5. Beyond results: What makes the difference between Argentina, Chile and México in PISA

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Resumen
Considerable effort has been exercised in the construction of school achievement tests that provide international comparability of results. One of the most widely accepted studies for international comparison of student achievement is PISA. Argentina, Chile and Mexico mean score in language was quite similar in PISA 2000. However, a statistically significant gap developed during the decade, resulting in Chile and Mexico outperforming Argentina by some 50 and 30 points, respectively, in PISA 2009, and is the issue that motivates the research. This paper represents an attempt to develop some answers to the question of what makes the difference. Potential factors of policy interest explaining the gap in language test score between these countries are introduced through a linear model in which the relative effect of personal attributes of the student, relevant characteristics of his/her family and public/private school control are treated as covariates. The Oaxaca-Blinder decomposition technique is then applied and allows us to explain the mean gap between these three countries in PISA 2009 reading test scores in terms of coefficient and characteristics effects. Preliminary results suggested that compared to Argentina, Chile performed better in both, coefficient and characteristics dimensions, and 66% of the 50 point gap was associated with coefficient effects. The Mexico-Argentina 23 point gap resulted from the former's hefty coefficient effects overcompensating for its relatively poorer characteristics.

Keywords: PISA Study, Latin America, Oaxaca-Blinder decomposition

JEL Code: I21, H52

1. Introduction

Considerable effort has been exercised in the construction of school achievements tests that provide international comparability of results. One of the most widely accepted studies for international comparisons of student achievement is PISA.

Last year's release of PISA 2009 results brought different conclusions among education experts in Argentina. While some of the experts considered Argentina alone and how it improved (compared to PISA 2006) or worsened (PISA 2000) compared to previous editions of the test, others focused in the backlash suffered by Argentina compared to the rest of Latin America in the three subjects. As one of the aspects of PISA is international comparability, we found more interesting to explore the second issue and the question that arises is what makes these differences. In order to see this, we will focus on the comparison between Argentina and two countries (Chile and Mexico) whose mean scores were quite similar to that of Argentinean students in PISA 2000 and developed a statistically significant gap during the decade, as it is summarized in table 1.

Table 1. PISA Reading scores average by country

Country	2000	2009	Differences
Argentina	418.3	398.3	-20.0
Chile	409.6	449.4	39.8
Mexico	422.0	425.3	3.3
Argentina - Chile gap	8.7	-51.1	
Argentina - Mexico gap	-3.7	-27.0	

Source: PISA 2000 and 2009

To analyze these gaps, we follow the works of Blinder (1973) and Oaxaca (1973), according to which the differences can be decomposed in a coefficients and a characteristics effect, plus a combined or residuals effect. The interesting part of this decomposition is that it allows us to see whether the student and family characteristics are more promising in Chile and Mexico or if the returns to those characteristics in terms of student performance are more beneficial in those countries than in Argentina. In order to do that, we begin by estimating education production functions using weighted linear regressions where the performance in reading is used as the dependent variable, and personal and family traits are used as covariates. A public/private school control variable is also included. Once we have the estimated coefficients, we apply the Oaxaca-Blinder decomposition technique, which allows us to explain the gap in the mean of the scores of the three countries in PISA 2009 reading test, highlighting characteristics and coefficient effects. The characteristics effect (explained component) arises because the two compared group have different qualifications and both receive the same treatment, and the coefficient effect (unexplained component) arises as a result of different treatments to groups that have the same qualifications. In this sense, the exercise performed in the paper represents a microsimulation that seeks to explain the causes of this gap in performance between Argentina and Chile/Mexico. This is done to evaluate the impact on Argentinean achievement levels of assuming other countries' policies on students endowed with the characteristics of Argentina.

Section 2 presents the PISA database, section 3 introduces the theoretical models and section 4 presents and analyzes the results of the regression and the Oaxaca-Blinder decomposition.

