

TIMSS 2011

The TIMSS 2011 Students Confident in Mathematics Scale, Fourth Grade

The Students Confident in Mathematics (SCM) scale was created based on students' degree of agreement with the seven statements described below. See [Creating and Interpreting TIMSS and PIRLS 2011 Context Questionnaire Scales](#) for more information on how the scales were formed.

Exhibit 1: Items in the TIMSS 2011 Students Confident in Mathematics Scale, Fourth Grade

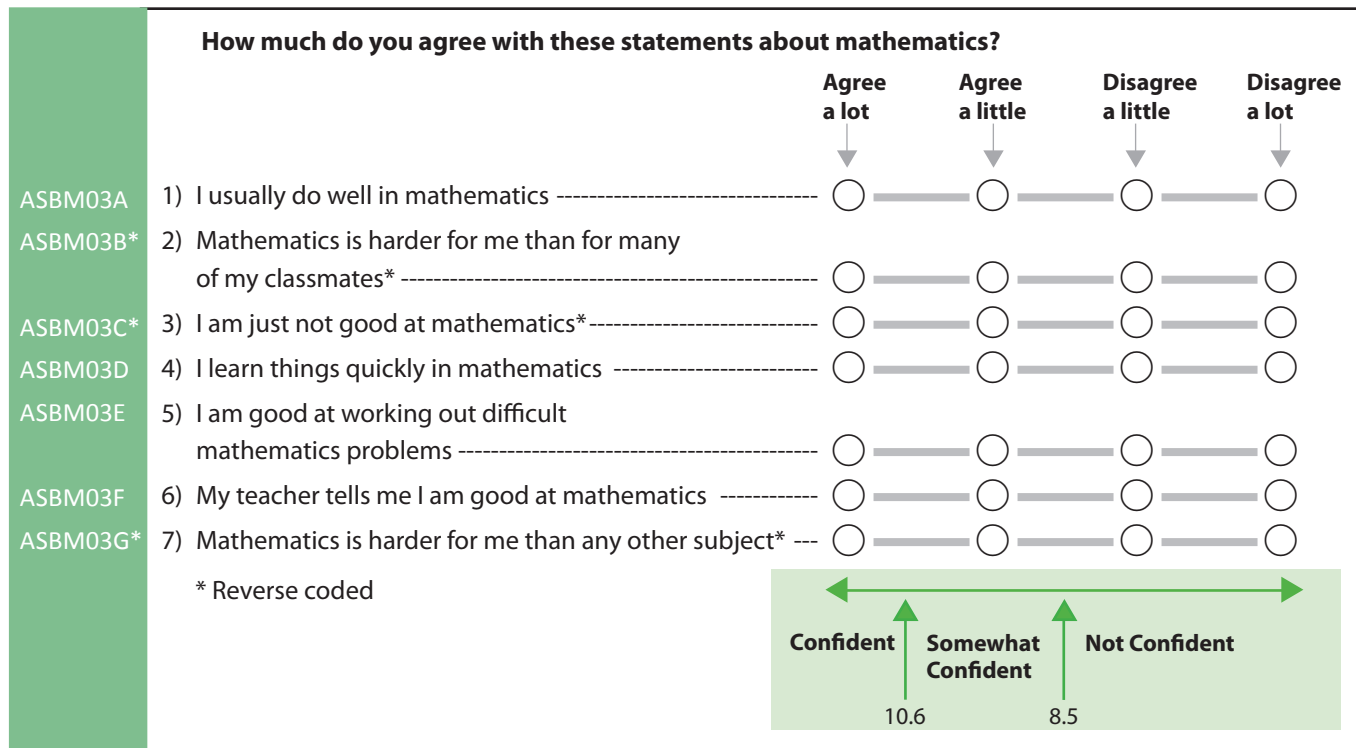


Exhibit 2: Item Parameters for the TIMSS 2011 Students Confident in Mathematics Scale, Fourth Grade

