



Programme for International Student Assessment (PISA) for Development

**Initial Technical Meeting
27 – 28 June 2013**

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Questions about School Policy and Practice

Student Performance	<p>What are the current levels of student performance? Mean score, percent vulnerable</p> <p>What are the current levels of student growth?</p> <p>What are the long-term trends in student performance and growth?</p> <p>To what extent do levels of performance and student growth vary within and among schools?</p>
Drivers of Performance	<p>To what extent are levels of student performance and student growth related to school processes and practices?</p>
Intervention Forecasting	<p>Can we identify students that require specific types of interventions?</p>
Resource Allocation	<p>To what extent do schools vary in their levels of socioeconomic status?</p> <p>To what extent are low socioeconomic status or minority group students concentrated in certain schools?</p>
Inequality	<p>To what extent do levels of performance and rates of growth vary among socioeconomic groups, immigrant and non-immigrant students, aboriginal and non-aboriginal students, males and females?</p>
Inequity	<p>To what extent do students from differing sub-populations have access to key school resources and processes?</p>



Design and Technical Issues



I. Measuring Student Performance

Successful countries have fewer vulnerable children. Their skill distribution is negatively skewed.



Proportion of Students

Below Level 1

Level 1

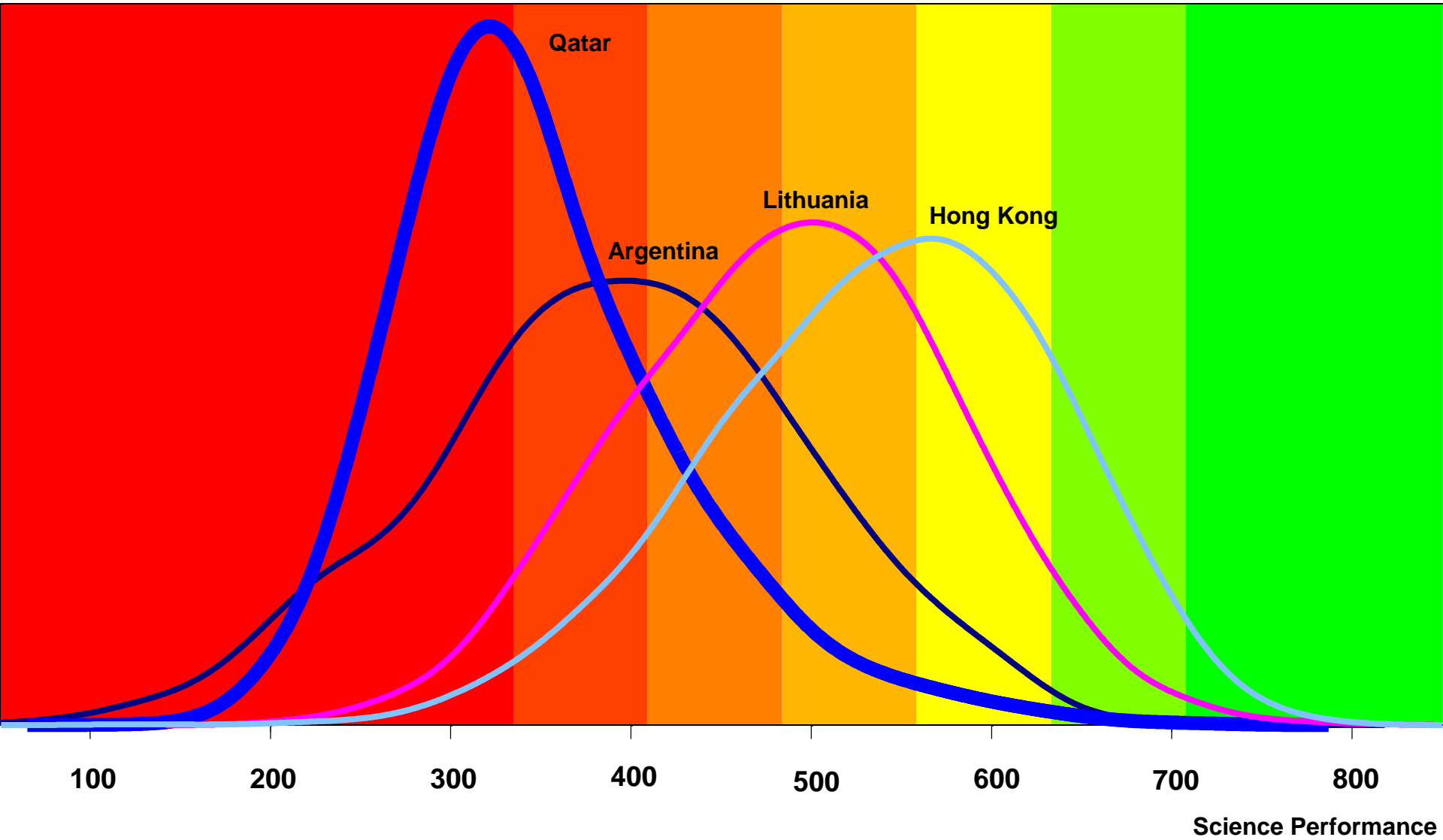
Level 2

Level 3

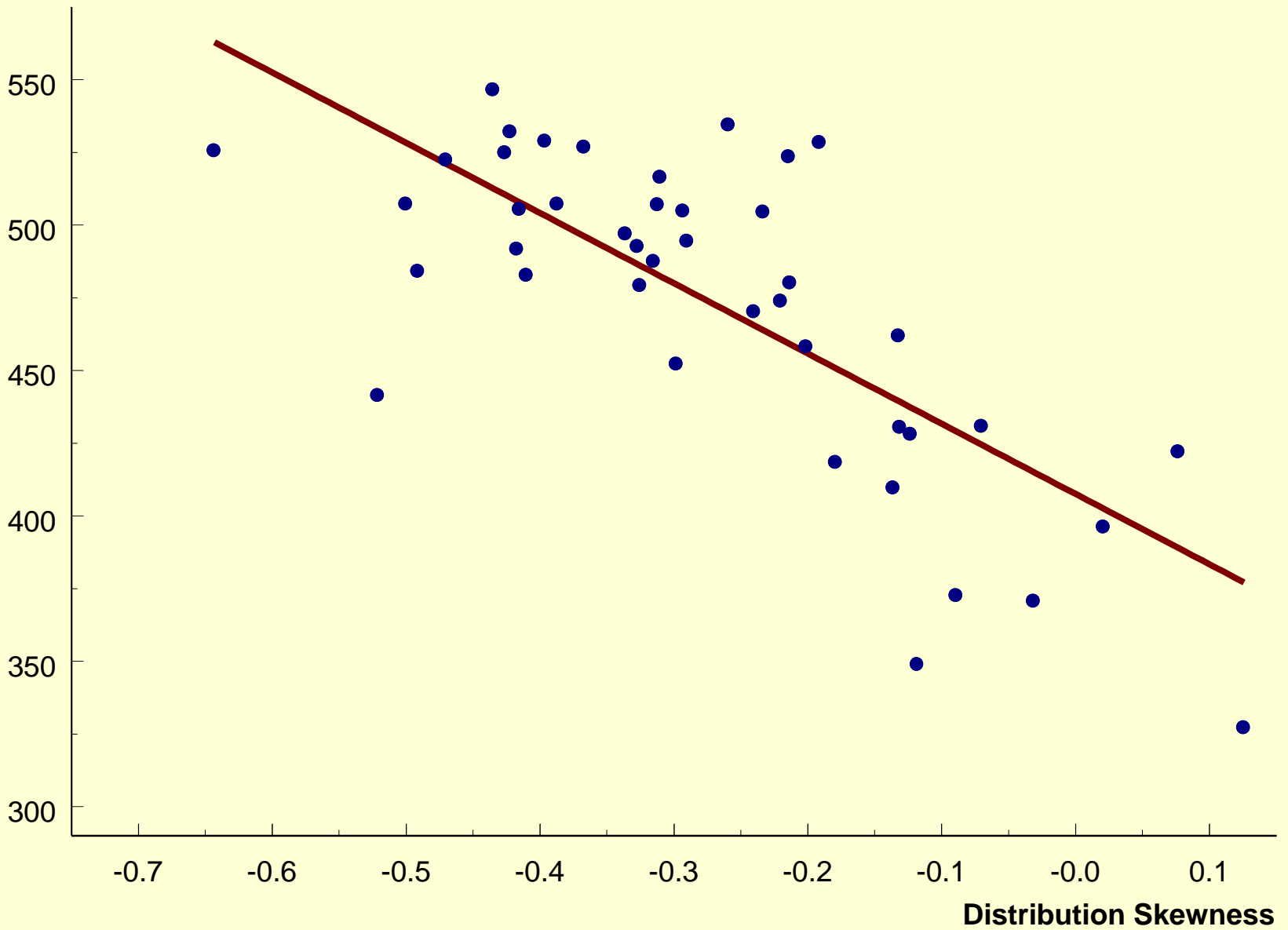
Level 4

Level 5

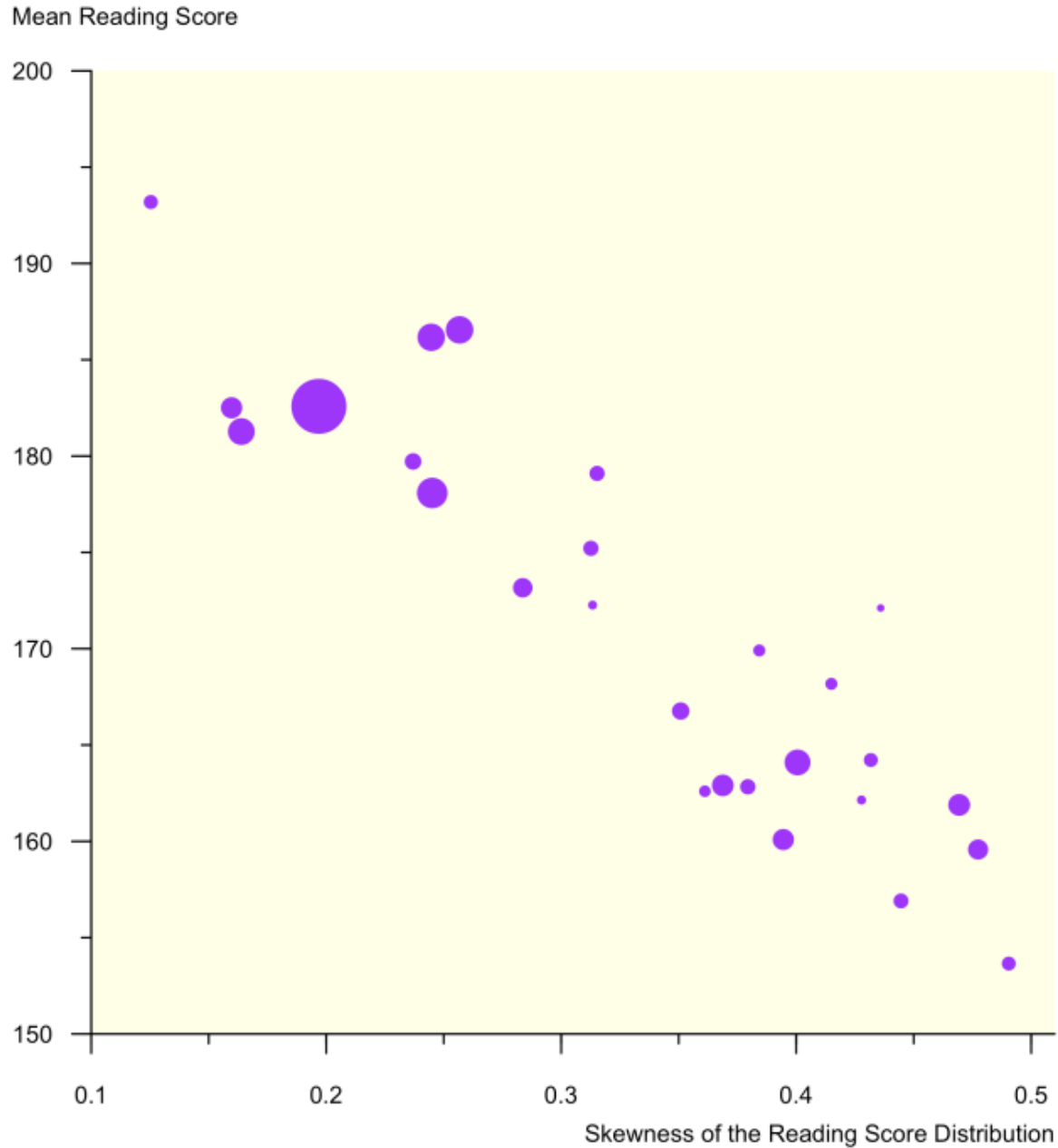
Level 6



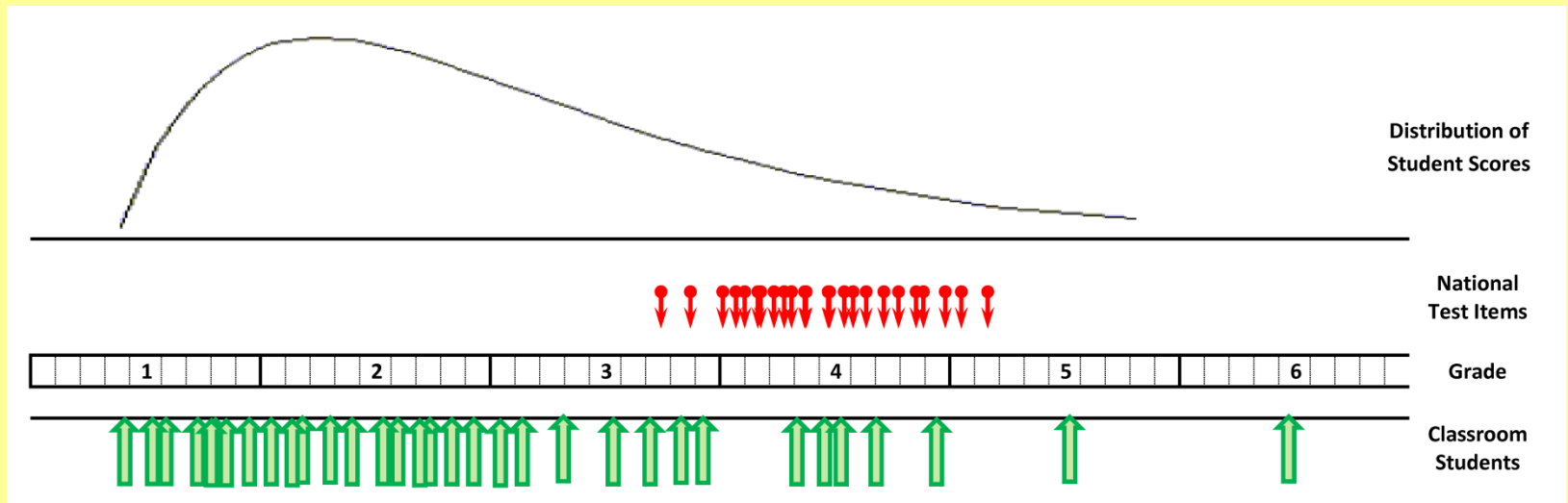
Mean Reading Performance



Mean grade 4 reading scores versus skewness of the distribution. Source: Prova Brazil 2007.



Student assessments cover a narrow range of skills.

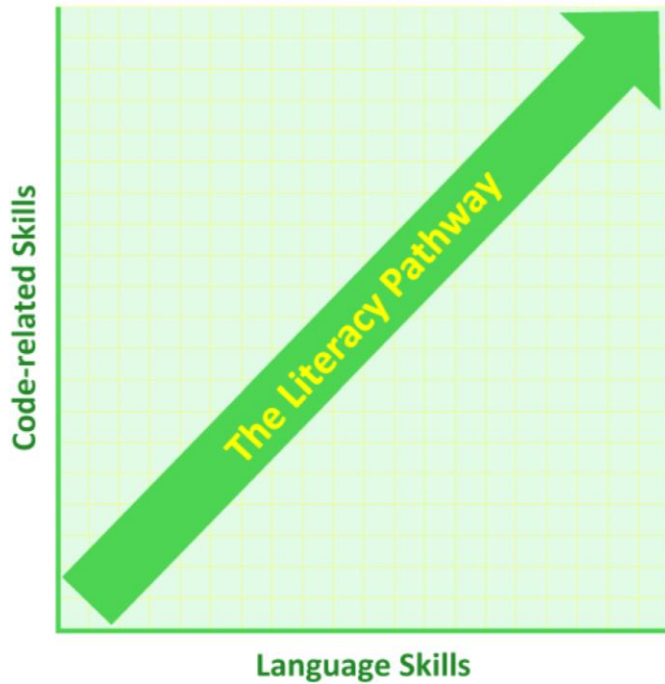




‘The simple view of reading’ (Rose, 2006) has two critical, complementary dimensions:

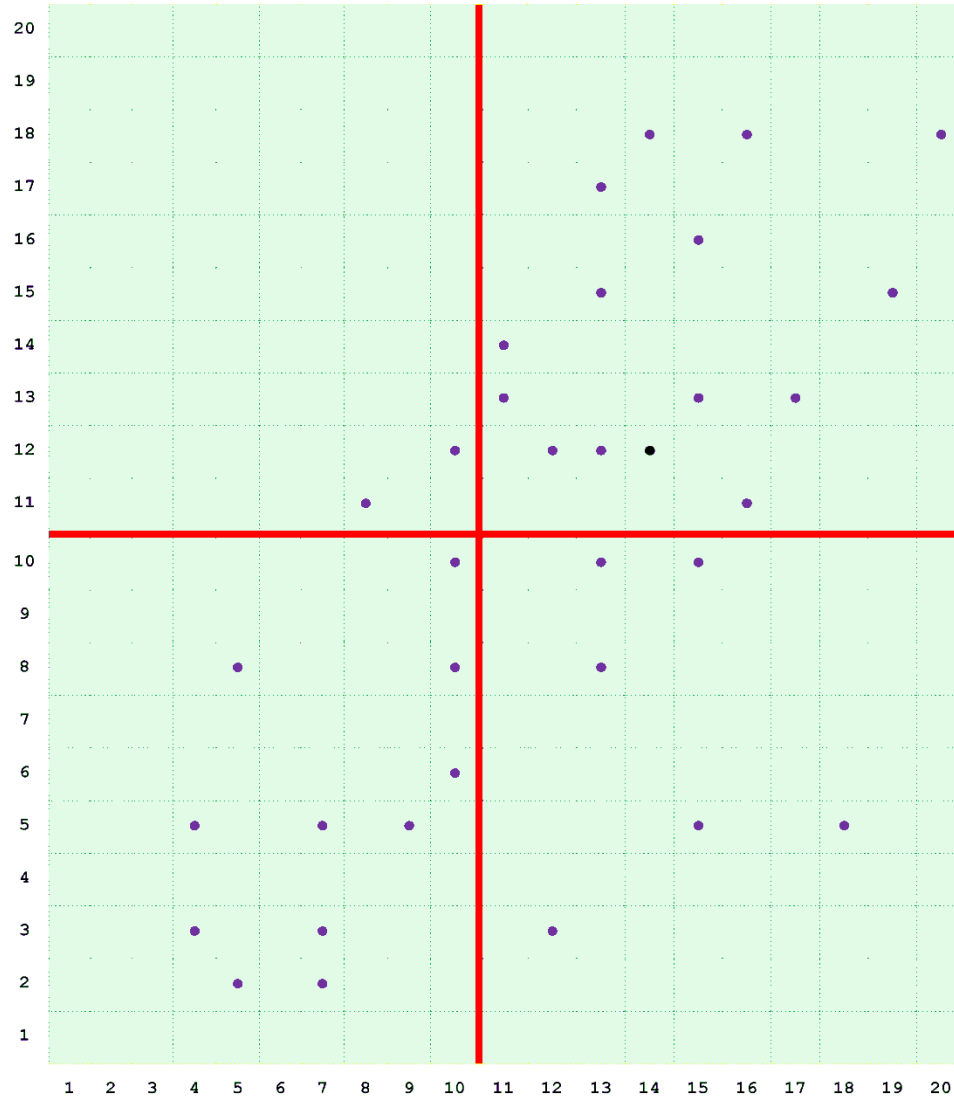
Code-related skills – the ability to recognize and understand particular words, and

Language skills – being able to understand and interpret spoken and written language.



The two critical skills on the pathway to literacy – decoding and language – are transferrable to building strength in an alphabetic native language and to learning an alphabetic second language. The content differs but the learning processes are the same.

Code-related Skills



Language Skills

The PISA framework is consistent with Bloom's Taxonomy for Assessment

	Taxonomy for Teaching, Learning, and Assessing (revised Bloom's taxonomy)	PISA Framework for Reading Literacy		
		Access and Retrieve	Integrate and Interpret	Reflect and Evaluate
Cognitive Processing Dimension	Creating (evaluation)	Locate and organize several pieces of deeply embedded info with precision and attention to detail	Make multiple inferences, comparisons and contrasts, detailed and precise	Integrate information from more than one text
	Evaluating (synthesis)	Locate and organize several pieces of deeply embedded info	Infer which information is relevant	Critically evaluate or hypothesize, draw on specialized knowledge
	Analyzing (analysis)	Locate and organize several pieces of embedded info	Interpret nuances of meaning, understand and apply categories in unfamiliar text	Make hypotheses, critically evaluate a text
	Applying (application)	Locate and recognize relationships among several pieces	Integrate several pieces of text to identify main idea, understand a relationship, or construe meaning	Understand connections, comparisons, explanations
	Understanding (comprehension)	Locate 1 or more pieces of information	Recognize main idea, understand relationships, construe meaning	Connect text with outside knowledge
	Remembering (knowledge)	Locate one piece of information in simple text	Recognize main theme or purpose in familiar text, recognize simple idea.	Make simple connection with everyday knowledge



LESSONS LEARNED:

We cannot simply add more items at the lower end of the current PISA framework, especially if we are to assess the skills of out-of-school students

Many students will not have successfully made the transition from learning-to-read to reading-to-learn. We need measures of pre-literacy skills, especially code-related and language skills.



II. Drivers of Student Performance



Success is Cumulative

International test scores (e.g., TIMSS, PISA) are the cumulative result of children's learning at home and at school since birth (or even earlier)

Learning is a function of:

Context

Quality Instruction

Learning Time

Engagement



Engagement is a function of:

