

TIMSS 2011

The TIMSS 2011 Students Value Mathematics Scale, Eighth Grade

The Students Value Mathematics (SVM) scale was created based on students' degree of agreement to the six 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 Value Mathematics Scale, Eighth Grade

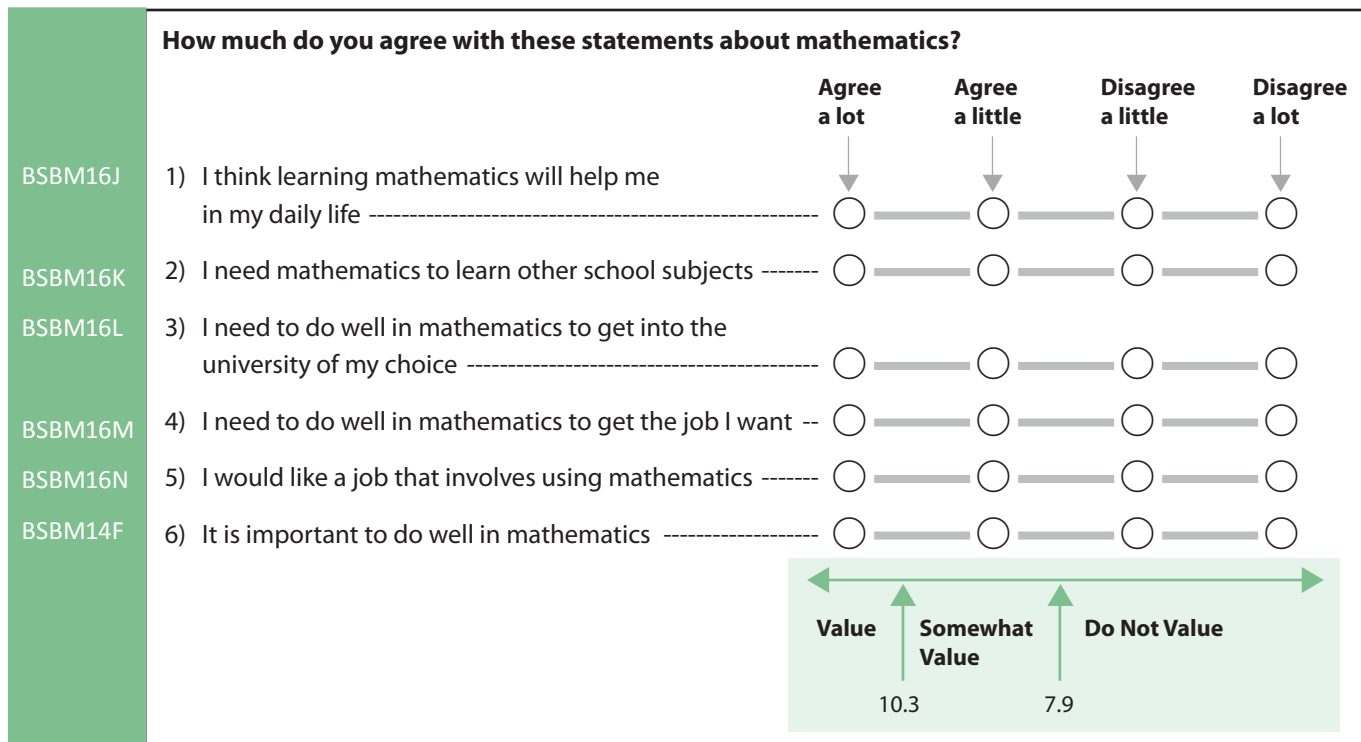


Exhibit 2: Item Parameters for the TIMSS 2011 Students Value Mathematics Scale, Eighth Grade

Item	delta	tau_1	tau_2	tau_3
BSBM16J	-1.82358	-0.64266	-0.51333	1.15599
BSBM16K	-1.34697	-1.15712	-0.41357	1.57069
BSBM16L	-1.65729	-0.69507	-0.23847	0.93354
BSBM16M	-1.52990	-0.89069	-0.14108	1.03177
BSBM16N	-0.01432	-1.02080	-0.15346	1.17426
BSBM14F	-2.06816	-0.24830	-0.64379	0.89209

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants

$$A = 10.06548$$

$$B = 1.39878$$

$$\text{Transformed Scale Score} = 10.06548 + 1.39878 \cdot \text{Logit Scale Score}$$

