluation. The average reading and mathematics scores of Traveller pupils were considerably lower than those of non-Travellers, at all grade levels. The proportion of pupils identified as Travellers in urban SSP schools has changed little since 2007. Pupils who had attended preschool for two years had higher achievement than those who had attended for one year or not at all. Pupils receiving learning support for reading and mathematics had considerably lower average achievement than those not receiving such support. Engagement in some out-of-school activities was associated with higher achievement (e.g. reading a book at home for fun, membership of a music group such as a choir or orchestra), while others were associated with lower achievement (large amounts of time spent watching television or 'hanging out' with friends, membership of youth clubs). On the whole, large amounts of technology use and time spent online were associated with lower achievement, while moderate amounts were not.

When comparing findings from urban SSP pupils to pupils nationally in NA '14, some differences were noted. There was a slightly higher proportion of EAL pupils in the urban SSP sample in 2016 than in equivalent grades nationally in 2014. There were higher rates of learning support in urban

SSP than the national sample of schools in NA ’14. Urban SSP pupils were more likely to have televisions in their bedrooms, to have mobile phones/smartphones, to spend more than two hours per day watching television and to hardly ever or never read books at home for enjoyment than pupils nationally. Each of these attributes/behaviours were associated with lower reading and mathematics achievement in both the SSP evaluation and the National Assessments.

Chapter 5:
Parent and Family Factors

This chapter considers home and family characteristics of pupils who participated in testing in 2016, and explores associations between these characteristics and achievement in English reading and mathematics. Data are drawn from responses to a questionnaire administered to parents/guardians of Second and Third class pupils in participating schools. The chapter has four main sections. First, demographic characteristics of responding parents and families are considered. Next, elements of home atmosphere are outlined. Third, parental aspirations and expectations for their children's educational attainment are described. Fourth, home support for children's learning is considered. Where available, trends over time are described. Comparisons with findings from the 2014 National Assessments of English Reading and Mathematics are made throughout. The chapter concludes with a summary.

Family Characteristics

Parents were asked to provide some basic demographic information about themselves and their families.

Just over one quarter of pupils (26-27%) at each grade level lived in homes where no parent was employed outside the home. These pupils had lower mean reading and mathematics and scores than pupils from homes where at least one parent was employed (at least on a part-time basis) (Table 5.1). Majorities of Second and Third class pupils (62-63%) had parents who were medical card holders. These pupils had lower average achievement in both reading and mathematics than pupils whose parents did not possess medical cards. Elements of family structure were also related to pupil achievement. Approximately one third (31-34%) of Second and Third class pupils lived in one-parent homes. These pupils had mean reading and mathematics scores that were lower than their counterparts living in two-parent homes. A minority of pupils (11% at Second class, 13% at Third) had four or more siblings. These pupils had lower average reading and mathematics achievement than pupils who had three siblings or fewer.

Table 5.1: Family characteristics and mean pupil reading and mathematics scores, by grade level

		Second Class			Third Class		
		%	Reading	Maths	%	Reading	Maths
Parent employed	Yes	74.3	99.8	99.8	73.3	98.4	102.0
	No	25.7	95.5	93.3	26.7	93.3	94.5
Lone parent	Yes	30.9	97.6	95.5	33.8	95.9	98.1
	No	69.1	99.1	99.2	66.2	97.7	101.2
Medical card	Yes	61.6	96.9	96.0	63.0	95.2	97.8
	No	38.4	101.3	101.4	37.0	100.1	103.8
No. of siblings	0 to 3	89.0	99.1	98.4	87.3	97.7	100.9
	4 or more	11.0	94.5	95.2	12.7	92.6	93.9

Nationally, in NA '14, 14% of Second class pupils lived in families where no parent was employed, 19% lived in one-parent households and 36% had parents who were medical card holders. These findings indicate that pupils in urban SSP schools remain more socioeconomically disadvantaged, on average, than pupils nationally in Ireland.

Similarly, while under a quarter (22-23%) of urban SSP pupils at each grade level had parents who held a third-level degree or higher, the corresponding figure in NA '14 was 37% for both Second and Sixth class pupils. There were clear associations between parents' educational attainment and pupil achievement in reading and mathematics in both studies. Lowest average scores were observed for those Second and Third class urban SSP pupils whose parents had never sat a State examination (5%), while highest mean scores were observed among those pupils whose parents had a postgraduate qualification (4%) (Table 5.2).

Table 5.2: Parents' educational attainment and mean pupil reading and mathematics scores, by grade level[17]

	Second Class (*n*= 2488)			Third Class (*n*= 3041)		
	%	Reading	Maths	%	Reading	Maths
Never sat an exam	4.7	92.0	90.9	4.8	89.2	90.5
Junior/Inter/Group Certificate	13.9	94.4	92.5	14.0	94.4	95.8
Leaving Certificate or equivalent	26.1	98.4	96.7	26.5	95.9	99.1
Short course or diploma (not third-level)	2.3	98.2	98.3	2.7	98.5	98.2
Third-level cert or diploma (not degree)	29.6	99.7	99.2	30.4	98.6	101.6
Third-level degree	19.5	101.4	102.0	18.1	99.7	103.9
Postgraduate degree or diploma	3.9	105.0	107.3	3.5	103.3	107.5
Total	100	98.8	98.1	100	97.2	100.1

Parents were asked to indicate the main language spoken in their homes. For approximately three quarters of pupils (75-77%), this language was English. For less than 2% of pupils, Irish or a combination of English and Irish were the main languages of the home[18]. For 13% of pupils at each grade level, the main language of the home was a language other than English or Irish. These pupils had mean English reading scores that were lower than those of pupils whose main home language was English/Irish and mean mathematics scores that were higher than pupils whose main home language was English/Irish (Table 5.3). An additional 10% indicated that both English and another language (not Irish) were the main languages of the home.

17 Where a respondent indicated their own highest level of education and that of their spouse/partner, the higher of the two was selected.

18 Participants were asked to select one of three options to indicate the main language of their home. These options were 'English', 'Irish', 'a different language (please specify)'. However, given that over 10% of respondents selected more than one option, the combinations 'English and Irish' and 'English and a different language' are reported here.

Table 5.3: Main language(s) of the home and mean pupil reading and mathematics scores, by grade level

	Second Class (*n*=2547)			Third Class (*n*=3134)		
	%	Reading	Maths	%	Reading	Maths
English	75.3	99.5	98.0	77.2	97.9	99.4
Irish	0.2	101.0	97.8	0.2	84.6	84.4
Another language	13.4	94.6	98.9	12.5	93.4	104.7
English and Irish	1.2	97.3	94.5	1.1	92.5	94.0
English and another language	9.9	98.0	97.5	9.1	95.0	99.6
Total	100	98.6	98.1	100	96.5	100.0

Home Atmosphere and Resources

Parents were asked to provide information on elements of home atmosphere. Here, the term 'home atmosphere' is used to refer to the degree to which a home environment has features that are supportive of academic achievement.

One indicator of a supportive home atmosphere that has been considered in many previous studies is the number of books in the home. There were clear associations between the number of books in the homes of Second and Third class pupils in the present study and pupil achievement in both reading and mathematics, with differences of over a standard deviation in mean scores between those pupils with no books at home and those with more than 250 books in their homes (Table 5.4). Just 3% of Second and Third class pupils lived in homes were there were no books, compared to 1% of Second class pupils nationally in NA '14. At the opposite end of the scale, 5-7% of pupils lived in homes where there were more than 250 books. In NA '14, one quarter (25%) of Second class pupils lived in homes where there were more than 250 books.

Table: 5.4 Number of (printed) books in the home and mean pupil reading and mathematics scores, by grade level

	Second Class (*n*= 2463)			Third Class (*n*= 3029)		
	%	Reading	Maths	%	Reading	Maths
None	3.4	90.9	91.8	3.3	90.2	90.3
Between 1 and 10	20.8	94.3	93.6	19.8	93.1	96.0
Between 11 and 50	35.6	98.3	97.3	35.3	96.8	99.3
Between 51 and 100	19.8	100.8	100.2	21.3	98.8	102.1
Between 101 and 250	13.0	102.9	103.2	13.0	102.0	104.8
More than 250	7.4	105.5	105.5	5.4	105.0	106.3
Total	100	98.9	98.3	100	97.2	100.2

Parents were asked to indicate whether any members of their families were members of a public library. Just under three quarters (71-73%) of pupils were from families where there was at least one library member. These pupils had higher average reading and mathematics achievement than their peers from families with no library members.

Table 5.5: Family membership of public library and mean pupil reading and mathematics scores, by grade level

	Second Class (*n*= 2551)			Third Class (*n*= 3138)		
	%	Reading	Maths	%	Reading	Maths
Yes	73.1	99.6	98.6	71.3	98.2	100.9
No	26.9	96.1	96.6	28.9	94.1	97.9
Total	100	98.6	98.1	100	97.0	100.0

Parents were asked to indicate whether their child had access to a range of educational resources at home. Over three quarters of Second and Third class pupils (75-77%) had educational games at home, over half (52-59%) had reference books at home, and 69-71% had a computer at home (not including a games console). In each case, those in possession of these resources at home had higher average reading and mathematics achievement than pupils who did not, with gaps ranging from 2 to 5 standard score points (Table 5.6).

Table 5.6: Educational resources at home and mean pupil reading and mathematics scores, by grade level

		Second Class			Third Class		
		%	Reading	Maths	%	Reading	Maths
Educational games (incl. software)	Yes	77.1	99.4	98.8	75.4	97.5	100.8
	No	22.9	96.0	95.5	24.6	95.5	97.5
Reference books	Yes	52.4	100.8	100.1	59.4	98.8	102.0
	No	47.6	96.2	95.8	40.6	94.4	97.1
Computer (not games console)	Yes	68.6	99.3	98.9	71.2	98.0	101.4
	No	31.4	97.1	96.2	28.8	94.5	97.1

Parents were asked to provide information about their own reading habits by indicating the frequency with which they read different types of material. More frequent parental reading of books was associated with higher pupil reading achievement, while more frequent reading of magazines was associated with lower reading achievement (Table 5.7), echoing findings presented in Chapter 4 about pupils' own reading habits. Just under a fifth of pupils (18%) at each grade level had parents who hardly ever or never read books, while more than a quarter (27%) at each grade level had parents who did so most days or every day.

