

Annex 1 Psychometric properties of items

1. Method

1.1. Item fit

Item fit is illustrated with a graph on which ICC from a unidimensional 2PL/SGR IRT model including both TIMSS and LLM-generated items (for either math or science domain) can be compared with a nonparametric trace line estimated using GAM, as implemented in the function *itemGAM* from the *mirt* R package (version 1.43), with argument *formula* set to *resp ~ s(Theta, k = 6)* and a single PV estimated from the aforementioned model provided as a latent trait estimate (i.e. *Theta* in the GAM formula).

Reported RMSE is calculated using χ^2 statistic with 10 bins, using the function *itemfit* from the *mirt* R package (version 1.43).

Reported correlations with latent ability estimates are Pearson correlations of the item score with a single PV estimate of the latent ability, estimated from a unidimensional models for a given domain: one including both TIMSS and LLM-generated items (column labelled as *all items*) and another including TIMSS item only.

1.2. Gender DIF

The logistic regression method (Swaminathan and Rogers, 1990) was used to detect both uniform and nonuniform gender DIF. Because of the missing by design property of the data the EAP ability estimates (from unidimensional models estimated separately for math and science, which included both TIMSS and LLM-generated item) were used as the matching criterion. Items with partial credit scoring rules were recoded into binary scores prior to the analysis by merging the middle score to the least frequently occurring of the remaining scores.

Because of the large number of performed tests Holm's correction for multiple comparisons was applied - separately to math items and science items DIF testing results. Jodoin and Gierl's (2001) criteria were used to categorise DIF effect size for the items for which DIF was statistically significant at the 0.05 significance level. Direction of DIF effect was reported on the basis of logistic regression coefficients. Analysis was performed using *difR* R package (Magis et al., 2010).

1.3. Distractors functioning

To illustrate distractor functioning differences in their frequency - taking into account only those students who did not choose the correct answer - between test-takers of different ability is shown:

1. In groups distinguished on the basis of a single PV estimate of the latent ability, estimated from unidimensional models for a given domain including both TIMSS and LLM-generated items. Groups are divided according to the values of 1st and 3rd quartile of the theoretical ability distribution across all test-takers (i.e. the ability cutoffs are the same across different items) - students whose estimates are below the 1st quartile constitute the low ability group, those whose estimates are above the 3rd quartile constitute the high ability group, and those in between are the middle ability group.
2. Using a nonparametric regression: with probability of selecting a given distractor estimated independently for each distractor using GAM, as implemented in the function *geom_smooth* from the *ggplot2* R package, internally using the *gam* function from the *mgcv* R package provided with the $y \sim s(x, bs = "cr")$ model formula (i.e. using cubic splines). Please note that the probabilities of selecting a distractor estimated in this way are not warranted to sum up to 1 for a given value of the latent ability (although they usually sum up to a value close to 1).

1.4. Answering time

On the graphs distributions of answering time are illustrated using kernel density estimates, computed with the default setting of the function *geom_density()* of the *ggplot2* R package. Ability groups are distinguished in the same way as in the distractor functioning analysis.

