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# Difference in Literacy between Private and Public Schools: Evidence from a Survey of 61 Economies

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## Abstract

Recent research in the United States suggests that student performance differences between private and public schools disappear once student and school level characteristics are controlled for. This is an important result as it suggests that in the absence of such differences delivery of education through public means can be as efficient as that through private means. However, given the often significant variation in economic, social, and political systems across countries, generalization of recent U.S. results to the rest of the world may not be appropriate. The current study bridges this gap in the literature by examining the private versus public school difference in literacy in key areas such as mathematics, reading, and science using recent comparable nationally representative samples from 61 economies. Our findings suggest that most economies have significant private-public school performance gaps, and for many economies these differences persist even after controlling for student and school level characteristics such as age, gender, grade, socioeconomic status, disability status, school size, and student-teacher ratio. Implications are discussed.

## Introduction

A number of prior studies across different countries have examined private versus public school differences with mixed results. Depending on their empirical findings these studies can be grouped into two broad categories. The first set of studies maintains that any observed performance-based differences between private and public schools occur because private schools are relatively more efficient at managing economic resources. This point of view is part of a broader argument that advances the free market system and contends that given their inherent flexibility and profit-maximizing motive, private organizations are better positioned towards generating optimal outcomes. In contrast to this market-based hypothesis, the second category of studies supports the notion that private schools tend to perform better than their public counterparts simply because of their ability to attract and retain higher quality students with desirable attributes such as high socioeconomic status, parental support, and access to opportunities etc. that make them more likely to succeed in education. Thus, once such characteristics are adequately controlled for, public schools perform as well as their private counterparts.

For examples of relevant evidence supporting the two positions, see Alsher, 2021; Caldwell, 2010; Delprato and Antequera, 2021; Espinoza and González, 2013; Filer and Münich, 2013; Friedman, 1955; Greenwald, Hedges,

and Laine, 1996; Kenayathulla, 2013; Levy, 2012; Levy, 2013; Lubienski and Lubienski; 2013, Sandefur, Watkins, and Green, 2013; Stitzlein, 2013; and Thapa, 2013. Although both sides of the fence have fielded strong arguments and empirical evidence to support their relative positions, the overall picture remains ambiguous. For instance, a comprehensive literature review by McEwan (2000) reported mixed findings and a general lack of consensus between the opposing viewpoints with little promise of a meaningful end to the debate any time soon (Bagde, Epple, & Taylor, 2022; Braun, Jenkins, & Grigg, 2013; Carbonaro, 2006; Chakrabarti, 2008; Kenayathulla, 2013; Lubienski & Lubienski, 2006; Lubienski, Lubienski, & Crane, 2008; Romulad, 2023).

Despite this lack of empirical consensus one fact that is difficult to argue against is that private versus public performance differences do exist. From a policy perspective this makes it important to investigate and understand such differences in order to identify interventions that may help bridge this gap. The elimination of performance gap between different school types is desirable because existence of such a gap in a country implies that the public education system in that country is unable to provide a quality of education that is otherwise available through private means.

In other words, such gaps signal a failure of the education system, and contribute to discrimination between parents who can afford to send their children to private schools and consequently provide them access to a relatively higher quality of education and better opportunities in life, versus parents who cannot afford to do so. While desirable for any country, policies that aim to reduce performance gaps between private and public education are especially important to countries that identify themselves as welfare states. Although the set of studies supporting nonmarket-based hypothesis for private-public performance differences offers some strong empirical evidence, it is difficult to say whether or not the findings are generalizable to countries not included in their empirical samples (Heyneman, 2005).

In order to examine the hypothesis that private-public school performance differences disappear once important predictors of such performance are controlled for, the first step is to identify such predictors. Prior research has revealed several factors that are significantly associated with school performance as measured at the student level. Such factors can be grouped into two sets based on whether they occur at the school level or the student level. Important school level predictors of student performance include school size, school climate, school location, resource management, teacher qualification, class size, teacher involvement, and instructional practices while student level predictors include socioeconomic status, race, gender, disability status, limited English proficiency, parental expectations, and parental involvement (Darling-Hammond, 2000; Entwisle, Alexander, & Olson, 1994; Forgasz & Hill, 2013; Hanushek, 1996; Hanushek, 1999; Hanushek, Kane, & Rivkin, 2009; Lam, 2014; Lubienski & Lubienski, 2006; Lubienski, Lubienski, & Crane, 2008; Pasta et al., 2013; Régner, Loose, & Dumas, 2009; Xu, 2009; Stull, 2013).

The second step is to ensure that in order to properly compare countries on the same outcome, an identical set of predictors be used. The idea is to eliminate any differences in outcomes that may be attributable to variation in the number of or measurement of predictors. This means using identical or psychometrically equivalent items, instruments, and measures, In addition to such standardization of outcomes and predictors, it is important to use

the same method of analysis and an identical sample selection procedure for all countries included in the study. This ensures that any observed cross-country differences are not due to sensitivity of results to the choice of analytical or sampling methods (Kitsantas, Ware, & Cheema, 2010). The considerations listed in this paragraph make it apparent that only large scale cross country samples can hope to meet these criteria.

The main purpose of this study is to examine the difference between private and public schools in key areas of literacy such as mathematics, reading, and science using a large scale sample that allows wide generalizability of statistical results. By using identical measures and variables for observations spread across a large number of countries our hope is minimize the influence of cross-sample contamination (e.g. due to different sets of assessments, instruments, and/or predictors used), and to have a uniform yardstick with which to measure results across countries. Our specific hypothesis is that there is a significant mean difference in literacy between private and public schools that persists even after controlling for student and school level covariates. The rest of this paper is organized into four sections. Section two describes our sample and method. Section three provides interpretation of statistical results. A discussion summarizing main conclusions of the study and their implications is provided in section four. Conclusions are summarized in section five.

## Methodology

### Sample and Participants

Our sample was drawn from OECD-administrated Program for International Student Assessment student and school surveys. This is an international assessment of literacy in areas such as mathematics, reading, and science. The target population is the entire 15-year old student population in a country/economy. We include the term economy here to highlight the fact that a very small number of participants in our survey are not actual countries but independent regions within sovereign countries (e.g. Hong Kong). A two stage stratified random selection process was used within each country to ensure that selected samples remain representative of their target populations. Of the 68 economies that participated in both the student and the school surveys, 37 were OECD members and 31 were not.

This overall sample consisted of 485,490 students nested within 18,292 schools. However, not all of the 68 economies represented in this sample had information on all variables needed for this study. For example, Israel reported zero students in private schools, and Albania did not have information on key student level covariates such as socioeconomic status, and school level covariates such as school size and student-teacher ratio at school. After listwise deletion of cases with missing data we were left with a usable sample of 411,867 students (15% attrition) nested within 15,606 schools (15% attrition) in 61 economies (10% attrition). As a study based on publicly available international data, it was exempt from IRB review.

For the 61 economies included in our sample, the number of schools sampled from a country ranged between 11 and 1,230 ($M$ = 255.84, $SD$ = 229.03), and the number of students sampled from a school ranged between 1 and 347 ($M$ = 26.39, $SD$ = 15.65). The total number of students sampled from a country ranged between 259 for Liechtenstein and 28,970 for Mexico ($M$ = 6,751.92, $SD$ = 5,408.80). Although our dataset has a nested structure,

given the small number of students sampled from many schools a multilevel method such as hierarchical linear model (HLM) cannot be applied. Of the 15,606 schools in our sample 897 schools (5.75%) sampled five students or less, 843 (5.40%) sampled between six and ten students, and 2,461 (15.77%) sampled between 11 and 20 students. Removing these cases from the dataset would have resulted in an unacceptably high attrition rate.

**Measures**

*Literacy*

The assessment component of the survey measured literacy of sampled students in mathematics, reading, and science. Assessments items were administered in various formats including multiple choice, open-ended response, and fill-in-the-blank type items. Scale scores were reported for each student as a set of five plausible values with each plausible value standardized over the OECD sample ($M$ = 500, $SD$ = 100) for each of the three literacy areas. Such plausible values are random draws from the posterior distribution of all possible scores that can be attributed to a particular student. Reporting more than one score per student allows preservation of uncertainty associated with point estimates (Mislevy, 1991; Mislevy, Beaton, Kaplan, and Sheehan, 1992, Wu, 2005).

Plausible values are designed to capture characteristics of the target population as opposed to the sample. In order to properly deal with plausible values an analyst can either choose one plausible value at random, or repeat the analysis separately with each plausible value and then average parameter estimates and their standard errors (Brown & Mickleright, 2004; von Davier, Gonzalez, & Mislevy, 2009). In the latter case plausible values function in a way similar to values obtained from multiple imputation of missing data (Rubin, 1987). Readers interested in a detailed discussion of assessment items and methodological issues related to reporting of scale scores are referred to OECD (2023).

*School Type*

This is a nominal variable that captures school type (private, public). The determination of whether a school type was categorized as private or public was based on school administrator's response to a survey item that defined a school managed directly or indirectly by an organization other than the government such as a business, church, mosque, or another non-governmental organization [NGO] as a private school, and a school managed directly or indirectly by a public or government body as a public school (OECD, 2023).

*Covariates*

In order to account for any moderating effects and to ensure that our models are able to explain a reasonable proportion of variation in the three literacy areas, we controlled for a number of student and school level covariates. Grade, gender, and socioeconomic status were used as student level covariates, and school size and student-teacher ratio were used as school level covariates. The selection of this set of covariates was based on (1) reasonable availability of valid non-missing data on variables of interest (minimum weighted cell size for categorical variables, 30), and (2) well-known evidence in the literature about the relationship of these covariates

with our outcome measures.

- *Gender.* This is a nominal variable with two values, M for boys and F for girls.
- *Grade.* This variable records a student's grade in school, and can take any value between 7 and 12 (both inclusive).
- *Socioeconomic status.* This variable measures the socioeconomic status of a student and is based on subscales such as family wealth, number of cultural possessions at home, parental occupation, parental education, and availability of educational resources at home. For a thorough discussion of scale construction, country-level reliabilities, and other relevant details please refer to OECD (2023). The values of this variable are standardized over the OECD sample ($M = 0$, $SD = 1$).
- *Student-teacher ratio.* This variable is the ratio of total number of students to the total number of teachers at a school at the time of the survey.
- *School size.* This is the total number of students enrolled at a school at the time of the survey.

In addition to the above variables the survey design automatically controlled for age and learning disability status as all students in the sample are 15-years old and the survey excludes students with learning disabilities.

