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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 Munich, 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 η^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 η^2 values estimate the unique contribution of school type in explaining the total variation in math literacy in our sample. These η_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

Country	Descriptive statistics						ΔM	t'	d	Interp.
	Private			Public						
	n	M	SD	n	M	SD				
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	—
<i>Min</i>	19	446	63	1,171	390	71	-19	—	0.03	—
<i>Max</i>	7,537	588	102	26,353	547	102	86	—	0.95	—
<i>M</i>	1,565	520	87	6,295	491	90	29	—	0.37	—
<i>SD</i>	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

Country	Descriptive statistics						ΔM	t'	d	Int.
	Private			Public						
	n	M	SD	n	M	SD				
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
<i>Min</i>	7	364	49	218	339	62	-89	—	0.01	—
<i>Max</i>	5,797	644	110	13,179	608	111	111	—	1.28	—
<i>M</i>	1,191	480	77	4,335	448	82	32	—	0.65	—
<i>SD</i>	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

Country	Descriptive statistics						ΔM	<i>t'</i>	<i>d</i>	Int.
	Private			Public						
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>				
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
<i>Min</i>	19	461	62	1,171	411	72	-24	—	0.00	—
<i>Max</i>	7,537	596	109	26,353	540	108	89	—	0.98	—
<i>M</i>	1,565	526	87	6,295	494	93	32	—	0.38	—
<i>SD</i>	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

Country	Descriptive statistics						ΔM	t'	d	Int.
	Private			Public						
	n	M	SD	n	M	SD				
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
<i>Min</i>	7	289	52	218	355	68	-117	—	0.02	—
<i>Max</i>	5,797	600	112	13,179	571	117	136	—	1.34	—
<i>M</i>	1,191	478	78	4,335	446	85	32	—	0.63	—
<i>SD</i>	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

Country	Descriptive statistics						ΔM	t'	d	Int.
	Private			Public						
	n	M	SD	n	M	SD				
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
<i>Min</i>	19	439	63	1,171	410	69	-43	—	0.00	—
<i>Max</i>	7,537	601	109	26,353	551	103	87	—	0.98	—
<i>M</i>	1,565	526	87	6,295	499	91	27	—	0.34	—
<i>SD</i>	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

Country	Descriptive statistics						ΔM	t'	d	Int.
	Private			Public						
	n	M	SD	n	M	SD				
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
<i>Min</i>	7	352	46	218	345	65	-75	—	0.04	—
<i>Max</i>	5,797	599	107	13,179	581	105	111	—	1.20	—
<i>M</i>	1,191	480	76	4,335	452	80	28	—	0.59	—
<i>SD</i>	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

Country	Main effects						Marginal M			R^2	η_p^2
	Gender	Grade	ESCS	Size	S-T	Type	Pvt.	Pub.	Δ		
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
<i>Min</i>	—	—	—	—	—	—	397	381	-28	0.07	~0
<i>Max</i>	—	—	—	—	—	—	567	543	71	0.52	0.02
<i>M</i>	—	—	—	—	—	—	483	474	9	0.26	0.01
<i>SD</i>	—	—	—	—	—	—	45	38	24	0.12	~0

Note. ESCS = Index of economic and socio cultural status. S-T = Student-teacher ratio. Pvt. = Private. Pub. = Public. η_p^2 = Partial eta-squared for school type. ^aCzech Republic. ^bLuxembourg. ^cNetherlands. ^dNew Zealand. ^eSlovak Republic. ^fSwitzerland. * $p < .001$.

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

Country	Main effects						Marginal M				
	Gender	Grade	ESCS	Size	S-T	Type	Pvt.	Pub.	Δ	R^2	η_p^2
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
<i>Min</i>	—	—	—	—	—	—	360	321	-105	0.12	0.01
<i>Max</i>	—	—	—	—	—	—	613	588	89	0.56	0.16
<i>M</i>	—	—	—	—	—	—	453	432	20	0.29	0.05
<i>SD</i>	—	—	—	—	—	—	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. η_p^2 = Partial eta-squared for school type. % = Percentage of explained variance attributable to school type.

