

## **THE PISA ASSESSMENT OF READING LITERACY**

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The performance of 15-year olds in Ireland on reading literacy ranked in the top quarter of OECD countries in PISA in 2000 and 2003. In 2000, just over 1 in 10 students (11.0%) scored at or below the lowest proficiency level (Level 1), and just over 4 in 10 (41.3%) at the two highest levels (Levels 4 and 5). In 2003, the same percentage scored at Level 1 or below, while the percentage scoring at Levels 4 and 5 had decreased to 35.5. Ireland was one of three OECD countries in which there was a significant decline in mean achievement since 2000. Students scoring at the 75th, 90th, and 95th percentile ranks also performed significantly less well in 2003. Significant performance differences in favour of female students in 2000 and 2003 are interpreted with reference to differential performance on text type and process subscales. Gender effects are also examined in three multi-level models of reading literacy which provide rather different results. In 2000, engagement of students in Ireland in leisure reading was fourth lowest among OECD countries. In 2003, one-fifth of students reported never reading non-fiction texts at school, and 70% said that they never read electronic texts.

In the first cycle of PISA in 2000, reading literacy was the major assessment domain. This enabled the development of a comprehensive profile of the reading skills and attitudes toward reading of 15-year olds in participating countries. In the second cycle, in 2003, when reading literacy was a minor assessment domain, less comprehensive information on reading performance was obtained. Nevertheless, taken together, the findings of the two studies allow us to look in some detail at performance standards, including changes in performance over time; differences in performance between male and female students, and how these can be interpreted; and patterns of students' engagement in reading different text types, both at home and at school. Before considering these issues, the framework for the PISA assessment of reading literacy is briefly described.

### THE READING LITERACY FRAMEWORK

The PISA assessment of reading literacy is underpinned by a detailed framework that defines literacy, specifies the text types and reading processes that are assessed, and outlines the contexts in which texts are embedded (see OECD, 1999, 2003). Literacy is defined as 'understanding, using and reflecting on written texts, in order to achieve one's goals, to develop one's knowledge and

potential, and to participate in society' (OECD, 1999, p. 20). Reference in the definition to participation in society leads to the use of texts that students are likely to encounter in real-life situations as well as in school. These include continuous texts (narration, exposition, description, argumentation, documents and hypertext<sup>1</sup>) and non-continuous texts (charts and graphs, tables and matrices, diagrams, maps, forms and information sheets, calls and advertisements, vouchers, and certificates).

The assessment framework identifies three broad clusters of reading process, ranging from simple to complex:

- retrieving information from text and forming a broad general understanding;
- developing an interpretation;
- reflecting on and evaluating the content and form of a text.

The PISA assessment of reading literacy made use of five item formats: simple multiple-choice, complex multiple-choice (where the respondent answers 'yes' or 'no' to three to five statements related to a text), short response, close constructed response, and open constructed response. While most items assessing retrieval used the simple multiple-choice format, items assessing the ability to evaluate texts used open response, in which students might be asked to respond with a paragraph-length text.

The situations in which texts in PISA were embedded are reading for private use; reading for public use; reading for work (occupational); and reading for education. These situations provide a link with PISA's aim of assessing literacy in 'real life' contexts.

As an example, one of the released reading literacy texts from PISA 2000, called the Gift, is a narrative about a woman whose houseboat broke from its mooring during a storm, and who had to deal with the presence of a panther on the balcony outside. Gripped with fear, the woman appeased the panther by sharing some of her meat with him. Since this narrative is a 'continuous' text, all six items based on the text are categorized as continuous. Each item is also categorized in terms of item type, and in terms of the principal reading process that it taps. One of these, a multiple-choice item categorized as 'retrieval of information', directed students towards a particular line in the text, and asked

<sup>1</sup> Hypertext is defined as 'a set of text slots linked together in such a way that the units can be read in different sequences, allowing readers to follow various routes to the information' (OECD, 2003, p. 110). Although referred to in the assessment framework, it was not assessed in 2000 or 2003.

them to indicate, from among four choices, what happened next. In Ireland, 85.3% of students selected the correct response. The corresponding OECD average was 86.8 percent. On a second question, categorized as 'interpretation of text', students were presented with three short quotations from the beginning of the story (e.g., 'the cry awoke her . . . a sound so anguished'), and were asked to indicate in writing why they thought the author introduced the panther using this language. Students who responded that the author intended to evoke pity (38.0% in Ireland, and an OECD average of 28.1%) received full credit, while students who provided a more general or literal response (e.g., the panther was hungry) (26.2% in Ireland, and an OECD average of 29.5%) were given partial credit. On a third item, categorized as 'reflect and evaluate', students were asked to indicate, again in writing, if the last sentence in the text gave an appropriate ending, and to demonstrate in their answers how the last sentence related to the story's meaning. Students receiving full credit (28.1% in Ireland, and an OECD average of 20.2%) went beyond a literal interpretation, by referring to thematic completeness, or to style and mood, while those receiving partial credit (28.8% in Ireland, and an OECD average of 28.8%) responded at a more literal level, generally with reference to the narrative sequence.

The same framework underpinned the assessment of reading literacy in 2000 and 2003. However, in 2000, the test included 48 texts and 141 items. In 2003, there were 8 texts and 28 items.<sup>2</sup> Nevertheless, the relative emphasis on framework elements was similar in 2000 and 2003. In both years, for example, about two-third of items were based on continuous texts and one-third on non-continuous texts. While in 2000, it was possible to report performance on an overall scale, as well as on three subscales (based on the three clusters of reading processes outlined above), in 2003, it was possible only to report in terms of an overall scale.