### Analytical Method

In order to evaluate the difference in literacy in mathematics, science, and reading between private and public schools we used two methods. The first of these was independent samples *t* test which was used to test for the significance of mean literacy scores in the three areas between private and public schools. Thus, this model evaluated the effect of school type on literacy without accounting for the effect of covariates. The second method was analysis of covariance (ANCOVA) that looked at the effect of school type on literacy scores after controlling for student and school level covariates. A comparison between the two methods allows us to examine the contraction or expansion in any observed literacy gaps between private and public schools due to the inclusion of covariates. Given our large sample size, in order to not overemphasize statistical significance we provide Cohen's *d*, $R^2$, and partial $\eta^2$ as measures of effect size that can be used to evaluate the practical effect of school type on literacy.

We evaluated all underlying assumptions for independent samples *t* test and ANCOVA, employed $R^2$ values to assess adequacy of model fit, and used .05 significance level for evaluation of tests of hypotheses. Normalized sampling weights were used to estimate all parameter values and their standard errors. All computations were performed with SPSS. Effect size interpretations are based on Cohen (1992).

## Results

### Independent Samples *t* Test Results

Independent samples *t* test results for the difference in mean literacy score in mathematics between private and public schools are provided in Table 1 for the OECD sample and in Table 2 for the non-OECD sample. Similar

comparisons for reading are provided in Tables 3 and 4, and for science in Tables 5 and 6. Our results indicate a significant mean difference in mathematics literacy between private and public schools for 27 out of the 32 countries in the OECD sample (see Table 1), and in 24 out of 29 countries in the non-OECD sample (see Table 2).

The mean effect size as measured by Cohen's *d* in the OECD sample ranged between 0.03 for Netherlands and 0.95 for Slovenia ($M$ = 0.37, $SD$ = 0.26). With the exception of Italy, Luxembourg, and Switzerland the mean difference in mathematics literacy score favored private schools. For the non-OECD sample, Cohen's d ranged between 0.01 for Latvia and 1.28 for Brazil ($M$ = 0.65, $SD$ = 0.41). With the exception of Chinese Taipei, Hong Kong, Liechtenstein, Montenegro, Thailand, and Vietnam, the mean difference in mathematics literacy score favored private schools. For the sake of brevity we have only discussed *t* test results for math literacy here. Corresponding results for reading and science literacy can be interpreted in a similar manner.

**ANCOVA Results**

ANCOVA results for the effect of school type on mathematics literacy after controlling for student and school level covariates are provided in Table 7 for OECD countries and in Table 8 for non-OECD countries. Similar results are provided for reading literacy in Tables 9 and 10, and for science literacy in Tables 11 and 12.

Our ANCOVA results indicate that the difference in mean literacy score in mathematics generally persisted between private and public schools for both OECD and non-OECD countries. However, ANCOVA results differed from *t* test results in several respects with some significant mean differences turning insignificant and vice versa. For example the significant mean difference between private and public schools in mathematics for Finland (Table 1: $\Delta M = 18$, $p < .01$) became insignificant after inclusion of the covariates (Table 7: $\Delta M = 10$, $p > .05$) while for USA (Table 1: $\Delta M = 7$, $p > .05$) the difference turned significant (Table 7: $\Delta M = -18$, $p < .001$). In some cases the direction of the difference shifted suggesting that estimating the effect of school type on literacy without controlling for covariates can generate incorrect results. For example, for Japan the independent samples *t* test generated a mean difference of 6 points in math literacy, $p < .05$, favoring private schools (Table 1). However, this gap increased to 17 points, $p < .001$, and changed direction favoring public schools once covariates were included in the model.

$R^2$ values in our ANCOVA model for mathematics ranged between 7% and 52% ($M$ = 26%, $SD$ = 12%) in the OECD sample and between 12% and 56% ($M$ = 29%, $SD$ = 11%) in the non-OECD sample. $R^2$ estimates the proportion of total variation in math literacy that can be explained by variables included in the ANCOVA model. In contrast to $R^2$, the reported partial $\eta^2$ values estimate the unique contribution of school type in explaining the total variation in math literacy in our sample. These $\eta_p^2$ values ranged between 0% and 2% ($M$ = 1%, $SD \sim 0\%$) in our OECD sample, and between 1% and 16% ($M$ = 5%, $SD$ = 4%) in our non-OECD sample. For the sake of brevity we have only discussed the ANCOVA results for math literacy here. Corresponding results for reading and science literacy can be interpreted in a similar manner.

Table 1. Descriptive Statistics and *t* Test Results for Difference in Mean Math Score between Private and Public

Schools in the OECD Sample

| | Descriptive statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Private | | | Public | | | | | | |
| Country | *n* | *M* | *SD* | *n* | *M* | *SD* | Δ*M* | *t'* | *d* | Interp. |
| Australia | 5,532 | 526 | 88 | 7,720 | 492 | 97 | 34 | 21.26*** | 0.37 | M |
| Belgium | 5,373 | 537 | 98 | 2,364 | 478 | 96 | 58 | 24.21*** | 0.60 | M |
| Canada | 1,578 | 565 | 80 | 16,776 | 517 | 87 | 49 | 22.88*** | 0.56 | M |
| Chile | 3,625 | 446 | 80 | 2,255 | 390 | 71 | 56 | 28.05*** | 0.73 | L |
| Czech Rep. | 389 | 505 | 91 | 4,011 | 498 | 95 | 7 | 1.40 | 0.07 | — |
| Denmark | 1,446 | 520 | 80 | 4,601 | 496 | 81 | 24 | 9.94*** | 0.30 | S |
| Estonia | 118 | 532 | 102 | 4,438 | 522 | 79 | 10 | 1.11 | 0.13 | — |
| Finland | 274 | 538 | 92 | 7,959 | 520 | 84 | 18 | 3.19** | 0.21 | S |
| France | 777 | 520 | 94 | 3,041 | 496 | 96 | 25 | 6.38*** | 0.26 | S |
| Germany | 276 | 553 | 88 | 3,285 | 516 | 99 | 37 | 6.61*** | 0.38 | M |
| Greece | 311 | 508 | 87 | 4,176 | 448 | 86 | 60 | 11.80*** | 0.69 | L |
| Hungary | 754 | 491 | 92 | 3,820 | 476 | 94 | 14 | 3.85*** | 0.15 | S |
| Iceland | 19 | 476 | 87 | 2,786 | 495 | 93 | -19 | -0.88 | 0.20 | — |
| Ireland | 2,480 | 510 | 81 | 1,605 | 491 | 85 | 19 | 6.93*** | 0.22 | S |
| Italy | 1,320 | 481 | 87 | 26,235 | 488 | 92 | -7 | -2.97** | 0.08 | S |
| Japan | 1,835 | 543 | 94 | 4,359 | 537 | 92 | 6 | 2.14* | 0.06 | S |
| Korea | 2,340 | 564 | 98 | 2,599 | 547 | 99 | 17 | 6.03*** | 0.17 | S |
| Luxembourg | 769 | 478 | 92 | 4,054 | 494 | 94 | -17 | -4.53*** | 0.18 | S |
| Mexico | 3,093 | 451 | 74 | 26,353 | 408 | 73 | 43 | 30.70*** | 0.58 | M |
| Netherlands | 2,333 | 520 | 93 | 1,171 | 517 | 93 | 2 | 0.74 | 0.03 | — |
| New Zealand | 214 | 586 | 90 | 3,304 | 500 | 97 | 85 | 12.55*** | 0.89 | L |
| Norway | 73 | 542 | 86 | 4,057 | 491 | 90 | 51 | 4.78*** | 0.57 | M |
| Poland | 98 | 566 | 102 | 3,998 | 516 | 89 | 50 | 5.50*** | 0.56 | M |
| Portugal | 571 | 542 | 81 | 4,398 | 482 | 93 | 59 | 16.23*** | 0.65 | L |
| Slovak Rep. | 353 | 526 | 97 | 3,653 | 479 | 102 | 47 | 8.32*** | 0.46 | M |
| Slovenia | 137 | 588 | 63 | 5,322 | 501 | 91 | 86 | 15.66*** | 0.95 | L |
| Spain | 7,537 | 513 | 80 | 15,717 | 473 | 87 | 40 | 34.55*** | 0.47 | M |
| Sweden | 579 | 496 | 91 | 3,727 | 481 | 89 | 15 | 3.75*** | 0.17 | S |
| Switzerland | 673 | 523 | 82 | 9,121 | 533 | 95 | -10 | -2.88** | 0.10 | S |
| Turkey | 62 | 506 | 75 | 4,448 | 450 | 92 | 56 | 4.81*** | 0.61 | M |
| UK | 4,837 | 508 | 93 | 5,783 | 488 | 91 | 20 | 11.08*** | 0.22 | S |
| USA | 315 | 491 | 78 | 4,315 | 484 | 90 | 7 | 1.52 | 0.08 | — |
| *Min* | 19 | 446 | 63 | 1,171 | 390 | 71 | -19 | — | 0.03 | — |
| *Max* | 7,537 | 588 | 102 | 26,353 | 547 | 102 | 86 | — | 0.95 | — |
| *M* | 1,565 | 520 | 87 | 6,295 | 491 | 90 | 29 | — | 0.37 | — |
| *SD* | 1,920 | 35 | 9 | 6,255 | 33 | 7 | 27 | — | 0.26 | — |

*Note.* *t'* = observed *t* with adjusted *df*. *d* = Cohen's *d*. Int. = Interpretation. L = Large. M = Medium. S = Small.