2. Database

The Program for International Student Assessment (PISA) is an internationally standardized assessment of three forms of literacy: reading, mathematics and science.

PISA 2009 is the fourth edition of this assessment developed by UNESCO and OECD to evaluate 15 year old youngsters' preparation to cope with real-life challenges related to the three subjects. PISA was first implemented in the year 2000 and has been continued every three years, each time focusing in a different subject. In total, 43 countries participated in the first assessment and that number grew to a total of 74 in the 2009 edition. Argentina and Chile participated in all the editions but 2003, while México participated in the four editions.

In this paper we treat reading test scores as academic attainment because PISA 2000 and PISA 2009 both focus on this subject. The reading test has been administered to all the students in these editions while math and science ones were administered to half of the participants; this way we ensure the biggest sample possible.

PISA test scores that will be used in this paper are the plausible values. "They are random numbers drawn from the distribution of scores that could be reasonably assigned to each

individual—that is, the marginal posterior distribution." (Adams and Wu 2002). Five plausible values were calculated for each student in each of the subjects. The regression and decomposition are done five times using each value at a time as dependent variable and then the mean of the coefficient values of each explanatory variable is calculated.

The sample size in PISA 2009 in Argentina, Chile and, Mexico is of 4774, 5669 and 38250 students in 199, 200 and 1535 schools, respectively. The sampling design used for the PISA assessment was a two-stage stratified sample in most countries. "The first-stage sampling units consisted of individual schools having 15-year old students[24]. The second-stage sampling units were students within sampled schools. Once schools were selected to be in the sample, a list of each sampled school's 15-year old students was prepared. From each list that contained more than 35 students, 35 students were selected with equal probability and for lists of fewer than 35, all students on the list were selected" (PISA 2001).

Apart from test scores PISA provides a large amount of environment data of the students based on questionnaires completed by the students and school principals. Students questionnaire provides information about basic demographics, family background and measures of socioeconomic status, student description of school/instructional processes, student attitudes towards reading and reading habits, student access to educational resources outside school, institutional patterns of participation and programmed orientation, and student career and educational expectations. School questionnaire attends basic school characteristics, school policies and practices, school climate and school resources. In this paper we will focus on students and family characteristics using only the public/private data from the school principals' database as a control variable.

3. Theoretical Model

The theoretical model starts with the design of educational production functions, used to estimate the mean effects of covariates on student expected performance. Then, the mean effects are decomposed by applying the classic Oaxaca-Blinder technique.
The educational production function used in this paper is:

$$R_{ij} = \beta_0 + \beta_F F_{ij} + \beta_S S_{ij} + \beta_P P_j + \varepsilon_{ij}$$

Where R_{ij} is the reading plausible value of student i in school j, F_{ij} is the vector of family background variables, S_{ij} is the vector of student individual variables, P_j is the school variable used as control and ε_{ij} is the error term (Wooldridge, 2002).
βF, βS and βP measure the impact of the covariates on the educational achievement and are going to be estimated by OLS. Due to the two-way stratified sample design in PISA a survey regression and balanced repeated replication (BRR) weights will be used. These estimates provide the effect of each of the explanatory variables at the conditional mean of the scores' distribution (PISA 2009).

PISA provides five plausible values of reading score for each student, and recommends running independent regressions for each of the five plausible values. The coefficients and standard errors are then calculated following Willms (2005) to obtain a summary estimation, which is the one that we report in this paper. We use all five reading plausible values as the dependent variable (Reading score) and a reduced set of independent variables that capture student and family background endowment.

Students variables are: repeated course[25] and enjoy reading. Family background endowment

24 Students who are between age 15 years and 3 months and age 16 years and 2 months at the time of the test.
25 Although PISA 2009 database provides a construct of grade repetition, this research uses information about the grade currently being attended by students to decide whether they have repeated (grade 9th or below) or not (grade

is taken into account by Highest Parental Socio-Economic Index of Occupational Status (Hisei), Cultural Possessions (Cultposs) and Home Educational Resources (Hedres); these three variables have been reformulated as indexes in a 0/100 scale. Finally, gender and school management are used as control variables. The mean of the five estimators obtained for each coefficient of the explanatory variable is then calculated.

