

Chapter 1

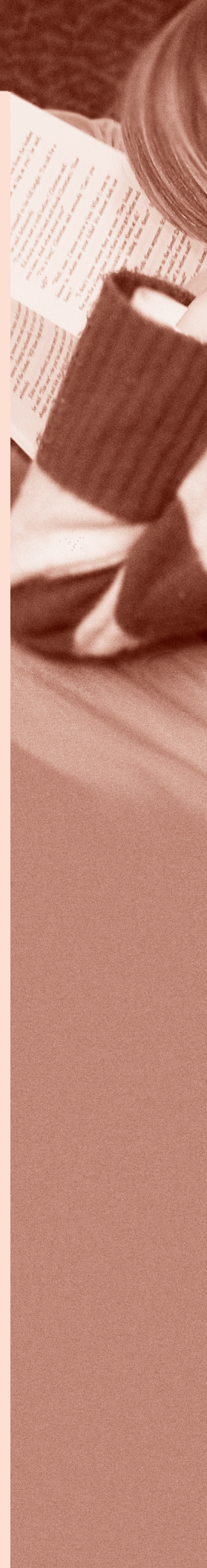
International Student Achievement in Reading

Chapter 1 presents the reading comprehension achievement results for students in their fourth year of formal schooling for the 40 countries, including Belgium with 2 education systems and Canada with 5 provinces, that participated in PIRLS 2006 (45 participants in total). The chapter begins with a discussion of students' achievement in PIRLS 2006, and then presents changes in achievement over the past 5-year period for those countries that also participated in PIRLS 2001. The reading comprehension achievement results for 2006 and changes from 2001 also are provided by gender. Next, the chapter presents the corresponding achievement results for the reading purposes and processes of reading comprehension described in the *PIRLS 2006 Assessment Framework and Specifications*.¹ The two reading purposes are Literary and Informational. Achievement in the processes of reading comprehension is reported for two categories: (1) Retrieving and straightforward inferencing and (2) Interpreting, integrating, and evaluating.

How Do Countries Differ in Reading Achievement?

Exhibit 1.1 displays the distributions of achievement for PIRLS 2006 for 40 participating countries, including Belgium with 2 education systems and Canada with 5 provinces. Historically, because they have separately administered education systems, England and Scotland, as well as Hong Kong, prior to becoming a Special Administrative Region (SAR) of the People's Republic of China, have participated separately in IEA studies and

1 Mullis, I.V.S., Kennedy, A.M., Martin, M.O., & Sainsbury, M. (2006). *PIRLS 2006 assessment framework and specifications*, (2nd ed.). Chestnut Hill, MA: Boston College.



this practice continues in TIMSS and PIRLS to monitor trends and have comparability between the two studies. For the purposes of this report, these three education systems are treated as countries. Since Belgium has two education systems, one administered by the French-speaking community and the other by the Dutch-speaking community, the two education systems traditionally have participated separately in IEA studies, so again, this practice has been kept and two sets of data are reported for Belgium. The five Canadian provinces represent 88 percent of the student population in Canada, but preferred to participate in PIRLS 2006 separately but not collectively as a country. Thus, as a compromise, their results are reported in italics together with the other participants. Altogether, then, the tables in the *PIRLS 2006 International Report* typically contain results for the 45 participants in PIRLS 2006. For their own purposes as an additional effort, Iceland and Norway administered PIRLS 2006 to small samples of their fifth-grade students, and these results are presented in Appendix F.

In Exhibit 1.1, the 45 participants are shown in descending order of average reading achievement. Each participant's average score on the PIRLS achievement scale (with its 95% confidence interval) is shown graphically on the participant's achievement distribution, and listed (together with its standard error) in the first column in the table. Because there often are relatively small differences between participants in average achievement, Exhibit 1.2 shows whether or not the differences in average achievement are statistically significant.

The highest achieving participants in PIRLS 2006 represent different regions of the world geographically, including Eastern Europe (the Russian Federation, Hungary, and Bulgaria), Asia (Hong Kong SAR and Singapore), Canada (Alberta, British Columbia, and Ontario), Italy in Southern Europe, Western Europe (Luxembourg, Germany, the Netherlands, and Belgium (Flemish)), and Scandinavia (Sweden and Denmark). The PIRLS reading achievement scale was established in PIRLS 2001 to have a mean of 500 and a standard deviation of 100,² and was designed to remain constant from assessment to assessment. There is an indication by a participant's average

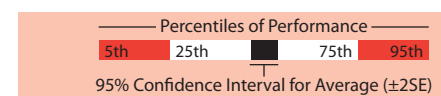
2 PIRLS uses item response theory scaling (IRT) methods to summarize achievement results on a scale with a mean of 500 and a standard deviation of 100. For more information, see the "IRT Scaling and Data Analysis" section of Appendix A.

Exhibit 1.1 Distribution of Reading Achievement

PIRLS 2006
4th Grade

Countries	Reading Achievement Distribution	Average Scale Score	Years of Formal Schooling*	Average Age	Human Development Index**
^{2a} Russian Federation		565 (3.4)	4	10.8	0.797
Hong Kong SAR		564 (2.4)	4	10.0	0.927
^{2a} Canada, Alberta		560 (2.4)	4	9.9	0.950
Singapore		558 (2.9)	4	10.4	0.916
^{2a} Canada, British Columbia		558 (2.6)	4	9.8	0.950
Luxembourg		557 (1.1)	5	11.4	0.945
^{2a} Canada, Ontario		555 (2.7)	4	9.8	0.950
Italy		551 (2.9)	4	9.7	0.940
Hungary		551 (3.0)	4	10.7	0.869
Sweden		549 (2.3)	4	10.9	0.951
Germany		548 (2.2)	4	10.5	0.932
[†] Netherlands		547 (1.5)	4	10.3	0.947
^{†2a} Belgium (Flemish)		547 (2.0)	4	10.0	0.945
^{2a} Bulgaria		547 (4.4)	4	10.9	0.816
^{2a} Denmark		546 (2.3)	4	10.9	0.943
Canada, Nova Scotia		542 (2.2)	4	10.0	0.950
Latvia		541 (2.3)	4	11.0	0.845
^{†2a} United States		540 (3.5)	4	10.1	0.948
England		539 (2.6)	5	10.3	0.940
Austria		538 (2.2)	4	10.3	0.944
Lithuania		537 (1.6)	4	10.7	0.857
Chinese Taipei		535 (2.0)	4	10.1	0.910
Canada, Quebec		533 (2.8)	4	10.1	0.950
New Zealand		532 (2.0)	4.5–5.5	10.0	0.936
Slovak Republic		531 (2.8)	4	10.4	0.856
[†] Scotland		527 (2.8)	5	9.9	0.940
France		522 (2.1)	4	10.0	0.942
Slovenia		522 (2.1)	3 or 4	9.9	0.910
Poland		519 (2.4)	4	9.9	0.862
Spain		513 (2.5)	4	9.9	0.938
^{2b} Israel		512 (3.3)	4	10.1	0.927
Iceland		511 (1.3)	4	9.8	0.960
PIRLS Scale Avg.		500	–	–	–
Moldova, Rep. of		500 (3.0)	4	10.9	0.694
Belgium (French)		500 (2.6)	4	9.9	0.945
[‡] Norway		498 (2.6)	4	9.8	0.965
Romania		489 (5.0)	4	10.9	0.805
^{2a} Georgia		471 (3.1)	4	10.1	0.743
Macedonia, Rep. of		442 (4.1)	4	10.6	0.796
Trinidad and Tobago		436 (4.9)	5	10.1	0.809
Iran, Islamic Rep. of		421 (3.1)	4	10.2	0.746
Indonesia		405 (4.1)	4	10.4	0.711
Qatar		353 (1.1)	4	9.8	0.844
Kuwait		330 (4.2)	4	9.8	0.871
Morocco		323 (5.9)	4	10.8	0.640
South Africa		302 (5.6)	5	11.9	0.653

SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2006



▲ Country average significantly higher than PIRLS scale average
 ▼ Country average significantly lower than PIRLS scale average

* Represents years of schooling counting from the first year of ISCED level 1.
 ** Taken from United Nations Development Programme's Human Development Report 2006, p. 283–286, except for Chinese Taipei taken from Directorate General of Budget, Accounting and Statistics, Executive Yuan, R.O.C. Statistical Yearbook 2005. Data for Belgium (Flemish) and Belgium (French) are for the entire country of Belgium. Data for England and Scotland are for the United Kingdom.
 † Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).
 ‡ Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).
 2a National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).
 2b National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).
 () Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
 NOTE: See Exhibit C.1 for percentiles of achievement in reading.

scale score, if the average achievement is significantly higher (up arrow) or lower (down arrow) than the scale average of 500.

The graph of the achievement distributions indicates the ranges in performance for the middle half of students (25th to 75th percentiles) and the extremes (5th and 95th percentiles). Although it was to a differing degree from country to country, by the fourth year of schooling, every PIRLS 2006 participant had some percentage of students who were good readers and some percentage of students who demonstrated difficulties. The majority of countries had approximately a 250-point difference between the 5th and 95th percentiles of achievement, although some had larger differences and others had more homogeneity in performance. It is important to note that the range in achievement in most countries is comparable to the difference in average achievement (263 points) between the highest performing country, the Russian Federation, and lowest performing country, South Africa.