Table 5.7: Frequency with which parent reads different types of material and mean pupil reading and mathematics scores, by grade level

	Second Class			Third Class		
Newspapers	**%**	**Reading**	**Maths**	**%**	**Reading**	**Maths**
Most days or every day	28.2	99.4	98.3	30.8	98.1	100.0
A few times a week	35.0	98.5	98.2	35.6	96.8	100.9
A few times a month	19.3	98.6	99.1	18.0	97.2	100.7
Hardly ever or never	17.4	97.6	97.5	15.5	96.7	98.9
Magazines	**%**	**Reading**	**Maths**	**%**	**Reading**	**Maths**
Most days or every day	9.3	97.2	95.4	9.8	95.7	97.3
A few times a week	28.2	97.9	97.5	27.5	95.7	99.0
A few times a month	34.4	99.9	99.3	35.5	97.6	101.0
Hardly ever or never	28.0	99.6	99.7	27.1	98.8	102.0
Books	**%**	**Reading**	**Maths**	**%**	**Reading**	**Maths**
Most days or every day	26.7	100.8	99.8	27.4	99.9	101.9
A few times a week	26.4	98.4	97.4	25.2	96.6	99.6
A few times a month	29.3	98.8	97.9	29.1	96.3	100.2
Hardly ever or never	17.7	97.0	98.3	18.3	95.9	99.4

Parent Expectations and Aspirations

Parents were asked to indicate how far they would like their child to progress in education and to indicate how far they expected that he/she actually would progress. The vast majority (95%) of Second and Third class pupils had parents who wanted them to attend college or university. These pupils had higher average reading and mathematics scores than their peers whose parents aspired for them to leave education before third level (4-5%) and those whose parents did not know (1%).

A smaller majority (82%) of pupils had parents who expected that they would attend college or university. Again, these pupils had higher average achievement in both reading and mathematics than pupils whose parents expected that they would not progress to third level (10-11%) and those whose parents did not know (6-7%).

As outlined in a previous evaluation report (Kavanagh, Weir & Moran, 2017), 64% of Third class pupils aspired to attend college or university, while 57% expected to do so. Parents' aspirations and expectations for their children's educational attainment, therefore, appear to be higher than those of pupils themselves, although for both pupils and parents there is a gap between expectations and aspirations.[19] As these questions were not included on the parent questionnaire on previous testing occasions, it is not possible to examine whether parents' educational aspirations and expectations have changed since the start of the SSP evaluation in 2007. Similarly, as the question was not included on the NA '14 parent questionnaire, it is not possible to compare parental aspirations and expectations across the two studies.

19 Note that this question was not included on the Second class pupil questionnaire.

Table 5.8: Parents' aspirations for their children's educational attainment and mean pupil reading and mathematics scores, by grade level

	Second Class (*n*= 2511)			Third Class (*n*= 3085)		
	%	Reading	Maths	%	Reading	Maths
Finish primary school	0.3	97.0	91.3	0.2	80.5	80.3
Do the Junior Cert	0.2	80.3	71.5	0.2	81.3	82.5
Do the Leaving Cert	3.5	87.3	89.7	4.2	88.8	90.8
Go to college or university	95.1	99.2	98.5	94.8	97.6	100.6
Don't know	0.9	93.4	95.7	0.6	84.3	85.7
Total	100	98.7	98.1	100	97.1	100.1

Table 5.9: Parents' expectations for their children's educational attainment and mean pupil reading and mathematics scores, by grade level

	Second Class (*n*= 2505)			Third Class (*n*= 3097)		
	%	Reading	Maths	%	Reading	Maths
Finish primary school	0.5	94.4	94.4	0.3	90.0	99.7
Do the Junior Cert	0.7	84.9	79.1	0.5	84.7	90.0
Do the Leaving Cert	9.2	91.2	90.3	9.8	89.3	91.5
Go to college or university	82.4	100.2	99.5	83.3	98.6	101.7
Don't know	7.3	92.6	94.4	6.0	90.4	92.0
Total	100	98.7	98.1	100	97.1	100.1

Family Support for Pupils' Education

Home-Based Involvement

In addition to the more indirect ways of supporting achievement described above, parents were asked to indicate whether their child received explicit support for home learning activities from someone in the family. Nearly all parents (98%) agreed that someone in the family helped the pupil with homework, practised spellings, mathematics or other skills with the child (98%), and read with the child (98%) (Table 5.10). Given that parents were near unanimous in their agreement that such practices took place in their homes, associated mean scores for other responses are not presented here.

Table 5.10: Support for learning in the home, by grade level

		Second	Third
Someone in this family…		**%**	**%**
Helps with child's homework	Agree	97.7	97.9
	Don't know	0.4	0.5
	Disagree	1.8	1.6
Practises spellings, maths or other skills with child	Agree	98.1	97.6
	Don't know	1.0	1.1
	Disagree	0.9	1.3
Reads with child	Agree	98.2	97.0
	Don't know	0.7	0.8
	Disagree	1.1	0.2

In addition to asking about current reading practices with their children, parents were also asked about past practices. First, parents were asked to indicate the frequency with which anyone at home read to the child before they started primary school. About one third of pupils (31-32%) had parents who indicated that someone had read to the child every day. These pupils had higher mean reading and mathematics scores than pupils who had been read to less frequently. Small minorities (4-5%) of pupils had parents who said that they were rarely or never read to before they started primary school. These pupils had lower average reading and mathematics achievement than pupils who had been read to with greater frequency (Table 5.11).

Table 5.11: Frequency with which child was read to at home before he/she started primary school and mean pupil reading and mathematics scores, by grade level

	Second Class			Third Class		
	%	**Reading**	**Maths**	**%**	**Reading**	**Maths**
Every day	31.3	102.6	101.1	31.6	101.3	103.8
A few times a week	47.5	97.9	97.1	47.8	95.8	98.6
A few times a month	16.8	94.8	95.8	15.6	93.7	97.3
Rarely or never	4.4	92.9	95.1	5.0	92.0	96.9

Additionally, parents were asked to indicate the frequency with which the child read aloud to someone at home when they were in infants classes. A substantial minority (40-42%) of pupils at each grade level had parents who indicated that the child had read aloud to someone at home every day when they had learned/were learning to read in infant classes. These pupils had higher average achievement in reading and mathematics than pupils who had read to someone at home less frequently. Lowest mean reading and mathematics scores were those of the 7-8% of pupils who rarely or never read aloud to someone at home (Table 5.12).

Table 5.12: Frequency with which child read to someone at home when he/she started was in infants classes and mean pupil reading and mathematics scores, by grade level

	Second Class			Third Class		
	%	Reading	Maths	%	Reading	Maths
Every day	39.5	101.5	100.2	42.3	99.5	102.1
A few times a week	42.0	98.3	97.4	41.3	96.5	99.5
A few times a month	9.8	95.8	96.9	9.4	93.9	98.8
Rarely or never	8.7	90.7	92.9	7.1	90.5	92.7

School-Based Involvement

Parents were asked to indicate whether anyone in their families participated in any of a series of school-based activities. Large majorities (91-92%) of Second and Third class pupils had parents who agreed that someone in their family attends special events at the child's school. These pupils had higher mean reading and mathematics scores than the 4% of pupils whose parents/guardians who said that they did not know (gaps ranging from 3 to 7 standard score points). Approximately two-thirds (64-68%) of Second and Third class pupils had parents who agreed that someone in the family helps out at the child's school. There were no clear patterns of association between helping at school and pupil achievement. Just over half of pupils had parents/guardians (53-55%) who agreed that someone in their family volunteers to go on class trips. Highest mean scores were those of pupils whose parents disagreed that someone in their family did so (Table 5.13). This counterintuitive finding is likely related to parent employment status and availability during the school day.

Table 5.13: Family involvement in school-based activities and mean pupil reading and mathematics scores, by grade level

		Second Class			Third Class		
Someone in this family…		%	Reading	Maths	%	Reading	Maths
Helps out at this child's school	Agree	67.5	99.0	98.2	64.2	96.9	100.3
	Don't know	12.1	96.3	96.6	12.4	96.8	99.9
	Disagree	20.5	99.7	99.1	23.5	98.4	100.6
Attends special events at school	Agree	92.0	99.2	98.4	91.2	97.5	100.3
	Don't know	4.3	92.0	95.0	4.0	91.5	96.7
	Disagree	3.6	95.2	95.4	4.7	96.2	100.3
Volunteers to go on class trips	Agree	54.6	98.4	97.5	53.2	96.6	99.5
	Don't know	17.5	98.0	97.9	17.5	96.5	99.8
	Disagree	27.9	100.1	100.0	29.3	98.8	101.8

Parents were asked to indicate whether they were currently, or had previously been, members of committees at their children's schools. Second and Third class pupils whose parents were members of the school's Board of Management, were members of the Parents' Association, or were involved in another school committee had higher mean reading and mathematics scores than their counterparts whose parents had not been involved in these ways (Table 5.14), although the gaps in average scores were small (in the region of 1-3 standard score points). Rates of parental

committee membership in urban SSP schools were somewhat lower than those nationally in NA '14. While in both studies, 4% of pupils had parents who were on the Board of Management, 24% of Second class pupils in NA '14 had parents who had been on the Parents' Association and 11% had parents involved in another school committee, compared to 14% and 7% of Second class parents, respectively, in the present study.

