

Chapter 3

Effective Schools in Reading, Mathematics, and Science at the Fourth Grade

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Boston College

Introduction

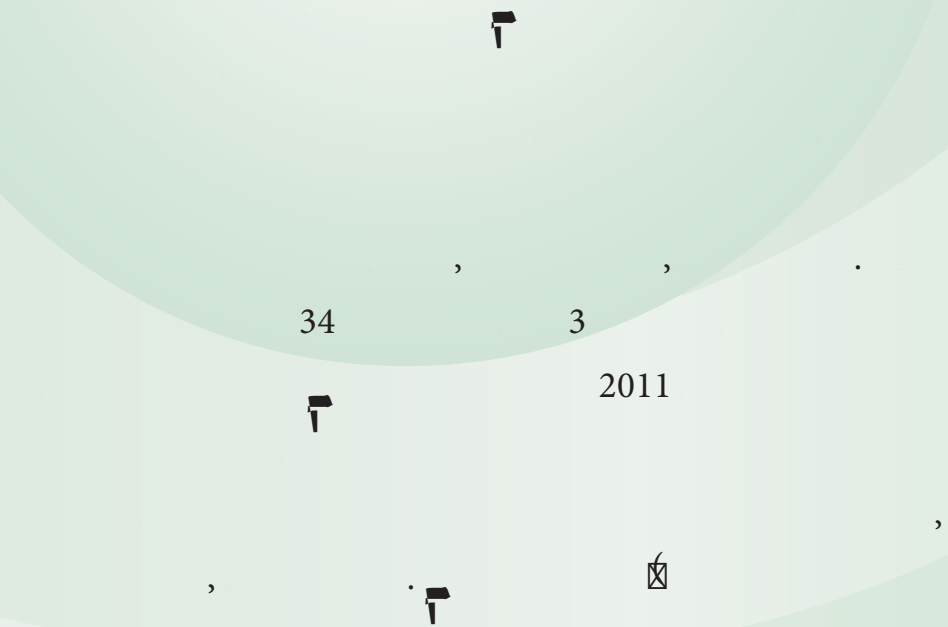


Figure 3.1: Relationship between TIMSS and PIRLS scores for reading, mathematics, and science at the fourth grade level

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Schools Support Academic Success

Adequate Environments and Resources

Teacher Working Conditions Scale

School Resource Sufficiency Scale

Adequate Environments and Resources

School Resource Sufficiency Scale

Adequate Environments and Resources



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School Instruction

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Student Engagement in Reading, Mathematics, and Science Lessons

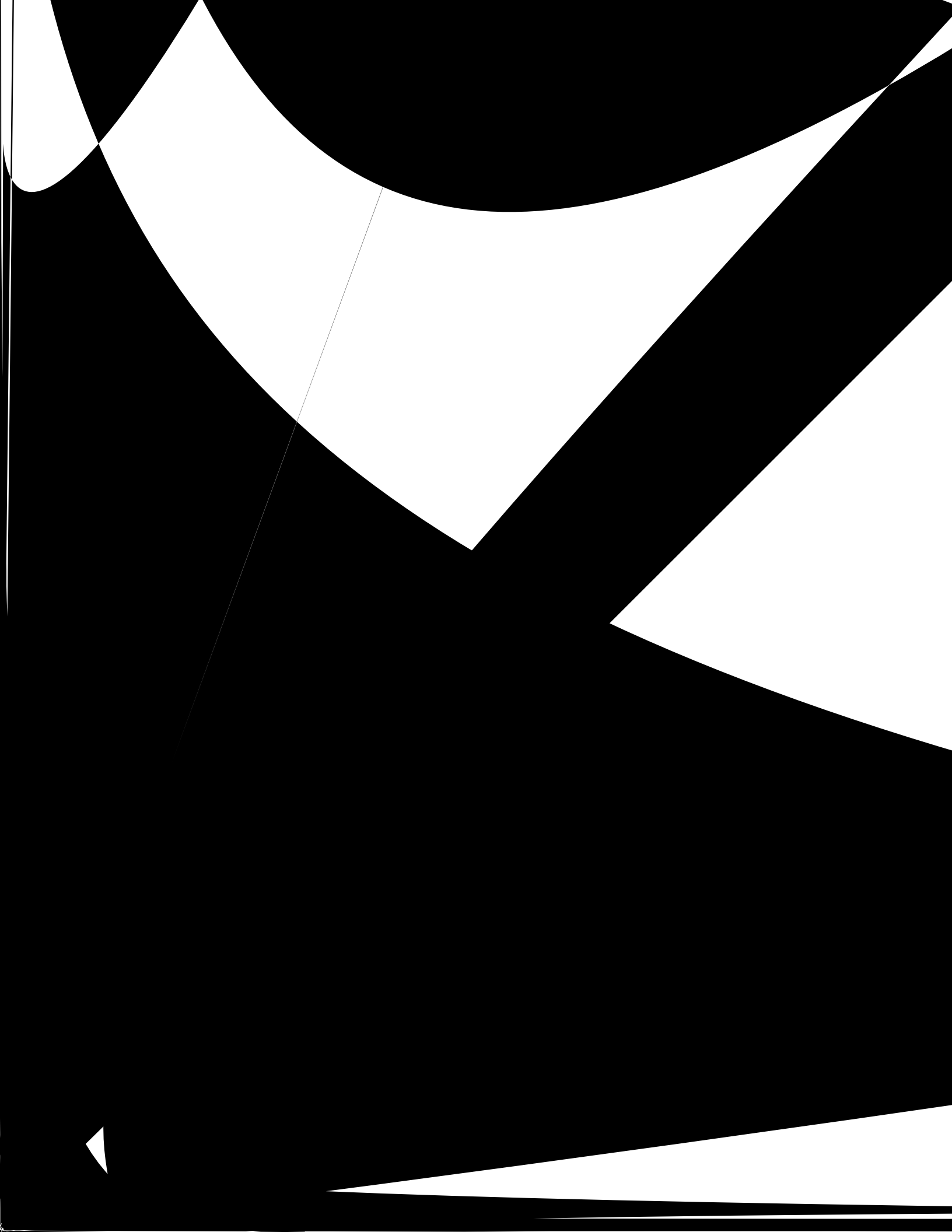
Figure 3.10 shows that students in the United States are more engaged in reading lessons than in mathematics or science lessons. The percentage of students who are engaged in reading lessons is 75 percent, compared to 65 percent for mathematics and 60 percent for science lessons. The percentage of students who are engaged in reading lessons is also higher than in any other country.

Student Engagement in Reading Lessons

Figure 3.11 shows that students in the United States are more engaged in reading lessons than in any other country. The percentage of students who are engaged in reading lessons is 75 percent, compared to 65 percent for mathematics and 60 percent for science lessons. The percentage of students who are engaged in reading lessons is also higher than in any other country.

Student Engagement in Reading Lessons

Figure 3.12 shows that students in the United States are more engaged in reading lessons than in any other country. The percentage of students who are engaged in reading lessons is 75 percent, compared to 65 percent for mathematics and 60 percent for science lessons. The percentage of students who are engaged in reading lessons is also higher than in any other country.



The School Effectiveness Analysis

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School Explanatory Models

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School Explanatory with Control Models

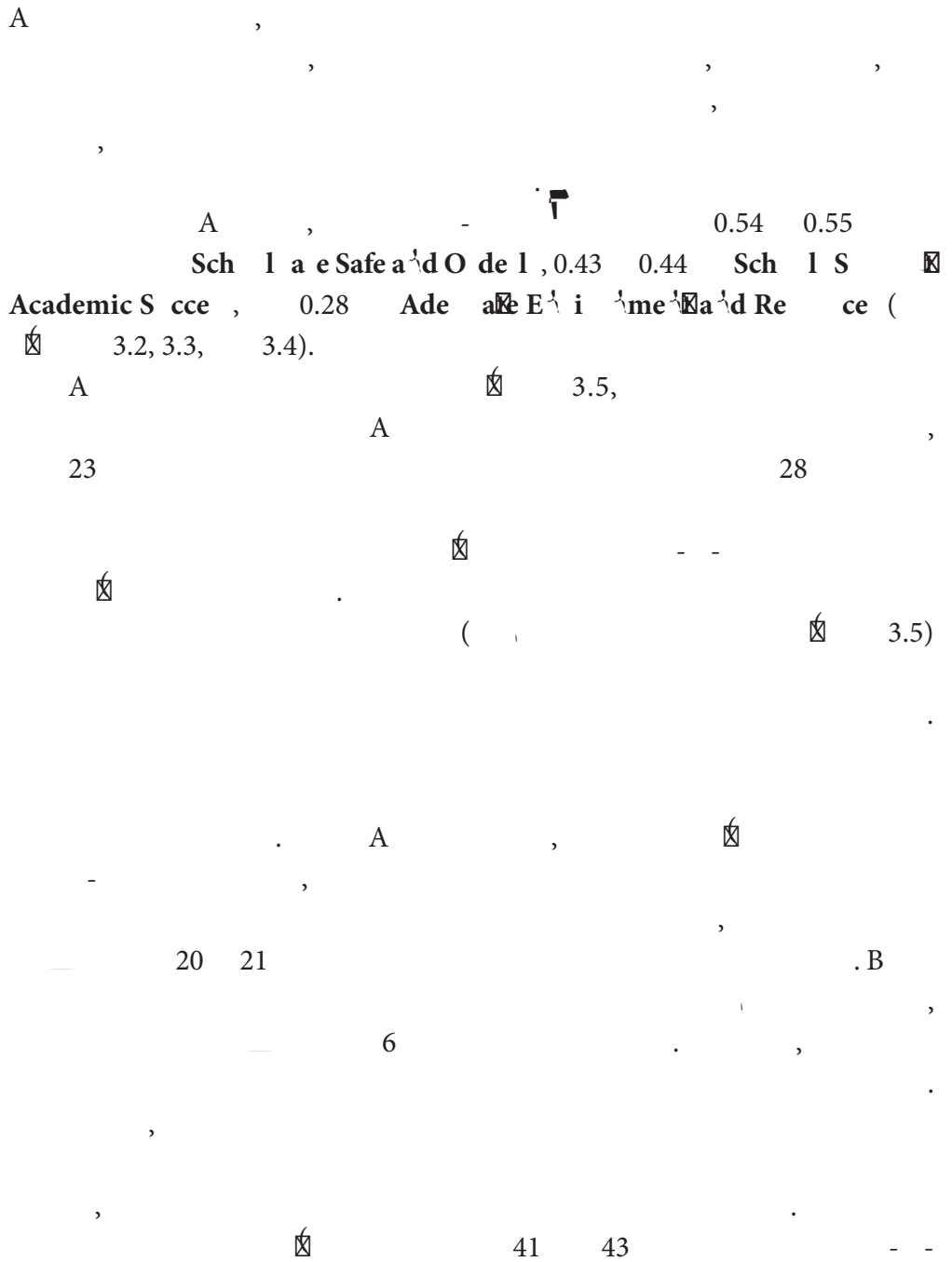
Interpreting the Multilevel Regression Models

