Supplementary material
Additional models

Table 1. Additional multilevel regression results with only Monumentalism-Flexibility and Collectivism-Individualism as country-level variables. Unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	Mathematics achievement		Science achievement		Reading achievement	
Fixed Part						
Intercept	191.43	***	207.54	***	164.54	***
	(18.39)		(19.06)		(18.90)	
	[5.65]		[7.42]		[5.70]	
Student level						
ESCS	13.03	***	13.06	***	12.88	***
	(1.42)		(1.43)		(1.44)	
	[0.20]		[0.19]		[0.18]	
Gender (Girl)	-9.68	***	-3.68	**	20.96	***
	(1.46)		(1.32)		(1.49)	
	[-0.06]		[-0.02]		[0.13]	
Grade	28.78	***	26.71	***	29.52	***
	(1.92)		(2.01)		(1.96)	
	[0.29]		[0.27]		[0.28]	
School level						
School ESCS	37.91	***	37.16	***	41.98	***
	(3.36)		(3.36)		(3.24)	
	[0.72]		[0.71]		[0.74]	
Country level						
Monumentalism	-0.19	***	-.14	***	-0.08	
	(.05)		(.04)		(0.05)	
	[-.52]		[-0.46]		[-0.27]	
Collectivism	-0.10	*	-.07		-0.24	**
	(0.04)		(.05)		(0.04)	
	[0.25]		[-0.22]		[-0.35]	
Variance components						
Student level	35.3%		38.4%		36.9%	
School level	8.7%		9.1%		8.6%	
Country level	4.7%		3.8%		3.9%	
Total variance explained	51.2%		48.8%		50.7%	
-2*loglikelihood:	2830476		2845524		2868137	
Reduction	4.47		2.82		3.2	
Degrees of freedom	1		1		1	

Note: Reduction compared to Model 2a, for mathematics and science; and Model 2b, for reading.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 2. Multilevel regression results for mathematics achievement in PISA 2015 with unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model		1. Student & School		2a. Monumentalism		2b. Collectivism		2c. GDP		3. Full model	
Fixed Part												
Intercept	441.11	*	176.62	***	178.77	***	176.13	***	178.28	***	178.97	***
	(194.41)		(21.55)		(21.72)		(21.77)		(22.00)		(22.22)	
	[6.20]		[4.82]		[4.90]		[4.77]		[4.86]		[4.91]	
Student level												
ESCS			13.76	***	13.76	***	13.76	***	13.76	***	13.76	***
			(1.44)		(1.44)		(1.44)		(1.44)		(1.44)	
			[0.21]		[0.21]		[0.21]		[0.21]		[0.21]	
Gender (Girl)			-13.04	***	-13.04	***	-13.04	***	-13.04	***	-13.04	***
			(1.38)		(1.38)		(1.38)		(1.38)		(1.38)	
			[-0.08]		[-0.08]		[-0.08]		[-0.08]		[-0.08]	
Grade			31.24	***	31.20	***	31.23	***	31.23	***	31.26	***
			(2.37)		(2.36)		(2.36)		(2.37)		(2.38)	
			[0.33]		[0.33]		[0.33]		[0.33]		[0.33]	
School level												
School ESCS			36.90	***	36.84	***	36.86	***	36.83	***	36.83	***
			(3.62)		(3.62)		(3.64)		(3.64)		(3.65)	
			[0.69]		[0.69]		[0.69]		[0.69]		[0.69]	
Country level												
Monumentalism					-0.19	***					-0.19	***
					(0.04)						(0.05)	
					[-0.48]						[-0.48]	
Collectivism							-0.06				0.02	
							(0.10)				(0.08)	
							[-0.13]				[0.05]	
GDP per capita (1,000)									0.48		0.09	
									(0.43)		(0.36)	
									[0.23]		[0.05]	
Variance components												
Student level	38.8%		36.1%		36.1%		36.1%		36.1%		36.1%	
School level	24.1%		9.7%		9.7%		9.7%		9.7%		9.7%	
Country level	37.1%		9.9%		7.5%		9.8%		9.3%		7.5%	
Total variance explained			44.3%		46.7%		44.3%		44.8%		46.7%	
-2*loglikelihood:	2658739		2633866		2633857		2633866		2633865		2633856	
Reduction			24873.3		9.0		-0.3		1.3		0.6	
Degrees of freedom			4		1		1		1		2	

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
*p < .05. **p < .01. ***p < .001.