2. Math items

2.1. M890021 (LLM)

2.1.1. Item fit:

Graph 2.1.1.1

Item M890021 ICC and nonparametric trace line

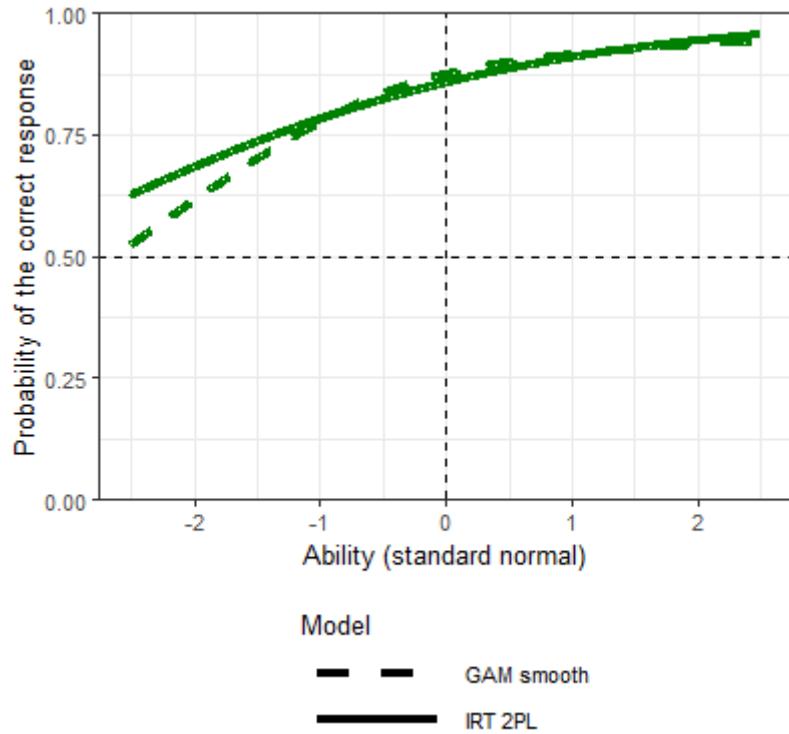


Table 2.1.1.1

Item M890021 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic					
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	84.6%	319	MC	0.22	0.13	0.51	-3.51	0.008	0.379	

2.1.2. Gender DIF:

Table 2.1.2.1

Item M890021 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.16	0.560	1.000		0.005

2.1.3. Frequency of answers:

Table 2.1.3.1

Item M890021 answer frequency

Answer	Frequency	Percent
75 (correct)	270	84.6%
80	19	6.0%
85	20	6.3%
90	10	3.1%
Overall	319	100.0%

2.1.4. Distractors functioning:

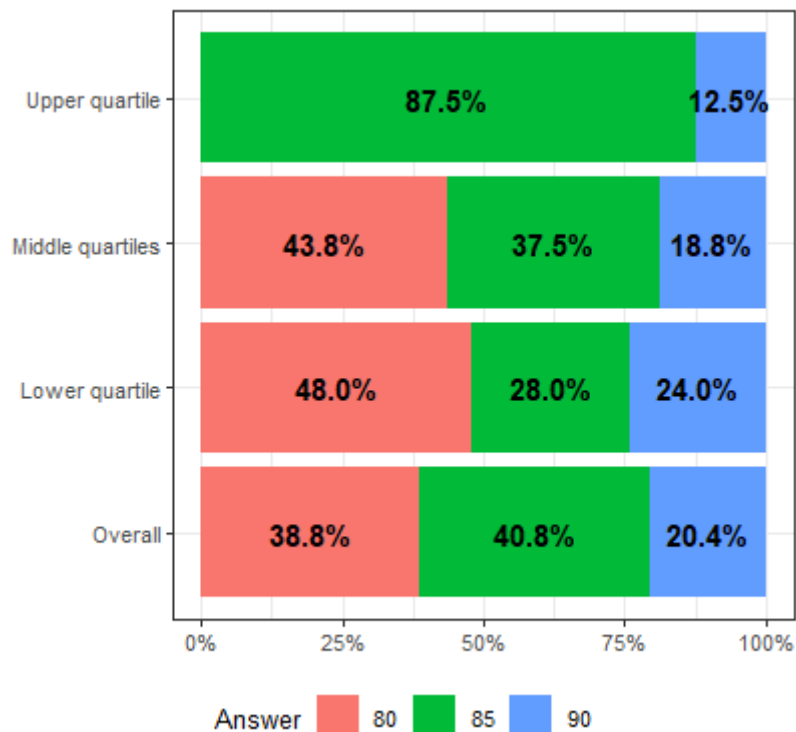
Table 2.1.4.1

Item M890021 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
80	12	7	0	19	48.0%	43.8%	0.0%	38.8%
85	7	6	7	20	28.0%	37.5%	87.5%	40.8%
90	6	3	1	10	24.0%	18.8%	12.5%	20.4%
Overall	25	16	8	49	100.0%	100.0%	100.0%	100.0%