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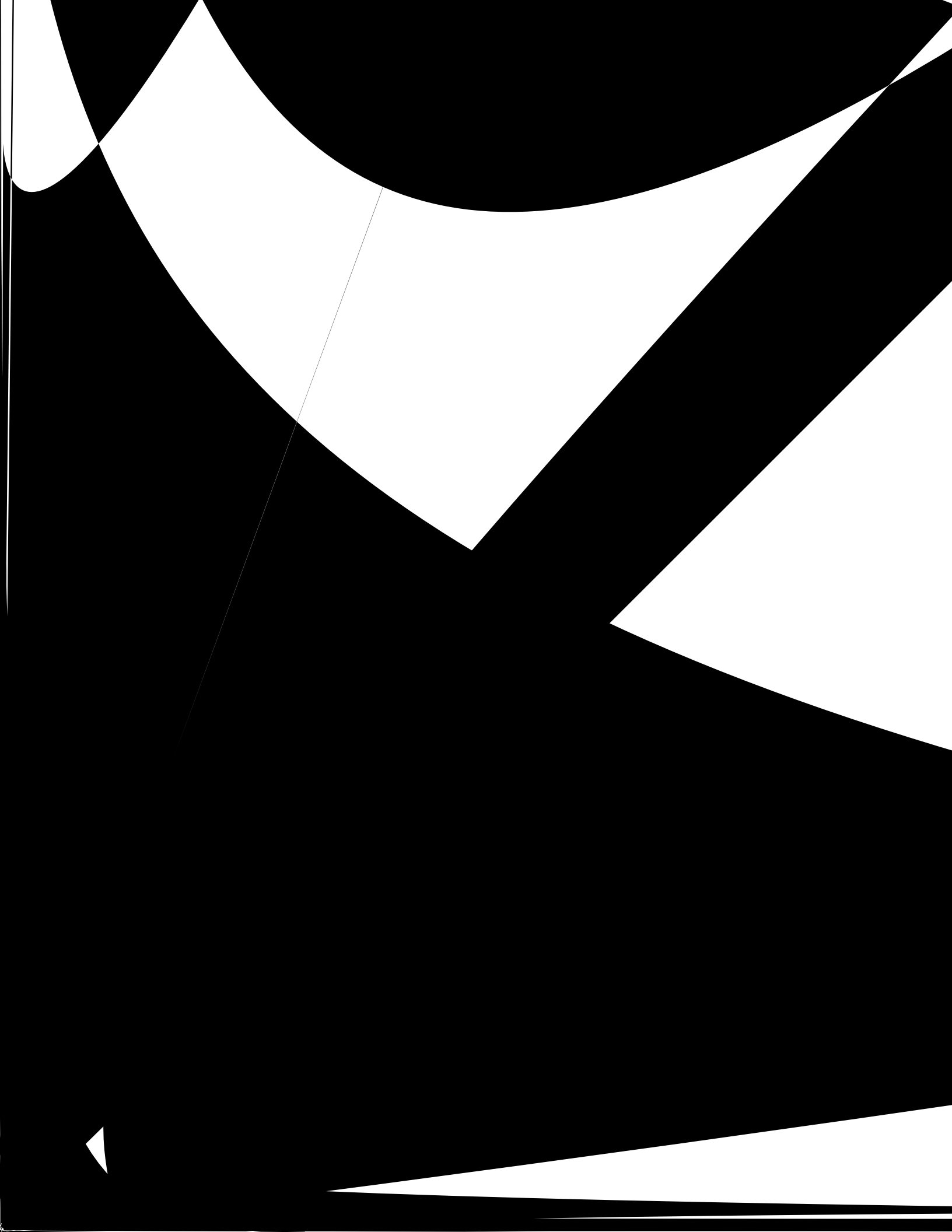
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School Explanatory Models—Australia



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Results across TIMSS and PIRLS 2011 Participants



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**E hibi 3.3: Variance Decomposition and Correlation of School Effect on
Variance in Mathematics Achievement**

Component	Percentage of Total Variance		School-level Correlations				
	Between Schools	Within Schools	Schools Are Safe and Orderly	Schools Support Academic Learning	Teacher Effectiveness	Parent Effectiveness	Student Effectiveness
Overall	28	72	0.54	0.43	0.28	0.04	0.21
Teacher Effectiveness	16	84	0.38	0.37	0.15	-0.05	-0.08
Parent Effectiveness	48	52	0.19	0.16	0.11	-0.08	0.54
Student Effectiveness	11	89	0.18	0.27	0.06	-0.01	0.26
Schools Support Academic Learning	13	87	0.06	0.21	-0.02	0.16	-0.13
Schools Are Safe and Orderly	21	79	0.04	0.14	-0.12	-0.01	0.00
Teacher Effectiveness	9	91	0.39	0.41	0.14	0.18	-0.06
Parent Effectiveness	38	62	0.07	0.25	-0.03	-0.04	0.34
Student Effectiveness	27	73	0.39	0.52	0.13	0.21	-0.08
Schools Support Academic Learning	22	78	0.18	0.13	-0.03	0.18	0.41
Schools Are Safe and Orderly	36	64	0.48	0.53	-0.02	0.07	0.01
Teacher Effectiveness	38	62	0.15	0.31	0.11	0.20	-0.02
Parent Effectiveness	17	83	0.52	0.42	0.12	0.07	0.12
Student Effectiveness	26	74	0.18	0.10	0.20	0.01	0.08
Schools Support Academic Learning	20	80	0.21	0.42	0.00	0.13	0.14
Schools Are Safe and Orderly	20	80	0.47	0.54	0.23	0.00	0.41
Teacher Effectiveness	44	56	0.21	0.36	0.20	0.20	0.41
Parent Effectiveness	17	83	0.42	0.28	0.07	0.03	0.20
Student Effectiveness	14	86	0.35	0.35	0.04	0.02	0.21
Schools Support Academic Learning	20	80	0.18	0.36	0.16	0.23	0.35
Schools Are Safe and Orderly	13	87	-0.11	0.35	-0.03	-0.04	-0.23
Teacher Effectiveness	38	62	0.28	0.40	0.04	-0.11	0.35
Parent Effectiveness	45	55	0.44	0.38	0.39	0.22	0.36
Student Effectiveness	38	62	0.37	0.43	0.09	0.09	0.29
Schools Support Academic Learning	34	66	0.16	0.12	0.09	-0.05	0.05
Schools Are Safe and Orderly	37	63	0.21	0.37	0.12	0.09	0.22
Teacher Effectiveness	25	75	0.27	0.42	-0.03	-0.01	0.10
Parent Effectiveness	27	73	0.29	0.38	0.02	0.06	0.04
Student Effectiveness	8	92	0.08	0.17	0.00	-0.06	-0.11
Schools Support Academic Learning	21	79	0.42	0.49	0.03	-0.05	0.20
Schools Are Safe and Orderly	12	88	0.51	0.46	0.28	0.14	-0.09
Teacher Effectiveness	45	55	0.34	0.36	0.30	0.42	0.27
Parent Effectiveness	26	74	0.28	0.34	0.10	0.07	0.15
Single Grade Correlation							
Teacher Effectiveness	31	69	0.49	0.61	0.23	0.03	0.62
Parent Effectiveness	47	53	0.13	0.13	0.39	0.21	-0.04
Benchmarking Participants							
Teacher Effectiveness	15	85	0.29	0.45	0.27	-0.05	0.08
Parent Effectiveness	42	58	0.33	0.37	0.31	0.25	0.22
Student Effectiveness	52	48	0.41	0.37	0.33	0.48	0.36

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28	72	0.54	0.44	0.28	0.02	0.21
13	87	0.42	0.38	0.14	-0.04	-0.15
49	51	0.22	0.18	0.06	-0.04	0.55
10	90	0.18	0.26	0.06	0.01	0.24
11	89	0.10	0.20	-0.12	0.10	-0.13
14	86	0.07	0.15	-0.10	-0.03	0.02
10	90	0.42	0.43	0.08	0.14	-0.13
32	68	0.05	0.21	-0.07	-0.03	0.34
26	74	0.44	0.55	0.16	0.20	-0.07
20	80	0.13	0.08	-0.04	0.18	0.36
38	62	0.46	0.51	-0.04	0.06	0.01
42	58	0.13	0.32	0.09	0.20	-0.06
19	81	0.53	0.42	0.12	0.12	0.12
26	74	0.20	0.07	0.15	-0.01	0.06

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School Explanatory Variables

School Enrollment

REA	8	▲	—	8	▲	—	4 (2.4)	—	4 (2.4)
MAT	9	▲	—	9 (4.1)	▲	—	6 (3.7)	—	5 (3.6)
SCI	10	▲	—	10 (3.7)	▲	—	6 (3.1)	—	5 (3.0)
REA	5	▲	—	5	▲	—	2 (2.0)	—	2 (1.9)
MAT	5	▲	—	6 (2.6)	▲	—	2 (2.4)	—	3 (2.4)
SCI	6	▲	—	6 (2.5)	▲	—	2 (2.2)	—	2 (2.2)
REA	-2	—	—	-2	—	—	-2 (1.2)	—	-2 (1.2)
MAT	0	—	—	0	—	—	0 (1.6)	—	1 (1.6)
SCI	-1	—	—	-1	—	—	0 (1.3)	—	0 (1.3)

School Instruction

REA	—	-1	-2 (1.6)	—	—	-2 (1.5)	-2 (1.4)
MAT	—	-2	-3 (1.7)	—	—	-3 (1.8)	-3 (1.6)
SCI	—	-1 (2.0)	-2 (1.7)	—	—	-3 (1.8)	-3 (1.6)
REA	—	-4	-4 (3.8)	—	—	-2 (3.2)	-2 (3.2)
MAT	—	-3	-2	—	—	0	1 (4.6)
SCI	—	-5	-5	—	—	-2	-2 (4.0)

REA	—	—	—	19 (0.8)	▲	19	▲	19 (0.8)	▲	19 (0.8)	▲
MAT	—	—	—	16 (0.7)	▲	16	▲	16 (0.7)	▲	16 (0.7)	▲
SCI	—	—	—	20 (0.9)	▲	20	▲	20 (1.0)	▲	20 (1.0)	▲
REA	—	—	—	5 (0.8)	▲	5	▲	5 (0.8)	▲	5 (0.8)	▲
MAT	—	—	—	8 (0.7)	▲	8	▲	8 (0.7)	▲	8 (0.7)	▲
SCI	—	—	—	5 (0.7)	▲	5	▲	5 (0.7)	▲	5 (0.7)	▲
REA	—	—	—	27	▲	24 (2.9)	▲	27 (2.6)	▲	24 (2.9)	▲
MAT	—	—	—	25	▲	21 (3.6)	▲	26	▲	21 (3.5)	▲
SCI	—	—	—	26 (3.4)	▲	23 (3.5)	▲	26 (3.4)	▲	23 (3.5)	▲
REA	—	—	—	-1 (6.4)	—	0 (6.3)	—	-2 (6.0)	—	-1 (5.9)	—
MAT	—	—	—	7 (7.0)	—	9 (7.0)	—	6 (6.4)	—	8 (6.3)	—
SCI	—	—	—	-4	—	-3 (6.7)	—	-5 (6.3)	—	-4 (6.3)	—
REA	—	▲	—	—	—	—	—	—	—	—	—
MAT	—	▼	—	—	—	—	—	—	—	—	—
SCI	—	—	—	—	—	—	—	—	—	—	—

Reading

25	2	28	55	58	57	60
—	—	—	18	18	18	18
2	0	2	21	22	21	22
22	1	24	37	42	38	44
—	—	—	20	20	20	20
3	0	4	23	23	23	24
26	2	28	46	52	48	54
3	0	4	24	24	24	25

() Percentage of available variance shown in parentheses.