PIRLS devoted considerable energy to maximizing comparability across the grades and ages tested, but this is difficult considering the variation internationally in many educational policies, such as school entry ages and the number of languages of instruction. Exhibit 1.1 shows that, in accordance with the PIRLS guidelines, most countries assessed students in their fourth year of formal schooling. Thus, for convenience in this report, the students will be referred to as fourth-grade students even though several countries did not assess students in the fourth grade. In consultation with the PIRLS sampling specialists, Slovenia included some students in third grade because the country is in transition toward having students start school at a younger age so they will have 4 years of primary schooling instead of 3 years, but the transition is not complete. Also, in accordance with PIRLS guidelines, since their students start school at a very early age and otherwise would have been very young, four countries (England, New Zealand, Scotland, and Trinidad and Tobago) tested the fifth year of schooling. Two other countries also tested the fifth year because of challenges concerning the language(s) of instruction (Luxembourg and South Africa), which resulted in their students being older, on average, than the rest of the students tested.

Given that students are in their fourth year of schooling and the majority begin school at age 6, as presented in Exhibit 3, they are expected to be approximately 10 years old. Typically, as was the case in most of the countries (and all provinces), students would average from 9.7 to 10.6 years old, depending on whether they started school at age 6 or 7 and when during the calendar year they started school (January, the beginning of the school year, or some other time). In a few countries, primarily in Eastern Europe, students do not start school until age 7 and consequently were a little older (10.7 to 11 years old). As would be anticipated in PIRLS with a wide range of cultural and economic diversity, higher performing countries included those with younger and older students, on average, and lower performing countries also had students averaging from the youngest to the oldest.

To provide some context about the economic and educational development of the PIRLS 2006 participants, Exhibit 1.1 also includes each one's value on the Human Development Index³ provided by the United Nations Development Programme. The index has a minimum value of 0.0 and a maximum of 1.0. Countries with high values on the index have a long life expectancy, high levels of school enrollment and adult literacy, and a good standard of living, as measured by per capita Gross Domestic Product. The majority of the PIRLS 2006 participants had index values greater than 0.9, and most with values this high performed above the 500 scale average, except Belgium (French) and Norway that were approximately at the average. The countries with averages significantly below 500 all had values lower than 0.9 (.653 to .871) and the two lowest performing countries, Morocco and South Africa, had the lowest values (.640 and .653). However, it is important to note that some countries with reading achievement significantly above the 500 average had indices ranging from .797 to .869, including the top-achieving Russian Federation, as well as Hungary, Latvia, the Slovak Republic, and Poland.

Exhibit 1.2 depicts whether or not the differences in average achievement between pairs of countries and/or Canadian provinces are statistically significant. Selecting a PIRLS 2006 participant of interest and reading across the table, a circle with a triangle pointing up indicates significantly higher performance than the comparison country listed across the top. Absence of

3 The value for the United Kingdom is given for England and Scotland, Belgium's value is given for both Flemish and French education systems, and Canada's value is given for each of the five provinces.

Exhibit 1.2 Multiple Comparisons of Average Reading Achievement

PIRLS 2006
4th Grade

Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

Countries	Russian Federation	Hong Kong SAR	Canada, Alberta	Singapore	Canada, British Columbia	Luxembourg	Canada, Ontario	Italy	Hungary	Sweden	Germany	Netherlands	Belgium (Flemish)	Bulgaria	Denmark	Canada, Nova Scotia	Latvia	United States	England	Austria	Lithuania	Chinese Taipei	Canada, Quebec	New Zealand	Slovak Republic	Scotland	France	Slovenia	Poland	Spain	
Russian Federation																															
Hong Kong SAR																															
Canada, Alberta																															
Singapore																															
Canada, British Columbia																															
Luxembourg																															
Canada, Ontario																															
Italy																															
Hungary																															
Sweden																															
Germany																															
Netherlands																															
Belgium (Flemish)																															
Bulgaria																															
Denmark																															
Canada, Nova Scotia																															
Latvia																															
United States																															
England																															
Austria																															
Lithuania																															
Chinese Taipei																															
Canada, Quebec																															
New Zealand																															
Slovak Republic																															
Scotland																															
France																															
Slovenia																															
Poland																															
Spain																															
Israel																															
Iceland																															
Moldova, Rep. of																															
Belgium (French)																															
Norway																															
Romania																															
Georgia																															
Macedonia, Rep. of																															
Trinidad and Tobago																															
Iran, Islamic Rep. of																															
Indonesia																															
Qatar																															
Kuwait																															
Morocco																															
South Africa																															

SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2006

Note: 5% of these comparisons would be statistically significant by chance alone.

Exhibit 1.2 Multiple Comparisons of Average Reading Achievement (Continued)

PIRLS 2006
4th Grade

Instructions: Read across the row for a country to compare performance with the countries listed along the top of the chart. The symbols indicate whether the average achievement of the country in the row is significantly lower than that of the comparison country, significantly higher than that of the comparison country, or if there is no statistically significant difference between the average achievement of the two countries.

Israel	Iceland	Moldova, Rep. of	Belgium (French)	Norway	Romania	Georgia	Macedonia, Rep. of	Trinidad and Tobago	Iran, Islamic Rep. of	Indonesia	Qatar	Kuwait	Morocco	South Africa	Countries
▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	Russian Federation
▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	Hong Kong SAR
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▼	▼	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	Belgium (French)
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▼	▼	▼	▼	▼	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	Georgia
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▼	▼	▼	▼	▼	▼	▲	▲	▲	▲	▲	▲	▲	▲	▲	Trinidad and Tobago
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▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▲	▲	▲	▲	Morocco
▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	South Africa

SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2006

- ▲ Average achievement significantly higher than comparison country
- ▼ Average achievement significantly lower than comparison country

a symbol indicates no significant difference in performance, and a circle with a triangle pointing down indicates significantly lower performance than the comparison country or Canadian province.

The results in Exhibit 1.2 help interpret the typically small differences in achievement among the PIRLS 2006 participants shown close to each other in Exhibit 1.1. The Russian Federation, Hong Kong SAR, and Singapore were the three top-performing countries, and fourth-grade students in the Canadian provinces of Alberta and British Columbia had similar average achievement. Considering the five participants with the highest achievement, the Russian Federation and Hong Kong SAR had significantly higher average achievement than all of the remaining participants except the other three in the top five, while the Canadian province of Alberta also performed similarly to Luxembourg and the province of Ontario. In turn, Singapore and the Canadian province of British Columbia showed no significant difference compared to two additional countries—Italy and Hungary. Luxembourg, the Canadian province of Ontario, Italy, and Hungary also performed very well. Luxembourg and the Canadian province of Ontario were outperformed only by the Russian Federation and Hong Kong SAR, Italy by those two and the Canadian province of Alberta, and Hungary also by Luxembourg. Next, although outperformed by the highest achieving countries and provinces, Sweden, Germany, the Netherlands, Belgium (Flemish), Bulgaria, and Denmark achieved at comparable levels, and had higher achievement than the majority of other participants.

Looking at the other end of the achievement continuum in Exhibit 1.2, the lowest performing countries were each, in turn, outperformed by one or two additional countries. That is, South Africa had lower achievement than all the other countries, while Kuwait and Morocco had higher achievement than South Africa (but no other countries). In turn, Qatar had higher achievement than the previous 3 countries, Indonesia than the previous 4 countries, Iran than the previous 5 countries, Trinidad and Tobago together with Macedonia than the previous 6 countries, and Georgia had higher achievement than the previous 8 countries. The next cluster of countries after Georgia all had similar achievement—Romania, Norway, Belgium (French), and Moldova.

Fourth-grade students in these four countries outperformed those in the previously mentioned nine lowest-performing countries, but had significantly lower average achievement than the rest of the participants.

How Has Achievement in Reading Comprehension Changed Between PIRLS 2001 and PIRLS 2006?

Exhibit 1.3 displays changes in average achievement between 2001 and 2006 for the 26 countries and 2 Canadian provinces that participated in both assessments.⁴ The participants are shown in order of the most improvement to largest decline. A red bar indicates that the difference is statistically significant. The Russian Federation, Hong Kong SAR, Singapore, Slovenia, the Slovak Republic, Italy, Germany, and Hungary all showed significant gains in average reading achievement between 2001 and 2006. The gain in Moldova was not significant statistically due to a comparatively larger standard error, even though the increase (8 points) was comparable to that in Hungary. Countries with significant decreases in reading achievement since PIRLS 2001 were Lithuania, the Netherlands, Sweden, England, Romania, and Morocco. (As a trend note, for the Canadian province of Ontario, only public schools participated in PIRLS 2001. To be comparable to PIRLS 2001, the PIRLS 2006 data for Ontario used in the trend analyses included only public schools and differs slightly from Exhibit 1.1.)

It is interesting to consider the PIRLS 2006 achievement results in light of the information countries provided in the *PIRLS 2006 Encyclopedia*. For example, the trend results illustrate how PIRLS data can be used to monitor the impact of structural and curricular changes in education systems. Although the education systems in the PIRLS trend countries and provinces have been relatively stable in most respects between 2001 and 2006, several have undergone fundamental changes. Table A.8 in Appendix A documents the grades, average ages, and percentages of exclusions in 2001 and 2006 for the trend participants.

