TIMSS 2011

The TIMSS 2011 Students Confident in Earth Science Scale, Eighth Grade

The Students Confident in Earth Science (SCE) scale was created based on students' degree of agreement to the nine statements described below. This scale was administered in countries where the sciences are taught as separate subjects. 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 Earth Science Scale, Eighth Grade

How much do you agree with these statements about earth science?

		Agree a lot	Agree a little	Disagree a little	Disagree a lot
BSBE24A	1) I usually do well in earth science	○	○	○	○
BSBE24B*	2) Earth science is more difficult for me than for many of my classmates*	○	○	○	○
BSBE24C*	3) Earth science is not one of my strengths*	○	○	○	○
BSBE24D	4) I learn things quickly in earth science	○	○	○	○
BSBE24E*	5) Earth science makes me confused and nervous*	○	○	○	○
BSBE24F	6) I am good at working out difficult earth science problems	○	○	○	○
BSBE24G	7) My teacher thinks I can do well in earth science <programs/classes/lessons> with difficult materials	○	○	○	○
BSBE24H	8) My teacher tells me I am good at earth science	○	○	○	○
BSBE24I*	9) Earth science is harder for me than any other subject*	○	○	○	○

* Reverse coded

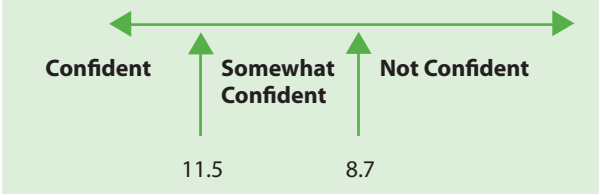

Exhibit 2: Item Parameters for the TIMSS 2011 Students Confident in Earth Science Scale, Eighth Grade

Item	delta	tau_1	tau_2	tau_3
BSBE24A	–1.13356	–1.22293	–0.32616	1.54909
BSBE24B*	–0.83864	–1.07856	–0.08306	1.16162
BSBE24C*	–0.40190	–1.23027	0.06023	1.17004
BSBE24D	–0.95700	–1.33369	–0.13263	1.46632
BSBE24E*	–1.05293	–0.70445	–0.23873	0.94318
BSBE24F	–0.34149	–1.45772	–0.04468	1.50240
BSBE24G	–0.57560	–1.36420	–0.10281	1.46701
BSBE24H	–0.57422	–1.35142	–0.10738	1.45880
BSBE24I*	–0.83388	–0.71471	–0.16346	0.87817

*Reverse coded

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants	
A = 9.94308 B = 1.52518	Transformed Scale Score = 9.94308 + 1.52518 • 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	2.54704		14	8.84867	
1	4.27303		15	9.08987	
2	5.10676		16	9.33737	
3	5.67853		17	9.59435	
4	6.12427		18	9.86220	
5	6.49904		19	10.14587	
6	6.82593		20	10.45004	
7	7.12114		21	10.77971	
8	7.39270		22	11.14539	
9	7.65070		23	11.56161	11.5
10	7.89812		24	12.05475	
11	8.13870		25	12.67510	
12	8.37555		26	13.56203	
13	8.61137	8.7	27	15.34398	

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item								
			BSBE24A	BSBE24B*	BSBE24C*	BSBE24D	BSBE24E*	BSBE24F	BSBE24G	BSBE24H	BSBE24I*
Armenia	0.76	37	0.81	0.36	0.18	0.76	0.29	0.73	0.75	0.84	0.28
Finland	0.90	57	0.85	0.70	0.77	0.83	0.64	0.77	0.80	0.79	0.60
Georgia	0.82	43	0.76	0.52	0.61	0.76	0.44	0.74	0.75	0.74	0.46
Hungary	0.89	54	0.83	0.62	0.77	0.80	0.57	0.77	0.77	0.80	0.60
Indonesia	0.78	37	0.71	0.50	0.56	0.74	0.56	0.57	0.64	0.68	0.43
Kazakhstan	0.86	49	0.76	0.62	0.70	0.76	0.53	0.78	0.76	0.79	0.49
Lebanon	–	–	–	–	–	–	–	–	–	–	–
Lithuania	0.87	50	0.80	0.64	0.64	0.80	0.56	0.77	0.78	0.74	0.58
Macedonia, Rep. of	0.79	39	0.76	0.42	0.40	0.76	0.46	0.72	0.72	0.78	0.39
Morocco	0.74	33	0.47	0.52	0.43	0.71	0.46	0.69	0.66	0.73	0.43
Romania	0.81	41	0.81	0.45	0.43	0.79	0.32	0.78	0.77	0.80	0.35
Russian Federation	0.88	51	0.79	0.68	0.73	0.81	0.57	0.77	0.71	0.77	0.58
Slovenia	0.89	54	0.82	0.69	0.77	0.81	0.68	0.68	0.70	0.78	0.69
Sweden	0.87	51	0.76	0.67	0.73	0.80	0.63	0.75	0.70	0.73	0.61
Syrian Arab Republic	0.67	29	0.53	0.35	0.23	0.70	0.32	0.71	0.66	0.74	0.26
Ukraine	0.87	51	0.79	0.61	0.60	0.78	0.59	0.78	0.79	0.81	0.61

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 Earth Science Scale, Eighth Grade, and TIMSS 2011 Science Achievement

Country	Pearson's Correlation with Science Achievement		Variance in Science Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r^2)	
Armenia	0.27	0.07	0.06
Finland	0.34	0.12	0.10
Georgia	0.43	0.18	0.17
Hungary	0.20	0.04	0.04
Indonesia	–0.13	0.02	0.02
Kazakhstan	0.22	0.05	0.04
Lebanon	–	–	–
Lithuania	0.29	0.09	0.08
Macedonia, Rep. of	0.41	0.16	0.15
Morocco	0.26	0.07	0.06
Romania	0.32	0.10	0.09
Russian Federation	0.19	0.04	0.04
Slovenia	0.27	0.07	0.08
Sweden	0.26	0.07	0.06
Syrian Arab Republic	0.22	0.05	0.04
Ukraine	0.27	0.07	0.07
International Median	0.27	0.07	0.06

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