The types of reading tasks that students are expected to perform in PISA reading literacy are broadly similar to those they are asked to perform in junior cycle English. In a comparison of PISA with junior cycle English, it was concluded that students taking Higher-level Junior Certificate English would be expected to be 'very familiar' or 'familiar' with the processes assessed by 96% of PISA items, as well as the contexts (genre, text length, density, complexity)

<sup>2</sup> All texts and items used in PISA 2003 were drawn from the PISA 2000 pool. No new texts or items were released following the 2003 assessment. Readers wishing to examine texts and items similar to those encountered by students in PISA 2003 are referred to the examples in OECD (2001) and to Shiel, Cosgrove, Sofroniou, & Kelly (2001), where released items from the 2000 assessment are presented and discussed.

underlying 87% of the items. The corresponding percentages for Ordinary level students were 91% for processes and 82% for contexts, while for Foundation level they were 75% for processes and 49.3% for contexts (Shiel et al., 2001). Hence, in broad terms, it can be concluded students in Ireland would be expected to be familiar with the reading processes and texts included in PISA.

#### PERFORMANCE ON READING LITERACY IN PISA 2000

The mean performance of Irish students on the PISA 2000 reading literacy scale was 526.7, which is significantly higher than the OECD country average of 500.<sup>3</sup> Ireland ranked 5th of 27 OECD countries; just one country (Finland) achieved a significantly higher mean score.<sup>4</sup> Countries with mean scores that do not differ significantly from Ireland's include Australia, Canada, Japan, Korea, and Sweden. Belgium, France, Germany, Norway, and Switzerland achieved significantly lower mean scores. The performance of Irish students on the Retrieve and Interpret scales was about the same as on the test as a whole. Again, only students in Finland achieved a significantly higher mean score. On the Reflect/Evaluate subscale, Ireland's mean score did not differ significantly from the mean of Canada, the highest-scoring country. On the Continuous and Non-continuous text subscales (on which Ireland ranked 4th and 6th respectively), Finland was the only country that achieved significantly higher mean scores than Ireland.

Five proficiency levels (Levels 1 to 5) were used to describe the performance of students on the reading scales. Students scoring at Level 1 (the lowest level) or below<sup>5</sup> could, at best, be expected to succeed on basic reading tasks such as locating a single piece of information, identifying the main theme in a text, and making a simple connection with everyday knowledge. In Ireland, 11.0% of students were at Level 1 or below on the combined scale, compared to an OECD average of 17.9% (Figure 1). The percentage of students in Ireland scoring at Levels 4 and 5 (41.3%) was also higher than the corresponding OECD country

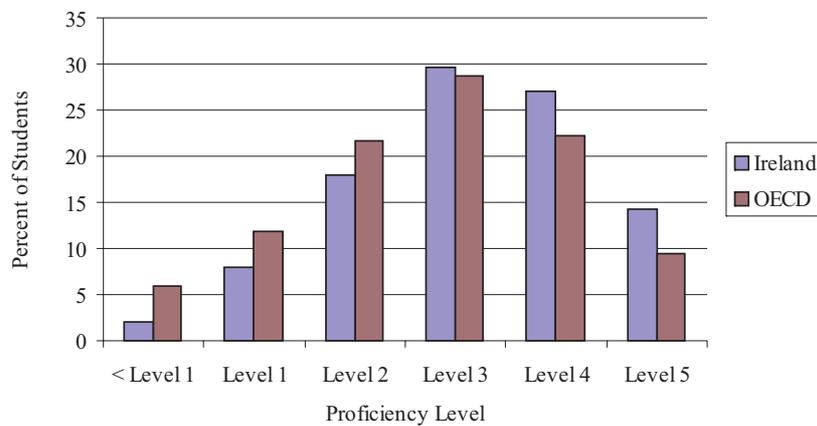
<sup>3</sup> In PISA 2000, the mean for OECD countries on the PISA combined reading literacy scale was set at 500, and the standard deviation at 100.

<sup>4</sup> Since data are based on samples, it is not possible to report with complete accuracy the rank order for each country. To address this, the OECD also reports the range of rank order positions within which a country mean lies 95% of the time. In PISA 2000, Ireland ranked between 3rd and 9th (OECD, 2001, Figure 2.4).

<sup>5</sup> The term 'below Level 1' was used to denote students with scores below the lowest proficiency level (i.e., students who had a less than 50% chance of answering items at Level 1 correctly).

average percentage (31.8%). Students at these levels would be likely to succeed on such tasks as locating embedded information, constructing meaning from nuances of language, and critically evaluating a text.

Figure 1  
*Percentages of Students Performing at Each Level on the PISA Combined Reading Literacy Proficiency Scale (2000) – Ireland and OECD Country Average*



In 2000, the score of Irish students at the 10th percentile was 401.3, which is well above the corresponding OECD country average score (365.9), again indicating a relatively strong performance by low achievers in Ireland. The score of Irish students at the 90th percentile was 641.1. This is not significantly different from the OECD country average score of 622.7 at this benchmark.

In 2000, the percentage of variance in reading achievement scores attributable to differences between schools in Ireland (17.8%) was well below the OECD country average estimate (34.7%), and ranked 7th lowest among OECD countries. This can be taken as indicating that differences in achievement between schools in Ireland are relatively small. However, between-school variance was considerably lower in Scandinavian countries such as Iceland (7.6%), Sweden (9.7%), and Norway (10.9%).