Once we have the estimates, we proceed to apply the Oaxaca-Blinder decomposition technique (Blinder 1973, Oaxaca 1973). This procedure is often used to study labor market outcomes by groups. It divides the wage differential between two groups into a part that is "explained" by group differences in productivity, characteristics such as education or work experience and a residual part that cannot be accounted for by such differences in wage determinants and is supposed to come from some type of discrimination (Jann 2008). In our case, differences in school achievements can be explained by a number of reasons. They may arise from individual and family characteristics allocations being more favorable in Chile and Mexico than in Argentina. This would resemble the explained part in wage gaps. But in this case, also the coefficient effect could be explained and refer to how effects of this variables on student achievement differ between countries. This effect would reflect how well each country uses their given allocation in order to obtain better qualified students.

The total score gap between two countries at the mean is defined as

$$SG_{a-b} = E(R^a) - E(R^b)$$

where E(R) denotes the expected value of the outcome variable and a and b represent two different countries.

The total score gap can be decomposed into a characteristics, a coefficient and a joint characteristics-coefficient effect. Since

$E(S]_{\square\downarrow}$

With $E(\hat{\beta}^a) = \hat{\beta}^a$ and $E(\varepsilon^a) = 0$ by assumption.

$$SG_{a-b} = \hat{\beta}_0^a + \hat{\beta}_F^a E[(F]_{ij}^a) + \hat{\beta}_S^a [E(S]_{ij}^a) + \hat{\beta}_P^a E(P_j^a) - \hat{\beta}_0^b - \hat{\beta}_F^b E[(F]_{ij}^b) - \hat{\beta}_S^b [E(S]_{ij}^b) - \hat{\beta}_P^b E(P_j^b)$$

Rearranging

$$SG_{a-b} = \left(E[(F]_{ij}^a) - E[(F]_{ij}^b)\right)\hat{\beta}_F^b + \left(E[(S]_{ij}^a) - E[(S]_{ij}^b)\right)\hat{\beta}_S^b + \left(E[(P]_j^a) - E[(P]_j^b)\right)\hat{\beta}_P^b +$$

$$(\hat{\beta}_0^a - \hat{\beta}_0^b) + [(\hat{\beta}]_F^a - \hat{\beta}_F^b)E[(F]_{ij}^b) + [(\hat{\beta}]_S^a - \hat{\beta}_S^b)E[(S]_{ij}^b) + [(\hat{\beta}]_P^a - \hat{\beta}_P^b)E[(P]_{ij}^b) +$$

$$[(\hat{\beta}]_F^a - \hat{\beta}_F^b)\left(E[(F]_{ij}^a) - E[(F]_{ij}^b)\right) + [(\hat{\beta}]_S^a - \hat{\beta}_S^b)\left(E[(S]_{ij}^a) - E[(S]_{ij}^b)\right) + [(\hat{\beta}]_P^a - \hat{\beta}_P^b)\left(E[(P]_j^a) - E[(P]_j^b)\right)$$

This is a "three-fold" decomposition: the three first summands refer to the allocation effects, that is, the differences in family, individual and school characteristics between the countries; the second component is formed by second four summands and refers to the coefficient

10th or above). Correlation between both measures is 84 % (see Annex 3). This formulation is used because in a parallel work in progress comparisons between PISA 2000 and PISA 2009 will be driven and the former variables related to grade repetition were not included in PISA 2000.

or return effect (including the intercept); finally, the last three summands are the interaction terms presuming allocations and coefficients differences occur simultaneously between the countries.