According to ongoing reforms described in the *PIRLS 2006 Encyclopedia*, improvement in the Russian Federation and Slovenia may have been anticipated. These two countries have been undergoing structural changes

4 For PIRLS 2006, New Zealand and Singapore tested on the Southern Hemisphere schedule of October through December 2005. For PIRLS 2001, the Southern Hemisphere testing was scheduled after the Northern Hemisphere (instead of before it) in October through December of 2001. Thus, the changes for New Zealand and Singapore are over a 4-year period rather than a 5-year period.



Exhibit 1.3 Trends in Reading Achievement

PIRLS 2006
4th Grade

[†] Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).

[‡] Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).

^{2a} National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).

^{2b} National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Trend Note: The primary education systems of the Russian Federation and Slovenia underwent structural changes. Data for Canada, Ontario include only public schools.



in their primary system that involve adding one more year of schooling at the primary level, as well as associated curricular and instructional reforms. In the Russian Federation, the primary level of the education system has been undergoing a transition from 3 years to 4 years of schooling. In PIRLS 2001, more than half of the Russian students were still in the 3-year system, whereas by 2006 the transition essentially was complete to the 4-year system. When the transition was conceived, the idea was to have students start school a year younger at age 6, but in actuality, parents are still sending their children to school at age 7. Thus, in 2006, about half of the students in the Russian Federation had an extra year of school, and the average age increased from 10.3 to 10.8. Slovenia is in the middle of a similar transition; so, in anticipation of this reform, they tested students in their third year of schooling in 2001. By 2006, about half of the students had attended school for 4 years. However, in Slovenia, students having attended school for 4 years started school younger, so the average age has not changed (9.8 to 9.9). According to the Slovenian chapter in the *PIRLS 2006 Encyclopedia*, one of the reasons for changing from an 8- to a 9-year elementary school system was to improve literacy.

In Hong Kong SAR, as described in the *PIRLS 2006 Encyclopedia*, curriculum reform since 2000 has involved the government doing extensive work to promote reading and enable all children to read with comprehension in both official languages of Chinese and English. In 2000, the Curriculum Development Council established clear reading goals for schools giving them the responsibility for promoting reading and building a culture of reading. The Curriculum Development Council gave schools the power to adjust the curriculum and schedule to meet the literacy needs of students, and suggested that teachers expand the range of teaching materials used in lessons. Schools ensure that students are given opportunities to develop reading fluency, and many have trained “Reading Mothers” to help students read stories. There also has been considerable community involvement. For example, the *Reading Ambassador* project has trained 2,500 parents, university students including prospective teachers, older secondary school students, and community leaders to read and share their perspectives with students in schools.



According to the Singaporean chapter in the *PIRLS 2006 Encyclopedia*, Singapore implemented a new English language syllabus in 2001 that was significantly different from the previous one. Organized loosely around three areas: language for information, language for literary response and expression, and language for social interaction, the new syllabus focuses on language use through study of a wide range of text types. It is supported by new instructional materials, and learning outcomes specified in the syllabus give teachers more explicit information on teaching reading skills and strategies at various levels. During 2000 and 2001, nationwide training workshops were conducted to prepare all English language teachers to teach the new syllabus. Children in Singapore also have been exposed to more opportunities to learn English (the language of the test). The number of students whose predominant home language is English increased from 37 percent in 2001 to 42 percent in 2005. The 2-year Learning Support Programme provides early intervention and support for students who enter primary school with weak English language skills.

What Are the Gender Differences in Reading Achievement?

Exhibit 1.4 shows differences in fourth-grade students' reading achievement between girls and boys. For each of the *PIRLS 2006* participants, the percentage of girls and boys is shown with their respective average achievement. The countries and provinces are shown in increasing order of the gender difference. Because girls had higher average achievement than boys in every country and province, the ordering is according to the extent of the difference favoring girls from the least to the most difference (shown in the last column). Except in the two countries with the most equitable results, Luxembourg and Spain, the differences were statistically significant.

For the first time in this chapter, Exhibit 1.4 provides an "international average" based on averaging the results across countries. The five Canadian provinces were not included in the computations. As point of reference, the results were averaged separately for boys and for girls to examine the extent of the gender difference, on average internationally. On average internationally,

the average scale score for girls was 509 compared to that of 492 for boys, a difference of 17 scale score points on average.

Exhibit 1.5 presents, in alphabetical order, changes in average reading achievement for girls and boys between PIRLS 2001 and PIRLS 2006. The changes for Hong Kong SAR, Italy, the Russian Federation, Singapore, the Slovak Republic, and Slovenia mirror their overall gains, with increases for both girls and boys. Interestingly, only boys showed improvement in Germany and Hungary (as well as in Moldova). The boys in the Canadian province of Ontario and Iran also showed improvement in average achievement between PIRLS 2001 and PIRLS 2006. For countries showing declines overall, both girls and boys showed decreases in achievement in England, Morocco, Romania, and Sweden. In the Netherlands, the decline overall seemed to be primarily attributable to the decrease in girls' average reading achievement.

How Does Achievement Differ Across Countries for Reading Literacy Purposes?

In both PIRLS 2001 and 2006, the assessment framework included two overarching purposes for reading:

- ▶ Reading for literary experience, and
- ▶ Reading to acquire and use information.

The PIRLS 2006 assessment included five literary passages and five informational passages, so that half of the assessment time was devoted to each purpose. Comprehension processes were assessed within each purpose (see next section). The literary texts were fictional stories where students could engage with the events, characters' actions and feelings, the setting, and ideas, as well as the language itself. The informational passages dealt with aspects of the real universe, and covered a variety of content and organizational structures. In addition to prose, each one involved some variety in format, by including features such as photographs, illustrations, text boxes, maps, and diagrams. More information about the passages can be found in Chapter 2, and two of the literary and informational passages are

Exhibit 1.4 Differences in Average Reading Achievement by Gender

PIRLS 2006
4th Grade

Countries	Girls		Boys		Difference Girls Higher Average Achievement Than Boys
	Percent of Girls	Average Scale Score	Percent of Students	Average Scale Score	
Luxembourg	49 (0.7)	559 (1.3)	51 (0.7)	556 (1.6)	3 (2.0)
Spain	49 (1.1)	515 (2.6)	51 (1.1)	511 (3.1)	4 (2.8)
Belgium (French)	50 (0.7)	502 (2.8)	50 (0.7)	497 (2.9)	5 (2.3)
Hungary	50 (0.9)	554 (3.6)	50 (0.9)	548 (2.9)	5 (2.6)
^{12a} Belgium (Flemish)	50 (0.9)	550 (2.3)	50 (0.9)	544 (2.4)	6 (2.5)
Italy	48 (0.8)	555 (3.3)	52 (0.8)	548 (3.3)	7 (2.9)
[†] Netherlands	51 (0.8)	551 (2.0)	49 (0.8)	543 (1.6)	7 (2.2)
Germany	49 (0.7)	551 (2.5)	51 (0.7)	544 (2.5)	7 (2.6)
^{2a} Canada, Alberta	48 (0.8)	564 (2.4)	52 (0.8)	556 (2.7)	8 (1.9)
^{2a} Canada, British Columbia	50 (0.8)	562 (2.9)	50 (0.8)	554 (3.1)	9 (3.0)
Austria	49 (0.7)	543 (2.3)	51 (0.7)	533 (2.6)	10 (2.3)
^{12a} United States	51 (0.7)	545 (3.3)	49 (0.7)	535 (4.4)	10 (3.2)
Hong Kong SAR	49 (1.3)	569 (2.5)	51 (1.3)	559 (2.8)	10 (2.5)
France	48 (0.7)	527 (2.4)	52 (0.7)	516 (2.4)	11 (2.5)
Slovak Republic	49 (0.8)	537 (2.7)	51 (0.8)	525 (3.3)	11 (2.5)
Canada, Quebec	49 (1.0)	539 (2.7)	51 (1.0)	527 (3.5)	13 (3.0)
^{2a} Canada, Ontario	49 (1.1)	562 (3.3)	51 (1.1)	549 (3.3)	13 (3.8)
Chinese Taipei	48 (0.5)	542 (2.2)	52 (0.5)	529 (2.3)	13 (1.9)
^{2a} Denmark	52 (0.9)	553 (2.8)	48 (0.9)	539 (2.7)	14 (3.2)
Moldova, Rep. of	50 (1.0)	507 (3.1)	50 (1.0)	493 (3.5)	14 (2.5)
Iran, Islamic Rep. of	46 (1.1)	429 (5.3)	54 (1.1)	414 (3.8)	14 (6.7)
Romania	48 (1.0)	497 (5.0)	52 (1.0)	483 (5.7)	14 (4.2)
^{2b} Israel	48 (1.2)	520 (4.1)	52 (1.2)	506 (3.7)	15 (4.0)
^{2a} Russian Federation	51 (0.9)	572 (3.9)	49 (0.9)	557 (3.4)	15 (2.9)
Singapore	48 (0.6)	567 (3.1)	52 (0.6)	550 (3.3)	17 (2.9)
Poland	51 (0.8)	528 (2.6)	49 (0.8)	511 (2.7)	17 (2.6)
^{2a} Georgia	48 (1.0)	480 (3.3)	52 (1.0)	463 (3.8)	17 (3.2)
Morocco	47 (1.0)	332 (6.6)	53 (1.0)	314 (6.6)	18 (5.8)
Sweden	48 (1.1)	559 (2.6)	52 (1.1)	541 (2.6)	18 (2.5)
Lithuania	49 (0.9)	546 (2.0)	51 (0.9)	528 (2.0)	18 (2.2)
Iceland	50 (0.9)	520 (1.7)	50 (0.9)	501 (1.9)	19 (2.5)
[‡] Norway	49 (1.1)	508 (2.8)	51 (1.1)	489 (3.1)	19 (3.2)
England	50 (0.9)	549 (3.0)	50 (0.9)	530 (2.8)	19 (2.7)
Slovenia	48 (0.7)	532 (2.1)	52 (0.7)	512 (2.7)	19 (2.5)
Indonesia	49 (0.9)	415 (4.2)	51 (0.9)	395 (4.6)	20 (3.3)
^{2a} Bulgaria	49 (1.0)	558 (4.4)	51 (1.0)	537 (5.0)	21 (3.8)
Canada, Nova Scotia	49 (0.7)	553 (2.5)	51 (0.7)	531 (2.8)	21 (3.2)
Macedonia, Rep. of	49 (0.7)	453 (4.4)	51 (0.7)	432 (4.4)	21 (3.5)
[†] Scotland	51 (0.9)	538 (3.6)	49 (0.9)	516 (3.1)	22 (3.8)
Latvia	48 (1.0)	553 (2.7)	52 (1.0)	530 (2.6)	23 (2.7)
New Zealand	49 (0.9)	544 (2.2)	51 (0.9)	520 (2.9)	24 (3.1)
Trinidad and Tobago	49 (1.7)	451 (4.9)	51 (1.7)	420 (6.0)	31 (5.6)
South Africa	52 (0.6)	319 (6.3)	48 (0.6)	283 (5.5)	36 (4.6)
Qatar	50 (0.2)	372 (1.7)	50 (0.2)	335 (1.7)	37 (2.6)
Kuwait	50 (2.0)	364 (4.7)	50 (2.0)	297 (6.2)	67 (7.5)
International Avg.	49 (0.2)	509 (0.6)	51 (0.2)	492 (0.6)	17 (0.5)

