

TIMSS 2011

The TIMSS 2011 Students Confident in Science Scale, Eighth Grade

Creating and Interpreting TIMSS and PIRLS 2011 Context Questionnaire Scales

Exhibit 1: Items in the TIMSS 2011 Students Confident in Science Scale, Eighth Grade

		Agree a lot	Agree a little	Disagree a little	Disagree a lot
BSBS19A	1) I do well in science -----	▲	▲	▲	▲
BSBS19B*	2) Science is more difficult for me than for most of my classmates* -----	▲	▲	▲	▲
BSBS19C*	3) Science is not one of my strengths* -----	▲	▲	▲	▲
BSBS19D	4) I learn things quickly in science -----	▲	▲	▲	▲
BSBS19E*	5) Science makes me confident and nervous* -----	▲	▲	▲	▲
BSBS19F	6) I am good at working on difficult science problems -----	▲	▲	▲	▲
BSBS19G	7) My teacher thinks I can do well in science <programs/classes/lessons> with the materials -----	▲	▲	▲	▲
BSBS19H	8) My teacher tells me I am good at science -----	▲	▲	▲	▲
BSBS19I*	9) Science is harder for me than another subject* -----	▲	▲	▲	▲

* Reverse coded

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

Item	delta	tau_1	tau_2	tau_3
BSBS19A	1.09627	1.13815	0.30626	1.44441
BSBS19B*	0.63620	1.33832	0.23181	1.10651
BSBS19C*	0.29060	1.20860	0.29343	0.91517
BSBS19D	0.89723	1.39683	0.00899	1.38784
BSBS19E*	0.81136	1.05658	0.07397	0.98261
BSBS19F	0.26819	1.42751	0.03386	1.46137
BSBS19G	0.59943	1.22047	0.04850	1.26897
BSBS19H	0.49743	1.12881	0.01620	1.14501
BSBS19I*	0.63757	0.93087	0.11634	0.81453

*Reverse coded

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants

$$A = 9.96314$$

$$B = 1.43299$$

$$\text{Transformed Scale Score} = 9.96314 + 1.43299 \text{ Logit Scale Score}$$

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	3.09503		14	9.17827	
1	4.73717		15	9.39956	
2	5.54017		16	9.62110	
3	6.09537		17	9.84751	
4	6.53296		18	10.08173	
5	6.89986		19	10.32740	
6	7.22358		20	10.58920	
7	7.51546		21	10.87142	
8	7.78509		22	11.18528	
9	8.03830		23	11.54467	11.5
10	8.27929		24	11.97494	
11	8.51130		25	12.52422	
12	8.73696		26	13.32445	
13	8.95858	9.0	27	14.96733	

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item								
			BSBS19A	BSBS19B*	BSBS19C*	BSBS19D	BSBS19E*	BSBS19F	BSBS19G	BSBS19H	BSBS19I*
California, US	0.87	50	0.76	0.69	0.70	0.78	0.63	0.72	0.69	0.68	0.68
Colorado, US	0.90	56	0.78	0.74	0.77	0.80	0.72	0.77	0.73	0.67	0.73
Connecticut, US	0.90	56	0.77	0.73	0.77	0.81	0.68	0.77	0.73	0.72	0.73
Florida, US	0.88	53	0.77	0.73	0.76	0.79	0.71	0.74	0.65	0.65	0.73
Indiana, US	0.89	55	0.79	0.74	0.75	0.82	0.69	0.76	0.73	0.67	0.72
Massachusetts, US	0.90	56	0.79	0.78	0.78	0.82	0.68	0.77	0.71	0.67	0.74
Minnesota, US	0.91	57	0.78	0.76	0.81	0.82	0.69	0.78	0.73	0.67	0.76
North Carolina, US	0.90	57	0.79	0.75	0.79	0.83	0.70	0.77	0.72	0.67	0.76

Exhibit 6: Relationship Between the TIMSS 2011 Students Confident in 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 (r ²)
	(r)	(r ²)	
Australia	0.39	0.15	0.13
Bahrain	0.34	0.11	0.11
Chile	0.25	0.06	0.06
Chinese Taipei	0.39	0.15	0.15
England	0.32	0.10	0.10
Ghana	0.37	0.14	0.13
Hong Kong SAR	0.24	0.06	0.05
Iran, Islamic Rep. of	0.29	0.08	0.08
Israel	0.40	0.16	0.15
Italy	0.28	0.08	0.07
Japan	0.38	0.14	0.12
Jordan	0.38	0.15	0.13
Korea, Rep. of	0.48	0.23	0.25
Malaysia	0.22	0.05	0.05
New Zealand	0.33	0.11	0.09
Norway	0.38	0.15	0.13
Oman	0.43	0.19	0.16
Palestinian National Authority	0.36	0.13	0.11
Qatar	0.41	0.17	0.16
Saudi Arabia	0.38	0.14	0.12
Singapore	0.26	0.07	0.06
Thailand	0.12	0.01	0.02