Exhibit 3.9: School Effectiveness Model for Reading, Mathematics, and Science Coefficients

2011

Variables	HLM Regression Coefficients							
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models			
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction	

School Explanatory Variables

School Environment

Schools Are Safe and Orderly	REA	2 (2.8)	—	3 (2.7)	—	4 (1.9)	—	4 (1.9) ▲
	MAT	1 (3.2)	—	2 (3.0)	—	3 (2.0)	—	3 (2.0)
	SCI	2 (2.9)	—	3 (2.7)	—	4 (2.1)	—	4 (2.0)
Schools Support Academic Success	REA	5 (1.9) ▲	—	5 (1.9) ▲	—	0 (1.2)	—	0 (1.2)
	MAT	5 (2.1) ▲	—	4 (2.0) ▲	—	-1 (1.3)	—	-1 (1.2)
	SCI	4 (1.7) ▲	—	4 (1.7) ▲	—	-1 (1.1)	—	-1 (1.1)
Adequate Environment and Resources	REA	-3 (1.5)	—	-2 (1.6)	—	-1 (1.2)	—	-1 (1.2)
	MAT	-1 (1.7)	—	0 (1.8)	—	1 (1.2)	—	1 (1.3)
	SCI	-3 (1.5)	—	-2 (1.6)	—	-1 (1.2)	—	-1 (1.2)

School Instruction

Early Emphasis on Reading Skills	REA	—	1 (1.5)	0 (1.6)	—	—	0 (1.0)	0 (1.1)
	MAT	—	2 (1.8)	1 (1.8)	—	—	0 (1.2)	0 (1.2)
	SCI	—	1 (1.4)	0 (1.4)	—	—	-1 (1.0)	-1 (1.0)
Students Engaged in Reading, Mathematics, and Science Lessons	REA	—	-7 (3.5) ▼	-8 (3.6) ▼	—	—	-2 (2.7)	-2 (2.6)
	MAT	—	-8 (4.3)	-9 (4.6) ▼	—	—	-1 (2.6)	-2 (2.7)
	SCI	—	-7 (3.4) ▼	-8 (3.6) ▼	—	—	-2 (2.7)	-2 (2.7)

Home Background Control Variables

Student Within School

Home Resources for Learning	REA	—	—	—	12 (0.8) ▲	12 (0.8) ▲	12 (0.8) ▲	12 (0.8) ▲
	MAT	—	—	—	11 (0.8) ▲	11 (0.8) ▲	11 (0.8) ▲	11 (0.8) ▲
	SCI	—	—	—	12 (1.0) ▲	12 (1.0) ▲	12 (1.0) ▲	12 (1.0) ▲
Early Literacy/Numeracy Tasks	REA	—	—	—	12 (0.7) ▲	12 (0.7) ▲	12 (0.7) ▲	12 (0.7) ▲
	MAT	—	—	—	16 (0.9) ▲	16 (0.9) ▲	16 (0.9) ▲	16 (0.9) ▲
	SCI	—	—	—	10 (0.9) ▲	10 (0.9) ▲	10 (0.9) ▲	10 (0.9) ▲
Between School	REA	—	—	—	23 (2.1) ▲	22 (2.0) ▲	23 (2.0) ▲	22 (1.9) ▲
	MAT	—	—	—	24 (2.4) ▲	25 (2.6) ▲	24 (2.4) ▲	25 (2.6) ▲
	SCI	—	—	—	21 (2.7) ▲	21 (2.6) ▲	21 (2.7) ▲	21 (2.7) ▲
School Average of Early Literacy/Numeracy Tasks	REA	—	—	—	9 (4.3) ▲	10 (4.2) ▲	9 (4.3) ▲	10 (4.2) ▲
	MAT	—	—	—	15 (5.5) ▲	15 (5.3) ▲	15 (5.5) ▲	15 (5.2) ▲
	SCI	—	—	—	4 (5.5)	6 (5.2)	4 (5.4)	5 (5.1)

() Standard errors appear in parentheses. REA - Reading ▲ Coefficient significantly greater than zero.
 MAT - Mathematics ▼ Coefficient significantly less than zero.
 SCI - Science

Source of Variance	Percentage of Variance Explained						
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models		
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction
Reading							
Between Schools (10%)	11	6	16	73	74	73	74
Within Schools (90%)	—	—	—	16	16	16	16
Total	1	1	2	22	22	22	22
Mathematics							
Between Schools (13%)	6	6	12	69	70	70	70
Within Schools (87%)	—	—	—	21	21	21	21
Total	1	1	2	27	27	27	27
Science							
Between Schools (11%)	9	5	13	62	64	62	64
Within Schools (89%)	—	—	—	16	16	16	16
Total	1	1	1	21	21	21	21

() Percentage of available variance shown in parentheses.

Exhibit 3.10: School Effectiveness Model for Reading, Mathematics, and Science
Country: Czech Republic



2011

Variables	HLM Regression Coefficients							
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models			
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction	

School Explanatory Variables

School Environment

Schools Are Safe and Orderly	REA	2 (5.4)	—	2 (5.5)	—	4 (3.0)	—	4 (2.9)
	MAT	1 (7.7)	—	2 (7.8)	—	5 (3.9)	—	5 (3.8)
	SCI	3 (5.9)	—	3 (5.9)	—	5 (3.2)	—	5 (3.2)
Schools Support Academic Success	REA	2 (2.4)	—	3 (2.4)	—	-1 (1.5)	—	-2 (1.5)
	MAT	3 (3.0)	—	3 (2.9)	—	-2 (1.5)	—	-2 (1.6)
	SCI	3 (2.5)	—	3 (2.5)	—	-1 (1.5)	—	-2 (1.6)
Adequate Environment and Resources	REA	-4 (2.9)	—	-5 (3.0)	—	-2 (1.6)	—	-1 (1.5)
	MAT	-5 (3.8)	—	-5 (3.8)	—	-2 (2.0)	—	-2 (1.9)
	SCI	-4 (3.2)	—	-4 (3.2)	—	-1 (1.7)	—	-1 (1.7)

School Instruction

Early Emphasis on Reading Skills	REA	—	0 (1.4)	-1 (1.3)	—	—	1 (0.9)	1 (0.9)
	MAT	—	0 (1.5)	-1 (1.5)	—	—	1 (0.9)	1 (0.9)
	SCI	—	0 (1.4)	-1 (1.3)	—	—	1 (0.9)	1 (0.8)
Students Engaged in Reading, Mathematics, and Science Lessons	REA	—	-1 (4.7)	-2 (4.5)	—	—	1 (3.3)	1 (3.2)
	MAT	—	-1 (5.5)	-2 (5.2)	—	—	1 (3.4)	1 (3.4)
	SCI	—	1 (4.2)	0 (4.2)	—	—	3 (3.1)	3 (3.2)

Home Background Control Variables

Student Home Environment

Home Resources for Learning	REA	—	—	—	15 (1.1) ▲	15 (1.1) ▲	15 (1.1) ▲	15 (1.1) ▲
	MAT	—	—	—	17 (1.2) ▲	17 (1.2) ▲	17 (1.2) ▲	17 (1.2) ▲
	SCI	—	—	—	17 (1.3) ▲	17 (1.3) ▲	17 (1.3) ▲	17 (1.3) ▲
Early Literacy/Numeracy Tasks	REA	—	—	—	7 (0.8) ▲	7 (0.8) ▲	7 (0.8) ▲	7 (0.8) ▲
	MAT	—	—	—	9 (0.9) ▲	9 (0.9) ▲	9 (0.9) ▲	9 (0.9) ▲
	SCI	—	—	—	7 (1.0) ▲	7 (1.0) ▲	7 (1.0) ▲	7 (1.0) ▲

Between School

School Average of Home Resources for Learning	REA	—	—	—	31 (4.5) ▲	31 (4.3) ▲	31 (4.5) ▲	31 (4.4) ▲
	MAT	—	—	—	37 (5.9) ▲	38 (5.6) ▲	38 (6.0) ▲	38 (5.8) ▲
	SCI	—	—	—	31 (4.9) ▲	32 (4.8) ▲	32 (4.9) ▲	32 (4.9) ▲
School Average of Early Literacy/Numeracy Tasks	REA	—	—	—	16 (5.5) ▲	17 (5.2) ▲	16 (5.7) ▲	16 (5.4) ▲
	MAT	—	—	—	26 (7.7) ▲	26 (7.2) ▲	25 (7.9) ▲	26 (7.5) ▲
	SCI	—	—	—	19 (5.7) ▲	19 (5.4) ▲	18 (6.0) ▲	19 (5.6) ▲

() Standard errors appear in parentheses. REA - Reading ▲ Coefficient significantly greater than zero.
 MAT - Mathematics ▼ Coefficient significantly less than zero.
 SCI - Science

Source of Variance	Percentage of Variance Explained							
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models			
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction	
Reading								
Between Schools (15%)	6	0	7	76	77	76	77	
Within Schools (85%)	—	—	—	16	16	16	16	
Total	1	0	1	25	25	25	25	
Mathematics								
Between Schools (21%)	5	0	6	77	78	77	79	
Within Schools (79%)	—	—	—	19	19	19	19	
Total	1	0	1	31	31	31	31	
Science								
Between Schools (14%)	6	0	6	73	75	74	76	
Within Schools (86%)	—	—	—	17	17	17	17	
Total	1	0	1	25	25	25	25	

() Percentage of available variance shown in parentheses.

School Explanatory Variables

School Enrollment

	REA	9	▲	—	9	▲	—	10 (2.6)	▲	—	10 (2.6)	▲
	MAT	9	▲	—	9 (3.1)	▲	—	10 (2.6)	▲	—	10 (2.5)	▲
	SCI	11	▲	—	11 (2.6)	▲	—	10 (2.3)	▲	—	11 (2.3)	▲
	REA	5	▲	—	5	—	—	0 (2.2)	—	—	-1 (2.3)	—
	MAT	5	▲	—	5 (2.3)	▲	—	0 (2.2)	—	—	-1 (2.1)	—
	SCI	6	▲	—	6 (2.3)	▲	—	2 (2.1)	—	—	2 (2.2)	—
	REA	-2	—	—	-2	—	—	1 (1.6)	—	—	1 (1.5)	—
	MAT	-1	—	—	0	—	—	2 (1.5)	—	—	3 (1.5)	—
	SCI	-3	—	—	-3	—	—	0 (1.5)	—	—	0 (1.5)	—

School Instruction

	REA	—	—	1	0 (1.7)	—	—	—	—	1 (1.7)	1 (1.5)	—
	MAT	—	—	2	1 (2.3)	—	—	—	—	2 (2.4)	2 (2.1)	—
	SCI	—	—	1 (2.0)	0 (1.9)	—	—	—	—	1 (1.7)	1 (1.6)	—
	REA	—	—	-4	-3 (5.2)	—	—	—	—	1 (4.6)	0 (4.2)	—
	MAT	—	—	-3	-3	—	—	—	—	-1	-1 (5.4)	—
	SCI	—	—	-6	-5	—	—	—	—	0	-1 (4.0)	—

	REA	—	—	—	—	11 (1.1)	▲	11	▲	11 (1.0)	▲	11 (1.0)	▲
	MAT	—	—	—	—	10 (0.9)	▲	10	▲	10 (0.9)	▲	10 (0.9)	▲
	SCI	—	—	—	—	11 (1.0)	▲	11	▲	11 (1.0)	▲	11 (1.0)	▲

	REA	—	—	—	—	15 (1.0)	▲	15	▲	15 (1.0)	▲	15 (1.0)	▲
	MAT	—	—	—	—	18 (0.8)	▲	18	▲	18 (0.8)	▲	18 (0.8)	▲
	SCI	—	—	—	—	12 (1.0)	▲	12	▲	12 (1.0)	▲	12 (1.0)	▲

	REA	—	—	—	—	19	▲	19 (4.3)	▲	19 (3.9)	▲	19 (4.0)	▲
	MAT	—	—	—	—	15	▲	15 (5.8)	▲	15	▲	16 (5.1)	▲
	SCI	—	—	—	—	20 (4.7)	▲	18 (4.4)	▲	20 (4.9)	▲	18 (4.3)	▲

	REA	—	—	—	—	10 (6.2)	—	10 (5.4)	—	10 (6.3)	—	10 (5.5)	—
	MAT	—	—	—	—	15 (6.1)	▲	15 (5.6)	▲	15 (6.2)	▲	15 (5.5)	▲
	SCI	—	—	—	—	7	—	6 (5.3)	—	7 (6.1)	—	6 (5.3)	—

REA ▲
MAT ▼
SCI

Reading

	39	3	40	30	58	31	58
	—	—	—	22	22	22	22
	3	0	3	23	25	23	25
	32	4	34	18	42	20	44
	—	—	—	28	28	28	28
	3	0	3	27	29	27	29
	40	4	42	25	53	26	54
With R5Td(—)T0 9.761685821 -1457	—	—	—	20	20	20	20
	4	0	4	20	23	20	23

() Percentage of available variance shown in parentheses.