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 2. Descriptive Statistics and *t* Test Results for Difference in Mean Math Score between Private and Public

Schools in the Non-OECD Sample

| | Descriptive statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Private | | | Public | | | | | | |
| Country | *n* | *M* | *SD* | *n* | *M* | *SD* | Δ*M* | *t'* | *d* | Int. |
| Argentina | 1,640 | 427 | 69 | 2,975 | 372 | 69 | 55 | 26.03*** | 0.80 | L |
| Brazil | 2,385 | 467 | 79 | 13,179 | 376 | 69 | 91 | 52.39*** | 1.28 | L |
| Bulgaria | 60 | 551 | 98 | 5,023 | 439 | 92 | 111 | 9.23*** | 1.20 | L |
| Chinese Taipei | 2,119 | 521 | 110 | 3,714 | 579 | 111 | -58 | -19.23*** | 0.52 | M |
| Colombia | 1,369 | 421 | 86 | 6,839 | 370 | 70 | 51 | 20.87*** | 0.70 | L |
| Costa Rica | 649 | 472 | 67 | 2,830 | 396 | 62 | 76 | 26.22*** | 1.20 | L |
| Croatia | 86 | 482 | 62 | 4,749 | 472 | 88 | 10 | 1.45 | 0.11 | — |
| Hong Kong (China) | 4,209 | 561 | 95 | 311 | 597 | 93 | -36 | -6.40*** | 0.38 | M |
| Indonesia | 2,033 | 373 | 74 | 3,094 | 378 | 73 | -5 | -2.33* | 0.07 | S |
| Jordan | 1,027 | 444 | 88 | 4,982 | 378 | 69 | 66 | 22.48*** | 0.90 | L |
| Kazakhstan | 158 | 434 | 61 | 5,500 | 432 | 71 | 2 | 0.40 | 0.03 | — |
| Latvia | 98 | 491 | 72 | 3,745 | 490 | 83 | 1 | 0.11 | 0.01 | — |
| Liechtenstein | 7 | 462 | 52 | 247 | 551 | 87 | -89 | -2.74** | 1.04 | L |
| Lithuania | 66 | 554 | 73 | 4,163 | 479 | 89 | 75 | 8.27*** | 0.85 | L |
| Macao (China) | 5,060 | 542 | 92 | 218 | 475 | 79 | 67 | 12.12*** | 0.73 | L |
| Malaysia | 209 | 493 | 93 | 4,936 | 419 | 79 | 74 | 11.30*** | 0.93 | L |
| Montenegro | 18 | 370 | 72 | 4,578 | 409 | 82 | -39 | -2.03* | 0.48 | M |
| Peru | 1,235 | 421 | 83 | 4,066 | 351 | 76 | 70 | 26.68*** | 0.91 | L |
| Qatar | 3,244 | 444 | 101 | 5,146 | 339 | 75 | 105 | 51.43*** | 1.23 | L |
| Romania | 32 | 518 | 70 | 5,003 | 445 | 81 | 73 | 5.12*** | 0.90 | L |
| Russian Federation | 32 | 560 | 61 | 4,782 | 481 | 86 | 79 | 7.35*** | 0.92 | L |
| Serbia | 15 | 477 | 49 | 3,954 | 447 | 88 | 30 | 2.29* | 0.34 | — |
| Shanghai (China) | 480 | 644 | 88 | 4,547 | 608 | 101 | 35 | 8.26*** | 0.35 | M |
| Singapore | 127 | 575 | 79 | 5,061 | 576 | 107 | -1 | -0.16 | 0.01 | S |
| Thailand | 1,081 | 397 | 76 | 5,480 | 433 | 82 | -36 | -14.01*** | 0.44 | M |
| Tunisia | 9 | 364 | 55 | 3,715 | 389 | 78 | -25 | -0.98 | 0.32 | — |
| UAE | 5,797 | 466 | 91 | 4,234 | 397 | 75 | 69 | 41.47*** | 0.81 | L |
| Uruguay | 884 | 492 | 74 | 4,244 | 394 | 81 | 98 | 35.13*** | 1.23 | L |
| Vietnam | 408 | 494 | 68 | 4,391 | 513 | 86 | -18 | -5.11*** | 0.22 | S |
| *Min* | 7 | 364 | 49 | 218 | 339 | 62 | -89 | — | 0.01 | — |
| *Max* | 5,797 | 644 | 110 | 13,179 | 608 | 111 | 111 | — | 1.28 | — |
| *M* | 1,191 | 480 | 77 | 4,335 | 448 | 82 | 32 | — | 0.65 | — |
| *SD* | 1,588 | 67 | 15 | 2,295 | 77 | 11 | 54 | — | 0.41 | — |

*Note.* *t'* = observed *t* with adjusted *df*. *d* = Cohen's *d*. Int. = Interpretation. L = Large. M = Medium. S = Small.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3. Descriptive Statistics and *t* Test Results for Difference in Mean Reading Score between Private and Public Schools in the OECD Sample

| | Descriptive statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Private | | | Public | | | | | | |
| Country | *n* | *M* | *SD* | *n* | *M* | *SD* | Δ*M* | *t'* | *d* | Int. |
| Australia | 5,532 | 536 | 87 | 7,720 | 500 | 96 | 36 | 22.46*** | 0.39 | M |
| Belgium | 5,373 | 530 | 93 | 2,364 | 475 | 103 | 56 | 22.54*** | 0.58 | M |
| Canada | 1,578 | 566 | 79 | 16,776 | 524 | 90 | 42 | 20.26*** | 0.48 | M |
| Chile | 3,625 | 463 | 76 | 2,255 | 411 | 72 | 52 | 26.39*** | 0.70 | L |
| Czech Rep. | 389 | 508 | 89 | 4,011 | 493 | 90 | 15 | 3.15** | 0.17 | S |
| Denmark | 1,446 | 517 | 78 | 4,601 | 492 | 84 | 25 | 10.62*** | 0.31 | S |
| Estonia | 118 | 542 | 100 | 4,438 | 517 | 79 | 25 | 2.71** | 0.32 | S |
| Finland | 274 | 554 | 100 | 7,959 | 525 | 92 | 29 | 5.04*** | 0.31 | S |
| France | 777 | 526 | 102 | 3,041 | 508 | 108 | 18 | 4.28*** | 0.17 | S |
| Germany | 276 | 546 | 77 | 3,285 | 512 | 92 | 34 | 6.95*** | 0.38 | M |
| Greece | 311 | 534 | 84 | 4,176 | 471 | 97 | 63 | 12.51*** | 0.65 | M |
| Hungary | 754 | 508 | 82 | 3,820 | 486 | 93 | 22 | 6.49*** | 0.24 | S |
| Iceland | 19 | 461 | 75 | 2,786 | 486 | 98 | -24 | -1.07 | 0.25 | — |
| Ireland | 2,480 | 534 | 82 | 1,605 | 510 | 87 | 25 | 9.03*** | 0.29 | S |
| Italy | 1,320 | 486 | 95 | 26,235 | 493 | 96 | -8 | -2.82** | 0.08 | S |
| Japan | 1,835 | 544 | 96 | 4,359 | 540 | 97 | 4 | 1.62 | 0.05 | — |
| Korea | 2,340 | 544 | 84 | 2,599 | 529 | 88 | 15 | 6.18*** | 0.18 | S |
| Luxembourg | 769 | 489 | 93 | 4,054 | 490 | 104 | 0 | -0.12 | 0.00 | — |
| Mexico | 3,093 | 466 | 79 | 26,353 | 419 | 79 | 47 | 31.44*** | 0.60 | M |
| Netherlands | 2,333 | 508 | 96 | 1,171 | 510 | 92 | -2 | -0.49 | 0.02 | — |
| New Zealand | 214 | 596 | 93 | 3,304 | 513 | 102 | 82 | 11.45*** | 0.81 | L |
| Norway | 73 | 559 | 90 | 4,057 | 507 | 98 | 52 | 4.52*** | 0.53 | M |
| Poland | 98 | 556 | 109 | 3,998 | 517 | 85 | 40 | 3.57*** | 0.46 | M |
| Portugal | 571 | 540 | 75 | 4,398 | 484 | 92 | 56 | 16.32*** | 0.62 | M |
| Slovak Rep. | 353 | 520 | 90 | 3,653 | 461 | 104 | 60 | 11.70*** | 0.58 | M |
| Slovenia | 137 | 571 | 62 | 5,322 | 482 | 91 | 89 | 16.26*** | 0.98 | L |
| Spain | 7,537 | 517 | 83 | 15,717 | 478 | 91 | 39 | 32.52*** | 0.44 | M |
| Sweden | 579 | 513 | 101 | 3,727 | 486 | 103 | 27 | 5.86*** | 0.26 | S |
| Switzerland | 673 | 509 | 76 | 9,121 | 509 | 91 | 0 | -0.12 | 0.00 | — |
| Turkey | 62 | 555 | 78 | 4,448 | 477 | 85 | 78 | 7.17*** | 0.92 | L |
| UK | 4,837 | 513 | 94 | 5,783 | 497 | 92 | 16 | 8.76*** | 0.17 | S |
| USA | 315 | 524 | 84 | 4,315 | 499 | 91 | 25 | 5.00*** | 0.27 | S |
| *Min* | 19 | 461 | 62 | 1,171 | 411 | 72 | -24 | — | 0.00 | — |
| *Max* | 7,537 | 596 | 109 | 26,353 | 540 | 108 | 89 | — | 0.98 | — |
| *M* | 1,565 | 526 | 87 | 6,295 | 494 | 93 | 32 | — | 0.38 | — |
| *SD* | 1,920 | 31 | 10 | 6,255 | 28 | 8 | 27 | — | 0.26 | — |

*Note. t'* = observed *t* with adjusted *df*. *d* = Cohen's *d*. Int. = Interpretation. L = Large. M = Medium. S = Small.

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 4. Descriptive Statistics and *t* Test Results for Difference in Mean Reading Score between Private and