The previous decomposition is formulated from the point of view of Country b. Therefore, the allocation component measures the expected change in Country b's mean outcome, if it had Country a's predictor levels. Moreover, the coefficient component measures the expected change in Country b's mean outcome, if it had Country a's coefficients. Our analysis is formulated from the point of view of Argentina as we want to address how Argentinean students would perform if they had the same characteristics or returns as their Chilean or Mexican peers. Again, this procedure is done with the five plausible values available for each student and the effect is calculated at the mean of the coefficient values of each variable. The model was estimated using Stata 11(Jann 2008, Kreuter and Valliant 2007, Oyeyemi et al 2010).

4. Results

At first glance, after checking the means of the covariates (see Appendix, Annex II, tables A1.a, A1.b and A1.c) and the regression coefficients for the three countries in PISA 2009 (table 2), it can be seen that not only the environment and background of the students differ between countries, but also the way the educational system transforms those characteristics and turns them into academic performance presents variations.

One of the covariates where interesting differences could be perceived was repetition. While approximately 40% of the students were repeaters in Mexico and Argentina, only 25% of Chileans were in the same situation. Other striking contrast between these three school systems that needs to be addressed is related to school management. Clearly, Chile is more targeted to private schooling as almost three fifths of its students concur to private schools. The opposite situation is that of Mexico, where almost 90 % of the students evaluated in PISA attend public schools. Argentina is placed in the middle with almost two fifths of its students in private schools.

When analyzing the socioeconomic status of the families (Hisei, Cultposs, Hedres), Chile and Argentina prove to be rather equal in means, but Mexico is situated below them in cultural possessions and home educational resources, showing a big handicap of Mexican students in extracurricular learning possibilities.

Table 2. Regression coefficients and p-values

Variable	Argentina	Chile	Mexico
Intercept	276.175	321.888	348.130
	(0.000)	*(0.000)*	*(0.000)*
Gender (male=1)	-16.619	-7.177	-13.643
	(0.000)	*(0.000)*	*(0.000)*
Management (private=1)	37.106	20.989	19.045
	(0.000)	*(0.000)*	*(0.000)*
Repetition (Yes=1)	-63.005	-59.246	-55.337
	(0.000)	*(0.000)*	*(0.000)*
Hisei	0.995	0.868	0.694
	(0.000)	*(0.000)*	*(0.000)*
Cultposs	0.143	0.193	0.008
	(0.000)	*(0.000)*	*(0.419)*
Hedres	0.626	0.442	0.561
	(0.000)	*(0.000)*	*(0.000)*
Joyread	1.281	1.301	1.038
	(0.000)	*(0.000)*	*(0.000)*
R^2	0.3657	0.367	0.29986
n	4,205	4,880	35,787
F	279.38	621.38	979.21

Dependent Variable: Reading Score

Note: between brackets p-values are indicated

Regression

Above, it was shown how Chileans are more bound to private schooling than Mexicans and Argentineans. In addition, by looking at Table 2, Argentina is the country where attending a private school creates the largest difference in terms of scores, although the effect is positive in all three countries. This means students attending a private school tend to perform better than their peers[26] in public schools in general, but in Argentina the plus for being enrolled in a private institution is of 37 points at the mean, while in Mexico and Chile is only of 20 points[27]. Girls outperform boys in all countries, and the gender effect in Argentina and Mexico doubles the size of that in Chile. By looking at the coefficients, the analysis shows that the institutions in Chile ´remunerate´ gender characteristics more equally than in the other countries, and this might be indicative of higher commitment to gender equalizing goals. Family background and socioeconomic characteristics coefficients have the expected sign, with slight differences between countries except for "cultural possessions", which turns out to be non significant in Mexico. Repetition and the "enjoy reading" index also have the expected sign and do not present major differences between countries. Students that repeated at least once perform significantly below than their schoolfellows that have not.