Table 5.14: Parental membership of school committees and mean pupil reading and mathematics scores, by grade level

		Second Class			Third Class		
		%	Reading	Maths	%	Reading	Maths
Board of Management	Yes	3.6	99.7	100.4	3.9	98.4	101.7
	No	96.4	98.5	98.0	96.4	96.9	99.9
	Total	100	98.6	98.1	100	97.0	100.0
		%	Reading	Maths	%	Reading	Maths
Parents' Association	Yes	14.3	100.2	99.5	14.4	99.6	102.9
	No	85.7	98.4	98.0	85.6	96.9	99.8
	Total	100	98.7	98.2	100	97.3	100.3
		%	Reading	Maths	%	Reading	Maths
Other committee	Yes	6.7	101.1	101.2	7.7	97.4	100.8
	No	93.3	98.4	97.9	92.3	97.1	100.1
	Total	100	98.6	98.2	100	97.1	100.2

Summary

A number of family background characteristics were associated with pupil achievement in 2016. At both Second and Third class, pupils who were from one-parent households, whose parents were not employed outside the home, and whose parents held medical cards had lower average achievement in reading and mathematics than their peers. Pupils whose parents had higher educational attainment had higher achievement, on average, in both reading and mathematics. Pupils who mainly spoke a language other than English or Irish at home had lower average reading achievement and higher average mathematics achievement than their counterparts who spoke mainly English or Irish at home. Having more books in the home and having home access to educational resources (e.g. educational games) were associated with higher achievement in both reading and mathematics. Parents who read books more frequently at home themselves had children with higher average reading scores than parents who read books less frequently; the converse was observed for magazine reading. Additionally, pupils who engaged in reading with someone at home with greater frequency had higher achievement than pupils who did so less frequently.

Overall, parents had high aspirations and expectations for their children's future educational attainment. Pupils whose parents had lower aspirations and expectations for them had lower achievement in both reading and mathematics. Nearly all parents agreed that there was support for children's learning (e.g. for homework, practising spellings, etc.) at home. Some forms of school-based involvement were found to be associated with higher pupil achievement (e.g. committee membership), while others were not (e.g. volunteering to go on class trips).

When comparing urban SSP pupils to pupils nationally in NA '14, a number of differences were observed. As would be expected, there were higher rates of parental unemployment and medical card possession, as well as lower levels of parental educational attainment in the SSP sample than nationally. Additionally, there was less access to home educational resources (e.g. books), and lower rates of parental committee membership in the SSP sample than nationally in NA '14.

Chapter 6:
Understanding Pupil Performance: Multilevel Analyses of Third Class Achievement in Reading and Mathematics

This chapter presents results of multilevel analyses of Third class reading and mathematics achievement in urban SSP primary schools in 2016. The chapter contains six main sections. First, a description of multilevel modelling and reasons for its use here is provided; key terms and concepts are also defined. Second, the various data sources drawn upon for the present analyses are outlined and a rationale is given for focusing on modelling achievement at the Third class level only. Third, the specific variables chosen for use in the present analyses are presented. Fourth, the manner in which the total variance in achievement is partitioned between and within classes/schools is described for both reading and mathematics. Fifth, information on the data analysis procedure is provided. Sixth, the final models of achievement are presented and interpreted. The chapter concludes with a summary.

Multilevel Modelling

Previous chapters in this report have looked at associations between a range of background variables and pupil achievement, examining these relationships one at a time (i.e. in a series of bivariate analyses). Many of the background variables examined are likely to be interrelated, however, and bivariate analyses cannot account for these interrelationships. In other words, analyses reported in previous chapters have related one variable (e.g. a pupil or parent characteristic) to a second (i.e. achievement test score in reading or mathematics), but there may be a third variable which underpins the relationship between these two variables (e.g. socioeconomic status). Multivariate techniques such as multiple regression allow the examination of the effects of several explanatory variables in combination (i.e. they allow examination of the way in which a dependent variable such as achievement varies for some specific characteristic, after adjustment for other characteristics in the model). Such an approach thus reduces the risk of misinterpreting the relationship between achievement and a characteristic of interest.

Traditional regression techniques assume the independence of observations; that is, they assume that unmeasured factors influencing the dependent variable are not related from one individual to another (Finch & Bolin, 2017). When data are nested or clustered in some way, as is the case in the SSP evaluation where pupils within classes within schools are sampled, this assumption is violated. Individuals who are clustered within groups are (due to a variety of factors) more like one another than individuals in different groups. Ignoring the clustering of the data results in underestimation of the standard errors associated with regression coefficients, leading to overstatement of statistical significance (O'Connell & McCoach, 2008). Multilevel modelling is a statistical technique that accounts for this clustering in a way that traditional regression procedures cannot. The type of multilevel modelling used for the present analysis is hierarchical linear modelling, which is an extension of multiple regression for use with hierarchical data.

Multilevel modelling allows the partitioning of variation in the outcome (in this case Third class reading or mathematics achievement) into that which lies within schools and that which lies between schools, meaning it is possible to estimate the extent to which differences in achievement are attributable to schools rather than pupils' backgrounds. In addition to answering the question of whether schools differ with respect to achievement, however, the question of *why* they differ is of interest. Multilevel modelling allows examination of the effects[20] of school-level characteristics on pupil achievement above and beyond individual-level characteristics (Kreft & de Leeuw, 1998).

As with traditional regression procedures, hierarchical linear modelling also allows the examination of *interaction effects.* If two explanatory variables interact, the effect of one variable differs depending on the level of the other. For example, the relationship between frequency of technology use and achievement in reading might be different for boys than it is for girls. Were this to be the case, we would say that there is an interaction between gender and technology use with respect to reading achievement.

One final feature of multilevel modelling that is relevant here is that of random slopes models. If a pupil-level slope varies significantly across schools, it means that the relationship between the explanatory variable and achievement is stronger in some schools than in others. For example, the relationship between pupil SES and achievement might be significantly stronger in lower-achieving schools than higher-achieving schools (or vice versa).

For more information on key terms and concepts related to the analysis, see inset 6.1.

Inset 6.1: Concepts and terms used in Chapter 6

Intercept: The intercept is the estimated achievement (standard score) of a pupil who has a value of zero on all explanatory variables.

Explanatory variables: With one exception, all of the explanatory variables in the final models are categorical. This means that each variable is represented by a discrete number of categories and each pupil belongs to one of these categories; e.g. the variable *DEIS band* is represented by the two categories: Band 1 and Band 2; the *frequency with which the pupil reads a book for fun* variable is represented by four categories: 'every day or almost every day', 'once or twice a week', 'once or twice a month' and 'hardly ever or never'.

The one non-categorical variable in the final model is the variable *total number of jobs in the home*, which is a numeric variable. As the intercept for a given model is the estimated outcome when explanatory variables have a value of zero, oftentimes it makes sense to centre numeric variables around their mean values in order to interpret the intercept (i.e. a value of zero for a variable such as height or weight is not easily interpretable). As zero is a meaningful value for the only non-categorical variable in the final models presented here (i.e. it is possible that nobody in the home holds a job), this variable was left uncentered in the final models.

For categorical variables, the beta coefficients presented can be interpreted as the difference in the dependent variable (reading or mathematics standard score) between a given category and the reference category, when other explanatory variables in the model are held constant (more below). For continuous variables, the coefficient represents the difference in the dependent variable (the effect on the intercept score) corresponding to a one-unit change in the explanatory variables when all other explanatory variables remain constant.

20 The term 'effect' is used in a statistical sense only. The analyses presented do not allow causality to be inferred.

Dummy variables and reference groups: Categorical variables (i.e. all those in the final model except total number of jobs in the household) are entered into the model using dummy variables. This means that for each category of the variable, a pupil has the value 1 or 0, so a pupil who reads a book for fun 'once or twice a week' would have a value of 0 for 'every day or almost every day', 'once or twice a month' and 'hardly ever/never'. When using dummy coding in this way, one category is selected as the reference category and the variables in the model are compared to the reference category (which is not entered in the model). Using the frequency of reading a book example, 'every day or almost every day' was selected as the reference category. This means that the model estimates how the reading achievement of pupils who read a book 'once or twice a week', 'once or twice a month', or 'hardly every/never' compares to that of pupils who read 'every day or almost every day'. Specifically, in this example, the parameter estimates in the model give the expected difference in achievement between pupils who read less frequently and those who read 'every day or almost every day', assuming that all other variables in the model are equal.

Standard error: Model parameters give *estimates* of the association between reading achievement and the variable of interest in the population (having accounted for all other variables in the model). These estimates are computed on the basis of having gathered data from a sample of pupils, and have two main types of error associated with them. The first derives from having tested only a sample of pupils (sampling error) and the other refers to measurement error. The standard error associated with a parameter estimate in the model gives an indication of how likely the model estimate is to be close to the underlying population parameter. When standard errors are large, there is a greater degree of uncertainty that the model parameter is close to the underlying population parameter. In general, standard errors are larger when there are fewer pupils in a particular category of variable used in the model.

Between-class/school variance: This is the proportion or percentage of the total variation in achievement that is between groups (classes or schools). The higher the percentage, the more groups differ with respect to achievement. High between-school variance may be indicative of a less equal education system. Between-group variance is indicated by the intraclass correlation (ICC), obtained from running the null model (a model without any predictors).

Explained variance: This is the amount of variation in reading achievement that is explained by the variables in the model when compared to the null model.

Based on Cosgrove & Creaven, 2013, p.203; Cosgrove, Gilleece & Shiel, 2011, p. 122; Kavanagh, Shiel & Gilleece, p.144.

The primary research questions prompting the multilevel analyses described in this chapter are as follows:

- How much of the variation in Third class reading/mathematics achievement is within classes/schools and how much is between classes/schools?
- Has between-school variance changed since the introduction of the School Support Programme under DEIS?
- Which pupil-level variables predict Third class reading/mathematics achievement?
- Which group-level (school-level) variables predict Third class reading/mathematics achievement?
- How much of the (within-school, between-school, total) variance in reading/mathematics achievement is explained by the final models?