Public Schools in the Non-OECD Sample

| | Descriptive statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Private | | | Public | | | | | | |
| Country | *n* | *M* | *SD* | *n* | *M* | *SD* | Δ*M* | *t'* | *d* | Int. |
| Argentina | 1,640 | 450 | 81 | 2,975 | 375 | 84 | 74 | 29.11*** | 0.90 | L |
| Brazil | 2,385 | 481 | 80 | 13,179 | 395 | 79 | 86 | 49.05*** | 1.09 | L |
| Bulgaria | 60 | 574 | 92 | 5,023 | 438 | 117 | 136 | 11.26*** | 1.16 | L |
| Chinese Taipei | 2,119 | 497 | 92 | 3,714 | 537 | 86 | -40 | -16.52*** | 0.46 | M |
| Colombia | 1,369 | 456 | 87 | 6,839 | 396 | 80 | 60 | 23.60*** | 0.74 | L |
| Costa Rica | 649 | 505 | 67 | 2,830 | 431 | 68 | 74 | 25.23*** | 1.10 | L |
| Croatia | 86 | 521 | 74 | 4,749 | 485 | 86 | 36 | 3.93*** | 0.43 | M |
| Hong Kong (China) | 4,209 | 544 | 85 | 311 | 571 | 86 | -27 | -5.40*** | 0.32 | S |
| Indonesia | 2,033 | 396 | 74 | 3,094 | 400 | 77 | -4 | -1.93 | 0.06 | — |
| Jordan | 1,027 | 451 | 87 | 4,982 | 391 | 85 | 60 | 20.43*** | 0.70 | L |
| Kazakhstan | 158 | 407 | 58 | 5,500 | 393 | 74 | 13 | 2.81** | 0.18 | S |
| Latvia | 98 | 490 | 82 | 3,745 | 488 | 86 | 2 | 0.22 | 0.02 | — |
| Liechtenstein | 7 | 441 | 60 | 247 | 527 | 84 | -86 | -2.72** | 1.03 | L |
| Lithuania | 66 | 537 | 69 | 4,163 | 478 | 86 | 60 | 6.92*** | 0.69 | L |
| Macao (China) | 5,060 | 512 | 81 | 218 | 456 | 72 | 55 | 11.03*** | 0.68 | L |
| Malaysia | 209 | 422 | 107 | 4,936 | 398 | 82 | 24 | 3.23** | 0.29 | S |
| Montenegro | 18 | 435 | 52 | 4,578 | 422 | 91 | 13 | 1.06 | 0.14 | — |
| Peru | 1,235 | 438 | 86 | 4,066 | 367 | 87 | 71 | 25.08*** | 0.81 | L |
| Qatar | 3,244 | 450 | 112 | 5,146 | 355 | 95 | 95 | 39.86*** | 0.93 | L |
| Romania | 32 | 519 | 72 | 5,003 | 439 | 90 | 80 | 6.31*** | 0.90 | L |
| Russian Federation | 32 | 582 | 64 | 4,782 | 475 | 89 | 108 | 6.88*** | 1.21 | L |
| Serbia | 15 | 439 | 71 | 3,954 | 447 | 90 | -7 | -0.31 | 0.08 | — |
| Shanghai (China) | 480 | 600 | 75 | 4,547 | 566 | 79 | 34 | 9.11*** | 0.44 | M |
| Singapore | 127 | 554 | 87 | 5,061 | 544 | 101 | 10 | 1.29 | 0.10 | — |
| Thailand | 1,081 | 413 | 78 | 5,480 | 447 | 76 | -34 | -13.41*** | 0.45 | M |
| Tunisia | 9 | 289 | 62 | 3,715 | 406 | 88 | -117 | -4.11*** | 1.34 | L |
| UAE | 5,797 | 469 | 95 | 4,234 | 408 | 86 | 61 | 33.75*** | 0.67 | L |
| Uruguay | 884 | 497 | 77 | 4,244 | 397 | 89 | 101 | 34.24*** | 1.16 | L |
| Vietnam | 408 | 490 | 53 | 4,391 | 510 | 75 | -20 | -6.87*** | 0.27 | S |
| *Min* | 7 | 289 | 52 | 218 | 355 | 68 | -117 | — | 0.02 | — |
| *Max* | 5,797 | 600 | 112 | 13,179 | 571 | 117 | 136 | — | 1.34 | — |
| *M* | 1,191 | 478 | 78 | 4,335 | 446 | 85 | 32 | — | 0.63 | — |
| *SD* | 1,588 | 65 | 14 | 2,295 | 61 | 9 | 59 | — | 0.40 | — |

*Note.* *t'* = observed *t* with adjusted *df*. *d* = Cohen's *d*. Int. = Interpretation. L = Large. M = Medium. S = Small. *$p$ < .05. **$p$ < .01. ***$p$ < .001.

Table 5. Descriptive Statistics and *t* Test Results for Difference in Mean Science Score between Private and

Public Schools in the OECD Sample

| | Descriptive statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Private | | | Public | | | | | | |
| Country | *n* | *M* | *SD* | *n* | *M* | *SD* | Δ*M* | *t'* | *d* | Int. |
| Australia | 5,532 | 544 | 93 | 7,720 | 509 | 100 | 34 | 20.25*** | 0.35 | M |
| Belgium | 5,373 | 526 | 94 | 2,364 | 473 | 100 | 53 | 21.78*** | 0.55 | M |
| Canada | 1,578 | 559 | 77 | 16,776 | 526 | 90 | 32 | 15.68*** | 0.37 | M |
| Chile | 3,625 | 469 | 79 | 2,255 | 414 | 73 | 55 | 27.19*** | 0.72 | L |
| Czech Rep. | 389 | 522 | 88 | 4,011 | 509 | 89 | 13 | 2.71** | 0.14 | S |
| Denmark | 1,446 | 518 | 85 | 4,601 | 493 | 92 | 25 | 9.69*** | 0.28 | S |
| Estonia | 118 | 553 | 109 | 4,438 | 543 | 78 | 10 | 0.97 | 0.12 | — |
| Finland | 274 | 560 | 102 | 7,959 | 547 | 91 | 13 | 2.12* | 0.15 | S |
| France | 777 | 518 | 92 | 3,041 | 499 | 101 | 18 | 4.88*** | 0.19 | S |
| Germany | 276 | 562 | 87 | 3,285 | 526 | 96 | 37 | 6.65*** | 0.39 | M |
| Greece | 311 | 519 | 82 | 4,176 | 462 | 87 | 58 | 11.29*** | 0.66 | L |
| Hungary | 754 | 507 | 89 | 3,820 | 495 | 90 | 13 | 3.62*** | 0.14 | S |
| Iceland | 19 | 439 | 94 | 2,786 | 481 | 100 | -43 | -1.83 | 0.42 | — |
| Ireland | 2,480 | 530 | 88 | 1,605 | 510 | 91 | 20 | 7.11*** | 0.23 | S |
| Italy | 1,320 | 494 | 88 | 26,235 | 496 | 93 | -2 | -0.68 | 0.02 | — |
| Japan | 1,835 | 548 | 96 | 4,359 | 551 | 93 | -2 | -0.89 | 0.02 | — |
| Korea | 2,340 | 545 | 79 | 2,599 | 532 | 83 | 13 | 5.56*** | 0.16 | S |
| Luxembourg | 769 | 482 | 97 | 4,054 | 496 | 102 | -14 | -3.58*** | 0.14 | S |
| Mexico | 3,093 | 451 | 71 | 26,353 | 410 | 69 | 40 | 30.58*** | 0.58 | M |
| Netherlands | 2,333 | 519 | 97 | 1,171 | 521 | 92 | -2 | -0.68 | 0.02 | — |
| New Zealand | 214 | 592 | 91 | 3,304 | 517 | 101 | 74 | 11.54*** | 0.74 | L |
| Norway | 73 | 549 | 91 | 4,057 | 495 | 97 | 53 | 4.66*** | 0.55 | M |
| Poland | 98 | 569 | 97 | 3,998 | 525 | 85 | 44 | 5.05*** | 0.52 | M |
| Portugal | 571 | 536 | 77 | 4,398 | 485 | 88 | 51 | 14.53*** | 0.58 | M |
| Slovak Rep. | 353 | 514 | 93 | 3,653 | 469 | 103 | 44 | 8.45*** | 0.43 | M |
| Slovenia | 137 | 601 | 63 | 5,322 | 514 | 89 | 87 | 15.75*** | 0.98 | L |
| Spain | 7,537 | 522 | 77 | 15,717 | 487 | 85 | 35 | 31.17*** | 0.42 | M |
| Sweden | 579 | 508 | 96 | 3,727 | 487 | 97 | 21 | 4.82*** | 0.22 | S |
| Switzerland | 673 | 516 | 74 | 9,121 | 516 | 92 | 0 | 0.12 | 0.00 | — |
| Turkey | 62 | 510 | 65 | 4,448 | 465 | 80 | 46 | 5.49*** | 0.57 | M |
| UK | 4,837 | 530 | 97 | 5,783 | 510 | 97 | 20 | 10.49*** | 0.20 | S |
| USA | 315 | 514 | 83 | 4,315 | 501 | 93 | 14 | 2.83** | 0.15 | S |
| *Min* | 19 | 439 | 63 | 1,171 | 410 | 69 | -43 | — | 0.00 | — |
| *Max* | 7,537 | 601 | 109 | 26,353 | 551 | 103 | 87 | — | 0.98 | — |
| *M* | 1,565 | 526 | 87 | 6,295 | 499 | 91 | 27 | — | 0.34 | — |
| *SD* | 1,920 | 35 | 11 | 6,255 | 32 | 8 | 27 | — | 0.25 | — |

*Note.* *t'* = observed *t* with adjusted *df*. *d* = Cohen's *d*. Int. = Interpretation. L = Large. M = Medium. S = Small.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 6. Descriptive Statistics and *t* Test Results for Difference in Mean Science Score between Private and

