

TIMSS 2011

The Home Resources for Learning Scale, Fourth Grade

The Home Resources for Learning (HRL) scale was created based on students' responses to questions concerning availability of home resources (number of books, and number of home study supports) and their parents' responses to questions in the PIRLS Home Questionnaire (number of children's books, level of educational, and occupation), as described below. See [Creating and Interpreting TIMSS and PIRLS 2011 Context Questionnaire Scales](#) for more information on how the scales were formed. Because three of the items used to derive the HRL scale were administered in the PIRLS Home Questionnaire, results reported in Exhibits 2–5 were estimated from the PIRLS 2011 data. Results reported in Exhibit 6 were estimated from the TIMSS 2011 data.

Exhibit 1: Items in the Home Resources for Learning Scale, Fourth Grade

ASBG04	<p>Number of books in the home (students):</p> <ol style="list-style-type: none"> 1) 0-10 2) 11-25 3) 26-100 4) 101-200 5) More than 200 	ASBH15A	<p>Number of children's books in the home (parents):</p> <ol style="list-style-type: none"> 1) 0-10 2) 11-25 3) 26-50 4) 51-100 5) More than 100
ASDG05S	<p>Number of home study supports (students):¹</p> <ol style="list-style-type: none"> 1) None 2) Internet connection or own room 3) Both 	ASDHEDUP	<p>Highest level of education of either parent (parents):¹</p> <ol style="list-style-type: none"> 1) Finished some primary or lower secondary or did not go to school 2) Finished lower secondary 3) Finished upper secondary 4) Finished post-secondary education 5) Finished university or higher
ASDHOCCP	<p>Highest level of occupation of either parent (parents):¹</p> <ol style="list-style-type: none"> 1) Has never worked outside home for pay, general laborer, or semi-professional (skilled agricultural or fishery worker, craft or trade worker, plant or machine operator) 2) Clerical (clerk or service or sales worker) 3) Small business owner 4) Professional (corporate manager or senior official, professional, or technician or associate professional) 		

¹ Derived variable, for more details see [Supplement 3](#) of the *TIMSS 2011 User Guide for the International Database*.

Exhibit 2: Item Parameters for the TIMSS 2011 Home Resources for Learning Scale, Fourth Grade

Item	delta	tau_1	tau_2	tau_3	tau_4
ASBG04	0.15913	-1.32362	-0.57201	0.99439	0.90124
ASDG05S ¹	-1.06090	-0.66319	0.66319		
ASBH15A	0.20308	-0.82069	-0.52303	0.40176	0.94196
ASDHEDUP ¹	-0.60425	-0.84118	-0.78305	0.99919	0.62504
ASDHOCCP ¹	-0.15991	-0.38414	0.90751	-0.52337	

¹ Derived variable, for more details see Supplement 3 of the *TIMSS 2011 User Guide for the International Database*

Exhibit 3: Scale Transformation Constants

Scale Transformation Constants

A = 10.03092

Transformed Scale Score = 10.03092 + 1.82492 • Logit Scale Score

B = 1.82492

Raw Score	Transformed Scale Score	Cutpoint	Raw Score	Transformed Scale Score	Cutpoint
0	3.60566		9	9.94316	
1	5.60409		10	10.29048	
2	6.58747		11	10.64776	
3	7.29889	7.3	12	11.03130	
4	7.87839		13	11.46049	
5	8.37640		14	11.95418	11.9
6	8.82040		15	12.56691	
7	9.22128		16	13.42059	
8	9.59128		17	15.14335	

Exhibit 5: Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2011 Home Resources for Learning Scale, Fourth Grade^b

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			ASBG04	ASDG05S	ASBH15A	ASDHEDUP	ASDHOCCP
Australia	0.62	41	0.68	0.19	0.69	0.73	0.72
Austria	0.71	47	0.73	0.34	0.79	0.74	0.73
Azerbaijan	0.57	37	0.56	0.41	0.54	0.73	0.73
Chinese Taipei	0.73	49	0.75	0.35	0.78	0.79	0.73
Croatia	0.69	46	0.69	0.27	0.73	0.78	0.77
Czech Republic	0.69	45	0.71	0.24	0.74	0.77	0.74
Finland	0.63	41	0.65	0.22	0.68	0.76	0.72
Georgia	0.70	47	0.69	0.49	0.75	0.75	0.71
Germany	0.71	46	0.72	0.29	0.77	0.77	0.74

Exhibit 5: Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2011 Home Resources for Learning Scale, Fourth Grade^b (Continued)