Data Sources

A primary aim of the analysis was to examine the combined effects of a range of pupil-level and school-level attributes on reading achievement in urban SSP primary schools, using data collected as part of the SSP evaluation. Although reading and mathematics test data were available at all four grade levels at which achievement tests were administered (Second, Third, Fifth and Sixth classes), the nature and extent of the contextual data that were collected differed across grade levels, influencing the selection of grade levels to be included in the analysis. One source of contextual data was the Pupil Information Form, which was completed by teachers with respect to each pupil in their class; this form was completed by teachers of pupils of four grade levels. Much of the information available on pupils' home backgrounds, however, was obtained from parent questionnaires. As questionnaires were not administered to parents of Fifth class and Sixth class pupils (see Chapter 2), home background information for these pupils was limited; it was thus decided not to include these grade levels in the analysis. Although parent questionnaires were administered at both the Second class and Third class levels, the pupil questionnaires administered at each of these grade levels, from which much of the information on individual pupil attributes and behaviours was derived, differed considerably. The Second class pupil questionnaire contained fewer items and elicited less detail on variables of interest. In combination, these study design factors led to a decision to model achievement at the Third class level only.

At the school level, a distinction was drawn between 'school context' variables, which refer to the 'hardware' of the school (Ma, Ma & Bradley, 2008) and include such factors as school gender composition and DEIS status, and 'school climate' variables, or the 'software' of the school (Ma, Ma & Bradley, 2008), which include factors such as teacher expectations and methods of instructional organisation. Information on school context was available from the DES schools database. In order to include information on school climate, data derived from a questionnaire administered to SSP principals at the end of 2011 were drawn upon.[21]

Variation in Achievement

As mentioned previously, pupils who participated in testing were clustered within classes, within schools. This meant that the hierarchical structure to be adopted in the modelling exercise required careful consideration. A three-level structure (with pupils at Level 1, classes at Level 2, and schools at Level 3) was initially considered. Overall, 113 schools had Third class pupils (N = 4289; M = 38.0). Most schools had multiple classes at each grade level. However, 38% of schools with Third class pupils (n = 43) had only one class at the Third class level, meaning that, for these schools, the class level and school level would be equivalent. Consequently, it was decided that a two-level structure would be adopted, with pupils at level 1 and either classes or schools at level 2. For the purposes of the SSP evaluation, the main policy interest is in achievement differences across schools rather than across classes. Additionally, analysis of variance in cases where there was more than one class indicated that between-class variance within schools was very low (less than 1%; see Table 6.1). As such, a decision was taken to adopt a two-level structure, with pupils at level 1 and schools at level 2.

21 While principals have been consulted several times in recent years as part of the SSP evaluation (see Chapter 6 of Kavanagh, Weir & Moran, 2017), 2011 represents the most recent occasion where a questionnaire containing school climate variables of interest was administered to all schools in the urban evaluation sample.

Table 6.1: Variance decomposition of Third class reading and mathematics achievement in 2016: Two- and three-level null models

	Reading	Maths
	%	%
Two level: School and pupil		
Between-school variance	6.1	8.5
Within-school variance	93.9	91.5
Two level: Class and pupil		
Between-class variance	6.5	10.1
Within-class variance	93.9	89.9
Three level: School, class and pupil (All schools)		
Between-school variance	5.8	7.0
Between-class variance	0.4	2.8
Within-class variance	93.8	90.2
Three level: school, class and pupil (Only schools with two or more classes)		
Between-school variance	5.5	7.0
Between-class variance	0.4	2.9
Within-class variance	94.1	90.1

The between-school variance was statistically significant in both domains, indicating that Third class reading and mathematics achievement both varied significantly across schools. The intraclass correlation (ICC) for reading in 2016 indicates that just 6% of the variance is between schools, while 94% is attributable to differences between pupils within schools. For mathematics, 10% of the variance in Third class achievement lies between schools and 90% within schools. Between-school variance in achievement tends to be low in Ireland, relative to others countries, and tends to be lower in reading than in mathematics. In the 2014 National Assessments of English Reading and Mathematics, for example, the between-school variance in Second class reading achievement was 9% (Kavanagh, Shiel & Gilleece, 2015). In PIRLS 2011, the between-school variance in reading achievement at Grade 4 (Fourth class) ranged from a low of 5% to a high of 50% across participating countries, while in Ireland it was 12%; the corresponding percentages for mathematics and science in Ireland as assessed by TIMSS 2011 were higher, at 18% and 21% respectively (Cosgrove & Creaven, 2013).

As previously mentioned, lower between-school variance may be indicative of a more equitable school system. As shown in Table 6.2, the between-school variance in reading achievement in urban SSP schools has decreased at each round of testing since initial testing in 2007. This is also the case for mathematics achievement (Table 6.3). As these decreases have occurred in the context of rising average achievement (see Chapter 1 for a summary of performance outcomes in urban SSP schools from 2007 to 2016), it indicates that there has been improvement in outcomes as well as in equity of outcomes across schools since the introduction of the programme, in relation to both reading and mathematics.

Table 6.2: Percentage of variance in Third class reading achievement between and within schools, by year

	2007	2010	2013	2016
Between-school	10.3	7.5	7.2	6.1
Within-school	89.7	92.5	92.8	93.9

Table 6.3: Percentage of variance in Third class mathematics achievement between and within schools, by year

	2007	2010	2013	2016
Between-school	14.5	13.5	10.7	8.5
Within-school	85.5	86.5	89.3	91.5

Variables Examined

Variables were selected for inclusion in the analysis based on existing literature and policy relevance. Variables were categorised into conceptually-related 'blocks' at the pupil and school levels, as shown in Table 6.4 (for more information on the candidate variables, see Appendix Table 6.1).

Levels of missing data were low (0-5%) for all variables except those where data were derived from parent questionnaires. Of Third class pupils who provided reading test data, 73% had parents who returned the parent questionnaire, while 72% of those who provided mathematics test data had parents who returned the questionnaire. Analyses indicated that parent questionnaire were not missing completely at random. For example, the mean reading and mathematics scores of pupils whose parents did not return the questionnaire (92.5 and 94.5, respectively) were significantly lower than the mean scores of pupils whose parents did return the questionnaire (97.0 for reading and 100.0 for mathematics). Missing data were dealt with using full information maximum likelihood (FIML) in MPlus, which means that instead of dropping cases with missing data on any of the variables, all available information is used to estimate the model.

Table 6.4: Candidate variables at the pupil and school level used in modelling Third class achievement in urban SSP primary schools

Pupil-level variables	
Outcomes	
Reading achievement	Mathematics achievement
A. Pupil background	**D. Out-of-school activities**
Gender	Frequency of reading books for fun
Age	Frequency of reading magazines/comics for fun
Language of the home	Frequency of playing sports
Lone parent household	Frequency of hanging out with friends
Family size	Time spent watching television
Medical card	Time spent playing games on a computer
Traveller	Time spent playing games on devices
Total number of jobs in the household	Time spent messaging friends
Parent educational attainment	Time spent reading online
Preschool attendance	Time spent streaming TV or movies
B. Home climate	Time spent streaming music
Number of books in the home	Time spent streaming videos
Computer at home	Member of Scouts/Guides
Access to reference books at home	Member of a youth club
Educational games at home	Member of a homework club
Library membership	Member of a band/choir/orchestra
Pupil has a TV in bedroom	Member of a sports club
Pupil owns a smartphone	Member of a dance or drama group
	Member of a social network

C. Pupil attitudes and expectations	E. Parental Involvement
Liking of school	Parental membership of Board of Management
Liking of reading	Parental membership of Parents' Association
Liking of mathematics	Parental membership of another committee
Pupil aspires to attend college or university	Frequency with which child was read to before school
Pupil expects to attend college or university	Frequency with which child read aloud to parent while learning to read (in infants classes)
	Parent aspires for pupil to attend college or university
	Parent expects pupil to attend college or university
School-level variables	
F. School context	**G. School climate**
DEIS band	Teacher expectations for pupil achievement
Gender composition	Teacher job satisfaction
Medium of instruction	Average attendance rate
Enrolment size	Organisation of learning support
Average class size (Third class)	Levels of parental support for pupil achievement
	Levels of parental involvement in school activities

Note: For more information on each of these variables, see Table A6.1.

Analysis Procedure

All multilevel analyses of data reported in this chapter were conducted using MPlus version 7.4 (Muthén & Muthén, 1998-2012) and the method of estimation was maximum likelihood with robust standard errors. No weights were used in the development of the model.

Initially, each pupil-level variable was tested individually against the null model. All significant variables (using a p-value of < 0.05 as the criterion) within a given block were then tested simultaneously. Non-significant variables were removed one at a time, in order of descending p-value, until all variables within a block were significant. This procedure was then repeated for all school-level variables. Next, all blocks were entered together and non-significant variables were removed individually until all remaining variables were significant at the 0.05 level.

Before finalising the model, interactions between gender and all other pupil-level variables were explored. Finally, analyses explored whether the associations between any pupil-level variables and reading achievement varied significantly across schools (i.e. random slopes models were considered).

Results

Reading

When tested individually, all pupil background and home climate variables were significantly associated with reading achievement. Similarly, all pupil attitude variables were significant when tested separately with respect to their association with reading achievement. All but two of the parental involvement variables (parental membership of the school's Board of Management and parental membership of another school committee) were significantly associated with reading achievement when tested individually. Most of the out-of-school activities were significantly associated with reading achievement when tested separately; the exceptions were: the pupil being a member of a sports club, of a dance

or drama group, and of an online social network.

At the school-level, two of the school context variables were not significantly associated with reading achievement when tested individually with reading achievement: medium of instruction (English or Irish) and the average class size at the Third class level. Of the school climate variables, the only variable not significantly associated with reading achievement when examined in a bivariate analysis was that of teacher expectations for pupil achievement. It is worth noting, however, that this variable relates to principals' ratings of the expectations of teachers in his/her school as a group; individual teachers' expectations for achievement (either of individual pupils or their pupils as a group) were not assessed.