Context

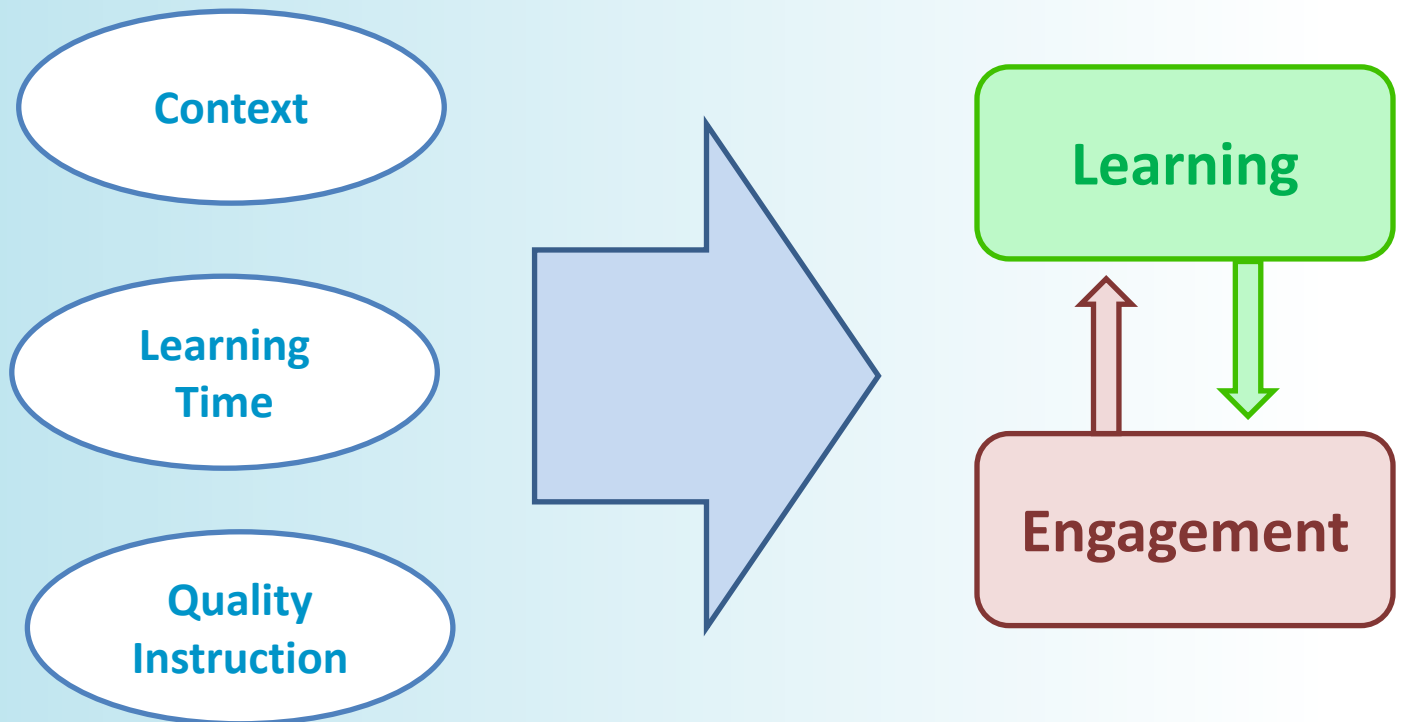
Quality Instruction

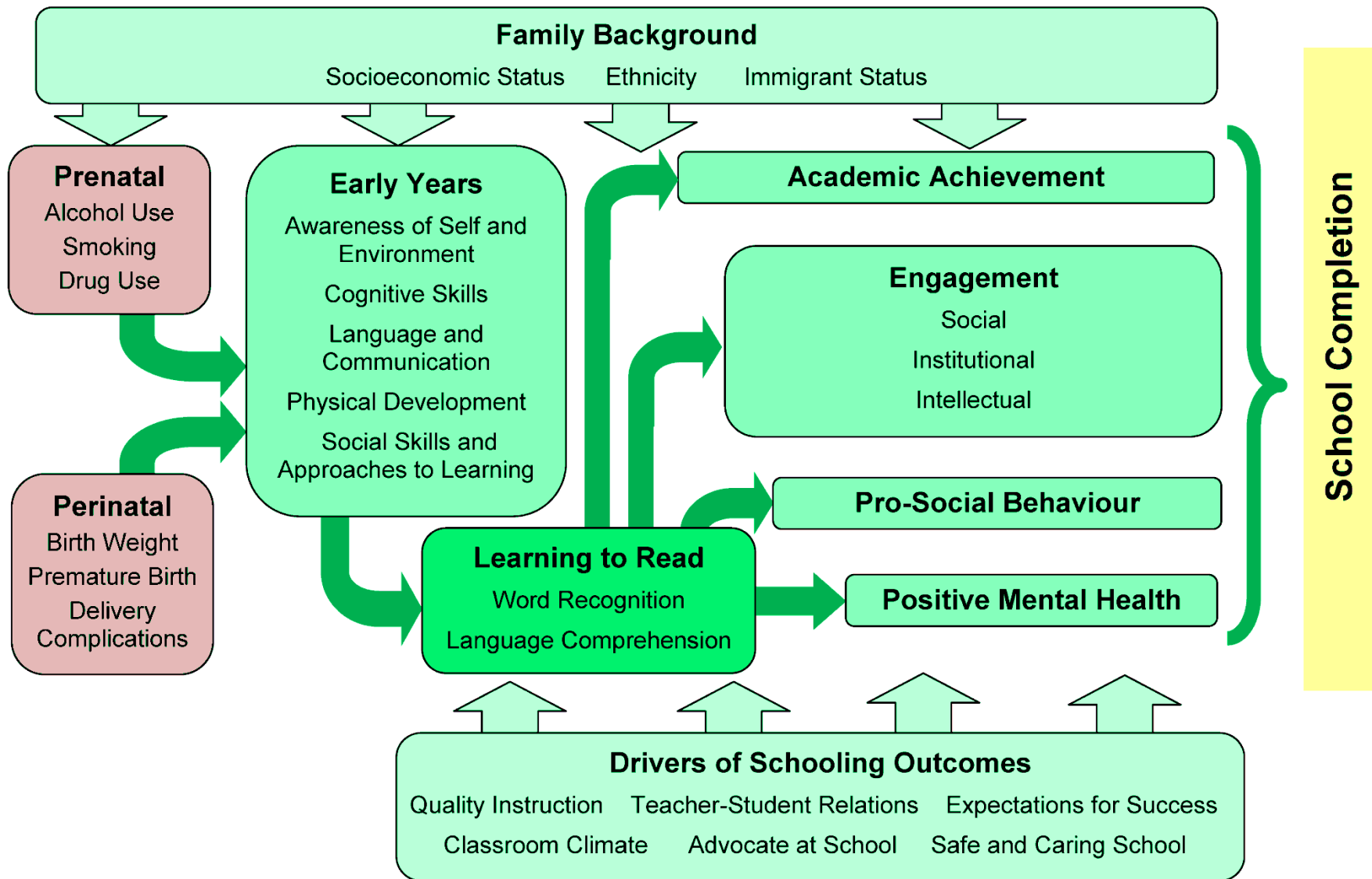
Learning Time

Learning



Engagement begets Learning Learning begets Engagement





Birth	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
					Pre-K	K	1	2	3	4	5	6	7	8	9	10	11	12



LESSONS LEARNED:

If we want to understand children's academic success in low income countries, we need to assess their opportunities for learning over their school career. The traditional drivers of school climate measured at age 15 will not be that helpful. We would learn more from a detailed assessment of school resources and strong measures of the quality of teaching.



III. Intervention Forecasting



Early Years Evaluation for Responsive Tiered Instruction

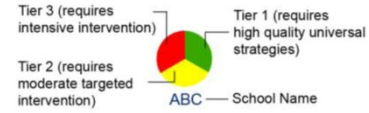
A prediction model based
on longitudinal data

2006 Census Socioeconomic Status



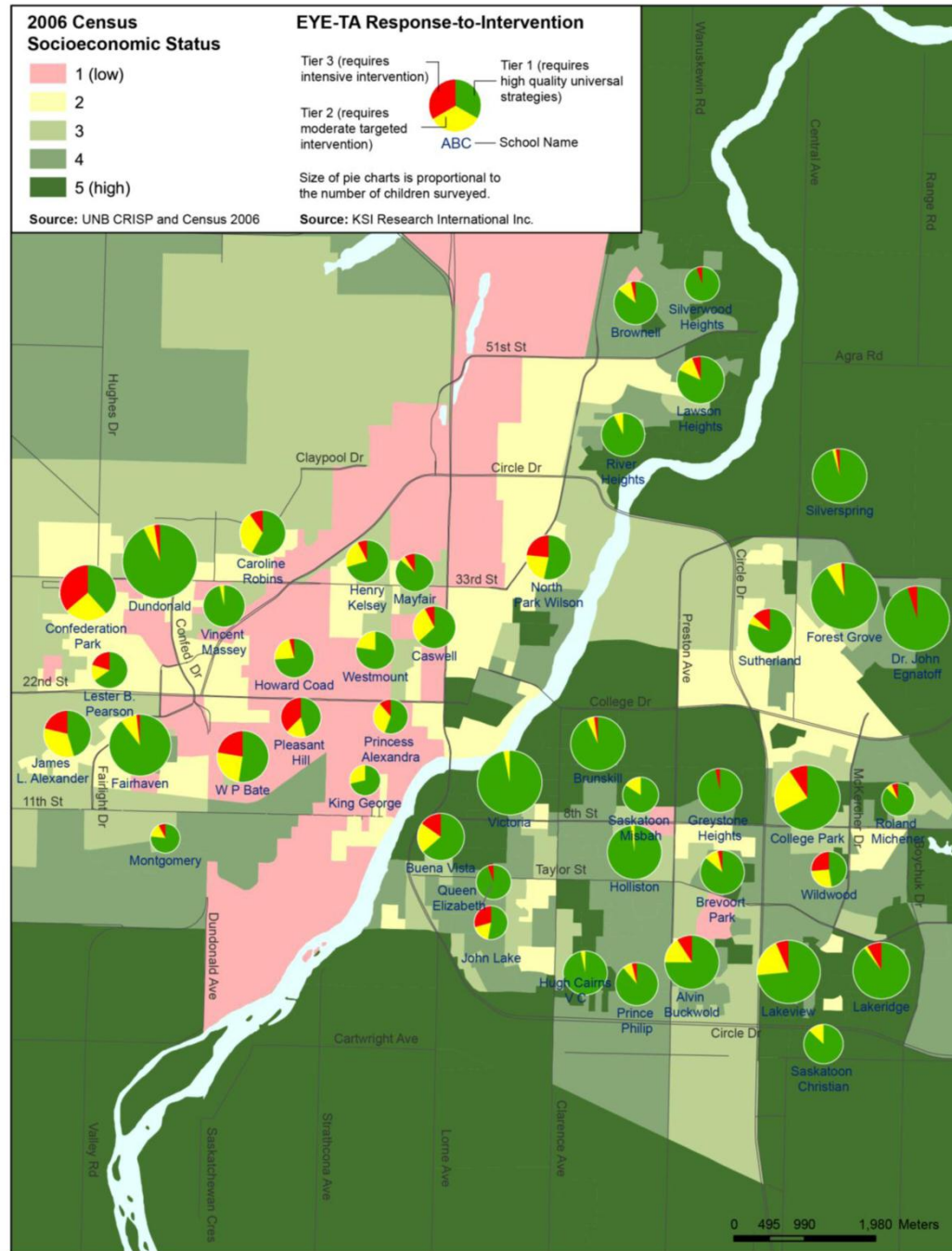
Source: UNB CRISP and Census 2006

EYE-TA Response-to-Intervention



Size of pie charts is proportional to the number of children surveyed.

Source: KSI Research International Inc.





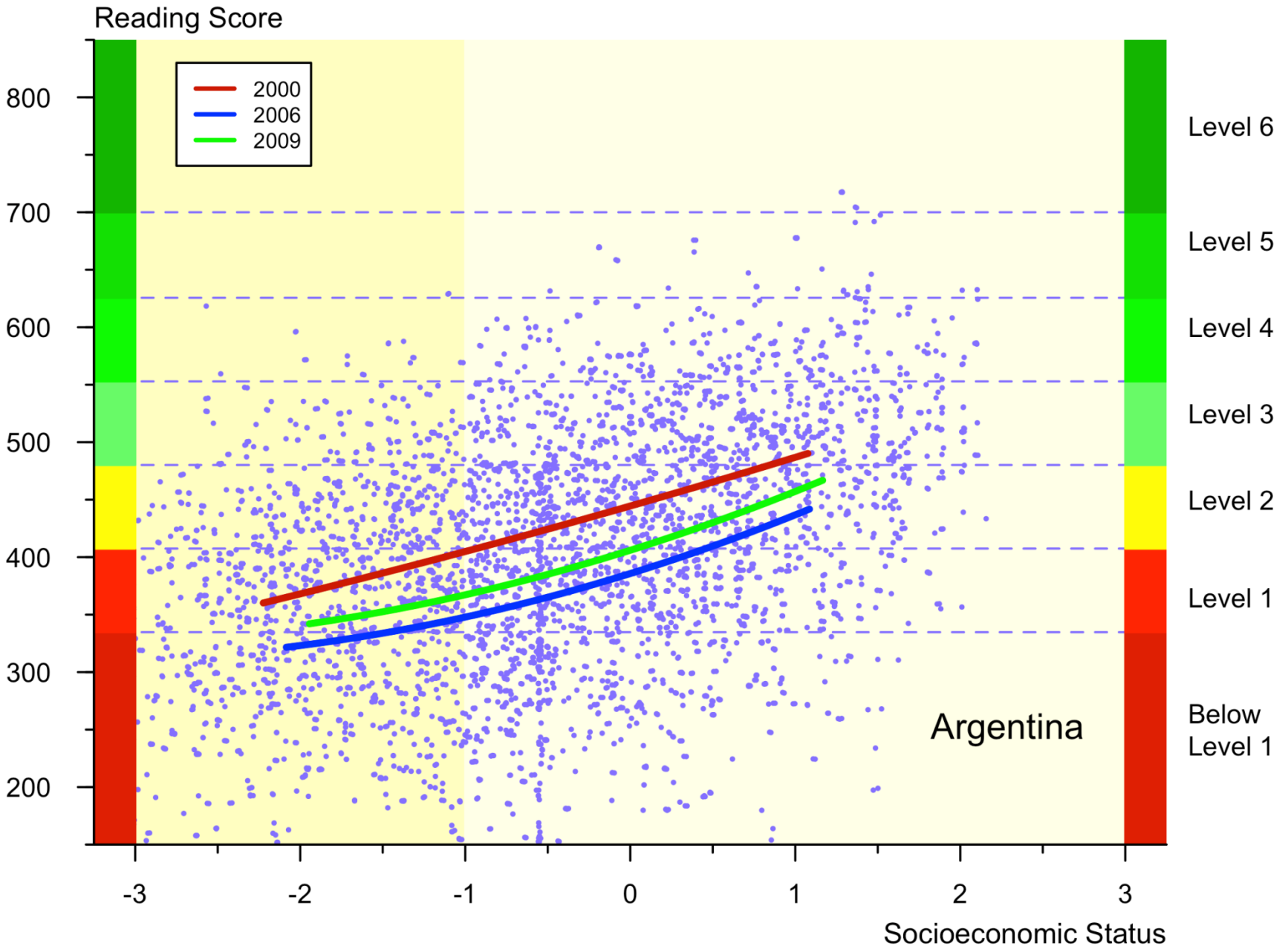
LESSONS LEARNED:

The revised PISA academic measures can give us a portrait of the end results. However, if we can identify some of the key aspects of school human and physical resources that students have been exposed to over their schooling career, we can begin to build prediction models.

