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# American Achievement in International Perspective



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# Overview

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## THE RELEASE OF THE LATEST RESULTS OF THE PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENT (PISA) GARNERED ALL THE USUAL HEADLINES ABOUT AMERICA'S LACKLUSTER PERFORMANCE AND THE RISE OF COMPETITOR NATIONS.

And to be sure, the findings—that America's fifteen-year-olds perform in the middle of the pack in both reading and math—are disconcerting for a nation that considers itself an international leader, priding itself on its home-grown innovation, intellect, and opportunity.

But the headlines—and the national averages—don't tell the whole story. Particularly among other industrialized and advanced nations, the United States still has the upper hand in one critical measure—size. In this brief analysis, prepared in advance of this month's International Summit on the Teaching Profession, we dug into the data to examine four questions:

1. What proportion of students in each country is particularly high-achieving? This measure is relevant to a nation's international competitiveness, as its high-achieving students are most likely to produce breakthroughs in science, technology, business, and other fields.
2. Likewise, what proportion of each country's students is low-achieving? This query addresses issues of equity, as students with minimal literacy and numeracy skills are likely to be left behind in the global economy—and may serve as a drag on economic growth.
3. In raw numbers, how many high-achieving and low-achieving students does each country produce? Size does matter—in terms of explaining why certain countries (like the United States) might still dominate admissions to prestigious universities or scientific prizes even though, on a percentage basis, they perform comparatively poorly.
4. How do America's racial and ethnic groups stack up against students in other countries, at both the high and low ends of the achievement spectrum?

To answer these four questions, we compared the United States to thirty-three other nations belonging to the Organisation for Economic Co-operation and Development (OECD). While additional countries and polities participated in the 2009 PISA, the OECD nations represent the majority of those at the upper end of the performance spectrum—i.e., the countries with which the United States is most often compared. The most notable exception here is Shanghai, which came out on top of the 2009 PISA results, producing a bona fide "[Sputnik moment](#)" for the U.S.; as a city and non-OECD entity, however, Shanghai was not included in our international comparison.

Here are some of the key findings. First, the good news for the United States:

- *In raw numbers*, the United States produces many more high-achieving students than any other OECD nation. In both reading and math, the U.S. produces more high achievers than France, Germany, and the United Kingdom *combined*.
- The U.S. produces a particularly large number of high-achieving readers. In this subject, the U.S. also produces more high achievers than Japan and Korea combined.

## Methods

Data on international high- and low-achieving students were drawn from the 2009 Programme for International Student Assessment and from the International Data Explorer tool developed by the National Center for Education Statistics.<sup>1</sup> PISA 2009 describes student proficiency on a scale ranging from Level 1 to Level 6, with Level 1 further divided into Level 1a and Level 1b. PISA 2009 defines “top performers” as “those students proficient at Level 5 or Level 6 of the assessment,” and “lowest performers” as “those students proficient below Level 2 of the assessment.” Therefore, in this analysis we define high achievers as all students who performed at Level 5 or above, and low achievers as all students who performed at Levels 1a and 1b or below.

To calculate raw numbers of high and low achievers in each country, proficiency rates were multiplied by each country’s total fifteen-year-old population. These population figures were also provided by PISA 2009, and defined as “total enrolled population of 15-year-olds in Grade 7 or above.” PISA did not provide population data disaggregated by U.S. race; these data were collected from the U.S. Census Bureau population estimates for 2009.<sup>2</sup>

<sup>1</sup> OECD, *PISA 2009 Results: What Students Know and Can Do* (Paris: OECD, 2010), available at <http://dx.doi.org/10.1787/9789264091450-en>; National Center for Education Statistics, PISA International Data Explorer (Washington, D.C.: Institute of Education Sciences, 2011), available at <http://nces.ed.gov/surveys/international/ide/>.

<sup>2</sup> *Monthly Population Estimates by Age, Sex, Race, and Hispanic Origin for the United States: January 1, 2009* (Washington, D.C.: U.S. Bureau of the Census, Population Division, 2010), available at <http://www.census.gov/popest/national/asrh/2009-nat-res.html>. To align to proficiency data and racial categorizations employed by the National Center for Education Statistics, any person of full or partial Hispanic ethnicity as recorded by the census was categorized as Hispanic in this report and was excluded from the white, black, and Asian racial totals. Because the census estimates *total population* of fifteen-year-olds, one might expect the census data to overestimate the total population of fifteen-year-olds *enrolled in school*; but the total population of fifteen-year-olds in January 2009 as reported by the census was 4,158,890, while the “total enrolled population of 15-year-olds in grade 7 or above” as reported by PISA for the entire U.S. was 4,210,475. As of this report’s publication, PISA had not yet published a forthcoming technical manual for its 2009 report; thus we cannot account for this discrepancy.

- Racial and ethnic segments of the U.S. population rival overall populations in other countries as well:
  - Proportionally, Asian American students are the best readers in the world, and white Americans are bested only by Finns and New Zealanders.
  - In raw numbers, high-achieving black American readers outnumber high-achieving readers in each of twenty-three OECD countries, including Belgium, Finland, and New Zealand.