Table 3. Multilevel regression results for science achievement in PISA 2015 with unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model	1. Student & School	2a. Monumentalism	2b. Collectivism	2c. GDP	3. Full model
Fixed Part						
Intercept	476.12 ***	180.87 **	182.61 **	181.36 **	181.13 **	183.04 **
	(7.56)	(21.22)	(21.46)	(21.07)	(21.46)	(21.38)
	[6.69]	[5.31]	[5.37]	[5.30]	[5.33]	[]
Student level						
ESCS		14.03 ***	14.03 ***	14.03 ***	14.02 ***	14.03 ***
		(1.65)	(1.65)	(1.65)	(1.65)	(1.65)
		[0.20]	[0.20]	[0.20]	[0.20]	[0.20]
Gender (Girl)		-9.18 ***	-9.19 ***	-9.19 ***	-9.18 ***	-9.19 ***
		(1.40)	(1.40)	(1.40)	(1.40)	(1.40)
		[-0.06]	[-0.06]	[-0.06]	[-0.06]	[-0.06]
Grade		31.04 ***	31.05 ***	31.04 ***	31.06 ***	31.05 ***
		(2.33)	(2.33)	(2.33)	(2.33)	(2.33)
		[0.32]	[0.32]	[0.32]	[0.32]	[0.32]
School level						
School ESCS		39.26 ***	39.19 ***	39.27 ***	39.26 ***	39.25 ***
		(3.83)	(3.83)	(3.85)	(3.85)	(3.85)
		[0.72]	[0.72]	[0.72]	[0.72]	[0.71]
Country level						
Monumentalism			-0.13 **			-0.16 ***
			(0.04)			(0.04)
			[-0.35]			[-0.44]
Collectivism				.04		0.09
				(0.10)		(0.09)
				[0.09]		[0.21]
GDP per capita (1,000)					0.06 ***	-0.08
					(0.45)	(0.32)
					[0.03]	[-0.04]
Variance components						
Student level	39.4%	36.9%	36.9%	36.9%	36.9%	36.9%
School level	26.1%	9.0%	9.0%	9.0%	9.0%	9.0%
Country level	34.5%	7.9%	6.9%	7.9%	7.9%	6.5%
Total variance explained		46.3%	47.2%	46.2%	46.3%	47.6%
-2*loglikelihood:	2679083	2655787	2655782	2655787	2655787	2655781
Reduction		23295.8	4.8	0.2	0.1	1.7
Degrees of freedom		4	1	1	1	2

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
*p < .05. **p < .01. ***p < .001.

Table 4. Multilevel regression results for reading achievement in PISA 2015 with unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model	1. Student & School	2a. Monumentalism	2b. Collectivism	2c. GDP	3. Full model
Fixed Part						
Intercept	464.02 ***	143.54 **	143.38 **	143.38 **	143.29 **	143.35 **
	(9.71)	(19.16)	(19.40)	(19.25)	(19.53)	(19.63)
	[6.47]	[4.82]	[4.82]	[4.79]	[4.80]	[4.82]
Student level						
ESCS		13.35 ***	13.35 ***	13.35 ***	13.35 ***	13.35 ***
		(1.57)	(1.57)	(1.57)	(1.57)	(1.57)
		[0.19]	[0.19]	[0.19]	[0.19]	[0.19]
Gender (Girl)		17.77 ***	17.77 ***	17.77 ***	17.76 ***	17.76 ***
		(1.68)	(1.68)	(1.68)	(1.68)	(1.68)
		[0.11]	[0.11]	[0.11]	[0.11]	[0.11]
Grade		33.28 ***	33.28 ***	33.29 ***	33.32 ***	33.32 ***
		(2.04)	(2.06)	(2.06)	(2.06)	(2.06)
		[0.33]	[0.33]	[0.33]	[0.33]	[0.33]
School level						
School ESCS		41.15 ***	41.15 ***	41.22 ***	41.18 ***	41.20 ***
		(3.56)	(3.56)	(3.59)	(3.58)	(3.59)
		[0.72]	[0.72]	[0.72]	[0.72]	[0.72]
Country level						
Monumentalism			-0.09 ‡			-0.11 *
			(0.05)			(0.05)
			[-.26]			[-0.32]
Collectivism				0.03		0.07
				(0.08)		(0.07)
				[0.07]		[0.17]
GDP per capita (1,000)					0.06	-0.02
					(0.35)	(0.30)
					[0.04]	[-0.01]
Variance components						
Student level	38.4%	35.4%	35.4%	35.4%	35.4%	35.4%
School level	29.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Country level	32.6%	5.6%	5.3%	5.6%	5.6%	5.1%
Total variance explained		50.0%	50.3%	50.0%	50.0%	50.5%
-2*loglikelihood:	2689645	2663294	2663291	2663294	2663294	2663291
Reduction		26350.5	2.8	0.2	0.1	0.9
Degrees of freedom		4	1	1	1	2

