

HOME ENVIRONMENTS FOSTERING CHILDREN'S READING LITERACY: RESULTS FROM THE PIRLS 2001 STUDY OF READING LITERACY ACHIEVEMENT IN PRIMARY SCHOOLS IN 35 COUNTRIES

Michael O. Martin, Boston College, USA

Ina V.S. Mullis, Boston College, USA

Eugenio Gonzalez, Boston College, USA

Abstract

Although formal instruction in reading is a school responsibility, there is little doubt that the foundation for future literacy is laid in the early years. Considerable existing research highlights the importance of home environment in fostering children's literacy. The PIRLS data shows that this holds for in all participating countries, and confirms that time devoted to early reading literacy activities, access to reading material in the home, and a supportive atmosphere all are key factors. Using methods generally associated with effective schools research, the proposed analyses will determine factors that tend to be associated with effective homes in terms of literacy development by fourth grade. More specifically, those factors will be identified that discriminate between the top one-third of high-achieving homes/students and the bottom one-third of low-achieving homes/students.

INTRODUCTION

PIRLS (Progress in International Reading Literacy Study) is IEA's newly developed assessment of students' reading achievement at fourth grade. Designed to provide trends in reading achievement on a regular five-year cycle, PIRLS 2001 has been completed with 35 countries participating. Development of PIRLS 2006 is well underway with more than 40 countries participating. The achievement results from the initial assessment as well as considerable information from home, student, teacher, and school questionnaires were reported in the *PIRLS 2001 International Report* (Mullis, Martin, Gonzalez, & Kennedy, 2003).

To provide an overview of the achievement findings, Exhibit 1 presents the 35 countries that participated in PIRLS 2001 in decreasing order of average (mean) scale score, together with an indication of whether the country average was significantly higher or lower than the international average. (The international average of 500 is

the mean of the average scale score of each of the participating countries.). Sweden had the highest reading literacy achievement with The Netherlands, England, Bulgaria, Lithuania, Hungary, the United States, Germany, and Italy also performing better than most countries (based on tests of statistically significant differences between pairs of countries).

Considering the rich array of background factors discussed in the *PIRLS 2001 International Report*, one of the most striking findings was the impact of the home on reading achievement at the fourth grade. The purpose of this paper is to report further analyses of data from the *PIRLS 2001 Learning to Read Survey* completed by the parents or primary caregivers of the students participating in PIRLS 2001. The *PIRLS 2001 Learning to Read Survey* asked about children's experiences in learning to read, about their own reading, and about literacy resources in the home.

THE ANALYSIS

Data from the *PIRLS 2001 Learning to Read Survey* were available for 33 of the 35 participating countries, all except Morocco and the United States. For the analysis, students within each of the 33 countries were first ranked by their achievement. Students in the top third of the achievement distribution in each country were assigned to the highest-achieving group, and those in the bottom third were assigned to the lowest-achieving group. The idea was to work through the variables and indices based on parents' reports from the *PIRLS 2001 Learning to Read Survey* to see which of the home factors could discriminate effectively between the high-achieving students and the low-achieving students.

In an attempt to characterize home effectiveness in fostering children's reading literacy achievement, for each variable and index, the percentage of high-achieving students having the home characteristic was compared to the percentage of low-achieving students with the home characteristic. Contrasting high- and low-achieving students according to home characteristics on which they have the most difference is a useful device for highlighting areas that might prove fruitful in furthering parental support for literacy, and this paper presents such areas with consistent differences across countries.

The home environment characteristics showing consistent significant differences between the highest- and lowest-performing students fell into three major areas: early literacy activities, educational resources, and parental reading. Each area is discussed, in turn, below.

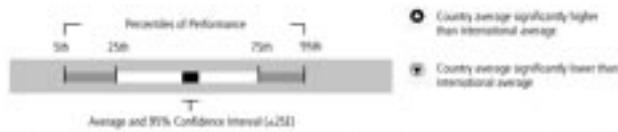
ENGAGING IN EARLY LITERACY ACTIVITIES

In every country, PIRLS 2001 found a strong positive relationship between fourth-grade reading achievement and home environments where parents reported engaging in literacy activities with their children before the children started school. The importance of laying the foundation for future literacy in the early years is widely recognized. Nevertheless, it was still quite powerful to find this strong relationship in every PIRLS 2001 country.

Exhibit 1: Distribution of Reading Achievement



OECD: IEA Progress in International Reading Literacy Study (PIRLS) 2001



¹ National Desired Population does not cover all of International Desired Population. Because coverage falls below 65%, Canada is annotated Canada (O, Q) for the provinces of Ontario and Quebec only.
 () Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

As a fundamental issue, one PIRLS 2001 background question about early literacy activities asked about the frequency of reading books to children before the children began school.¹ Parents and caregivers were asked how often they read books to their child, and given the response options of *Often*, *Sometimes*, and *Never or almost never*. For each country, Exhibit 2 presents the percentage of the lowest-achieving third of students read to "often," the percentage of the highest-achieving third of students read to "often," and the difference between the two percentages. Standard errors also are shown. Countries are ordered by the difference in the two percentages, with the international average highlighted. A darkened bar indicates that the difference is statistically significant.

As shown in Exhibit 2, many PIRLS 2001 countries had a substantial difference in the percentages of students whose parents reported reading to them "often" between the highest-achieving third of the students and lowest-achieving third of the students. The difference was 22%, on average internationally, reaching 36% in France. In addition to observing the difference in percentages between the lowest- and highest-achieving students, it is also interesting to note the general prevalence of reading books to children before they start school. The pervasiveness of the practice sometimes means a smaller difference between the groups of students. For example, the data in Exhibit 2 reveal that in several countries 90% of the highest performing students had parents that read to them on a frequent basis, including New Zealand with a large difference (35%), but also Iceland and England with relatively small differences (19% in both countries).