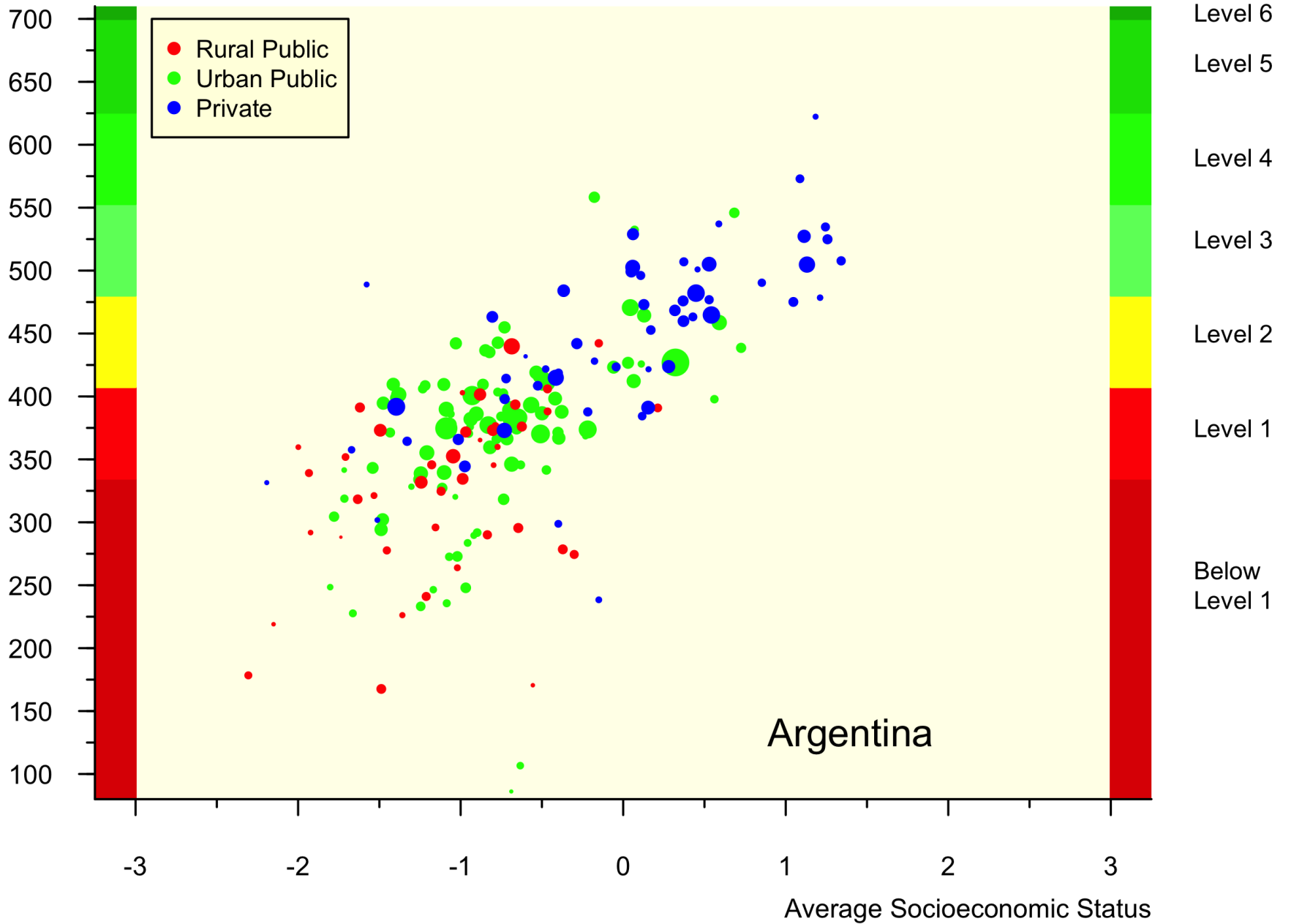
Such models are very powerful for allocating resources.