^aChinese Taipei. ^bLiechtenstein. ^cMontenegro. ^dRussian 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

Country	Main effects						Marginal M				
	Gender	Grade	ESCS	Size	S-T	Type	Pvt.	Pub.	Δ	R^2	η_p^2
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	—
<i>Min</i>	—	—	—	—	—	—	411	397	-36	0.12	0.01
<i>Max</i>	—	—	—	—	—	—	563	546	68	0.51	0.02
<i>M</i>	—	—	—	—	—	—	488	476	12	0.27	0.01
<i>SD</i>	—	—	—	—	—	—	41	35	22	0.11	~0

Note. ESCS = Index of economic and socio cultural status. S-T = Student-teacher ratio. Pvt. = Private. Pub. = Public. η_p^2 = Partial eta-squared for school type. ^aCzech Republic. ^bLuxembourg. ^cNetherlands. ^dNew Zealand. ^eSlovak Republic. ^fSwitzerland. * $p < .001$.

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

Country	Main effects						Marginal M				
	Gender	Grade	ESCS	Size	S-T	Type	Pvt.	Pub.	Δ	R^2	η_p^2
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
<i>Min</i>	—	—	—	—	—	—	291	332	-83	0.18	0.01
<i>Max</i>	—	—	—	—	—	—	578	544	91	0.5	0.12
<i>M</i>	—	—	—	—	—	—	450	428	23	0.32	0.04
<i>SD</i>	—	—	—	—	—	—	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. η_p^2 = Partial eta-squared for school type. % = Percentage of explained variance attributable to school type.

^aChinese Taipei. ^bLiechtenstein. ^cMontenegro. ^dRussian 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

Country	Main effects						Marginal M				
	Gender	Grade	ESCS	Size	S-T	Type	Pvt.	Pub.	Δ	R^2	η_p^2
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	—
<i>Min</i>	—	—	—	—	—	—	418	397	-60	0.07	0.01
<i>Max</i>	—	—	—	—	—	—	586	556	72	0.47	0.02
<i>M</i>	—	—	—	—	—	—	491	483	8	0.23	0
<i>SD</i>	—	—	—	—	—	—	44	38	24	0.11	~0

Note. ESCS = Index of economic and socio cultural status. S-T = Student-teacher ratio. Pvt. = Private. Pub. = Public. η_p^2 = Partial eta-squared

for school type. ^aCzech Republic. ^bLuxembourg. ^cNetherlands. ^dNew Zealand. ^eSlovak Republic. ^fSwitzerland. * $p < .001$.

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

Country	Main effects						Marginal M				
	Gender	Grade	ESCS	Size	S-T	Type	Pvt.	Pub.	Δ	R^2	η_p^2
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
<i>Min</i>	—	—	—	—	—	—	344	330	-76	0.12	0.01
<i>Max</i>	—	—	—	—	—	—	574	547	93	0.49	0.16
<i>M</i>	—	—	—	—	—	—	455	437	18	0.26	0.05
<i>SD</i>	—	—	—	—	—	—	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. η_p^2 = Partial eta-squared for school type. % = Percentage of explained variance attributable to school type.

^aChinese Taipei. ^bLiechtenstein. ^cMontenegro. ^dRussian 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.

References

- Alsher, T. (2021). Error analysis of written essays: Do private school students show better EFL writing performance? *International Journal of Research in Education and Science*, 7(3), 609–629. <https://www.ijres.net/index.php/ijres/article/view/1815>
- Arenas, A., & Gortazar, L. (2024). Learning loss one year after school closures: Evidence from the Basque Country. *SERIEs - Journal of the Spanish Economic Association*. <https://doi.org/10.1007/s13209-024-00296-4>
- Bagde, S., Epple, D., & Taylor, L. (2022). The emergence of private high schools in India: The impact of public-private competition on public school students. *Journal of Public Economics*, 215, 1–9. <https://www.sciencedirect.com/science/article/pii/S0047272722001517>
- Braun, H., Jenkins, F., and Grigg, W. (2006). *Comparing private schools and public schools using hierarchical linear modeling* (NCES 2006-461). U.S. Department of Education, National Center for Education Statistics, Institute of Education Sciences. Washington, DC: U.S. Government Printing Office. <https://nces.ed.gov/nationsreportcard/pdf/studies/2006461.pdf>
- Brown, G., & Micklewright, J. (2004). *Using international surveys of achievement and literacy: A view from the outside*. Montreal, Canada: UNESCO Institute for Statistics. https://uis.unesco.org/sites/default/files/documents/using-international-surveys-of-achievement-and-literacy-a-view-from-the-outside-04-en_0.pdf
- Caldwell, B. (2010). Is private schooling becoming the preferred model of school choice in Australia? *Journal of School Choice*, 4, 378–397. <https://eric.ed.gov/?id=EJ908162>
- Carbonaro, W. (2006). Public-private differences in achievement among kindergarten students: Differences in learning opportunities and student outcomes. *American Journal of Education*, 113(1), 31–65. <https://eric.ed.gov/?id=EJ750303>