PIRLS 2001 also asked parents how often they (or someone else in the home) engaged in five other early literacy activities with their child before the child began primary school. These activities included: tell stories, sing songs, play with alphabet toys, play word games, and read aloud signs and labels. By combining the parents' reports about these five activities with those about reading books to their children (see above), PIRLS developed the Index of Early Home Literacy Activities. Parents' responses were averaged across the six activities, and students whose parents reported having engaged in the activities "often," on average, were placed in the high category. Exhibit 3 presents the percentages of students in the high category for the lowest- and highest-achieving students. The difference in percentages was statistically significant in every country, underscoring the critical role of early attention to literacy activities in children's lives in fostering later success in school. The differences ranged from 26% to 6% with an international average of 16%.

The parents of the PIRLS fourth-grade students also were asked how well their child could do each of five literacy activities when beginning primary school, including:

- Recognize most of the alphabet
- Read some words
- Read sentences
- Write letters of the alphabet
- Write some words.

Exhibit 2: Percent of Students Whose Parents Often Read Book with Them Before the Student Began Primary School

Students with Lowest and Highest Reading Achievement – PIRLS 2001 – 4th Grade



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An "r" indicates data are available for 70-85% of the students. An "s" indicates data are available for 50-70% of the students. An "x" indicates data are available for less than 50% of the students.

Exhibit 3: Percent of Students at a High Level on the Index of Early Home Literacy Activities*

Students with Lowest and Highest Reading Achievement – PIRLS 2001 – 4th Grade



* Based on parents' responses to the frequency of the following activities they engage in with their child prior to entry into primary school: read books; tell stories; sing songs; play with alphabet toys (e.g., blocks with letters of the alphabet); play word games; or read aloud signs and labels. Average is computed across the 6 items based on a 3-point scale: Never or almost never = 1, Sometimes = 2, and Often = 3. High level indicates an average of greater than 2.33 through 3.

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For each activity, parents were asked to respond according to a 4-point scale: *Not at all* = 1, *Not very well* = 2, *Moderately well* = 3, and *Very well* = 4. To summarize parents' judgments, the results were averaged across the five activities. Based on their parents' responses, students with scores of greater than 2.5 were determined to be above average, and able (in their parents' opinions) to manage these initial literacy skills at least "moderately well."

Exhibit 4 shows that significantly greater percentages of the highest-achieving third of students had parents reporting their children did at least "moderately well" across the five literacy activities when beginning primary school. Interestingly, the difference between the lowest- and highest-achieving third of the students tended to be largest in several of the Eastern European and Nordic countries. The countries with the largest differences (30% or more) were Norway, Lithuania, Slovenia, Latvia, Bulgaria, the Russian Federation, and Iceland (and Sweden had 29%).

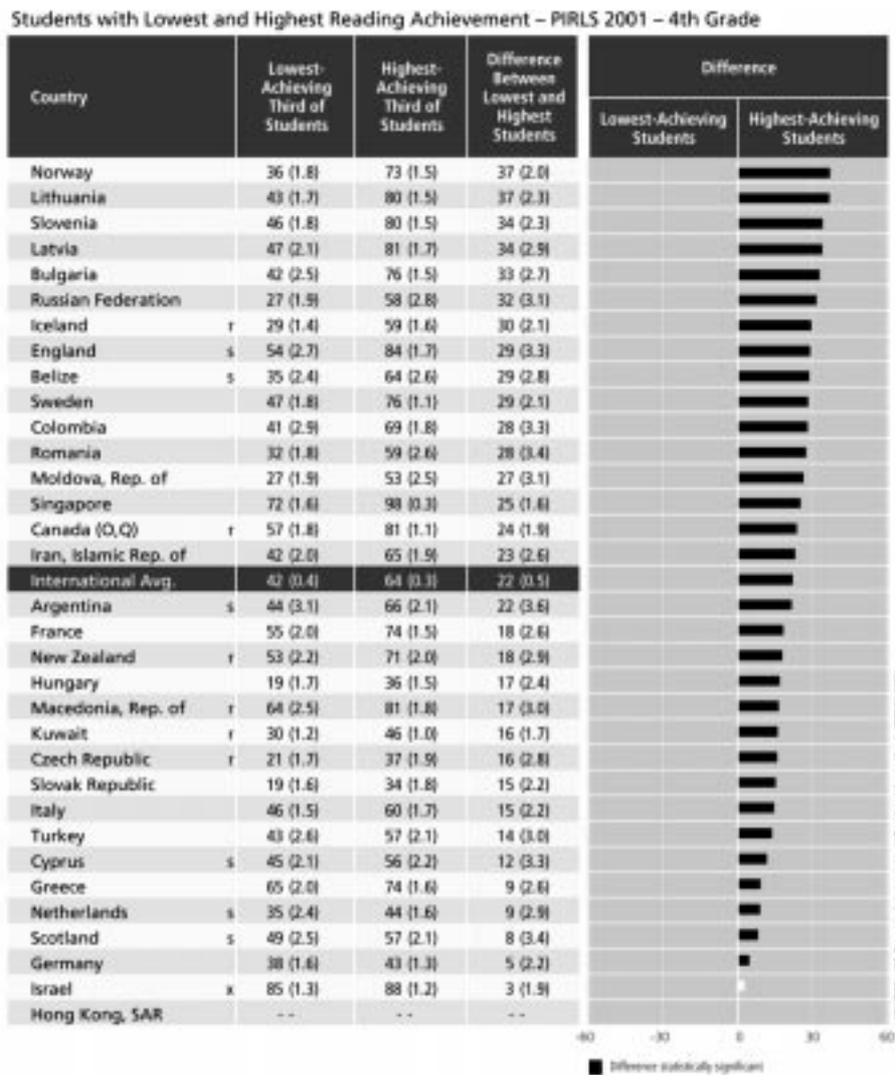
Clearly, an emphasis on literacy activities in the home during children's years prior to attending school has an enormous impact on the success they have as readers by the fourth grade in school. Students familiar with literacy activities and with basic literacy skills upon entering schools comprised substantial percentages of the highest-achieving third of the students on PIRLS 2001. However, countries also can help with reading readiness by offering preschool programs either on a regular or voluntary basis. If such programs are available and parents take advantage of them, it can help children with the transition between home and school.