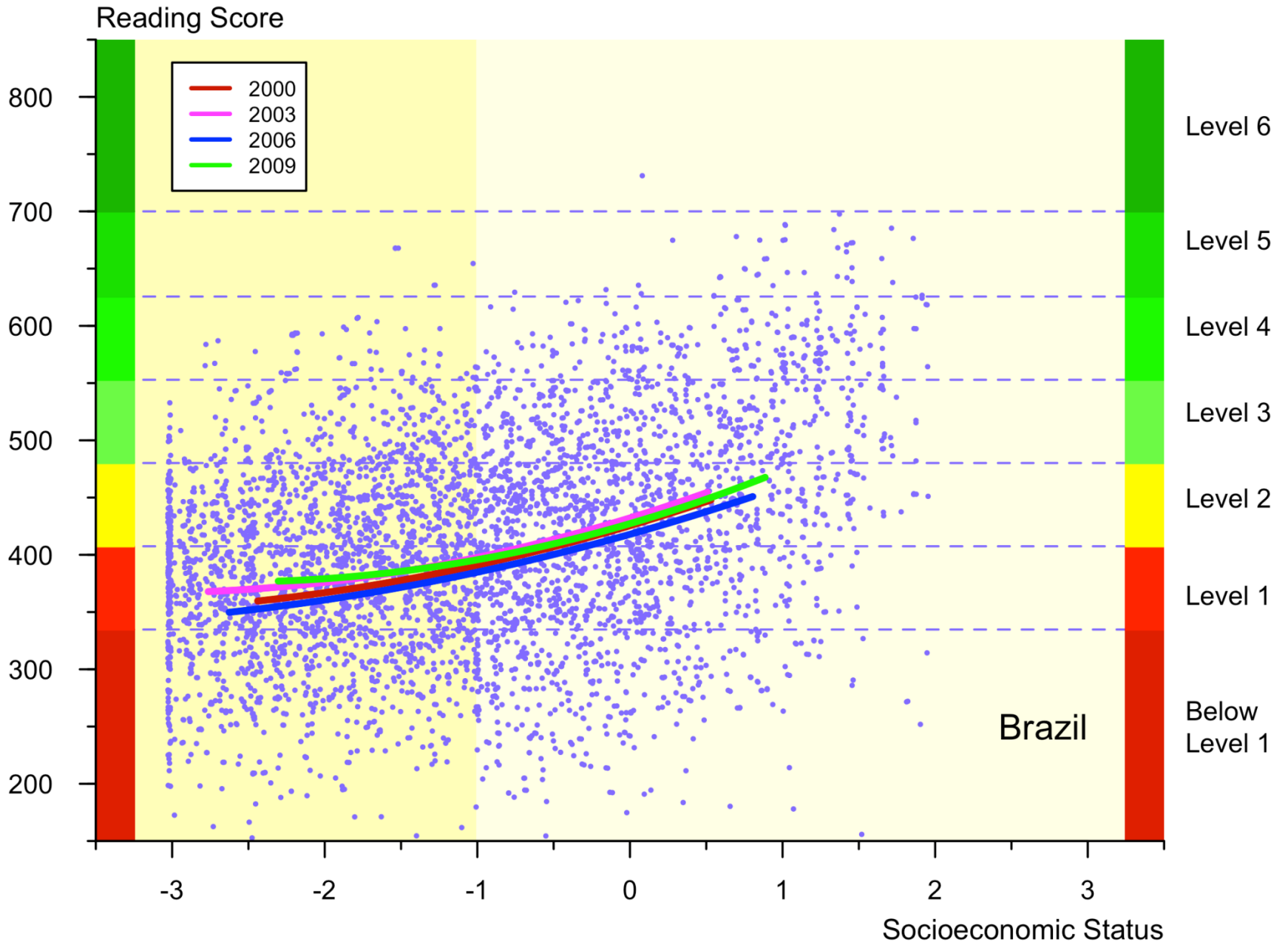


IV. Allocation of Resources

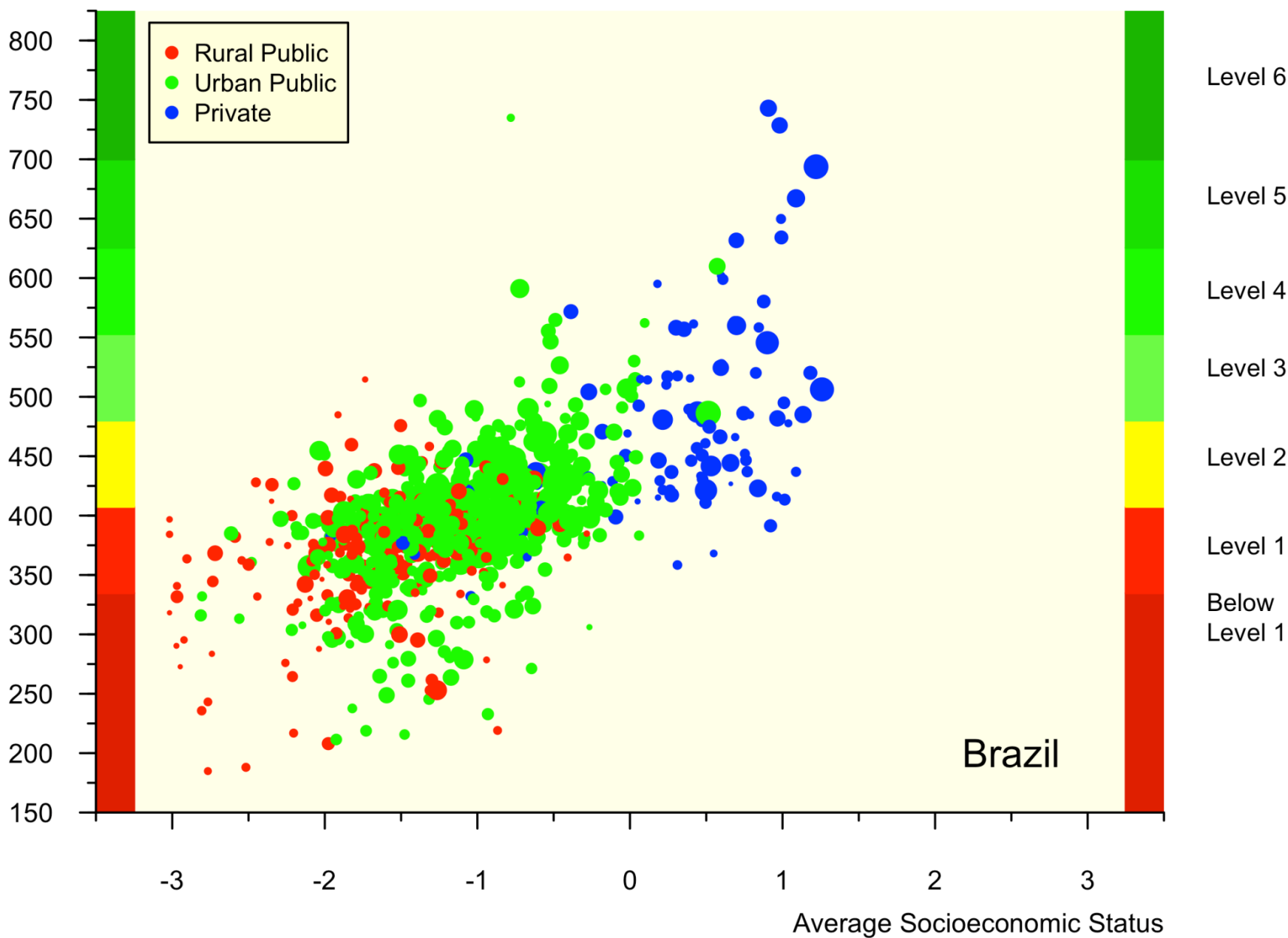


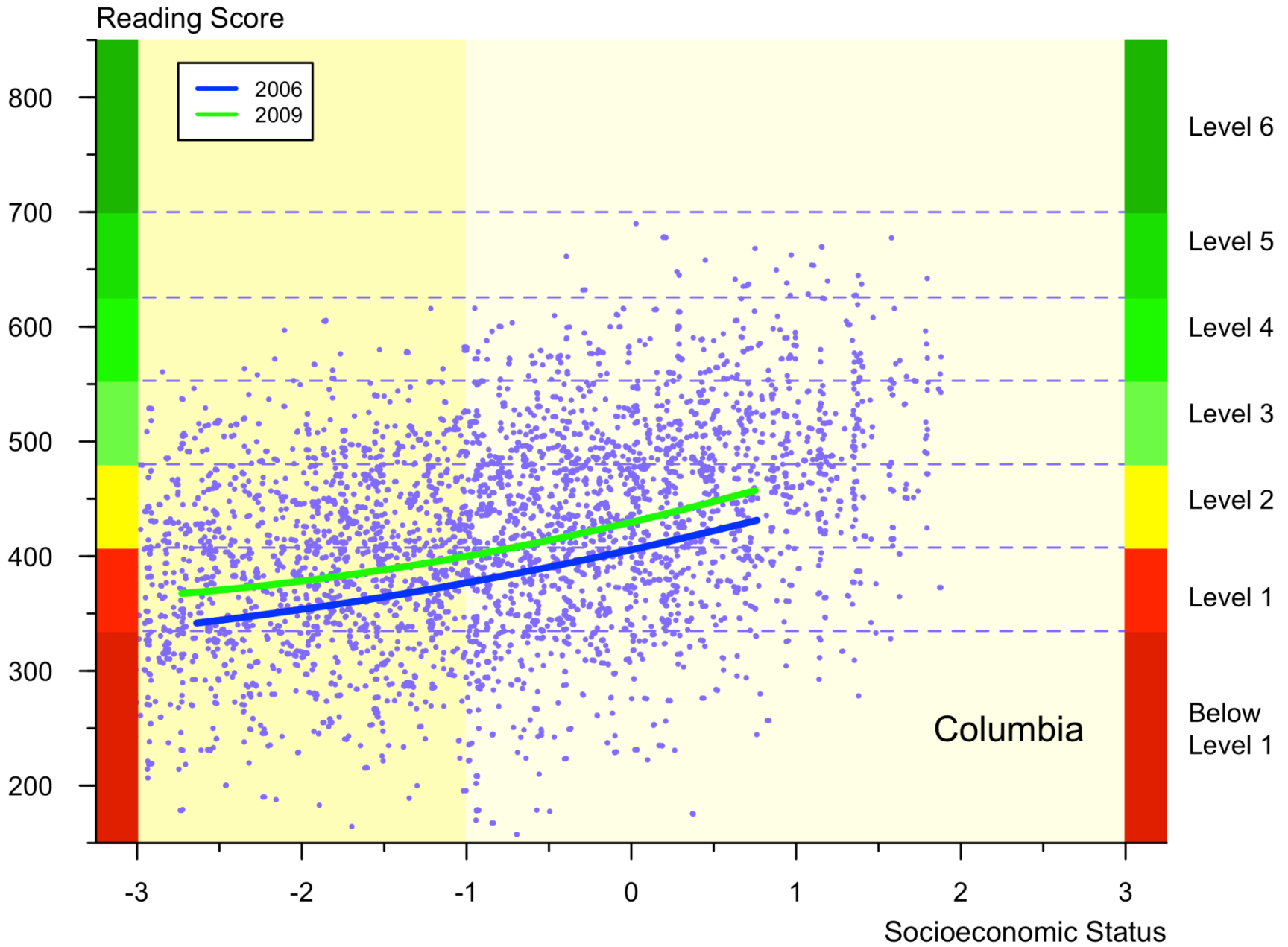
Average Reading Proficiency

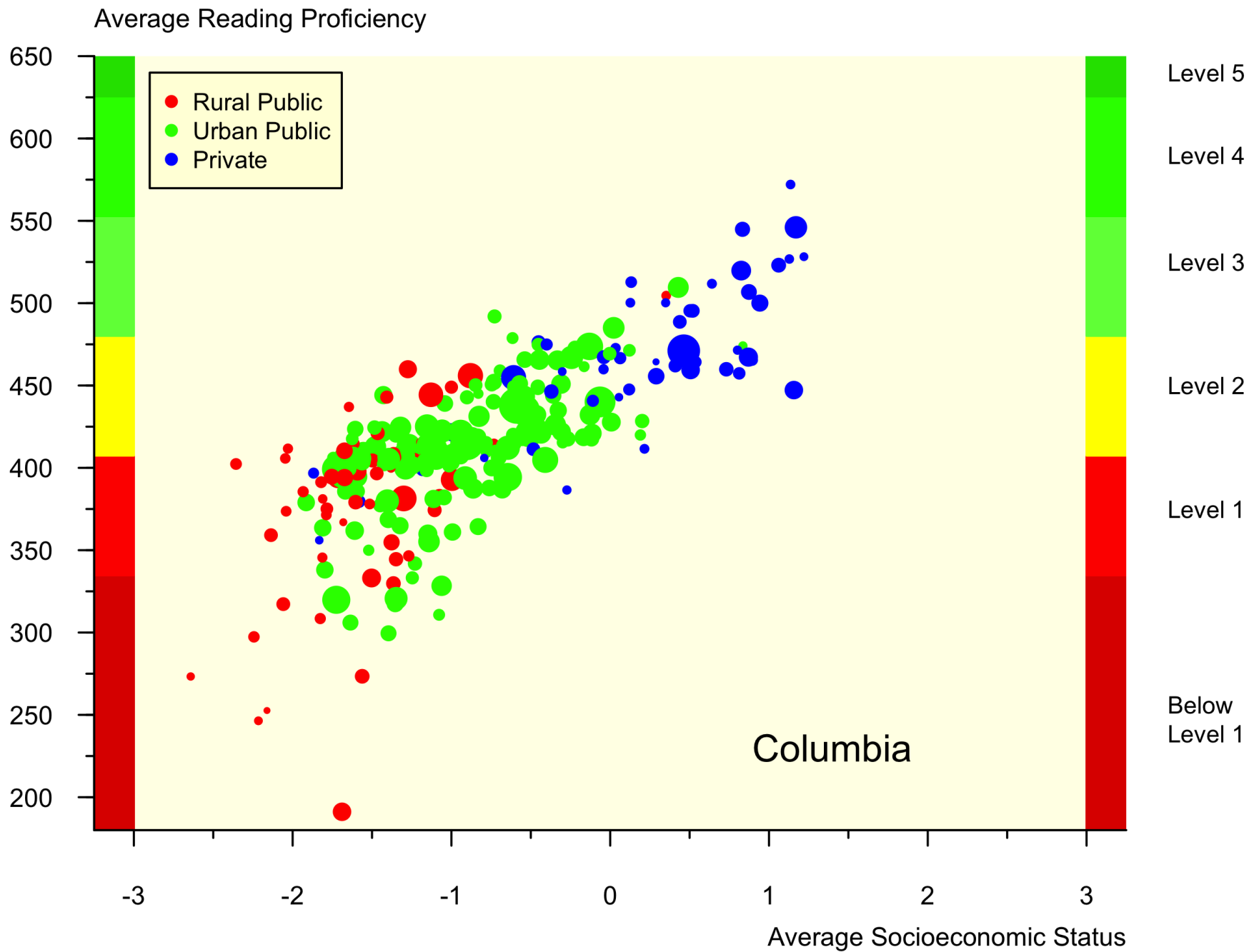