## PERFORMANCE ON READING LITERACY IN PISA 2003

Irish students achieved a mean score of 515.5 on the combined PISA reading literacy scale in 2003 (OECD, 2004). Again, this is significantly higher than the OECD country average (494.2).<sup>6</sup> Ireland ranked 7th of 40 countries, and 6th of 29 OECD countries. Three countries, Finland, Canada and Korea, had significantly higher mean scores than Ireland. Seven countries, including Australia, New Zealand, Sweden, The Netherlands, and Belgium, had mean scores that are not significantly different from Ireland's. Countries with mean scores that are significantly lower than Ireland again include Norway, Switzerland, Japan, France, the United States, Denmark, and Germany.

On the combined reading literacy proficiency scale, 11.0% of Irish students again scored at Level 1 or below, compared to an OECD average of 17.1 percent. The percentage of students scoring at Levels 4 and 5 (35.5%) was above the corresponding OECD average (29.6%) (Figure 2). Hence, lower-achieving and higher-achieving students in Ireland did relatively well. However, in Finland, just 5.7% of students scored at or below Level 1, while 48.1% scored at Levels 4 and 5. The corresponding estimates for Korea were 6.8% and 43% respectively, while for Canada, they were 6.8% and 41.2%. Thus, Ireland had marginally more very low achievers, and marginally fewer very high achievers, than the three countries with significantly higher mean scores.

In 2003, the score of Irish students at the 10th percentile was 401.3. This is significantly higher than the corresponding OECD country average score (360.8). The score of Irish students at the 90th percentile was 622.1, which is not significantly different from the OECD country average at this benchmark (616.9).

The percentage of variance in reading achievement scores attributable to differences between schools in Ireland (22.5%) was again below the OECD average (32.7%) in 2003. Again, between-school variance was considerably lower in countries such as Finland (3.9%), Iceland (4.0%), and Norway (7.8%).

<sup>6</sup> In 2003, the OECD average on the combined reading literacy scale was 494.2, and the standard deviation 100.2.

Table 1  
 Mean Achievement Scores and Standard Deviations on the PISA Reading Literacy Scale (2003) – OECD and Partner Countries

	Mean	(SE)	SD	OECD Diff		Mean	(SE)	SD	OECD Diff
Finland	543.5	(1.64)	81.0	▲	Austria	490.7	(3.76)	103.1	○
Korea	534.1	(3.09)	82.6	▲	Larvia	490.6	(3.67)	90.4	○
Canada	527.9	(1.75)	88.5	▲	Czech Rep	488.5	(3.46)	95.5	○
Australia	525.4	(2.13)	97.4	▲	Hungary	481.9	(2.47)	92.0	▼
Liechtenstein	525.1	(3.58)	89.8	▲	Spain	480.5	(2.60)	95.4	▼
New Zealand	521.6	(2.46)	104.6	▲	Luxembourg	479.4	(1.48)	99.7	▼
<b>Ireland</b>	<b>515.5</b>	<b>(2.63)</b>	<b>86.5</b>	▲	Portugal	477.6	(3.73)	92.7	▼
Sweden	514.3	(2.42)	95.6	▲	Italy	475.7	(3.04)	100.7	▼
Netherlands	513.1	(2.85)	84.8	▲	Greece	472.3	(4.10)	104.5	▼
Hong Kong-Ch	509.5	(3.69)	84.8	▲	Slovak Rep	469.2	(3.12)	92.5	▼
Belgium	507.0	(2.58)	110.0	▲	Russian Fed.	442.2	(3.94)	93.3	▼
Norway	499.7	(2.78)	102.5	○	Turkey	441.0	(5.79)	95.3	▼
Switzerland	499.1	(3.28)	94.8	○	Uruguay	434.1	(3.43)	121.5	▼
Japan	498.1	(3.92)	105.5	○	Thailand	419.9	(2.81)	78.1	▼
Macao-Ch	497.6	(2.16)	66.9	○	Serbia and Monte.	411.7	(3.56)	81.5	▼
Poland	496.6	(2.88)	95.9	○	Brazil	402.8	(4.58)	111.3	▼
France	496.2	(2.68)	97.0	○	Mexico	399.7	(4.09)	95.1	▼
United States	495.2	(3.22)	101.2	○	Indonesia	381.6	(3.38)	76.3	▼
Denmark	492.3	(2.82)	88.3	○	Tunisia	374.6	(2.81)	95.7	▼
Iceland	491.7	(1.56)	98.3	○	OECD Total	487.7	(1.18)	103.8	
Germany	491.4	(3.39)	109.1	○	OECD Average	494.2	(0.64)	100.2	

Mean significantly higher than Ireland

Mean not significantly different from Ireland

Mean significantly lower than Ireland

▲ Above OECD average

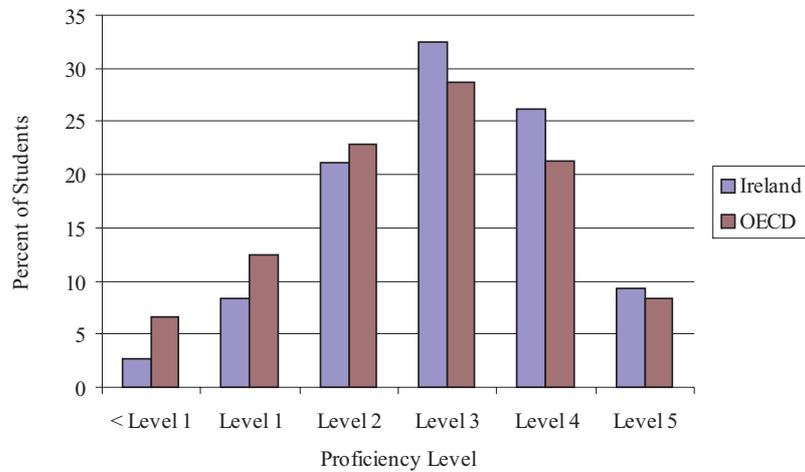
○ At OECD average

▼ Below OECD average

The column "OECD Diff" indicates whether each country scores at, significantly above, or significantly below the OECD average ( $p < .05$ ), using Bonferroni-adjustments with an overall alpha level of .05.

