Llywodraeth Cymru
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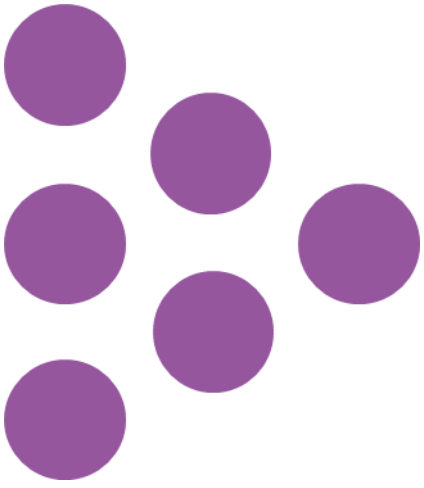
PISA 2018 additional analyses:

Welsh- and English-medium school results

National Foundation for Education Research (NFER)



PISA 2018 Additional Analyses: Welsh- and English-medium school results

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Published in November 2020

By the National Foundation for Educational Research,

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www.nfer.ac.uk

ISBN: 978-1-912596-21-8

How to cite this publication:

Classick, R., Galvis, M. and Sizmur, J. (2020). *PISA 2018 additional analyses: Welsh- and English-Medium School Results.* Slough: NFER.

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Executive Summary

The Programme for International Student Assessment (PISA) is a study of educational achievement run by the Organisation for Economic Co-operation and Development (OECD). Schools and pupils from 79 participating countries and economies participated in PISA 2018. The PISA study takes place every three years and examines the performance of 15 year old pupils in reading, mathematics and science. It also collects a range of contextual information on school and pupil backgrounds. Wales has participated in PISA since 2006.

This report expands on the 2018 PISA results for Wales (Sizmur *et al.*, 2019) by looking at the differences in reading performance between:

- pupils who attended English- and Welsh- medium schools
- pupils who took the assessment in English and those who took the assessment in Welsh
- pupils who spoke English at home and those who spoke Welsh at home.

The findings in this report show:

- Just over a quarter (27%) of pupils who participated in PISA 2018 were from Welsh-medium schools. Attending a Welsh-medium school did not automatically mean pupils took the PISA assessment in Welsh. Instead, participating schools were asked to decide the language of assessment for each of their sampled pupils.
- Pupils in Welsh-medium schools had, on average, significantly[1] lower scores than those in English-medium schools.
- Pupils taking the assessment in Welsh language had, on average, significantly lower scores than those taking the assessment in English language.
- Pupils who spoke Welsh at home had, on average, significantly lower scores than those who spoke English. However, due to the small sample of pupils, comparisons between groups should be interpreted with caution.
- The largest score difference is seen between pupils taking the assessment in Welsh and those taking the assessment in English compared to the differences seen in the other two groups.
- These differences in the mean scores are reflected in the distribution of pupils across the PISA proficiency levels in that higher proportions of pupils working below Level 2 are found in Welsh-medium schools and among pupils taking the

[1] When statistical significance is reported, it indicates that the compared means are significantly different at the 5% level.

assessment in Welsh-language. Similarly, lower proportions from these groups are found among the high achieving pupils who score Level 5 and above.

- The gender gap between the performance of girls and boys was similar whether pupils took the assessment in English or Welsh.
- The proportion of pupils eligible for FSM in Welsh-medium schools was seven per cent, while in English-medium schools it was 13 per cent.
- Among those who took the assessment in Welsh, the proportion of pupils eligible for FSM was seven per cent, compared with 12 per cent of FSM eligible pupils among those who took the assessment in English.
- The score difference between FSM eligible and non-eligible pupils was statistically significant in English-medium schools but the score difference between FSM eligible and non-eligible pupils in Welsh-medium schools was not significant.
- When the effects of all three variables (school medium, language of assessment and language spoken at home) are taken into account, the only one which was found to have a statistically significant effect on reading scores was the language of assessment. This suggests, therefore, that the lower performance of Welsh-medium schools is likely to be driven by the language of assessment.
- The length of the reading texts are often longer in Welsh than in English and in some questions the word count can be up to 25% higher. A comparison of the time taken to read the assessments in each language could be an area for further investigation, particularly in an adaptive testing situation.
- Further research is required to ascertain why taking the assessment in Welsh has a significant negative effect on PISA reading performance.

1. Introduction

The Programme for International Student Assessment (PISA) is a study of educational achievement run by the Organisation for Economic Co-operation and Development (OECD). Schools and pupils from 79 participating countries and economies participated in PISA 2018. The PISA study takes place every three years and examines the performance of 15 year old pupils in reading, mathematics and science. It also collects a range of contextual information on school and pupil backgrounds. Wales has participated in PISA since 2006.

This report expands on the 2018 PISA results for Wales (Sizmur *et al.*, 2019) by looking at the differences in reading performance in English- and Welsh-medium schools.

The analysis contained in this report should be read alongside the analysis contained in *PISA 2018 Additional Analyses: Regional Performance and PISA/GCSE matching in Wales* (Gambhir *et al.*, *2020*). The PISA assessments are a single set of assessments taken at a specific point in time. In order to properly interpret and put these outcomes into context they should be viewed alongside the achievements of these pupils and their peers in public examinations at GCSE.

During the academic year 2018-19, 29 per cent (55) of all secondary schools in Wales were Welsh-medium or bilingual schools[2]. Table 1.1 shows that just over a quarter (27 per cent) of the 3165 pupils who participated in PISA 2018 attended a Welsh-medium school[3].

Attending a Welsh-medium school did not automatically mean pupils took the PISA assessment in Welsh, as there are several models of Welsh-medium and bilingual schools across Wales. Schools decided whether each of their sampled pupils should take the PISA assessment in Welsh or English, with the determining factor being that the assessment should be taken in the language of instruction of the pupils. It should be noted that learners in Welsh-medium schools could represent a variety of different experiences in terms of Welsh-medium learning and Welsh language exposure.

PISA was then administered to each pupil in the language the school had assigned to them. This report will, therefore, also explore the differences between pupils who took the assessment in Welsh and those who took the assessment in English. Table 1.1 shows that 15 per cent of pupils took the PISA assessment in the Welsh language, indicating

[2] https://statswales.gov.wales/Catalogue/Education-and-Skills/Schools-and-Teachers/Schools-Census/Pupil-Level-Annual-School-Census/Schools/Schools by local authority, region and Welsh medium type
This includes schools categorised as Welsh-medium, Bilingual-AB, Bilingual-BB and Bilingual-CB and English with significant Welsh.

[3] Including bilingual schools.

that some pupils from Welsh-medium and bilingual schools took the assessment in English, as decided by their school.

A further part to this report was intended to examine the differences between pupils who spoke English and those who spoke Welsh at home. The question '*What language do you speak at home most of the time'* was included in the Student Questionnaire[4]. However, only six per cent of pupils who answered the questionnaire spoke Welsh at home and five per cent spoke another language, and therefore comparisons between these groups should be interpreted with caution.

Table 1.1 Sample breakdown by school type, language of assessment and language spoken at home

Category	Number of pupils	% of weighted sample
School type	-	-
English-medium	2367	75
Welsh-medium	798	25
Language of assessment	-	-
English	2707	85
Welsh	458	15
Language spoken at home	-	-
English	2664	84
Welsh	178	6
Another language	158	5

Source: PISA 2018 school census matched database

[4] Data is missing for 165 pupils in the sample either because they did not take the Student Questionnaire or they did not answer this particular question.

2. Overall score in reading

In PISA 2018, the mean score for Wales in reading was 483 (Sizmur *et al.*, 2019). Table 2.1 shows that the reading scores of pupils from English-medium schools were, on average, significantly[5] higher than those of pupils from Welsh-medium schools by a difference of 43 score points[6].