Now for the bad news:

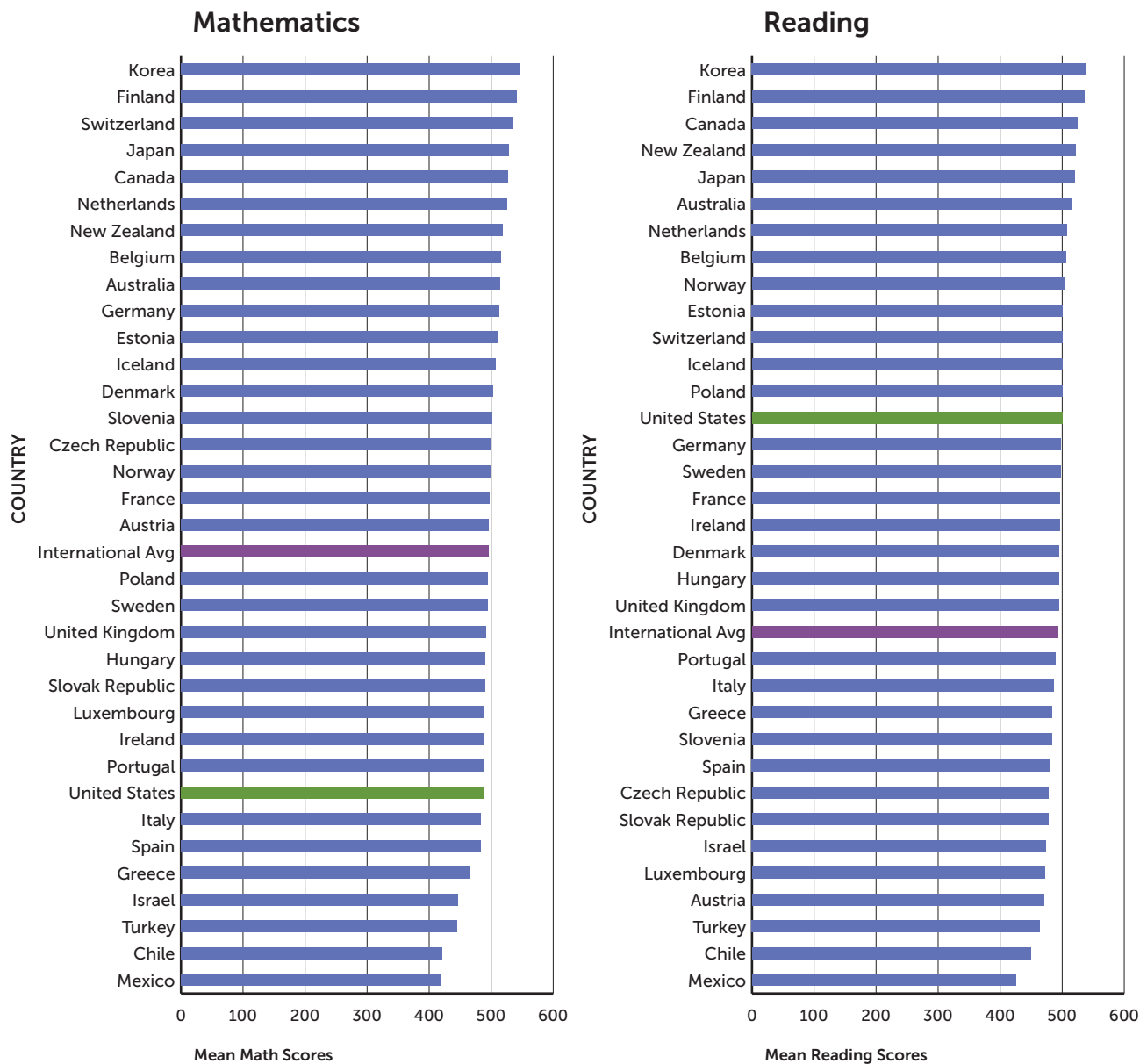
- *In raw numbers*, the United States produces many more low-achieving students than any other OECD nation, including even two developing economies, Mexico and Turkey.
- In both reading and math, the U.S. produces more low achievers than France, Germany, Italy, Japan, and the United Kingdom *combined*.
- Approximately 50 percent of black American students are low-achieving in math—a higher proportion of students than is found in any OECD country save Chile and Mexico. In reading, only Mexico does worse.

And a few interesting tidbits:

- In both reading and math, *in raw numbers*, the United States produces more high-achieving Hispanic students than Asian students.
- In both reading and math, the U.S. produces about the same *number* of low-achieving white students as low-achieving black students.