Source: Cosgrove et al. (2005), Table 3.1.

Figure 2  
*Percentages of Students Performing at Each Level on the PISA Combined Reading Literacy Proficiency Scale (2003) – Ireland and OECD Country Average*



#### COMPARING PERFORMANCE IN 2000 AND 2003

Although reading literacy was a minor assessment domain in 2003, it is possible to compare performance in that year with performance in 2000, when reading literacy was a major assessment domain. The comparison was facilitated by administering 8 texts and 28 items (called 'link items') from the 2000 assessment to students in the 2003 assessment. In the course of scaling the data, performance in 2003 was placed on a combined reading literacy scale developed in 2000. There is error associated with any set of items used to establish the link between the two years. However, since a common (cross-country) transformation was used to map performance in 2003 on to the 2000 scale, each student's score will be overestimated (or underestimated) by the same amount.<sup>7</sup>

<sup>7</sup> The standard deviations of scores will not be affected by link error as the overestimation of each student's score by a common error will not affect the underlying distribution of scores.

While each student's score in 2003 is affected by linking error, as are country mean scores, comparisons between groups within the same year (e.g., male and female students in 2003) should not be affected, since scores for male and female students are impacted by the same level of error (OECD, 2005).

Among OECD countries that participated in PISA in 2000 and 2003, three (Italy, Ireland, and Spain) had significantly lower mean scores in 2003 than in 2000 (Table 2).<sup>8</sup> In Ireland, the difference was 11.1 points (just over one-tenth of a national standard deviation in 2000). In Italy, it was 11.8 points, and in Spain 12.1 points. Students in Ireland scoring at the 75th, 90th, and 95th percentiles also achieved significantly lower mean scores in 2003 than in 2000, while performance at the 5th, 10th, and 25th percentiles was unchanged. In Italy, on the other hand, scores at the 5th, 10th, and 25th percentiles were significantly lower in 2003 than in 2000, while scores at the higher benchmarks remained unchanged. In Spain, performance was significantly lower at the 25th percentile in 2003.

Table 2

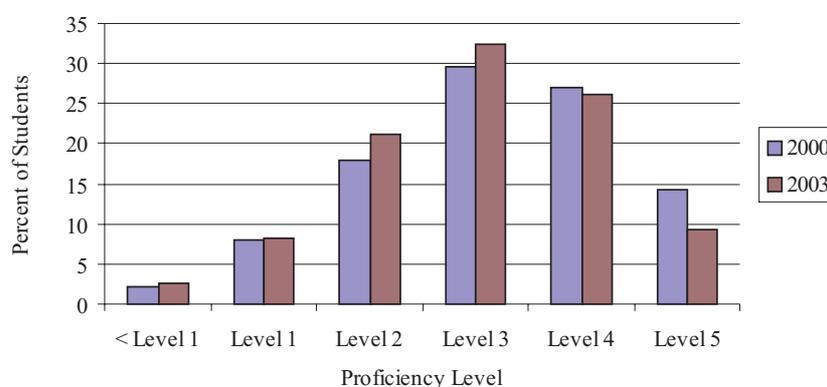
*Countries in Which Mean Scores on Combined Reading Literacy were Significantly Higher or Significantly Lower in 2003 than in 2000*

Mean Significantly Higher in 2003 (p<.05)	Mean Significantly Higher in 2003 (p<.10)	Mean Significantly Lower in 2003 (p<.10)	Mean Significantly Lower in 2003 (p<.05)
Poland	Korea	Austria	Ireland
Latvia	Indonesia	Iceland	Italy
Lichtenstein		Japan	Spain
		Mexico	Thailand
		Hong-Kong-Ch	
		Russian Fed	

The decline in scores in Ireland at the 75th, 90th, and 95th percentiles in 2003 is apparent in the significant decrease in the percentage of students scoring at Level 5 on the literacy proficiency scales between 2000 and 2003 (from 14.2% to 9.3%) (Figure 3), and non-significant increases in the percentages scoring below Level 1 and at Levels 1 to 3.

<sup>8</sup> OECD (2004) also notes countries in which achievement in 2003 was significantly lower (or higher) at the .10 level.

Figure 3  
*Percentages of Students in Ireland Performing at Each Level on the PISA  
 Combined Reading Literacy Proficiency Scale, 2000 and 2003*



#### GENDER DIFFERENCES IN READING LITERACY

In PISA 2000, the mean score in Ireland on the combined reading literacy scale was 541.5 for females and 512.8 for males. The difference, 28.7 points (three-tenths of a standard deviation) is not significantly different from the OECD average difference of 32 score points. Female students outperformed males in all OECD countries. The greatest difference was observed in Finland (51 points) and the smallest in Korea (14). Irish females outperformed males on the three reading process subscales, with the largest difference (37.2 points) on the Reflect/Evaluate subscale, and the smallest (22.3) on the Retrieve scale. These subscale differences are broadly similar to the corresponding OECD average country difference of 40 on the Evaluate/Reflect subscale, 23 on the Retrieve subscale, and 26 on the Interpret subscale. Female students in Ireland also outperformed males on continuous texts (by 33.6 points) and non-continuous texts (by 16.9 points) subscales. The corresponding OECD average differences (in favour of females) were 39.1 and 17.6 respectively.