▲ Average significantly higher than other gender

[†] Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).

[‡] Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).

^{2a} National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).

^{2b} National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

NOTE: The International Average does not include the results from the Canadian provinces.

SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2006



Exhibit 1.5 Trends in Average Reading Achievement by Gender

**PIRLS 2006
4th Grade**

Countries	Girls		Boys		
	2006 Average Scale Score	2001 to 2006 Difference	2006 Average Scale Score	2001 to 2006 Difference	
Bulgaria	558 (4.4)	-5 (5.7)	537 (5.0)	-1 (6.8)	
Canada, Ontario	560 (3.3)	2 (5.0)	548 (3.3)	10 (4.8)	▲
Canada, Quebec	539 (2.7)	-5 (4.3)	527 (3.5)	-3 (4.7)	
England	549 (3.0)	-14 (4.9)	530 (2.8)	-11 (4.7)	▼
France	527 (2.4)	-3 (3.6)	516 (2.4)	-4 (3.9)	
Germany	551 (2.5)	6 (3.3)	544 (2.5)	11 (3.5)	▲
Hong Kong SAR	569 (2.5)	32 (3.9)	559 (2.8)	40 (4.5)	▲
Hungary	554 (3.6)	3 (4.3)	548 (2.9)	12 (3.8)	▲
Iceland	520 (1.7)	-2 (2.5)	501 (1.9)	-2 (2.4)	
Iran, Islamic Rep. of	429 (5.3)	2 (7.8)	414 (3.8)	15 (6.8)	▲
Israel	520 (4.1)	1 (5.3)	506 (3.7)	8 (5.2)	
Italy	555 (3.3)	10 (4.2)	548 (3.3)	11 (4.2)	▲
Latvia	553 (2.7)	-3 (4.1)	530 (2.6)	-4 (3.6)	
Lithuania	546 (2.0)	-6 (3.5)	528 (2.0)	-7 (3.4)	
Macedonia, Rep. of	453 (4.4)	1 (6.8)	432 (4.4)	1 (6.5)	
Moldova, Rep. of	507 (3.1)	3 (5.6)	493 (3.5)	14 (5.3)	▲
Morocco	332 (6.6)	-29 (11.6)	314 (6.6)	-27 (12.8)	▼
Netherlands	551 (2.0)	-11 (3.4)	543 (1.6)	-4 (3.2)	
New Zealand	544 (2.2)	2 (5.2)	520 (2.9)	4 (5.1)	
Norway	508 (2.8)	-3 (4.5)	489 (3.1)	0 (4.6)	
Romania	497 (5.0)	-22 (6.6)	483 (5.7)	-22 (8.1)	▼
Russian Federation	572 (3.9)	38 (5.8)	557 (3.4)	35 (5.9)	▲
Scotland	538 (3.6)	2 (5.3)	516 (3.1)	-3 (5.2)	
Singapore	567 (3.1)	27 (6.1)	550 (3.3)	34 (6.6)	▲
Slovak Republic	537 (2.7)	10 (4.0)	525 (3.3)	15 (4.7)	▲
Slovenia	532 (2.1)	19 (3.3)	512 (2.7)	22 (3.6)	▲
Sweden	559 (2.6)	-14 (3.7)	541 (2.6)	-10 (3.6)	▼
United States	545 (3.3)	-6 (5.0)	535 (4.4)	2 (6.6)	
International Avg.	526 (0.7)	1 (1.0)	510 (0.7)	5 (1.1)	▲

SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2006

▲ 2006 average significantly higher
▼ 2006 average significantly lower

† Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).
 ‡ Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).
 2a National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).
 2b National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
 NOTE: The International Average does not include the results from the Canadian provinces. Trend Note: The primary education systems of the Russian Federation and Slovenia underwent structural changes. Data for Canada, Ontario include only public schools.

reproduced in the Appendix D and in the PIRLS 2006 Reader in the pocket at the end of this report.

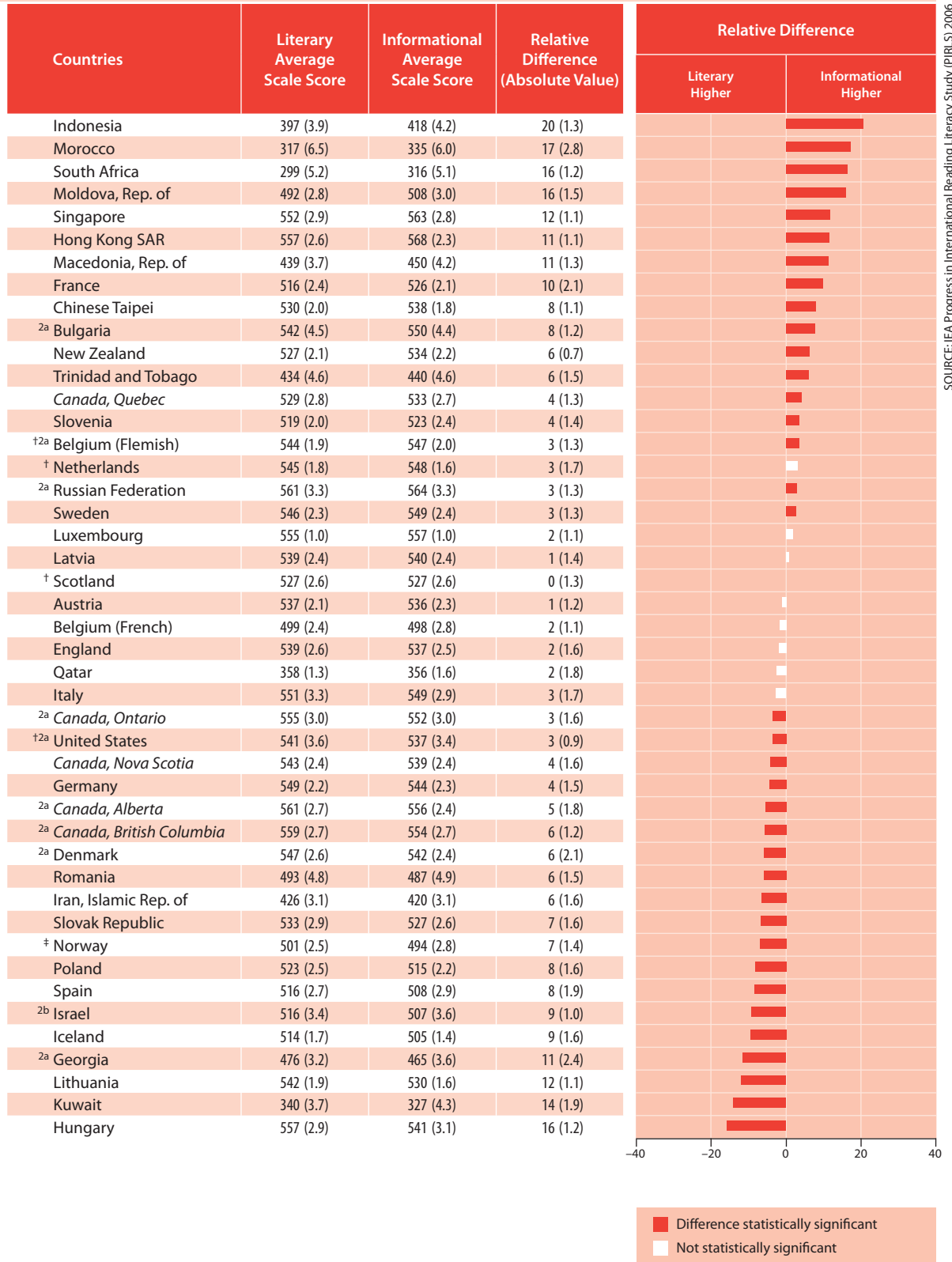
For each country and Canadian province, Exhibit 1.6 presents the average achievement for fourth-grade students in reading for literary purposes and in reading for informational purposes. The two numerical scale scores are not directly comparable, since they represent different constructs, and the assessments were of slightly different difficulties. As shown in Exhibit A.16 containing the average percent correct across the items on the PIRLS 2006 scales, on average internationally, the informational scale was slightly more difficult than the literary scale, 52 percent correct on average compared to 55 percent correct. This pattern held for most but not all of the PIRLS 2006 participants. However, to allow comparison of the relative performance of each PIRLS 2006 participant for each purpose, the international average for each purpose was scaled to be 500, the same as the overall PIRLS scale average. This makes it possible to examine relative strengths and weaknesses of countries by comparing the relative positions of the participants on the two scales. To assist in the relative comparisons, the graph displays the differences.