# Performance across the Globe

**FIGURE 1:** Average PISA Scores by Country

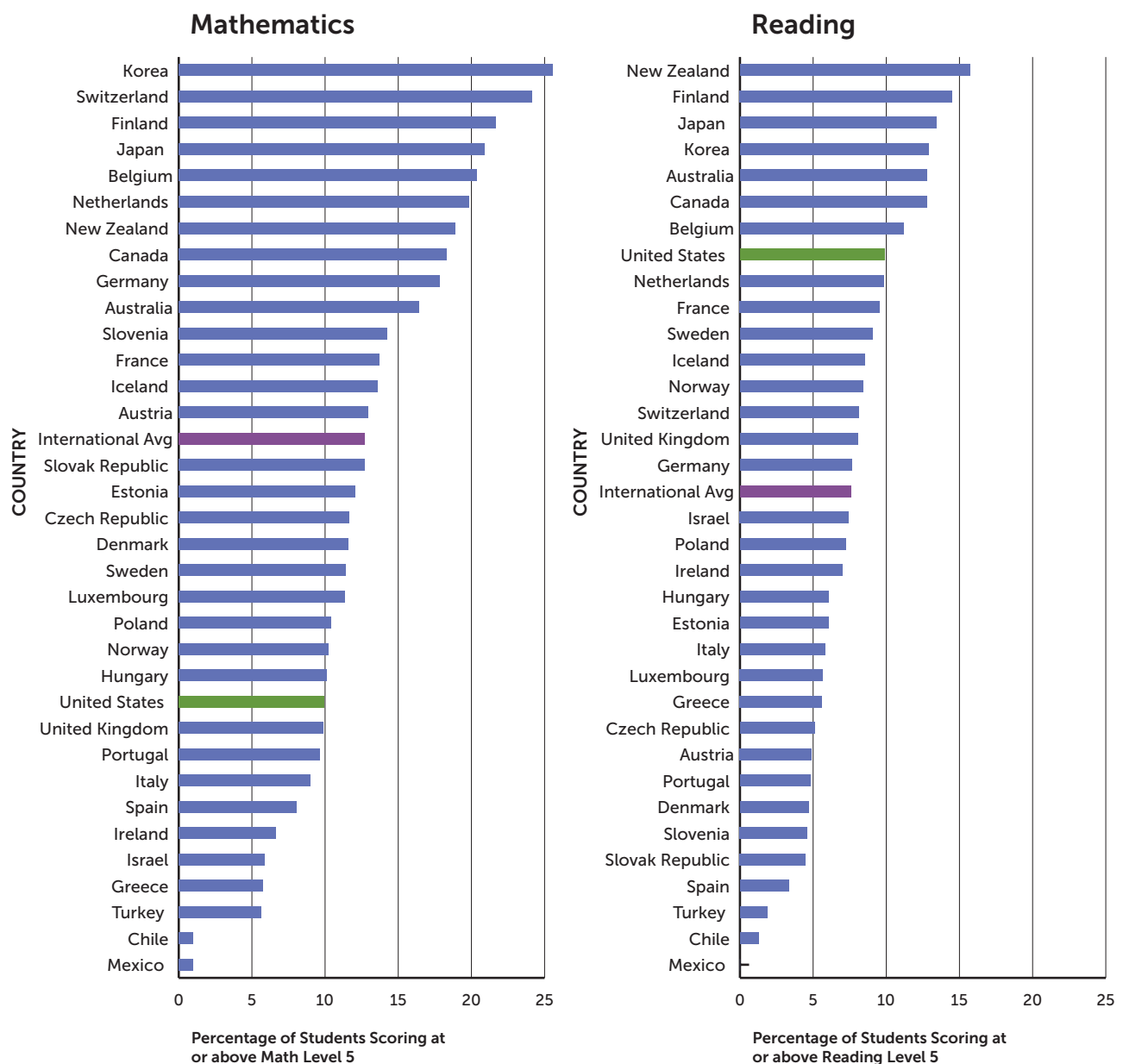


Source: Authors, based on OECD data.

When measured by the average performance of fifteen-year-olds in math and reading, the United States shakes out in the middle of the pack of OECD countries. As shown in figure 1, the U.S. mean score on PISA's 600-point scale is below average in math, at 487, and above average in reading, at 500 (the difference between the U.S. and international reading scores is not statistically significant). In the following analysis, however, we look beyond mean scores; instead, we segment each country's high and low achievers to see two things: first, which countries produce stellar (and not-so-stellar) students at particularly high rates, and second, which countries pump the most of these students (in raw numbers) into the global economy.

# High-Achieving Students

**FIGURE 2:** Percentage of High-Achieving Students by Country

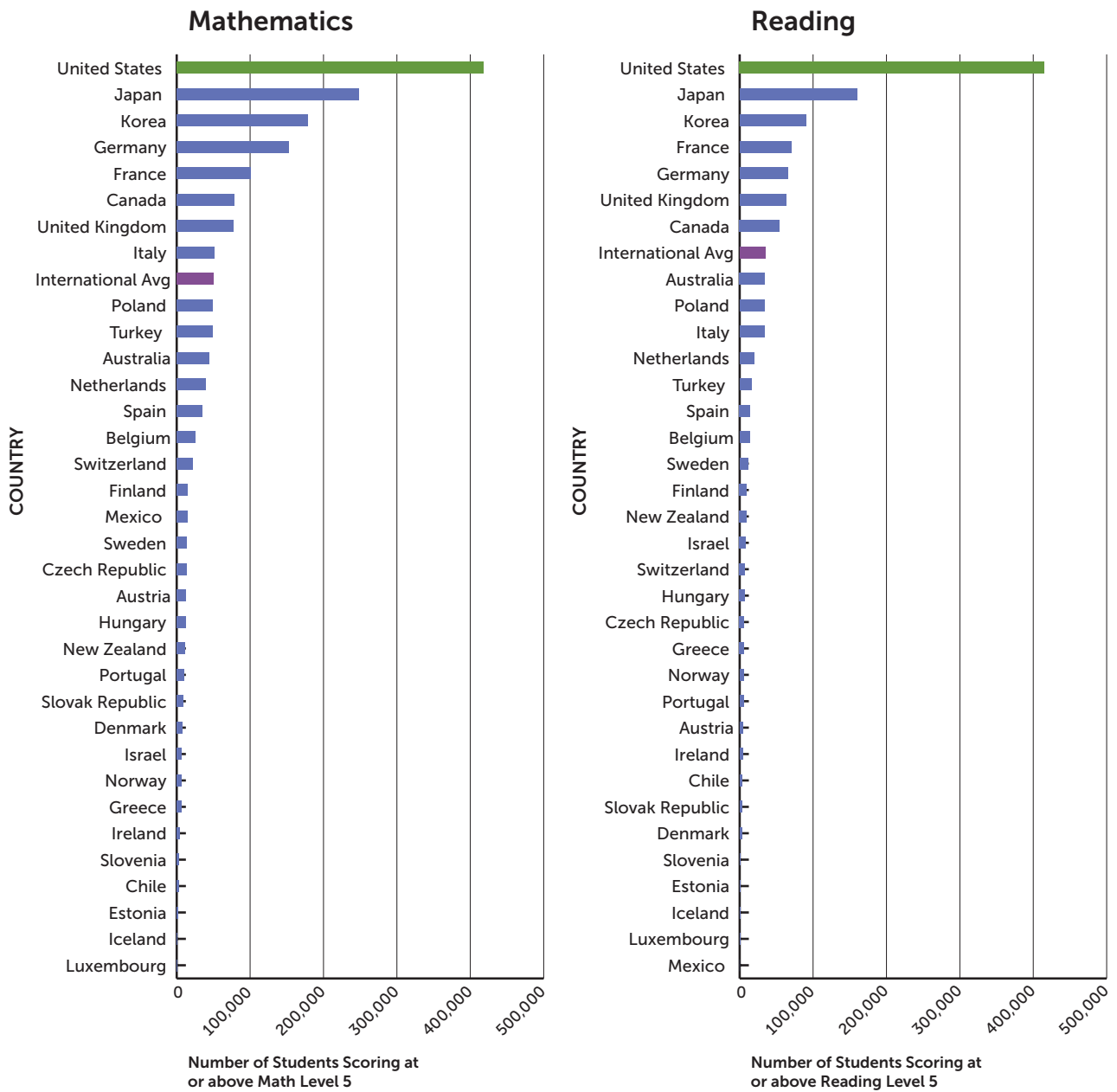


Source: Authors, based on OECD data.