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
‡$p < .10.$ *$p < .05.$ **$p < .01.$ ***$p < .001.$

Table 5. Multilevel regression results for mathematics achievement in PISA 2012 with unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model		1. Student & School		2a. Monumentalism		2b. Collectivism		2c. GDP		3. Full model	
Fixed Part												
Intercept	471.85	***	119.60	***	117.93	**	118.42	**	118.71	**	116.84	**
	(17.48)		(37.11)		(37.47)		(37.57)		(37.32)		(37.55)	
	[6.65]		[2.97]									
Student level												
ESCS			12.90	***	12.89	***	12.89	***	12.89	***	12.89	***
			(1.67)		(1.67)		(1.67)		(1.67)		(1.67)	
			[0.20]		[0.20]		[0.20]		[0.20]		[0.20]	
Gender (Girl)			-15.66	***	-15.66	***	-15.66	***	-15.66	***	-15.65	***
			(1.52)		(1.52)		(1.52)		(1.52)		(1.52)	
			[-0.10]		[-0.10]		[-0.10]		[-0.10]		[-0.10]	
Grade			37.10	***	37.08	***	37.13	***	37.12	***	37.18	***
			(4.06)		(4.06)		(4.06)		(4.06)		(4.05)	
			[0.39]		[0.39]		[0.39]		[0.39]		[0.39]	
School level												
School ESCS			30.36	***	30.29	***	30.32	***	30.33	***	30.27	***
			(6.23)		(6.21)		(6.24)		(6.24)		(6.23)	
			[0.59]		[0.59]		[0.59]		[0.59]		[0.59]	
Country level												
Monumentalism					-0.23	***					-0.21	***
					(0.06)						(0.06)	
					[-0.52]						[-0.48]	
Collectivism							-0.12				-0.03	
							(0.09)				(0.09)	
							[-0.23]				[-0.05]	
GDP per capita (1,000)									0.84	┼	0.18	
									(0.50)		(0.49)	
									[0.33]		[0.07]	
Variance components												
Student level	34.6%		30.9%		30.9%		30.9%		30.9%		30.9%	
School level	30.0%		12.0%		12.0%		12.0%		12.0%		12.0%	
Country level	35.4%		11.4%		8.3%		10.9%		10.2%		4.6%	
Total variance explained			45.7%		48.8%		46.2%		46.9%		50.6%	
-2*loglikelihood:	3282918		3244807		3244793		3244804		3244802		3244794	
Reduction			38110.4		13.9		2.8		5.1		-0.6	
Degrees of freedom			4		1		1		1		2	

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
┼p < .10. *p < .05. **p < .01. ***p < .001.

Table 6. Multilevel regression results for science achievement in PISA 2012 with unstandardized coefficients, standard errors (in parentheses), standardized coefficients [in brackets].