Table 6.5 presents the final model of Third class reading achievement. Any variable in the final model is statistically significantly associated with Third class reading achievement after controlling for the other variables in the model. That is, the final model presents the association between reading achievement and a variable of interest, assuming that the effects of all other variables in the model are held constant. Variables with relatively strong effects[22] on reading achievement are: language of the home, Traveller status, number of books in the home, pupil aspirations, and parent expectations for pupils' educational attainment.

All else being equal, pupils who spoke a language other than English or Irish at home had a mean reading score that is 5.6 standard score points lower than their English/Irish speaking peers. Being from the Traveller community was associated with a 5.7 point disadvantage in reading achievement. Pupils who had more than 250 books at home had a 4.1 point advantage over pupils in the reference category (11-50 books at home). Pupils who aspired to attend college or university had a 4.2 point advantage over pupils who did not.

Not having attended preschool equated to a 1.4 point disadvantage when compared to having attended preschool for one year. There was no significant difference in the reading achievement of those who attended preschool for one year and those who attended for two years, all else being equal. Each additional (full-time) job in a pupil's home was associated with a 1.2 point increase in reading achievement (i.e. a pupil living with two parents in full-time employment had a 2.4 point advantage over a pupil who had no parent in employment). Pupils who liked reading had a 3.3 point advantage over those who did not or who indicated that they did not know, all else being equal.

A number of out-of-school activities were associated with reading achievement in the final model. Being a member of a homework club was associated with a 2.6 point lower reading score, while being a member of scouts/guides was associated with a 2.5 disadvantage and being a member of a youth club was associated with a 1.8 point disadvantage. Pupils who were members of a band, choir or orchestra had a 1.1 point advantage over pupils who were not, all else being equal. Less frequent reading of books for fun was associated with lower reading achievement, with pupils who read books for pleasure once or twice a week, once or twice a week, or hardly ever/never having scores in the region of two points lower than pupils who read books for fun every day or almost every day. In contrast, reading magazines or comics for fun less frequently was associated with *higher* reading achievement. Pupils who read such material once or twice a month, or hardly ever or never, had 2.4 and 1.8 point advantages, respectively, over pupils who did so every day or almost every day.

Technology use was associated with reading achievement, although the interpretation of the associations is not straightforward. Pupils who spent more than four hours streaming television shows or films scored 3.1 points lower, on average, than pupils who spent 1-2 hours doing so. However,

22 The term 'effect' is used in a statistical sense only. The analyses presented do not allow causality to be inferred.

pupils who spent less than an hour watching or streaming television did not differ significantly with respect to reading achievement from pupils who spent 1-2 hours doing so, all else being equal. Pupils who indicated that they spent more than four hours reading material online had significantly lower reading scores (by 2.7 points) than those in the reference category (1-2 hours). Greater time spent streaming music was also associated with lower achievement.

Finally, at the pupil level, three variables from the parental involvement block survived to the final model. Pupils whose parents expect them to attend college or university had a 4.3 point advantage over those whose parents did not have this expectation. Pupils whose parents indicated that they read to the child every day or almost every day before they started school significantly outperformed pupils who parents indicated that they did so a few times a week (by 2.0 points) or a few times a month (by 1.7 points). Similarly, parents who indicated that their children read aloud to them every day or almost day when learning to read significantly outperformed pupils who did so a few times a week (by 1.1 point), a few times a month (by 2.4 points), and those who did so hardly ever or never (by 4.5 points).

None of the school context variables (DEIS band, enrolment size, gender composition, average class size, medium of instruction) survived to the final model. In terms of school climate variables, pupils in schools characterised by principals as having very low parental support for pupil achievement had significantly lower reading scores (by 2.5 points) than pupils in the reference category (schools with medium levels of parental support). As the between-school variance was very low, at 6%, it is perhaps not surprising that so few school-level variables were statistically significant in the final model.

No significant gender interactions were revealed, meaning that all pupil-level variables were related to reading achievement in the same manner for boys as for girls. Additionally, none of the pupil-level slopes were found to vary significantly across schools, meaning that the relationships between all pupil-level factors and reading achievement were consistent across schools.

Table 6.5: Model of Third class reading achievement in urban SSP primary schools

		SE	p
Intercept	89.2	1.28	
A. Pupil Background			
Home language (Ref: English/Irish)	-5.6	0.53	***
Number of jobs in the household	1.2	0.32	***
Traveller status (Ref: Not a Traveller)	-5.7	1.12	***
Preschool attendance (Ref: Attended for one year)			
Attended for two years	1.4	0.38	***
Did not attend preschool	-0.6	0.77	
B. Home Climate			
Books in the home (Ref: 11-50)			
None	-1.2	1.27	
1-10	-0.7	0.62	
51-100	1.1	0.56	
101-250	2.1	0.61	***
More than 250	4.1	0.95	***
Access to reference books at home (Ref: No)	1.2	0.44	**
Child owns a smartphone (Ref: No)	-0.9	0.40	*
Child has a TV in his/her bedroom (Ref: No)	-1.3	0.41	**

		SE	p
C. Pupil Attitudes and Expectations			
Pupil likes reading (Ref: No/Doesn't know)	3.3	0.59	***
Pupil aspires to attend college/university (Ref: No)	4.2	0.35	***
D. Out-of-School Activities			
Attends a youth club (Ref: No)	-1.8	0.48	***
Attends Scouts/Guides (Ref: No)	-2.5	0.56	***
Attends a homework club (Ref: No)	-2.6	0.46	***
Member of a band/choir/orchestra (Ref: No)	1.1	0.50	*
Reading books for fun (Ref: every day/almost every day)			
Once or twice a week	-2.0	0.43	***
Once or twice a month	-2.0	0.45	***
Hardly ever/never	-2.1	0.52	***
Reading magazines/comics for fun (Ref: every day/almost every day)			
Once or twice a week	0.7	0.60	
Once or twice a month	2.4	0.61	***
Hardly ever/never	1.8	0.56	**
Time spent streaming music (Ref: 1-2 hours)			
Less than an hour	0.0	0.39	
2-4 hours	-1.6	0.61	**
More than 4 hours	-1.8	0.58	**
Time spent streaming videos (Ref: 1-2 hours)			
Less than an hour	1.0	0.60	
2-4 hours	1.6	0.72	*
More than 4 hours	2.3	0.65	***
Time spent streaming TV/films (Ref: 1-2 hours)			
Less than an hour	-0.3	0.57	
2-4 hours	-0.1	0.52	
More than 4 hours	-3.1	0.60	***
Time spent playing games on devices (Ref: 1-2 hours)			
Less than an hour	1.8	0.53	**
2-4 hours	1.4	0.54	**
More than 4 hours	0.9	0.55	
Time spent reading online (Ref: 1-2 hours)			
Less than an hour	-0.1	0.40	
2-4 hours	-1.2	0.73	
More than 4 hours	-2.7	0.75	**
E. Parental Involvement			
Frequency with which parent read to child before he/she started school (Ref: Every day/almost every day)			
A few times a week	-2.0	0.51	***
A few times a month	-1.7	0.68	*
Rarely/never	0.2	1.00	

		SE	p
Frequency with which child reads aloud to parent (Ref: Every day/ almost every day)			
A few times a week	-1.1	0.50	*
A few times a month	-2.4	0.88	**
Rarely/never	-4.5	1.08	***
Parent expects child to attend college/university (Ref: No)	4.3	0.64	***
G. School climate			
Parent support for pupil achievement (Ref: Medium)			
Very high	-1.2	1.90	
High	0.5	0.66	
Low	-1.3	0.83	
Very low	-2.5	1.16	*

*significant at the 0.05 level **significant at the 0.01 level ***significant at the 0.001 level

Table 6.6 shows the proportion of the within-school, between-school, and total variance explained by combinations of the blocks of variables. Pupil background variables accounted for 24% of the between-school variance, 8% of the within-school variance, and 9% of the total variance in reading achievement. The addition of the home climate block explained an additional 26% of the between-school variance, an additional 6% of within-school variance and an additional 7% of the total variance. The two significant pupil attitude variables explain an additional 5% of the between-school variance, 5% of the within-school variance and 5% of the total variance. The addition of the out-of-school activities explained an additional 6% of the within-school variance and an additional 5% of the total variance, while the addition of this block results in a small reduction in the explained between-school variance.[23] Adding the one significant school-level variable explained an additional 6% of the between-school variance. The final model explained 60% of the between-school variance, 28% of the within-school variance, and 30% of the total variance in Third class reading achievement.

Table 6.6: Percentage of variance in Third class reading achievement explained by various combinations of blocks of variables

Block(s)	% Between	% Within	% Total
Pupil-level			
A	23.8	8.1	9.1
A+B	49.6	14.0	16.2
A+B+C	54.6	19.2	21.3
A+B+C+D	51.9	24.9	26.6
A+B+C+D+E	54.3	27.8	29.4
A+B+C+D+E+F (final model)	60.0	27.8	29.7

23 While in classical regression, the addition of predictor variables always results in a decrease in the residual variance (i.e. an increase in the variance explained), multilevel models can behave differently. See Gelman & Hill (2006) for a discussion of the phenomenon.

Mathematics

When tested individually, all but two pupil background variables were significantly associated with mathematics achievement; the exceptions were age and gender. All seven home climate variables and all four pupil attitude variables were significantly associated with mathematics achievement when tested separately. Most out-of-school activities were significantly associated with mathematics achievement; not significant were: membership of a sports club, membership of a social network, and membership of a choir, orchestra or band. Of the parental involvement variables, parental membership of the Board of Management or of another school committee were the only two not to be significant when tested separately with respect to mathematics achievement. Of the school context variables, DEIS band, average class size (Third class) and school size were significantly associated with mathematics achievement when tested individually; school gender composition and medium of instruction were not significant. Of the school climate variables, three were not significant when tested separately: teacher job satisfaction, teacher expectations for pupil achievement, and organisation of learning support. Levels of parental involvement in school activities, levels of parental support for pupil achievement and school attendance rates were all significantly associated with mathematics achievement when examined individually.