With overall math and reading scores in the middling range, it comes as no surprise that the United States produces fewer high-achieving students per capita than world powers typically praised for their education systems, such as Finland, Korea, and Japan—and the U.S. fares worse in math than in reading, as shown in figure 2. With 25.6 percent of its math students scoring in PISA’s high-achieving range, Korea has proportionally 2.5 times as many high math achievers as the United States.<sup>3</sup> Likewise, with a high-achievement rate of 15.7 in reading, New Zealand has proportionally 1.5 times as many high achievers as the U.S. in reading.

<sup>3</sup> For a comparison of math achievement among OECD countries and individual U.S. states, see Eric A. Hanushek, Paul E. Peterson, and Ludger Woessmann, “Teaching Math to the Talented,” *Education Next* 11, no. 1 (2011), at <http://educationnext.org/teaching-math-to-the-talented/>. The analysis finds that even the highest-achieving U.S. state, Massachusetts, is no match for countries such as Korea and Finland.

**FIGURE 3:** Number of High-Achieving Students by Country

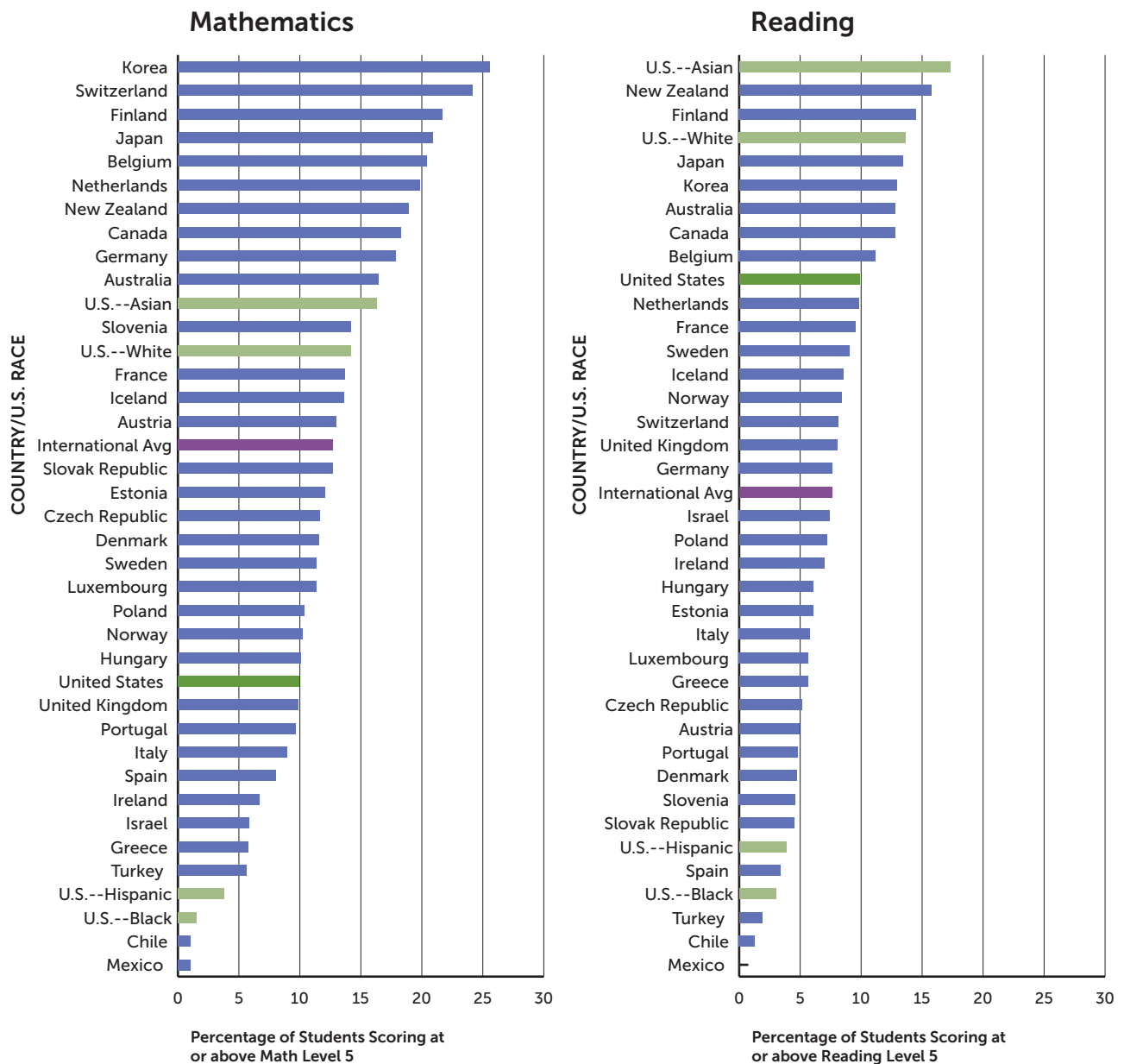


Source: Authors, based on OECD data.

In terms of raw numbers, however, the United States ultimately produces a larger population of high-achieving students in both subjects than any other OECD country (see figure 3). In math, the total number of high-achieving students in the U.S.—over 417,000—is nearly as great as the number of all high math achievers in Japan and Korea combined. In reading, the total number of high-achieving students in the U.S.—about 415,000—is greater than that of Japan, Korea, and France combined.