Item	delta	tau_1	tau_2	tau_3
ASBM03A	-1.49380	-0.54001	-0.50325	1.04326
ASBM03B*	-0.71219	-0.55625	0.28935	0.26690
ASBM03C*	-0.83486	-0.35576	0.20521	0.15055
ASBM03D	-1.24535	-0.70679	-0.26236	0.96915
ASBM03E	-0.74113	-0.84984	-0.27348	1.12332
ASBM03F	-0.92465	-0.73830	-0.28676	1.02506
ASBM03G*	-0.71519	-0.17255	0.18892	-0.01637

*Reverse coded

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants

$$A = 10.01830$$

$$B = 1.58282$$

$$\text{Transformed Scale Score} = 10.01830 + 1.58282 \cdot \text{Logit Scale Score}$$

Exhibit 4: Equivalence Table of the Raw Score and the Transformed Scale Score

Raw Score	Transformed Scale Score	Cutpoint	Raw Score	Transformed Scale Score	Cutpoint
0	3.34397		11	8.64408	
1	4.97714		12	8.87883	
2	5.74890		13	9.11728	
3	6.27973		14	9.36542	
4	6.69957		15	9.63103	
5	7.05574		16	9.92558	
6	7.37059		17	10.26443	
7	7.65659		18	10.67906	10.6
8	7.92178		19	11.22909	
9	8.17204		20	12.06421	
10	8.41228	8.5	21	13.85435	

Exhibit 5: Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2011 Students Confident in Mathematics Scale, Fourth Grade

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item						
			ASBM03A	ASBM03B*	ASBM03C*	ASBM03D	ASBM03E	ASBM03F	ASBM03G*
Armenia	0.76	43	0.72	0.49	0.57	0.72	0.78	0.77	0.44
Australia	0.86	55	0.78	0.72	0.77	0.78	0.78	0.63	0.72
Austria	0.87	57	0.79	0.74	0.74	0.79	0.70	0.75	0.76
Azerbaijan	0.70	39	0.67	0.52	0.28	0.74	0.76	0.78	0.46
Bahrain	0.65	33	0.46	0.58	0.49	0.65	0.61	0.61	0.60
Belgium (Flemish)	0.86	60	0.83	0.76	0.84	0.74	–	0.67	0.79
Chile	0.77	44	0.77	0.54	0.62	0.77	0.72	0.60	0.59
Chinese Taipei	0.86	55	0.80	0.66	0.71	0.78	0.78	0.76	0.67
Croatia	0.88	60	0.83	0.71	0.77	0.80	0.79	0.82	0.70
Czech Republic	0.87	56	0.78	0.74	0.77	0.81	0.65	0.72	0.76
Denmark	0.85	54	0.81	0.74	0.77	0.79	0.80	0.53	0.68
England	0.83	51	0.78	0.68	0.76	0.77	0.75	0.48	0.70
Finland	0.89	60	0.84	0.73	0.81	0.81	0.78	0.71	0.75
Georgia	0.75	41	0.69	0.63	0.72	0.67	0.54	0.61	0.63
Germany	0.89	62	0.83	0.78	0.81	0.81	0.77	0.75	0.75
Hong Kong SAR	0.87	56	0.80	0.70	0.78	0.78	0.74	0.71	0.73
Hungary	0.88	60	0.79	0.74	0.78	0.80	0.77	0.80	0.73

Exhibit 5: Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2011 Students Confident in Mathematics Scale, Fourth Grade (Continued)