- Chakrabarti, R. (2008). Can increasing private school participation and monetary loss in a voucher program affect public school performance? Evidence from Milwaukee. *Journal of Public Economics*, 92, 1371–1393. https://econpapers.repec.org/article/eeepubeco/v_3a92_3ay_3a2008_3ai_3a5-6_3ap_3a1371-1393.htm
- Cohen, J. (1992). Quantitative methods in Psychology: A power primer. *Psychological Bulletin*, 112(1), 155–159. <https://www2.psych.ubc.ca/~schaller/528Readings/Cohen1992.pdf>
- Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. *Education Policy Analysis Archives*, 8. <https://epaa.asu.edu/index.php/epaa/article/view/392>
- Delprato, M. & Antequera, G. (2021). Public and private school efficiency and equity in Latin America: New evidence based on PISA for development. *International Journal of Educational Development*, 84, 1–32. <https://www.sciencedirect.com/science/article/abs/pii/S0738059321000572>
- Entwisle, D., Alexander, K., & Olson, L. (1994). The gender gap in math: Its possible origins in neighborhood effects. *American Sociological Review*, 59(6), 822–838. <https://www.jstor.org/stable/2096370>
- Espinoza, O., & González. (2013). Access to higher education in Chile: A public vs. private analysis. *Prospects*, 43, 199–214. <https://unesdoc.unesco.org/ark:/48223/pf0000223180>
- Filer, R., & Münich, D. (2013). Responses of private and public schools to voucher funding. *Economics of Education Review*, 34, 269–285. <https://www.sciencedirect.com/science/article/pii/S0272775712001495>
- Forgasz, H., & Hill, J. (2013). Factors implicated in high mathematics achievement. *International Journal of Science and Mathematics Education*, 11(2), 481–499. <https://eric.ed.gov/?id=EJ998163>
- Friedman, M. (1955). The role of government in education. In Solo, R. (Ed.), *Economics and the public interest*. New Brunswick, NJ: Rutgers University Press. <https://www.worldcat.org/title/role-of-government-in-education/oclc/80693211>
- González, S., & Bonal, X. (2021). COVID-19 school closures and cumulative disadvantage: Assessing the learning gap in formal, informal and non-formal education. *European Journal of Education*, 56, 607–622. <https://onlinelibrary.wiley.com/doi/full/10.1111/ejed.12476>
- Greenwald, R., Hedges, L., & Laine, R. (1996). The effect of school resources on student achievement. *Review of Educational Research*, 66(3), 361–396. <https://www.jstor.org/stable/1170528>
- Hanushek, E. (1996). A more complete picture of school resource policies. *Review of Educational Research*, 66(3), 397–409. <https://hanushek.stanford.edu/sites/default/files/publications/Hanushek%201996%20RevEdRes%2066%283%29.pdf>
- Hanushek, E. (1999). Some findings from an independent investigation of the Tennessee Star Experiment and from other investigations of class size effects. *Educational Evaluation and Policy Analysis*, 21(2), 143–164. <https://hanushek.stanford.edu/publications/some-findings-independent-investigation-tennessee-star-experiment-and-other>
- Hanushek, E., Kain, J., & Rivkin, S. (2009). New evidence about Brown v. Board of Education: The complex effects of school racial composition on achievement. *Journal of Labor Economics*, 27(3), 349–383. <https://www.jstor.org/stable/10.1086/600386>
- Heyneman, S. (2005). Student background and student achievement: What is the right question? *American Journal of Education*, 112(1), 1–9. <https://eric.ed.gov/?id=EJ725604>