The first two columns in Exhibit 1.6 present the average achievement for the literary purpose and the average achievement for the informational purpose. Generally, the PIRLS 2006 participants with the highest achievement overall also had the highest achievement in both literary and informational reading. Exhibit B.1 for literary reading and Exhibit B.2 for informational reading, respectively, present the PIRLS 2006 participants in order of average achievement and show whether or not the differences in average achievement are statistically significant.

The results in Exhibit 1.6 reveal, however, that many countries performed relatively better or worse in one reading purpose compared to the other (the red bar indicates that the difference is statistically significant). The countries with relatively better performance in informational reading are shown in the upper portion of the exhibit, and those with relatively better performance in literary reading are shown in the lower portion. Except for a consistent pattern among countries where Chinese is one of the major languages (Singapore,

Exhibit 1.6 Relative Difference in Performance Between Literary and Informational Purposes

PIRLS 2006
4th Grade



SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2006

[†] Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).
[‡] Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).
^{2a} National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).

^{2b} National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).
 () Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Hong Kong SAR, and Chinese Taipei), there is considerable diversity among the countries achieving relatively higher in informational reading. Similarly, there is considerable diversity among countries with a relative strength in literary reading, except perhaps for English-speaking North America (the United States as well as the English-speaking Canadian provinces), which achieved somewhat higher in literary reading.

Exhibit 1.7 shows changes in average achievement in reading for the literary purpose. Again, the countries are shown according to the amount of their increase between PIRLS 2001 and PIRLS 2006 (with the bar colored if the change is statistically significant). Consistent with their improvement overall, Hong Kong SAR, the Russian Federation, Singapore, the Slovak Republic, Slovenia, Moldova, Germany, Italy, and Hungary all showed improvement in reading for literary purposes. Also, consistent with their overall decreases, Morocco, England, Romania, Sweden, and the Netherlands declined in average achievement. Iceland, which showed essentially no change overall, had a decrease in reading for literary purposes.

The changes in average achievement in reading for the informational purpose are presented in Exhibit 1.8. Similar to the results for reading for the literary purpose, many countries with improvement overall also improved in informational reading, including Singapore, the Russian Federation, Hong Kong SAR, Slovenia, Italy, and Germany. Interestingly, even though the Slovak Republic, Moldova, and Hungary improved in reading for the literary purpose, they showed little, if any, change in achievement in informational reading. Iran and the Canadian province of Ontario showed improvement in informational reading. (Also, New Zealand had a 9-point increase that did not meet the criteria used for statistical significance.) The decreases in Romania, Sweden, Lithuania, and England as well as in Morocco were consistent with their overall declines. Average achievement in informational reading also declined in Latvia and France. (The 7-point decrease in the Canadian province of Quebec was accompanied by a slightly larger standard error, so the difference was not statistically significant.)

Exhibit 1.7 Trends in Reading Achievement for Literary Purposes

PIRLS 2006
4th Grade



[†] Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).

[‡] Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).

^{2a} National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).

^{2b} National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Trend Note: The primary education systems of the Russian Federation and Slovenia underwent structural changes. Data for Canada, Ontario include only public schools.

Exhibit 1.8 Trends in Reading Achievement for Informational Purposes

PIRLS 2006
4th Grade

[†] Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).

[‡] Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).

^{2a} National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).

^{2b} National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Trend Note: The primary education systems of the Russian Federation and Slovenia underwent structural changes. Data for Canada, Ontario include only public schools.



What Are the Gender Differences in Achievement for the Reading Purposes?

Exhibit 1.9 presents the PIRLS 2006 gender differences in average achievement for literary and informational reading. For the literary reading purpose, girls had significantly higher average achievement than boys in every participating entity (except Iran where the 11-point difference was not statistically significant). In contrast, some European countries had little if any gender difference in informational reading, including Belgium (French), Hungary, Italy, Luxembourg, and Spain.

To provide an international context for the differences, Exhibit 1.9 presents the international average for girls and boys for each of the purposes. The international average is the mean of the average scale score of the PIRLS 2006 countries, excluding the five Canadian provinces. Across all the participating countries (excluding the provinces), the average differences were similar for the two purposes—17 points for literary and 16 points for informational.

How Does Achievement Differ Across Countries for Reading Comprehension Processes?

Within reading for literary and informational purposes, the test questions or items were designed to measure four major processes of reading comprehension described in the framework. Briefly, the four major reading comprehension processes addressed by PIRLS 2006 are:

- ▶ Focus on and retrieve explicitly stated information,
- ▶ Make straightforward inferences,
- ▶ Interpret and integrate ideas and information, and
- ▶ Examine and evaluate content, language, and textual elements.

Given the number of items in the assessment, it was not possible to create four separate achievement scales for the reading processes. Based on research conducted by Germany⁵ and at the TIMSS & PIRLS International Study Center⁶ examining PIRLS 2001, PIRLS 2006 was designed to support the

5 Bos, W., Lankes, E. M., Prenzel, M., Schwippert, K., Walther, G., & Valtin, R. (Hrsg.). (2003). *Ergebnisse aus IGLU: Schülerleistungen am Ende der vierten Jahrgangsstufe im internationalen Vergleich*. New York: Waxmann.

6 Mullis, I.V.S., Martin, M.O., and Gonzalez, E.J. (2004). *PIRLS international achievement in the processes of reading comprehension: Results from PIRLS 2001 in 35 countries*. Chestnut Hill, MA: Boston College.



Exhibit 1.9 Average Achievement in Reading for Literary and Informational Purposes by Gender