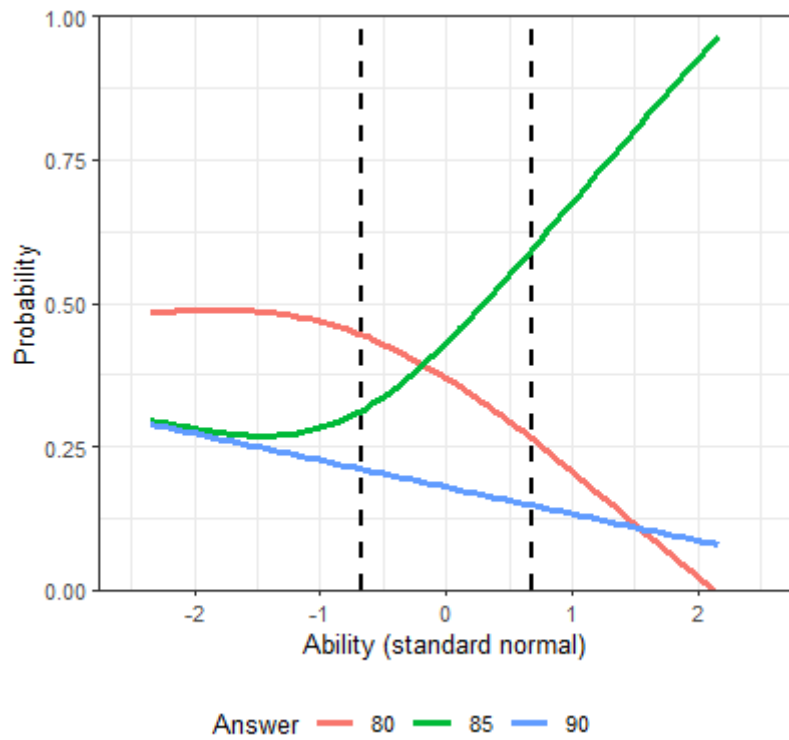
Graph 2.1.4.1

Item M890021 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.1.4.2

Item M890021 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.1.5. Answering time:

Graph 2.1.5.1

Item M890021 answering time distribution in groups of different ability level

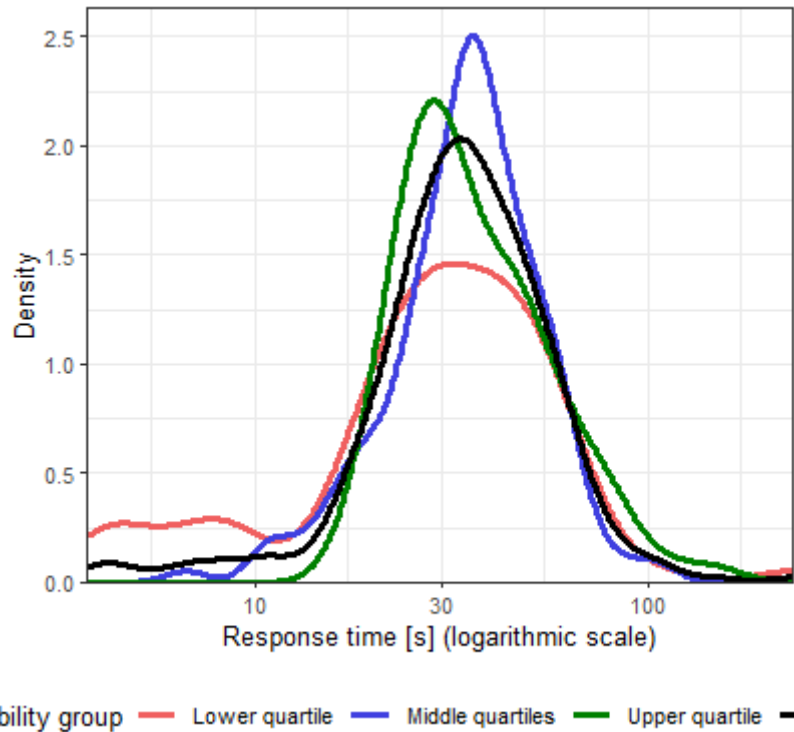


Table 2.1.5.1

Item M890021 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.76	20.86	29.87	45.17	234.02	3.31	0.78
Middle quartiles	6.70	27.38	35.48	44.72	108.49	3.53	0.45
Upper quartile	17.39	26.04	32.78	46.88	150.27	3.60	0.44
Overall	3.76	25.52	34.42	46.06	234.02	3.49	0.56