Public Schools in the Non-OECD Sample

| | Descriptive statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Private | | | Public | | | | | | |
| Country | *n* | *M* | *SD* | *n* | *M* | *SD* | Δ*M* | *t'* | *d* | Int. |
| Argentina | 1,640 | 453 | 71 | 2,975 | 387 | 78 | 65 | 28.92*** | 0.87 | L |
| Brazil | 2,385 | 476 | 74 | 13,179 | 390 | 71 | 86 | 52.34*** | 1.20 | L |
| Bulgaria | 60 | 559 | 99 | 5,023 | 448 | 100 | 111 | 8.46*** | 1.10 | L |
| Chinese Taipei | 2,119 | 494 | 80 | 3,714 | 538 | 79 | -43 | -20.13*** | 0.55 | M |
| Colombia | 1,369 | 434 | 86 | 6,839 | 393 | 73 | 41 | 16.40*** | 0.54 | M |
| Costa Rica | 649 | 492 | 67 | 2,830 | 419 | 65 | 73 | 25.54*** | 1.11 | L |
| Croatia | 86 | 495 | 79 | 4,749 | 492 | 85 | 3 | 0.37 | 0.04 | — |
| Hong Kong (China) | 4,209 | 555 | 84 | 311 | 581 | 79 | -26 | -5.26*** | 0.31 | S |
| Indonesia | 2,033 | 380 | 69 | 3,094 | 385 | 70 | -6 | -2.87** | 0.08 | S |
| Jordan | 1,027 | 462 | 84 | 4,982 | 402 | 78 | 60 | 21.18*** | 0.76 | L |
| Kazakhstan | 158 | 428 | 64 | 5,500 | 425 | 75 | 3 | 0.58 | 0.04 | — |
| Latvia | 98 | 523 | 73 | 3,745 | 502 | 79 | 21 | 2.57* | 0.26 | S |
| Liechtenstein | 7 | 461 | 66 | 247 | 536 | 79 | -75 | -2.53* | 0.96 | L |
| Lithuania | 66 | 556 | 71 | 4,163 | 496 | 85 | 61 | 6.90*** | 0.71 | L |
| Macao (China) | 5,060 | 523 | 78 | 218 | 485 | 65 | 38 | 8.36*** | 0.49 | M |
| Malaysia | 209 | 451 | 98 | 4,936 | 419 | 77 | 31 | 4.55*** | 0.40 | M |
| Montenegro | 18 | 385 | 67 | 4,578 | 410 | 83 | -25 | -1.28 | 0.30 | — |
| Peru | 1,235 | 417 | 74 | 4,066 | 360 | 73 | 57 | 24.16*** | 0.78 | L |
| Qatar | 3,244 | 452 | 107 | 5,146 | 345 | 82 | 107 | 48.81*** | 1.16 | L |
| Romania | 32 | 482 | 65 | 5,003 | 439 | 79 | 43 | 3.08** | 0.54 | M |
| Russian Federation | 32 | 570 | 71 | 4,782 | 486 | 84 | 84 | 5.64*** | 1.00 | L |
| Serbia | 15 | 473 | 46 | 3,954 | 443 | 85 | 30 | 2.47* | 0.35 | — |
| Shanghai (China) | 480 | 599 | 71 | 4,547 | 577 | 82 | 22 | 6.36*** | 0.27 | S |
| Singapore | 127 | 559 | 84 | 5,061 | 553 | 105 | 5 | 0.71 | 0.05 | — |
| Thailand | 1,081 | 416 | 76 | 5,480 | 450 | 75 | -35 | -14.01*** | 0.47 | M |
| Tunisia | 9 | 352 | 55 | 3,715 | 399 | 78 | -47 | -1.86 | 0.60 | — |
| UAE | 5,797 | 475 | 96 | 4,234 | 418 | 83 | 57 | 31.74*** | 0.63 | M |
| Uruguay | 884 | 501 | 78 | 4,244 | 401 | 89 | 101 | 33.95*** | 1.16 | L |
| Vietnam | 408 | 512 | 65 | 4,391 | 530 | 78 | -17 | -5.14*** | 0.23 | S |
| *Min* | 7 | 352 | 46 | 218 | 345 | 65 | -75 | — | 0.04 | — |
| *Max* | 5,797 | 599 | 107 | 13,179 | 581 | 105 | 111 | — | 1.20 | — |
| *M* | 1,191 | 480 | 76 | 4,335 | 452 | 80 | 28 | — | 0.59 | — |
| *SD* | 1,588 | 61 | 13 | 2,295 | 66 | 8 | 50 | — | 0.37 | — |

*Note. t'* = observed *t* with adjusted *df*. *d* = Cohen's *d*. Int. = Interpretation. L = Large. M = Medium. S = Small.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 7. ANCOVA Results for Difference in Mean Math Score Between Private and Public Schools After

Controlling for Student and School Level Effects in the OECD Sample

| | Main effects | | | | | | Marginal M | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Gender | Grade | ESCS | Size | S-T | Type | Pvt. | Pub. | Δ | $R^2$ | $\eta^2_p$ |
| Australia | 118.9* | 205.1* | 1175.6* | 111.2* | 1.6 | 84.4* | 513 | 497 | 15 | 0.16 | 0.01 |
| Belgium | 192.6* | 608.4* | 476.4* | 0.7 | 583.8* | 162.9* | 485 | 461 | 24 | 0.52 | 0.02 |
| Canada | 142.4* | 194.4* | 1136.5* | 158.8* | 12.5* | 372.1* | 551 | 506 | 46 | 0.16 | 0.02 |
| Chile | 214.4* | 220.0* | 539.4* | 72.2* | 1.6 | 63.5* | 397 | 381 | 16 | 0.36 | 0.01 |
| Czech.[a] | 61.4* | 163.1* | 575.0* | 37.9* | 6.8 | 2.9 | 458 | 466 | -8 | 0.24 | — |
| Denmark | 93.3* | 117.8* | 843.3* | 15.6* | 6.9 | 40.9* | 519 | 502 | 16 | 0.21 | 0.01 |
| Estonia | 8.7 | 93.0* | 342.1* | 6.9 | ~0 | 1.4 | 534 | 527 | 8 | 0.12 | — |
| Finland | 6.2 | 244.3* | 578.0* | 9.2 | 3.7 | 3.5 | 477 | 466 | 10 | 0.14 | — |
| France | 103.8* | 481.0* | 346.1* | 24.1* | 76.3* | 44.4* | 495 | 476 | 19 | 0.50 | 0.01 |
| Germany | 63.9* | 160.4* | 401.8* | 246.8* | 0.1 | 13.9* | 508 | 490 | 18 | 0.38 | ~0 |
| Greece | 21.2* | 70.9* | 603.3* | 5.6* | 63.1* | 30.8* | 425 | 398 | 26 | 0.20 | 0.01 |
| Hungary | 52.7* | 179.1* | 1175.2* | 21.3* | 1.5 | 2.1 | 455 | 451 | 4 | 0.32 | — |
| Iceland | 0.5 | — | 202.7* | 1.3 | 0.7 | 1.6 | 469 | 495 | -26 | 0.07 | — |
| Ireland | 41.6* | 26.3* | 467.0*** | 7.4 | 5.1* | 17.1* | 502 | 491 | 11 | 0.17 | ~0 |
| Italy | 556.4* | 509.0* | 1413.2* | 172.8* | 1610.3* | 30.7* | 425 | 440 | -14 | 0.28 | ~0 |
| Japan | 69.8* | — | 524.4* | 226.1* | ~0 | 42.7* | 526 | 543 | -17 | 0.18 | 0.01 |
| Korea | 46.2* | 36.2* | 521.8* | 1.7 | 10.0 | 24.1* | 545 | 532 | 13 | 0.13 | ~0 |
| Luxem.[b] | 131.6* | 421.4* | 558.6* | 3.4 | 48.8* | 22.0* | 449 | 464 | -15 | 0.38 | ~0 |
| Mexico | 476.4* | 495.7* | 1027.0* | 468.6* | 6.5* | 245.3* | 415 | 392 | 24 | 0.21 | 0.01 |
| Nether.[c] | 47.4* | 238.0* | 248.7* | 342.5* | 143.0* | 3.7 | 495 | 500 | -5 | 0.39 | — |
| New Zea.[d] | 32.4* | 34.8* | 518.9* | 54.9* | 5.5 | 84.4* | 555 | 495 | 60 | 0.23 | 0.02 |
| Norway | 1.9 | — | 301.4* | 10.6 | 14.2* | 21.0* | 540 | 491 | 49 | 0.08 | 0.01 |
| Poland | 9.8 | 168.1* | 570.9* | 7.0 | 37.2* | 4.1 | 447 | 475 | -28 | 0.20 | — |
| Portugal | 143.8* | 596.2* | 413.6* | 0.3 | 9.72 | 0.5 | 436 | 433 | 3 | 0.50 | — |
| Slovak.[e] | 18.9* | 92.8* | 922.6* | 83.6* | 31.4* | 13.5* | 472 | 455 | 17 | 0.34 | ~0 |
| Slovenia | 33.8* | 134.5* | 608.2* | 287.4* | 6.0 | 109.5* | 567 | 496 | 71 | 0.25 | 0.02 |
| Spain | 611.6* | 3905.9* | 1342.2* | 4.2* | 1.8 | 148.5* | 459 | 445 | 14 | 0.41 | 0.01 |
| Sweden | 1.0 | 84.5* | 396.2* | 5.9* | ~0 | 1.6 | 482 | 477 | 5 | 0.15 | — |
| Switzer.[f] | 83.4* | 420.3* | 1009.6* | 64.6* | 11.3* | 69.4* | 471 | 498 | -27 | 0.28 | 0.01 |
| Turkey | 63.2* | 169.4* | 538.1* | 114.3* | 49.7* | 3.6 | 421 | 440 | -20 | 0.30 | — |
| UK | 41.4* | 1.0 | 1191.3* | 3.2 | 0.5 | 19.6* | 512 | 503 | 9 | 0.14 | ~0 |
| USA | 21.2* | 208.5* | 732.2* | ~0 | 0.5 | 17.5* | 459 | 477 | -18 | 0.22 | ~0 |
| *Min* | — | — | — | — | — | — | 397 | 381 | -28 | 0.07 | ~0 |
| *Max* | — | — | — | — | — | — | 567 | 543 | 71 | 0.52 | 0.02 |
| *M* | — | — | — | — | — | — | 483 | 474 | 9 | 0.26 | 0.01 |
| *SD* | — | — | — | — | — | — | 45 | 38 | 24 | 0.12 | ~0 |

*Note.* ESCS = Index of economic and socio cultural status. S-T = Student-teacher ratio. Pvt. = Private. Pub. = Public. $\eta_p^2$ = Partial eta-squared for school type. [a]Czech Republic. [b]Luxembourg. [c]Netherlands. [d]New Zealand. [e]Slovak Republic. [f]Switzerland. *$p < .001$.

Table 8. ANCOVA Results for Difference in Mean Math Score between Private and Public Schools After

