



A CONTEXT FOR COMPARING THE PERFORMANCE OF COUNTRIES

Comparing reading performance, and educational performance more generally, poses numerous challenges. When teachers give a reading test in a classroom, they require students with varying abilities, attitudes and social backgrounds to respond to the same set of tasks. When educators compare the performance of schools, they give the same tests across schools that may differ significantly in the structure and sequencing of their curricula, their pedagogical emphases and instructional methods, as well as the demographic and social contexts of their student populations. Comparing the performance of education systems across countries adds further layers of complexity, because students are given tests in different languages and because the social, economic and cultural context of the countries that are being compared can be very different. However, while different students within a country may learn in different contexts according to their home background and the school that they have attended, they are subjected to common tests and exams because in adult life they will all face common challenges, having to compete for the same jobs. Similarly, in a global economy, the benchmarks for educational success are no longer national standards alone, but increasingly, the best performing education systems internationally. As difficult as international comparisons are, they are important for educators, and PISA has made significant efforts to ensure that such comparisons are valid and fair.

This section discusses countries' reading performance in the context of important economic, demographic and social factors that can influence assessment results, so as to provide a framework for interpreting the results that are presented later in the chapter.

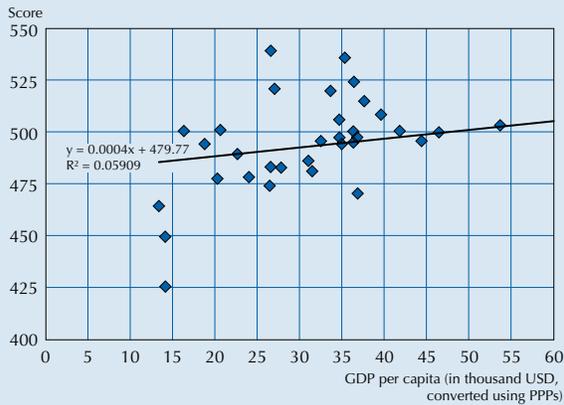
As shown in Volume II, *Overcoming Social Background*, a family's wealth influences the educational performance of children, but that influence varies markedly across countries. Similarly, the relative prosperity of some countries allows them to spend more on education, while other countries find themselves constrained by a lower national income. It is therefore important to keep the national income of countries in mind when comparing the performance of education systems across countries. Figure I.2.1 displays the relationship between national income as measured by the per capita Gross Domestic Product (GDP) and students' average reading performance.⁵ The figure also shows a trend line⁶ that summarises the relationship between per capita GDP and mean student performance in reading among OECD countries. The scatter plot suggests that countries with higher national incomes tend to perform better in reading. The relationship suggests that 6% of the variation between the OECD countries' mean scores can be predicted on the basis of their per capita GDP. Countries with higher national incomes are thus at a relative advantage, even if the chart provides no indications about the causal nature of this relationship. This should be taken into account particularly when interpreting the performance of countries with comparatively low levels of national income, such as Mexico, Chile and Turkey. Table I.2.20 shows an "adjusted" score that would be predicted if the country had all of its present characteristics except that per capita GDP was equal to the average for OECD countries.

While per capita GDP reflects the potential resources available for education in each country, it does not directly measure the financial resources actually invested in education. Figure I.2.2 compares countries' actual spending per student, on average, from the age of 6 up to the age of 15, with average student performance in reading.⁷ The results are expressed in USD using purchasing power parities. Figure I.2.2 shows a positive relationship between spending per student and mean reading performance among OECD countries. As expenditure on educational institutions per student increases, so does a country's mean performance. Expenditure per student explains 9% of the variation in mean performance between countries and relatively low spending per student needs to be taken into account when interpreting the performance of countries such as Turkey, Mexico or Chile. At the same time, deviations from the trend line suggest that moderate spending per student cannot automatically be equated with poor performance by education systems. For example, Estonia and Poland, which spend around 40 000 USD per student, perform at the same level as Norway, Switzerland and the United States, which spend over 100 000 USD per student. Similarly, New Zealand, one of the highest performing countries in reading, spends well below the average per student.

Given the close interrelationship between a student's performance and his or her parents' level of education, it is also important to bear in mind the educational attainment of adult populations when comparing the performance of OECD countries, as countries with more highly educated adults are at an advantage over countries where parents have less education. Figure I.2.3 shows the percentage of 35-44 year-olds that have attained tertiary level of education. This group roughly corresponds to the age group of parents of the 15-year-olds assessed in PISA and how this relates to reading performance.