Exhibit 3.12: School Explanatory Model for Reading, Mathematics, and Science Achievement

School Explanatory Variables

School Environment

Schools Are Safe and Orderly	REA	5 (4.2)	—	3 (3.7)	—	3 (3.5)	—	2 (3.2)
	MAT	0 (5.8)	—	-2 (4.8)	—	-1 (5.4)	—	-2 (4.5)
	SCI	0 (5.1)	—	-2 (4.3)	—	-2 (4.6)	—	-4 (4.0)
Schools Support Academic Success	REA	9 (3.8) ▲	—	7 (3.6)	—	2 (3.3)	—	1 (3.0)
	MAT	16 (5.9) ▲	—	13 (5.5) ▲	—	12 (6.8)	—	10 (6.2)
	SCI	12 (4.8) ▲	—	10 (4.4) ▲	—	7 (5.7)	—	6 (5.2)
Adequate Environment and Resources	REA	-4 (3.8)	—	-6 (3.7)	—	-7 (3.2) ▼	—	-7 (3.1) ▼
	MAT	-8 (4.9)	—	-9 (4.9)	—	-11 (4.6) ▼	—	-11 (4.5) ▼
	SCI	-7 (4.6)	—	-8 (4.6)	—	-9 (4.1) ▼	—	-10 (4.0) ▼

School Instruction

Early Emphasis on Reading Skills	REA	—	1 (3.1)	0 (3.3)	—	—	-1 (2.6)	0 (2.7)
	MAT	—	-2 (4.1)	-2 (4.1)	—	—	-3 (3.4)	-2 (3.4)
	SCI	—	0 (3.5)	0 (3.6)	—	—	-2 (3.1)	-1 (3.2)
Students Engaged in Reading, Mathematics, and Science Lessons	REA	—	31 (9.2) ▲	29 (9.5) ▲	—	—	23 (8.8) ▲	24 (8.7) ▲
	MAT	—	40 (12.5) ▲	37 (12.9) ▲	—	—	35 (11.8) ▲	35 (11.4) ▲
	SCI	—	35 (11.6) ▲	34 (12.0) ▲	—	—	29 (11.2) ▲	31 (10.8) ▲

Home Background Control Variables

Student Characteristics

Home Resources for Learning	REA	—	—	—	11 (1.2) ▲	11 (1.2) ▲	11 (1.2) ▲	11 (1.2) ▲
	MAT	—	—	—	10 (1.5) ▲	10 (1.5) ▲	10 (1.5) ▲	10 (1.5) ▲
	SCI	—	—	—	11 (1.3) ▲	11 (1.3) ▲	11 (1.3) ▲	11 (1.3) ▲
Early Literacy/Numeracy Tasks	REA	—	—	—	9 (0.8) ▲	9 (0.8) ▲	9 (0.8) ▲	9 (0.8) ▲
	MAT	—	—	—	8 (1.1) ▲	8 (1.0) ▲	8 (1.0) ▲	8 (1.0) ▲
	SCI	—	—	—	9 (1.0) ▲	9 (1.1) ▲	9 (1.0) ▲	9 (1.1) ▲

Between-School

School Average of Home Resources for Learning	REA	—	—	—	20 (3.2) ▲	21 (3.4) ▲	18 (3.2) ▲	20 (3.4) ▲
	MAT	—	—	—	21 (4.7) ▲	19 (5.1) ▲	18 (4.6) ▲	18 (5.1) ▲
	SCI	—	—	—	17 (4.4) ▲	17 (4.9) ▲	15 (4.4) ▲	15 (4.9) ▲
School Average of Early Literacy/Numeracy Tasks	REA	—	—	—	5 (5.4)	4 (5.3)	4 (5.0)	4 (4.9)
	MAT	—	—	—	-1 (9.2)	-2 (9.1)	-2 (8.2)	-3 (8.3)
	SCI	—	—	—	4 (7.5)	3 (7.5)	3 (6.7)	3 (6.8)

() Standard errors appear in parentheses.

REA ▲
MAT ▼
SCI

Reading

Between Schools (25%)	9	16	22	34	37	41	45
Within Schools (75%)	—	—	—	11	11	11	11
Total	2	4	5	17	18	19	20

Mathematics

Between Schools (38%)	10	14	21	11	16	20	25
Within Schools (62%)	—	—	—	11	11	11	11
Total	4	5	8	11	13	14	16

Science

Between Schools (32%)	8	15	21	16	21	25	30
Within Schools (68%)	—	—	—	12	12	12	12
Total	3	5	7	13	15	16	18

() Percentage of available variance shown in parentheses.

—	16 (0.8) ▲	16 (0.8) ▲	16 (0.8) ▲	16 (0.8) ▲
—	13 (0.8) ▲	13 (0.8) ▲	13 (0.8) ▲	13 (0.8) ▲
—	17 (0.8) ▲	16 (0.8) ▲	17 (0.8) ▲	16 (0.8) ▲
—	7 (0.9) ▲	7 (0.9) ▲	7 (0.9) ▲	7 (0.9) ▲
—	9 (1.0) ▲	9 (1.0) ▲	9 (1.0) ▲	9 (1.0) ▲
—	5 (1.1) ▲	5 (1.1) ▲	5 (1.1) ▲	5 (1.1) ▲
—	35 (3.9) ▲	26 (3.7) ▲	33 (3.6) ▲	25 (3.8) ▲
—	31 (3.9) ▲	22 (3.8) ▲	30 (3.8) ▲	21 (3.9) ▲
—	36 (4.1) ▲	26 (3.9) ▲	34 (3.9) ▲	25 (4.0) ▲
—	8 (10.4)	11 (9.4)	6 (10.0)	10 (9.0)
—	10 (9.5)	13 (8.5)	9 (9.3)	13 (8.2)

44	49	58	53	61
—	15	15	15	15
11	23	25	24	26
41	44	52	47	55
—	17	17	17	17
11	24	26	25	27
44	48	58	51	59
—	17	17	17	17
11	25	27	25	28

**Exhibit 3.14: School Effectiveness Model for Reading, Mathematics, and Science
Hong Kong SAR**

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Variables	HLM Regression Coefficients							
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models			
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction	

School Explanatory Variables

School Environment

Schools Are Safe and Orderly	REA	7 (4.0)	—	2 (3.9)	—	4 (2.2) ▲	—	3 (2.1)
	MAT	6 (3.9)	—	1 (3.9)	—	3 (2.1)	—	2 (2.2)
	SCI	5 (4.2)	—	0 (4.3)	—	2 (2.2)	—	1 (2.4)
Schools Support Academic Success	REA	0 (2.6)	—	-4 (2.5)	—	-4 (1.9)	—	-5 (2.0) ▼
	MAT	3 (2.6)	—	-1 (2.5)	—	-2 (1.7)	—	-2 (1.7)
	SCI	2 (2.7)	—	-2 (2.6)	—	-2 (1.8)	—	-3 (1.9)
Adequate Environment and Resources	REA	-2 (3.8)	—	-2 (3.5)	—	-1 (1.9)	—	-1 (1.8)
	MAT	-2 (3.6)	—	-2 (3.3)	—	-2 (2.5)	—	-2 (2.4)
	SCI	-2 (4.2)	—	-2 (3.9)	—	-2 (2.2)	—	-2 (2.2)

School Instruction

Early Emphasis on Reading Skills	REA	—	3 (1.6) ▲	4 (1.6) ▲	—	—	1 (1.1)	1 (1.0)
	MAT	—	3 (1.5) ▲	3 (1.5)	—	—	0 (0.9)	0 (0.9)
	SCI	—	3 (1.6) ▲	3 (1.6) ▲	—	—	1 (1.0)	1 (1.0)
Students Engaged in Reading, Mathematics, and Science Lessons	REA	—	22 (4.3) ▲	23 (5.2) ▲	—	—	8 (3.3) ▲	9 (3.5) ▲
	MAT	—	22 (4.4) ▲	22 (5.0) ▲	—	—	7 (3.3) ▲	7 (3.5)
	SCI	—	20 (4.4) ▲	21 (5.3) ▲	—	—	4 (3.4)	6 (3.7)

Home Background Control Variables

Student Home School

Home Resources for Learning	REA	—	—	—	2 (0.7) ▲	2 (0.7) ▲	3 (0.7) ▲	2 (0.7) ▲
	MAT	—	—	—	3 (0.7) ▲	3 (0.7) ▲	3 (0.7) ▲	3 (0.7) ▲
	SCI	—	—	—	5 (0.8) ▲	5 (0.8) ▲	5 (0.8) ▲	5 (0.8) ▲
Early Literacy/Numeracy Tasks	REA	—	—	—	13 (1.1) ▲	13 (1.1) ▲	13 (1.1) ▲	13 (1.1) ▲
	MAT	—	—	—	12 (1.1) ▲	12 (1.1) ▲	12 (1.1) ▲	12 (1.1) ▲
	SCI	—	—	—	15 (1.4) ▲	15 (1.4) ▲	15 (1.4) ▲	15 (1.4) ▲

Between School

School Average of Home Resources for Learning	REA	—	—	—	3 (2.0)	5 (2.2) ▲	2 (2.1)	4 (2.2) ▲
	MAT	—	—	—	6 (2.0) ▲	7 (2.2) ▲	5 (2.0) ▲	6 (2.2) ▲
	SCI	—	—	—	5 (1.9) ▲	6 (2.1) ▲	4 (2.0) ▲	6 (2.1) ▲
School Average of Early Literacy/Numeracy Tasks	REA	—	—	—	62 (4.7) ▲	60 (4.5) ▲	59 (4.5) ▲	56 (4.4) ▲
	MAT	—	—	—	55 (4.9) ▲	54 (4.8) ▲	53 (5.0) ▲	52 (5.0) ▲
	SCI	—	—	—	60 (5.2) ▲	58 (5.2) ▲	58 (5.2) ▲	56 (5.2) ▲

() Standard errors appear in parentheses. REA - Reading ▲ Coefficient significantly greater than zero.
 MAT - Mathematics ▼ Coefficient significantly less than zero.
 SCI - Science

Source of Variance	Percentage of Variance Explained						
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models		
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction
Reading							
Between Schools (21%)	4	20	22	68	70	70	73
Within Schools (79%)	—	—	—	8	8	8	8
Total	1	4	4	20	21	21	21
Mathematics							
Between Schools (22%)	4	20	20	68	69	70	71
Within Schools (78%)	—	—	—	10	10	10	10
Total	1	4	5	23	23	23	24
Science							
Between Schools (20%)	2	17	18	69	69	69	71
Within Schools (80%)	—	—	—	11	11	11	11
Total	0	3	4	22	23	23	23

() Percentage of available variance shown in parentheses.

	REA	7	▲	7	▲		5	▲	5
	MAT	7		7			5		5
	SCI	9	▲	9	▲		7		7
	REA	-3		-2			-3		-3
	MAT	-1		-1			-2		-2
	SCI	-2		-2			-2		-2
	REA	3		3			3		3
	MAT	6	▲	6	▲		7	▲	7
	SCI	4		4			4		4
	REA			-1					0
	MAT			0					1
	SCI			-1					0
	REA			-2					-1
	REA			4					6
	MAT			6					6
	SCI			4					6
	REA			3					5
	MAT			3					4
	SCI			2					4
	REA					16	▲	16	▲
	MAT					12	▲	12	▲
	SCI					15	▲	15	▲
	REA					7	▲	7	▲
	MAT					10	▲	10	▲
	SCI					6	▲	6	▲
	REA					22	▲	21	▲
	MAT					20	▲	19	▲
	SCI					23	▲	22	▲
	REA					2		3	0
	MAT					7		8	4
	SCI					1		2	-1
	REA		▲						
	MAT		▼						
	SCI								

Reading

		6	1	70			23	26
		—	—	—				
		1	0	0				
				0				
			1	OMAT				14
		—	—	—		15	15	15
			0					
					14		15	18
		—	—	—	14			
		1	0	2	14			

() Percentage of available variance shown in parentheses.