PIRLS 2006
4th Grade

Countries	Literary			Informational		
	Girls Average Scale Score	Boys Average Scale Score	Girls Higher Average Achievement	Girls Average Scale Score	Boys Average Scale Score	Girls Higher Average Achievement
Austria	543 (2.6) ▲	531 (2.4)	11 (2.7)	540 (2.7) ▲	533 (2.6)	7 (2.6)
^{†2a} Belgium (Flemish)	547 (2.2) ▲	541 (2.3)	6 (2.4)	550 (2.4) ▲	545 (2.2)	5 (2.1)
Belgium (French)	504 (2.6) ▲	495 (2.8)	9 (2.5)	499 (3.3)	497 (3.0)	1 (3.0)
^{2a} Bulgaria	553 (4.6) ▲	532 (5.4)	21 (4.7)	558 (4.4) ▲	542 (5.2)	16 (4.3)
^{2a} Canada, Alberta	567 (2.9) ▲	556 (3.0)	11 (2.2)	559 (2.5) ▲	553 (2.8)	7 (2.1)
^{2a} Canada, British Columbia	565 (3.0) ▲	553 (3.2)	12 (3.2)	556 (3.3) ▲	551 (2.8)	6 (3.0)
Canada, Nova Scotia	552 (3.4) ▲	534 (2.6)	18 (3.7)	549 (2.8) ▲	529 (3.0)	20 (3.3)
^{2a} Canada, Ontario	562 (3.5) ▲	549 (3.3)	12 (3.5)	558 (3.3) ▲	547 (3.9)	11 (4.0)
Canada, Quebec	536 (3.1) ▲	523 (3.4)	12 (3.5)	539 (2.7) ▲	528 (3.6)	11 (3.3)
Chinese Taipei	538 (2.2) ▲	523 (2.2)	15 (1.8)	543 (1.8) ▲	534 (2.3)	8 (2.0)
^{2a} Denmark	554 (3.0) ▲	541 (3.1)	13 (3.2)	547 (2.8) ▲	536 (3.1)	11 (3.4)
England	550 (3.1) ▲	528 (2.7)	22 (2.7)	545 (2.8) ▲	529 (2.9)	16 (2.6)
France	523 (2.6) ▲	510 (2.7)	12 (2.4)	531 (2.7) ▲	521 (2.3)	10 (2.8)
^{2a} Georgia	484 (3.7) ▲	470 (3.6)	14 (3.3)	474 (3.7) ▲	457 (4.4)	17 (3.8)
Germany	554 (2.4) ▲	544 (2.6)	9 (2.5)	547 (2.4) ▲	542 (2.7)	6 (2.4)
Hong Kong SAR	564 (2.6) ▲	551 (3.3)	13 (2.8)	572 (2.2) ▲	564 (2.8)	8 (2.2)
Hungary	560 (3.6) ▲	553 (2.9)	7 (2.9)	543 (3.7)	539 (3.1)	4 (2.8)
Iceland	525 (2.4) ▲	504 (1.9)	20 (2.9)	514 (1.9) ▲	497 (2.1)	17 (2.9)
Indonesia	408 (4.0) ▲	387 (4.4)	20 (3.3)	427 (4.6) ▲	409 (5.0)	18 (4.8)
Iran, Islamic Rep. of	432 (5.3)	421 (4.0)	11 (6.8)	429 (4.9) ▲	412 (3.8)	17 (6.1)
^{2b} Israel	524 (4.0) ▲	509 (3.8)	15 (3.8)	513 (4.5) ▲	502 (4.1)	11 (4.8)
Italy	556 (3.6) ▲	548 (3.6)	8 (3.0)	551 (3.1)	547 (3.4)	5 (2.9)
Kuwait	372 (4.5) ▲	310 (5.2)	62 (6.8)	361 (6.3) ▲	292 (6.0)	68 (9.2)
Latvia	550 (3.0) ▲	529 (2.7)	21 (3.1)	553 (2.7) ▲	527 (2.7)	26 (2.8)
Lithuania	550 (2.4) ▲	533 (2.0)	17 (2.2)	539 (2.2) ▲	521 (2.0)	17 (2.6)
Luxembourg	557 (1.4) ▲	552 (1.4)	5 (2.2)	557 (1.2)	556 (1.5)	1 (1.9)
Macedonia, Rep. of	449 (4.3) ▲	429 (4.0)	20 (3.7)	460 (4.6) ▲	440 (4.4)	21 (3.4)
Moldova, Rep. of	499 (3.3) ▲	486 (3.0)	13 (2.9)	514 (3.2) ▲	502 (3.5)	13 (2.6)
Morocco	326 (6.9) ▲	310 (7.4)	17 (6.3)	344 (6.1) ▲	326 (6.9)	19 (5.1)
[†] Netherlands	548 (2.2) ▲	541 (2.3)	6 (2.7)	552 (1.8) ▲	543 (1.9)	9 (2.0)
New Zealand	539 (2.3) ▲	516 (2.9)	23 (3.1)	545 (2.3) ▲	522 (3.0)	23 (2.9)
[‡] Norway	512 (2.8) ▲	491 (2.7)	21 (2.6)	502 (3.4) ▲	486 (2.8)	16 (3.0)
Poland	532 (2.8) ▲	514 (3.0)	18 (3.0)	523 (2.3) ▲	507 (2.8)	16 (2.6)
Qatar	376 (1.8) ▲	341 (2.3)	36 (3.3)	374 (2.3) ▲	339 (2.3)	35 (3.2)
Romania	501 (4.9) ▲	485 (5.6)	16 (4.2)	494 (5.2) ▲	481 (5.4)	13 (3.8)
^{2a} Russian Federation	568 (3.8) ▲	554 (3.3)	15 (2.5)	572 (3.5) ▲	555 (3.6)	17 (2.7)
[†] Scotland	538 (3.4) ▲	515 (3.0)	23 (3.9)	537 (3.6) ▲	517 (2.8)	20 (3.9)
Singapore	560 (3.2) ▲	544 (3.4)	16 (3.2)	572 (2.9) ▲	555 (3.3)	16 (2.7)
Slovak Republic	539 (2.9) ▲	527 (3.5)	12 (3.1)	532 (2.5) ▲	522 (3.3)	10 (2.7)
Slovenia	529 (2.3) ▲	511 (2.6)	18 (2.7)	533 (2.4) ▲	514 (3.2)	18 (3.2)
South Africa	318 (6.0) ▲	281 (5.3)	38 (4.3)	332 (5.8) ▲	299 (5.4)	33 (4.5)
Spain	520 (3.1) ▲	513 (3.1)	7 (3.0)	508 (3.2)	508 (3.2)	0 (2.7)
Sweden	557 (2.7) ▲	536 (2.6)	20 (2.8)	557 (2.9) ▲	541 (2.6)	15 (3.0)
Trinidad and Tobago	450 (4.9) ▲	419 (5.6)	31 (5.4)	455 (5.0) ▲	426 (5.5)	28 (5.4)
^{†2a} United States	547 (3.6) ▲	534 (4.1)	12 (2.8)	542 (3.1) ▲	532 (4.4)	9 (3.3)
International Avg.	509 (0.6) ▲	491 (0.6)	17 (0.5)	509 (0.7) ▲	493 (0.6)	16 (0.7)

▲ Average significantly higher than other gender

† Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).

‡ Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).

^{2a} National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).^{2b} National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

NOTE: The International Average does not include the results from the Canadian provinces.

SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2006



creation of two reading achievement scales for the reading processes. One scale combines the retrieval and straightforward inferencing processes and is called the retrieving and straightforward inferencing scale. The second scale combines the interpreting and integrating processes with the examining and evaluating processes and is called the interpreting, integrating, and evaluating scale. This combination makes sense conceptually, because it combines the two text-based processes and the two processes that require more reasoning. It also works well analytically, because it allocates about half of the assessment items to each scale.

In the *PIRLS 2006 Assessment Framework and Specifications*, retrieving information was allocated 20 percent of the assessment and straightforward inferencing 30 percent. These two comprehension processes involve locating explicitly stated information, as well as filling in the “gaps” in information contained in the text. Straightforward inferences are very much text based. Although not explicitly stated in the text, the meaning remains relatively clear. Interpreting and integrating ideas and information was given a weight of 30 percent and examining and evaluating 20 percent. Interpreting and integrating ideas can be at a global level or require relating details and information in the text to an overall idea. Readers are making connections that are not only implicit, but that may be open to some interpretation based on their own perspective. Evaluation focuses on considering the text itself, including the author’s purpose, claims made in the text, and the structure and genre, as well as language conventions.

Exhibit 1.10 presents average achievement for the two achievement scales for the reading processes. Just as was the case with the scales for the reading purposes, the scales for the processes are not directly comparable, since they represent different constructs, and, as shown by average percent correct in Exhibit A.16, items on the interpreting, integrating, and evaluating scale were more difficult than those on the retrieving and straightforward inferencing scale. Internationally on average, for the retrieving and straightforward inferencing scale, the average percent correct was 64 percent. In contrast the average percent correct was 20 percentage points lower for the interpreting,

integrating, and evaluating scale (44%). This pattern held to some degree for each of the PIRLS 2006 participants.

To allow for relative comparisons between the processes for the PIRLS 2006 participants, again just as was done for the purposes, the international average of each process was scaled to be 500 (the same as the overall PIRLS scale average). However, as can be seen in Exhibit A.16, the items in the interpreting, integrating, and evaluating scale were very difficult, less than 20 percent correct on average, for students in Kuwait, Morocco, Qatar, and South Africa. This low performance created a floor effect in the scaling process that made it difficult to obtain accurate achievement scale estimates for these countries (please see Appendix A for further information). Therefore, achievement results for the interpreting, integrating, and evaluating scale were not produced for these four countries.