**FIGURE 4 :** Percentage of High-Achieving Students by Country and U.S. Race

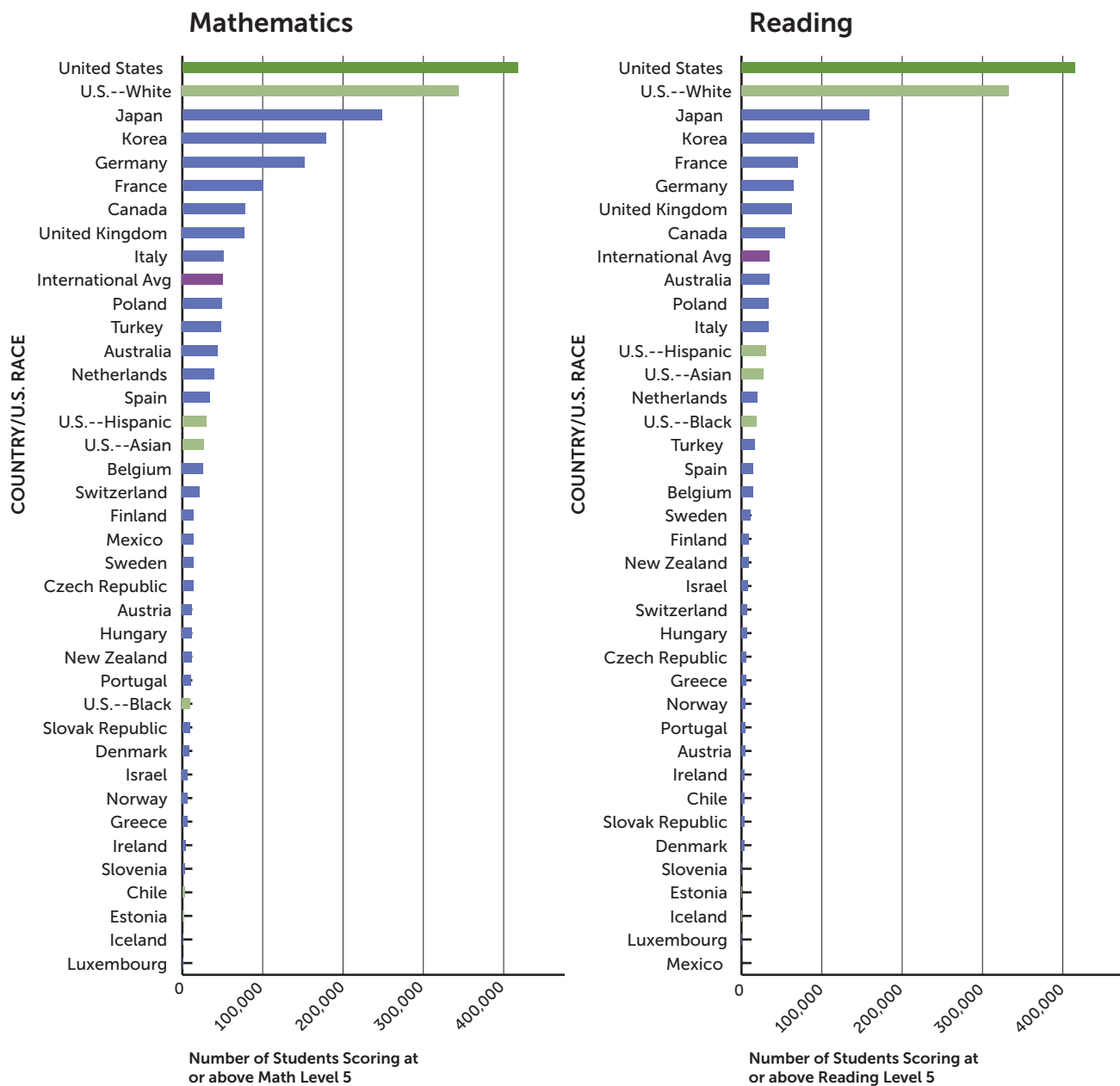


Source: Authors, based on OECD data.

When U.S. high achievers are broken out by race, white and Asian students fare well in international comparisons. Particularly in reading, the proportions of U.S. white and Asian students who are high-achieving mirror the proportions of some of the highest-achieving OECD countries, such as New Zealand, Finland, and Japan (see figure 4). In fact, the rate of high achievement among U.S. Asian readers is higher than that of any other population, at 17.3 percent. Black and Hispanic proportions, however, fall to the bottom of the pack.