	0. Unconditional model		1. Student & School		2a. Monumentalism		2b. Collectivism		2c. GDP		3. Full model	
Fixed Part												
Intercept	454.91	***	154.95	***	153.61	***	154.48	***	155.70	***	154.51	***
	(78.38)		(29.37)		(29.77)		(29.83)		(29.63)		(30.08)	
	[6.47]		[4.10]		[4.08]		[4.10]		[4.12]		[4.10]	
Student level												
ESCS			12.95	***	12.96	***	12.95	***	12.95	***	12.96	***
			(1.77)		(1.77)		(1.77)		(1.77)		(1.77)	
			[0.20]		[0.20]		[0.20]		[0.20]		[0.20]	
Gender (Girl)			-6.51	**	-6.51	**	-6.52	**	-6.51	**	-6.51	**
			(1.35)		(1.35)		(1.35)		(1.35)		(1.35)	
			[-0.04]		[-0.04]		[-0.04]		[-0.04]		[-0.04]	
Grade			33.61	***	33.61	***	33.60	***	33.51	***	33.49	***
			(3.23)		(3.23)		(3.23)		(3.24)		(3.24)	
			[0.35]		[0.35]		[0.35]		[0.35]		[0.35]	
School level												
School ESCS			30.41	***	30.26	***	30.36	***	30.39	***	30.33	***
			(6.61)		(6.12)		(6.17)		(6.17)		(6.17)	
			[0.59]		[0.59]		[0.59]		[0.59]		[0.59]	
Country level												
Monumentalism					-0.22	***					-0.22	***
					(0.05)						(0.06)	
					[-0.53]						[-0.53]	
Collectivism							-0.12				-0.06	
							(0.09)				(0.08)	
							[-0.25]				[-0.14]	
GDP per capita (1,000)									0.64		-0.17	
									(0.47)		(0.41)	
									[0.27]		[-0.07]	
Variance components												
Student level	36.3%		33.3%		33.3%		33.3%		33.3%		33.3%	
School level	28.6%		12.3%		12.3%		12.3%		12.3%		12.3%	
Country level	35.1%		10.2%		7.2%		9.5%		9.4%		7.1%	
Total variance explained			44.2%		47.1%		44.9%		45.0%		47.3%	
-2*loglikelihood:	3292407		3262010		3261996		3262007		3262007		3261995	
Reduction			30396.8		14.1		2.7		3.2		0.7	
Degrees of freedom			4		1		1		1		2	

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
*p < .05. **p < .01. ***p < .001.

Table 7. Multilevel regression results for reading achievement in PISA 2012 with unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model		1. Student & School		2a. Monumentalism		2b. Collectivism		2c. GDP		3. Full model	
Fixed Part												
Intercept	475.72	***	101.74	**	99.37	**	100.83	**	99.97	**	100.11	**
	(7.86)		(32.31)		(32.41)		(32.61)		(32.29)		(32.66)	
	[6.74]		[2.82]		[2.75]		[2.79]		[2.76]		[2.76]	
Student level												
ESCS			12.01	***	12.00	***	12.01	***	12.00	***	12.01	***
			(1.58)		(1.57)		(1.58)		(1.57)		(1.58)	
			[0.18]		[0.18]		[0.18]		[0.18]		[0.18]	
Gender (Girl)			28.90	***	28.90	***	28.90	***	28.90	***	28.90	***
			(1.60)		(1.60)		(1.60)		(1.60)		(1.60)	
			[0.19]		[0.19]		[0.19]		[0.19]		[0.19]	
Grade			36.66		36.80	***	36.72	***	36.83	***	36.71	***
			(3.47)		(3.47)		(3.47)		(3.47)		(3.47)	
			[0.37]		[0.37]		[0.37]		[0.37]		[0.37]	
School level												
School ESCS			34.99	***	34.90	***	34.92	***	34.88	***	34.89	***
			(6.10)		(6.09)		(6.11)		(6.10)		(6.11)	
			[0.64]		[0.64]		[0.64]		[0.64]		[0.64]	
Country level												
Monumentalism					-0.18	***					-0.17	***
					(0.05)						(0.06)	
					[-0.44]						[-0.43]	
Collectivism							-0.09				-0.05	
							(0.09)				(0.09)	
							[-0.20]				[-0.10]	
GDP per capita (1,000)									0.52		-0.10	
									(0.43)		(0.39)	
									[0.23]		[-0.05]	
Variance components												
Student level	34.5%		30.6%		30.6%		30.6%		30.6%		30.6%	
School level	32.6%		11.5%		11.5%		11.5%		11.5%		11.5%	
Country level	32.9%		8.6%		7.0%		8.3%		8.2%		7.0%	
Total variance explained			49.4%		51.0%		49.6%		49.8%		51.0%	
-2*loglikelihood:	3304109		3259789		3259781		3259786		3259788		3259779	
Reduction			44320.0		8.2		2.5		1.3		1.8	
Degrees of freedom			4		1		1		1		2	