Table 2.1 Mean reading score for English- and Welsh-medium schools

-	English-medium schools	Welsh-medium schools	Difference
Mean reading score	495*	452	43

*Indicates a significant difference from the 'Welsh-medium' group.

Source: PISA 2018 school census matched database

A similar pattern was also seen when considering the language of assessment and language spoken at home, as shown in Table 2.2. In both cases, the mean scores for Welsh language were significantly lower than the mean scores for English. There was a 73 score point[7] difference between the mean scores of pupils who took the PISA reading assessment in Welsh (422) and those who took the assessment in English (494), and a 55 score point[8] difference between pupils who spoke English at home (491) and those who spoke Welsh (435).

Table 2.2 Mean reading score by language of assessment and language spoken at home

Category	English	Welsh	Difference
Language of assessment	494*	422	73
Language spoken at home	491*	435	55

* Indicates a significant difference from the 'Welsh' group.

Source: PISA 2018 school census matched database

[5] When statistical significance is reported, it indicates that the compared means are significantly different at the 5% level.
[6] See Appendix A for a breakdown by school ownership.
[7] after taking into account the rounding of figures
[8] after taking into account the rounding of figures

3. Distribution of scores

The spread of performance can be examined by looking at the distribution of scores in each group. Table 3.1 shows the scores achieved by pupils at different percentiles in English- and Welsh-medium schools. The 10th percentile is the score below which the lowest performing ten per cent of pupils lay, while the 90th percentile is the score above which the highest performing ten per cent lay and so on. The score at the 50th percentile can also be considered the 'median' score, as it is the score below which 50 per cent of pupils lay.

The scores at each percentile (10th, 25th, 50th, 75th and 90th) were significantly lower for Welsh-medium schools than for English-medium schools in PISA 2018. The differences in scores were similar, and ranged from 38 score points at the 90th percentile to 46 score points at the 25th percentile. This suggests that the gap between pupils from English-medium and Welsh-medium schools is largely consistent across all ability levels, rather than becoming wider or narrower as performance increases.

Table 3.1 Distribution of reading scores for English- and Welsh-medium schools

Percentile	English-medium schools	Welsh-medium schools	Difference
10th	373*	332	41
25th	430*	384	46
50th	495*	450	45
75th	561*	520	42
90th	617*	579	38

* Indicates a significant difference from the 'Welsh-medium' group.

Source: PISA 2018 school census matched database

The scores across each percentile were also significantly higher for pupils who took the assessment in English than those who took the assessment in Welsh as shown in Table 3.2. Unlike the pattern seen for school type, the size of the difference between the two languages increased as performance increased, from a difference of 56 score points at the 10th percentile to 83 score points at the 90th percentile.

The score at the 75th percentile for pupils who took the assessment in English (561) was significantly higher than the score at the 90th percentile for pupils who took the assessment in Welsh (532). This means the highest attaining pupils who took the assessment in Welsh are performing below the top 25 per cent of pupils who took the assessment in English.

Table 3.2 Distribution of reading scores by language of assessment

Percentile	English	Welsh	Difference
10th	372*	316	56
25th	430*	364	66
50th	495*	419	76
75th	561*	478	83
90th	615*	532	83

* Indicates a significant difference from the 'Welsh' group.

Source: PISA 2018 school census matched database

Table 3.3 shows the score at each percentile was also significantly lower for pupils who spoke Welsh at home than those who spoke English. The size of the difference varied slightly across each percentile but the smallest difference was seen at the 10th percentile (43 score points) and the largest difference was seen at the 90th percentile (61 score points).

Table 3.3 Distribution of reading scores by language spoken at home

Percentile	English	Welsh	Difference
10th	366*	323	43
25th	424*	372	53
50th	491*	433	59
75th	558*	504	54
90th	614*	553	61

* Indicates a significant difference from the 'Welsh' group.

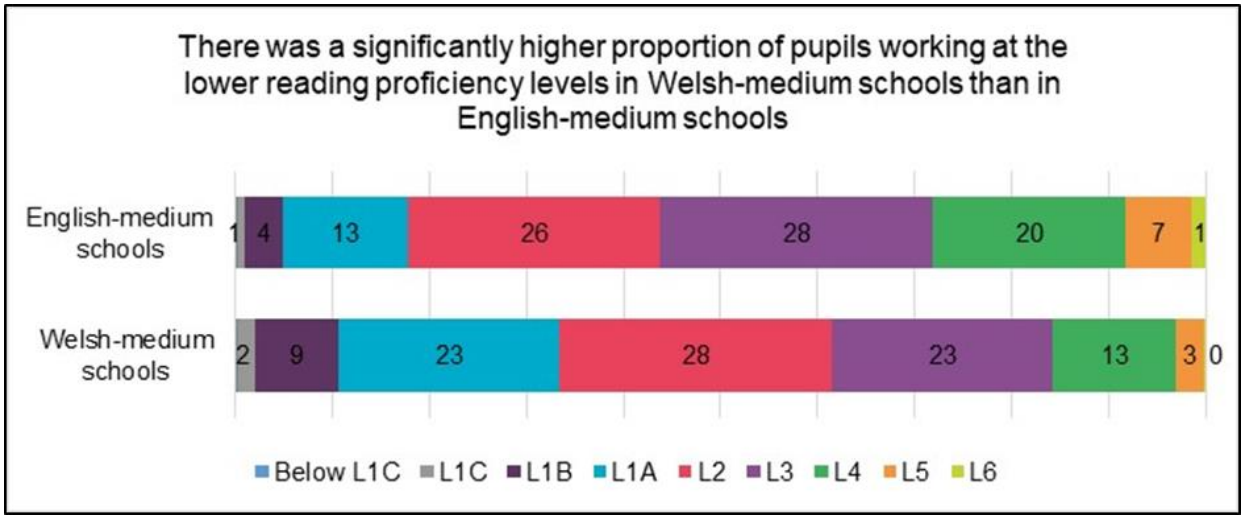
Source: PISA 2018 school census matched database

4. Proficiency levels

Another way of examining the spread of attainment is by looking at performance at each of the PISA proficiency levels. Chapter 5 of the OECD International report (OECD, 2019b) provides summary descriptions for the eight levels of reading proficiency in PISA 2018 (see Appendix A1.2 of the Wales 2018 PISA national report (Sizmur *et al.*, 2019)). Pupils who score below Level 2 are considered to be low performers in reading and those that perform at Level 5 or above are considered top performers (OECD, 2019b). In PISA 2018, seven per cent of pupils in Wales were working at Level 5 or above (high performers) and 22 per cent were working below Level 2 (low performers).

Figure 4.1 shows the proportion of pupils at the different proficiency levels in English- and Welsh-medium schools. There was a significantly higher proportion of pupils working at the lower reading proficiency levels (below Level 2) in Welsh-medium schools (33 per cent[9]) than in English-medium schools (18 per cent). Additionally, there were significantly more pupils working at the higher reading proficiency levels (Levels 5 and 6) in English-medium schools (8 per cent) than in Welsh-medium schools (3 per cent).