2.2. M041135 (TIMSS)

2.2.1. Item fit:

Graph 2.2.1.1

Item M041135 ICC and nonparametric trace line

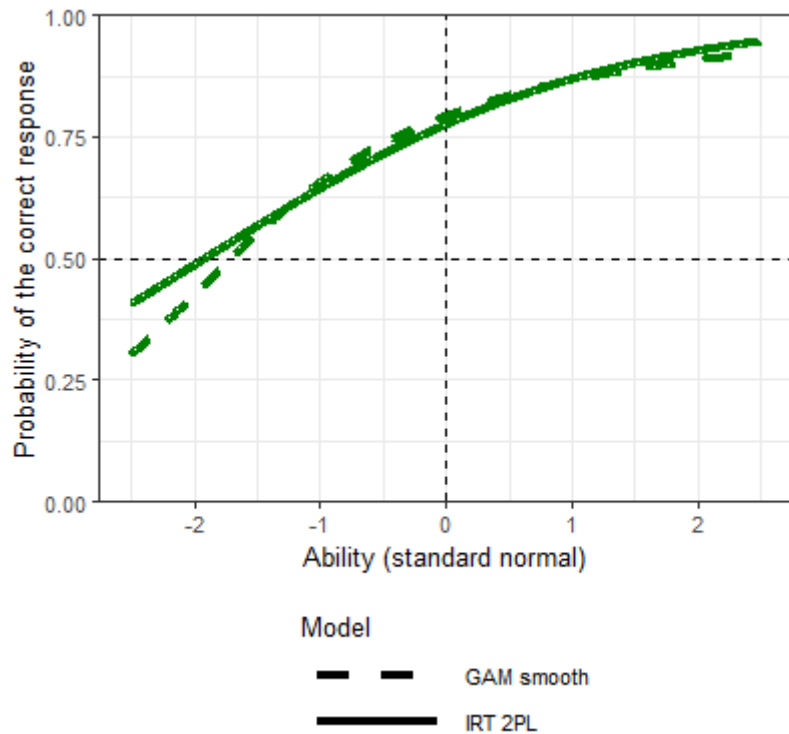


Table 2.2.1.1

Item M041135 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	76.2%	299	MC	0.27	0.28	0.65	-1.92	0.026	0.073

2.2.2. Gender DIF:

Table 2.2.2.1

Item M041135 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
12.53	0.002	0.181	0.043	

2.2.3. Frequency of answers:

Table 2.2.3.1

Item M041135 answer frequency

Answer	Frequency	Percent
Rysunek A (correct)	227	76.2%
Rysunek B	16	5.4%
Rysunek C	41	13.8%
Rysunek D	14	4.7%
Overall	298	100.0%