Average Reading Proficiency

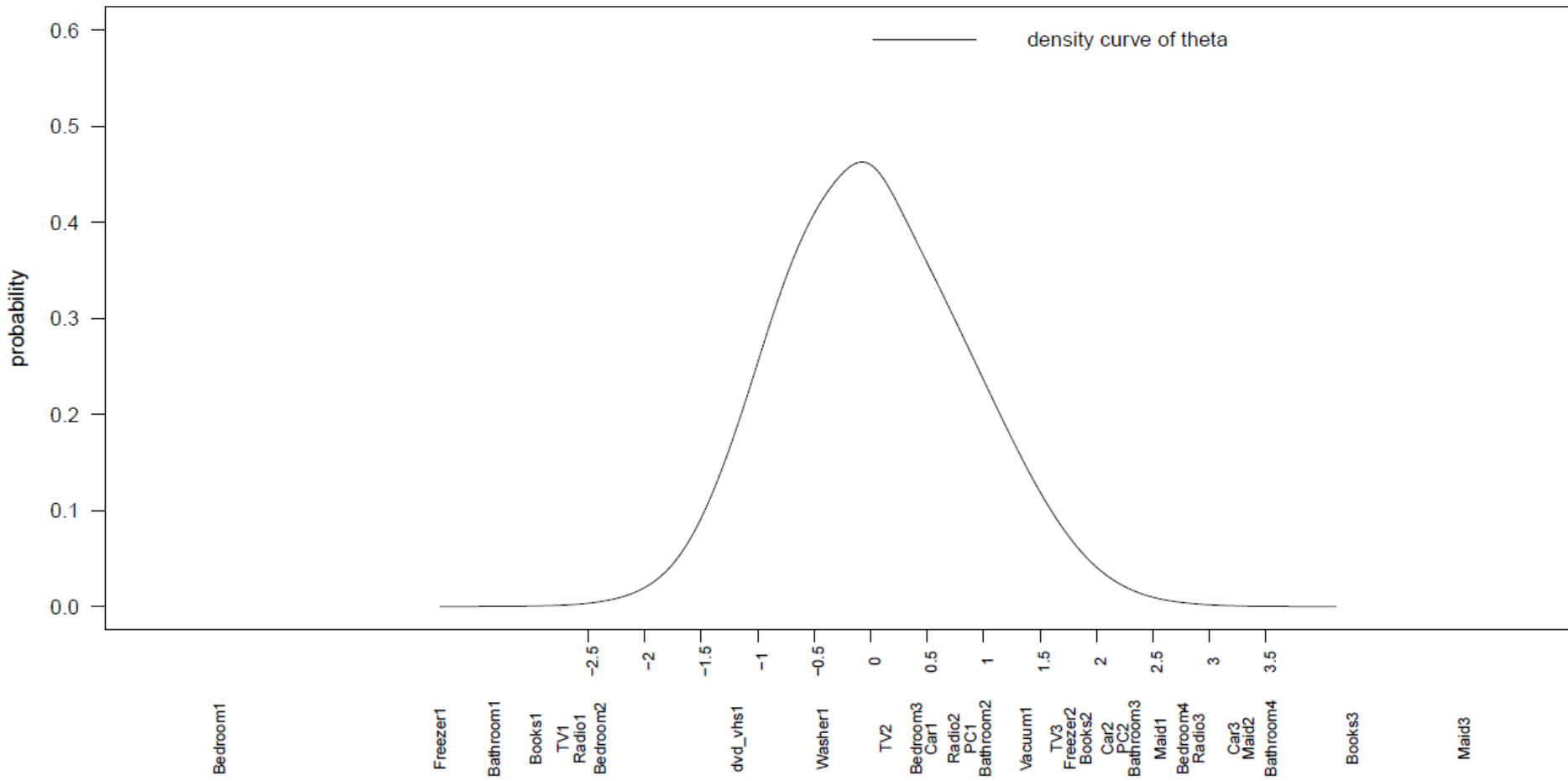




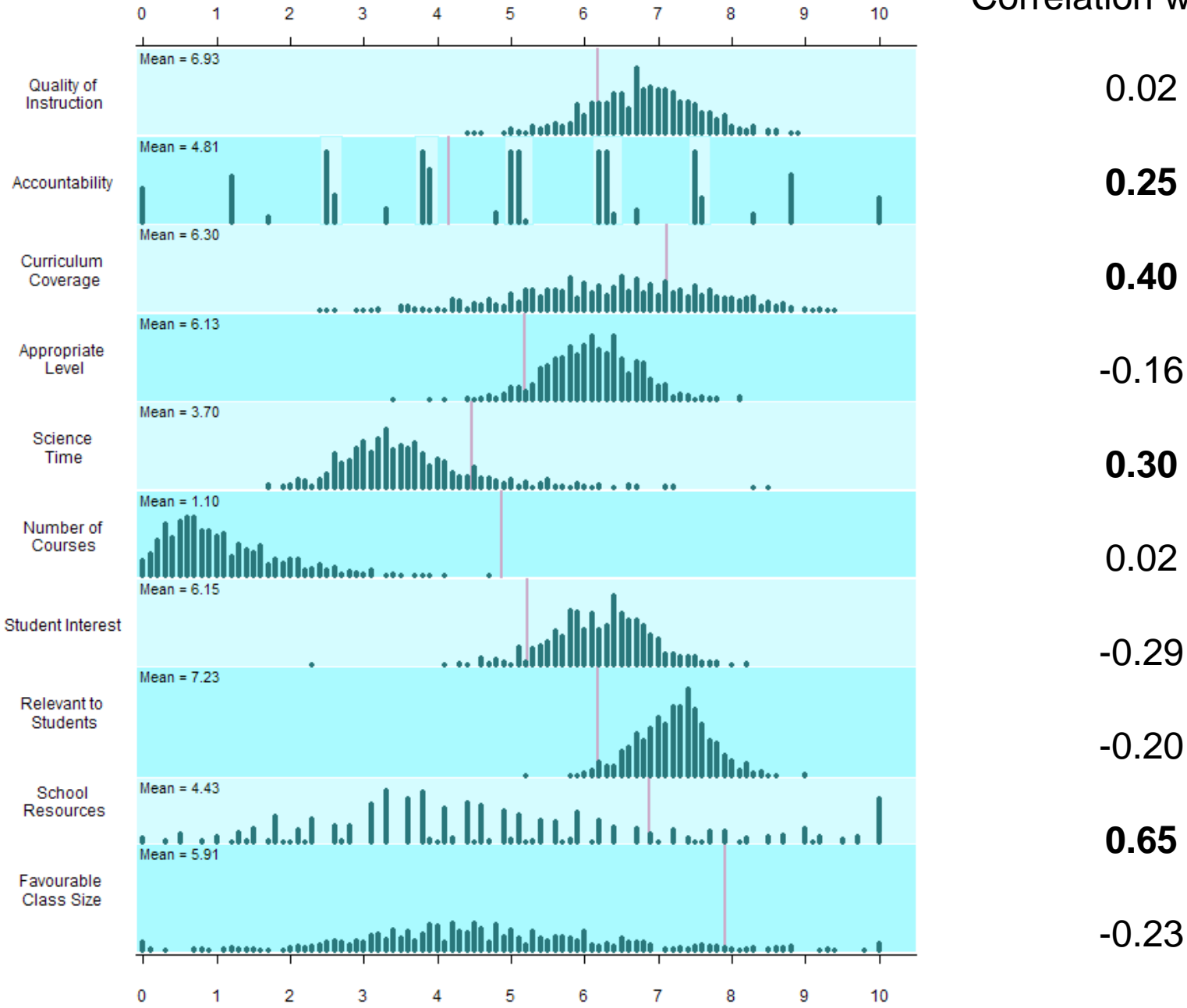


Use modern scaling techniques to scale variables and identify cut-points related to desired standards.