Figure 4.1 Reading proficiency levels in English- and Welsh-medium schools



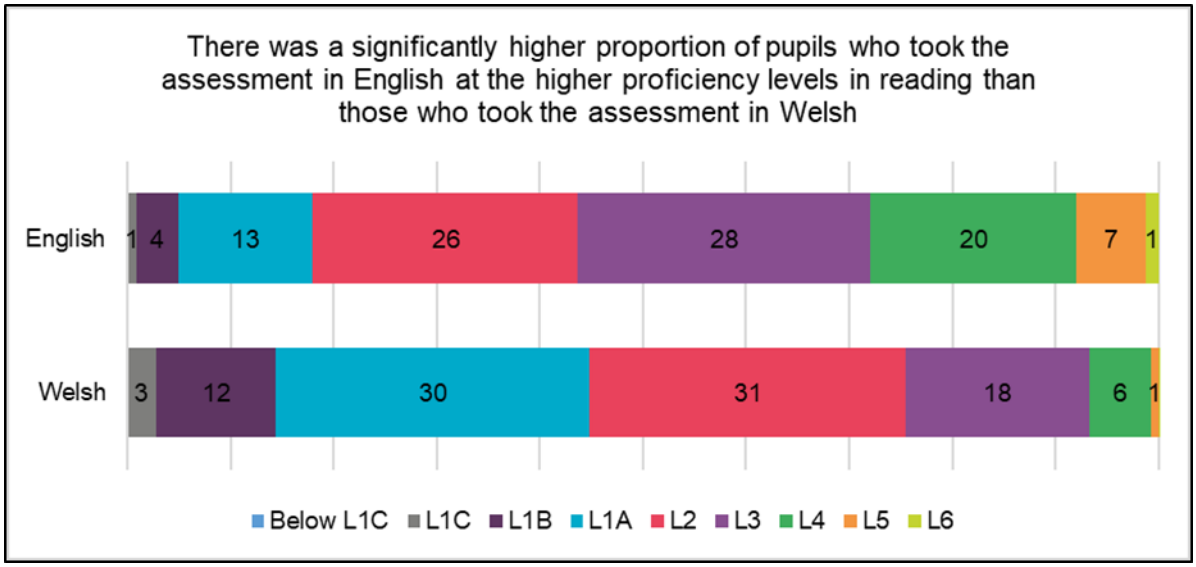
Note: All percentages are rounded.

Source: PISA 2018 school census matched database

When considering the language of the assessment, 45 per cent of pupils who took the assessment in Welsh were categorised as low performers (working below Level 2); this was significantly more than the 18 per cent of low performers who took the assessment in English. One per cent of pupils who took the assessment in Welsh were working at Level 5 and less than 0.5 per cent were working at Level 6. Significantly more pupils (eight per cent) were categorised as high performers in the group who took the assessment in English.

[9] after taking into account the rounding of figures

Figure 4.2 Reading proficiency levels by language of assessment



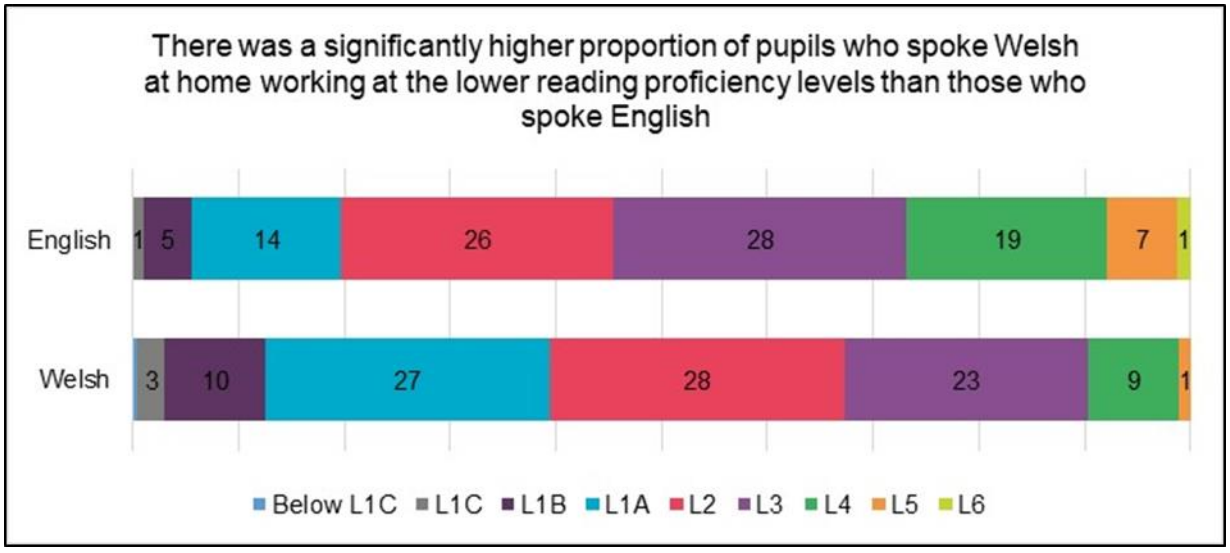
Note: All percentages are rounded.

Source: PISA 2018 school census matched database

Finally, eight per cent of pupils who spoke English at home were working at Level 5 or above. This was a significantly higher proportion than for those who spoke Welsh at home, which was one per cent. No pupils who spoke Welsh at home were working at Level 6. There was a significantly higher proportion of pupils who spoke Welsh at home working at the lower proficiency levels (39 per cent[10]) compared with the proportion of pupils who spoke English (20 per cent).

[10] after taking into account the rounding of figures

Figure 4.3 Reading proficiency levels by language spoken at home



Note: All percentages are rounded.

Source: PISA 2018 school census matched database

5. Reading subscale scores

5.1 Cognitive Processes

The PISA 2018 Assessment and Analytical Framework (OECD, 2019a) identified four reading processes which readers use when engaging with a text. These were 'locating information', 'understanding', 'evaluating and reflecting' and 'reading fluency'. Chapter 1 of the PISA 2018 International report (OECD, 2019b) provides definitions of these processes. In 2018, Wales had a mean score of 494 for locating information, 479 for understanding and 492 for evaluating and reflecting (Sizmur *et al.*, 2019). Reading fluency was not reported in the same way as the other three processes. For more information, see the PISA 2018 International report.

As shown in Table 5.1 pupils from English-medium schools scored, on average, significantly higher in all three cognitive processes than pupils from Welsh-medium schools. The biggest difference was between mean scores for understanding (38 score points) compared to locating information and evaluating and reflecting which both had differences of 32 score points.

Table 5.1 Mean scores for each cognitive process for English- and Welsh- medium schools

Cognitive process	English-medium	Welsh-medium	Difference
Locating information	502*	470	32
Understanding	489*	451	38
Evaluating and reflecting	500*	468	32

* Indicates a significant difference from the 'Welsh-medium' group.

Source: PISA 2018 school census matched database

Table 5.2 shows that pupils who took the PISA assessment in English scored significantly higher in all three cognitive processes than those who took the assessment in Welsh, but the differences were larger than was seen by school type. Again, the biggest difference was seen in understanding, with a 67 score point difference between the two means. The score point differences for locating information and evaluating and reflecting were similar, at 54 and 57, respectively.

Table 5.2 Mean scores for each cognitive process by language of assessment

Cognitive process	English	Welsh	Difference
Locating information	502*	448	54
Understanding	489*	422	67
Evaluating and reflecting	500*	443	57

*Indicates a significant difference from the 'Welsh' group.

Source: PISA 2018 school census matched database

There was much more variation in score point difference across the three cognitive processes when considering the language spoken at home compared to school type and language of assessment, as shown in Table 5.3, locating information provided the smallest difference between mean scores at 31 score points. The difference between mean scores for understanding was larger, at 53 score points.

Table 5.3 Mean scores for each cognitive process by language spoken at home

Cognitive process	English	Welsh	Difference
Locating information	500*	469	31
Understanding	485*	432	53
Evaluating and reflecting	497*	455	42

*Indicates a significant difference from the 'Welsh' group.

Source: PISA 2018 school census matched database

5.2 Reading source

The PISA 2018 Assessment and Analytical Framework (OECD, 2019a) classified texts by the source, that is, whether it was made up of a single unit or multiple units. In 2018, Wales had a mean score of 480 for single-source texts and 489 for multiple-source texts (Sizmur *et al.*, 2019).