The estimated equations indicate that the use of individual and socioeconomic covariates helps to explain 36% of the total variance of the dependent variable in Argentina and Chile, and 30% in Mexico[28]. Similar explanatory power has been found in previous studies of the authors (Gertel et al. 2006)

26 This effect can be biased due to auto-selection, but that effect will not be considered in this work.

27 Ceteris paribus.

28 In a similar work made in Germany comparing Germany with Finland the author retrieved that his estimated equation helped to explain 53% of the variance in Germany and 17% in Finland.

Oaxaca-Blinder decomposition

After analyzing the characteristics and the coefficient differences between countries, the mean score gap reported by Table 1 is broken down with the Oaxaca-Blinder technique, so as to identify the contribution made to the gap by changes in coefficients (returns), characteristics (endowment) and the combined effect of the two (residuals). Results are presented in Table 3 below, which shows the estimated gaps between Argentina and Chile, and Argentina and Mexico average performance, and how they are composed.

Table 3. Oaxaca-Blinder Decomposition of Reading score gap.

	Argentina/Chile		Argentina/Mexico	
Real Total Gap	51.000		27.000	
Estimated Total Gap	42.729	100.00%	20.202	100.00%
	(0.000)		*(0.000)*	
Characteristic Effect	15.428	36.11%	-21.868	-108.25%
	(0.000)		*(0.000)*	
Coefficient Effect	30.962	72.46%	34.329	169.93%
	(0.000)		*(0.000)*	
Combined Effect	-3.662	-8.57%	7.741	38.32%
	(0.001)		*(0.000)*	
n	10443		43024	

Note: between brackets p-values are indicated

The size of the gap between Argentina and Chile is about 51 points, which is half the international standard deviation of PISA[29]. It shows that even though on international standards both countries belong to the same low performance group, there are striking differences between them. The model explains almost 43 points of the real gap, 15 of which are due to the part of the simulation in which the coefficients remain constant and the effect of differing characteristics is measured. The complement, of 30 points, comes from keeping constant the characteristics of an average Argentinean student and accounting for varying returns. The positive sign of this coefficients effect might indicate that Chilean students are better equipped than Argentineans to make use of the measured characteristics in the production of scores. In this sense Chile does not have only better inputs but makes a better use of them. More than two thirds of the Chile/ Argentina total estimated gap is explained by the coefficient effect, suggesting that a more pro-active policy is behind the results obtained by Chilean students.

The characteristic effect that explains about a third of the gap does not appear to be related to socioeconomic differences between countries as all the indexes report similar values but to repetition and management issues. The lesser proportion of repeaters found in Chile respect to Argentina (0.25 against 0.38) seems to be the most important single factor (Table A1.a and A1.b, Appendix). Another important structural factor is the proportion of students attending private schools in both countries (Chile: 0.58; Argentina: 0.36).

When compared to Mexico, the situation of Argentinean students is completely different. The coefficient effect is not only larger than the gap but larger than Chile/Argentina coefficient effect meaning that Argentinean students would perform better with Mexican education system than Chilean or their own. The characteristic effect is negative and larger than the estimated gap which means that the gap would have been twice as large if Argentina had the same characteristics as Mexico. The large negative characteristics effect was explained previously when

29 A 100 points standard deviation was set in PISA 2009.

large differences in socioeconomic indexes between these two countries were found. Coefficient effect instead, looks to be in big part related to the large difference in the unobservable variables caught by the intercept.