Controlling for Student and School Level Effects in the Non-OECD Sample

| | Main effects | | | | | | Marginal M | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Gender | Grade | ESCS | Size | S-T | Type | Pvt. | Pub. | Δ | $R^2$ | $\eta^2_p$ |
| Argentina | 178.6* | 159.0* | 305.0* | 0.5 | 0.2 | 229.4* | 389 | 356 | 32 | 0.35 | 0.05 |
| Brazil | 549.1* | 898.8* | 520.2* | 144.9* | 136.2* | 1457.2* | 432 | 373 | 60 | 0.41 | 0.09 |
| Bulgaria | 18.6* | 47.6* | 561.6* | 695.7* | 26.8* | 59.4* | 494 | 417 | 77 | 0.33 | 0.01 |
| Chinese Tai.[a] | 0.5 | 232.2* | 1093.5* | 14.3* | 38.7* | 634.7* | 482 | 588 | -105 | 0.29 | 0.1 |
| Colombia | 523.89* | 481.0* | 558.4* | 24.9* | 33.5* | 150.9* | 384 | 359 | 25 | 0.35 | 0.02 |
| Costa Rica | 202.7* | 243.5* | 193.5* | 33.3* | 4.3 | 218.9* | 427 | 384 | 44 | 0.42 | 0.06 |
| Croatia | 40.5* | 81.2* | 605.2* | 81.1* | 68.1* | 3.6 | 497 | 479 | 18 | 0.18 | — |
| Hong Kong[†] | 72.1* | 82.7* | 214.7* | 30.5* | 339.0* | 14.5* | 541 | 560 | -19 | 0.26 | ~0 |
| Indonesia | 13.0* | 39.0* | 231.5* | 339.1* | 101.5* | 38.3* | 375 | 362 | 13 | 0.22 | 0.01 |
| Jordan | 103.4* | 87.2* | 226.8* | 27.7* | 96.1* | 409.1* | 403 | 350 | 54 | 0.22 | 0.07 |
| Kazakhstan | 1.0 | 3.3 | 494.3* | 155.1* | 9.0 | 1.9 | 422 | 431 | -8 | 0.12 | — |
| Latvia | 2.9 | 156.3* | 466.6* | 33.9* | 2.2 | 0.2 | 480 | 477 | 3 | 0.27 | — |
| Liechten.[b] | 8.4 | 12.1* | 6.5 | 31.3* | 46.0* | 1.3 | 511 | 543 | -32 | 0.56 | — |
| Lithuania | 4.0 | 91.2* | 384.5* | 198.1* | 0.1 | 41.6* | 534 | 470 | 64 | 0.21 | 0.01 |
| Macao[†] | 74.5* | 639.0* | 12.7* | 208.3* | 0.6 | 29.6* | 504 | 475 | 29 | 0.37 | 0.01 |
| Malaysia | 16.9* | 213.7* | 668.1* | 45.1* | 18.0* | 106.6* | 439 | 383 | 56 | 0.19 | 0.02 |
| Monten.[c] | 2.9 | 13.4* | 593.2* | 30.5* | 79.5* | 0.4 | 400 | 410 | -10 | 0.16 | — |
| Peru | 157.8* | 224.8* | 447.3* | 73.0* | 0.1 | 342.7* | 377 | 332 | 45 | 0.39 | 0.06 |
| Qatar | 82.0* | 104.8* | 168.4* | 126.6* | 46.4* | 1584.5* | 410 | 321 | 89 | 0.34 | 0.16 |
| Romania | 0.1 | 9.1* | 1208.1* | 51.5* | 0.1 | 6.9 | 486 | 453 | 33 | 0.20 | — |
| Russia[d] | ~0 | 58.6* | 461.5* | 51.3* | 8.8 | 6.9 | 492 | 452 | 40 | 0.15 | — |
| Serbia | 20.2* | 40.6* | 396.2* | 7.0 | 72.0* | 0.6 | 441 | 424 | 17 | 0.16 | — |
| Shanghai[†] | 19.2* | 122.8* | 421.7* | 10.9* | 221.5* | 102.1* | 613 | 568 | 45 | 0.28 | 0.02 |
| Singapore | 17.0* | 79.7* | 567.5* | 903.0* | 91.4* | 8.7 | 564 | 538 | 26 | 0.30 | — |
| Thailand | 28.9* | 12.2* | 263.0* | 196.0* | 72.3* | 155.5* | 405 | 440 | -36 | 0.15 | 0.03 |
| Tunisia | 156.7* | 382.3* | 230.8* | 9.3 | 0.3 | 0.2 | 360 | 368 | -8 | 0.42 | — |
| UAE | 0.1 | 147.3* | 347.2* | 173.1* | 13.2* | 445.8* | 429 | 388 | 41 | 0.28 | 0.05 |
| Uruguay | 104.0* | 456.1* | 266.8* | 38.0* | 49.0* | 248.3* | 435 | 390 | 46 | 0.47 | 0.04 |
| Vietnam | 85.8* | 369.2* | 463.7* | 75.8* | 16.5* | 156.3* | 399 | 449 | -50 | 0.35 | 0.03 |
| *Min* | — | — | — | — | — | — | 360 | 321 | -105 | 0.12 | 0.01 |
| *Max* | — | — | — | — | — | — | 613 | 588 | 89 | 0.56 | 0.16 |
| *M* | — | — | — | — | — | — | 453 | 432 | 20 | 0.29 | 0.05 |
| *SD* | — | — | — | — | — | — | 63 | 74 | 42 | 0.11 | 0.04 |

*Note.* ESCS = Index of economic and socio cultural status. S-T ratio = Student-teacher ratio. Pvt. = Private. Pub. = Public. $\eta_p^2$ = Partial eta-squared for school type. % = Percentage of explained variance attributable to school type.

[a]Chinese Taipei. [b]Liechtenstein. [c]Montenegro. [d]Russian Federation. †City/region of China.

Table 9. ANCOVA Results for Difference in Mean Reading Score between Private and Public Schools After

Controlling for Student and School Level Effects in the OECD Sample

| | Main effects | | | | | | Marginal M | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Gender | Grade | ESCS | Size | S-T | Type | Pvt. | Pub. | Δ | $R^2$ | $\eta^2_p$ |
| Australia | 399.3* | 169.7* | 1172.6* | 110.2* | 3.0 | 107.4* | 522 | 505 | 17 | 0.18 | 0.01 |
| Belgium | 148.8* | 475.2* | 424.7* | 1.2 | 713.4* | 121.3* | 474 | 454 | 21 | 0.51 | 0.02 |
| Canada | 577.0* | 233.3* | 1111.9* | 158.8* | 11.6* | 194.1* | 540 | 506 | 33 | 0.18 | 0.01 |
| Chile | 131.1* | 257.6* | 543.1* | 49.3* | 7.6 | 47.5* | 411 | 398 | 14 | 0.37 | 0.01 |
| Czech.[a] | 165.9* | 142.6* | 577.0* | 39.4* | 1.6 | 0.4 | 467 | 464 | 3 | 0.26 | — |
| Denmark | 176.4* | 96.4* | 778.5* | 15.4* | 26.4* | 41.7* | 513 | 497 | 17 | 0.22 | 0.01 |
| Estonia | 426.5* | 36.2* | 294.5* | 15.7* | ~0 | 12.3* | 543 | 520 | 22 | 0.16 | ~0 |
| Finland | 890.9* | 158.3* | 447.4* | 10.2 | ~0 | 12.2* | 499 | 479 | 20 | 0.20 | ~0 |
| France | 153.0* | 449.6* | 260.9* | 70.1* | 99.0* | 26.0* | 499 | 483 | 16 | 0.50 | 0.01 |
| Germany | 256.0* | 126.3* | 369.9* | 240.9* | 0.6 | 18.7* | 507 | 488 | 19 | 0.39 | 0.01 |
| Greece | 328.9* | 80.9* | 473.1* | 4.9 | 68.2* | 30.7* | 442 | 413 | 29 | 0.23 | 0.01 |
| Hungary | 220.3* | 195.6* | 1037.5* | 2.9 | 2.0 | 2.9 | 462 | 457 | 5 | 0.33 | — |
| Iceland | 198.6* | — | 209.4* | 0.8 | ~0 | 2.9 | 450 | 486 | -36 | 0.12 | — |
| Ireland | 126.1* | 17.5* | 507.8* | 8.6 | 7.7 | 25.5* | 523 | 510 | 13 | 0.21 | 0.01 |
| Italy | 1122.4* | 568.0* | 1491.5* | 261.1* | 1425.7* | 7.0 | 434 | 441 | -7 | 0.31 | — |
| Japan | 109.9* | — | 427.7* | 150.9* | 0.4 | 39.5* | 528 | 546 | -17 | 0.15 | 0.01 |
| Korea | 97.9* | 19.4* | 437.7* | 2.7 | 8.1 | 29.6* | 534 | 521 | 13 | 0.12 | 0.01 |
| Luxem.[b] | 144.2* | 316.5* | 496.9* | 5.6 | 41.0* | 16.9* | 447 | 462 | -15 | 0.33 | ~0 |
| Mexico | 595.5* | 501.8* | 1239.9* | 696.7* | 18.1* | 259.4* | 422 | 397 | 25 | 0.24 | 0.01 |
| Nether.[c] | 77.6* | 134.5* | 236.2* | 376.1* | 143.8* | 8.8 | 490 | 498 | -8 | 0.38 | — |
| New Zea.[d] | 114.3* | 41.2* | 522.2* | 58.6* | 0.5 | 52.5* | 555 | 506 | 50 | 0.23 | 0.01 |
| Norway | 245.8* | — | 271.5* | 37.7* | 10 | 23.7* | 563 | 507 | 56 | 0.12 | 0.01 |
| Poland | 244.6* | 142.6* | 434.8* | 30.2* | 12.6* | 1.2 | 466 | 480 | -14 | 0.22 | — |
| Portugal | 198.9* | 518.6* | 318.8* | 14.2* | 8.5 | 1.0 | 442 | 438 | 4 | 0.50 | — |
| Slovak.[e] | 243.1* | 116.1* | 870.1* | 99.5* | 14.6* | 41.9* | 462 | 433 | 30 | 0.39 | 0.01 |
| Slovenia | 547.4* | 41.0* | 638.4* | 216.7* | 0.9 | 106.7* | 549 | 481 | 68 | 0.29 | 0.02 |
| Spain | 474.1* | 3120.8* | 957.9* | 0.5 | 2.2 | 155.2* | 467 | 452 | 15 | 0.36 | 0.01 |
| Sweden | 243.7* | 82.2* | 345.9* | 23.0* | ~0 | 15.2* | 481 | 465 | 16 | 0.19 | ~0 |
| Switzer.[f] | 457.2* | 371.9* | 1198.3* | 79.0* | 13.8* | 48.6* | 462 | 483 | -21 | 0.32 | 0.01 |
| Turkey | 329.1* | 203.3* | 522.9* | 40.4* | 45.3* | ~0 | 460 | 459 | 1 | 0.35 | — |
| UK | 174.6* | 1.0 | 1202.7* | 7.2 | 2.5 | 7.6 | 508 | 502 | 6 | 0.14 | — |
| USA | 124.1* | 197.8* | 564.2* | 3.1 | 1.2 | 0.2 | 494 | 492 | 2 | 0.21 | — |
| *Min* | — | — | — | — | — | — | 411 | 397 | -36 | 0.12 | 0.01 |
| *Max* | — | — | — | — | — | — | 563 | 546 | 68 | 0.51 | 0.02 |
| *M* | — | — | — | — | — | — | 488 | 476 | 12 | 0.27 | 0.01 |
| *SD* | — | — | — | — | — | — | 41 | 35 | 22 | 0.11 | ~0 |

*Note.* ESCS = Index of economic and socio cultural status. S-T = Student-teacher ratio. Pvt. = Private. Pub. = Public. $\eta_p^2$ = Partial eta-squared for school type. [a]Czech Republic. [b]Luxembourg. [c]Netherlands. [d]New Zealand. [e]Slovak Republic. [f]Switzerland. *$p < .001$.