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	3.41233		10	8.20673	
1	4.82293		11	8.55351	
2	5.49149		12	8.92971	
3	5.96004		13	9.34439	
4	6.33324		14	9.81093	
5	6.66537		15	10.35139	10.3
6	6.97345		16	11.01771	
7	7.27410		17	11.94250	
8	7.57539		18	13.70742	
9	7.88323	7.9			

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item					
			BSBM16J	BSBM16K	BSBM16L	BSBM16M	BSBM16N	BSBM14F
Armenia	0.81	51	0.67	0.63	0.84	0.84	0.78	0.46
Australia	0.82	54	0.77	0.73	0.76	0.79	0.66	0.70
Bahrain	0.81	52	0.76	0.75	0.80	0.79	0.61	0.60
Chile	0.71	43	0.66	0.61	0.72	0.78	0.61	0.52
Chinese Taipei	0.85	58	0.77	0.72	0.80	0.82	0.70	0.75
England	0.78	49	0.73	0.68	0.73	0.79	0.63	0.64
Finland	0.84	55	0.75	0.72	0.75	0.80	0.70	0.74
Georgia	0.73	45	0.71	0.58	0.75	0.77	0.61	0.58
Ghana	0.69	42	0.67	0.58	0.74	0.73	0.53	0.58
Hong Kong SAR	0.85	57	0.77	0.76	0.78	0.82	0.66	0.74
Hungary	0.76	47	0.72	0.68	0.67	0.78	0.64	0.59
Indonesia	0.78	49	0.66	0.67	0.80	0.80	0.63	0.59
Iran, Islamic Rep. of	0.74	45	0.66	0.68	0.76	0.78	0.66	0.42
Israel	0.76	47	0.71	0.68	0.75	0.78	0.57	0.61
Italy	0.78	48	0.69	0.65	0.74	0.78	0.70	0.58
Japan	0.79	48	0.70	0.69	0.72	0.78	0.61	0.67
Jordan	0.72	45	0.67	0.70	0.74	0.74	0.53	0.60
Kazakhstan	0.78	49	0.75	0.58	0.78	0.81	0.65	0.57
Korea, Rep. of	0.81	52	0.65	0.74	0.80	0.81	0.62	0.68

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item					
			BSBM16J	BSBM16K	BSBM16L	BSBM16M	BSBM16N	BSBM14F
Lebanon	0.77	47	0.67	0.67	0.76	0.77	0.63	0.59
Lithuania	0.80	51	0.75	0.70	0.78	0.78	0.59	0.67
Macedonia, Rep. of	0.80	51	0.68	0.72	0.78	0.80	0.71	0.57
Malaysia	0.79	49	0.69	0.65	0.79	0.77	0.64	0.66
Morocco	0.70	43	0.61	0.67	0.78	0.76	0.55	0.51
New Zealand	0.82	54	0.77	0.74	0.77	0.78	0.65	0.68
Norway	0.80	51	0.72	0.67	0.81	0.80	0.64	0.63
Oman	0.72	43	0.68	0.69	0.76	0.74	0.53	0.51
Palestinian Nat'l Auth.	0.74	46	0.71	0.70	0.77	0.75	0.52	0.59
Qatar	0.82	55	0.77	0.75	0.82	0.80	0.57	0.70
Romania	0.81	51	0.70	0.69	0.81	0.81	0.67	0.59
Russian Federation	0.81	52	0.74	0.68	0.81	0.81	0.68	0.59
Saudi Arabia	0.75	46	0.70	0.70	0.77	0.74	0.58	0.56
Singapore	0.80	51	0.75	0.70	0.76	0.78	0.64	0.66
Slovenia	0.78	49	0.75	0.69	0.75	0.78	0.59	0.61
Sweden	0.81	52	0.71	0.69	0.81	0.83	0.64	0.63
Syrian Arab Republic	0.73	44	0.62	0.66	0.76	0.75	0.58	0.57
Thailand	0.77	47	0.67	0.64	0.76	0.79	0.62	0.62
Tunisia	0.75	46	0.68	0.71	0.78	0.77	0.57	0.55
Turkey	0.75	46	0.60	0.66	0.77	0.80	0.65	0.54
Ukraine	0.81	52	0.75	0.68	0.80	0.82	0.64	0.64
United Arab Emirates	0.78	49	0.73	0.69	0.76	0.78	0.63	0.60
United States	0.79	50	0.77	0.72	0.71	0.76	0.62	0.66
Ninth Grade Participants								
Botswana	0.69	41	0.68	0.55	0.73	0.69	0.51	0.66
Honduras	0.67	41	0.65	0.65	0.73	0.75	0.54	0.46
South Africa	0.73	45	0.71	0.60	0.76	0.77	0.55	0.61
Benchmarking Participants								
Alberta, Canada	0.81	53	0.77	0.71	0.77	0.78	0.65	0.69
Ontario, Canada	0.79	50	0.73	0.69	0.75	0.76	0.65	0.65
Quebec, Canada	0.78	49	0.75	0.68	0.75	0.77	0.62	0.63
Abu Dhabi, UAE	0.78	50	0.73	0.70	0.78	0.78	0.61	0.61
Dubai, UAE	0.79	50	0.74	0.69	0.75	0.78	0.66	0.60
Alabama, US	0.78	50	0.79	0.71	0.72	0.76	0.58	0.69
California, US	0.78	49	0.77	0.72	0.72	0.75	0.59	0.64
Colorado, US	0.80	51	0.79	0.72	0.73	0.77	0.60	0.69
Connecticut, US	0.78	49	0.74	0.70	0.72	0.77	0.60	0.67
Florida, US	0.79	50	0.77	0.74	0.70	0.77	0.57	0.68