The final model of Third class mathematics achievement in urban SSP schools is presented in Table 6.7. Pupil background variables had relatively strong effects on mathematics achievement. Membership of the Travelling community was associated with a 4.4 point disadvantage in mathematics, when all other variables in the model were held constant. Each additional full-time job in the pupil's home was associated with an additional 2.3 points (i.e. a pupil with two parents in full-time employment had a 4.6 point advantage over pupils who had no parent who was employed), all else being equal. In contrast to the reading model, language of the home did not survive to the final model of mathematics achievement. Number of books in the home was significantly associated with mathematics achievement in the final model, with a gap of 6.2 points between those with the most books at home and those with none.

Pupil attitudes also had relatively strong effects on achievement, with pupils who liked mathematics scoring an average of 4.2 points higher than those who did not, and those who had aspirations to attend college scoring four points higher than their peers who did not.

Out-of-school activities also had significant, if generally more modest, effects on mathematics achievement. Notably, pupils who indicated that they never played sports scored 3.9 lower in mathematics than pupils who did so every day or almost every day, all else being equal. Reading books for fun less frequently was associated with lower mathematics scores, while reading magazines or comics less frequently was associated with higher achievement. Pupils who read aloud to their parents and those who were read to by their parents more frequently when they were younger had higher achievement than those whose parents did so less frequently. Parents' expectations were significantly associated with mathematics achievement; parents who expected their child to attend college outperformed their peers by 4.2 points.

Two school-level variables remained significant in the final model. When all other variables in the model were held constant, pupils in small schools had a mathematics score that was significantly lower, by 2.5 standard score points, than pupils in large schools. Pupils in schools where levels of parental support for pupil achievement were categorised as very low had significantly lower mathematics scores than pupils in the reference group (schools with medium levels of parental support), underperforming them by 4.4 points.

Table 6.7: Model of Third class mathematics achievement in urban SSP primary schools

		SE	p
Intercept			
A. Pupil Background			
Number of jobs in the household	2.3	0.38	***
Traveller status (Ref: Not a Traveller)	-4.4	1.28	**
B. Home Climate			
Books in the home (Ref: 11-50)			
None	-3.6	1.43	*
1-10	-0.8	0.77	
51-100	1.2	0.71	
101-250	1.5	1.86	
More than 250	2.6	1.07	***
Child has a TV in his/her bedroom (Ref: No)	-1.7	0.47	***
Educational games at home (Ref: No)	1.2	0.56	*
C. Pupil Attitudes and Expectations			
Pupil likes mathematics (Ref: No/Doesn't know)	4.2	0.46	***
Pupil aspires to attend college/university (Ref: No)	4.0	0.49	***
D. Out-of-School Activities			
Attends a youth club (Ref: No)	-1.4	0.58	*
Attends Scouts/Guides (Ref: No)	-2.7	0.73	***
Attends a homework club (Ref: No)	-3.8	0.62	***
Reading books for fun (Ref: every day/almost every day)			
Once or twice a week	-1.6	0.47	**
Once or twice a month	-0.6	0.57	
Hardly ever/never	-0.6	0.62	
Reading magazines/comics for fun (Ref: every day/almost every day)			
Once or twice a week	0.6	0.68	
Once or twice a month	2.7	0.77	***
Hardly ever/never	2.4	0.68	***
Time spent watching television (Ref: 1-2 hours)			
Less than an hour	-1.5	0.60	*
2-4 hours	1.0	0.70	
More than 4 hours	0.6	0.76	
Time spent streaming music (Ref: 1-2 hours)			
Less than an hour	-0.5	0.56	
2-4 hours	-1.8	0.69	**
More than 4 hours	-2.9	0.72	***
Time spent streaming TV/films (Ref: 1-2 hours)			
Less than an hour	-0.5	0.56	
2-4 hours	0.1	0.63	
More than 4 hours	-2.8	0.66	***
Time spent reading online (Ref: 1-2 hours)			
Less than an hour	0.7	0.54	
2-4 hours	-2.3	0.92	*
More than 4 hours	-2.9	0.90	**

		SE	p
Time spent playing computer games (Ref: 1-2 hours)			
Less than an hour	-1.5	0.62	*
2-4 hours	-0.1	0.75	
More than 4 hours	-1.5	0.58	
Time spent playing games on a device (Ref: 1-2 hours)			
Less than an hour	-1.4	0.72	
2-4 hours	0.4	0.59	
More than 4 hours	-0.2	0.63	a
Time spent messaging friends (Ref: 1-2 hours)			
Less than an hour	-0.7	0.57	
2-4 hours	-1.1	0.71	
More than 4 hours	-3.1	0.65	***
Frequency of playing sports (Ref: every day/almost every day)			
Once or twice a week	-0.9	0.52	
Once or twice a month	-2.2	0.80	**
Hardly ever/never	-3.9	0.76	***
Frequency of hanging out with friends (Ref: every day/almost every day)			
Once or twice a week	1.1	0.54	*
Once or twice a month	1.8	0.77	**
Hardly ever/never	-0.3	0.82	
E. Parental Involvement			
Frequency with which child read aloud to parent while learning to read (Ref: Every day/almost every day)			
A few times a week	-0.9	0.63	
A few times a month	-0.4	1.1	
Rarely/never	-4.8	1.35	***
Parent expects child to attend college/university (Ref: No)	4.2	0.75	***
F. School context			
School size (ref: large)			
Small	-2.5	1.04	*
Medium	-0.7	1.00	
G. School climate			
Levels of parental support for pupil achievement (Ref: medium)			
Very high	0.9	1.34	
High	1.7	1.01	
Low	-1.3	1.17	
Very low	-4.4	1.61	*

*significant at the 0.05 level **significant at the 0.01 level
***significant at the 0.001 level a. involved in a significant interaction with gender

Most of the pupil-level variables were related to mathematics in the same manner for both girls and boys and girls. However, there was a significant interaction between gender and time spent playing games on devices. As can be seen in Figure 6.1, girls who spent more than four hours playing games on devices (19%) had a significantly lower score in mathematics than boys who spent this amount of time doing so (26%); the size of the gap is approximately four standard score points.

Figure 6.1: Interaction between gender and time spent playing games on devices each day

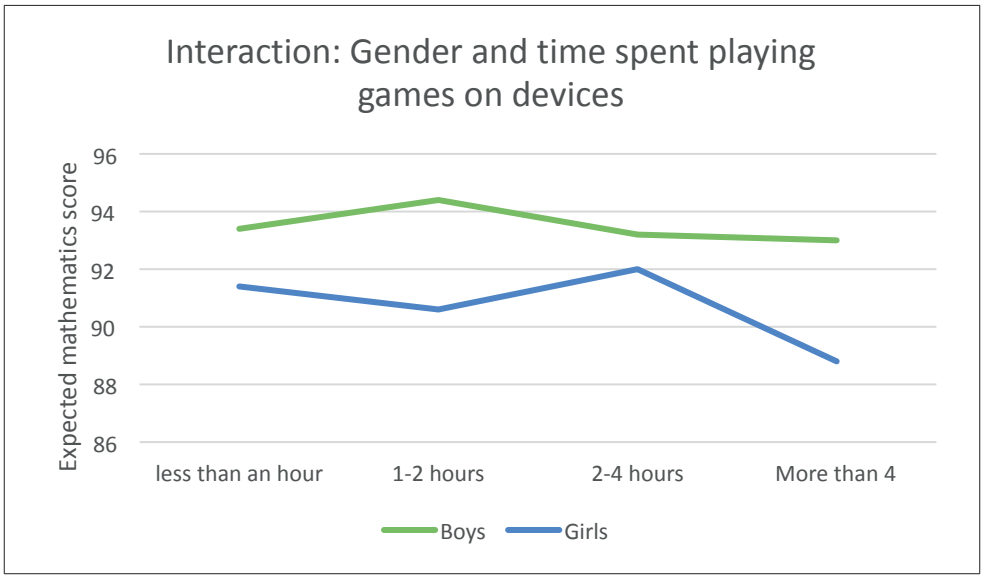


Table 6.8 shows the percentage of variance explained by combinations of the blocks of variables. Alone, the pupil background block explained 13.2% of the between-school variance, 5.8% of the within school variance, and 6.5% of the total variance in Third class mathematics achievement. Combined, the pupil background and home climate blocks explained 22.0% of the between-school variance, 9.2% of the within-school variance and 10.3% of the total variance. The addition of pupil attitude variables explained an additional 5.4% of the between-school variance, 4.7% of the within school variance and 5.3% of the total variance. Addition of the out-of-school activities block explained an additional 3.9% of the between-school variance, 8.6% of the within-school variance and 7.8% of the total variance. Finally, at the pupil level, the addition of the parental involvement block explains an additional 2.9% of the between-school variance, 2.0% of the within-school variance and 2.1% of the total variance. The addition of the one significant school context variable, school size, explained an additional 5.5% of the between-school variance. Adding the one school climate variable (levels of parental support for achievement) explained an additional 8.2% of the between-school variance and 1.3% of the total variance. The final model, then, explained 47.9% of the between-school variance, 24.5% of the within-school variance, and 26.5% of the total variance in Third class mathematics achievement in urban SSP schools.

Table 6.8: Percentage of variance in Third class maths achievement explained by various combinations of blocks of variables

Block(s)	% Between	% Within	% Total
A	13.2	5.8	6.5
A+B	22.0	9.2	10.3
A+B+C	27.4	13.9	15.0
A+B+C+D	31.3	22.5	23.2
A+B+C+D+E (Full pupil-level model)	34.2	24.5	25.3
A+B+C+D+E+F	39.7	24.5	25.8
A+B+C+D+E+F+G (Final model)	47.9	24.5	26.5

Summary

Between-school variance in both reading and mathematics achievement was low, and has decreased at each testing occasion since the introduction of DEIS. Given the low between-school variance, it is perhaps not surprising that very few school-level characteristics were significantly associated with achievement in either domain. At the pupil level, home background characteristics and home climate variables such as parents' employment status and number of books in the home were significantly associated with pupil achievement in both domains. Language of the home was significantly associated with pupil achievement in reading, but not in mathematics. Pupil attitudes were also significantly associated with achievement, with pupils who liked reading or mathematics and pupils who had high educational aspirations significantly outperforming their peers. Pupils whose parents had high expectations for their educational attainment and whose parents read frequently to them had significantly higher mean achievement scores than pupils whose parents did not. Smaller but still significant effects on achievement were found for a range of pupils' out-of-school activities, with reading books and playing sports more frequently associated with higher achievement and spending large amounts of time watching television associated with lower achievement. Only one significant gender interaction was revealed, indicating that, on the whole, pupil-level variables were related to achievement in the same manner for boys as for girls. Implications of the findings are discussed in the following chapter.