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
*p < .05. **p < .01. ***p < .001.

Table 8. Multilevel regression results for mathematics achievement in PISA 2018, excluding countries with higher proportion of missing values. Unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model	1. Student & School	2a. Monumentalism	2b. Collectivism	2c. GDP	3. Full model
Fixed Part						
Intercept	434.53 ***	196.97 ***	199.98 ***	198.15 ***	201.14 ***	201.90 ***
	(20.05)	(16.91)	(16.98)	(17.68)	(17.13)	(17.39)
	[5.96]	[5.62]	[5.75]	[5.69]	[5.78]	[5.83]
Student level						
ESCS		12.93 ***	12.92 ***	12.92 ***	12.92 ***	12.93 ***
		(1.55)	(1.55)	(1.55)	(1.55)	(1.55)
		[0.20]	[0.20]	[0.20]	[0.20]	[0.20]
Gender (Girl)		-9.43 ***	-9.43 ***	-9.43 ***	-9.43 ***	-9.43 ***
		(1.56)	(1.56)	(1.56)	(1.56)	(1.56)
		[-0.06]	[-0.06]	[-0.06]	[-0.06]	[-0.06]
Grade		27.48 ***	27.51 ***	27.53 ***	27.53 ***	27.50 ***
		(1.74)	(1.74)	(1.74)	(1.74)	(1.75)
		[0.28]	[0.28]	[0.28]	[0.28]	[0.28]
School level						
School ESCS		38.63 ***	38.59 ***	38.56 ***	38.49 ***	38.47 ***
		(3.25)	(3.24)	(3.26)	(3.26)	(3.26)
		[0.73]	[0.73]	[0.73]	[0.72]	[0.72]
Country level						
Monumentalism			-0.24 ***			-0.18 ***
			(0.05)			(0.04)
			[-0.63]			[-0.50]
Collectivism				-0.16 ***		-0.05
				(0.04)		(0.05)
				[-0.38]		[-0.10]
GDP per capita (1,000)					0.89 ***	0.44 ‡
					(0.23)	(0.22)
					[0.52]	[0.26]
Variance components						
Student level	37.8%	35.9%	35.9%	35.9%	35.9%	35.9%
School level	24.7%	9.0%	9.0%	9.0%	9.0%	9.0%
Country level	37.4%	8.7%	5.1%	7.3%	6.2%	4.3%
Total variance explained		46.4%	50.0%	47.8%	48.9%	50.8%
-2*loglikelihood:	2580634	2561587	2561569	2561580	2561576	2561563
Reduction		19046	19.1	7.5	12.0	5.8
Degrees of freedom		4	1	1	1	2

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
‡$p < .10.$ *$p < .05.$ **$p < .01.$ ***$p < .001.$