Table 5.4 shows that pupils who attended an English-medium school did significantly better than those who attended a Welsh-medium school for both single- and multiple-source texts. The size of the score differences was similar for single-source texts (37 score points) and multiple-source texts (35 score points).

Table 5.4 Mean scores for reading source for English- and Welsh-medium schools

Reading source	English-medium	Welsh-medium	Difference
Single-source	490*	453	37
Multiple-source	499*	464	35

*Indicates a significant difference from the 'Welsh-medium' group.

Source: PISA 2018 school census matched database

Table 5.5 shows that pupils who took the PISA assessment in Welsh had significantly lower scores for both single- and multiple-source texts than those who took the assessment in English. The size of the score difference was similar for single-source texts (63 score points) and multiple-source texts (60 score points[11]), but larger than the differences seen by school type and language spoken at home.

Table 5.5 Mean scores for reading source by language of assessment

Reading source	English	Welsh	Difference
Single-source	489*	426	63
Multiple-source	499*	438	60

* Indicates a significant difference from the 'Welsh' group.

Source: PISA 2018 school census matched database

Table 5.6 shows that pupils who spoke English at home had, on average, significantly higher scores than those who spoke Welsh. Pupils who spoke Welsh at home had a mean score 49 score points lower than those who spoke English for single-source texts, and 44 score points lower for multiple-source texts.

[11] after taking into account the rounding of figures

Table 5.6 Mean scores for reading source by language spoken at home

Reading source	English	Welsh	Difference
Single-source	486*	437	49
Multiple-source	495*	451	44

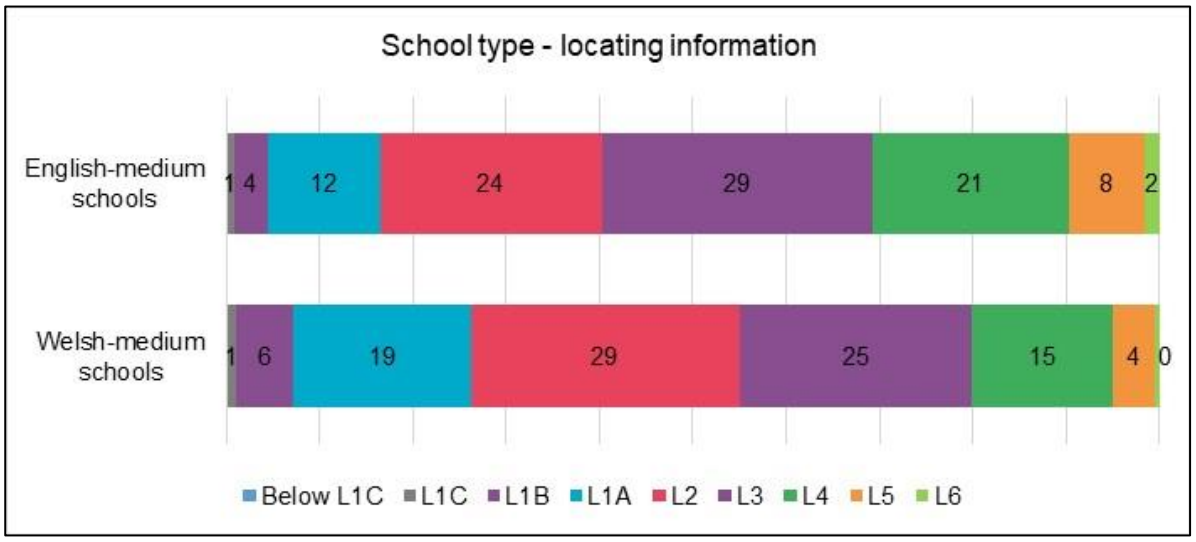
* Indicates a significant difference from the 'Welsh' group.

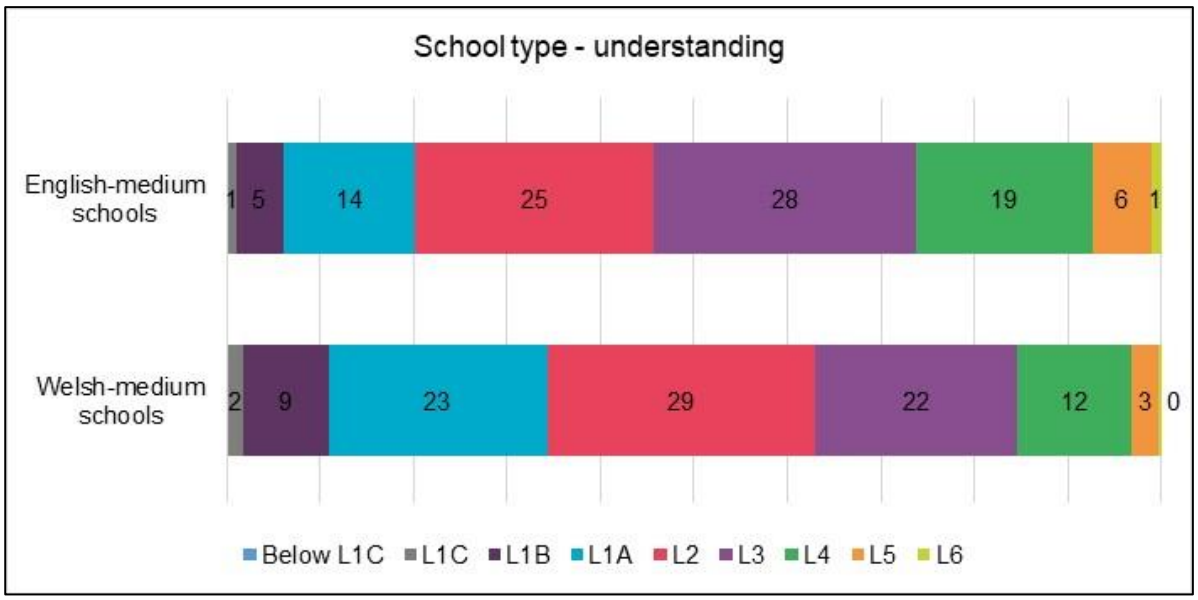
Source: PISA 2018 school census matched database

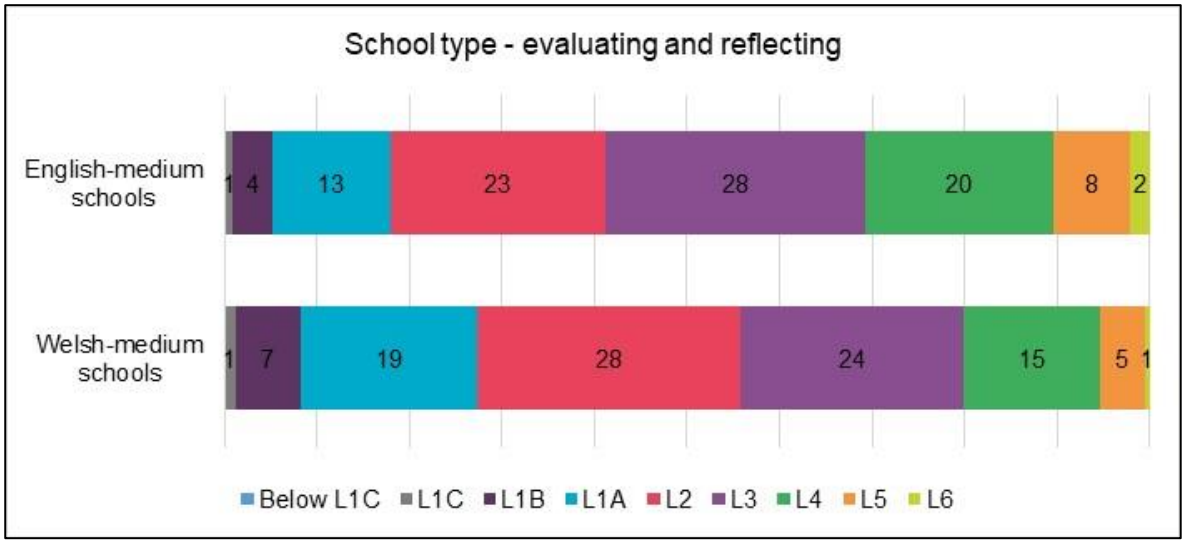
5.3 Performance in reading subscales across PISA proficiency levels