PIRLS 2001 asked parents if their children attended preschool and for how long. Many of the PIRLS 2001 countries had preprimary education programs, known also as preschool, kindergarten, and early childhood education—sometimes up to three years long. As explained in the *PIRLS 2001 International Report*, almost all countries made provision for at least one year of preprimary education (only in Iran and Turkey did the majority of students not attend preschool). Exhibit 5 presents the percentages of students attending two years or more of preprimary education for the lowest- and highest-achieving students. Because the provision for preprimary education can be a matter of national policy the differences between percentages were not large, but more of the highest achieving students had the benefit of such education—a difference of 7%, on average, internationally.

EDUCATIONAL RESOURCES IN THE HOME

IEA reading literacy studies have shown that students from homes with extensive literacy resources have higher achievement in reading and other subjects than those from less-advantaged backgrounds. For example, IEA's 1991 study of reading literacy in 32 countries (Elley, 1992) found a clear-cut relationship between the number of books students reported in their homes and their reading achievement levels. Building on previous studies, PIRLS 2001 asked parents a series of questions to ascertain the level of home resources to support and encourage literacy activities.

Exhibit 4: Percent of Students Whose Parents Report the Student Could Do Early Literacy Activities Moderately or Very Well when Beginning Primary School*

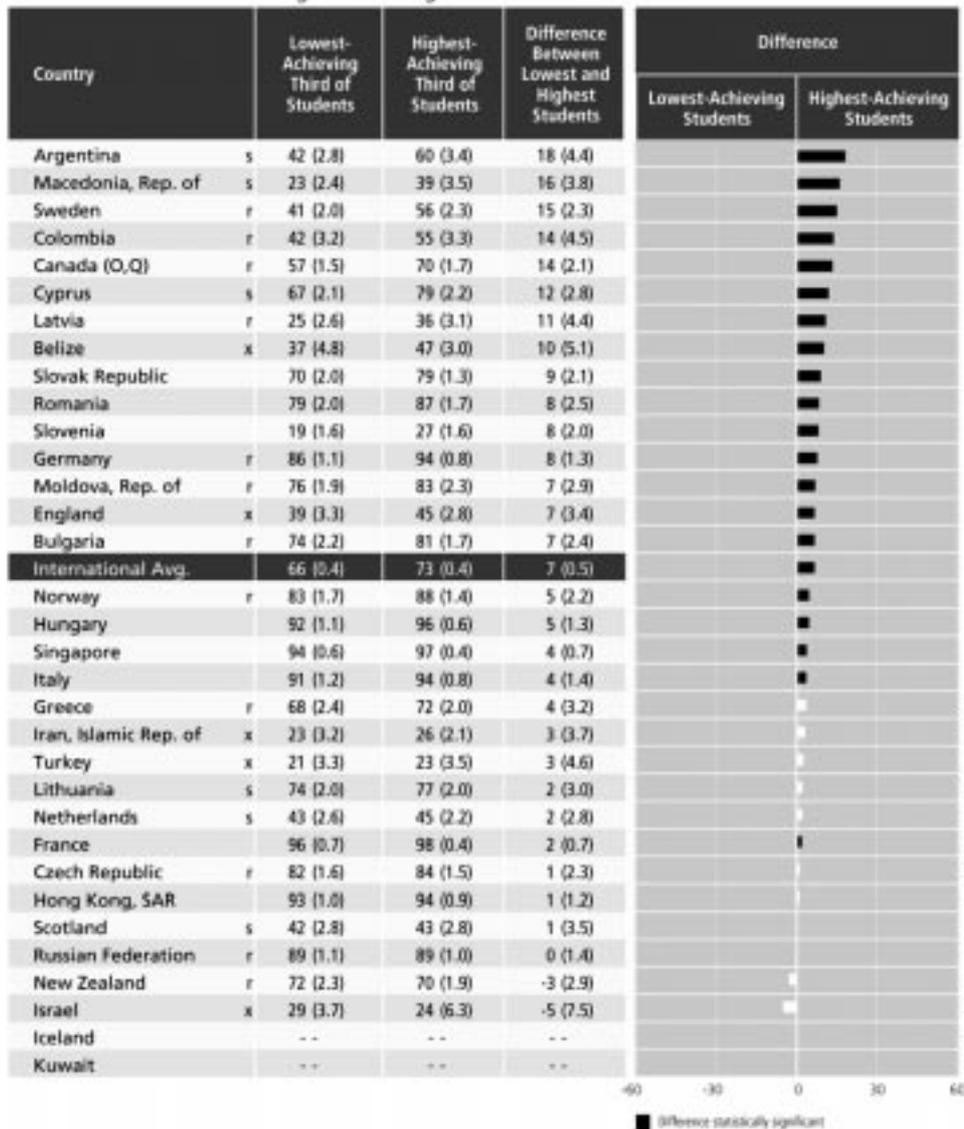


* Based on parents' responses to questions about how well their child could do the following when he/she began primary school: Recognize most of the letters of the alphabet; write letters of the alphabet; read some words; write some words; and read sentences. Average is computed across the 5 items based on a 4-point scale: Not at all = 1, Not very well = 2, Moderately well = 3, and Very well = 4. Very well indicates an average response score of greater than 3.25 through 4. Moderately well indicates an average of greater than 2.5 through 3.25.