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Factor Loadings for Each Item				
			ASBG04	ASDG05S	ASBH15A	ASDHEDUP	ASDHOCCP
Hong Kong SAR	0.72	48	0.70	0.30	0.76	0.80	0.77
Hungary	0.80	56	0.75	0.43	0.81	0.86	0.81
Iran, Islamic Rep. of	0.76	52	0.73	0.62	0.72	0.81	0.70
Ireland	0.69	46	0.72	0.29	0.74	0.78	0.72
Italy	0.66	43	0.66	0.20	0.73	0.75	0.76
Lithuania	0.74	50	0.68	0.43	0.76	0.81	0.78
Malta	0.61	40	0.55	0.08	0.59	0.84	0.80
Morocco	0.66	43	0.68	0.63	0.62	0.72	0.61
Northern Ireland	0.70	46	0.71	0.24	0.74	0.79	0.75
Norway	0.64	42	0.62	0.15	0.68	0.80	0.77
Oman	0.63	41	0.52	0.52	0.60	0.78	0.74
Poland	0.75	50	0.66	0.45	0.72	0.83	0.79
Portugal	0.77	52	0.71	0.37	0.78	0.83	0.81
Qatar	0.53	36	0.38	0.38	0.63	0.77	0.73
Romania	0.81	57	0.77	0.62	0.79	0.83	0.76
Russian Federation	0.65	42	0.63	0.44	0.69	0.74	0.71
Saudi Arabia	0.60	39	0.61	0.46	0.54	0.76	0.69
Singapore	0.67	44	0.67	0.35	0.70	0.77	0.72
Slovak Republic	0.77	52	0.75	0.46	0.78	0.80	0.76
Slovenia	0.69	45	0.67	0.20	0.74	0.80	0.77
Spain	0.72	48	0.67	0.27	0.75	0.82	0.79
Sweden	0.70	47	0.71	0.44	0.74	0.75	0.72
United Arab Emirates	0.64	41	0.58	0.38	0.73	0.73	0.72
Sixth Grade Participants							
Botswana	0.64	41	0.56	0.53	0.50	0.79	0.77
Honduras	0.65	42	0.60	0.56	0.49	0.78	0.76
Benchmarking Participants							
Quebec, Canada	0.59	39	0.68	0.21	0.66	0.73	0.68
Abu Dhabi, UAE	0.57	38	0.50	0.32	0.68	0.75	0.71
Dubai, UAE	0.67	44	0.63	0.42	0.77	0.71	0.72

^b Available only for countries that administered both TIMSS and PIRLS to the same fourth grade students because some of the items used to derive this scale were administered in the PIRLS Home Questionnaire completed by parents.

Exhibit 6: Relationship Between the Home Resources for Learning Scale, Fourth Grade, and TIMSS 2011 Achievement^{b)}

Country	Pearson's Correlation with Achievement				Variance in Achievement Accounted for by Difference Between Regions of the Scale (η^2)	
	(r)		(r ²)		Mathematics	Science
	Mathematics	Science	Mathematics	Science		
Australia	0.40	0.43	0.16	0.19	0.11	0.13
Austria	0.43	0.46	0.19	0.21	0.09	0.09
Azerbaijan	0.15	0.16	0.02	0.03	0.01	0.01
Chinese Taipei	0.40	0.40	0.16	0.16	0.10	0.10
Croatia	0.37	0.35	0.14	0.12	0.06	0.06
Czech Republic	0.41	0.40	0.17	0.16	0.08	0.08
Finland	0.31	0.33	0.10	0.11	0.06	0.07
Georgia	0.33	0.34	0.11	0.12	0.06	0.07
Germany	0.44	0.47	0.20	0.22	0.13	0.15
Hong Kong SAR	0.21	0.20	0.04	0.04	0.03	0.03
Hungary	0.57	0.57	0.33	0.33	0.24	0.24
Iran, Islamic Rep. of	0.43	0.45	0.19	0.20	0.14	0.15
Ireland	0.43	0.44	0.18	0.19	0.13	0.14
Italy	0.28	0.32	0.08	0.10	0.04	0.06
Lithuania	0.42	0.43	0.17	0.18	0.09	0.10
Malta	0.36	0.43	0.13	0.19	0.07	0.10
Morocco	0.13	0.16	0.02	0.03	0.02	0.02
Northern Ireland	0.42	0.44	0.18	0.19	0.11	0.12
Norway	0.28	0.34	0.08	0.11	0.06	0.09
Oman	0.28	0.28	0.08	0.08	0.04	0.04
Poland	0.46	0.47	0.21	0.22	0.14	0.15
Portugal	0.35	0.34	0.12	0.12	0.08	0.07
Qatar	0.38	0.34	0.14	0.12	0.08	0.06
Romania	0.44	0.50	0.20	0.25	0.15	0.19
Russian Federation	0.32	0.32	0.10	0.10	0.06	0.06
Saudi Arabia	0.19	0.24	0.04	0.06	0.02	0.04
Singapore	0.44	0.49	0.20	0.24	0.12	0.14
Slovak Republic	0.41	0.43	0.17	0.18	0.12	0.13
Slovenia	0.43	0.44	0.18	0.20	0.09	0.10
Spain	0.38	0.37	0.15	0.14	0.09	0.09
Sweden	0.40	0.43	0.16	0.19	0.11	0.13
United Arab Emirates	0.39	0.38	0.16	0.15	0.09	0.08
International Median	0.40	0.40	0.16	0.16	0.09	0.09

Exhibit 6: Relationship Between the Home Resources for Learning Scale, Fourth Grade, and TIMSS 2011 Achievement^b (Continued)

Country	Pearson's Correlation with Achievement				Variance in Achievement Accounted for by Difference Between Regions of the Scale (η^2)	
	(r)		(r ²)		Mathematics	Science
	Mathematics	Science	Mathematics	Science		
Sixth Grade Participants						
Botswana	0.37	0.42	0.14	0.17	0.09	0.12
Honduras	0.31	0.35	0.10	0.12	0.08	0.11
Benchmarking Participants						
Quebec, Canada	0.30	0.36	0.09	0.13	0.06	0.09
Abu Dhabi, UAE	0.36	0.34	0.13	0.11	0.08	0.06
Dubai, UAE	0.49	0.49	0.24	0.24	0.14	0.13

^b Available only for countries that administered both TIMSS and PIRLS to the same fourth grade students because some of the items used to derive this scale were administered in the PIRLS Home Questionnaire completed by parents.