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item						
			ASBM03A	ASBM03B*	ASBM03C*	ASBM03D	ASBM03E	ASBM03F	ASBM03G*
Iran, Islamic Rep. of	0.77	43	0.72	0.52	0.63	0.71	0.69	0.71	0.59
Ireland	0.86	55	0.79	0.74	0.77	0.79	0.76	0.58	0.74
Italy	0.81	48	0.75	0.65	0.55	0.81	0.65	0.72	0.68
Japan	0.84	52	0.76	0.69	0.83	0.76	0.80	0.48	0.70
Kazakhstan	0.81	48	0.72	0.65	0.68	0.71	0.72	0.70	0.67
Korea, Rep. of	0.87	58	0.84	0.78	0.77	0.75	0.81	0.63	0.71
Kuwait	0.62	31	0.26	0.66	0.65	0.56	0.54	0.52	0.63
Lithuania	0.85	54	0.80	0.72	0.72	0.71	0.75	0.73	0.71
Malta	0.83	51	0.73	0.71	0.71	0.73	0.70	0.71	0.70
Morocco	0.57	28	0.39	0.47	0.46	0.65	0.60	0.60	0.50
Netherlands	0.88	59	0.83	0.74	0.80	0.77	0.79	0.65	0.77
New Zealand	0.81	47	0.75	0.64	0.72	0.74	0.76	0.54	0.65
Northern Ireland	0.85	54	0.80	0.72	0.80	0.78	0.74	0.56	0.74
Norway	0.83	51	0.78	0.67	0.71	0.75	0.76	0.61	0.69
Oman	0.69	35	0.54	0.62	0.60	0.59	0.57	0.62	0.60
Poland	0.85	54	0.80	0.73	0.65	0.81	0.76	0.70	0.71
Portugal	0.86	57	0.77	0.68	0.77	0.79	0.77	0.76	0.70
Qatar	0.71	37	0.41	0.64	0.61	0.67	0.58	0.66	0.64
Romania	0.84	53	0.76	0.68	0.71	0.72	0.73	0.76	0.70
Russian Federation	0.88	59	0.81	0.74	0.78	0.84	0.76	0.74	0.72
Saudi Arabia	0.62	31	0.40	0.61	0.41	0.64	0.61	0.61	0.59
Serbia	0.87	57	0.82	0.71	0.78	0.76	0.76	0.75	0.70
Singapore	0.86	56	0.80	0.74	0.76	0.77	0.75	0.68	0.72
Slovak Republic	0.87	57	0.80	0.68	0.78	0.79	0.73	0.73	0.75
Slovenia	0.84	53	0.79	0.72	0.66	0.77	0.66	0.75	0.73
Spain	0.82	48	0.75	0.68	0.70	0.69	0.65	0.71	0.69
Sweden	0.85	54	0.80	0.71	0.73	0.78	0.73	0.65	0.73
Thailand	0.68	35	0.67	0.47	0.57	0.67	0.65	0.63	0.44
Tunisia	0.59	32	0.08	0.59	0.46	0.63	0.70	0.68	0.58
Turkey	0.78	44	0.68	0.62	0.71	0.65	0.67	0.69	0.61
United Arab Emirates	0.73	39	0.58	0.61	0.56	0.68	0.63	0.67	0.63
United States	0.84	52	0.75	0.74	0.75	0.76	0.73	0.54	0.74
Yemen	0.61	32	0.68	0.24	0.26	0.73	0.72	0.73	0.23

Exhibit 5: Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2011 Students Confident in Mathematics Scale, Fourth Grade (Continued)

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item						
			ASBM03A	ASBM03B*	ASBM03C*	ASBM03D	ASBM03E	ASBM03F	ASBM03G*
Sixth Grade Participants									
Botswana	0.70	37	0.68	0.51	0.59	0.64	0.58	0.67	0.54
Honduras	0.64	35	0.73	0.22	0.25	0.74	0.78	0.78	0.11
Yemen	0.62	32	0.62	0.37	0.42	0.70	0.69	0.68	0.34
Benchmarking Participants									
Alberta, Canada	0.85	54	0.77	0.74	0.80	0.77	0.76	0.48	0.76
Ontario, Canada	0.85	53	0.78	0.76	0.79	0.76	0.75	0.48	0.74
Quebec, Canada	0.87	57	0.81	0.77	0.76	0.79	0.76	0.60	0.75
Abu Dhabi, UAE	0.69	35	0.49	0.60	0.51	0.65	0.61	0.67	0.61
Dubai, UAE	0.78	44	0.69	0.64	0.63	0.71	0.66	0.67	0.66
Florida, US	0.86	55	0.78	0.75	0.76	0.76	0.75	0.58	0.77
North Carolina, US	0.83	50	0.74	0.75	0.71	0.74	0.72	0.51	0.75

A dash (-) indicates that the item was not administered or comparable data was not available.