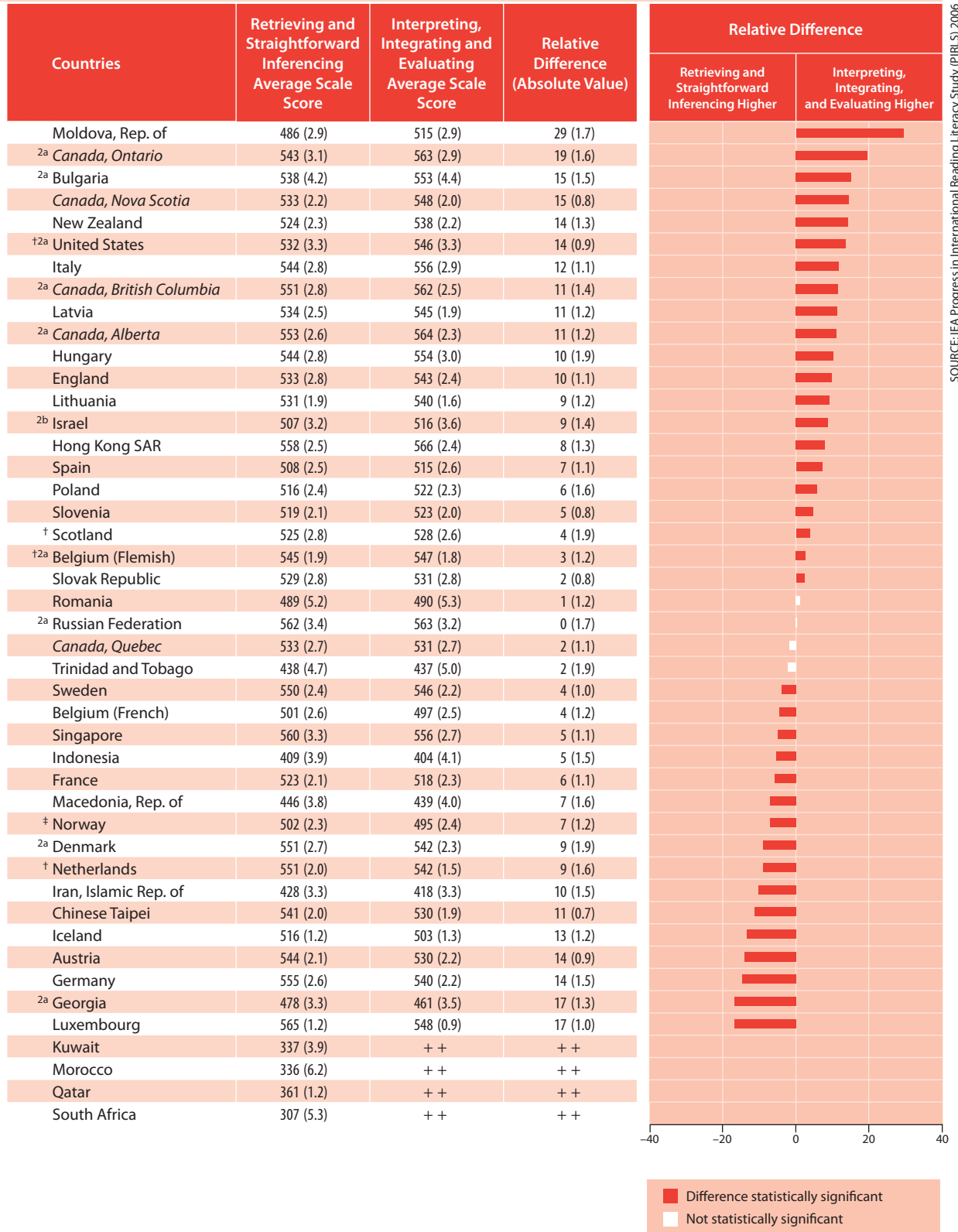
As would be anticipated, the countries and Canadian provinces with high achievement overall tended to have the highest achievement in the reading processes (as they did in the reading purposes). Exhibits B.3 and B.4 provide the multiple-comparison information for the two achievement scales for the reading processes.

Exhibit 1.10 also displays the differences between average achievement in the retrieving and straightforward inferencing processes compared to the interpreting, integrating, and evaluating processes. There were some interesting results in relative performance, with about half the PIRLS 2006 participants performing relatively better in the reasoning processes, and most of the others performing relatively better in the text-based processes (the red bar indicates that the difference is statistically significant).

Countries and provinces with higher relative performance in the interpreting, integrating, and evaluating processes included Moldova, Bulgaria, New Zealand, the United States, Italy, Latvia, Hungary, England, Lithuania, Israel, Hong Kong SAR, Spain, Poland, Slovenia, Scotland, Belgium (Flemish), and the Slovak Republic as well as the Canadian provinces of Ontario, Nova Scotia, British Columbia, and Alberta. Interestingly, all of the participants with English as the predominant language had relatively higher

Exhibit 1.10 Relative Differences in Performance Between Reading Comprehension Processes

PIRLS 2006
4th Grade



SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2006

† Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).
 ‡ Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).
 2a National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).

2b National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).
 () Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
 A plus (+) sign indicates average achievement could not be accurately estimated on the interpreting, integrating, and evaluating scale.

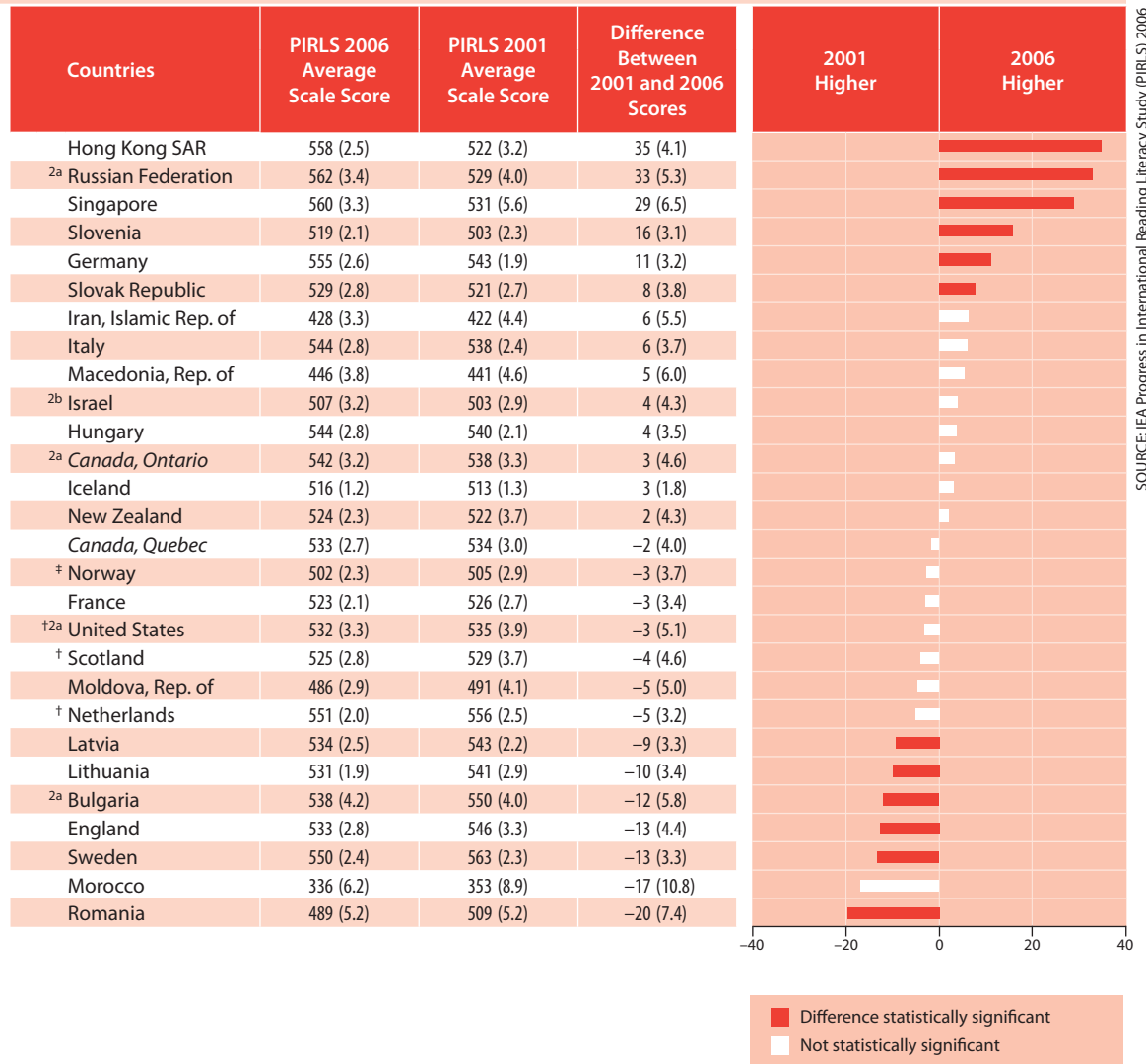
achievement in the reasoning processes than in the text-based processes. Countries with higher relative performance in retrieving and straightforward inferencing processes included Luxembourg, Georgia, Germany, Austria, Iceland, Chinese Taipei, Iran, the Netherlands, Denmark, Norway, Macedonia, France, Indonesia, Singapore, Belgium (French), and Sweden. This set of countries included the German- and French-speaking countries (except the Canadian province of Quebec) as well as the Scandinavian countries.

Exhibit 1.11 presents changes between PIRLS 2001 and PIRLS 2006 in average achievement for the retrieving and straightforward inferencing processes. Many, but not all, of the countries with improved achievement overall also showed improvement in retrieving and straightforward inferencing (red bar), including Hong Kong SAR, the Russian Federation, Singapore, Slovenia, Germany, and the Slovak Republic. Also, almost all of the countries showing declines overall (except the Netherlands) also had decreases in these text-based comprehension processes, including Romania, Morocco (large but not significant), Sweden, England, and Lithuania. In addition, Bulgaria and Latvia had decreases in average achievement in retrieving and straightforward inferencing.

Exhibit 1.12 presents changes in average achievement between PIRLS 2001 and PIRLS 2006 for the interpreting, integrating, and evaluating processes. The same countries that showed improvement overall, also had higher average achievement in 2006 in interpreting, integrating, and evaluating—the Russian Federation, Hong Kong SAR, Singapore, Slovenia, Moldova, the Slovak Republic, Italy, Hungary, and Germany. In addition, Iran improved in the interpreting, integrating, and evaluating processes. (The 8-point increase in the Canadian province of Ontario was not statistically significant.) Many of the countries that had declines overall also had decreases in average achievement in interpreting, integrating, and evaluating, including Romania, England, Sweden, and the Netherlands. In addition, the Canadian province of Quebec and Iceland declined in this area.