Table 9. Multilevel regression results for science achievement in PISA 2018, excluding countries with higher proportion of missing values. Unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model		1. Student & School		2a. Monumentalism		2b. Collectivism		2c. GDP		3. Full model	
Fixed Part												
Intercept	470.77	***	216.74	***	215.55	***	213.77	***	215.81	***	216.74	***
	(8.52)		(18.82)		(18.34)		(18.97)		(18.67)		(18.82)	
	[6.59]		[7.56]		[7.54]		[7.43]		[7.46]		[7.56]	
Student level												
ESCS			12.88	***	12.88	***	12.88	***	12.88	***	12.88	***
			(1.55)		(1.55)		(1.55)		(1.55)		(1.55)	
			[0.19]		[0.19]		[0.19]		[0.19]		[0.19]	
Gender (Girl)			-3.31	***	-3.31	***	-3.31	***	-3.31	***	-3.31	***
			(1.40)		(1.40)		(1.40)		(1.40)		(1.40)	
			[-0.02]		[-0.02]		[-0.02]		[-0.02]		[-0.02]	
Grade			25.47	***	25.49	***	25.51	***	25.52	***	25.47	***
			(1.95)		(1.95)		(1.95)		(1.95)		(1.95)	
			[0.26]		[0.26]		[0.26]		[0.26]		[0.26]	
School level												
School ESCS			37.90	***	37.96	***	37.93	***	37.91	***	37.90	***
			(3.23)		(3.22)		(3.23)		(3.24)		(3.23)	
			[0.72]		[0.72]		[0.72]		[0.72]		[0.72]	
Country level												
Monumentalism					-0.18	***					-0.15	***
					(0.04)						(0.04)	
					[-0.57]						[-0.49]	
Collectivism							-0.11	*			-0.04	
							(0.05)				(0.05)	
							[-0.32]				[-0.11]	
GDP per capita (1,000)									0.56	**	0.18	
									(0.18)		(0.18)	
									[0.40]		[0.13]	
Variance components												
Student level	39.7%		38.1%		38.0%		38.0%		38.0%		38.1%	
School level	24.0%		9.1%		9.1%		9.1%		9.2%		9.1%	
Country level	36.3%		3.7%		3.9%		5.3%		5.0%		3.7%	
Total variance explained			49.1%		48.9%		47.6%		47.8%		49.1%	
-2*loglikelihood:	2589790		2573138		2573123		2573134		2573130		2573119	
Reduction			16652.1		14.9		4.0		7.7		3.4	
Degrees of freedom			4		1		1		1		2	

Note: Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
*p < .05. **p <. 01. ***p <. 001.

Table 10. Multilevel regression results for reading achievement in PISA 2018, excluding countries with higher proportion of missing values. Unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model		1. Student & School		2a. Monumentalism		2b. Collectivism		2c. GDP		3. Full model	
Fixed Part												
Intercept	440.42	***	170.96	***	172.56	***	171.88	***	174.75	***	174.55	***
	(156.69)		(17.75)		(17.91)		(18.45)		(18.22)		(18.56)	
	[5.77]		[5.76]		[5.86]		[5.85]		[5.93]		[5.96]	
Student level												
ESCS			12.68	***	12.67	***	12.67	***	12.68	***	12.68	***
			(1.52)		(1.52)		(1.52)		(1.52)		(1.52)	
			[0.18]		[0.18]		[0.18]		[0.18]		[0.18]	
Gender (Girl)			20.87	***	20.87	***	20.88	***	20.88	***	20.88	***
			(1.49)		(1.49)		(1.49)		(1.49)		(1.49)	
			[0.13]		[0.13]		[0.13]		[0.13]		[0.13]	
Grade			28.21	***	28.22	***	28.23	***	28.20	***	28.22	***
			(1.87)		(1.87)		(1.87)		(1.87)		(1.88)	
			[0.27]		[0.27]		[0.27]		[0.27]		[0.27]	
School level												
School ESCS			42.97	***	42.97	***	42.86	***	42.86	***	42.82	***
			(3.18)		(3.18)		(3.19)		(3.19)		(3.19)	
			[0.75]		[0.75]		[0.75]		[0.75]		[0.75]	
Country level												
Monumentalism					-0.13	**					-0.08	‡
					(0.05)						(0.04)	
					[-0.41]						[-0.25]	
Collectivism							-0.14	**			-0.07	
							(0.04)				(0.05)	
							[-0.41]				[-0.19]	
GDP per capita (1,000)									0.68	***	0.09	‡
									(0.17)		(0.37)	
									[0.47]		[0.26]	
Variance components												
Student level	37.5%		35.3%		35.3%		35.3%		35.3%		35.3%	
School level	27.4%		8.4%		8.4%		8.4%		8.4%		8.4%	
Country level	35.1%		5.3%		4.3%		4.3%		4.1%		3.6%	
Total variance explained			51.0%		52.0%		52.0%		52.2%		52.7%	
-2*loglikelihood:	2613952		2592721		2592714		2592715		2592712		2592708	
Reduction			21231		6.7		6.4		9.4		3.7	
Degrees of freedom			4		1		1		1		2	