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Exhibit 5: Percent of Students that Attended Preprimary Education for Two Years or More

Students with Lowest and Highest Reading Achievement – PIRLS 2001 – 4th Grade



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As detailed in the *PIRLS 2001 International Report*, having children's books in the home may be more important for fostering literacy among young children than having books in general. The average reading achievement difference between students from homes where parents reported lots of children's books and those from homes where parents reported few such books was very large (86 scale-score points between more than 100 books compared to 10 books or less). Exhibit 6 shows that the differences in having children's books in the home also were very large between the lowest- and highest-achieving students. Differences in the percentage of students in these groups from homes with more than 50 children's books averaged 22% and reached a high of 42%. Countries with differences 35% or greater included, Singapore, France, Hungary, Germany, Czech Republic, and Scotland.

As part of the *PIRLS 2001 Learning to Read Survey*, parents provided information about their highest level of education. Among other things, parents' educational levels can indicate the level of home support for literacy and academic endeavors. As shown in Exhibit 7, substantially higher percentages of the highest achieving third of the students than of the lowest achieving third of the students had at least one parent who finished university. The differences were statistically significant in every country, ranging from a high of 39% in Hungary and Israel to 4% in Hong Kong, SAR.

Similar to the questions about educational background, parents provided information about their occupations. They were asked to select among a range of job categories, each one with a few examples to help parents decide the best category. The categories of *corporate manager or senior official*, *professional*, and *technician or associate professional* were combined into one category called "professional." The percentages of low- and high-achieving students having at least one parent with a professional occupation are provided in Exhibit 8. In nearly all the PIRLS 2001 countries, the highest achieving third of students had larger percentages of such students than the lowest achieving third of students. On average, internationally, the difference was 20%.