Table 10. ANCOVA Results for Difference in Mean Reading Score between Private and Public Schools After

Controlling for Student and School Level Effects in the Non-OECD Sample

| | Main effects | | | | | | Marginal M | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Gender | Grade | ESCS | Size | S-T | Type | Pvt. | Pub. | Δ | $R^2$ | $\eta^2_p$ |
| Argentina | 116.1* | 160.4* | 215.0* | 1.8 | ~0 | 335.1* | 403 | 357 | 47 | 0.37 | 0.07 |
| Brazil | 451.5* | 920.5* | 344.5* | 158.3* | 148.3* | 1043.4* | 444 | 388 | 56 | 0.39 | 0.07 |
| Bulgaria | 466.6* | 94.2* | 542.5* | 853.7* | 30.0* | 59.3* | 491 | 401 | 91 | 0.42 | 0.01 |
| Chinese Tai.[a] | 284.7* | 147.8* | 875.3* | 23.0* | 25.1* | 526.1* | 467 | 544 | -77 | 0.27 | 0.09 |
| Colombia | 73.5* | 498.8* | 575.5* | 61.7* | 8.2 | 194.8* | 412 | 380 | 31 | 0.35 | 0.02 |
| Costa Rica | 121.4* | 195.6* | 167.6* | 62.0* | 3.4 | 225.1* | 464 | 416 | 48 | 0.39 | 0.06 |
| Croatia | 422.1* | 75.6* | 649.5* | 63.4* | 113.7* | 15.9* | 527 | 492 | 35 | 0.25 | ~0 |
| Hong Kong† | 86.6* | 96.2* | 146.3* | 12.1* | 316.8* | 4.2 | 522 | 531 | -9 | 0.25 | — |
| Indonesia | 196.4* | 65.2* | 103.2* | 384.9* | 55.5* | 40.7* | 400 | 386 | 13 | 0.25 | 0.01 |
| Jordan | 1165.4* | 146.3* | 159.0* | 20.0* | 42.5* | 339.5* | 405 | 353 | 52 | 0.31 | 0.06 |
| Kazakhstan | 374.1* | 18.6* | 749.8* | 108.1* | 47.2* | 1.5 | 396 | 389 | 7 | 0.21 | — |
| Latvia | 487.6* | 163.0* | 483.5* | 61.0* | 0.6 | 2.6 | 478 | 467 | 12 | 0.36 | — |
| Liechten.[b] | 13.3* | 4.5 | 5.3 | 37.2* | 29.7* | 1.5 | 488 | 522 | -34 | 0.5 | — |
| Lithuania | 530.5* | 75.1* | 324.5* | 331.3* | 2.5 | 36.9* | 524 | 469 | 55 | 0.3 | 0.01 |
| Macao† | 160.1* | 463.5* | ~0 | 232.2* | 2.0 | 32.0* | 483 | 455 | 27 | 0.33 | 0.01 |
| Malaysia | 350.4* | 414.6* | 412.7* | 7.6 | 24.0* | 8.9 | 362 | 345 | 17 | 0.21 | — |
| Monten.[c] | 775.5* | 10.2 | 660.7* | 8.0 | 96.9* | 4.7 | 461 | 424 | 37 | 0.26 | — |
| Peru | 72.3* | 264.7* | 502.4* | 131.8* | ~0 | 248.4* | 386 | 344 | 42 | 0.41 | 0.04 |
| Qatar | 1119.8* | 102.6* | 188.3* | 47.0* | 2.4 | 1106.2* | 416 | 332 | 83 | 0.34 | 0.12 |
| Romania | 367.7* | 2.6 | 1060.6* | 28.6* | 2.5 | 6.8 | 478 | 442 | 36 | 0.22 | — |
| Russia[d] | 288.0* | 43.1* | 543.4* | 55.5* | 0.1 | 29.9* | 527 | 444 | 83 | 0.21 | 0.01 |
| Serbia | 288.0* | 34.6* | 335.7* | 12.5* | 60.6* | 0.3 | 434 | 422 | 12 | 0.18 | — |
| Shanghai† | 110.4* | 90.7* | 464.9* | ~0 | 229.8* | 125.3* | 578 | 538 | 39 | 0.28 | 0.02 |
| Singapore | 253.4* | 123.2* | 663.6* | 779.5* | 82.4* | 12.9* | 530 | 500 | 30 | 0.32 | ~0 |
| Thailand | 865.4* | 18.0* | 276.7* | 289.6* | 48.0* | 173.8* | 418 | 451 | -32 | 0.29 | 0.03 |
| Tunisia | 72.8* | 510.7* | 155.4* | ~0 | 3.9 | 15.1* | 291 | 375 | -83 | 0.47 | ~0 |
| UAE | 829.8* | 187.0* | 273.7* | 176.0* | 3.7 | 199.4* | 426 | 397 | 28 | 0.31 | 0.02 |
| Uruguay | 212.4* | 420.8* | 133.6* | 47.5* | 10.4 | 296.8* | 442 | 387 | 55 | 0.45 | 0.05 |
| Vietnam | 180.7* | 452.0* | 325.9* | 115.6* | 20.4* | 149.7* | 408 | 449 | -41 | 0.4 | 0.03 |
| *Min* | — | — | — | — | — | — | 291 | 332 | -83 | 0.18 | 0.01 |
| *Max* | — | — | — | — | — | — | 578 | 544 | 91 | 0.5 | 0.12 |
| *M* | — | — | — | — | — | — | 450 | 428 | 23 | 0.32 | 0.04 |
| *SD* | — | — | — | — | — | — | 61 | 62 | 43 | 0.08 | 0.03 |

*Note.* ESCS = Index of economic and socio cultural status. S-T ratio = Student-teacher ratio. Pvt. = Private. Pub. = Public. $\eta_p^2$ = Partial eta-squared for school type. % = Percentage of explained variance attributable to school type.

[a]Chinese Taipei. [b]Liechtenstein. [c]Montenegro. [d]Russian Federation. †City/region of China.

Table 11. ANCOVA Results for Difference in Mean Science Score between Private and Public Schools After

Controlling for Student and School Level Effects in the OECD Sample

| | Main effects | | | | | | Marginal M | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Gender | Grade | ESCS | Size | S-T | Type | Pvt. | Pub. | Δ | $R^2$ | $\eta^2_p$ |
| Australia | 32.9* | 176.4* | 1145.8* | 67.7* | 4.0 | 73.3* | 529 | 514 | 15 | 0.15 | 0.01 |
| Belgium | 79.6* | 497.0* | 499.7* | 3.6 | 437.4* | 122.4* | 474 | 453 | 21 | 0.47 | 0.02 |
| Canada | 26.5* | 248.2* | 1039.7* | 1.2 | 47.6* | 69.0* | 535 | 514 | 20 | 0.13 | ~0 |
| Chile | 23.9* | 141.0* | 437.4* | 47.0* | 5.5 | 76.5* | 423 | 404 | 19 | 0.29 | 0.02 |
| Czech.[a] | 19.4* | 147.1* | 505.4* | 24.2* | 0.8 | ~0 | 480 | 479 | 1 | 0.21 | — |
| Denmark | 60.9* | 117.7* | 710.9* | 22.2* | 9.6 | 41.4* | 519 | 500 | 19 | 0.19 | 0.01 |
| Estonia | 0.5 | 33.1* | 294.5* | 11.0* | 0.6 | 1.2 | 553 | 546 | 7 | 0.09 | — |
| Finland | 28.3* | 186.6* | 485.6* | ~0 | 0.8 | 2.4 | 499 | 490 | 9 | 0.12 | — |
| France | 17.6* | 448.6* | 348.8* | 16.6* | 98.9* | 16.5* | 491 | 479 | 12 | 0.47 | ~0 |
| Germany | 4.3 | 125.0* | 430.5* | 155.1* | 0.4 | 15.2* | 521 | 502 | 19 | 0.34 | ~0 |
| Greece | 15.7* | 59.0* | 519.9* | 2.5 | 97.1* | 31.6* | 443 | 416 | 27 | 0.19 | 0.01 |
| Hungary | 17.4* | 153.9* | 1105.0* | 7.9 | 0.2 | 2.0 | 475 | 471 | 4 | 0.29 | — |
| Iceland | 0.4 | — | 220.2* | 9.2 | 0.3 | 7.1 | 421 | 481 | -60 | 0.08 | — |
| Ireland | 6.3 | 16.8* | 456.8* | 15.2* | 3.3 | 15.5* | 520 | 509 | 11 | 0.16 | ~0 |
| Italy | 52.7* | 431.5* | 1393.2* | 277.3* | 1073.6* | 0.8 | 444 | 447 | -2 | 0.24 | — |
| Japan | 21.2* | — | 417.9* | 150.4* | ~0 | 68.7* | 533 | 556 | -22 | 0.14 | 0.01 |
| Korea | 2.5 | 34.1* | 337.1* | 2 | 9.9 | 19.9* | 531 | 521 | 10 | 0.09 | ~0 |
| Luxem.[b] | 26.8* | 302.0* | 703.8* | 9.8 | 32.7* | 22.7* | 450 | 467 | -17 | 0.34 | ~0 |
| Mexico | 104.9* | 343.9* | 1202.9* | 502* | 18.9* | 216.3* | 418 | 397 | 21 | 0.19 | 0.01 |
| Nether.[c] | 8.9 | 141.9* | 277.3* | 257.5* | 156.4* | 9.4 | 498 | 506 | -8 | 0.35 | — |
| New Zea.[d] | 3.5 | 25.1* | 558.3* | 41.6* | ~0 | 35.3* | 550 | 510 | 41 | 0.21 | 0.01 |
| Norway | 0.6 | — | 278.8* | 6.6 | 6.1 | 20.4* | 549 | 496 | 53 | 0.07 | ~0 |
| Poland | 0.4 | 155.4* | 449.4* | 13.8* | 23.1* | 0.4 | 479 | 487 | -8 | 0.18 | — |
| Portugal | 20.5* | 474.3* | 403.1* | 5 | 5.9 | 0.1 | 441 | 442 | -1 | 0.46 | — |
| Slovak.[e] | 11.4* | 95.2* | 1020.0* | 108.0* | 22.6* | 8.9 | 458 | 444 | 14 | 0.36 | — |
| Slovenia | 0.1 | 63.4* | 560.0* | 247.6* | 13.0* | 113.6* | 586 | 514 | 72 | 0.21 | 0.02 |
| Spain | 172.4* | 2571.2* | 1185.5* | 3.8 | 0.8 | 129.8* | 478 | 465 | 13 | 0.32 | 0.01 |
| Sweden | 0.8 | 66.2* | 403.7* | 2.8 | 4.0 | 9.5 | 491 | 479 | 12 | 0.14 | — |
| Switzer.[f] | 21.4* | 346.1* | 1333.8* | 19.1* | 2.4 | 35.9* | 469 | 488 | -19 | 0.27 | ~0 |
| Turkey | 2 | 140.4* | 345.1* | 85.7* | 71.7* | 4.6 | 431 | 451 | -20 | 0.26 | — |
| UK | 38.8* | 3.4 | 1319.1* | 2.6 | 0.4 | 12.1* | 538 | 531 | 7 | 0.15 | ~0 |
| USA | 2.5 | 164.7* | 674.5* | 6.5 | 4.7 | 10.8 | 478 | 493 | -15 | 0.19 | — |
| *Min* | — | — | — | — | — | — | 418 | 397 | -60 | 0.07 | 0.01 |
| *Max* | — | — | — | — | — | — | 586 | 556 | 72 | 0.47 | 0.02 |
| *M* | — | — | — | — | — | — | 491 | 483 | 8 | 0.23 | 0 |
| *SD* | — | — | — | — | — | — | 44 | 38 | 24 | 0.11 | ~0 |

*Note.* ESCS = Index of economic and socio cultural status. S-T = Student-teacher ratio. Pvt. = Private. Pub. = Public. $\eta_p^2$ = Partial eta-squared for school type. [a]Czech Republic. [b]Luxembourg. [c]Netherlands. [d]New Zealand. [e]Slovak Republic. [f]Switzerland. *$p < .001$.