**FIGURE 5:** Number of High-Achieving Students by Country and U.S. Race

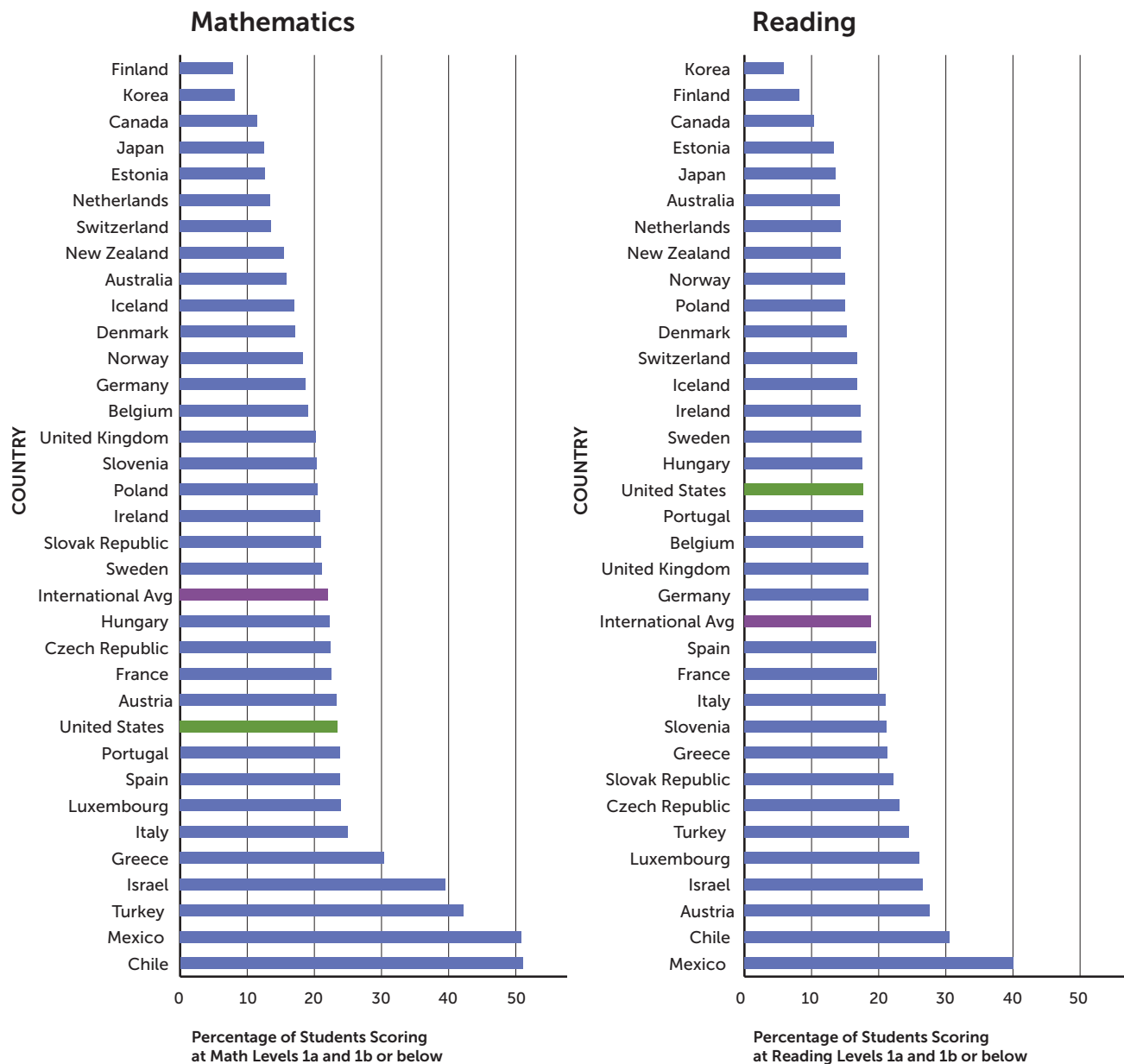


Source: Authors, based on OECD and U.S. Census data.

When we look at raw numbers, and include America’s racial and ethnic groups, we see that white students make up the vast majority of high-achieving American students in both math and reading—82 and 80 percent of all high-achieving students in the U.S. in each subject, respectively (see figure 5). America’s white students alone outnumber the high achievers of every other OECD country.

# Low-Achieving Students

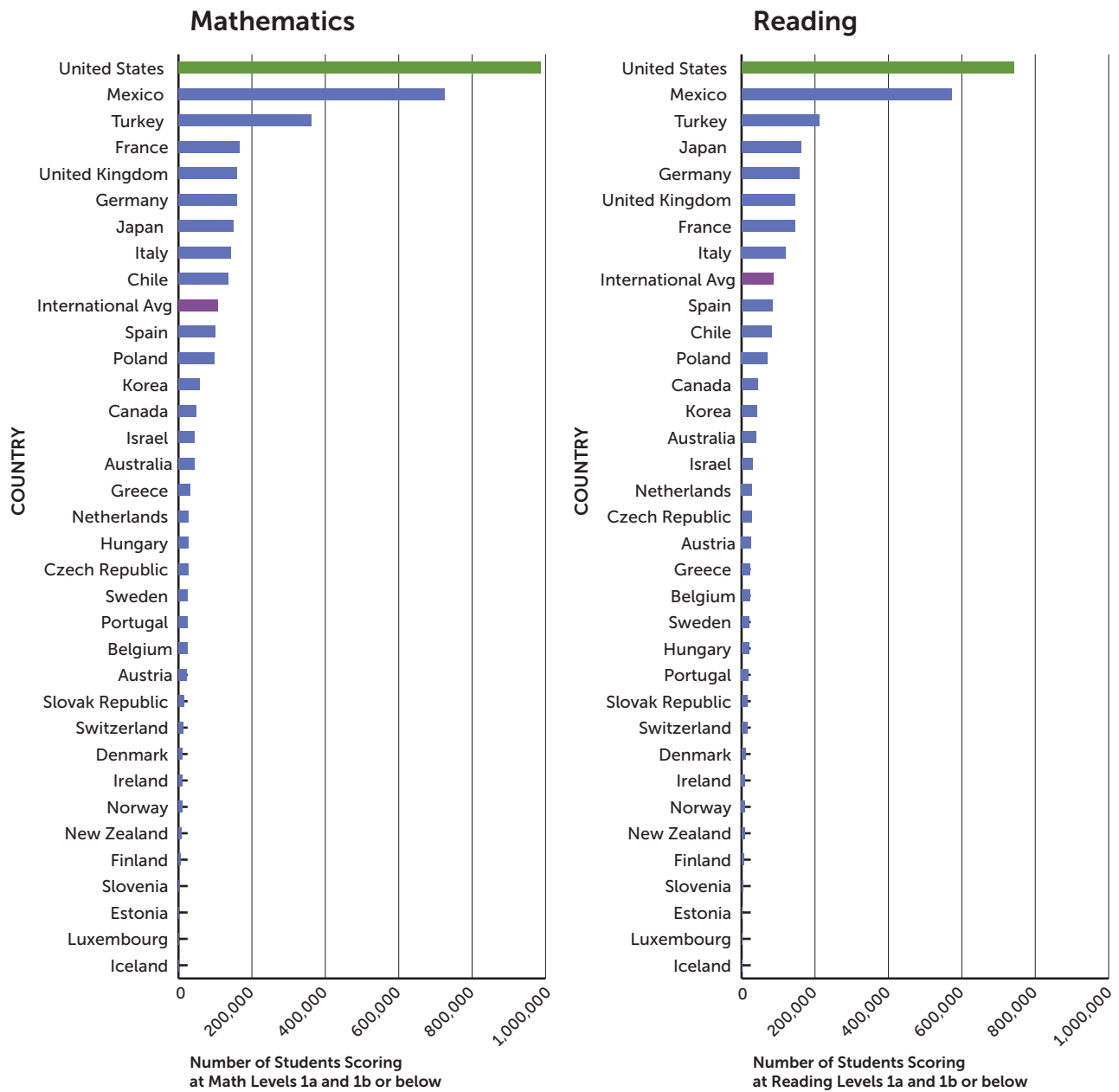
**FIGURE 6:** Percentage of Low-Achieving Students by Country



Source: Authors, based on OECD data.