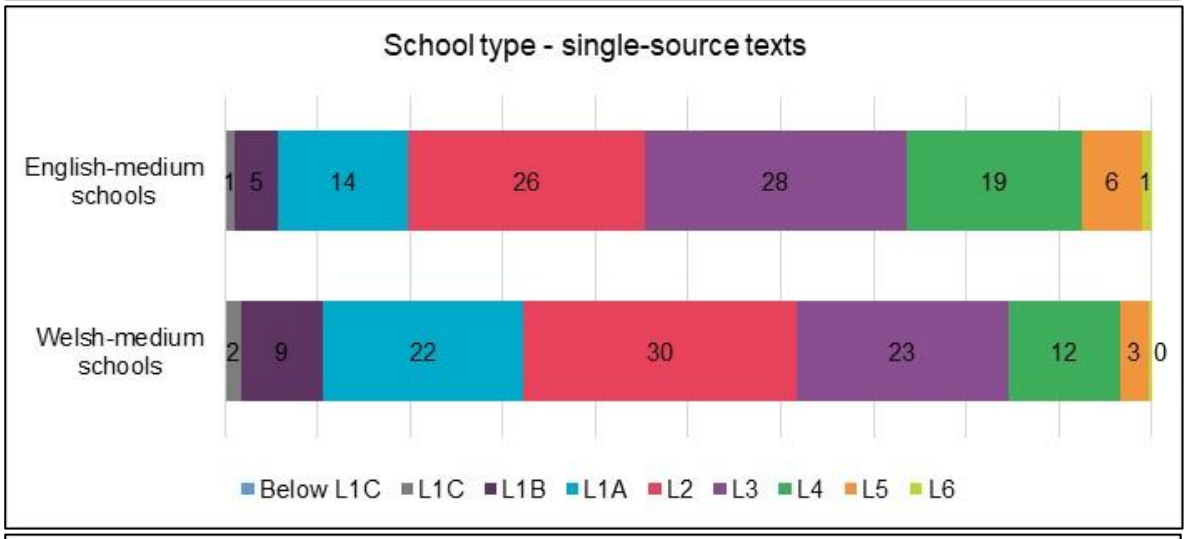
The following figures show the proportions of pupils across the eight PISA proficiency levels in reading for each subscale (locating information, understanding, evaluating and reflecting and single- and multiple-texts) for school type, language of assessment and language spoken at home. The pattern is similar across all subscales with regards to proficiency levels, that is, there are higher proportions of pupils at the lower proficiency levels in Welsh-medium schools and a lower proportion at the high proficiency levels. The same pattern was found for pupils who took the assessment in Welsh, and who spoke Welsh at home. As with the previous analyses, the biggest differences were found when comparing the results by the language of the assessment.

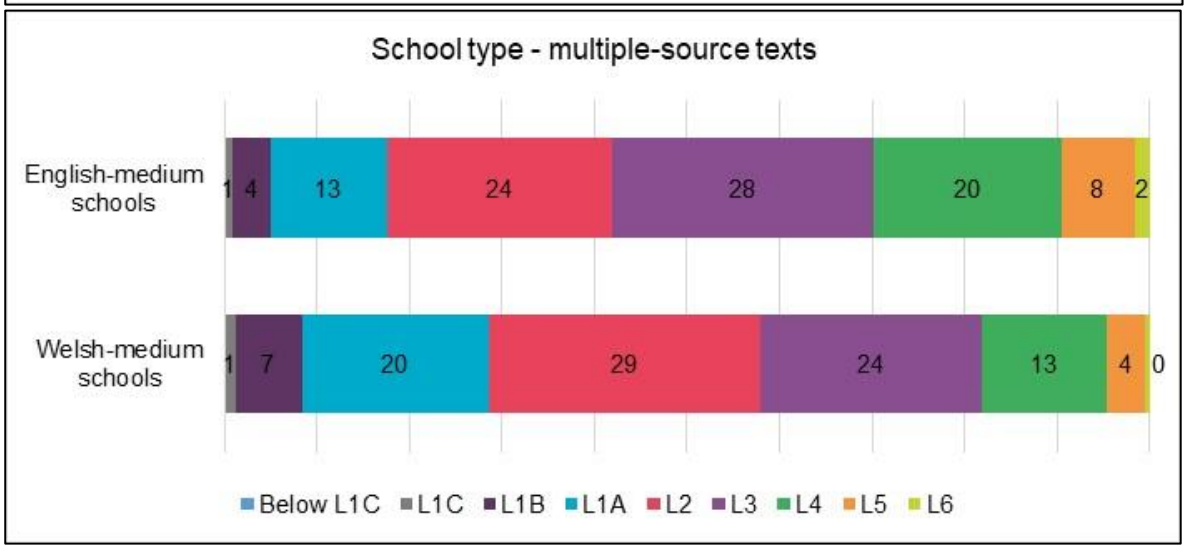
Figure 5.1 Distribution of performance for each subscale for English- and Welsh-medium schools







