

TIMSS 2011

The TIMSS 2011 Students Value Biology Scale, Eighth Grade

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

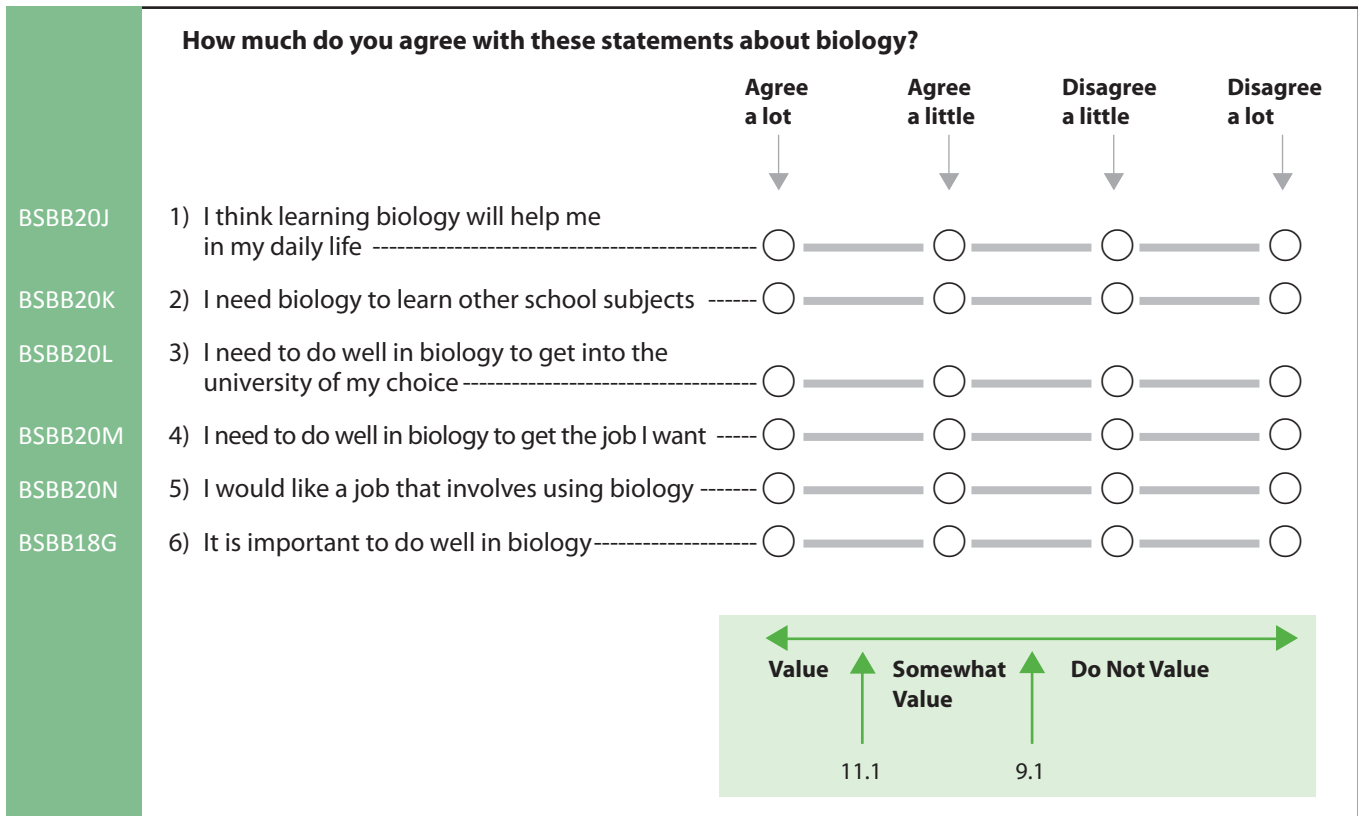


Exhibit 2: Item Parameters for the TIMSS 2011 Students Value Biology Scale, Eighth Grade

Item	delta	tau_1	tau_2	tau_3
BSBB20J	-1.69487	-1.40249	-0.32604	1.72853
BSBB20K	-0.72010	-1.85782	0.02359	1.83423
BSBB20L	-0.70398	-1.36553	0.05102	1.31451
BSBB20M	-0.51443	-1.40508	0.14665	1.25843
BSBB20N	-0.00436	-1.30850	0.15285	1.15565
BSBB18G	-1.80941	-1.52046	-0.29654	1.81700

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants

$$A = 10.04112$$

$$B = 1.13924$$

$$\text{Transformed Scale Score} = 10.04112 + 1.13924 \cdot \text{Logit Scale Score}$$

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	4.18009		10	9.38873	
1	5.54693		11	9.71774	
2	6.25871		12	10.04951	
3	6.78693		13	10.39317	
4	7.23311		14	10.76368	
5	7.63632		15	11.17826	11.1
6	8.01388		16	11.68057	
7	8.37408		17	12.37302	
8	8.72120		18	13.72842	
9	9.05829	9.1			

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item					
			BSBB20J	BSBB20K	BSBB20L	BSBB20M	BSBB20N	BSBB18G
Armenia	0.83	55	0.61	0.70	0.86	0.87	0.83	0.50
Finland	0.88	62	0.78	0.75	0.82	0.85	0.78	0.76
Georgia	0.85	58	0.73	0.73	0.82	0.85	0.77	0.67
Hungary	0.87	61	0.74	0.74	0.83	0.86	0.78	0.72
Indonesia	0.83	54	0.66	0.68	0.83	0.83	0.72	0.67
Kazakhstan	0.86	60	0.74	0.73	0.85	0.86	0.78	0.68
Lebanon	0.85	58	0.73	0.74	0.83	0.83	0.75	0.66
Lithuania	0.87	62	0.76	0.76	0.85	0.85	0.76	0.71
Macedonia, Rep. of	0.86	59	0.62	0.78	0.85	0.86	0.78	0.69

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

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item					
			BSBB20J	BSBB20K	BSBB20L	BSBB20M	BSBB20N	BSBB18G
Morocco	0.81	52	0.64	0.71	0.82	0.82	0.71	0.60
Romania	0.86	58	0.67	0.73	0.84	0.84	0.78	0.69
Russian Federation	0.88	63	0.74	0.73	0.88	0.88	0.81	0.71
Slovenia	0.86	60	0.79	0.73	0.82	0.85	0.75	0.68
Sweden	0.87	60	0.71	0.73	0.86	0.86	0.78	0.70
Syrian Arab Republic	0.79	50	0.62	0.69	0.78	0.79	0.72	0.61
Ukraine	0.86	59	0.76	0.74	0.84	0.84	0.72	0.70

Exhibit 6: Relationship Between the TIMSS 2011 Students Value Biology 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	-0.12	0.01	0.02
Finland	0.18	0.03	0.02
Georgia	-0.12	0.01	0.02
Hungary	-0.05	0.00	0.01
Indonesia	-0.03	0.00	0.00
Kazakhstan	-0.15	0.02	0.03
Lebanon	0.08	0.01	0.00
Lithuania	-0.03	0.00	0.00
Macedonia, Rep. of	-0.23	0.05	0.05
Morocco	-0.04	0.00	0.00
Romania	-0.05	0.00	0.01
Russian Federation	-0.09	0.01	0.01
Slovenia	0.03	0.00	0.00
Sweden	0.11	0.01	0.01
Syrian Arab Republic	0.03	0.00	0.00
Ukraine	-0.09	0.01	0.01
International Median	-0.05	0.01	0.01