Similar patterns are found among low-achieving students in the United States. The U.S. produces roughly average proportions of low achievers in math and reading when compared to other OECD countries (see figure 6). Proportionally, Finland is home to a third as many low achievers as the U.S. in math, and Korea is home to a third as many in reading. In the U.S., low achievers (like high achievers) fare worse in math than in reading.

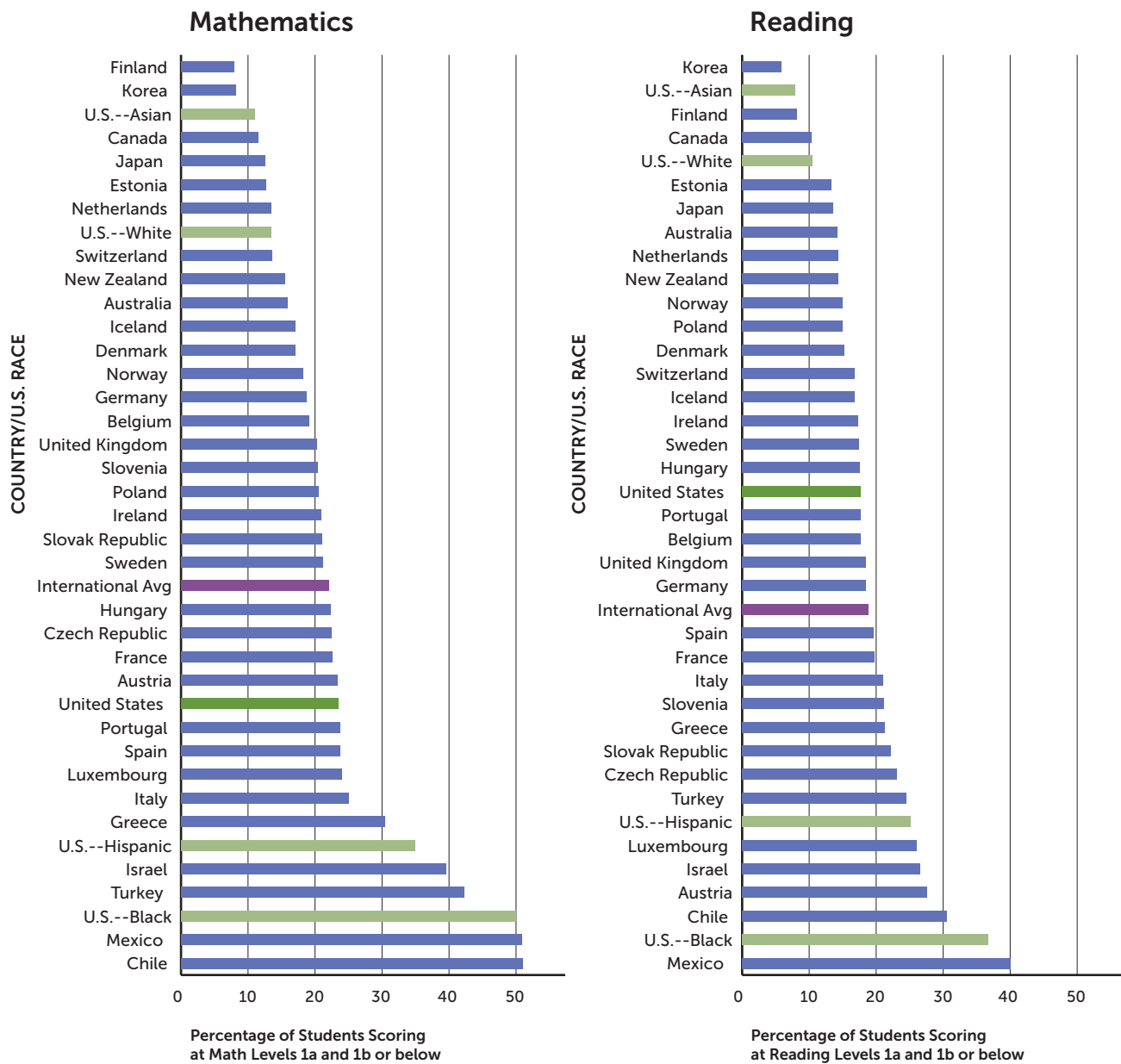
**FIGURE 7:** Number of Low-Achieving Students by Country



Source: Authors, based on OECD data.

But in terms of raw numbers, the United States produces by far the most low-achieving students in both math and reading. America produces more low-achieving math students—over 987,000—than France, the United Kingdom, Germany, Japan, Italy, and Chile *combined* (see figure 7). The same goes for low-achieving readers: The U.S. produces more low-achieving readers—about 742,000—than Japan, Germany, the United Kingdom, France, and Italy *combined*.