Variables	HLM Regression Coefficients							
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models			
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction	

School Explanatory Variables

School Environment

Schools Are Safe and Orderly	REA	8 (6.0)	—	7 (5.5)	—	7 (3.3) ▲	—	7 (3.4) ▲
	MAT	6 (6.5)	—	5 (6.3)	—	5 (3.7)	—	6 (3.8)
	SCI	8 (6.5)	—	7 (5.8)	—	7 (2.9) ▲	—	7 (2.9) ▲
Schools Support Academic Success	REA	11 (2.8) ▲	—	9 (2.6) ▲	—	0 (1.9)	—	0 (1.8)
	MAT	13 (3.4) ▲	—	12 (3.2) ▲	—	1 (2.0)	—	1 (2.0)
	SCI	10 (3.5) ▲	—	9 (3.3) ▲	—	-1 (2.1)	—	-1 (2.1)
Adequate Environment and Resources	REA	-4 (3.9)	—	-4 (4.0)	—	2 (1.8)	—	1 (1.8)
	MAT	-5 (4.6)	—	-5 (4.6)	—	2 (2.2)	—	2 (2.2)
	SCI	-5 (4.8)	—	-5 (4.8)	—	1 (2.2)	—	1 (2.2)

School Instruction

Early Emphasis on Reading Skills	REA	—	5 (1.8) ▲	4 (1.9) ▲	—	—	2 (1.2)	2 (1.2)
	MAT	—	4 (2.1) ▲	3 (1.9)	—	—	2 (1.1)	2 (1.1)
	SCI	—	3 (2.0)	3 (2.0)	—	—	1 (1.2)	2 (1.2)
Students Engaged in Reading, Mathematics, and Science Lessons	REA	—	18 (6.1) ▲	13 (5.0) ▲	—	—	8 (3.1) ▲	6 (3.1)
	MAT	—	14 (6.3) ▲	9 (5.3)	—	—	3 (3.6)	1 (3.5)
	SCI	—	18 (6.2) ▲	13 (4.8) ▲	—	—	7 (3.2) ▲	5 (3.1)

Home Background Control Variables

Student in School

Home Resources for Learning	REA	—	—	—	13 (0.8) ▲	13 (0.8) ▲	13 (0.8) ▲	13 (0.8) ▲
	MAT	—	—	—	11 (1.2) ▲	11 (1.2) ▲	11 (1.2) ▲	11 (1.2) ▲
	SCI	—	—	—	10 (0.9) ▲	10 (0.9) ▲	10 (0.9) ▲	10 (0.9) ▲
Early Literacy/Numeracy Tasks	REA	—	—	—	15 (0.9) ▲	15 (0.9) ▲	15 (0.9) ▲	15 (0.9) ▲
	MAT	—	—	—	18 (0.9) ▲	18 (0.9) ▲	18 (0.9) ▲	18 (0.9) ▲
	SCI	—	—	—	14 (0.9) ▲	14 (0.9) ▲	14 (0.9) ▲	14 (0.9) ▲

Between School

School Average of Home Resources for Learning	REA	—	—	—	19 (3.4) ▲	19 (3.1) ▲	18 (3.0) ▲	19 (2.8) ▲
	MAT	—	—	—	21 (3.7) ▲	21 (3.6) ▲	21 (3.6) ▲	21 (3.4) ▲
	SCI	—	—	—	18 (3.4) ▲	19 (3.3) ▲	18 (3.2) ▲	18 (3.1) ▲
School Average of Early Literacy/Numeracy Tasks	REA	—	—	—	26 (6.6) ▲	25 (5.8) ▲	24 (6.1) ▲	23 (5.2) ▲
	MAT	—	—	—	27 (5.4) ▲	26 (5.4) ▲	26 (5.5) ▲	26 (5.3) ▲
	SCI	—	—	—	29 (5.7) ▲	28 (5.5) ▲	27 (5.3) ▲	27 (5.1) ▲

() Standard errors appear in parentheses. REA - Reading ▲ Coefficient significantly greater than zero.
 MAT - Mathematics ▼ Coefficient significantly less than zero.
 SCI - Science

Source of Variance	Percentage of Variance Explained						
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models		
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction
Reading							
Between Schools (19%)	24	15	31	78	82	80	83
Within Schools (81%)	—	—	—	21	21	21	21
Total	5	3	6	32	33	33	33
Mathematics							
Between Schools (20%)	23	9	27	78	81	78	81
Within Schools (80%)	—	—	—	22	22	22	22
Total	5	2	5	33	34	33	34
Science							
Between Schools (23%)	20	12	26	77	80	78	81
Within Schools (77%)	—	—	—	20	20	20	20
Total	5	3	6	33	34	33	34

() Percentage of available variance shown in parentheses.

School Explanatory Variables

School Enrollment

REA	7		5	—	11 (3.3) ▲	—	9 (3.3) ▲
MAT	8 ▲		6	—	11 (3.4) ▲	—	8 (3.4) ▲
SCI	10 ▲		7 (4.0)	—	14 (4.0) ▲	—	9 (4.0) ▲
REA	12 ▲		9 ▲	—	8 (2.5) ▲	—	7 (2.5) ▲
MAT	12 ▲		9 (2.7) ▲	—	8 (2.6) ▲	—	6 (2.6) ▲
SCI	15 ▲		11 (3.1) ▲	—	11 (2.9) ▲	—	8 (3.0) ▲
REA	3		4	—	0 (2.7)	—	1 (2.7)
MAT	-1	—	1	—	-3 (2.8)	—	-1 (2.7)
SCI	-2		0	—	-4 (3.4)	—	-2 (3.2)

School Instruction

REA		5 ▲	4 (1.9)	—	—	2 (1.7)	2 (1.7)
MAT	—	4 ▲	3 (1.9)	—	—	2	2 (1.8)
SCI	—	5 (2.3) ▲	3 (2.3)	—	—	2	2 (2.1)
REA	—	22 ▲	19 (4.3) ▲	—	—	21 ▲	17 (4.5) ▲
MAT	—	24 ▲	20 ▲	—	—	23 ▲	19 (4.7) ▲
SCI	—	34 ▲	30 ▲	—	—	33 ▲	29 (5.9) ▲

REA				12 ▲	12 ▲	12 (1.0) ▲	12 (1.0) ▲
MAT				13 ▲	13 ▲	13 (0.9) ▲	13 (0.9) ▲
SCI				15 ▲	15 ▲	15 (1.3) ▲	15 (1.3) ▲

REA				19 ▲	19 ▲	19 (1.0) ▲	19 (1.0) ▲
MAT				18 ▲	18 ▲	18 (0.9) ▲	18 (0.9) ▲
SCI	—	—	—	22 ▲	22 ▲	22 (1.2) ▲	22 (1.2) ▲

REA				22 ▲	19 (3.5) ▲	19 (3.5) ▲	18 ▲
MAT				18 ▲	16 (3.8) ▲	15 ▲	14 (3.8) ▲
SCI				18 (4.6) ▲	17 (4.4) ▲	16 (4.4) ▲	14 (4.4) ▲

REA			—	-9 (13.9)	-6 (13.1)	-10 (11.6)	-7 (11.4)
MAT				-5 (11.7)	-4 (11.0)	-7 (9.3)	-5 (9.1)
SCI				0.001 kD61Tc13.746Twp0.06 T0.4.Td(7)Tj747(6.02)(28)T642.6.7-73(819)6.83.791-2529962)-4.388 T0(-)Tj21.478-28.3			

REA ▲
MAT ▼
SCI —

Reading

	18	16	28	17	29	28	36
	—	—	—	15	15	15	15
	3	3	5	15	18	17	19
	13	16	24	10	20	22	28
	—	—	—	16	16	16	16
	3	3	5	15	17	17	18
	14	21	28	7	19	24	30
	—	—	(3.5) — 13Sc98	17	17	17	17
	3	4	6	15	17	18	20

() Percentage of available variance shown in parentheses.

School Explanatory Variables

School Enrollment

	REA	-7	—	-5	—	3 (3.6)	—	2 (3.4)
	MAT	-8	—	-6	—	1 (4.0)	—	0 (3.9)
	SCI	-8	—	-6 (4.6)	—	1 (3.7)	—	1 (3.5)
	REA	9 ▲	—	8 ▲	—	3 (1.9)	—	3 (1.8)
	MAT	8 ▲	—	8 (2.0) ▲	—	3 (1.8)	—	3 (1.8)
	SCI	8 ▲	—	8 (2.2) ▲	—	3 (1.9)	—	3 (1.9)
	REA	-3	—	-3	—	-2 (1.9)	—	-1 (1.8)
	MAT	-3	—	-3	—	-1 (2.1)	—	-1 (2.1)
	SCI	-4	—	-4	—	-2 (1.9)	—	-2 (1.8)

School Instruction

	REA	—	-1	-2 (2.3)	—	—	0 (1.7)	-1 (1.7)
	MAT	—	-1	-2 (2.4)	—	—	-1	-1 (1.8)
	SCI	—	-1 (2.5)	-2 (2.3)	—	—	-1	-1 (1.8)
	REA	—	-13 ▼	-8 (5.5)	—	—	8	7 (5.3)
	MAT	—	-16 ▼	-11	—	—	3	3 (5.8)
	SCI	—	-15 ▼	-9	—	—	5	5 (5.4)

	REA	—	—	—	18 ▲	18 ▲	18 (0.8) ▲	18 (0.8) ▲
	MAT	—	—	—	16 ▲	16 ▲	16 (0.8) ▲	16 (0.8) ▲
	SCI	—	—	—	18 ▲	18 ▲	18 (0.8) ▲	18 (0.8) ▲
	REA	—	—	—	13 ▲	13 ▲	13 (0.9) ▲	13 (0.9) ▲
	MAT	—	—	—	13 ▲	13 ▲	13 (0.8) ▲	13 (0.8) ▲
	SCI	—	—	—	11 ▲	11 ▲	11 (0.9) ▲	11 (0.9) ▲
	REA	—	—	—	21 ▲	20 (2.5) ▲	22 (2.6) ▲	22 ▲
	MAT	—	—	—	19 ▲	19 (2.6) ▲	20 ▲	19 (2.7) ▲
	SCI	—	—	—	20 (2.5) ▲	20 (2.3) ▲	22 (2.7) ▲	21 (2.5) ▲
	REA	—	—	—	7 (5.2)	6 (5.4)	8 (5.3)	7 (5.4)
	MAT	—	—	—	10 (5.1)	9 (5.3)	10 (5.3)	9 (5.4)
	SCI	—	—	—	9	8 (5.5)	9 (5.2)	7 (5.5)
	REA	▲	—	—	—	—	—	—
	MAT	—	▼	—	—	—	—	—
	SCI	—	—	—	—	—	—	—

Reading

	22	6	24	64	67	67	70
	—	—	—	25	25	25	25
	2	1	2	29	29	29	30
	22	10	26	59	61	60	62
	—	—	—	26	26	26	26
	3	1	3	30	30	30	30
	23	9	27	68	70	70	72
	—	—	—	24	24	24	24
	2	1	3	29	29	29	30

() Percentage of available variance shown in parentheses.