Table 12. ANCOVA Results for Difference in Mean Science Score between Private and Public Schools After

Controlling for Student and School Level Effects in the Non-OECD Sample

| | Main effects | | | | | | Marginal M | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Gender | Grade | ESCS | Size | S-T | Type | Pvt. | Pub. | Δ | $R^2$ | $\eta^2_p$ |
| Argentina | 6.1 | 158* | 308.2* | 0.4 | ~0 | 294.7* | 415 | 375 | 40 | 0.35 | 0.06 |
| Brazil | 56.2* | 807.7* | 422.5* | 86.8* | 161.3* | 1222.2* | 443 | 387 | 56 | 0.37 | 0.08 |
| Bulgaria | 10.4 | 51.9* | 663.6* | 633.0* | 9.4 | 41.9* | 494 | 424 | 70 | 0.35 | 0.01 |
| Chinese Tai.a | 1.6 | 149.1* | 970.9* | 33.2* | 28.1* | 630.5* | 468 | 544 | -76 | 0.27 | 0.1 |
| Colombia | 267.6* | 496.7* | 366.8* | 94.9* | 42.8* | 57.6* | 396 | 380 | 16 | 0.32 | 0.01 |
| Costa Rica | 31.2* | 176.3* | 169.0* | 50.7* | 0.8 | 192.7* | 452 | 407 | 45 | 0.35 | 0.05 |
| Croatia | ~0 | 37.3* | 491.5* | 71.2* | 42.7* | 1.0 | 506 | 497 | 9 | 0.14 | — |
| Hong Kong† | 25.4* | 99.9* | 151.1* | 14.4* | 296.7* | 6.2 | 533 | 544 | -11 | 0.23 | — |
| Indonesia | 2.7 | 40.2* | 178.5* | 330.1* | 87.1* | 21.2* | 387 | 378 | 9 | 0.2 | ~0 |
| Jordan | 377.1* | 90.3* | 230.9* | 11.2* | 36.3* | 306.4* | 423 | 374 | 49 | 0.22 | 0.06 |
| Kazakhstan | 14.9* | 15.0* | 538.2* | 173.1* | 29.4* | ~0 | 424 | 425 | -1 | 0.14 | — |
| Latvia | 12.3* | 133.2* | 346.4* | 32.7* | 8.2 | 12.3* | 510 | 485 | 26 | 0.23 | ~0 |
| Liechten.[b] | 6.5 | 6.6 | 9.9 | 52.4* | 6.7 | 0.8 | 505 | 529 | -24 | 0.49 | — |
| Lithuania | 23.6* | 41.8* | 341.5* | 196.5* | 0.8 | 27.0* | 538 | 488 | 50 | 0.18 | 0.01 |
| Macao† | 37.7* | 455* | 7.3 | 236.2* | 0.5 | 2.3 | 494 | 487 | 7 | 0.3 | — |
| Malaysia | 29.0* | 224.2* | 559.5* | 9.3 | 27.1* | 14.8* | 403 | 382 | 21 | 0.16 | ~0 |
| Monten.[c] | 38.2* | 2.4 | 583.9* | 1.8 | 165.1* | 0.1 | 415 | 410 | 5 | 0.17 | — |
| Peru | 17.8* | 151.6* | 436.6* | 57.6* | 1.1 | 193.5* | 378 | 345 | 33 | 0.32 | 0.03 |
| Qatar | 381.5* | 81.8* | 180.8* | 84.7* | 70.9* | 1539.5* | 423 | 330 | 93 | 0.34 | 0.16 |
| Romania | 8.7 | 16.7* | 1027.9* | 35.0* | 1.6 | ~0 | 452 | 450 | 2 | 0.18 | — |
| Russia[d] | 2.4 | 22.3* | 627.0* | 37.4* | 4.6 | 9.7 | 511 | 465 | 46 | 0.16 | — |
| Serbia | 3.0 | 35.0* | 273.7* | 5.6 | 84.7* | 2.2 | 446 | 414 | 32 | 0.12 | — |
| Shanghai† | 17.7* | 103.5* | 473.3* | 8.6 | 197.8* | 53.5* | 574 | 547 | 27 | 0.27 | 0.01 |
| Singapore | 8.5 | 103.6* | 706.0* | 830.5* | 82.1* | 10.7 | 539 | 511 | 28 | 0.32 | — |
| Thailand | 75.2* | 14.2* | 198.1* | 258.8* | 75.9* | 163.0* | 421 | 455 | -34 | 0.16 | 0.03 |
| Tunisia | 40.1* | 375.4* | 104.7* | 1.1 | ~0 | 2.5 | 344 | 377 | -33 | 0.37 | — |
| UAE | 187.4* | 131.0* | 381.6* | 89.7* | 6.4 | 175.0* | 437 | 410 | 28 | 0.24 | 0.02 |
| Uruguay | 5.0 | 383.6* | 190.8* | 29.8* | 9.4 | 239.8* | 445 | 394 | 51 | 0.42 | 0.04 |
| Vietnam | 25.5* | 399.0* | 268.8* | 18.6* | 4.6 | 130.3* | 426 | 468 | -42 | 0.31 | 0.03 |
| *Min* | — | — | — | — | — | — | 344 | 330 | -76 | 0.12 | 0.01 |
| *Max* | — | — | — | — | — | — | 574 | 547 | 93 | 0.49 | 0.16 |
| *M* | — | — | — | — | — | — | 455 | 437 | 18 | 0.26 | 0.05 |
| *SD* | — | — | — | — | — | — | 56 | 63 | 36 | 0.1 | 0.04 |

*Note.* ESCS = Index of economic and socio cultural status. S-T ratio = Student-teacher ratio. Pvt. = Private. Pub. = Public. $\eta_p^2$ = Partial eta-squared for school type. % = Percentage of explained variance attributable to school type.

[a]Chinese Taipei. [b]Liechtenstein. [c]Montenegro. [d]Russian Federation. †City/region of China.

## Discussion

Recent research in the United States suggests that student performance differences between private and public schools disappear once student and school level differences are controlled for. This is an important result as it suggests that in the absence of such differences, delivery of education through public means can be as efficient as that through private means. However, given the often significant differences in economic, social, and political systems across countries, generalization of recent U.S. results to the rest of the world may not be appropriate. The current study bridges this gap in the literature by examining the private versus public school difference in literacy in key areas such as mathematics, reading, and science using recent comparable nationally representative samples from 61 economies. Our empirical results suggest that most economies have significant private-public school performance differences, and for many economies these differences persist even after controlling for student and school level characteristics such as age, gender, grade, socioeconomic status, disability status, school size, and student-teacher ratio. This finding is supported by recent studies that found a significant gap in formal learning favoring private schools such as Arenas and Gortazar (2024), and González and Bonal (2021) in Spain; Bagde et al. (2022) in India; Delprato and Antequera (2021) in Ecuador, Guatemala, Honduras, and Paraguay; and Romuald (2023) in Sub-Saharan Africa.

Our statistical results have several important implications. First, our results indicate considerable variability in the observed magnitude and direction of effect of school type on literacy across countries and literacy areas represented in our sample. This finding highlights the importance of country level studies for an in depth coverage of this effect, and reinforces the idea that policies that work in one country may not be applicable to or work in another one.

Second, our results suggest that in general the private-public literacy gap favors private schools in all three areas of literacy, mathematics, reading, and science, examined in this study. This lends credence to the notion that in a majority of countries around the globe the quality of education available through private means surpasses that which is available publicly. In other words, in many parts of the world there is a justification for parents to send their children to private schools and consequently pay higher fees given the failure of the public education system in their countries to provide an educational experience that is otherwise available through private means.

Third, an examination of our results evaluating mean difference in literacy between private and public schools across the three literacy areas before and after controlling for the effect of covariates suggests that inclusion of covariates can have a critical effect on the interpretation of mean differences for some countries. For example, for the U.S. the simple *t* test results suggested that private schools perform no better than public schools when it comes to providing literacy in mathematics. However, once covariates were included, the mean difference turned significant in favor of public schools suggesting that on average public school students have better literacy in mathematics as compared to their private counterparts. This is an important result highlighting the inadequacy of simple mean comparison methods such as the *Student's t* test that ignore the effect of covariates for comparing academic outcomes between various school types.

Although our analytical results showed presence of some significant effects, those results should not be generalized to countries and populations of schools and students different from those represented by our sample. Future research in this area can examine the effect of school type on additional areas of literacy, sub-areas within each literacy area, and can target additional countries and student age groups in order to generate stronger evidence for the relationship between school type and literacy.

## Conclusions

Private-public achievement gap has been a subject of on-going debate in education literature. However, the pattern of this gap is not consistent across countries. In most countries private school performance significantly exceeds that of public schools, but for some countries either the reverse is true, or there is no evidence of an achievement gap between the two school types. Thus, there is a need for country level in-depth studies of the determinants of private-public school achievement gap. In addition, it is important to model this gap using sophisticated statistical methods that allow controlling for important student and school level covariates because empirical results tend to be misleading when such covariates are omitted.

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