5. Conclusions

The decomposition analysis revealed that the gap between Argentinean and Chilean/ Mexican students' performance can be explained mostly by differences in the coefficient effect, in how home, family and individual characteristics are transformed by schools into student's performance – the coefficient effect in table 3. The characteristics effect instead – characteristic effect in table 3 – is completely different in both analysis: with the gap being positive and explaining an important part of the gap in Chile's superiority, but being negative and larger than the whole gap in the Mexico/Argentina comparison. One important lesson to be learned from the decomposition analysis is that similar total gaps between countries may come from different combinations in the weight attached to the characteristics of the students and their families, on one side, and the marginal effect of the environmental and school incentives on the performance, on the other side[30]. To put it more clearly, in terms of simulation analysis, results corresponding to the coefficient part of the decomposition would suggest that if an average Argentinean student was rewarded with the returns of a Chilean student instead of his own, he would have obtained a score 30 points higher. If that same Argentinean student were to be rewarded with Mexican returns instead, his marks would have been boosted by 34 points. In this case, not only he would have closed the gap, but he would also be outperforming the average Mexican student by 7 points. This rings an alarm on the working of institutional arrangements for the provision of education in Argentina, for it seems not to be generating the incentives that would lead students to make an efficient use of their endowed characteristics.

Once we extend the simulation to the second part of the decomposition, it turns out that an Argentinean student that had the characteristics of an average Chilean student would have obtained 15 points more than one who had not. On the contrary, had he been endowed with characteristics of a Mexican average student, his score would have been penalized by about 22 points.

As a conclusion, if Argentinean student performance is meant to be improved, the educational system has to be taken care of, because the marginal effect of the environmental and school incentives was found to be lower than in similar countries, suggesting that the country is making an inefficient use of the endowed characteristics of its population that contribute to human capital formation through education.

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30 The return effect shows how Argentinean students-given their characteristics- would perform if they had been immersed in the education system either of Mexico or Chile. At first sight, one could conclude that - as Chile/ Argentina gap is twice as Mexico/Argentina gap - Argentinean students would achieve better results in Chile than in Mexico. After doing the decomposition and analyzing the coefficient effect in both gaps, it arises that the first conclusion is completely wrong. Argentinean students would have obtained a mean score of 429 if they were inserted in Chilean education system and a mean score of 432 if they were in Mexico.

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Annex I. Description of variables

VARIABLE	REFERENCE	EXPECTED SIGN	VALUES	DEFINITION
Plausible value for combined reading literacy	pvread			Random numbers, drawn from the distribution of combined reading literacy scores, that could be reasonably assigned to each individual.
Student attributes				
Repeated course	repetition	(-)	Dummy	The variable takes the value of 0 if the student is in either the tenth or eleventh grade, and 1 if he is in seventh, eighth or ninth grade.
Engagement in reading	joyread	(+)	0-100 (continuous)	The index measures student´s engagement in reading. It derives from students' level of agreement with eight statements about reading habits, enjoyment and attitude towards this activity. The variable was rescaled to the 0/100 range for the three countries together.
Family background				
Highest Parental Socio-Economic Index of Occupational Status	hisei	(+)	0-100 (continuous)	Occupational data for student´s parents was obtained by asking open ended questions. The response were coded to four-digit ISCO codes and mapped to the international socio-economic index of occupational status (ISEI). This index captures the highest ISEI attained by either the mother or father of the student. The variable was rescaled to the 0/100 range for the three countries together.
Cultural activities	cultposs	(+)	0-100 (continuous)	The index measures the frequency with which students engage in activities related to classical culture. The variable was rescaled to the 0/100 range for the three countries together.
Home Educational Resources	hedres	(+)	0-100 (continuous)	The index builds on the availability and number of certain educational items at home, namely a quiet place to study, a desk, text books and calculators. The variable was rescaled to the 0/100 range for the three countries together.
Control variables				
Gender (male=1)	gender	(+)	Dummy	0 was assigned to females and 1 to males.
School type (private=1)	Management	(+)	Dummy	Schools were classified as either public or private according to whether a public agency or a private entity had the ultimate decision-making power concerning its affairs.