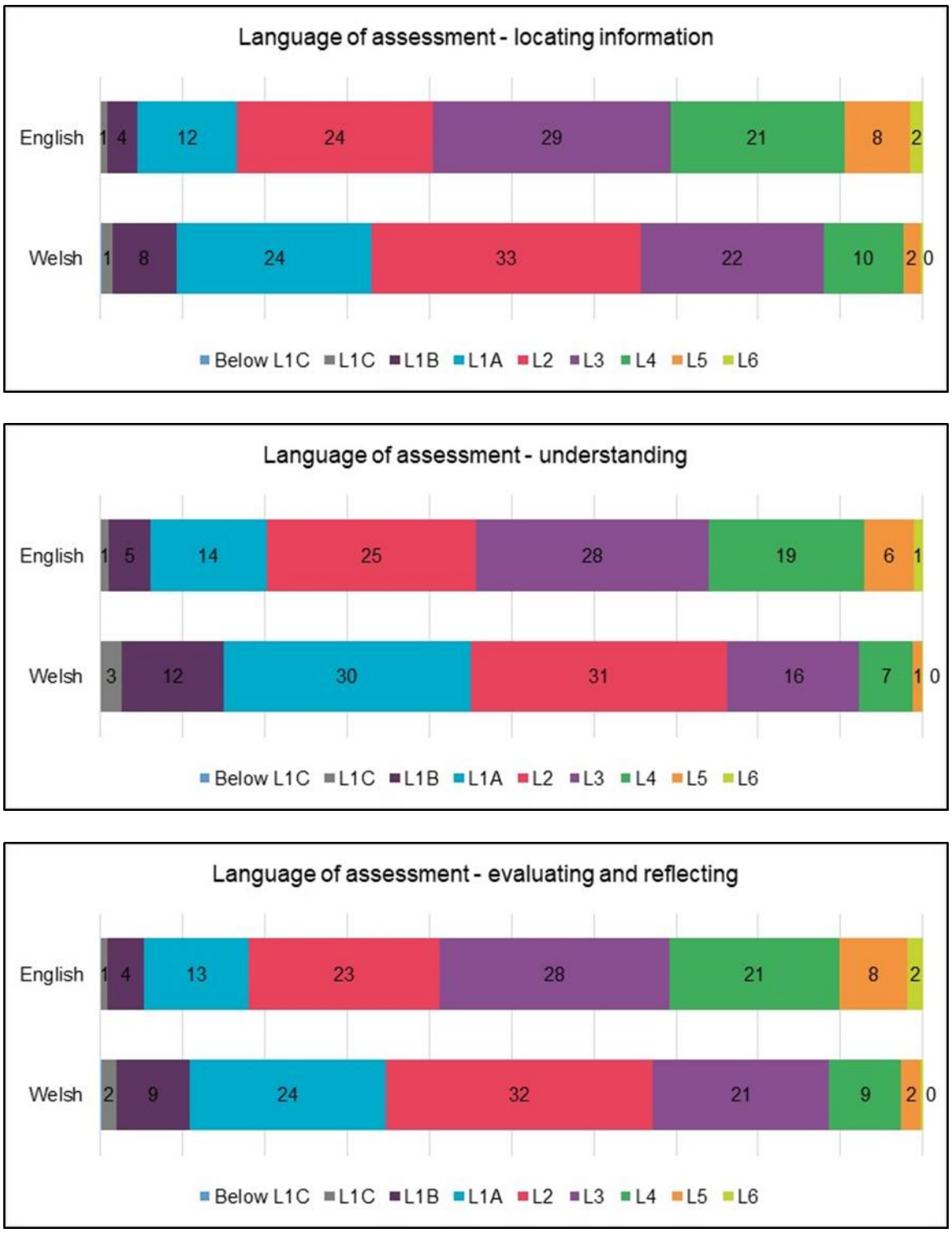


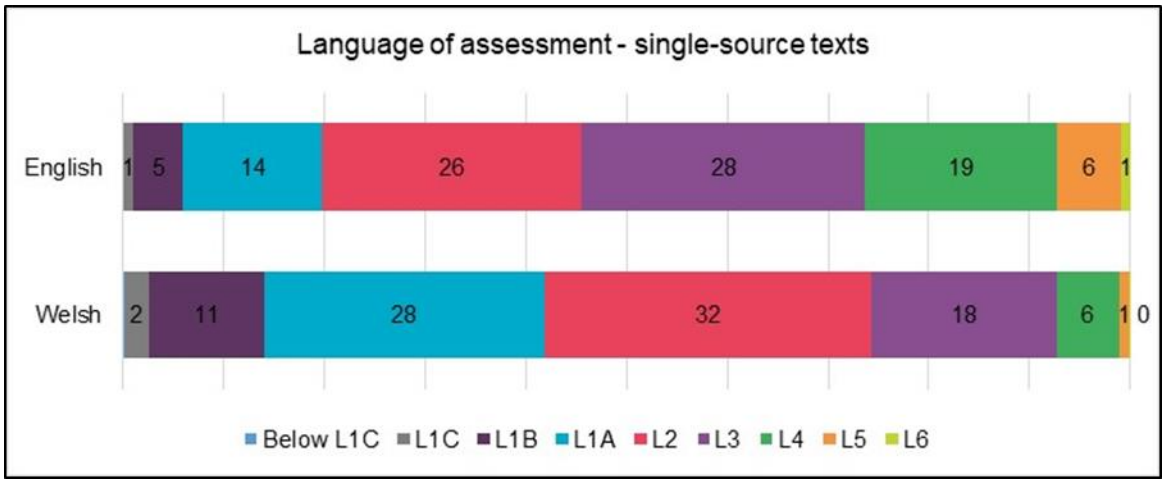


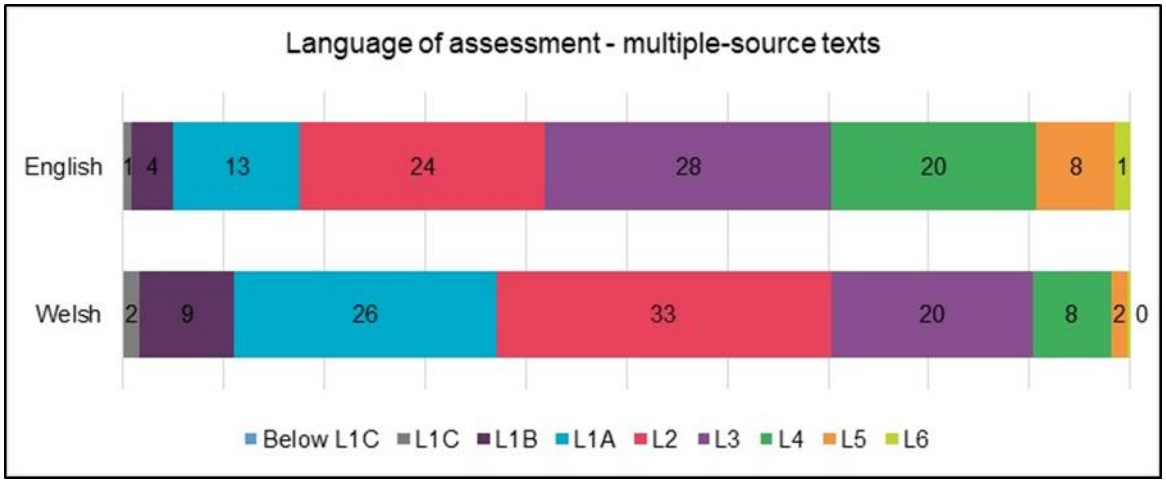
Note: All percentages are rounded.

Source: PISA 2018 school census matched database

Figure 5.2 Distribution of performance for each subscale for language of assessment