School Explanatory Variables

School Environment

Schools Are Safe and Orderly	REA	2	—	-2	—	4 (3.2)	—	1 (2.9)
	MAT	0	—	-4 (5.4)	—	6 (5.3)	—	1 (4.9)
	SCI	0	—	-4 (4.8)	—	3 (5.1)	—	-1 (4.7)
Schools Support Academic Success	REA	9 ▲	—	8 ▲	—	5 (2.3) ▲	—	4 (2.1)
	MAT	7	—	9 (4.1) ▲	—	6 (3.3)	—	4 (3.1)
	SCI	12 ▲	—	10 (3.9) ▲	—	8 (3.5) ▲	—	6 (3.2)
Adequate Environment and Resources	REA	-5	—	-5 ▼	—	-7 (2.4) ▼	—	-7 (2.2) ▼
	MAT	-4	—	-4	—	-8 (3.3) ▼	—	-8 (3.2) ▼
	SCI	-5	—	-5	—	-7 (3.0) ▼	—	-7 (2.9) ▼

School Instruction

Early Emphasis on Reading Skills	REA	—	-4 (2.4)	-4 (2.3)	—	—	-2 (2.0)	-2 (1.8)
	MAT	—	-6 (3.9)	-6 (3.8)	—	—	-5 (3.5)	-5 (3.3)
	SCI	—	-6 (3.5)	-6 (3.3)	—	—	-5 (3.4)	-5 (3.3)
Students Engaged in Reading, Mathematics, and Science Lessons	REA	—	21 ▲	17 (5.1) ▲	—	—	19 (4.8) ▲	17 (5.0) ▲
	MAT	27	25 ▲	22 ▲	—	—	23 (6.8) ▲	21 (7.4) ▲
	SCI	—	26 ▲	23 ▲	—	—	24 (7.2) ▲	22 (7.7) ▲

Home Background Control Variables

Student Characteristics

Home Resources for Learning	REA	—	—	—	12 (1.2) ▲	12 (1.2) ▲	12 (1.2) ▲	12 (1.2) ▲
	MAT	—	—	—	10 (1.0) ▲	10 (1.0) ▲	10 (1.0) ▲	10 (1.0) ▲
	SCI	—	—	—	11 (1.1) ▲	11 (1.1) ▲	11 (1.1) ▲	11 (1.1) ▲
Student Characteristics	REA	—	—	—	10 (0.9) ▲	10 (0.9) ▲	10 (0.9) ▲	10 (0.9) ▲
	MAT	—	—	—	9 (0.9) ▲	9 (0.9) ▲	9 (0.9) ▲	9 (0.9) ▲
	SCI	—	—	—	8 (1.0) ▲	8 (1.1) ▲	8 (1.0) ▲	8 (1.1) ▲

Between School

School Average of Early Literacy/Numeracy Tasks	REA	14.8	—	—	15 ▲	14 (3.6) ▲	13 (3.2) ▲	13 (3.0) ▲
	MAT	—	—	—	17 ▲	16 (5.6) ▲	15 (5.0) ▲	15 (4.8) ▲
	SCI	—	—	—	14 (5.7) ▲	12 (5.3) ▲	13 (4.7) ▲	12 (4.5) ▲

() Standard errors appear in parentheses.

REA ▲
MAT ▼
SCI ▼

Reading

Between Schools (18%)	26	26	40	28	44	50	57
—	—	—	—	15	15	15	15
—	4	5	7	17	20	21	22

Mathematics

—	15	21	29	15	24	33	37
—	—	—	—	15	15	15	15
Total	6	8	11	15	18	22	23

Science

Within Schools (66%)	19	23	33	11	23	31	37
—	—	—	—	14	14	14	14
Total	6	8	11	13	17	20	22

() Percentage of available variance shown in parentheses.

E hibi 3.28: School E ec i ene Model fo Reading, Ma hema ic , and Science Romania

School Explanatory Variables

School En i onmen

Schools Are Safe and Orderly	REA	11 (7.5)	—	6 (8.0)	—	9 (7.4)	—	7 (7.5)
	MAT	11 (9.9)	—	10 (10.7)	—	11 (10.0)	—	12 (10.3)
	SCI	13 (9.5)	—	8 (10.2)	—	10 (9.1)	—	9 (9.1)
Schools Support Academic Success	REA	10 (4.8)	—	11 (5.2) ▲	—	2 (5.2)	—	2 (5.3)
	MAT	12 (6.4)	—	13 (6.7)	—	8 (7.2)	—	7 (6.9)
	SCI	12 (5.8) ▲	—	13 (6.2) ▲	—	6 (6.8)	—	7 (6.6)
Adequate Environment and Resources	REA	1 (4.3)	—	1 (4.1)	—	-3 (4.0)	—	-3 (4.1)
	MAT	1 (5.0)	—	1 (5.0)	—	-3 (4.7)	—	-3 (4.8)
	SCI	1 (4.8)	—	1 (4.6)	—	-3 (4.5)	—	-3 (4.6)

School In c i on

Early Emphasis on Reading Skills	REA	—	3 (6.3)	5 (6.0)	—	—	-2 (4.9)	-1 (5.1)
	MAT	—	0 (7.2)	2 (6.9)	—	—	-4 (6.0)	-2 (6.0)
	SCI	—	3 (7.0)	5 (6.6)	—	—	0 (5.5)	1 (5.2)
Students Engaged in Reading, Mathematics, and Science Lessons	REA	—	19 (7.8) ▲	15 (8.4)	—	—	8 (7.7)	4 (7.4)
	MAT	—	12 (9.8)	6 (10.2)	—	—	2 (11.0)	-4 (9.9)
	SCI	—	19 (9.7) ▲	14 (10.2)	—	—	8 (9.5)	4 (8.6)

Home Background Control Variables

S den i hin School

Home Resources for Learning	REA	—	—	—	16 (1.6) ▲	16 (1.6) ▲	16 (1.5) ▲	16 (1.6) ▲
	MAT	—	—	—	14 (2.1) ▲	14 (2.1) ▲	14 (2.1) ▲	14 (2.1) ▲
	SCI	—	—	—	16 (1.8) ▲	16 (1.8) ▲	16 (1.8) ▲	16 (1.8) ▲
Early Literacy/Numeracy Tasks	REA	—	—	—	9 (1.5) ▲	9 (1.5) ▲	9 (1.5) ▲	9 (1.5) ▲
	MAT	—	—	—	10 (2.5) ▲	10 (2.4) ▲	10 (2.5) ▲	10 (2.4) ▲
	SCI	—	—	—	10 (1.7) ▲	10 (1.7) ▲	10 (1.7) ▲	10 (1.7) ▲

Be een School

School Average of Home Resources for Learning	REA	—	—	—	25 (4.8) ▲	25 (4.9) ▲	24 (4.8) ▲	25 (4.7) ▲
	MAT	—	—	—	21 (6.6) ▲	19 (7.1) ▲	21 (6.7) ▲	20 (6.7) ▲
	SCI	—	—	—	23 (5.7) ▲	21 (6.3) ▲	21 (5.5) ▲	20 (5.9) ▲
School Average of Early Literacy/Numeracy Tasks	REA	—	—	—	3 (7.0)	1 (7.1)	4 (7.2)	2 (7.4)
	MAT	—	—	—	-1 (10.2)	-3 (10.0)	1 (9.8)	-2 (9.9)
	SCI	—	—	—	-1 (9.3)	-3 (9.0)	0 (9.1)	-3 (9.0)

() Standard errors appear in parentheses.

REA ▲
MAT ▼
SCI

Reading

Between Schools (35%)	14	10	20	41	45	43	46
Within Schools (65%)	—	—	—	21	21	21	21
Total	5	3	7	28	30	29	30

Ma hema ic

Between Schools (38%)	14	3	16	13	20	14	20
Within Schools (62%)	—	—	—	24	24	24	24
Total	6	1	6	19	22	20	22

Science

Between Schools (37%)	15	8	20	23	30	25	30
Within Schools (63%)	—	—	—	23	23	23	23
Total	6	3	7	23	25	24	25

() Percentage of available variance shown in parentheses.

Exhibit 3.29: School Effectiveness Model for Reading, Mathematics, and Science Results from Federal

School Explanatory Variables

School Environment

Schools Are Safe and Orderly	REA	3 (4.2)	—	4 (4.5)	—	6 (3.7)	—	5 (4.1)
	MAT	6 (5.3)	—	8 (5.5)	—	8 (4.6)	—	8 (4.6)
	SCI	5 (5.2)	—	5 (5.4)	—	7 (4.6)	—	6 (4.7)
Schools Support Academic Success	REA	3 (3.2)	—	3 (3.3)	—	-2 (2.9)	—	-3 (2.8)
	MAT	0 (3.3)	—	0 (3.4)	—	-5 (2.9)	—	-5 (2.9)
	SCI	2 (3.6)	—	1 (3.6)	—	-4 (3.2)	—	-4 (3.2)
Adequate Environment and Resources	REA	3 (2.2)	—	3 (2.3)	—	1 (2.1)	—	2 (2.1)
	MAT	1 (2.3)	—	2 (2.4)	—	0 (2.3)	—	1 (2.3)
	SCI	3 (2.5)	—	3 (2.5)	—	2 (2.4)	—	2 (2.5)

School Instruction

Early Emphasis on Reading Skills	REA	—	-1 (1.7)	-2 (1.8)	—	—	-2 (1.6)	-2 (1.6)
	MAT	—	-2 (2.4)	-4 (2.4)	—	—	-2 (2.2)	-3 (2.2)
	SCI	—	-1 (2.3)	-2 (2.4)	—	—	-1 (2.1)	-2 (2.2)
Students Engaged in Reading, Mathematics, and Science Lessons	REA	—	1 (3.4)	0 (3.6)	—	—	5 (3.0)	4 (3.2)
	MAT	—	1 (4.2)	-1 (4.4)	—	—	4 (3.8)	2 (4.0)
	SCI	—	2 (4.4)	1 (4.7)	—	—	5 (3.9)	3 (4.1)

Home Background Control Variables

Student Characteristics in School

Home Resources for Learning	REA	—	—	—	10 (1.2) ▲	10 (1.2) ▲	10 (1.2) ▲	10 (1.2) ▲
	MAT	—	—	—	8 (1.0) ▲	8 (1.0) ▲	8 (1.0) ▲	8 (1.0) ▲
	SCI	—	—	—	8 (1.0) ▲	8 (1.0) ▲	8 (1.0) ▲	8 (1.0) ▲
Early Literacy/Numeracy Tasks	REA	—	—	—	11 (0.8) ▲	11 (0.8) ▲	11 (0.8) ▲	11 (0.8) ▲
	MAT	—	—	—	10 (0.9) ▲	10 (0.9) ▲	10 (0.9) ▲	10 (0.9) ▲
	SCI	—	—	—	10 (0.9) ▲	10 (0.9) ▲	10 (0.9) ▲	10 (0.9) ▲

Between School

School Average of Home Resources for Learning	REA	—	—	—	24 (4.2) ▲	25 (4.2) ▲	24 (4.1) ▲	25 (4.1) ▲
	MAT	—	—	—	23 (5.4) ▲	25 (5.2) ▲	22 (5.4) ▲	24 (5.2) ▲
	SCI	—	—	—	24 (5.0) ▲	25 (5.0) ▲	23 (5.0) ▲	25 (5.0) ▲
School Average of Early Literacy/Numeracy Tasks	REA	—	—	—	2 (4.8)	2 (4.6)	4 (4.8)	3 (4.7)
	MAT	—	—	—	4 (7.2)	3 (6.9)	5 (7.3)	4 (7.0)
	SCI	—	—	—	2 (6.7)	1 (6.4)	3 (6.6)	3 (6.4)

() Standard errors appear in parentheses. REA - Reading Coefficient sign: ▲ Positive, ▼ Negative
 MAT - Mathematics
 SCI - Science

Reading

Between Schools (25%)	4	0	5	40	42	42	43
Within Schools (75%)	—	—	—	16	16	16	16
Total	1	0	1	22	22	22	22

Mathematics

Between Schools (34%)	2	1	4	20	22	21	24
Within Schools (66%)	—	—	—	12	12	12	12
Total	1	0	1	15	16	16	16

Science

Between Schools (33%)	3	0	4	25	27	26	28
Within Schools (67%)	—	—	—	13	13	13	13
Total	1	0	1	16	17	17	18

() Percentage of available variance shown in parentheses.