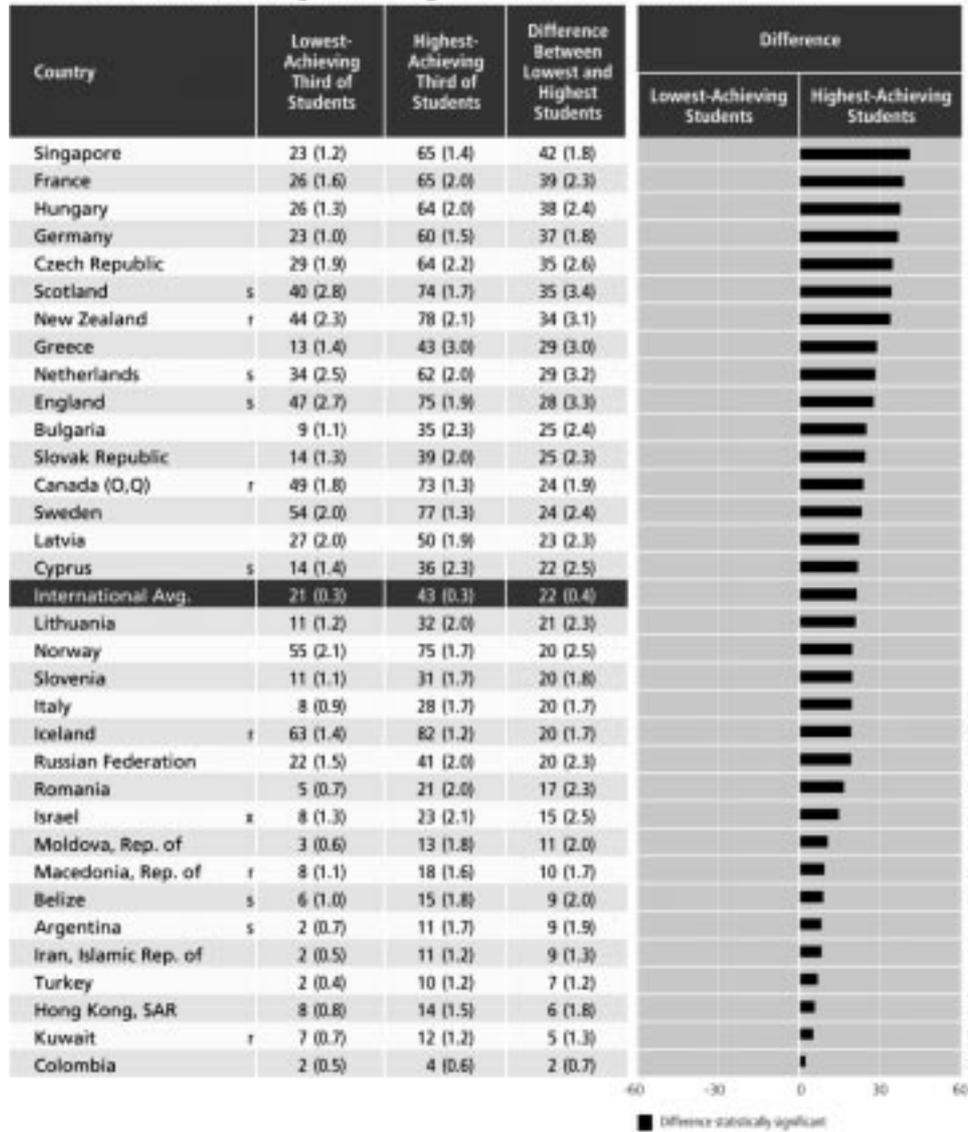
PARENTS HAVE POSITIVE READING HABITS AND ATTITUDES

Fostering good habits and attitudes about literacy can begin with parents providing good role models for their children. As part of collecting information about parents' reading habits, PIRLS 2001 asked parents how much time they spent reading for themselves at home, including books, magazines, newspapers, and materials for work. As described in the *PIRLS 2001 International Report*, reading achievement was highest among students whose parents read for more than 10 hours per week (524 scale-score points) or even 6 to 10 hours per week (520 points), lower among those whose parents read for 1 to 5 hours (505 points), and lowest among those whose parents read for less than one hour per week (478 points).

Exhibit 9 presents the percentages of lowest- and highest-achieving students whose parents reported reading for themselves at least 6 hours per week. There was a statistically significant difference in every country except Colombia, with more high-achieving students having parents who read on a regular basis. The international average was 16%, with the largest differences found in Hungary (28%) as well as in Bulgaria and Greece (both 26%).

Exhibit 6: Percent of Students with more than 50 Children's Books in the Home

Students with Lowest and Highest Reading Achievement – PIRLS 2001 – 4th Grade

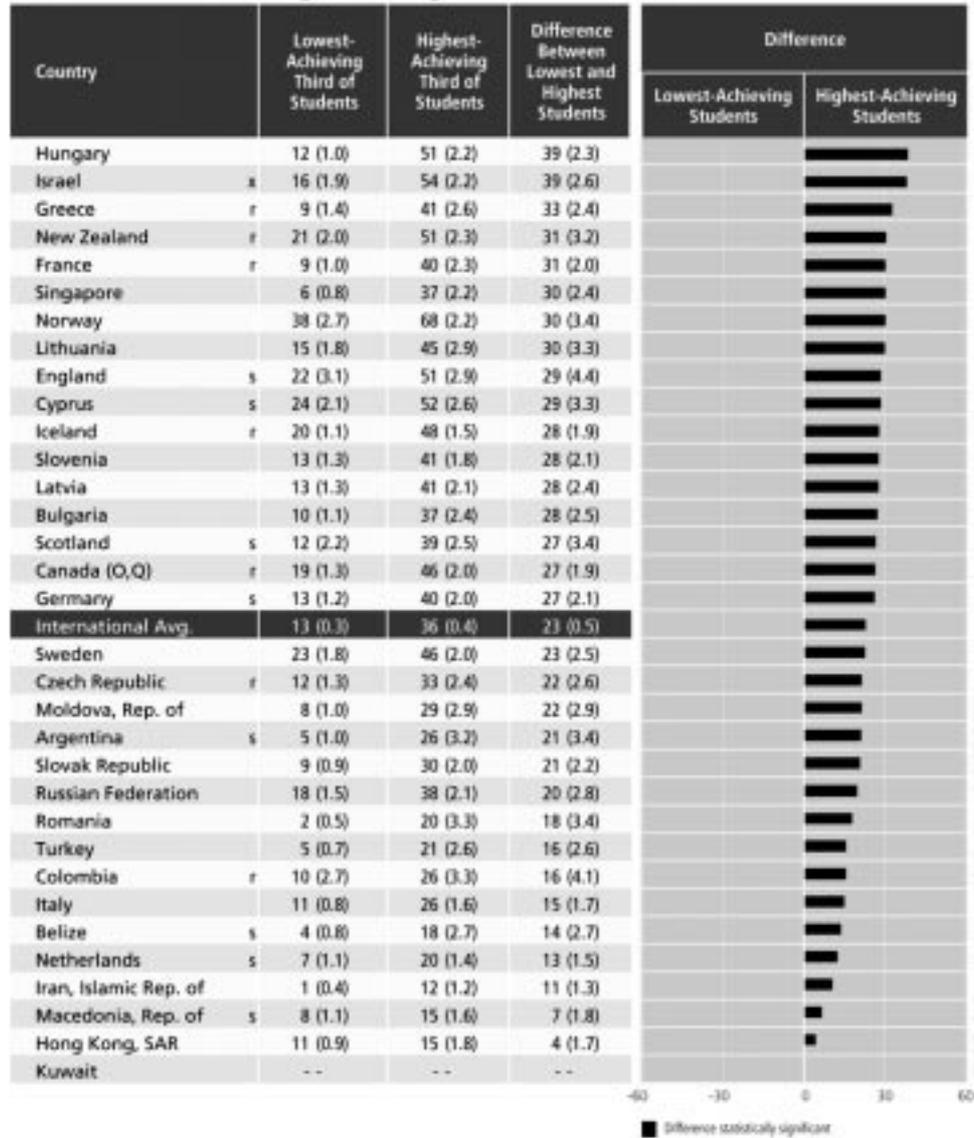


SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2001.