In PISA 2000, significantly more female than male students in Ireland achieved Levels 4 and 5 on the combined reading proficiency scale. Level 5 (the highest level) was achieved by 17.4% of female students, compared to 11.2% of

males. In contrast, significantly fewer females (14.3%) than males (21.3%) achieved Level 2. More males than females scored at Level 1 and below Level 1, though differences are not statistically significant. Across OECD countries, more females than males achieved at the higher levels of proficiency, and more males than females achieved at the lower levels.

In PISA 2003, the mean scores of male and female students on the PISA combined reading literacy scale were 501.1 and 530.1 respectively. The difference of 29.0 points (one-third of a standard deviation) is statistically significant, and is similar to the OECD average difference (34.1). In 2003, among OECD countries, the largest difference in favour of females (58 points) was in Iceland, and the smallest (21) in Korea, Mexico, and The Netherlands.

As in 2000, significantly more females than males in Ireland achieved the highest levels on the combined reading literacy scale in 2003. Among females, 12.3% achieved Level 5 (the highest level) compared to 6.3% of males. At Level 4, the corresponding percentages were 29.5 and 22.9 respectively. Conversely, significantly more males than females achieved at Level 1 (10.7% vs. 5.9%) and Level 2 (24.1 vs. 18.2). A similar pattern held across OECD countries.

Multi-level models of achievement using PISA 2000 and PISA 2003 reading literacy data sets for Ireland confirm an association between gender and achievement, though the association may be more complex than seems apparent at first. In the model based on PISA 2000, there was an interaction between gender and the number of books in a student's home (Shiel et al., 2001). Table 3 illustrates this interaction.<sup>9</sup> It shows that, for the two lowest categories, the difference between males and females in expected scores is quite large: 32.2 points (one-third of a standard deviation) for no books, and 18.8 points (one-fifth of a standard deviation) for 1-10 books. This indicates that males with few books have a better predicted score than females with few books (all other variables being equal). Conversely, females with higher numbers of books at home than males are expected to perform a little better. Females with 500+ books are expected to score 76.9 points (over three-quarters of a standard deviation) higher than females with no books. The corresponding estimate for males is 71.6 points. For both males and females, the actual and differential effects associated with increased books in the home taper off at the 101-250 category.

<sup>9</sup> The variable, number of books in the home, which was on a scale from 1 (no books) to 7 (500+ books) was placed on a logarithmic scale for modelling purposes, as its logarithmic form fitted the model better.

Table 3  
*Estimated Contributions to Scores in Reading Literacy Achievement  
 Attributable to Books in the Home, by Gender*

Log of Books Index	Estimated Contributions to Scores	
	Males	Females
No Books (1)	32.17	0
1-10 books (2)	46.22	27.39
11-50 books (3)	54.45	43.44
51-100 books (4)	60.27	43.44
101-250 books (5)	64.79	63.59
251-500 books (6)	68.50	70.80
500+ books (7)	71.62	76.91

Source: Shiel et al. (2001), Table 5.12

In the multi-level model based on the 2003 PISA reading literacy data set, no interaction between books in the home and gender was observed (Cosgrove, Shiel, Sofroniou, Zastrutzki, & Shortt, 2005). There is a significant difference of 21.5 points (close to one-quarter of a standard deviation) in favour of females. While the 2003 model included many of the same variables as in 2000, it did not include frequency of leisure reading or attitude to reading.

Finally, in a supplementary multi-level model based on PISA 2000 data, in which measures of instrumental motivation, preference for competitive learning, preference for co-operative learning, number of books in the home, diversity of reading materials read, attitude to reading, and frequency of leisure reading were considered as student-level candidate variables, there was no main effect for gender in the final model, nor did gender interact with any other variables (Sofroniou, Shiel, & Cosgrove, 2002). It seems that the retained variables (including instrumental motivation, co-operative learning, and competitive learning, but not diversity of reading) 'explained' the large gender difference in favour of females (28.1 points) observed in the null model. This finding further underlines the complexity of interpreting gender differences in reading achievement.

#### READING FOR ENJOYMENT AND FOR STUDY

PISA 2000 included a measure of engagement in reading based on students' responses to questions about frequency of reading for enjoyment, diversity of reading (range of texts read), and attitude to reading. The resulting scale had an OECD mean of 0, and a standard deviation of 1. The mean score of students in Ireland on the scale was one-fifth of a standard deviation (-0.20) below the

mean, and fourth lowest among OECD countries, just ahead of Belgium (-0.28), Germany (-0.26), and Spain (-0.23) (Kirsch, de Jong, Lafontaine, McQueen, Mendelovits, & Monseur, 2002). Highest levels of engagement were observed in Finland (one half of a standard deviation above the OECD country average), Korea (one-quarter above), Iceland (one-quarter above), and Japan (one-fifth above). The mean scores for male (-0.43) and female (0.03) students in Ireland were below the corresponding OECD country average scores (-0.19 and 0.19 respectively). Among OECD countries, the largest differences in favour of female students were in Finland (0.74), Switzerland (0.62), and the Czech Republic (0.57).