Correlation with SES



Learning resource plot for Brazil



LESSONS LEARNED:

We need a strong measure of socioeconomic status that can be used cross-nationally.

We also need to build a more comprehensive model of school resources. Imagine if we had a model of physical and human resources that was comparable to our achievement measures, with 4 or 5 levels. For example, schools without the basic physical infrastructure (plumbing, heating, basic teaching resources) would be at Level 1, while schools with high levels of resources (well-equipped library, trained teachers that demonstrate high-yield strategies) would be at Level 5.



V. Equality and Equity

Equality refers to differences in the distribution of outcomes among sub-populations, especially between high- and low-status groups.





Equity refers to fairness – a just treatment of people from different sub-populations.



An Approach for Assessing Quality, Equality, and Inequity

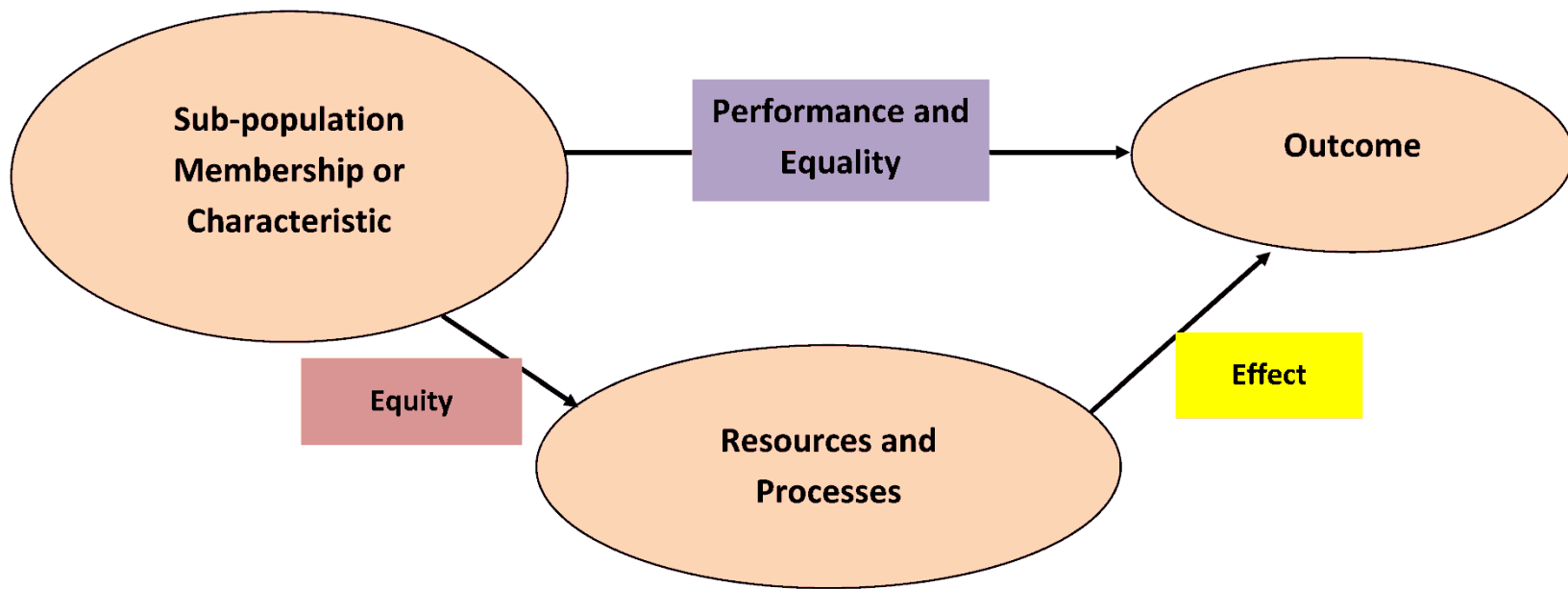


Table D6.3. Reading scores below PISA proficiency Level 3, age 15 (PISA 2009)

Results based on students' performance and self-reports

	Percent of students with reading scores below Level 3		Low socio-economic status (low vs. high)				Low parental education (low vs. high)				Immigrant status (immigrant vs. non-immigrant)				Gender (boys vs. girls)				
			Relative risk ¹		Population relevance ²		Relative risk ¹		Population relevance ²		Relative risk ¹		Population relevance ²		Relative risk ¹		Population relevance ²		
	%	S.E.	R.R.	S.E.	P.A.R. (%)	S.E.	R.R.	S.E.	P.A.R. (%)	S.E.	R.R.	S.E.	P.A.R. (%)	S.E.	R.R.	S.E.	P.A.R. (%)	S.E.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
OECD	Australia	34.7	(0.9)	1.94	(0.03)	19	(0.5)	1.64	(0.03)	8	(0.4)	0.93	(0.03)	-2	(0.7)	1.54	(0.04)	21	(1.2)
	Austria	51.7	(1.3)	1.61	(0.03)	13	(0.6)	1.70	(0.04)	3	(0.3)	1.58	(0.04)	8	(0.7)	1.39	(0.04)	16	(1.5)
	Belgium	38.0	(1.0)	2.03	(0.04)	21	(0.7)	1.85	(0.06)	5	(0.3)	1.87	(0.06)	11	(0.8)	1.34	(0.03)	15	(1.3)
	Canada	30.5	(0.7)	1.65	(0.04)	14	(0.7)	1.68	(0.07)	2	(0.2)	1.13	(0.04)	3	(0.9)	1.59	(0.03)	23	(0.7)
	Chile	63.7	(1.5)	1.44	(0.03)	10	(0.6)	1.44	(0.03)	9	(0.6)	c	c	c	c	1.15	(0.02)	7	(1.1)
	Czech Republic	50.5	(1.4)	1.59	(0.04)	13	(0.7)	1.34	(0.03)	6	(0.5)	1.12	(0.06)	0	(0.1)	1.56	(0.05)	23	(1.7)
	Denmark	41.2	(1.1)	1.82	(0.04)	17	(0.7)	1.79	(0.08)	5	(0.4)	1.82	(0.04)	7	(0.3)	1.41	(0.04)	17	(1.3)
	Estonia	39.0	(1.5)	1.50	(0.04)	11	(0.8)	1.62	(0.10)	2	(0.3)	1.43	(0.07)	3	(0.5)	1.76	(0.07)	28	(2.0)
	Finland	24.8	(0.9)	1.84	(0.07)	17	(1.2)	2.08	(0.12)	4	(0.5)	2.27	(0.17)	3	(0.5)	2.57	(0.09)	44	(1.5)
	France	40.8	(1.4)	1.92	(0.05)	19	(0.9)	1.82	(0.06)	8	(0.6)	1.67	(0.06)	8	(0.8)	1.48	(0.05)	19	(1.5)
	Germany	40.7	(1.3)	2.13	(0.08)	22	(1.2)	2.22	(0.06)	12	(0.6)	1.73	(0.05)	11	(0.7)	1.47	(0.04)	19	(1.4)
	Greece	46.9	(1.9)	1.67	(0.04)	14	(0.8)	1.57	(0.04)	8	(0.6)	1.56	(0.07)	5	(0.6)	1.54	(0.04)	21	(1.2)
	Hungary	41.3	(1.5)	2.17	(0.07)	23	(1.1)	1.94	(0.05)	20	(0.9)	0.88	(0.08)	0	(0.2)	1.48	(0.05)	19	(1.6)
	Iceland	39.0	(0.8)	1.49	(0.04)	11	(0.8)	1.53	(0.05)	5	(0.4)	1.94	(0.09)	2	(0.2)	1.62	(0.05)	23	(1.4)
	Ireland	40.5	(1.3)	1.85	(0.06)	18	(1.0)	1.74	(0.05)	7	(0.5)	1.39	(0.07)	3	(0.6)	1.47	(0.05)	19	(1.7)
	Israel	49.0	(1.3)	1.75	(0.05)	16	(0.9)	1.83	(0.05)	5	(0.3)	1.05	(0.04)	1	(0.8)	1.38	(0.04)	16	(1.3)
	Italy	45.1	(0.8)	1.69	(0.02)	15	(0.4)	1.56	(0.02)	12	(0.3)	1.69	(0.03)	4	(0.2)	1.58	(0.03)	23	(1.1)
	Japan	31.6	(1.4)	1.79	(0.05)	16	(0.8)	2.03	(0.15)	2	(0.3)	c	c	c	c	1.67	(0.09)	26	(2.7)
	Korea	21.2	(1.4)	2.26	(0.11)	24	(1.6)	2.32	(0.14)	8	(0.8)	c	c	c	c	2.07	(0.18)	36	(4.1)
	Luxembourg	50.0	(0.6)	1.84	(0.03)	17	(0.5)	1.74	(0.04)	13	(0.6)	1.50	(0.03)	17	(0.8)	1.32	(0.02)	14	(0.7)
	Mexico	73.1	(0.8)	1.30	(0.01)	7	(0.2)	1.33	(0.01)	14	(0.5)	1.33	(0.01)	1	(0.0)	1.13	(0.01)	6	(0.4)
	Netherlands	39.1	(2.7)	1.72	(0.04)	15	(0.8)	1.66	(0.07)	5	(0.6)	1.63	(0.09)	7	(1.1)	1.32	(0.04)	14	(1.4)
	New Zealand	33.7	(1.0)	1.98	(0.06)	20	(1.1)	1.51	(0.07)	10	(1.2)	1.23	(0.05)	5	(1.1)	1.67	(0.05)	25	(1.4)
	Norway	38.6	(1.2)	1.70	(0.06)	15	(1.1)	1.82	(0.10)	2	(0.2)	1.66	(0.06)	4	(0.4)	1.75	(0.06)	28	(1.5)
	Poland	39.5	(1.3)	1.75	(0.05)	16	(0.9)	1.72	(0.06)	18	(1.3)	c	c	c	c	1.81	(0.05)	29	(1.4)
	Portugal	44.0	(1.6)	1.67	(0.04)	14	(0.7)	1.79	(0.05)	28	(1.3)	1.37	(0.06)	2	(0.3)	1.50	(0.03)	20	(0.9)
	Slovak Republic	50.3	(1.3)	1.60	(0.04)	13	(0.8)	1.83	(0.08)	1	(0.2)	c	c	c	c	1.64	(0.03)	24	(1.0)
	Slovenia	46.8	(0.6)	1.65	(0.04)	14	(0.7)	1.41	(0.04)	14	(1.2)	1.48	(0.04)	4	(0.3)	1.70	(0.03)	26	(0.8)
	Spain	46.4	(1.1)	1.61	(0.04)	13	(0.7)	1.54	(0.04)	14	(1.0)	1.66	(0.03)	6	(0.3)	1.36	(0.02)	15	(0.9)
	Sweden	40.9	(1.3)	1.78	(0.04)	16	(0.8)	1.56	(0.04)	7	(0.5)	1.71	(0.05)	8	(0.8)	1.59	(0.03)	23	(0.9)
	Switzerland	39.5	(1.0)	1.79	(0.04)	10	(0.5)	1.79	(0.04)	10	(0.5)	1.12	(0.06)	1	(0.1)	1.54	(0.04)	22	(1.2)
	Turkey	56.7	(1.8)	1.93	(0.07)	43	(1.8)	1.93	(0.07)	43	(1.8)	1.12	(0.06)	1	(0.1)	1.43	(0.05)	18	(1.7)
	United Kingdom	43.3	(1.1)	1.62	(0.06)	2	(0.3)	1.62	(0.06)	2	(0.3)	1.12	(0.06)	1	(0.1)	1.29	(0.03)	12	(1.2)
United States	42.0	(1.5)	1.65	(0.06)	4	(0.4)	1.65	(0.06)	4	(0.4)	1.12	(0.06)	1	(0.1)	1.28	(0.04)	12	(1.5)	
OECD average	42.8	(0.2)	1.76	(0.04)	16	(0.8)	1.72	(0.01)	9	(0.1)	1.50	(0.07)	4	(0.5)	1.54	(0.05)	21	(1.4)	

