TIMSS 2011

The TIMSS 2011 Students Confident in Physics Scale, Eighth Grade

The Students Confident in Physics (SCP) 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 Physics Scale, Eighth Grade

How much do you agree with these statements about physics?

		Agree a lot	Agree a little	Disagree a little	Disagree a lot
BSBP32A	1) I usually do well in physics	○	○	○	○
BSBP32B*	2) Physics is more difficult for me than for many of my classmates*	○	○	○	○
BSBP32C*	3) Physics is not one of my strengths*	○	○	○	○
BSBP32D	4) I learn things quickly in physics	○	○	○	○
BSBP32E*	5) Physics makes me confused and nervous*	○	○	○	○
BSBP32F	6) I am good at working out difficult physics problems	○	○	○	○
BSBP32G	7) My teacher thinks I can do well in physics <programs/classes/lessons> with difficult materials	○	○	○	○
BSBP32H	8) My teacher tells me I am good at physics	○	○	○	○
BSBP32I*	9) Physics is harder for me than any other subject*	○	○	○	○

* Reverse coded

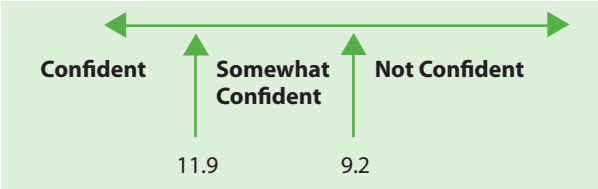

Exhibit 2: Item Parameters for the TIMSS 2011 Students Confident in Physics Scale, Eighth Grade

Item	delta	tau_1	tau_2	tau_3
BSBP32A	–0.72357	–1.11385	–0.20318	1.31703
BSBP32B*	–0.50835	–1.06959	0.05801	1.01158
BSBP32C*	–0.13500	–1.16964	0.11219	1.05745
BSBP32D	–0.49885	–1.27173	0.00103	1.27070
BSBP32E*	–0.67475	–0.73692	–0.05569	0.79261
BSBP32F	–0.06620	–1.28945	0.01165	1.27780
BSBP32G	–0.31340	–1.20330	–0.04026	1.24356
BSBP32H	–0.31225	–1.20797	–0.04833	1.25630
BSBP32I*	–0.32875	–0.79751	0.00317	0.79434

*Reverse coded

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants	
A = 9.94773 B = 1.57461	Transformed Scale Score = 9.94773 + 1.57461 • 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	2.98394		14	9.42249	
1	4.77087		15	9.65232	
2	5.63547		16	9.88649	
3	6.22688		17	10.12777	
4	6.68876		18	10.37935	
5	7.07350		19	10.64506	
6	7.40866		20	10.92825	
7	7.70952		21	11.23740	
8	7.98638		22	11.58183	
9	8.24580		23	11.97731	11.9
10	8.49268		24	12.45109	
11	8.73078		25	13.05528	
12	8.96317		26	13.93488	
13	9.19251	9.2	27	15.73817	

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item								
			BSBP32A	BSBP32B*	BSBP32C*	BSBP32D	BSBP32E*	BSBP32F	BSBP32G	BSBP32H	BSBP32I*
Armenia	0.78	40	0.85	0.28	0.15	0.80	0.21	0.84	0.81	0.87	0.16
Finland	0.92	61	0.87	0.73	0.80	0.85	0.63	0.83	0.83	0.82	0.64
Georgia	0.84	45	0.78	0.54	0.60	0.80	0.46	0.78	0.77	0.77	0.43
Hungary	0.90	55	0.84	0.63	0.76	0.82	0.57	0.81	0.81	0.84	0.56
Indonesia	0.79	38	0.75	0.48	0.49	0.75	0.55	0.65	0.67	0.73	0.39
Kazakhstan	0.87	51	0.78	0.65	0.71	0.80	0.49	0.82	0.79	0.81	0.48
Lebanon	0.79	39	0.76	0.41	0.36	0.79	0.37	0.75	0.73	0.81	0.34
Lithuania	0.88	51	0.83	0.65	0.61	0.82	0.55	0.80	0.79	0.79	0.54
Macedonia, Rep. of	0.78	41	0.83	0.22	0.20	0.85	0.25	0.81	0.81	0.87	0.17
Morocco	0.74	34	0.56	0.41	0.35	0.74	0.35	0.75	0.74	0.78	0.28
Romania	0.80	42	0.84	0.29	0.33	0.82	0.18	0.85	0.83	0.86	0.24
Russian Federation	0.88	53	0.79	0.68	0.73	0.83	0.55	0.81	0.73	0.79	0.56
Slovenia	0.90	56	0.83	0.69	0.76	0.83	0.64	0.72	0.75	0.83	0.68
Sweden	0.86	49	0.79	0.64	0.70	0.79	0.57	0.77	0.73	0.74	0.52
Syrian Arab Republic	0.70	32	0.63	0.23	0.15	0.77	0.25	0.78	0.72	0.79	0.12
Ukraine	0.88	53	0.81	0.62	0.60	0.81	0.59	0.81	0.80	0.82	0.59

*Reverse coded

Exhibit 6: Relationship Between the TIMSS 2011 Students Confident in Physics 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	0.31	0.10	0.09
Finland	0.37	0.14	0.13
Georgia	0.34	0.12	0.11
Hungary	0.35	0.12	0.12
Indonesia	–0.13	0.02	0.02
Kazakhstan	0.19	0.04	0.03
Lebanon	0.30	0.09	0.08
Lithuania	0.20	0.04	0.05
Macedonia, Rep. of	0.28	0.08	0.10
Morocco	0.27	0.07	0.07
Romania	0.19	0.04	0.05
Russian Federation	0.30	0.09	0.09
Slovenia	0.35	0.13	0.14
Sweden	0.36	0.13	0.11
Syrian Arab Republic	0.22	0.05	0.04
Ukraine	0.29	0.08	0.08
International Median	**0.30**	**0.09**	**0.09**