In PISA 2000, the measure of frequency of leisure reading was based on the amount of reading for enjoyment in which students engaged on a typical school day. One-third of students in Ireland (33%) said that they did not engage in any reading for enjoyment, 31% reported spending up to 30 minutes a day, 20% between 30 and 60 minutes, and 15% more than one hour. The correlation between frequency of leisure reading and reading achievement was .262 ( $p = .001$ ). This is illustrated in Table 4, where there is a significant and substantial increase (44.6 points, or over one half of a standard deviation) in reading achievement between students who did not spend any time reading, and those who spent 30 minutes or less a day, and a significant but smaller increase (21.9 points, or one-quarter of a standard deviation) between those who read for 30 minutes a day or less and those who read for 30 to 60 minutes. The difference of 5.6 points between those who read for 30 to 60 minutes, and those who read for longer is not statistically significant.

Table 4  
*Percentages of Students in Ireland Engaging in Leisure Reading on a Daily Basis, and Mean Reading Literacy Scores (2000)*

Daily reading	Percent of Students	Mean Reading Score
No time	33.4	491.0
30 minutes or less	30.9	535.6
30 to 60 minutes	20.4	557.5
60 minutes or more	15.4	551.9
Missing	-	448.5

Valid percentages are reported. Data on leisure reading were unavailable for 1.3% students for whom reading literacy scores were available.

Source: Shiel et al. (2001), Table 4.32

In PISA 2003, students were asked how often they read various texts for enjoyment out of school time.<sup>10</sup> The texts that students reported reading most often were non-news sections of newspapers (70.3% read them at least once a week), news sections of newspapers (65.0%), and magazines (50.6%). Among the texts read least frequently were plays/poetry (76.4% read them at most a few times a year), non-fiction (68.2%), fiction (49.0%), and e-mails and web pages (41.9%) (Table 5).

Table 5  
*Percentages of Students Reporting How Often They Read Various Types of Text for Enjoyment Out of School Time (2003)*

	Maga- zines	Fiction	Non- fiction	Plays/ Poetry	E-mail/ Web	Paper – News	Paper – Non-news
Never	14.9	24.5	45.5	54.1	31.3	13.7	15.2
A few times a year	12.9	24.5	22.7	22.3	10.6	7.9	5.5
Once a month	21.6	21.2	15.1	12.8	18.3	13.4	9.0
Once a week	31.7	11.3	10.2	7.1	20.1	30.6	26.4
Several times a week	18.9	12.9	6.6	3.8	19.7	34.4	43.9

Based on valid percentages. For each text genre, about 5% of students did not respond.

Source: PISA (Ireland) 2003 student database

It might be argued that, due to homework and other study commitments, students may not have adequate time to read texts for enjoyment, particularly during term time. In PISA 2003, students in Ireland were also asked about how often they read the same set of materials in school or as part of their homework (i.e., for study). The texts read most frequently in these contexts were non-fiction (50.2% read this genre once a week or more often) and plays and poetry (44.5%) (Table 6). The genres read least frequently were e-mails and web pages (read less often than once a month by 80.3% of students), magazines (80.3%) and non-news sections of newspapers (76.5%). It is noteworthy that non-fiction is read more often than fiction in study contexts, while fiction is read more often than non-fiction in leisure contexts. It seems that students' exposure to electronic texts is particularly limited in school settings, with over 70% of 15-year olds indicating that they hardly ever or never read such texts at school. The corresponding estimate for home is 31 percent.

<sup>10</sup> These questions were included as additional items on the Student Questionnaire completed by students in Ireland, and were not administered in other countries in PISA 2003.

Table 6  
*Percentages of Students Reporting How Often They Read Various Types of Text in School or as Part of Homework (2003)*

	Maga- zines	Fiction	Non- fiction	Plays/ Poetry	E-mails / Webpage	Paper – News Secs	Paper – Other Secs
Hardly ever/Never	68.2	13.0	20.7	11.4	71.3	51.0	62.2
A few times a year	12.1	28.4	15.6	22.3	9.8	18.8	14.3
Once a month	8.3	21.4	13.6	21.8	7.4	13.0	8.4
Once a week	7.8	21.8	20.1	25.6	8.2	11.6	8.7
Several times a week	3.6	15.4	30.1	18.9	3.3	5.6	6.4

Based on valid percentages. For each text genre, about 5% of students did not respond.

Source: PISA (Ireland) 2003 student database

As in PISA 2000, associations between frequency of reading and achievement were in evidence in PISA 2003. In PISA 2003, students who engaged in high volumes of leisure reading (those who read fiction several times a week) achieved a significantly higher mean score in reading literacy (558.9) than students who did so once a week (537.4), once a month (528.3), or a few times a year (520.5). The lowest mean scores were achieved by students who hardly ever or never read fiction (482.4) and those who did not respond to the question (445.7) (Table 7). Frequency of reading e-mails and webpages was also associated with achievement. Students who read such texts for enjoyment at least once a month did significantly better than students who read them less frequently, or who did not respond (Table 7).