RR=1.72

RR=1.54

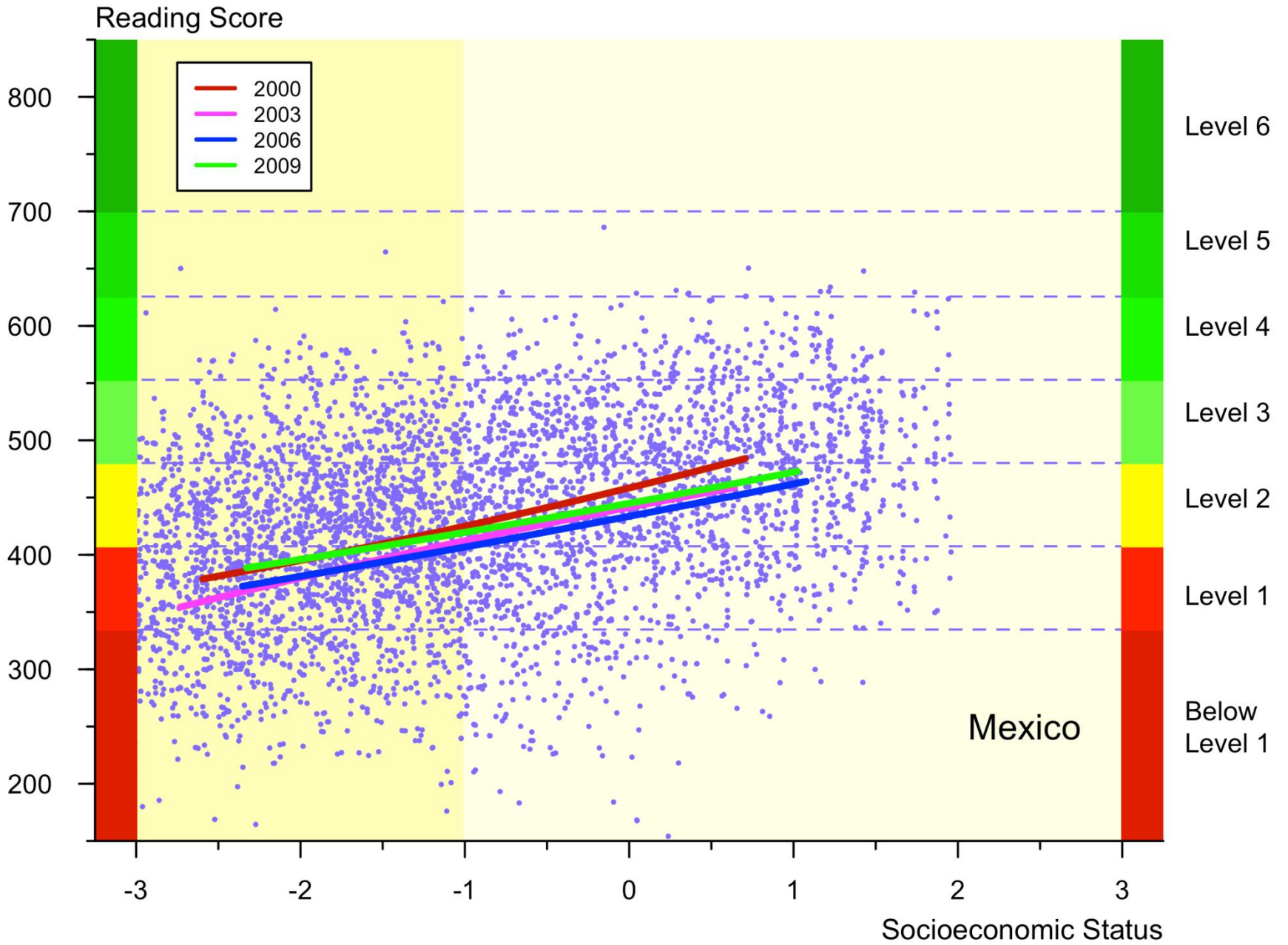
Table D6.5. **Student does not value schooling outcomes (PISA 2009)**

Results based on students' self-reports

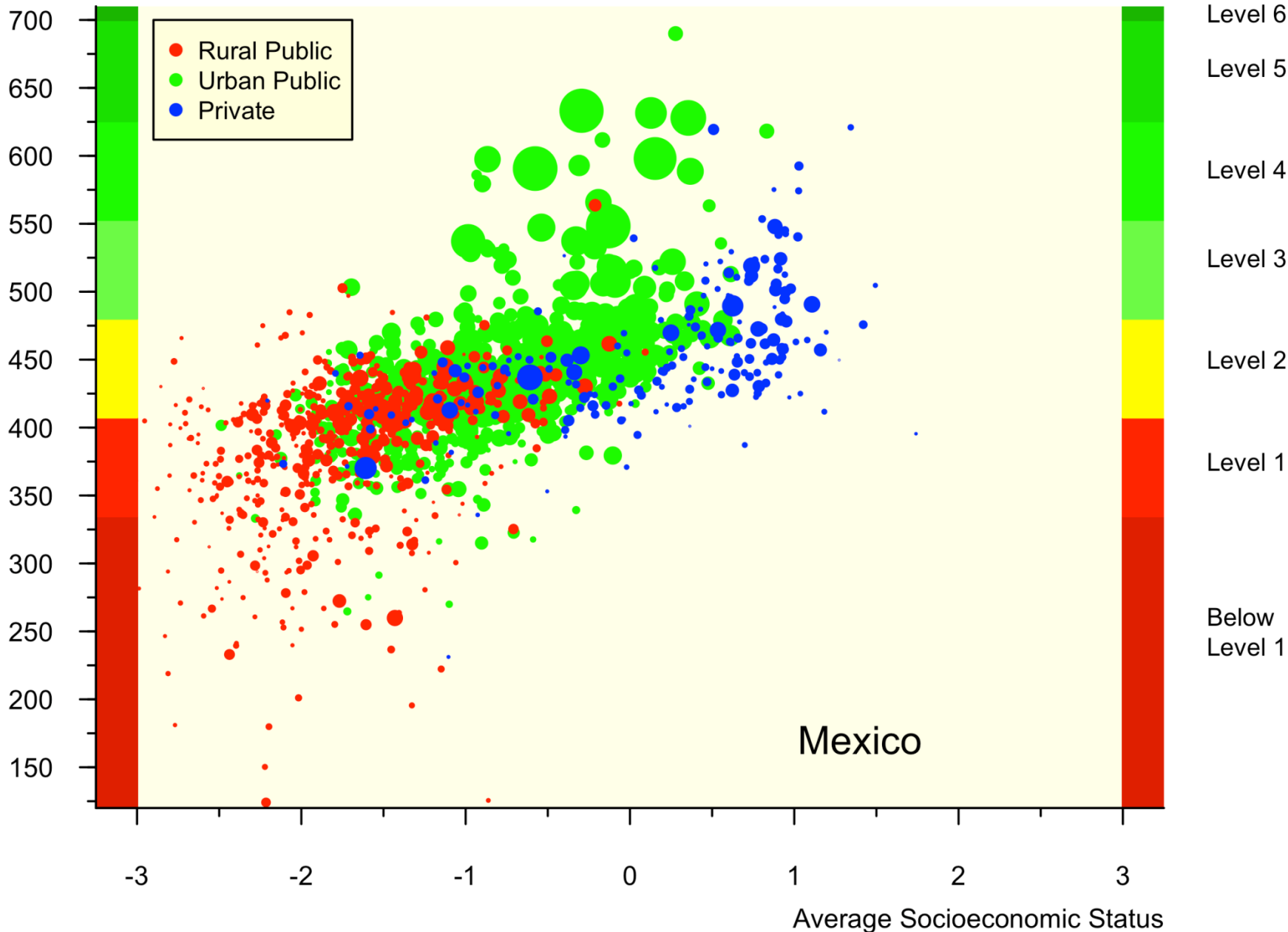
OECD		Percent of students who do not value schooling outcomes		Low socio-economic status (low vs. high)				Low parental education (low vs. high)				Immigrant status (immigrant vs. non-immigrant)				Gender (boys vs. girls)			
				Relative risk ¹		Population relevance ²		Relative risk ¹		Population relevance ²		Relative risk ¹		Population relevance ²		Relative risk ¹		Population relevance ²	
		%	S.E.	R.R.	S.E.	P.A.R. (%)	S.E.	R.R.	S.E.	P.A.R. (%)	S.E.	R.R.	S.E.	P.A.R. (%)	S.E.	R.R.	S.E.	P.A.R. (%)	S.E.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Australia	19.0	(0.4)	1.31	(0.03)	7	(0.6)	1.34	(0.04)	5	(0.5)	1.00	(0.03)	0	(0.6)	1.06	(0.02)	3	(1.0)	
Austria	26.3	(0.9)	1.04	(0.03)	1	(0.8)	0.95	(0.08)	0	(0.4)	0.78	(0.04)	-4	(0.7)	1.19	(0.03)	8	(1.3)	
Belgium	24.9	(0.6)	1.00	(0.03)	0	(0.7)	0.94	(0.04)	0	(0.2)	0.97	(0.03)	0	(0.5)	1.20	(0.03)	9	(1.1)	
Canada	21.7	(0.4)	1.13	(0.02)	3	(0.5)	0.97	(0.05)	0	(0.2)	0.84	(0.02)	-4	(0.6)	1.21	(0.02)	10	(0.9)	
Chile	17.9	(0.6)	0.99	(0.04)	0	(0.9)	1.00	(0.04)	0	(1.0)	c	c	c	c	0.95	(0.03)	-3	(1.6)	
Czech Republic	29.0	(0.8)	0.95	(0.02)	-1	(0.6)	0.89	(0.03)	-2	(0.6)	1.11	(0.08)	0	(0.2)	1.17	(0.03)	8	(1.3)	
Denmark	22.9	(0.7)	1.38	(0.04)	9	(0.8)	1.56	(0.07)	3	(0.4)	1.01	(0.04)	0	(0.4)	1.19	(0.04)	9	(1.5)	
Estonia	19.4	(0.7)	1.11	(0.05)	3	(1.2)	0.78	(0.19)	-1	(0.5)	0.92	(0.05)	-1	(0.4)	1.42	(0.05)	18	(1.7)	
Finland	20.0	(0.6)	1.49	(0.04)	11	(0.8)	1.40	(0.09)	2	(0.4)	0.75	(0.09)	-1	(0.3)	1.68	(0.05)	25	(1.4)	
France	22.5	(0.9)	1.22	(0.04)	5	(1.0)	1.21	(0.06)	2	(0.6)	0.92	(0.04)	-1	(0.6)	1.56	(0.05)	21	(1.4)	
Germany	30.4	(0.8)	0.85	(0.03)	-4	(0.7)	0.93	(0.04)	-1	(0.5)	0.90	(0.03)	-2	(0.6)	1.29	(0.03)	13	(1.3)	
Greece	37.4	(1.0)	0.77	(0.02)	-6	(0.5)	0.74	(0.03)	-4	(0.5)	0.72	(0.04)	-3	(0.4)	1.07	(0.03)	3	(1.1)	
Hungary	21.9	(0.8)	1.06	(0.04)	1	(1.1)	0.98	(0.04)	-1	(1.1)	0.80	(0.08)	0	(0.2)	1.28	(0.04)	12	(1.7)	
Iceland	23.1	(0.7)	1.45	(0.05)	10	(1.0)	1.45	(0.06)	4	(0.5)	0.83	(0.10)	0	(0.2)	1.36	(0.04)	15	(1.5)	
Ireland	19.5	(0.7)	1.34	(0.06)	8	(1.2)	1.19	(0.08)	2	(0.8)	0.93	(0.07)	-1	(0.6)	1.16	(0.04)	8	(1.7)	
Israel	31.0	(0.9)	0.95	(0.03)	-1	(0.7)	0.83	(0.05)	-1	(0.3)	1.19	(0.04)	4	(0.6)	1.27	(0.04)	12	(1.4)	
Italy	20.8	(0.4)	0.98	(0.02)	-1	(0.5)	0.91	(0.02)	-2	(0.4)	1.01	(0.04)	0	(0.2)	1.42	(0.03)	18	(0.9)	
Japan	45.6	(0.7)	1.10	(0.02)	3	(0.4)	0.96	(0.05)	0	(0.1)	c	c	c	c	1.13	(0.02)	6	(0.8)	
Korea	42.9	(0.9)	0.89	(0.02)	-3	(0.6)	0.91	(0.03)	-1	(0.2)	c	c	c	c	0.99	(0.02)	0	(1.1)	
Luxembourg	32.3	(0.7)	0.86	(0.02)	-4	(0.5)	0.87	(0.02)	-3	(0.5)	0.69	(0.02)	-14	(0.9)	1.32	(0.03)	14	(1.1)	
Mexico	12.6	(0.3)	1.27	(0.03)	6	(0.7)	1.26	(0.03)	11	(1.1)	2.33	(0.14)	2	(0.3)	1.54	(0.04)	21	(1.2)	
Netherlands	24.7	(0.8)	1.00	(0.03)	0	(0.7)	0.95	(0.06)	0	(0.5)	1.02	(0.06)	0	(0.7)	1.26	(0.04)	11	(1.5)	
New Zealand	17.2	(0.6)	1.44	(0.06)	10	(1.1)	1.39	(0.06)	8	(1.1)	0.84	(0.03)	-4	(0.8)	1.16	(0.05)	8	(2.0)	
Norway	33.6	(0.8)	1.26	(0.03)	6	(0.8)	1.39	(0.08)	1	(0.1)	0.88	(0.03)	-1	(0.2)	1.15	(0.03)	7	(1.1)	
Poland	37.3	(0.9)	0.89	(0.02)	-3	(0.5)	0.87	(0.02)	-4	(0.6)	c	c	c	c	1.21	(0.02)	9	(1.0)	
Portugal	12.4	(0.5)	1.13	(0.05)	3	(1.1)	0.95	(0.04)	-3	(2.0)	1.18	(0.09)	1	(0.5)	1.70	(0.07)	26	(1.8)	
Slovak Republic	25.9	(0.8)	1.01	(0.04)	0	(0.9)	0.88	(0.10)	0	(0.2)	c	c	c	c	1.40	(0.05)	16	(1.6)	
Slovenia	25.0	(0.7)	0.99	(0.04)	0	(0.9)	1.01	(0.02)	1	(0.9)	1.06	(0.05)	0	(0.4)	1.35	(0.04)	15	(1.4)	
Spain	19.7	(0.5)	1.16	(0.03)	4	(0.8)	1.08	(0.03)	3	(0.8)	1.00	(0.04)	0	(0.4)	1.55	(0.04)	22	(1.3)	
Sweden	28.3	(0.8)	1.20	(0.03)	5	(0.7)	1.15	(0.05)	2	(0.6)	0.94	(0.04)	-1	(0.5)	1.34	(0.03)	15	(1.3)	
Switzerland	28.1	(0.8)	0.99	(0.03)	0	(0.7)	0.90	(0.03)	-1	(0.4)	c	c	c	c	1.37	(0.04)	16	(1.3)	
Turkey	19.8	(0.7)	0.62	(0.02)	-44	(3.5)	0.62	(0.02)	-44	(3.5)	c	c	c	c	1.28	(0.04)	13	(1.6)	
United Kingdom	18.5	(0.5)	1.25	(0.08)	1	(0.3)	1.25	(0.08)	1	(0.3)	c	c	c	c	0.95	(0.03)	-3	(1.5)	
United States	18.9	(0.6)	1.01	(0.06)	0	(0.4)	1.01	(0.06)	0	(0.4)	c	c	c	c	1.31	(0.04)	14	(1.6)	
OECD average	25.0	(0.1)	1.11	(0.03)	2	(0.8)	1.05	(0.01)	-1	(0.2)	1.10	(0.07)	-1	(0.4)	1.28	(0.04)	12	(1.4)	