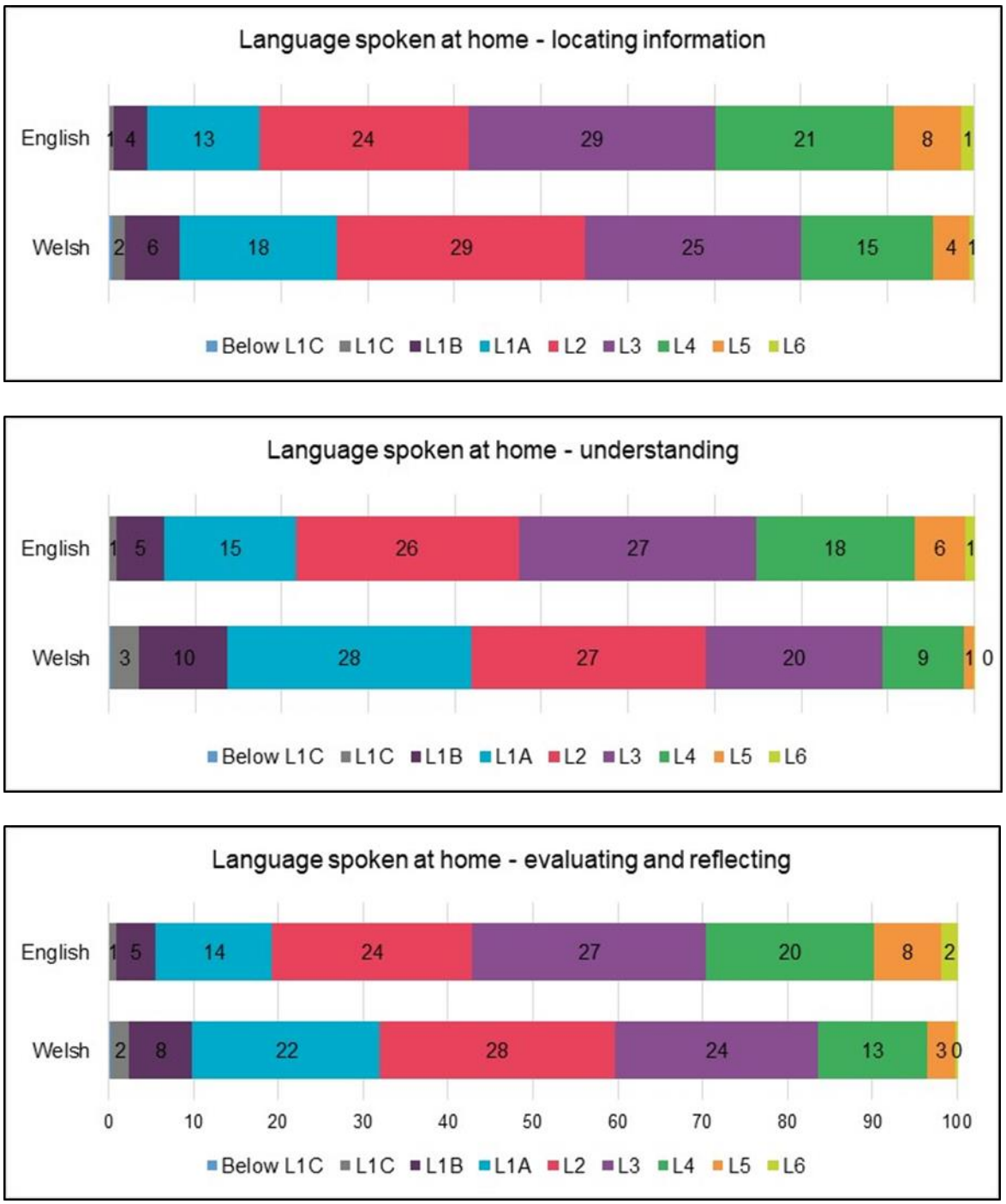


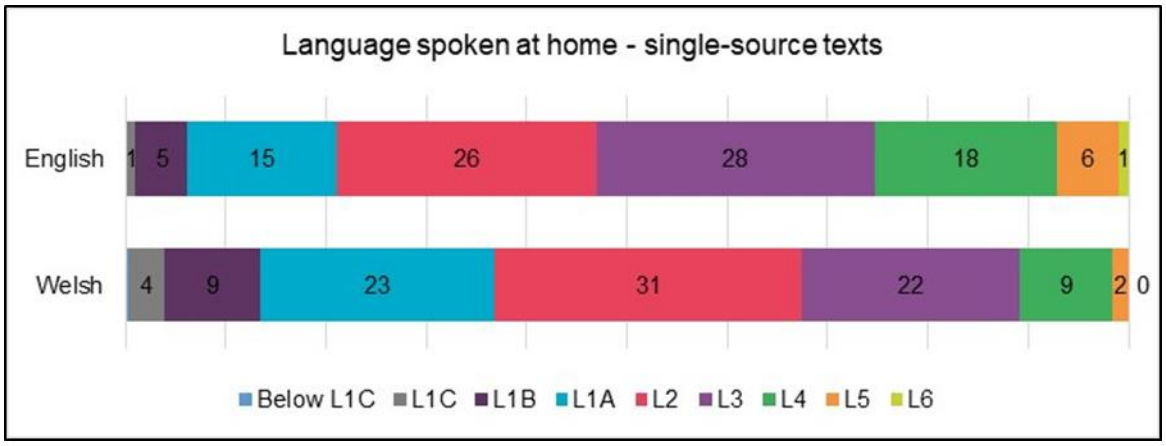


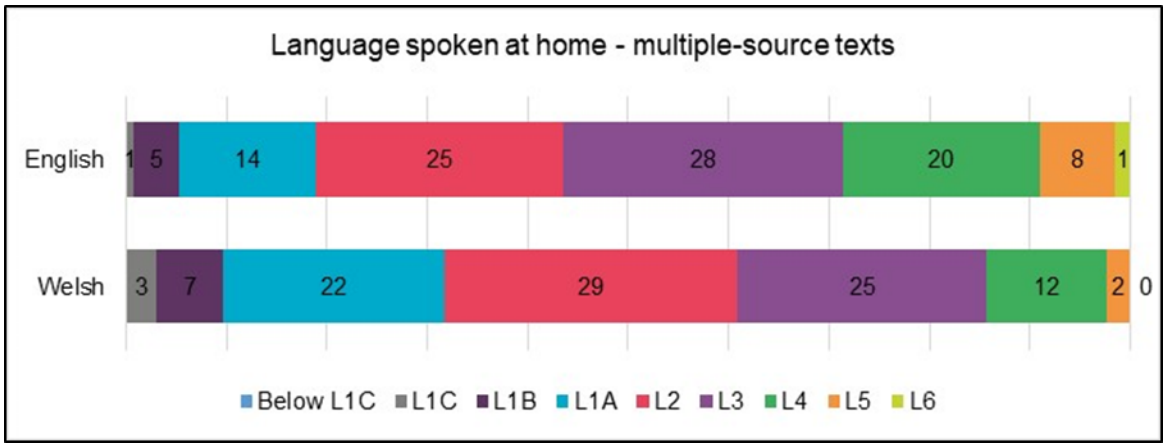
Note: All percentages are rounded.

Source: PISA 2018 school census matched database

Figure 5.3 Distribution of performance for each subscale for language spoken at home







Note: All percentages are rounded.

Source: PISA 2018 school census matched database

6. Gender differences

In PISA 2018, girls outperformed boys in reading in every participating country (OECD, 2019c). In Wales, the size of the gender gap was 26 score points (Sizmur *et al.*, 2019), with a mean score of 497 for girls and 470 for boys. Tables 6.1 to 6.3 show the different mean scores for boys and girls by school type, language of assessment and language spoken at home. Appendix B.1 shows the proportion of boys and girls in each category.

Table 6.1 shows that there was a significant gender gap in both English- and Welsh-medium schools and that the gender difference was larger in Welsh-medium schools (32 score points compared with 23 score points). The scores of both girls and boys in English-medium schools were significantly higher than their counterparts in Welsh-medium schools. Although lower, the mean score for girls from Welsh-medium schools was not significantly different from the mean score for boys from English-medium schools.

Table 6.1 Mean scores for boys and girls in English- and Welsh-medium schools

Gender	English-medium	Welsh-medium	Difference
Girls	506*	469	38
Boys	483* †	437 †	46
Gender gap	23	32	-

* Indicates a significant difference from the 'Welsh-medium' group.

† Indicates a significant difference from the mean score for girls.

Source: PISA 2018 school census matched database

Gender gaps were also seen when considering the language of assessment and were similar whether pupils took the assessment in English or Welsh (26[12] and 29 score points, respectively).

Both girls and boys who took the assessment in English had mean scores that were significantly higher than those of the same gender who took the assessment in Welsh.

Additionally, boys who took the assessment in English scored significantly better than girls who took the assessment in Welsh. The difference was 45 score points[13].

[12] after taking into account the rounding of figures
[13] after taking into account the rounding of figures

Table 6.2 Mean reading scores for boys and girls by language of assessment

Gender	English	Welsh	Difference
Girls	507*	436	71
Boys	482* †	408†	74
Gender gap	26	29	-

* Indicates a significant difference from the 'Welsh' group.

† Indicates a significant difference from the mean score for girls.

Source: PISA 2018 school census matched database

Table 6.3 shows there was a significant gender gap for both pupils who spoke English at home and for those who spoke Welsh at home. However, the gender gap for pupils who spoke Welsh at home was noticeably larger than for those who spoke English.

There was also a much bigger difference between the boys who spoke English or Welsh at home than between the girls.

Although lower, the mean score for girls who spoke Welsh at home was not significantly different from the mean score for boys who spoke English at home.