Variables	HLM Regression Coefficients						
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models		
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction

School Explanatory Variables

School Environment

Schools Are Safe and Orderly	REA	7 (4.8)	—	8 (4.7)	—	1 (1.9)	—	2 (1.9)
	MAT	6 (4.4)	—	6 (4.3)	—	1 (2.2)	—	1 (2.2)
	SCI	6 (4.8)	—	6 (4.7)	—	0 (2.1)	—	0 (2.1)
Schools Support Academic Success	REA	13 (2.8) ▲	—	14 (2.8) ▲	—	1 (1.4)	—	2 (1.4)
	MAT	12 (2.7) ▲	—	12 (2.6) ▲	—	1 (1.5)	—	2 (1.5)
	SCI	14 (2.9) ▲	—	15 (2.8) ▲	—	2 (1.4)	—	2 (1.4)
Adequate Environment and Resources	REA	-5 (2.5)	—	-4 (2.4)	—	1 (1.0)	—	1 (1.0)
	MAT	-5 (2.2) ▼	—	-4 (2.2)	—	0 (1.0)	—	0 (1.0)
	SCI	-5 (2.4) ▼	—	-4 (2.4)	—	1 (0.9)	—	1 (1.0)

School Instruction

Early Emphasis on Reading Skills	REA	—	0 (2.3)	-2 (2.0)	—	—	-1 (0.8)	-1 (0.8)
	MAT	—	0 (2.0)	-1 (1.8)	—	—	-1 (0.9)	-1 (0.9)
	SCI	—	0 (2.3)	-2 (2.0)	—	—	-1 (0.8)	-1 (0.8)
Students Engaged in Reading, Mathematics, and Science Lessons	REA	—	9 (7.7)	12 (6.9)	—	—	6 (3.4)	6 (3.4)
	MAT	—	10 (6.9)	13 (6.2) ▲	—	—	7 (3.5) ▲	7 (3.5) ▲
	SCI	—	7 (7.6)	10 (6.8)	—	—	4 (3.4)	5 (3.4)

Home Background Control Variables

Student Home School

Home Resources for Learning	REA	—	—	—	15 (0.7) ▲	15 (0.7) ▲	15 (0.7) ▲	15 (0.7) ▲
	MAT	—	—	—	12 (0.8) ▲	12 (0.8) ▲	12 (0.8) ▲	12 (0.8) ▲
	SCI	—	—	—	17 (0.8) ▲	17 (0.8) ▲	17 (0.8) ▲	17 (0.8) ▲
Early Literacy/Numeracy Tasks	REA	—	—	—	16 (1.1) ▲	16 (1.1) ▲	16 (1.1) ▲	16 (1.1) ▲
	MAT	—	—	—	15 (1.1) ▲	15 (1.1) ▲	15 (1.1) ▲	15 (1.1) ▲
	SCI	—	—	—	16 (1.1) ▲	16 (1.1) ▲	16 (1.1) ▲	16 (1.1) ▲

Between School

School Average of Home Resources for Learning	REA	—	—	—	29 (2.6) ▲	27 (3.1) ▲	30 (2.7) ▲	28 (3.1) ▲
	MAT	—	—	—	25 (2.6) ▲	23 (3.2) ▲	26 (2.6) ▲	23 (3.2) ▲
	SCI	—	—	—	32 (2.5) ▲	30 (3.0) ▲	32 (2.5) ▲	30 (3.0) ▲
School Average of Early Literacy/Numeracy Tasks	REA	—	—	—	51 (4.4) ▲	52 (4.5) ▲	50 (4.5) ▲	51 (4.6) ▲
	MAT	—	—	—	48 (4.4) ▲	49 (4.6) ▲	46 (4.5) ▲	48 (4.6) ▲
	SCI	—	—	—	47 (4.3) ▲	48 (4.5) ▲	46 (4.4) ▲	47 (4.6) ▲

() Standard errors appear in parentheses. REA - Reading ▲ Coefficient significantly greater than zero.
 MAT - Mathematics ▼ Coefficient significantly less than zero.
 SCI - Science

Source of Variance	Percentage of Variance Explained						
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models		
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction

Reading

Between Schools (25%)	23	1	25	88	88	88	89
Within Schools (75%)	—	—	—	22	22	22	22
Total	6	0	6	38	38	38	38

Mathematics

Between Schools (25%)	22	1	24	84	84	84	85
Within Schools (75%)	—	—	—	21	21	21	21
Total	5	0	6	37	37	37	37

Science

Between Schools (25%)	24	1	25	88	88	88	89
Within Schools (75%)	—	—	—	24	24	24	24
Total	6	0	6	40	41	41	41

() Percentage of available variance shown in parentheses.

School Explanatory Variables

School Enrollment

	REA	1	—	2	—	1 (2.6)	—	2 (2.5)
	MAT	1	—	2 (2.6)	—	1 (2.2)	—	1 (2.2)
	SCI	2	—	3 (2.9)	—	1 (2.6)	—	2 (2.5)
	REA	3	—	4 ▲	—	0 (1.8)	—	0 (1.8)
	MAT	4 ▲	—	4 (1.7) ▲	—	0 (1.7)	—	1 (1.8)
	SCI	3	—	3 (1.9)	—	-1 (1.9)	—	-1 (2.0)
	REA	0	—	0	—	2 (1.2)	—	2 (1.2)
	MAT	0	—	-1	—	1 (1.2)	—	1 (1.3)
	SCI	0	—	0	—	1 (1.4)	—	1 (1.5)

School Instruction

	REA	—	-1 (1.2)	-1 (1.3)	—	—	0 (1.2)	0 (1.2)
	MAT	—	-1 (1.4)	-2 (1.4)	—	—	-1 (1.3)	-1 (1.3)
	SCI	—	-1 (1.6)	-2 (1.7)	—	—	-1 (1.5)	-1 (1.5)
	REA	—	-3	-4 (3.8)	—	—	-1 (3.7)	-2 (3.6)
	MAT	—	-5	-6	—	—	-4	-4 (4.6)
	SCI	—	-5	-6	—	—	-4	-4 (4.5)

Home Background Control Variables

	REA	—	—	—	21 (0.9) ▲	21 ▲	21 (0.9) ▲	21 (0.9) ▲
	MAT	—	—	—	19 (1.2) ▲	19 ▲	19 (1.2) ▲	19 (1.2) ▲
	SCI	—	—	—	22 (1.3) ▲	22 ▲	22 (1.3) ▲	22 (1.3) ▲
	REA	—	—	—	11 (0.8) ▲	11 ▲	11 (0.8) ▲	11 (0.8) ▲
	MAT	—	—	—	11 (0.8) ▲	11 ▲	11 (0.8) ▲	11 (0.7) ▲
	SCI	—	—	—	9 (0.9) ▲	9 ▲	9 (0.9) ▲	9 (0.9) ▲
	REA	—	—	—	26 ▲	26 (3.1) ▲	26 (2.8) ▲	25 (3.1) ▲
	MAT	—	—	—	26 ▲	25 (3.2) ▲	25 (2.9) ▲	25 (3.1) ▲
	SCI	—	—	—	29 (3.5) ▲	29 (3.8) ▲	28 (3.4) ▲	28 (3.7) ▲
	REA	—	—	—	7 (3.8)	8 (3.9)	7 (3.8)	8 (3.9)
	MAT	—	—	—	8 (4.6)	9 (4.6)	8 (4.5)	9 (4.6)
	SCI	—	—	—	2 (5.2)	3 (5.2)	2 (5.2)	3 (5.2)
	REA	▲						
	MAT	▼						
	SCI							

Reading

	5	1	8	52	54	52	55
	—	—	—	23	23	23	23
	0	0	0	25	25	25	25
	4	3	10	44	45	46	47
	—	—	—	26	26	26	26
	0	0	1	28	28	28	28
Within Schools (92%)	3	3	8	44	45	45	46
	—	—	—	24	24	24	24
	0	0	1	26	26	26	26

() Percentage of available variance shown in parentheses.

School Explanatory Variables

School Enrollment

	REA	5	—	5	—	5 (2.9)	—	5 (2.8)
	MAT	7 ▲	—	6 (3.3) ▲	—	7 (2.8) ▲	—	6 (2.7) ▲
	SCI	6	—	5 (3.5)	—	6 (3.2)	—	5 (3.1)
	REA	8 ▲	—	8 ▲	—	0 (2.9)	—	1 (2.6)
	MAT	9 ▲	—	10 (2.4) ▲	—	1 (2.2)	—	2 (2.1)
	SCI	8 ▲	—	8 (2.6) ▲	—	1 (2.7)	—	1 (2.5)
	REA	-2	—	-2	—	0 (1.7)	—	0 (1.7)
	MAT	-3	—	-3	—	-1 (1.7)	—	0 (1.6)
	SCI	-3	—	-2	—	0 (2.0)	—	0 (2.0)

School Instruction

	REA	—	-3	-4 (1.6) ▼	—	—	-1 (1.3)	-2 (1.3)
	MAT	—	-1	-3 (1.5) ▼	—	—	0	-1 (1.4)
	SCI	—	-2 (1.7)	-3 (1.7)	—	—	-1	-1 (1.5)
	REA	—	9	7 (3.7)	—	—	6	5 (3.7)
	MAT	—	10 ▲	8 ▲	—	—	8 ▲	6 (2.8) ▲
	SCI	—	8	5	—	—	5	4 (3.7)

	REA	—	—	—	11 ▲	11 ▲	11 (1.0) ▲	11 (1.0) ▲
	MAT	—	—	—	11 ▲	11 ▲	11 (0.9) ▲	11 (0.9) ▲
	SCI	—	—	—	13 ▲	13 ▲	13 (1.0) ▲	13 (1.0) ▲

	REA	—	—	—	12 ▲	12 ▲	12 (1.0) ▲	12 (1.0) ▲
	MAT	—	—	—	12 ▲	12 ▲	12 (1.0) ▲	12 (1.0) ▲
	SCI	—	—	—	12 ▲	12 ▲	12 (1.1) ▲	12 (1.1) ▲

	REA	—	—	—	17 ▲	16 (3.0) ▲	17 (2.8) ▲	15 (3.0) ▲
	MAT	—	—	—	21 ▲	19 (2.9) ▲	20 ▲	18 (2.9) ▲
	SCI	—	—	—	17 (3.1) ▲	15 (3.1) ▲	16 (3.1) ▲	14 (3.1) ▲

	REA	—	—	—	22 (5.3) ▲	20 (5.7) ▲	22 (5.2) ▲	20 (5.5) ▲
	MAT	—	—	—	22 (4.8) ▲	19 (4.7) ▲	23 (4.6) ▲	19 (4.4) ▲
	SCI	—	—	—	25 ▲	22 (5.8) ▲	25 (5.1) ▲	23 (5.7) ▲

REA ▲
MAT ▼
SCI

Reading

	23	6	29	40	45	44	48
	—	—	—	15	15	15	15
	4	1	5	20	21	20	21

	34	7	39	55	62	58	64
	—	—	—	18	18	18	18
	7	1	8	26	27	26	28

	24	4	28	42	47	44	49
	—	—	—	18	18	18	18
	5	1	5	23	24	23	24

() Percentage of available variance shown in parentheses.