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
‡*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

Table 11. Multilevel regression results for mathematics achievement in PISA 2018, excluding countries with outlier scores on country-level variables. Unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model		1. Student & School		2a. Monumentalism		2b. Collectivism		2c. GDP		3. Full model	
Fixed Part												
Intercept	483.74	***	185.73	***	183.70	***	186.53	***	186.63	***	185.01	***
	(428.26)		(20.51)		(20.34)		(21.28)		(20.67)		(20.89)	
	[6.81]		[5.62]		[5.54]		[5.62]		[5.65]		[5.58]	
Student level												
ESCS			14.38	***	14.38	***	14.37	***	14.38	***	14.38	***
			(1.47)		(1.47)		(1.47)		(1.47)		(1.47)	
			[0.21]		[0.21]		[0.21]		[0.21]		[0.21]	
Gender (Girl)			-11.55	***	-11.55	***	-11.55	***	-11.55	***	-11.55	***
			(1.50)		(1.50)		(1.50)		(1.50)		(1.50)	
			[-0.07]		[-0.07]		[-0.07]		[-0.07]		[-0.07]	
Grade			29.54	***	29.56	***	29.56	***	29.56	***	29.54	***
			(2.20)		(2.20)		(2.21)		(2.20)		(2.21)	
			[0.30]		[0.30]		[0.30]		[0.30]		[0.30]	
School level												
School ESCS			37.45	***	37.37	***	37.39	***	37.35	***	37.33	***
			(4.00)		(4.00)		(4.00)		(4.00)		(4.00)	
			[0.72]		[0.72]		[0.72]		[0.72]		[0.72]	
Country level												
Monumentalism					-0.22	**					-0.19	**
					(0.06)						(0.07)	
					[-0.52]						[-0.44]	
Collectivism							-0.20	**			-0.10	
							(0.07)				(0.11)	
							[-0.35]				[-0.18]	
GDP per capita (1,000)									0.66	*	0.09	
									(0.32)		(0.38)	
									[0.35]		[0.05]	
Variance components												
Student level	39.8%		37.1%		37.1%		37.1%		37.1%		37.1%	
School level	24.6%		8.8%		8.9%		8.8%		8.8%		8.9%	
Country level	35.6%		7.7%		5.7%		6.8%		6.8%		5.3%	
Total variance explained			46.3%		48.4%		47.3%		47.3%		48.7%	
-2*loglikelihood:	2269279		2249924		2249914		2249919		2249920		2249912	
Reduction			19355		10.2		4.9		4.4		2.2	
Degrees of freedom			4		1		1		1		2	

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.