*Reverse coded

Exhibit 6: Relationship Between the TIMSS 2011 Students Confident in Mathematics Scale, Fourth Grade, and TIMSS 2011 Mathematics Achievement

Country	Pearson's Correlation with Mathematics Achievement		Variance in Mathematics Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r^2)	
Armenia	0.27	0.07	0.07
Australia	0.35	0.12	0.11
Austria	0.39	0.15	0.14
Azerbaijan	0.27	0.07	0.07
Bahrain	0.32	0.10	0.10
Belgium (Flemish)	0.45	0.20	0.19
Chile	0.42	0.18	0.17
Chinese Taipei	0.36	0.13	0.13
Croatia	0.46	0.21	0.20
Czech Republic	0.35	0.12	0.12
Denmark	0.37	0.14	0.13
England	0.28	0.08	0.08
Finland	0.43	0.18	0.18
Georgia	0.32	0.10	0.10
Germany	0.42	0.18	0.17
Hong Kong SAR	0.36	0.13	0.14
Hungary	0.51	0.26	0.25

Exhibit 6: Relationship Between the TIMSS 2011 Students Confident in Mathematics Scale, Fourth Grade, and TIMSS 2011 Mathematics Achievement (Continued)

Country	Pearson's Correlation with Mathematics Achievement		Variance in Mathematics Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r ²)	
Iran, Islamic Rep. of	0.27	0.07	0.08
Ireland	0.31	0.09	0.09
Italy	0.30	0.09	0.08
Japan	0.42	0.17	0.16
Kazakhstan	0.17	0.03	0.02
Korea, Rep. of	0.48	0.23	0.22
Kuwait	0.27	0.07	0.07
Lithuania	0.44	0.20	0.18
Malta	0.40	0.16	0.16
Morocco	0.25	0.06	0.06
Netherlands	0.47	0.22	0.22
New Zealand	0.28	0.08	0.07
Northern Ireland	0.34	0.12	0.12
Norway	0.31	0.09	0.08
Oman	0.39	0.15	0.14
Poland	0.41	0.17	0.17
Portugal	0.46	0.21	0.21
Qatar	0.31	0.10	0.11
Romania	0.42	0.17	0.16
Russian Federation	0.35	0.12	0.12
Saudi Arabia	0.24	0.06	0.06
Serbia	0.46	0.21	0.19
Singapore	0.42	0.18	0.18
Slovak Republic	0.42	0.18	0.16
Slovenia	0.44	0.19	0.18
Spain	0.40	0.16	0.16
Sweden	0.31	0.10	0.08
Thailand	0.19	0.04	0.03
Tunisia	0.24	0.06	0.06
Turkey	0.44	0.19	0.18
United Arab Emirates	0.26	0.07	0.07
United States	0.39	0.15	0.15
Yemen	0.25	0.06	0.06
International Median	0.36	0.13	0.13

Exhibit 6: Relationship Between the TIMSS 2011 Students Confident in Mathematics Scale, Fourth Grade, and TIMSS 2011 Mathematics Achievement (Continued)

Country	Pearson's Correlation with Mathematics Achievement		Variance in Mathematics Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r ²)	
Sixth Grade Participants			
Botswana	0.23	0.05	0.08
Honduras	0.27	0.07	0.06
Yemen	0.27	0.07	0.07
Benchmarking Participants			
Alberta, Canada	0.40	0.16	0.16
Ontario, Canada	0.43	0.19	0.18
Quebec, Canada	0.45	0.20	0.19
Abu Dhabi, UAE	0.29	0.09	0.09
Dubai, UAE	0.23	0.05	0.06
Florida, US	0.39	0.16	0.15
North Carolina, US	0.42	0.18	0.16