- Kenayathulla, H. (2013). Higher levels of education for higher private returns: New evidence from Malaysia. *International Journal of Educational Development*, 33, 380-393.
<https://www.sciencedirect.com/science/article/abs/pii/S0738059312000843>
- Kitsantas, A., Ware, H., & Cheema, J. (2010). Predicting mathematics achievement from mathematics efficacy: Does analytical method make a difference? *The International Journal of Educational and Psychological Assessment*, 5(1), 25-44.
<https://drive.google.com/file/d/0ByxuG44OvRlPmJWbTVEbHBTSDA/view>
- Lam, G. (2014). A theoretical framework of the relation between socioeconomic status and academic achievement of students. *Education*, 134(3), 326-331. <https://eric.ed.gov/?id=EJ1034279>
- Levy, D. (2012). How important is private higher education in Europe? A regional analysis in global context. *European Journal of Education*, 47(2), 178-197. <https://onlinelibrary.wiley.com/doi/10.1111/j.1465-3435.2012.01517.x>
- Levy, D. (2013). The decline of private higher education. *Higher Education Policy*, 26, 25-42.
<https://link.springer.com/article/10.1057/hep.2012.26>
- Lubienski, C., & Lubienski, S. (2013). *The public school advantage: Why public schools outperform private schools*. Chicago, IL: University of Chicago Press.
<https://press.uchicago.edu/ucp/books/book/chicago/P/bo16956223.html>
- Lubienski, S., & Lubienski, C. (2006). School sector and academic achievement: A multilevel analysis of NAEP mathematics data. *American Educational Research Journal*, 43(4), 651-698.
<https://www.jstor.org/stable/4121774>
- Lubienski, S., Lubienski, C., & Crane, C. (2008). Achievement differences and school type: The role of school climate, teacher certification, and instruction. *American Journal of Education*, 115, 97-138.
<https://psycnet.apa.org/record/2008-14677-003>
- McEwan, P. (2000). The potential impact of large-scale voucher programs. *Review of Educational Research*, 70(2), 103-149. <https://www.jstor.org/stable/1170659>
- Mislevy, R. (1991). Randomization-based inference about latent variables from complex samples. *Psychometrika*, 56, 177-196. <https://link.springer.com/article/10.1007/BF02294457>
- Mislevy, R., Beaton, A., Kaplan, B., & Sheehan, K. (1992). Estimating population characteristics from sparse matrix samples of item responses. *Journal of Educational Measurement*, 29, 133-161.
<https://www.jstor.org/stable/1434599>
- OECD. (2023). *PISA technical report*. Paris, France: OECD Publishing. Retrieved from <https://www.oecd.org/pisa/pisaproducts/PISA-2012-technical-report-final.pdf>
- Pasta, T., Mendola, M., Longobardi, C., Prino, L., Gastaldi, F. (2013). Attributional style of children with and without specific learning disability. *Electronic Journal of Research in Educational Psychology*, 11(3), 649-664. <https://psycnet.apa.org/record/2014-04678-004>
- Régner, I., Loose, F., & Dumas, F. (2009). Students' perception of parental and teacher academic involvement: Consequences on achievement goals. *European Journal of Psychology of Education*, 24(2), 263-277.
<https://psycnet.apa.org/record/2009-09351-012>
- Romuald, N. (2023). An analysis of inequalities in school performance between public and private students in sub-Saharan Africa. *International Journal of Educational Development*, 100, 102802.

- <https://www.sciencedirect.com/science/article/abs/pii/S0738059323000780>
- Rubin, D. (1987). *Multiple imputation for nonresponse in surveys*. New York, NY: John Wiley & Sons, Inc.
<https://onlinelibrary.wiley.com/doi/book/10.1002/9780470316696>
- Sandefur, J., Watkins, K., & Green, D. (2013). Public versus private education: What the debate in the developing world teaches us? *Solutions*, 4(5). <https://odi.org/en/insights/public-versus-private-education-what-the-debate-in-the-developing-world-teaches-us/>
- Stitzlein, S. (2013). For-profit charter schools and threats to the publicness of public schools. *Philosophical Studies in Education*, 44, 88–99. <https://files.eric.ed.gov/fulltext/EJ1015716.pdf>
- Stull, J. (2013). Family socioeconomic status, parent expectations, and a child's achievement. *Research in Education*, 90, 53–67. <https://journals.sagepub.com/doi/10.7227/RIE.90.1.4>
- Thapa, A. (2013). Does private school competition improve public school performance? The case of Nepal. *International Journal of Educational Development*, 33, 358–366.
<https://www.sciencedirect.com/science/article/abs/pii/S073805931200096X>
- von Davier, M., Gonzalez, E., & Mislevy, R.J. (2009). What are plausible values and why are they useful? *IERI Monograph Series: Issues and Methodologies in Large-Scale Assessments*, 2, 9–36.
https://ierinstitute.org/fileadmin/Documents/IERI_Monograph/Volume_2/IERI_Monograph_Volume_02_Chapter_01.pdf
- Wu, M. (2005). The role of plausible values in large-scale surveys. *Studies in Educational Evaluation*, 31(2), 114–128. <https://www.sciencedirect.com/science/article/pii/S0191491X05000209>
- Xu, J. (2009). School location, student achievement, and homework management reported by middle school students. *The School Community Journal*, 19(2), 27–43. <https://files.eric.ed.gov/fulltext/EJ867967.pdf>

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