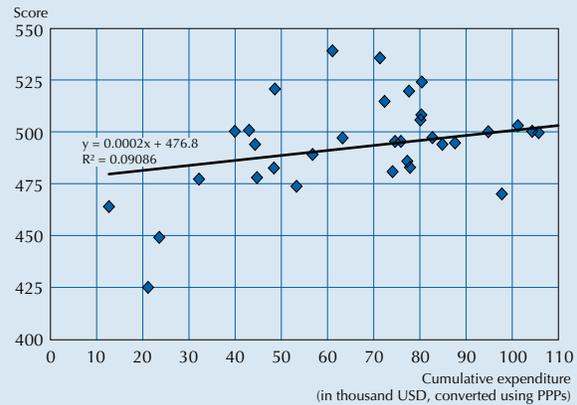


Figure I.2.1
Reading performance and GDP



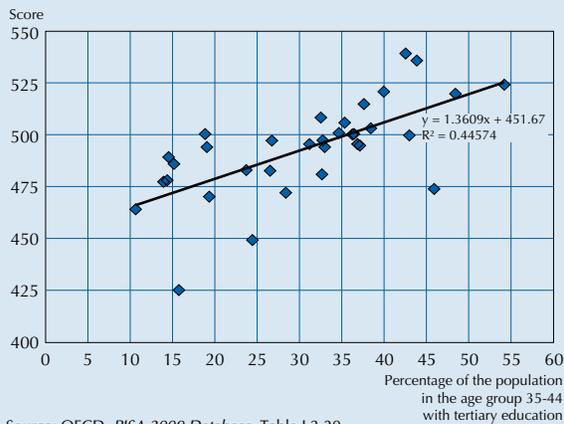
Source: OECD, *PISA 2009 Database*, Table I.2.20.
StatLink <http://dx.doi.org/10.1787/888932343133>

Figure I.2.2
Reading performance and spending on education



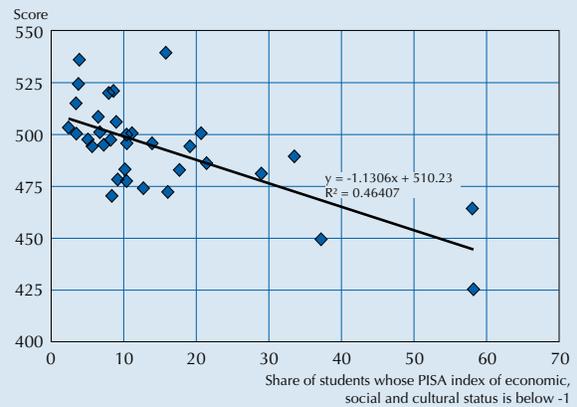
Source: OECD, *PISA 2009 Database*, Table I.2.20.
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Figure I.2.3
Reading performance and parents' education



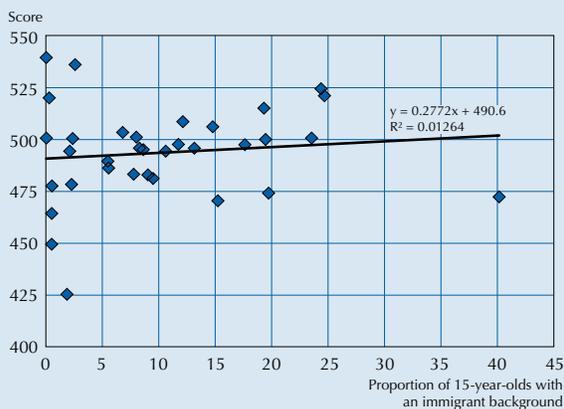
Source: OECD, *PISA 2009 Database*, Table I.2.20.
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Figure I.2.4
Reading performance and share of socio-economically disadvantaged students



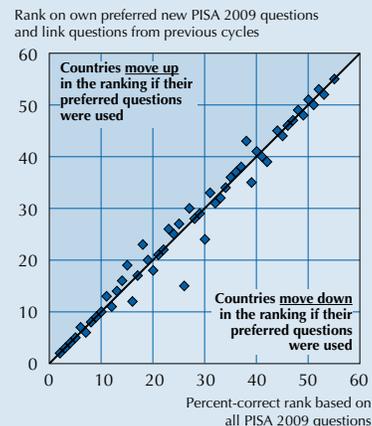
Source: OECD, *PISA 2009 Database*, Table I.2.20.
StatLink <http://dx.doi.org/10.1787/888932343133>