Annex II. Correlation matrixes and descriptive statistics by Country - 2009

Table A1.a Correlation matrix and descriptives for reading - Argentina - 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Media	Error Est.
(1) Reading score	1.000								398.26	1.719
(2) Gender (male=1)	-0.147	1.000							0.46	0.01
(3) Repetition (Yes=1)	-0.436	0.111	1.000						0.38	0.01
(4) Management (private=1)	0.372	-0.047	-0.288	1.000					0.36	0.01
(5) Hisei	0.384	0.053	-0.203	0.309	1.000				38.46	0.39
(6) Cultposs	0.233	-0.073	-0.112	0.165	0.230	1.000			53.54	0.53
(7) Hedres	0.296	-0.016	-0.187	0.224	0.282	0.354	1.000		69.02	0.29
(8) Joyread	0.207	-0.237	-0.075	0.027 *	0.023	0.202	0.075	1.000	45.62	0.18

n = 4205

Note 1: Standard Errors (S.E.) were obtained using balanced-repeated replicate weights (BRR).

*Note 2: * indicates no significance at 5%. Mean and standard deviation represent expanded sample*

Table A1.b Correlation matrix and descriptives for reading - Chile - 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Media	Error Est.
(1) Reading score	1.000								449.37	1.104
(2) Gender (male=1)	-0.142	1.000							0.51	0.007
(3) Repetition (Yes=1)	-0.403	0.099	1.000						0.25	0.006
(4) Management (private=1)	0.270	-0.039	-0.141	1.000					0.58	0.007
(5) Hisei	0.385	-0.015 *	-0.116	0.265	1.000				36.56	0.306
(6) Cultposs	0.274	-0.096	-0.090	0.145	0.278	1.000			53.11	0.441
(7) Hedres	0.313	0.015 *	-0.162	0.210	0.361	0.359	1.000		73.33	0.266
(8) Joyread	0.295	-0.267	-0.095	0.017 *	0.108	0.236	0.111	1.000	47.05	0.170

n = 4880

Note 1: Standard Errors (S.E.) were obtained using balanced-repeated replicate weights (BRR).

*Note 2: * indicates no significance at 5%. Mean and standard deviation represent expanded sample*

Table A1.c Correlation matrix and descriptives for reading - México - 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Media	Error Est.
(1) Reading score	1.000								425.27	0.675
(2) Gender (male=1)	-0.142	1.000							0.49	0.00
(3) Repetition (Yes=1)	-0.411	0.089	1.000						0.44	0.00
(4) Management (private=1)	0.178	-0.014 *	-0.055	1.000					0.12	0.00
(5) Hisei	0.336	0.020	-0.165	0.296	1.000				34.12	0.19
(6) Cultposs	0.193	-0.045	-0.091	0.170	0.310	1.000			44.78	0.26
(7) Hedres	0.308	0.008	-0.182	0.218	0.433	0.405	1.000		58.46	0.15
(8) Joyread	0.200	-0.227	-0.070	-0.028	0.010 *	0.187	0.081	1.000	50.11	0.09

n = 35787

Note 1: Standard Errors (S.E.) were obtained using balanced-repeated replicate weights (BRR).

*Note 2: * indicates no significance at 5%. Mean and standard deviation represent expanded sample*

Annex III. Repetition constructed variable

Table A2.a Correlation matrix Repetition

	(1)	(2)
(1) Repetition (Yes=1)	1.000	
(2) PISA Repetition (Yes=1)	0.833	1.000

*Note 1: * indicates no significance at 5%.*

Note 2: PISA Repetition is based on children response to ST07Q01, ST07Q02 and ST07Q03. Those three questions were related to repetition at level 1,2 and 3 of the ISCED scale. PISA Repetion = 0 if the answer given to all three question was "No, never". PISA Repetition = 1 if the answer to at least one of the three questions was "Yes, once" or "Yes, twice or more"

Table A2.b Repetition Frecuency Table

	PISA Repetition			
Repetition	No	Yes	Missing	Total
No	32688	668	1789	35145
Yes	1530	7094	4833	13457
Missing	53	24	14	91
Total	34271	7786	6636	48693