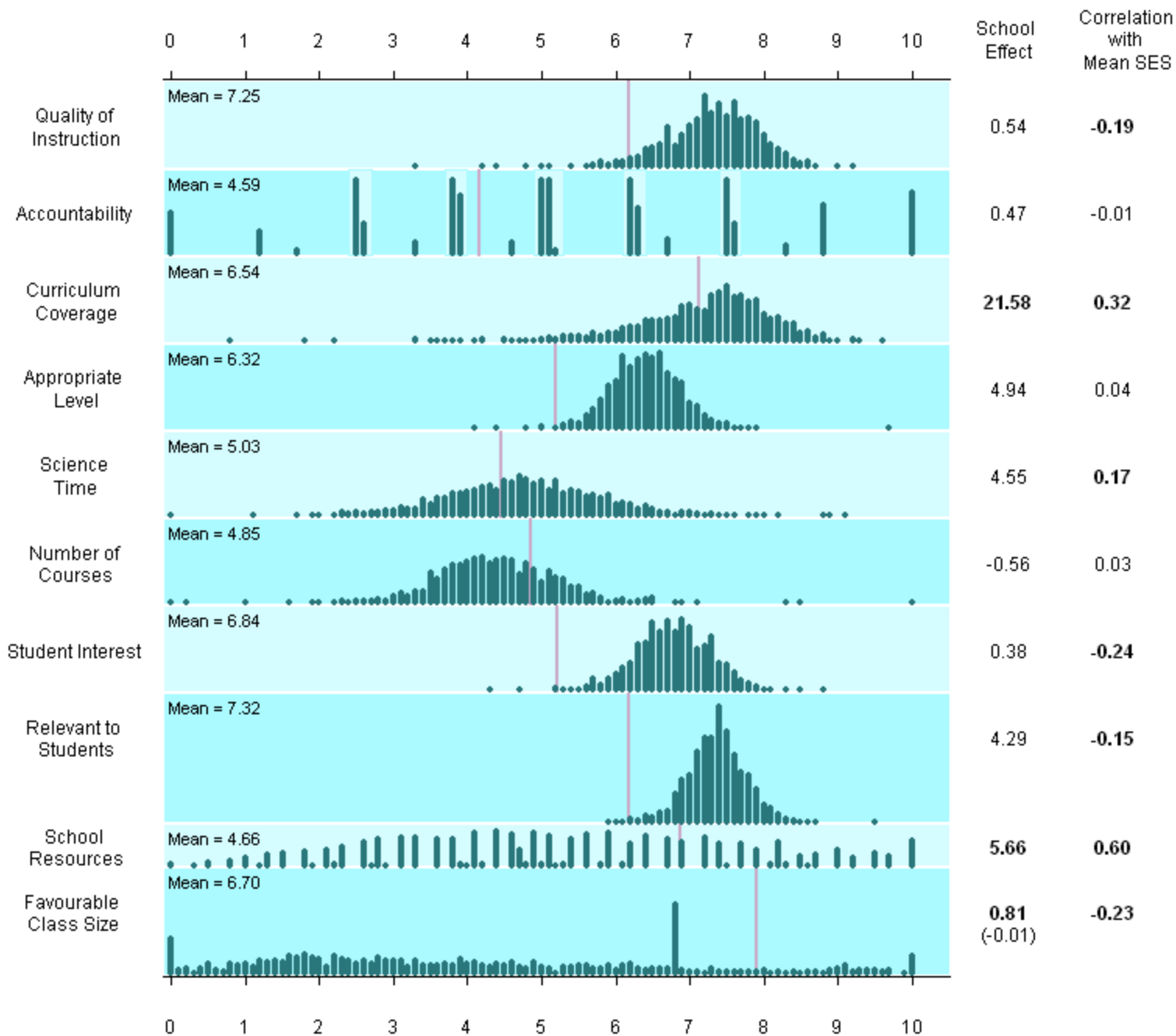
RR=1.72

RR=1.28



Average Reading Proficiency



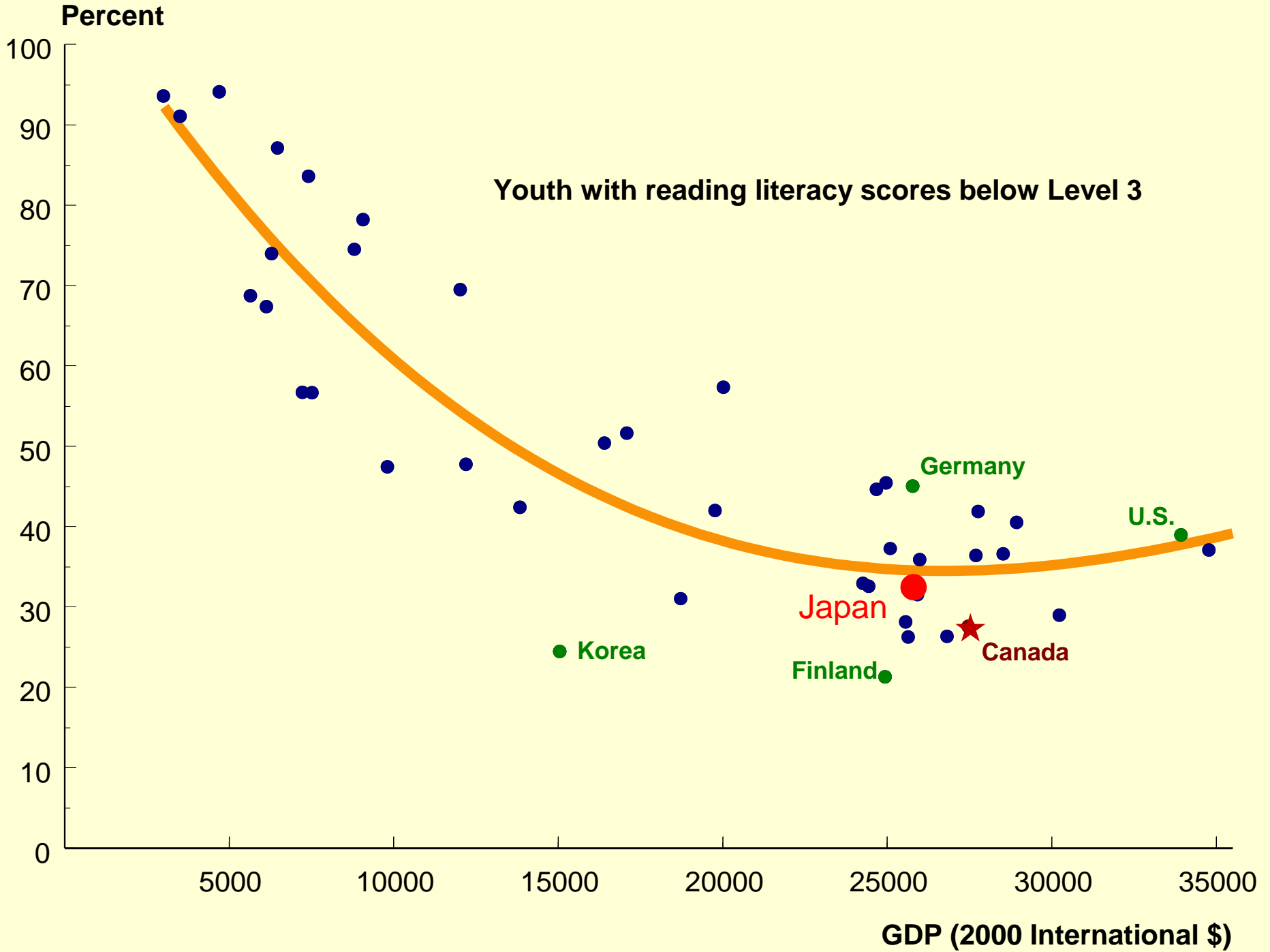




LESSONS LEARNED:

There are large inequalities in achievement that are entrenched in the social and economic realities of each country.

The earlier PISA results have taken us some way toward understanding the extent of inequalities. To move forward we need stronger measures of inequities - the factors associated with inequalities and how these are distributed among schools.



Questions about School Policy and Practice

Student Performance	<p>What are the current levels of student performance? Mean score, percent vulnerable</p> <p>What are the current levels of student growth?</p> <p>What are the long-term trends in student performance and growth?</p> <p>To what extent do levels of performance and student growth vary within and among schools?</p>
Drivers of Performance	<p>To what extent are levels of student performance and student growth related to school processes and practices?</p>
Intervention Forecasting	<p>Can we identify students that require specific types of interventions?</p>
Resource Allocation	<p>To what extent do schools vary in their levels of socioeconomic status?</p> <p>To what extent are low socioeconomic status or minority group students concentrated in certain schools?</p>
Inequality	<p>To what extent do levels of performance and rates of growth vary among socioeconomic groups, immigrant and non-immigrant students, aboriginal and non-aboriginal students, males and females?</p>
Inequity	<p>To what extent do students from differing sub-populations have access to key school resources and processes?</p>

**The
Pathway
to
Success**



Student Performance: measures of literacy skills that stretch the scale down to pre-literacy skills (e.g., code-related and language skills)

Drivers of Performance: measures that capture students' opportunities to learn from an early age.

Intervention Forecasting: models that will better predict long-term outcomes.

Resource Allocation: a strong measure of socioeconomic status that can be used cross-nationally; a comprehensive model of school resources.

Inequality and Inequity: stronger measures of inequities - the factors associated with inequalities and how these are distributed among schools.



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