Exhibit 3.36: School Effectiveness Model for Reading, Mathematics, and Science
United Arab Emirates

Variables	HLM Regression Coefficients							
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models			
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction	

School Explanatory Variables

School Environment

Schools Are Safe and Orderly	REA	17 (3.6) ▲	—	10 (3.4) ▲	—	12 (3.1) ▲	—	6 (2.9) ▲
	MAT	12 (3.5) ▲	—	7 (3.4)	—	7 (3.2) ▲	—	3 (3.1)
	SCI	14 (3.7) ▲	—	7 (3.5)	—	9 (3.4) ▲	—	3 (3.1)
Schools Support Academic Success	REA	12 (3.1) ▲	—	9 (2.9) ▲	—	6 (2.4) ▲	—	5 (2.3) ▲
	MAT	10 (2.9) ▲	—	8 (2.7) ▲	—	6 (2.4) ▲	—	4 (2.3)
	SCI	13 (3.1) ▲	—	11 (2.9) ▲	—	8 (2.7) ▲	—	7 (2.5) ▲
Adequate Environment and Resources	REA	7 (2.4) ▲	—	6 (2.4) ▲	—	-1 (2.1)	—	-1 (2.2)
	MAT	6 (2.2) ▲	—	5 (2.3)	—	-1 (2.1)	—	-1 (2.2)
	SCI	6 (2.3) ▲	—	4 (2.4)	—	-1 (2.2)	—	-1 (2.3)

School Instruction

Early Emphasis on Reading Skills	REA	—	13 (1.6) ▲	10 (1.6) ▲	—	—	5 (1.4) ▲	4 (1.3) ▲
	MAT	—	12 (1.5) ▲	10 (1.5) ▲	—	—	5 (1.5) ▲	5 (1.4) ▲
	SCI	—	11 (1.6) ▲	9 (1.6) ▲	—	—	4 (1.6) ▲	4 (1.5) ▲
Students Engaged in Reading, Mathematics, and Science Lessons	REA	—	28 (5.6) ▲	20 (5.6) ▲	—	—	26 (5.0) ▲	22 (5.0) ▲
	MAT	—	20 (5.2) ▲	15 (5.3) ▲	—	—	19 (4.8) ▲	16 (4.9) ▲
	SCI	—	30 (5.5) ▲	24 (5.5) ▲	—	—	27 (5.0) ▲	24 (5.1) ▲

Home Background Control Variables

Student Within School

Home Resources for Learning	REA	—	—	—	13 (0.8) ▲	13 (0.8) ▲	13 (0.8) ▲	13 (0.8) ▲
	MAT	—	—	—	9 (0.7) ▲	9 (0.7) ▲	9 (0.7) ▲	9 (0.7) ▲
	SCI	—	—	—	13 (1.0) ▲	13 (1.0) ▲	13 (1.0) ▲	13 (1.0) ▲
Early Literacy/Numeracy Tasks	REA	—	—	—	12 (0.6) ▲	11 (0.6) ▲	11 (0.6) ▲	11 (0.6) ▲
	MAT	—	—	—	10 (0.6) ▲	10 (0.6) ▲	10 (0.6) ▲	10 (0.6) ▲
	SCI	—	—	—	13 (0.8) ▲	13 (0.8) ▲	13 (0.8) ▲	13 (0.8) ▲

Between School

School Average of Home Resources for Learning	REA	—	—	—	48 (2.8) ▲	44 (2.9) ▲	43 (2.8) ▲	42 (3.0) ▲
	MAT	—	—	—	42 (2.6) ▲	39 (2.9) ▲	37 (2.7) ▲	36 (3.0) ▲
	SCI	—	—	—	41 (2.8) ▲	37 (3.1) ▲	37 (3.0) ▲	36 (3.3) ▲
School Average of Early Literacy/Numeracy Tasks	REA	—	—	—	17 (6.1) ▲	16 (6.5) ▲	11 (6.3)	11 (6.7)
	MAT	—	—	—	9 (6.3)	8 (6.6)	6 (6.5)	6 (6.8)
	SCI	—	—	—	22 (6.4) ▲	20 (6.8) ▲	15 (6.6) ▲	13 (6.9)

() Standard errors appear in parentheses. REA - Reading ▲ Coefficient significantly greater than zero.
 MAT - Mathematics ▼ Coefficient significantly less than zero.
 SCI - Science

Source of Variance	Percentage of Variance Explained						
	School Explanator Models			Home Background Control Model	School Explanator with Home Background Control Models		
	School Environment	School Instruction	School Environment and Instruction		School Environment	School Instruction	School Environment and Instruction
Reading							
Between Schools (43%)	21	25	34	48	54	58	60
Within Schools (57%)	—	—	—	10	10	10	10
Total	9	10	14	26	29	30	31
Mathematics							
Between Schools (45%)	16	21	28	40	44	48	49
Within Schools (55%)	—	—	—	9	9	9	9
Total	7	9	12	23	24	26	27
Science							
Between Schools (41%)	19	23	31	38	44	49	51
Within Schools (59%)	—	—	—	11	11	11	11
Total	8	9	13	22	24	26	27

() Percentage of available variance shown in parentheses.

School Explanatory Variables

School Enrollment

	REA	15	▲	—	7	—	12 (3.1)	▲	—	7 (3.3)	▲
	MAT	15	▲	—	8 (3.6)	▲	13 (3.0)	▲	—	8 (3.1)	▲
	SCI	20	▲	—	9 (5.4)	—	17 (4.1)	▲	—	9 (4.1)	▲
	REA	19	▲	—	15	▲	7 (2.1)	▲	—	5 (1.9)	▲
	MAT	14	▲	—	11 (2.1)	▲	7 (2.2)	▲	—	5 (1.9)	▲
	SCI	22	▲	—	17 (2.9)	▲	10 (2.9)	▲	—	7 (2.3)	▲
	REA	2	—	—	3	—	0 (2.5)	—	—	2 (1.9)	—
	MAT	1	—	—	3	—	1 (2.4)	—	—	2 (1.9)	—
	SCI	2	—	—	4	—	1 (3.5)	—	—	3 (2.5)	—

School Instruction

	REA	—	—	0	0 (1.9)	—	—	—	2 (1.2)	2 (1.2)	—	
	MAT	—	—	0	0 (1.5)	—	—	—	1 (1.2)	1 (1.1)	—	
	SCI	—	—	0 (2.5)	0 (2.2)	—	—	—	2 (1.5)	2 (1.5)	—	
	REA	—	—	55	▲	37 (6.5)	▲	—	34 (5.0)	▲	28 (4.8)	▲
	MAT	—	—	47	▲	32	▲	—	34	▲	27 (4.1)	▲
	SCI	—	—	75	▲	54	▲	—	52	▲	44 (5.6)	▲

	REA	—	—	—	—	6 (1.0)	▲	6	▲	6 (1.0)	▲	6 (1.0)	▲
	MAT	—	—	—	—	3 (0.9)	▲	3	▲	3 (0.9)	▲	3 (0.9)	▲
	SCI	—	—	—	—	6 (1.2)	▲	6	▲	6 (1.2)	▲	6 (1.2)	▲

	REA	—	—	—	—	10 (0.9)	▲	10	▲	10 (0.9)	▲	10 (0.9)	▲
	MAT	—	—	—	—	9 (1.0)	▲	9	▲	9 (1.0)	▲	9 (1.0)	▲
	SCI	—	—	—	—	14 (1.1)	▲	14	▲	14 (1.1)	▲	14 (1.1)	▲

	REA	—	—	—	—	37	▲	30 (5.2)	▲	37 (5.0)	▲	32 (5.2)	▲
	MAT	—	—	—	—	26	▲	19 (5.3)	▲	27	▲	21 (5.1)	▲
	SCI	—	—	—	—	39 (6.4)	▲	30 (6.9)	▲	40 (6.4)	▲	33 (6.6)	▲

	REA	—	—	—	—	9 (6.7)	—	9 (5.4)	-1 (5.6)	1 (4.7)	—
	MAT	—	—	—	—	9 (6.4)	—	8 (5.5)	-2 (4.8)	-1 (4.5)	—
	SCI	—	—	—	—	19	▲	17 (7.3)	▲	2 (6.4)	4 (5.6)

REA ▲
MAT ▼
SCI

Reading

	44	36	58	68	77	80	84
	—	—	—	7	7	7	7
	17	13	22	30	33	35	36

	46	40	62	56	70	74	80
	—	—	—	4	4	4	4
	14	12	19	20	25	26	28

8.702 T(0.1)Tj7.328 0 Td(—)Tj 1.343 T(—)Tj -3.045 T1.30	44	43	63	62	72	79	84
Within Schools 8e9.761 3p 9.77	—	—	—	6	6	6	6
	15	15	22	25	29	31	33

() Percentage of available variance shown in parentheses.

	REA	7	6		8	6
	MAT	4	4		4	3
	SCI	6	6		6	5
	REA	-3	-5		-5	-5
	MAT	-2	-3		-4	-4
	SCI	-2	-4		-5	-5
6	REA	6	5		1	0
		8	7		3	2

--	--	--	--

--	--	--	--

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REA	4		3		3		3
MAT	4		4		3		3
SCI	3		3		2		2
REA	7	▲	7	▲	2		2
MAT	8	▲	8	▲	4	▲	5
SCI	8	▲	8	▲	3		3
REA	1		2		1		1
MAT	1		1		1		1
SCI	0		0		0		0
REA		0	-1			0	-1
MAT		-1	-2			-1	-1
SCI		-1	-2			-1	-1
REA		11	▲	8	▲		6
MAT		5		2			2
SCI		10	▲	7			6

REA				12	▲	12	▲	12	▲	12	▲
MAT				10	▲	10	▲	10	▲	10	▲
SCI				12	▲	12	▲	12	▲	12	▲
REA				9	▲	9	▲	9	▲	9	▲
MAT				8	▲	8	▲	8	▲	8	▲
SCI				8	▲	8	▲	8	▲	8	▲
REA				25	▲	21	▲	25	▲	21	▲
MAT				22	▲	16	▲	22	▲	15	▲
SCI				26	▲	22	▲	26	▲	22	▲
REA				13	▲	13	▲	10		10	▲
MAT				6		5		5		5	
SCI				7		6		4		4	
REA		▲									
MAT		▼									
SCI											

	31	7	—		60	64
	—	—	—			
	3	1				
		2	—			41
	—	—	—	10		
		0				
		6(0)TJ2(6(0)TJ2(6(0)804 Td()TJT14Td(8)TJe48 0.10469227—)T1 1 Tf3.00)Tj.82				
	—	—	—			
	4		5			

REA	14	▲	7		13	▲	8
MAT	12	▲	7		11	▲	8
SCI	13	▲	6		11	▲	7f391.3612 .52 re10_1 Tf25.340.179t

	REA	27 ▲	17 ▲		9	2 (5.1)
	MAT	23 ▲	14 ▲		7	1 (4.7)
	SCI	26 ▲	14 (6.0) ▲		9	1 (5.2)
	REA	8	4		6 ▲	6 (2.7) ▲
	MAT	7	4		6 ▲	5 (2.4)
	SCI	8	5		7 ▲	6 (2.7) ▲
	REA	9 ▲	10 ^(1.9) ▲		3	5 (2.7)
	MAT	8 ▲	9 ▲		3	4 (2.6)
	SCI	8 ▲	10 ▲		3 (2.8)	5 (2.9)
	REA	17 ▲	15 ▲		3	3
	MAT	15 ▲	14 ▲		3	3
	SCI	16 ▲	15 ▲		3	3 (1.9)
	REA	48 ▲	35 ▲		36 ▲	33 (7.1) ▲
	MAT	39 ▲	29 ▲		30 ▲	27 (7.4) ▲
	SCI	50 ▲	39 ▲		—	40 ▲
	REA			15 ▲	15 ▲	15 (1.2) ▲
	MAT			11 ▲	11 ▲	11 (1.0) ▲
	SCI			15 ▲	15 ▲	15 (1.1) ▲
	REA			10 ▲	10 ▲	10 (0.8) ▲
	MAT			9 ▲	9 ▲	9 (0.8) ▲
	SCI			10 ▲	10 ▲	10 (1.1) ▲
	REA			67 ▲	61 (3.3) ▲	61 (4.0) ▲
	MAT			60 ▲	54 (3.2) ▲	54 ▲
	SCI			64 ▲	57 (3.6) ▲	57 (4.2) ▲
	REA			32 ▲	33 (10.7) ▲	22 (10.5) ▲
	MAT			23 ▲	24 ▲	14 (9.9)
	SCI			35 ▲	37 ▲	25 (11.3) ▲
	REA	▲				
	MAT	▼				
	SCI					

Reading

	25	35	49	70	74	76	79
	—	—	—	9	9	9	9
	13	18	25	40	42	43	44
	24	33	46	68	72	73	76
	—	—	—	8	8	8	8
	12	17	24	39	41	41	43
	25	36	49	65	70	73	76
	—	—	—	9	9	9	9
	12	18	24	37	39	41	42

() Percentage of available variance shown in parentheses.