Table 7  
*Mean Achievement Scores of Students, by Frequency of Reading Fiction and E-mails/ Webpages for Enjoyment Out of School Time (2003)*

	Fiction	E-mails/ Webpages
Hardly ever/Never	482.4	494.1
A few times a year	520.5	517.6
Once a month	528.3	529.2
Once a week	537.4	535.2
Several times a week	558.9	537.3
Missing (no response)	445.7	451.1

Source: Cosgrove et al. (2005), Tables 4.17 and 4.18

Frequency of reading fiction and e-mails/web pages was also compared for male and female students in leisure and study contexts (Table 8). While females engaged more frequently than males in leisure reading of fiction texts (30.3% of females read fiction at least once a week, compared to 20.8% of males), both males and females read fiction at school with the same levels of frequency. Surprisingly, one-third of male students (33.1%) and almost one-fifth of females (18.9%) said that they never read fiction at school. Broadly similar percentages of males and females reported reading electronic texts for leisure (with 38.4% of males and 41.4% of females doing so at least once a week) and in study contexts (11.3% of males and 11.6% of females did so at least once a week). Again, it is noteworthy that 71.1% of males and 71.6% of females said that they never read electronic texts at school.

Table 8  
*Percentages of Students Reporting How Often They Read Fiction and E-mails/Web pages for Leisure, by Gender (2003)*

	Male Students				Female Students			
	Fiction		E-mails/Web		Fiction		E-mails/Web	
	Leisure	Study	Leisure	Study	Leisure	Study	Leisure	Study
Never	33.1	17.7	31.6	71.1	18.9	8.3	30.9	71.6
A few times a year	27.9	26.3	10.6	10.4	24.0	30.5	10.7	9.3
Once a month	18.2	19.6	19.4	7.2	26.6	23.2	17.1	7.6
Once a week	9.7	21.5	20.1	8.0	14.1	22.1	20.2	8.4
Several times a week	11.1	14.8	18.3	3.3	16.2	15.9	21.2	3.2

Source: PISA (Ireland) 2003 student database

#### CONCLUSION

By international standards, performance on the PISA combined reading literacy scale in Ireland was strong in both 2000 and 2003. In both years, Irish 15-year olds achieved a mean score that is significantly above the OECD country average, and a ranking in the top quarter of OECD countries. The small proportion of students scoring at Level 1 or below (11.0% in both years) might be interpreted as indicating that the extent of literacy difficulties in schools in Ireland is smaller than in OECD countries in general. However, this conclusion needs to be qualified by Cosgrove's (2005) finding regarding relatively low

student participation rates for PISA in 2000 and 2003 in Ireland<sup>11</sup>, in particular the fact that students who were absent or declined to take the PISA tests had lower Junior Certificate examination grades in English than students who participated in the survey. Moreover, Ordinary and Foundation-level students were more likely than Higher-level students not to participate in PISA. While adjustments for school-level non-response in scaling PISA data may be efficient in eliminating bias in achievement estimates such as mean scores, they are less efficient in eliminating bias arising from non-participation at the student level, particularly in countries with low between-school variance (such as Ireland). Hence, PISA may underestimate the proportions of students in the population functioning at or below Level 1 on the reading literacy proficiency scale. This suggests that care should be exercised in using PISA data to estimate the extent of literacy problems among 15-year olds in Ireland.

The non-participation of some lower-achieving students in PISA also raises concerns about the proportion of students with low literacy skills who achieve a grade D (or higher) on the Junior Certificate English examination. Twenty-seven percent of students taking Ordinary level English in the 2003 Junior Certificate examination achieved at or below Level 1 on the PISA reading literacy scale in 2003 (Cosgrove et al., 2005). Since just 1.5% of students taking Ordinary level English achieved a grade E or lower, it can be concluded that about 25% of students who 'pass' Ordinary level English do not have adequate levels of literacy to meet their future needs. Moreover, given the non-participation of some Ordinary level students in PISA, the true figure may in fact be higher. A similar situation arises with respect to Foundation level English, where 3% achieved a 'failing' grade in the Junior Certificate English examination in 2003, but 77.5% achieved at or below Level 1 on PISA.

There was a significant decline at the conventional .05 level in mean achievement on combined reading literacy between 2000 and 2003 in three OECD countries, including Ireland. An additional four OECD countries had significantly lower mean scores at the less conventional .10 level. In Ireland, the performance of students scoring at the 75th, 90th, and 95th percentiles fell significantly, and, since performance at the 5th, 10th, and 25th percentiles did not change, the lower overall performance in 2003 can be attributed to the poorer performance of higher achievers.

<sup>11</sup> Although student participation rates in Ireland in 2000 and 2003 were low compared to several OECD countries, they still met the criteria established by the OECD.

To date, relatively little concern has been expressed about the decline in reading literacy scores in Ireland. This may be because Ireland's overall ranking is still in the top quarter of OECD countries. There may also be technical reasons for warranting caution. First, PISA assigned reading literacy scores to all students who sat PISA 2003, including those who were not offered reading literacy items (some test booklets included maths and/or science, but not reading).<sup>12</sup> It may be that this change in procedure had a negative effect on the mean achievement scores in some countries in 2003; anecdotal evidence indicates a tendency in several countries for students who did not respond to reading literacy items to receive a significantly lower mean score in reading literacy than students who did. There is also anecdotal evidence to suggest that the subset of reading literacy items that was used to link performance across the 2003 test booklets may have operated differently across countries (i.e., students in some countries did unexpectedly poorly on the link items). Clearly, until such concerns have been explored further, and until comparisons can be based on a larger pool of items (as will occur in 2009, when reading literacy will be a major assessment domain again), caution should be observed in interpreting differences in achievement scores between assessment cycles.