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Exhibit 7: Percent of Students Having at Least One Parent Who Finished University

Students with Lowest and Highest Reading Achievement – PIRLS 2001 – 4th Grade



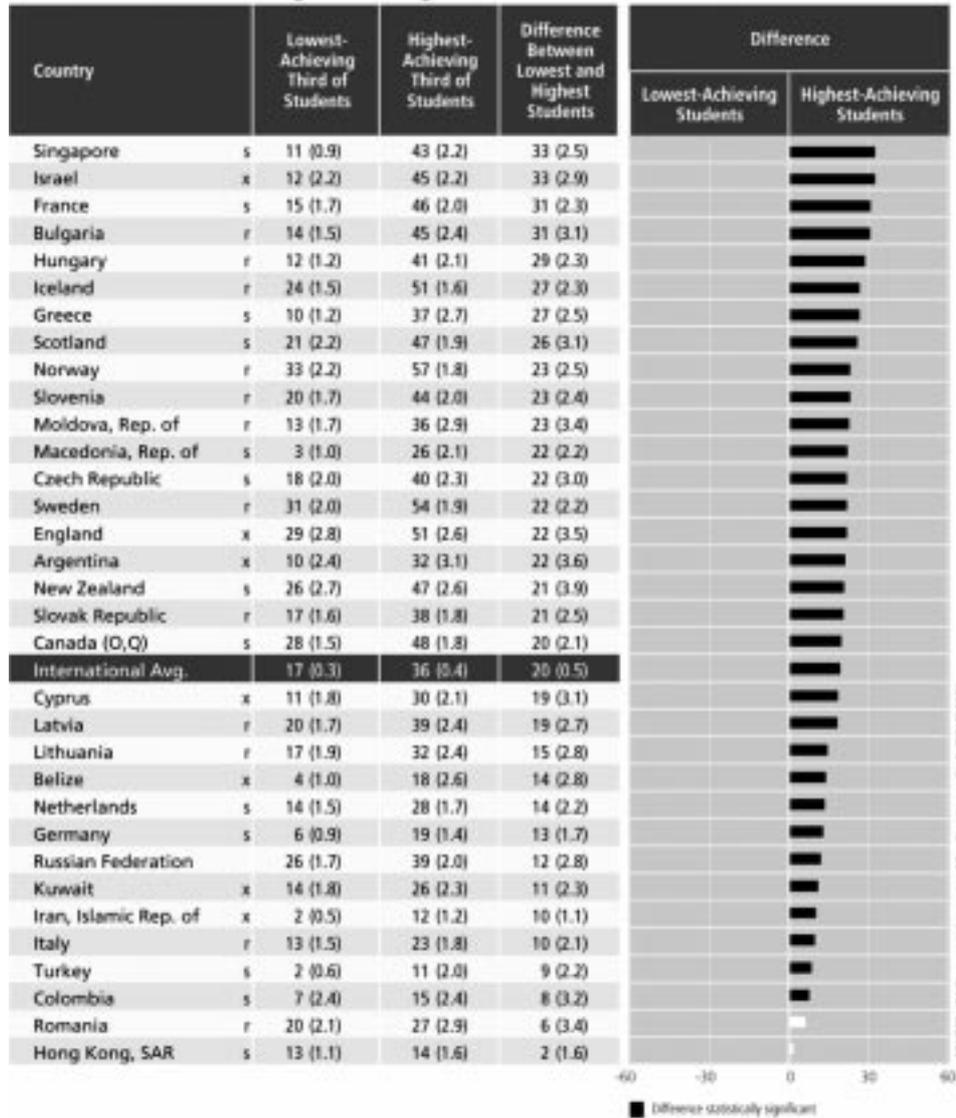
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Exhibit 8: Percent of Students Having at Least One Parent with a Professional Occupation*

Students with Lowest and Highest Reading Achievement – PIRLS 2001 – 4th Grade



* Based on parents' responses to the following: What kind of work does the child's father/stepfather/male guardian and mother/stepmother/female guardian do for their main job? a) Has never worked outside the home for pay; b) Small business owner; c) Clerk; d) Service or sales worker; e) Skilled agricultural or fishery worker; f) Craft or trade worker; g) Plant or machine operator; h) General laborer; i) Corporate manager or senior official; j) Professional; k) Technician or associate professional; l) not applicable. Some categories were combined so that Professional includes options i through k.

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Exhibit 9: Percent of Students Having Parents Who Read at Home for at Least Six Hours per Week

Students with Lowest and Highest Reading Achievement – PIRLS 2001 – 4th Grade

Country	Lowest-Achieving Third of Students	Highest-Achieving Third of Students	Difference Between Lowest and Highest Students	Difference	
				Lowest-Achieving Students	Highest-Achieving Students
Hungary	32 (1.6)	60 (1.4)	28 (2.0)		■
Bulgaria	33 (2.3)	59 (2.2)	26 (3.2)		■
Greece	21 (1.9)	47 (2.0)	26 (2.7)		■
Israel	x 27 (1.9)	52 (1.9)	25 (2.3)		■
Singapore	34 (1.2)	58 (1.6)	24 (2.1)		■
New Zealand	r 40 (2.4)	61 (2.0)	21 (3.3)		■
Slovenia	27 (1.6)	48 (1.7)	21 (2.1)		■
England	s 40 (2.2)	60 (2.1)	20 (3.2)		■
Germany	40 (1.5)	59 (1.5)	19 (2.0)		■
Slovak Republic	34 (1.7)	53 (1.9)	19 (2.6)		■
France	23 (1.5)	42 (1.9)	19 (2.2)		■
Moldova, Rep. of	24 (1.7)	42 (2.2)	18 (2.4)		■
Scotland	s 50 (3.2)	67 (2.4)	18 (4.2)		■
Italy	23 (1.3)	41 (1.7)	18 (2.2)		■
Norway	51 (2.4)	68 (1.8)	17 (3.1)		■
Czech Republic	41 (1.8)	58 (1.7)	16 (2.4)		■
International Avg.	32 (0.3)	48 (0.3)	16 (0.5)		■
Romania	19 (1.5)	35 (2.5)	15 (2.5)		■
Cyprus	s 25 (1.8)	40 (2.2)	15 (2.9)		■
Belize	s 18 (1.8)	33 (2.7)	15 (2.7)		■
Macedonia, Rep. of	r 38 (1.8)	53 (2.3)	15 (2.7)		■
Latvia	37 (1.7)	51 (1.6)	14 (2.3)		■
Netherlands	s 41 (2.0)	55 (1.9)	14 (2.8)		■
Lithuania	32 (2.1)	45 (1.6)	13 (2.7)		■
Sweden	52 (1.3)	64 (1.5)	13 (1.8)		■
Canada (O,Q)	r 42 (1.4)	54 (1.7)	12 (2.3)		■
Argentina	r 15 (1.5)	27 (2.3)	12 (2.8)		■
Hong Kong, SAR	34 (1.5)	45 (1.6)	12 (2.2)		■
Iceland	r 49 (1.5)	58 (1.5)	10 (2.1)		■
Kuwait	r 25 (1.0)	34 (1.1)	10 (1.6)		■
Turkey	25 (1.8)	33 (1.9)	8 (2.4)		■
Iran, Islamic Rep. of	23 (2.4)	27 (1.2)	5 (2.3)		■
Russian Federation	32 (1.6)	37 (1.7)	5 (2.2)		■
Colombia	16 (2.3)	20 (1.5)	4 (2.8)		■

SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2001.

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Exhibit 10: Percent of Students Having Parents Who Read for Enjoyment Every Day or Almost Every Day

Students with Lowest and Highest Reading Achievement – PIRLS 2001 – 4th Grade

Country	Lowest-Achieving Third of Students	Highest-Achieving Third of Students	Difference Between Lowest and Highest Students	Difference	
				Lowest-Achieving Students	Highest-Achieving Students
Singapore	25 (0.9)	44 (1.1)	19 (1.5)		
Macedonia, Rep. of	r 33 (1.6)	51 (2.2)	18 (2.8)		
Germany	r 42 (1.5)	58 (1.3)	16 (1.8)		
Bulgaria	r 45 (2.7)	59 (2.0)	15 (2.9)		
Scotland	s 54 (2.7)	69 (1.7)	15 (3.5)		
Italy	39 (1.5)	54 (1.5)	15 (2.3)		
England	s 46 (2.4)	61 (2.0)	14 (2.9)		
France	45 (1.6)	60 (1.9)	14 (2.4)		
New Zealand	r 49 (1.9)	63 (2.0)	13 (2.7)		
Moldova, Rep. of	30 (2.3)	43 (2.2)	13 (2.8)		
Hungary	44 (1.4)	56 (1.6)	12 (2.3)		
Israel	x 37 (1.9)	49 (2.0)	12 (2.9)		
Canada (O,Q)	r 46 (1.6)	58 (1.4)	11 (2.1)		
Greece	36 (1.9)	46 (1.9)	11 (2.9)		
Netherlands	s 55 (2.3)	66 (1.8)	11 (2.7)		
Sweden	62 (1.4)	72 (1.3)	10 (2.0)		
International Avg.	40 (0.3)	49 (0.3)	9 (0.5)		
Cyprus	s 32 (1.8)	40 (2.4)	8 (2.7)		
Hong Kong, SAR	27 (1.6)	34 (2.0)	8 (2.0)		
Slovak Republic	45 (2.1)	52 (1.4)	8 (2.6)		
Norway	55 (2.4)	61 (1.9)	6 (3.1)		
Turkey	r 19 (1.8)	25 (1.8)	6 (2.5)		
Slovenia	39 (1.7)	45 (1.6)	6 (2.4)		
Belize	s 25 (2.5)	31 (2.0)	6 (3.1)		
Romania	13 (1.4)	19 (2.2)	6 (2.4)		
Kuwait	r 38 (1.3)	43 (1.1)	4 (1.8)		
Russian Federation	47 (2.0)	50 (1.4)	4 (2.0)		
Latvia	51 (2.3)	54 (2.2)	3 (2.7)		
Argentina	s 34 (2.1)	37 (2.0)	2 (3.1)		
Colombia	r 24 (2.5)	26 (1.3)	2 (2.9)		
Iceland	r 61 (1.9)	63 (1.5)	2 (2.7)		
Czech Republic	r 50 (2.0)	50 (2.1)	0 (3.2)		
Lithuania	53 (2.0)	53 (1.8)	0 (2.9)		
Iran, Islamic Rep. of	r 23 (2.5)	22 (1.1)	-1 (2.7)		

SOURCE: IEA Progress in International Reading Literacy Study (PIRLS) 2001.

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Parents also were asked about the purposes for their at-home reading. In addition to various reasons for reading out of necessity (e.g., for work, to get news, and for education/school), parents were asked how often they read for enjoyment. The response options were: *Every day or almost every day*, *Once or twice a week*, *Once or twice a month*, and *Never or almost never*. As described in the *PIRLS 2001 International Report*, internationally, on average, 45% of the students had parents reporting reading for enjoyment on a daily basis, 34% on a weekly basis, 13% monthly, and 8% essentially never. The data in Exhibit 10 reveal that in about three-quarters of the countries, students whose parents reported reading for enjoyment every day or almost every day were more often among the highest than the lowest achievers on PIRLS 2001.