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

Table 12. Multilevel regression results for science achievement in PISA 2018, excluding countries with outlier scores on country-level variables. Unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model		1. Student & School		2a. Monumentalism		2b. Collectivism		2c. GDP		3. Full model	
Fixed Part												
Intercept	461.13	***	195.78	***	193.94	***	196.58	***	203.68	***	194.86	***
	(10.02)		(20.35)		(20.27)		(20.64)		(20.54)		(20.48)	
	[6.53]		[7.35]		[7.26]		[7.38]		[0.54]		[7.31]	
Student level												
ESCS			14.19	***	14.19	***	14.19	***	14.18	***	14.19	***
			(1.57)		(1.57)		(1.57)		(1.57)		(1.57)	
			[0.20]		[0.20]		[0.20]		[0.20]		[0.20]	
Gender (Girl)			-4.54	***	-4.53	***	-4.53	***	-4.53	***	-4.53	***
			(1.48)		(1.48)		(1.48)		(1.48)		(1.48)	
			[-0.03]		[-0.03]		[-0.03]		[-0.03]		[-0.03]	
Grade			28.18	***	28.25	***	28.16	***	28.25	***	28.18	***
			(2.13)		(2.14)		(2.13)		(2.13)		(2.14)	
			[0.28]		[0.28]		[0.28]		[0.28]		[0.28]	
School level												
School ESCS			37.21	***	37.09	***	37.14	***	37.18	***	37.11	***
			(3.92)		(3.92)		(3.94)		(3.97)		(3.94)	
			[0.72]		[0.72]		[0.72]		[0.72]		[0.72]	
Country level												
Monumentalism					-0.16	***					-0.15	**
					(0.05)						(0.05)	
					[-0.47]						[-0.45]	
Collectivism							-0.10				-0.09	
							(0.07)				(0.05)	
							[-0.22]				[-0.10]	
GDP per capita (1,000)									0.07		-0.06	
									(0.30)		(0.29)	
									[0.00]		[-0.04]	
Variance components												
Student level	41.4%		39.1%		39.1%		39.1%		39.1%		39.1%	
School level	24.9%		8.6%		8.6%		8.6%		8.6%		8.6%	
Country level	33.7%		4.8%		3.8%		4.6%		966.4%		3.7%	
Total variance explained			47.5%		48.5%		47.7%		-914.1%		48.5%	
-2*loglikelihood:	2285554		2268912		2268904		2268911		2269058		2268904	
Reduction			16642		8.1		1.3		-146.1		0.4	
Degrees of freedom			4		1		1		1		2	

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
*p < .05. **p < .01. ***p < .001.

Table 13. Multilevel regression results for reading achievement in PISA 2018, excluding countries with outlier scores on country-level variables. Unstandardized coefficients, standard errors (in parentheses), and standardized coefficients [in brackets].

	0. Unconditional model		1. Student & School		2a. Monumentalism		2b. Collectivism		2c. GDP		3. Full model	
Fixed Part												
Intercept	461.84	***	160.07	***	159.18	***	160.62	***	160.75	***	159.69	***
	(8.34)		(19.82)		(19.51)		(20.06)		(19.84)		(19.70)	
	[6.19]		[5.93]		[5.91]		[5.96]		[5.95]		[5.92]	
Student level												
ESCS			13.84	***	13.84	***	13.84	***	13.84	***	13.84	***
			(1.62)		(1.62)		(1.62)		(1.62)		(1.62)	
			[0.18]		[0.18]		[0.18]		[0.18]		[0.18]	
Gender (Girl)			21.27	***	21.27	***	21.27	***	21.27	***	21.27	***
			(1.83)		(1.83)		(1.83)		(1.83)		(1.83)	
			[0.12]		[0.12]		[0.12]		[0.12]		[0.12]	
Grade			30.42	***	30.42	***	30.44	***	30.44	***	30.42	***
			(2.03)		(2.02)		(2.03)		(2.03)		(2.03)	
			[0.28]		[0.28]		[0.28]		[0.28]		[0.28]	
School level												
School ESCS			41.89	***	41.85	***	41.83	***	41.81	***	41.79	***
			(3.75)		(3.75)		(3.78)		(3.78)		(3.78)	
			[0.75]		[0.74]		[0.74]		[0.74]		[0.74]	
Country level												
Monumentalism					-0.13	*					-0.10	‡
					(0.06)						(0.06)	
					[-0.37]						[-0.30]	
Collectivism							-0.10	‡			-0.02	
							(0.06)				(0.10)	
							[-0.22]				[-0.05]	
GDP per capita (1,000)									0.43	‡	0.18	
									(0.24)		(0.34)	
									[0.28]		[0.12]	
Variance components												
Student level	39.3%		36.6%		36.6%		36.6%		36.6%		36.6%	
School level	28.7%		7.8%		7.9%		7.8%		7.8%		7.8%	
Country level	32.0%		4.2%		3.6%		4.0%		3.9%		3.5%	
Total variance explained			51.4%		52.0%		51.6%		51.7%		52.1%	
-2*loglikelihood:	2307273		2287170		2287165		2287169		2287168		2287165	
Reduction			20102.8		4.9		1.7		2.7		0.7	
Degrees of freedom			4		1		1		1		2	

Note: PISA = Programme for International Student Assessment; GDP = gross domestic product; ESCS = index of economic, social, and cultural status.
‡$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.