Chapter 7:
Discussion and Conclusions

The independent evaluation of the School Support Programme under DEIS began in 2007. As part of the evaluation, large-scale assessment of the reading and mathematics achievement of pupils in a representative sample of urban SSP primary schools has been carried out four times. Previous evaluation reports have provided detailed information on the reading and mathematics performance outcomes of pupils attending urban SSP primary schools in 2007, 2010, 2013 and 2016 (Weir & Archer, 2011; Kavanagh et al., 2017; Weir & Denner, 2013). In conjunction with the administration of the achievement assessments, contextual information has been collected via questionnaires completed by pupils and their parents, and through pupil information forms completed by teachers with respect to each of their pupils. The primary aims of the present report were to use this information to provide a context in which achievement outcomes could be understood, as well as to provide information on important non-achievement outcomes.

Pupil achievement was considered with respect to a range of individual pupil characteristics, including gender. In 2016, girls had higher mean reading scores than boys at the lower grade levels, but the differences were small. There were no discernible gender differences in reading achievement at the higher grade levels. Boys had higher mean mathematics scores than girls at all four grade levels at which the tests were administered, but differences were very small. Gender was not significantly associated with achievement in either domain once other background characteristics were accounted for. These findings are generally in line with gender differences in pupil achievement nationally at the primary level; in the 2014 National Assessments of English Reading and Mathematics, for example, there were small statistically significant differences in reading achievement in favour of girls and in mathematics in favour of boys at the Second class level. In Sixth class, girls had a higher mean reading score and boys had a higher mean mathematics score, but the differences were not significant in either domain (Shiel, Kavanagh & Millar, 2014).

The proportion of pupils who speak a language other than English or Irish at home in urban SSP primary schools has increased over time, from 6-9% (depending on grade level) in 2007 to 13-17% in 2016, although most of the increase occurred between 2007 and 2010. Similar proportions of Band 1 and Band 2 pupils came from homes where a language other than Irish or English was spoken. Speaking a language other than English or Irish at home was not significantly associated with pupils' mathematics achievement after controlling for the effects of other home background variables. However, all else being equal, pupils who spoke a language other than English or Irish at home had significantly lower mean reading scores than pupils who spoke mostly English or Irish, underscoring the need for effective EAL support for these pupils. As reported in Chapter 4, 4-6% of urban SSP pupils were in receipt of EAL support in 2016.

Pupils from the Traveller community had considerably lower average mean achievement scores than their peers, at all grade levels and in both domains, indicating that this is a group of at risk pupils who require sustained support at school. The proportion of urban SSP pupils who are Travellers has remained constant at 4% since 2007, with similar proportions of Traveller pupils attending Band 1 and Band 2 schools.

Approximately one fifth of pupils in urban SSP primary schools were in receipt of learning support for reading in 2016, and a similar proportion were in receipt of learning support for mathematics. The

average reading and mathematics scores of pupils in receipt of learning support were approximately one standard deviation lower than other pupils at all grade levels in both domains, indicating that, on the whole, learning support is being provided to those pupils who need it most. Rates of learning support differed little by DEIS band, but were higher in urban SSP schools than in primary schools nationally; in NA '14, 13% of pupils were in receipt of learning support for English and 9% were in receipt for additional support in mathematics (Shiel et al., 2014).

As in many previous assessments in Ireland and internationally, indicators of pupils' family socioeconomic status, such as parental educational attainment, parental employment status, and medical card status were significantly associated with pupil achievement in the urban primary SSP evaluation sample in 2016. Elements of family structure, such as lone parent status and family size, were also associated with achievement. Such home background characteristics are not amenable to change and are not under the influence of schools. However, findings of the regression analyses reported in Chapter 6 illustrate that adaptable features of the home environment make independent contributions to reading and mathematics achievement, indicating that there are ways in which parents can be usefully advised to support their children's literacy and numeracy development at home, regardless of their socioeconomic status. For example, children who had televisions in their bedrooms and children who spent large amounts of time streaming television or films had, all else being equal, significantly lower achievement in reading and mathematics than their peers, indicating that parental monitoring or limiting of these activities may be beneficial. Children whose parents indicated that they engaged in reading activities with their children at home, particularly as young children, had significantly higher average achievement in reading and mathematics than their peers. This is in line with previous research that has shown such activities to be supportive of pupil achievement.

Parental expectations for children's educational attainment were significantly associated with pupil achievement in both domains, while more formal parental involvement activities such as membership of school committees were not. This supports findings of previous research in Ireland (e.g. Kavanagh, Shiel & Gilleece, 2015; Gilleece, 2015) and internationally (see Weir et al., 2017 for a review of the international literature on parental involvement in disadvantaged settings) which indicates that informal ways in which parents provide support for achievement have stronger associations with achievement than more formal activities.

As reported in Chapter 6, the proportion of variation in pupil achievement that is attributable to differences between schools was low in both domains, and has decreased over time. Few school characteristics were found to significantly predict pupil achievement in either reading or mathematics in 2016 or to be associated with school-level changes in achievement over time. As reported in the models of achievement presented in Chapter 6, the only school climate variable significantly associated with pupil achievement in reading and mathematics was principals' characterisation of the levels of parental support for pupil achievement in the school. The multilevel models reported in Chapter 6 provide better estimates of the effects of a range of variables on pupil outcomes in urban SSP primary schools than would be provided by examining a series of bivariate relationships or by conducting single-level regression analyses. However, as with any other kind of analysis, these models are limited by the quantity and quality of the variables included in them. It is important to note that measures of the constructs of interest may be imperfect. This applies to measures of achievements in reading and mathematics in the form of standardised test scores as well as to measures of attitudes and other pupil and parent attributes. Additionally, only the effects of variables selected to be assessed by evaluators in the course of the evaluation could be estimated, and there is greater coverage of some areas than of others. There is a greater number of pupil-level variables than school-level variables. Some important issues may not be represented at all. For

example, the school effectiveness literature suggests that particular attributes of school leaders may be important determinants of pupil success. Our models do not contain measures of these, and, indeed, the capacity of such factors to be operationalised into questionnaire items amenable to inclusion in such models may be limited. Overall, the model of reading achievement explained 30% of the total variance in reading achievement (60% of the between-school variance and 28% of the within school variance), and the model of mathematics achievement explained 27% of the total variance in mathematics achievement (48% of the between-school variance and 25% of the within school variance), meaning that the majority of the total variance in achievement is unexplained. There are unmeasured factors at the pupil and school level that may further explain differences in pupil achievement.

Nonetheless, most of the variation in pupil achievement outcomes is attributable to differences between pupils, including differences in backgrounds and home environments. This further emphasises the need for intervention to focus on the home domain as well as at school. The home-school-community- liaison (HSCL) scheme is an example of such an intervention, aiming as it does to improve pupil outcomes indirectly by focusing its efforts on salient adults in children's lives (Conaty, 2002). As part of the evaluation of the DEIS programme, a survey of HSCL coordinators working in SSP primary and post-primary schools was carried out in 2017. The survey sought information on how much time co-ordinators spend on a range of activities, where they feel their work has had most impact, the nature and extent to which parents were involved in the school and in their children's education, and on the current issues and challenges that are faced by parents of children in SSP schools. Analysis of data generated from the survey is currently being carried out and a report will be available later this year. It is also hoped to use the data to identify issues for further exploration in planned focus groups of pupils in urban primary schools in the SSP later this year.

Research shows that achievement gaps resulting from socioeconomic differences are already present when pupils enter primary school, emphasising the need for earlier intervention for children and families when tackling educational disadvantage. There is evidence that targeting preschool education at children from socioeconomically disadvantaged backgrounds can serve to reduce achievement gaps. As reported in Chapter 4, highest mean scores in reading and mathematics of urban SSP primary pupils in the evaluation sample were those of pupils who attended preschool for two years (compared to those who attended for one year or not at all). As reported in Chapter 6, preschool attendance remained significantly associated with reading achievement when all other variables in the model were held constant. Preschool education has been shown to have the potential to result in a range of short-, medium- and long-term benefits for disadvantaged children who attend, but only if the preschool experience is of high quality and geared towards the needs of the children for whom it caters (see Weir, Kavanagh, Kelleher & Moran, 2017 for a review of the empirical literature on the effectiveness of preschool education as a strategy to combat educational disadvantage).

Targeted preschool provision for participating SSP schools serving concentrations of pupils from disadvantaged backgrounds was part of the DEIS Action Plan (DES, 2005), but was not implemented. All children in Ireland are now offered a free preschool place under the Early Childhood Care and Education (ECCE) scheme. The scheme was introduced in 2010, initially offering one year of free preschool to all children in the target age group in the year prior to starting primary school; this was then extended to two years in Budget 2016. Reflecting the infrastructure that existed previously, the free preschool years are delivered by a range of private, community and/or voluntary organisations in crèches, nurseries, preschools, naíonraí (Irish language preschools), playgroups and day-care centres. The Inspectorate of the Department of Education and Skills (DES) has a key role in supporting quality within the sector. It has responsibility for an education-focussed inspection of more than 4,000 settings currently enrolled in the ECCE scheme (DES, 2018). This is in addition to

the regulatory inspections carried out by TUSLA, the Child and Family Agency established in 2014. Up until the introduction of the free preschool year, the role of the education authorities in early education had focussed on pilot interventions for children from disadvantaged areas such as the Rutland Street Project and Early Start or programmes for children with special needs (Archer & Weir, 2005). Traveller children were also recipients of state-funded early years' provision. The introduction of free preschool to all children can be seen as a clear policy departure from targeted provision aimed at reducing inequalities to universal provision. However, there is a commitment in the DEIS Plan 2017 to support transitions of students as they progress through education, including from preschool to primary school. Another stated goal in the DEIS Plan is that of improved cross-sectoral collaboration, with improved engagement between preschool and DEIS school settings to be encouraged.