As in 2000, female students achieved a significantly higher mean score than male students on the combined reading literacy scale in all OECD countries in PISA 2003. The size of the difference in Ireland – 29.0 points, or three-tenths of a standard deviation – is not significantly different from the OECD country average difference. Significantly more females than males in Ireland also achieved the highest proficiency levels (Levels 4 and 5) in reading. These differences are consistent with those observed for English in the Junior Certificate English examination, where, in 2003, females achieved more A, B, and C grades at Higher, Ordinary and Foundation levels than males.

The difficulty in teasing out how gender impacts on reading literacy (vis a vis a variety of school and student variables) was illustrated in the apparently contradictory outcomes obtained when modelling the PISA 2000 and PISA 2003 reading literacy data in Ireland. In one model, there was an interaction between gender and number of books in the home; in a second, there was no main effect or interaction involving gender, once variables associated with self-regulated learning had been added to the model; in a third, in which frequency of leisure reading and attitude to reading were not considered, there was a main

<sup>12</sup> In PISA 2000, only students who attempted some reading literacy items were assigned reading literacy scores.

effect for gender, and no interactions with other variables. Clearly, these issues need to be explored further in the context of multi-level modelling, perhaps using data sets outside of PISA (see, e.g., Sofroniou, Archer, & Weir, 2004, who looked at gender differences in Junior Certificate English in the context of socioeconomic status at school and student levels). There is some indication from the descriptive data from PISA 2000 that gender differences may, in part, relate to the texts that students are asked to read and the tasks that are given, in that the gap between female and male students was substantially smaller on non-continuous texts than on continuous texts, and on questions that required students to retrieve information in texts than on questions that called for evaluation.

The literature on gender and reading reflects a growing concern about the literacy levels of adolescent males, and quite diverse ways to address gaps in achievement have been put forward. Brozo (2002) identified lower-achieving boys as disenfranchised, and called on educators to engage boys in print-based literature that portrays traditional positive male archetypes so that they can develop a sense of their 'true masculine selves' (p. 7), and, ultimately, improved academic achievement. Smith and Wilhelm (2002) took a somewhat broader view, proposing that literacy be redefined in semiotic terms, including 'the ability to communicate and make meaning through various sign systems, such as music, video, visual arts, and electronic technologies' (p. 186). They argued that, 'if boys are not first engaged emotionally with texts – if they do not care about characters or issues presented – then they will never proceed to more nuanced readings' (p. 195). Hence, they urged teachers to provide a 'flow' experience for boys, through engaging them in active reading strategies, inquiry-based learning, and critical literacy, using a range of relevant texts, including out-of-school texts. Rowan, Knobel, Bigum and Lankshear (2002) warned against the pitfalls of gender-based literacy reform, pointing out that, while normative masculinity contributes to boys' alienation from school-based literacy, it must be addressed alongside emphasized femininity. Hence, they argued that one cannot afford to focus exclusively on the needs of boys or girls, and that it is preferable to work for diverse people and perspectives.

The 2003 data on students' engagement in reading for study purposes presented in this paper indicate that between one-half and two-thirds of students never read texts such as newspapers and magazines in school/homework contexts, and seven in ten never read electronic texts (e-mails and web pages). It is also a matter of concern that one-fifth of students say that they never read non-fiction for study purposes, and 13% that they never read fiction. To the extent that students' responses can be taken to reflect their actual reading habits, these

findings suggest that there is scope to broaden the range of texts to which students are exposed in study contexts, and, perhaps make learning more relevant for some students. While the Junior Certificate English syllabus suggests that teachers use a broad range of texts in English classes, it may be that, across the curriculum as a whole, students do not encounter sufficient variation in the texts they read. This, in turn, may have implications for their motivation, as well as their familiarity with different text types. Also of concern is the finding that more than twice as many boys (17.7%) as girls (8.3%) report that they never read fiction in study contexts.

The data on frequency of leisure reading indicate that, while a minority of 15-year olds engage in such reading on a frequent basis (two-thirds read newspapers, and one-half read magazines at least once a week), one-quarter never read fiction texts and almost one-half never read non-fiction texts. It might be argued that 15-year olds in Ireland often do not have the time to engage in leisure reading because of commitments in the areas of homework and out-of-school activities. However, the finding that there is a positive association between frequency of reading fiction (and, to a lesser extent, e-mails and webpages) and performance on the PISA literacy test suggests that it is the better readers who engage in more leisure reading. In all likelihood, there is a reciprocal relationship between engagement in leisure reading and achievement, with good readers more disposed to engage in leisure reading, which, in turn, enhances their achievement. It is of interest to note that students who engage in leisure reading of fiction several times a week achieve a significantly higher mean score on PISA reading literacy than students who read fiction once a week.<sup>13</sup> This mirrors a finding in the 2004 National Assessment of English Reading (NAER) involving pupils in fifth class in primary schools, where pupils who read stories/novels at home every day achieved a significantly higher mean score (by about one quarter of a standard deviation) than pupils who read at home once or twice a week (Eivers, Shiel, Perkins, & Cosgrove, 2005). However, whereas 57% of pupils in NAER said that they read stories or novels at home at least once a week, only 37% of students in PISA 2003 reported reading fiction for leisure purposes with this frequency. The apparent decline in leisure reading between primary and post-primary schooling may, in part, explain why Irish students ranked fourth from bottom on the engagement in reading scale

<sup>13</sup> It is also noteworthy that students who reported engaging in leisure reading and fiction several times a week achieved significantly higher mean scores in PISA mathematics and science in 2003 than students who reported reading fiction once a week.

developed by Kirsch et al. (2002). It also suggests that significant efforts should be made by communities, schools, and parents to promote engagement in leisure reading among adolescents.

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