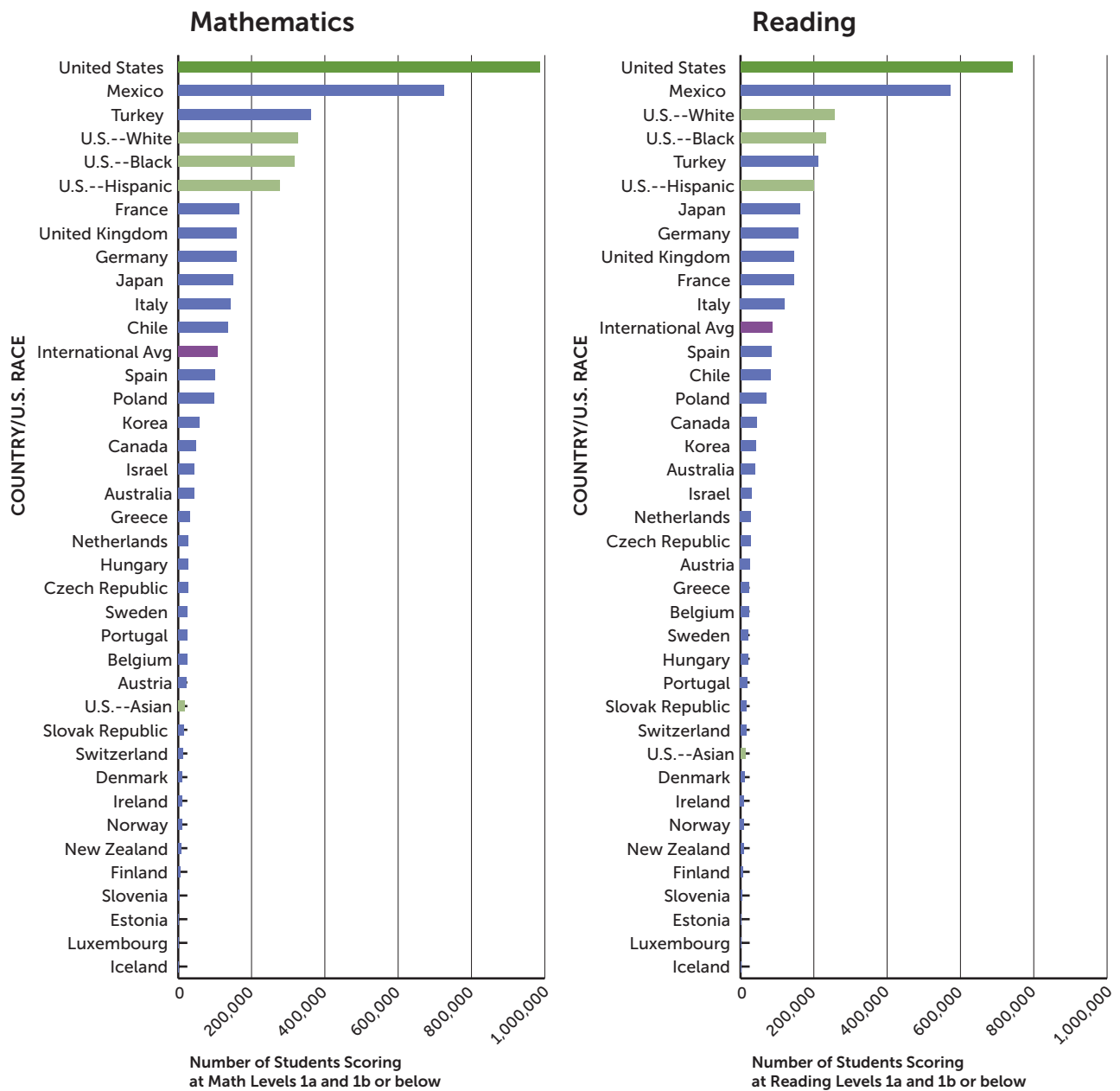
**FIGURE 8 :** Percentage of Low-Achieving Students by Country and U.S. Race



Source: Authors, based on OECD data.

The picture changes when low achievers in the U.S. are broken out by race. White and Asian students in the United States generally perform well; the rate of low achievement for each subgroup is comparable to the rates of low achievement among the top-performing countries internationally (see figure 8). On the other hand, black and Hispanic students in the U.S. have staggering rates of low achievement when compared internationally. Only Mexican students fare worse than U.S. black students in both math and reading.

**FIGURE 9:** Number of Low-Achieving Students by Country and U.S. Race



Source: Authors, based on OECD and U.S. Census data.

Looking at the *raw numbers* of low achievers in each subgroup introduces an altogether different picture. Despite the low rate of poor performance among white American students, the U.S. produces near-equal numbers of white, black, and Hispanic low achievers in both math and reading (see figure 9). Again, excluding Mexico and Turkey, each of these subgroups—white, black, and Hispanic Americans—*on its own* comprises a larger number of low achievers than is found in any other OECD country.

# Conclusion

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**WHAT TO MAKE OF THESE ANALYSES?** First, it's obvious that America's size alone makes it the major player at both ends of the achievement spectrum: Our top students outnumber high achievers in all other OECD countries—but our worst performers outnumber their peers in other countries, too. This situation helps to explain why, in spite of overall test scores best described as mediocre, the United States continues to send so many students to top universities and to produce so many innovative scientists and entrepreneurs. To be blunt: we're big. Of course, so are China and India, and when they starting taking the PISA exam we might discover that their high-achieving students outnumber ours many times over.

Our large number of low-achieving students is also a critical issue. It's not unfair to say that America's educational problems are the world's problems. While the same may be true for Mexico and Turkey (and for big non-OECD countries that took the PISA exam, like Brazil and Indonesia) as well, it's hard to imagine the U.S. maintaining its economic strength—or social cohesion—while miseducating such a large number of its youth.

Finally, the mile-wide chasm that is our own domestic achievement gap cannot be denied. America's white and Asian students perform among the world's best; our black and Hispanic students are battling it out with OECD's worst. Still, this report identifies an interesting wrinkle, and perhaps a ray of hope: In raw numbers, at least, our high-achieving Hispanic and black American students outnumber the high achievers of several other countries. At the least, this indicates that they will have a seat at the international table—on prestigious college campuses, in the board room, and in the laboratory. It's a start.

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