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item					
			BSBM16J	BSBM16K	BSBM16L	BSBM16M	BSBM16N	BSBM14F
Indiana, US	0.81	53	0.78	0.74	0.75	0.78	0.61	0.70
Massachusetts, US	0.78	49	0.75	0.70	0.70	0.76	0.65	0.66
Minnesota, US	0.79	50	0.76	0.72	0.67	0.77	0.65	0.68
North Carolina, US	0.74	46	0.71	0.66	0.68	0.74	0.62	0.65

Exhibit 6: Relationship Between the TIMSS 2011 Students Value Mathematics Scale, Eighth 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	0.12	0.01	0.01
Australia	0.21	0.04	0.04
Bahrain	0.20	0.04	0.03
Chile	0.14	0.02	0.01
Chinese Taipei	0.38	0.14	0.10
England	0.11	0.01	0.01
Finland	0.29	0.08	0.07
Georgia	0.08	0.01	0.01
Ghana	0.22	0.05	0.05
Hong Kong SAR	0.31	0.10	0.09
Hungary	0.15	0.02	0.02
Indonesia	0.04	0.00	0.01
Iran, Islamic Rep. of	0.11	0.01	0.01
Israel	0.13	0.02	0.02
Italy	0.20	0.04	0.04
Japan	0.27	0.07	0.05
Jordan	0.20	0.04	0.05
Kazakhstan	0.01	0.00	0.00
Korea, Rep. of	0.38	0.14	0.12
Lebanon	0.18	0.03	0.03
Lithuania	0.16	0.02	0.02
Macedonia, Rep. of	-0.04	0.00	0.00
Malaysia	0.16	0.03	0.02
Morocco	0.16	0.03	0.02
New Zealand	0.14	0.02	0.02
Norway	0.16	0.02	0.03
Oman	0.25	0.06	0.06
Palestinian Nat'l Auth.	0.24	0.06	0.06

Exhibit 6: Relationship Between the TIMSS 2011 Students Value Mathematics Scale, Eighth 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)	
Qatar	0.19	0.04	0.04
Romania	0.14	0.02	0.01
Russian Federation	0.11	0.01	0.01
Saudi Arabia	0.17	0.03	0.03
Singapore	0.12	0.01	0.01
Slovenia	0.16	0.03	0.03
Sweden	0.19	0.04	0.03
Syrian Arab Republic	0.14	0.02	0.03
Thailand	0.20	0.04	0.03
Tunisia	0.18	0.03	0.03
Turkey	0.24	0.06	0.04
Ukraine	0.13	0.02	0.01
United Arab Emirates	0.13	0.02	0.02
United States	0.17	0.03	0.02
International Median	0.16	0.03	0.03
Ninth Grade Participants			
Botswana	0.34	0.12	0.12
Honduras	-0.03	0.00	0.00
South Africa	0.15	0.02	0.03
Benchmarking Participants			
Alberta, Canada	0.21	0.04	0.03
Ontario, Canada	0.27	0.07	0.06
Quebec, Canada	0.16	0.02	0.02
Abu Dhabi, UAE	0.18	0.03	0.03
Dubai, UAE	0.10	0.01	0.01
Alabama, US	0.08	0.01	0.01
California, US	0.10	0.01	0.01
Colorado, US	0.20	0.04	0.02
Connecticut, US	0.19	0.03	0.03
Florida, US	0.19	0.04	0.03
Indiana, US	0.22	0.05	0.03
Massachusetts, US	0.18	0.03	0.02
Minnesota, US	0.25	0.06	0.05
North Carolina, US	0.17	0.03	0.02