Despite increases in average pupil achievement since the introduction of DEIS, substantial gaps remain between the achievement of pupils in non-SSP schools and those in SSP schools, particularly those in Band 1 schools. With that in mind, it is worth considering the issue of educational disadvantage in the wider context of equity issues. The relationship between poverty and educational outcomes is well-established in Ireland and elsewhere. Attempts to address problems associated with disadvantage are often focused on providing programmes and additional resources through the education system. However, the issue of disadvantage is one that should be conceived of as being a wider societal concern than an educational one: It is clear from the analyses undertaken for the present report that the overriding factors that are associated with outcomes are not school factors, but those that either arise from the pupils' own background, or from characteristics that are less amenable to change. This suggests that, while welcoming the fact that pupils that have participated in the SSP have demonstrated improved outcomes, there are probably limits on what school-based measures can achieve. Analyses reported here indicate that, of a wide range of variables considered, poverty remains the largest determinant of educational outcomes. It seems that until economic inequality is addressed, the achievement gap between children from poor backgrounds and their more affluent counterparts is likely to persist.

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Appendix 1: Publications by the Educational Research Centre associated with DEIS and its evaluation

Weir, S. (2006). *A report on the procedures used to identify post-primary schools for inclusion in the School Support Programme under DEIS.* Dublin: Educational Research Centre.

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Appendix 2:
Candidate pupil- and school-level variables for modelling Third class reading achievement in urban SSP schools (2016)

Name	Source	Type	Description
Outcome Variables			
Reading achievement	Test	Numeric	Standard score for Drumcondra Sentence Reading Test (DSRT) administered in May 2016 (*M*= 95.7 *SD*= 13.04)
Mathematics achievement	Test	Numeric	Standard score for the shortened Drumcondra Primary Maths Test—Revised (DPMT-R) administered in May 2016 (*M*=98.5; *SD*=15.85)
Background Variables (pupil-level)			
Gender	Pupil Information Form	Categorical	0=boy, 1=girl
Age	Pupil Information Form	Numeric	Age in months (*M*=112.8, *SD*= 4.95)
Home language	Pupil Information Form	Categorical	0=English/Irish, 1=Other
Traveller	Pupil Information Form	Categorical	0=No, 1 = Yes
Medical card	Parent Questionnaire	Categorical	0=No, 1 = Yes
Lone parent	Parent Questionnaire	Categorical	0=No, 1 = Yes
Family size	Parent Questionnaire	Numeric	Number of siblings + 1 (*M*= 2.9888, *SD*= 1.55)
Number of jobs in household	Parent Questionnaire	Numeric	(*M*= 0.8963, *SD*= 0.70; part-time employment status coded as 0.5)

Name	Source	Type	Description
Highest parent education	Parent Questionnaire	Categorical	0= no Third-level degree (50%), 1= Third-level degree (50%)
Preschool attendance	Parent Questionnaire	Categorical	Did not attend preschool, attended preschool for two years, with attended preschool for one year as the reference category
Home climate (pupil-level)			
Books in the home	Parent Questionnaire	Categorical, dummy variables	None, 1-10, 51-100, 101-250, 250 +, with 11-50 as the reference category
TV in bedroom	Pupil Questionnaire	Categorical	0=no, 1=yes
Own mobile phone/smartphone	Pupil Questionnaire	Categorical	0=no, 1=yes
Library membership	Parent Questionnaire	Categorical	0=no, 1=yes
Educational games at home	Parent Questionnaire	Categorical	0=no, 1=yes
Reference books at home	Parent Questionnaire	Categorical	0=no, 1=yes
Computer at home	Parent Questionnaire	Categorical	0=no, 1=yes
Parental involvement (pupil-level)			
Parental membership of BOM	Parent Questionnaire	Categorical, dummy variables	0=no, 1=yes (current or past)
Parental membership of PA	Parent Questionnaire	Categorical, dummy variables	0=no, 1=yes (current or past)
Parental membership of other committee	Parent Questionnaire	Categorical, dummy variables	0=no, 1=yes (current or past)
Read to child before starting school	Parent Questionnaire	Dummy variables	A few times a week, a few times a month, rarely/never, with every day as the reference category
Child reads with parent (infants)	Parent Questionnaire	Dummy variables	A few times a week, a few times a month, rarely/never, with every day as the reference category
Parent expectations	Parent Questionnaire	Categorical	0= does not expect child to attend college 1= expects child to attend college

Name	Source	Type	Description
Parent aspirations	Parent Questionnaire	Categorical	0= does not aspire for child to attend college 1= aspires for child to attend college
Pupil attitudes and expectations (pupil-level)			
Pupil expectations	Pupil Questionnaire	Categorical	0= does not expect to attend college 1= expects child to attend college
Pupil aspirations	Pupil Questionnaire	Categorical	0= does not aspire to attend college 1= aspires for child to attend college
Likes school	Pupil Questionnaire	Categorical	0= does not like school/does not know 1= likes school
Likes reading	Pupil Questionnaire	Categorical	0= does not like reading/does not know 1= likes reading
Likes working out maths problems	Pupil Questionnaire	Categorical	0= does not like maths problems/does not know 1= likes maths problems
Out-of-school activities (pupil-level)			
Frequency of reading books for fun	Pupil Questionnaire	Categorical, dummy variables	Once/twice a week, a few times a month, hardly ever/never, with every day/almost every day as the reference category
Frequency of reading magazines/comics	Pupil Questionnaire	Categorical, dummy variables	Once/twice a week, a few times a month, hardly ever/never, with every day/almost every day as the reference category
Frequency of playing sports	Pupil Questionnaire	Categorical, dummy variables	Once/twice a week, a few times a month, hardly ever/never, with every day/almost every day as the reference category
Frequency of hanging out with friends	Pupil Questionnaire	Categorical, dummy variables	Once/twice a week, a few times a month, hardly ever/never, with every day/almost every day as the reference category
Time spent watching television	Pupil Questionnaire	Categorical, dummy variables	0-1 hours, 2-4 hours, 4+ hours, with 1-2 hours as the reference category
Time spent playing computer games	Pupil Questionnaire	Categorical, dummy variables	0-1 hours, 2-4 hours, 4+ hours, with 1-2 hours as the reference category

Name	Source	Type	Description
Time spent reading online	Pupil Questionnaire	Categorical, dummy variables	0-1 hours (no time and up to one hour combined), 2-4 hours, 4+ hours, with 1-2 hours as the reference category
Time spent messaging friends	Pupil Questionnaire	Categorical, dummy variables	0-1 hours (no time and up to one hour combined), 2-4 hours, 4+ hours, with 1-2 hours as the reference category
Time spent streaming TV/movies	Pupil Questionnaire	Categorical, dummy variables	0-1 hours (no time and up to one hour combined), 2-4 hours, 4+ hours, with 1-2 hours as the reference category
Time spent streaming music	Pupil Questionnaire	Categorical, dummy variables	0-1 hours (no time and up to one hour combined), 2-4 hours, 4+ hours, with 1-2 hours as the reference category
Time spent streaming videos	Pupil Questionnaire	Categorical, dummy variables	0-1 hours (no time and up to one hour combined), 2-4 hours, 4+ hours, with 1-2 hours as the reference category
Times spent playing games on devices	Pupil Questionnaire	Categorical, dummy variables	0-1 hours (no time and up to one hour combined), 2-4 hours, 4+ hours, with 1-2 hours as the reference category
Scouts/guides	Pupil Questionnaire	Categorical	0=no, 1=yes
Youth club	Pupil Questionnaire	Categorical	0=no, 1=yes
Band/choir/orchestra	Pupil Questionnaire	Categorical	0=no, 1=yes
Sports club	Pupil Questionnaire	Categorical	0=no, 1=yes
Homework club	Pupil Questionnaire	Categorical	0=no, 1=yes
Dance/drama group	Pupil Questionnaire	Categorical	0=no, 1=yes
Online social network	Pupil Questionnaire	Categorical	0=no, 1=yes
School context (school-level)			
DEIS Band	SSP identification database	Categorical	0=Band 1, 1=Band 2

Name	Source	Type	Description
Gender composition	Department of Education and Skills (DES) database)	Categorical, dummy variables	Boys, mixed, with girls as the reference category
Medium of Instruction	DES database	Categorical	0= English-medium 1= Irish-medium
School enrolment size	DES database	Categorical	Small, medium, with large as the reference category
Average class size (Third class)	Pupil Information Form	Numeric	*M* = 22.3, *SD*=4.90
School climate (school-level)			
School percentage attendance	Pupil Information Form	Numeric	*M* =91.9, *SD*= 1.78
Teacher expectations	Principal Questionnaire	Categorical, dummy variables	Very high, medium, low, with high as the reference category (no 'very low' responses)
Teacher job satisfaction	Principal Questionnaire	Categorical, dummy variables	Very high, medium, low or very low, with high as the reference category
Organisation of learning support	Principal Questionnaire	Categorical, dummy variables	Mostly withdrawal, 50:50, mostly in-class, with entirely withdrawal as the reference category (there were no 'entirely in-class' responses)
Parental support for pupil achievement	Principal Questionnaire	Categorical, dummy variables	Very high, high, low, very low, with medium as the reference category
Parental involvement in school activities	Principal Questionnaire	Categorical, dummy variables	Very high, high, low, very low, with medium as the reference category

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