Table 6.3 Mean reading scores for boys and girls by language spoken at home

Gender	English	Welsh	Difference
Girls	502*	458	44
Boys	479* †	415 †	65
Gender gap	22	43	-

* Indicates a significant difference from the 'Welsh' group.

† Indicates a significant difference from the mean score for girls.

Source: PISA 2018 school census matched database

7. Free school meal eligibility

The national measure usually used to understand the effects of disadvantage is eligibility for free school meals (FSM). Eligibility for FSM divides pupils into two groups – those who are eligible and those who are not. In PISA 2018, pupils in Wales who were not eligible for FSM had a mean score of 485 and the mean score for pupils who were eligible for FSM was 451. Appendix B.2 shows the proportion of pupils who were eligible for FSM by school type and language of assessment. Due to the small number of pupils who spoke Welsh at home and were eligible for FSM, the results for the language spoken at home have been omitted to ensure confidentiality.

Table 7.1 shows that pupils who were eligible for FSM in English-medium schools had, on average, significantly higher scores (459) than those from Welsh-medium schools (417), with a difference of 42 score points[14]. There was also a significant 42 score point difference between English- and Welsh- medium pupils who were not eligible for FSM.

Whilst the 38-score point difference was significant between FSM eligible and non-eligible pupils in English-medium schools, a similar 38 score point difference between FSM eligible and non-eligible pupils in Welsh-medium schools was not significant[15]. The mean scores for FSM eligible pupils in English-medium schools and non-eligible pupils from Welsh-medium schools were not significantly different.

Table 7.1 Mean reading scores by FSM eligibility and medium of school

FSM eligibility	English-medium	Welsh-medium	Difference
Not eligible for FSM	498*	455	42
Eligible for FSM	459*†	417	42
Difference	38	38	-

* Indicates a significant difference from the 'Welsh-medium' group.

† Indicates a significant difference from the 'Not eligible for FSM' group.

Source: PISA 2018 school census matched database

When looking generally at the language of the assessment, pupils who took the assessment in Welsh had, on average, lower scores than pupils who took the assessment in English.

[14] after taking into account the rounding of figures
[15] Differences in the significance are due to larger standard errors in the FSM eligible group from Welsh-medium schools because of the much smaller numbers in that subsample.

For pupils eligible for FSM, that is, the most disadvantaged, there was a difference of 80 score points between those who took the assessment in English and those who took the assessment in Welsh.

FSM eligible pupils who took the assessment in English had, on average, significantly lower scores than those not eligible for FSM who took the assessment in English, with mean scores of 459 and 497, respectively. FSM eligible pupils who took the assessment in English had, on average, significantly higher sores than those not eligible for FSM who took the assessment in Welsh, with a difference of 36 score points[16].

Table 7.2 Mean reading scores for FSM eligible by language of assessment

FSM eligibility	English	Welsh	Difference
Not eligible for FSM	497*	424	73
Eligible for FSM	459*†	379†	80
Difference	38	44	-

* Indicates a significant difference from the 'Welsh' group.

† Indicates a significant difference from the 'Not eligible for FSM' group.

Source: PISA 2018 school census matched database

[16] after taking into account the rounding of figures

8. What has the most impact on PISA reading scores?

Thus far the report has shown that, across the PISA sample in Wales:

- Pupils in Welsh-medium schools performed less well in reading than their peers from English-medium schools.
- Pupils who took the assessment in Welsh scored lower than pupils who took the assessment in English.
- Pupils who spoke Welsh at home performed less well than those who spoke English at home.

Taken individually, each of these three variables (medium of school, language of assessment and language spoken at home) is seen to have a significant impact on PISA reading scores. However, the three variables are interlinked[17], that is, pupils can have two or three of these characteristics simultaneously. In line with this, we conducted a linear regression analysis to help determine which of these factors had more impact on reading performance.

The linear regression included three explanatory variables: school medium, language of assessment and language spoken at home. The results are shown in Table 8.1.

Table 8.1 Linear regression with three explanatory variables: medium of school, language of assessment and language spoken at home

Variable	Coefficient
Taking the PISA assessment in Welsh	-67.1*
Speaking Welsh at home most of the time	-16.9
Being in a Welsh-medium school	-1.0

* Indicates a significant effect at the 5 per cent level **N = 2,482

Source: PISA 2018 school census matched database

When the effects of all three variables are taken into account, the only one which was found to have a statistically significant effect on reading scores was the language of assessment (-67.1).

This suggests, therefore, that the lower performance of Welsh-medium schools is likely to be driven by the language of assessment. Neither medium of school, nor language spoken at home have a significant effect when the three variables are taken into account simultaneously.

[17] School medium sample breakdown by language of assessment and language spoken at home can be found in Appendix C

The length of the reading texts are often longer in Welsh than in English and in some questions the word count can be up to 25% higher. A comparison of the time taken to read the assessments in each language could be an area for further investigation, particularly in an adaptive testing situation.

It is important to note that in this analysis we did not include other characteristics that may also influence reading scores like gender and socioeconomic status. Further research is required to ascertain why taking the assessment in Welsh has a significant negative effect on PISA reading performance

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Appendix A

The nationally representative PISA sample comprised both maintained and private independent schools.

Pupils from private independent schools scored, on average, significantly higher than those from maintained schools, as is shown in Appendix A.1.

As Appendix A.2 shows, all of the independent schools were English-medium.

Appendix A.1 Mean reading score by school ownership (PISA 2018)

School ownership	Number of pupils	Mean reading score
Private independent	147	556*
Maintained	2901	482

* Indicates a significant difference from the 'Maintained' group.

Source: PISA 2018 school census matched database

As Appendix A.2 shows, pupils from maintained English-medium schools[18] also performed significantly better than those from maintained Welsh-medium schools.

Appendix A.2 Mean reading score by school ownership for English- and Welsh-medium schools (PISA 2018)

-	English-medium schools		Welsh-medium schools	
School ownership	**Number of pupils**	**Mean reading score**	**Number of pupils**	**Mean reading score**
Private independent	147	556	0	-
Maintained	2135	493*	766	455

* Indicates a significant difference from the 'Welsh-medium maintained' group.

Source: PISA 2018 school census matched database

Further comparisons between performance of Welsh- and English-medium pupils, relating PISA and GCSE results, are reported in *PISA 2018 Additional Analyses: Regional Performance and PISA/GCSE matching in Wales* (Gambhir *et al.*, *2020*).

[18] School ownership information is not available for 107 pupils. As a result, the reading means in Appendix A differ from the overall means found in the body of this report where this group of pupils can be included.

Appendix B

Appendix B.1 Sample breakdown by gender

Category	Girls	Boys
English-medium schools	1175 (37%)	1192 (38%)
Welsh-medium schools	390 (12%)	408 (13%)
Language of assessment – English	1335 (42%)	1372 (43%)
Language of assessment – Welsh	230 (7%)	228 (7%)
Language spoken at home - English	1324 (47%)	1340 (47%)
Language spoken at home - Welsh	87 (3%)	91 (3%)

Source: PISA 2018 school census matched database

Appendix B.2 Sample breakdown by FSM eligibility

Category	Not eligible for FSM	Eligible for FSM
English-medium schools	1910 (65%)	278 (9%)
Welsh-medium schools	711 (24%)	60 (2%)
Language of assessment – English	2222 (75%)	306 (10%)
Language of assessment – Welsh	399 (13%)	32 (1%)

Source: PISA 2018 school census matched database

Appendix C

Appendix C.1 School medium sample breakdown by language of assessment and language spoken at home

Category	English-medium school	Welsh-medium school
Language of assessment	**n**	**n**
English	2367	340
Welsh	0	458
Language spoken at home	-	-
English	2123	541
Welsh	15	163

Source: PISA 2018 school census matched database

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NFER ref. WPAA

ISBN. 978-1-912596-21-8