Figure I.2.5
Reading performance and proportion of students from an immigrant background



Source: OECD, *PISA 2009 Database*, Table I.2.20.
StatLink <http://dx.doi.org/10.1787/888932343133>

Figure I.2.6
Equivalence of the PISA test across cultures and languages



Source: OECD, *PISA 2009 Database*, Table I.2.21.
StatLink <http://dx.doi.org/10.1787/888932343133>



Socio-economic heterogeneity in student populations poses another major challenge for teachers and education systems. As shown in Volume II, *Overcoming Social Background*, teachers instructing socio-economically disadvantaged children are likely to face greater challenges than teachers teaching students from more advantaged social backgrounds. Similarly, countries with larger proportions of socio-economically disadvantaged children face greater challenges than countries with smaller proportions of disadvantaged students. Figure I.2.4 shows the proportion of students at the lower end of an international scale of the economic, social and cultural background of students, which is described in detail in Volume II, and how this relates to reading performance. The relationship is strong and explains 46% of the performance variation among countries. Turkey and Mexico, where 58% of students belong to the internationally most disadvantaged group, and Chile, Portugal, Spain, Italy and Poland, where this proportion reaches more than 20%, thus face much greater challenges than, for example, Norway, Australia, Iceland, Canada and Finland, where the proportion of disadvantaged students is less than 5%.

Integrating students with an immigrant background can also be challenging, and the level of performance of students who immigrated to the country in which they were assessed can be only partially attributed to their host country's education system. Figure I.2.5 shows the proportion of 15-year-olds with an immigrant background and how this relates to student performance.

When examining the results for individual countries as shown in Table I.2.20 it is apparent that countries vary in their demographic, social and economic contexts. The last column in Table I.2.20 summarises the different factors discussed above in an index.⁸ The index shows Norway, Japan, Iceland, Luxembourg, Finland and the United States with the most advantaged demographic, social and economic context and Turkey, Mexico and Chile with the most challenging context.

These differences need to be considered when interpreting PISA results. At the same time, the future economic and social prospects of both individuals and countries depend on the results they actually achieve, not on the performance they might have achieved under different social and economic conditions. That is why the results that are actually achieved by students, schools and countries are the focus of this volume.

Even after accounting for the demographic, economic and social context of education systems, the question remains: to what extent is an international test meaningful when differences in languages and cultures lead to very different ways in which subjects such as language, mathematics or science are taught and learned across countries? It is inevitable that not all tasks on the international PISA assessments are equally appropriate in different cultural contexts and equally relevant in different curricular and instructional contexts. To gauge this, PISA asked every country to identify those tasks from the PISA tests that it considered most appropriate for an international test. Countries were advised to give an on-balance rating for each task with regard to its relevance to "preparedness for life", authenticity and relevance for 15-year-olds. Tasks given a high rating by each country are referred to as that country's most preferred questions for PISA. PISA then scored every country on its own most preferred questions and compared the resulting performance with the performance on the entire set of PISA tasks (see Figure I.2.6). It is clear that generally, the proportion of questions answered correctly by students does not depend in significant ways on whether countries were only scored on their preferred questions or on the overall set of PISA tasks. This provides robust evidence that the results of the PISA assessments would not change markedly if countries had more influence in selecting texts that they thought might be "fairer" to their students.

Finally, when comparing student performance across countries, the extent to which student performance on international tests might be influenced by the effort that students in different countries invest in the assessment must be considered. In PISA 2003, students were asked to imagine an actual situation that was highly important to them, so that they could try their very best and invest as much effort as they could into doing well. They were then asked to report how much effort they had put into doing the PISA test compared to the situation they had just imagined and how much effort they would have invested if their marks from PISA had been counted in their school marks. The students generally answered realistically, saying that they would make more effort if the test results were to count towards their school marks but the analysis also established that the reported expenditure of effort by students was fairly stable across countries. This finding counters the claim that systematic cultural differences in the effort made by students invalidate international comparisons. The analysis also showed that within countries, effort was related to student achievement with an effect size similar to variables such as single-parent family structure, gender and socio-economic background.⁹