To summarize parents' attitudes towards reading, PIRLS constructed an Index of Parents' Attitudes Toward Reading based on parents' agreement with five statements about reading:

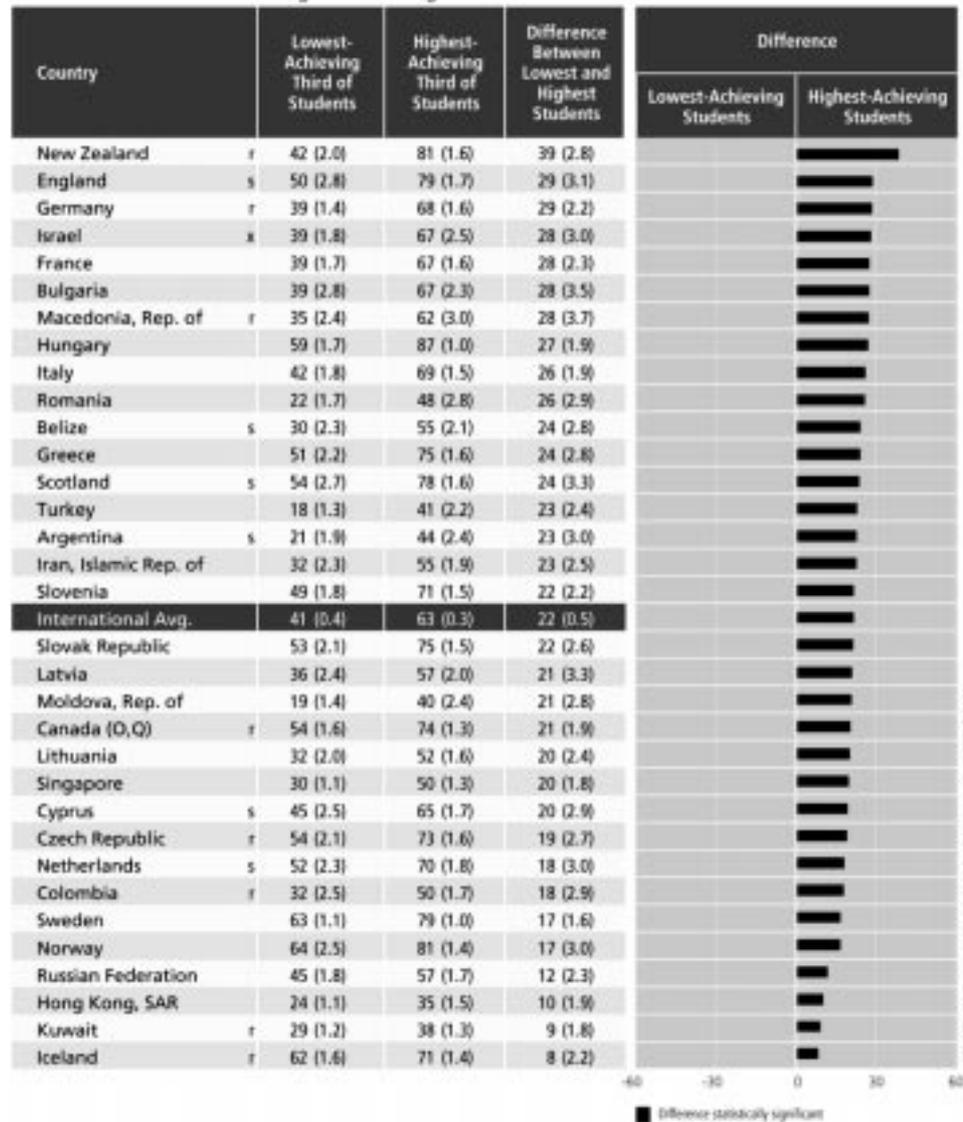
- I read only if I have to (reverse-coded).
- I like talking about books with other people.
- I like to spend my spare time reading.
- I read only if I need information (reverse-coded).
- Reading is an important activity in my home.

Parents were asked if they *Agree a lot*, *Agree a little*, *Disagree a little*, or *Disagree a lot* with each of the statements. To construct the index, parents' responses were assigned a numeric code from 4 to 1 and averaged across the five statements. If the average was greater than 3, the parents were classified as having favorable attitudes.

Exhibit 11 shows the percentages of lowest- and highest-achieving students whose parents reported favorable attitudes toward reading. In every country, significantly greater percentages of the highest- than the lowest-achieving students had parents with favorable attitudes toward reading. The difference was particularly striking in New Zealand, where the percentage of highest-achieving students (81%) was about twice that of the lowest-achieving students (42%). On average, internationally, the difference was 22%, ranging from the high of 39% in New Zealand to 8% in Iceland. Clearly, parents' viewpoints about the importance of reading as an enjoyable and worthwhile activity have a considerable impact on their children's success as readers.

Exhibit 11: Percent of Students Having Parents with Favorable Attitude Towards Reading*

Students with Lowest and Highest Reading Achievement – PIRLS 2001 – 4th Grade



SOURCE: EA Progress in International Reading Study (PIRLS) 2001.

* Based on parents' agreement with the following: I read only if I have to; I like talking about books with other people; I like to spend my spare time reading; I read only if I need information; and Reading is an important activity in my home. Average is computed across the 5 items based on a 4-point scale: Disagree a lot = 1, Disagree a little = 2, Agree a little = 3, and Agree a lot = 4. Responses for negative statements were reverse-coded. Favorable attitude corresponds to an average of greater than 3.

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 An "r" indicates data are available for 70-85% of the students. An "s" indicates data are available for 50-70% of the students. An "x" indicates data are available for less than 50% of the students.

References

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NOTE

1. The first grade of school was defined internationally across countries as Level I according to UNESCO's International Standard Classification of Education (ISCED) (UNESCO, 1999).