Exhibit 1.11 Trends in Reading Achievement for Retrieving and Straightforward Inferencing Processes

PIRLS 2006
4th Grade



SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2006

† Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).
 ‡ Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).
 2a National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).

2b National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).
 () Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
 Trend Note: The primary education systems of the Russian Federation and Slovenia underwent structural changes. Data for Canada, Ontario include only public schools.

Exhibit 1.12 Trends in Reading Achievement for Interpreting, Integrating, and Evaluating Processes PIRLS 2006 4th Grade



[†] Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).

[‡] Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).

^{2a} National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).

^{2b} National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A plus (+) sign indicates average achievement could not be accurately estimated on the interpreting, integrating, and evaluating scale.

Trend Note: The primary education systems of the Russian Federation and Slovenia underwent structural changes. Data for Canada, Ontario include only public schools.



What Are the Gender Differences in Achievement for the Reading Processes?

Exhibit 1.13 shows (in alphabetical order) average achievement for girls and boys for the retrieval and straightforward inferencing processes and the interpreting, integrating, and evaluating processes. Mirroring the results overall and for the literary and informational purposes, girls typically had higher achievement than boys. Notably, several countries did not have statistically significant differences for the text-based processes, including, Hungary, Iran, Italy, Luxembourg, the Netherlands, and Spain. However, in the remaining countries and provinces, girls had significantly higher average achievement than boys. For interpreting, integrating, and evaluating, girls had higher achievement than boys in all the participating countries and provinces except Hungary and Iran.

To indicate the pattern internationally, Exhibit 1.13 provides the international average for girls and boys for the two processes, based on the average achievement across the PIRLS 2006 countries, excluding the five Canadian provinces. On average, the advantage for girls was 15 points for the retrieving and straightforward inferencing processes, compared to 17 points for interpreting, integrating, and evaluating.

Exhibit 1.13 Average Achievement in Reading Processes of Comprehension by Gender

PIRLS 2006
4th Grade

Countries	Retrieving and Straightforward Inferencing Processes			Interpreting, Integrating, and Evaluating Processes		
	Girls Average Scale Score	Boys Average Scale Score	Girls Higher Average Achievement	Girls Average Scale Score	Boys Average Scale Score	Girls Higher Average Achievement
Austria	547 (2.3)	541 (2.5)	6 (2.4)	536 (2.7)	524 (2.4)	13 (2.6)
^{12a} Belgium (Flemish)	548 (2.3)	542 (2.3)	6 (2.6)	550 (2.4)	544 (2.0)	6 (2.5)
Belgium (French)	504 (2.8)	498 (3.0)	6 (2.5)	500 (2.6)	494 (2.9)	6 (2.5)
^{2a} Bulgaria	544 (4.3)	531 (5.0)	13 (4.1)	565 (4.4)	540 (5.1)	25 (3.9)
^{2a} Canada, Alberta	556 (2.7)	550 (3.1)	6 (2.5)	570 (2.5)	558 (2.8)	11 (2.5)
^{2a} Canada, British Columbia	554 (3.0)	547 (3.2)	7 (2.8)	567 (2.7)	557 (3.1)	9 (3.3)
Canada, Nova Scotia	542 (3.1)	525 (2.9)	17 (4.1)	559 (2.2)	537 (2.6)	21 (2.7)
^{2a} Canada, Ontario	548 (3.8)	538 (3.4)	11 (3.8)	569 (3.2)	556 (3.1)	13 (2.8)
Canada, Quebec	537 (2.8)	528 (3.3)	9 (3.0)	539 (2.6)	523 (3.3)	16 (2.8)
Chinese Taipei	546 (2.1)	536 (2.3)	10 (2.2)	537 (1.9)	523 (2.2)	14 (1.9)
^{2a} Denmark	558 (3.1)	543 (3.2)	15 (3.3)	548 (2.8)	536 (2.6)	12 (2.8)
England	543 (3.5)	524 (2.8)	20 (2.8)	552 (2.8)	534 (2.7)	18 (2.5)
France	529 (2.5)	518 (2.5)	11 (2.7)	523 (2.6)	513 (2.5)	10 (2.4)
^{2a} Georgia	486 (3.5)	471 (3.9)	15 (3.3)	471 (4.1)	453 (4.1)	18 (4.1)
Germany	559 (2.8)	550 (3.1)	8 (2.7)	543 (2.4)	537 (2.7)	6 (2.8)
Hong Kong SAR	562 (2.5)	553 (3.0)	8 (2.3)	572 (2.6)	559 (2.8)	13 (2.4)
Hungary	545 (3.5)	542 (2.8)	4 (3.1)	557 (3.6)	551 (3.0)	6 (2.9)
Iceland	525 (1.7)	508 (1.9)	17 (2.7)	514 (1.9)	493 (1.7)	21 (2.5)
Indonesia	418 (4.0)	401 (4.4)	17 (3.1)	415 (4.1)	393 (4.8)	22 (3.6)
Iran, Islamic Rep. of	435 (5.4)	422 (4.0)	13 (6.7)	425 (5.5)	412 (4.2)	13 (7.1)
^{2b} Israel	513 (3.9)	502 (3.7)	11 (4.0)	523 (4.3)	510 (3.7)	14 (3.7)
Italy	546 (2.9)	542 (3.4)	4 (2.8)	559 (2.9)	552 (3.4)	7 (2.9)
Kuwait	368 (4.6)	306 (5.2)	62 (6.6)	++	++	++
Latvia	546 (2.7)	523 (3.0)	23 (3.2)	557 (2.3)	534 (2.2)	24 (2.7)
Lithuania	541 (2.2)	521 (2.4)	20 (2.5)	549 (2.2)	532 (2.0)	17 (2.6)
Luxembourg	567 (1.9)	564 (1.5)	3 (2.3)	550 (1.4)	546 (1.2)	4 (1.9)
Macedonia, Rep. of	456 (4.1)	437 (4.2)	19 (3.2)	451 (4.7)	428 (4.2)	23 (3.7)
Moldova, Rep. of	491 (3.0)	481 (3.4)	10 (2.8)	523 (3.1)	508 (3.2)	15 (2.5)
Morocco	345 (7.2)	329 (6.5)	16 (5.8)	++	++	++
[†] Netherlands	553 (2.7)	549 (2.3)	4 (3.0)	547 (2.0)	538 (1.8)	9 (2.4)
New Zealand	535 (2.4)	513 (3.1)	22 (3.1)	550 (2.3)	526 (2.9)	24 (2.8)
[‡] Norway	510 (3.1)	494 (3.1)	16 (4.2)	505 (2.5)	485 (2.9)	20 (2.7)
Poland	525 (2.6)	507 (2.8)	18 (2.6)	529 (2.4)	514 (3.0)	16 (3.0)
Qatar	377 (2.0)	344 (1.6)	33 (2.7)	++	++	++
Romania	495 (5.2)	483 (5.9)	13 (4.1)	498 (5.6)	482 (5.9)	16 (4.6)
^{2a} Russian Federation	570 (3.9)	554 (3.4)	16 (2.5)	569 (3.8)	555 (3.2)	14 (2.8)
[†] Scotland	537 (3.8)	512 (3.0)	24 (3.8)	538 (3.3)	519 (2.9)	18 (3.6)
Singapore	570 (3.6)	552 (3.9)	18 (3.6)	564 (2.8)	548 (3.2)	16 (2.6)
Slovak Republic	534 (2.8)	524 (3.6)	10 (3.3)	538 (2.8)	525 (3.4)	13 (2.9)
Slovenia	527 (2.0)	511 (2.8)	16 (2.6)	534 (2.1)	514 (2.4)	20 (2.4)
South Africa	322 (6.0)	291 (5.4)	31 (4.4)	++	++	++
Spain	509 (2.8)	508 (2.7)	1 (2.4)	519 (2.9)	512 (3.0)	7 (2.7)
Sweden	558 (2.5)	544 (2.9)	14 (2.7)	557 (2.7)	537 (2.5)	20 (3.0)
Trinidad and Tobago	453 (5.0)	424 (5.6)	29 (5.4)	453 (5.5)	421 (5.8)	32 (5.5)
^{12a} United States	537 (3.2)	527 (4.1)	10 (3.1)	552 (3.0)	540 (4.1)	12 (2.7)
International Avg.	508 (0.6)	493 (0.6)	15 (0.6)	509 (0.6)	492 (0.6)	17 (0.5)

⬆ Average significantly higher than other gender

[†] Met guidelines for sample participation rates only after replacement schools were included (see Exhibit A.7).

[‡] Nearly satisfying guidelines for sample participation rates after replacement schools were included (see Exhibit A.7).

^{2a} National Defined Population covers less than 95% of National Desired Population (see Exhibit A.4).

^{2b} National Defined Population covers less than 80% of National Desired Population (see Exhibit A.4).

() Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

A plus (+) sign indicates average achievement could not be accurately estimated on the interpreting, integrating, and evaluating scale.

NOTE: The International Average does not include the results from the Canadian provinces.

SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2006