2.2.4. Distractors functioning:

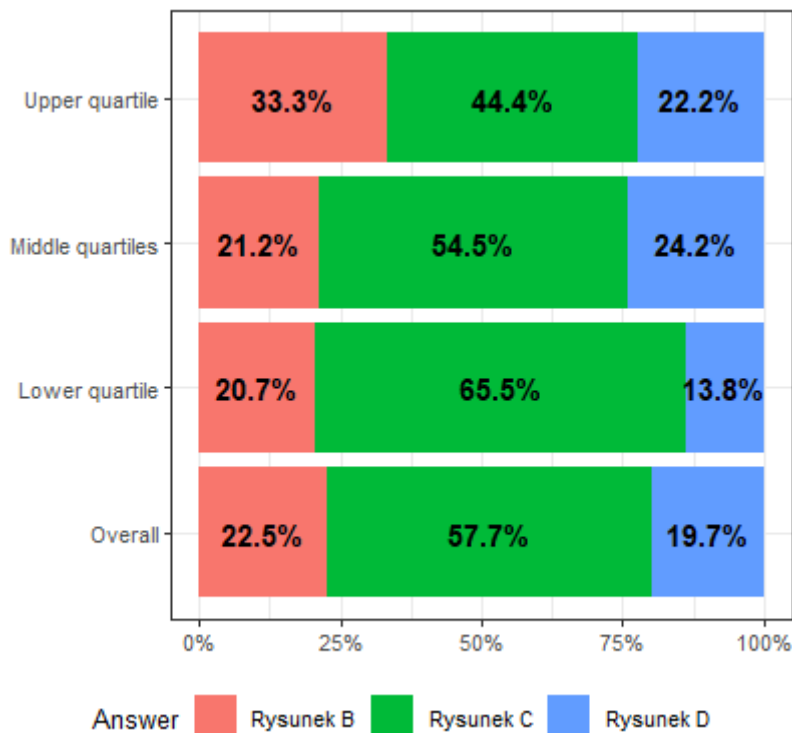
Table 2.2.4.1

Item M041135 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Rysunek B	6	7	3	16	20.7%	21.2%	33.3%	22.5%
Rysunek C	19	18	4	41	65.5%	54.5%	44.4%	57.7%
Rysunek D	4	8	2	14	13.8%	24.2%	22.2%	19.7%
Overall	29	33	9	71	100.0%	100.0%	100.0%	100.0%

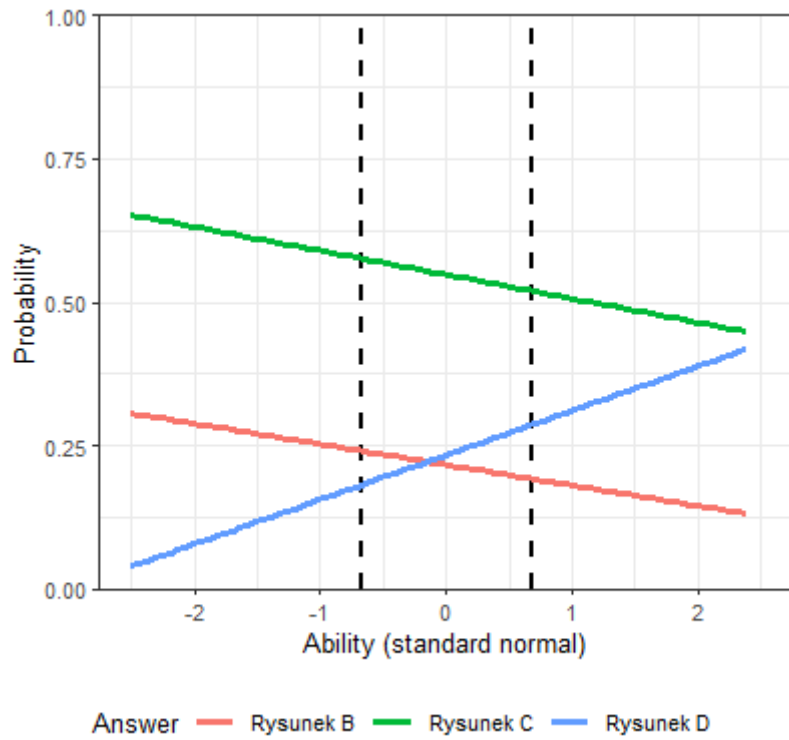
Graph 2.2.4.1

Item M041135 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.2.4.2

Item M041135 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.2.5. Answering time:

Graph 2.2.5.1

Item M041135 answering time distribution in groups of different ability level

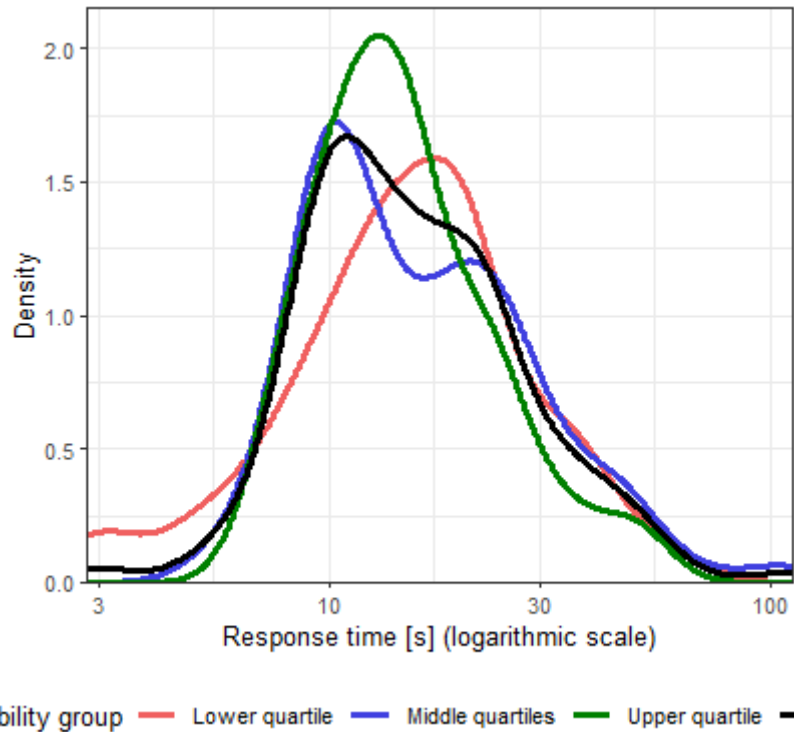


Table 2.2.5.1

Item M041135 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.84	10.41	15.34	21.24	58.41	2.70	0.64
Middle quartiles	5.38	10.02	15.02	23.92	112.34	2.78	0.59
Upper quartile	7.06	10.81	13.87	20.59	52.54	2.69	0.46
Overall	2.84	10.16	14.81	22.07	112.34	2.74	0.57

2.3. M041268 (TIMSS)

2.3.1. Item fit:

Graph 2.3.1.1

Item M041268 ICC and nonparametric trace line

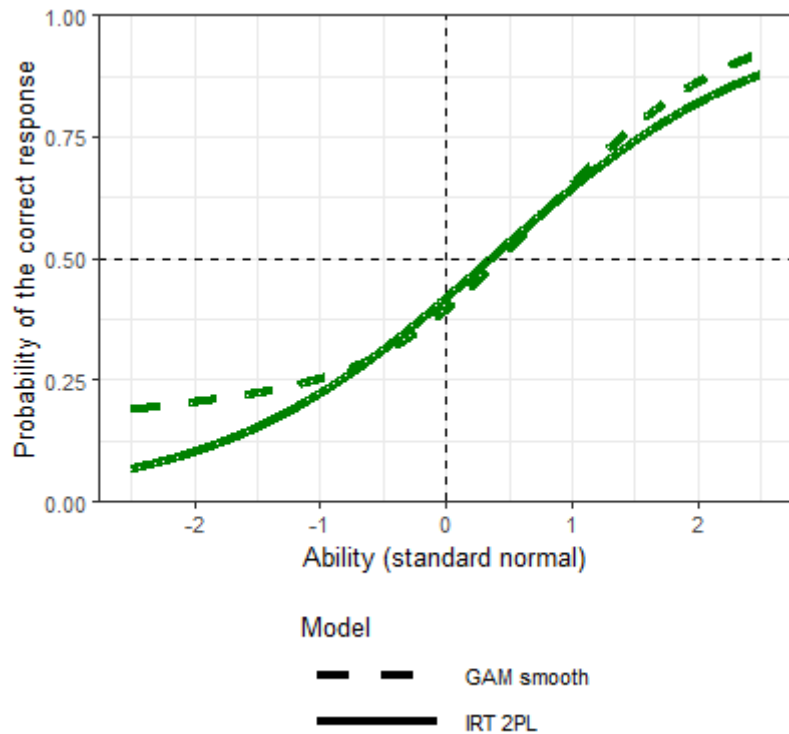


Table 2.3.1.1

Item M041268 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	44.0%	299	MC	0.36	0.41	0.92	0.36	0.035	0.010

2.3.2. Gender DIF:

Table 2.3.2.1

Item M041268 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.27	0.321	1.000		0.006

2.3.3. Frequency of answers:

Table 2.3.3.1

Item M041268 answer frequency

Answer	Frequency	Percent
12 cm	57	19.1%
18 cm	52	17.4%
6 cm	58	19.5%
9 cm (correct)	131	44.0%
Overall	298	100.0%

2.3.4. Distractors functioning:

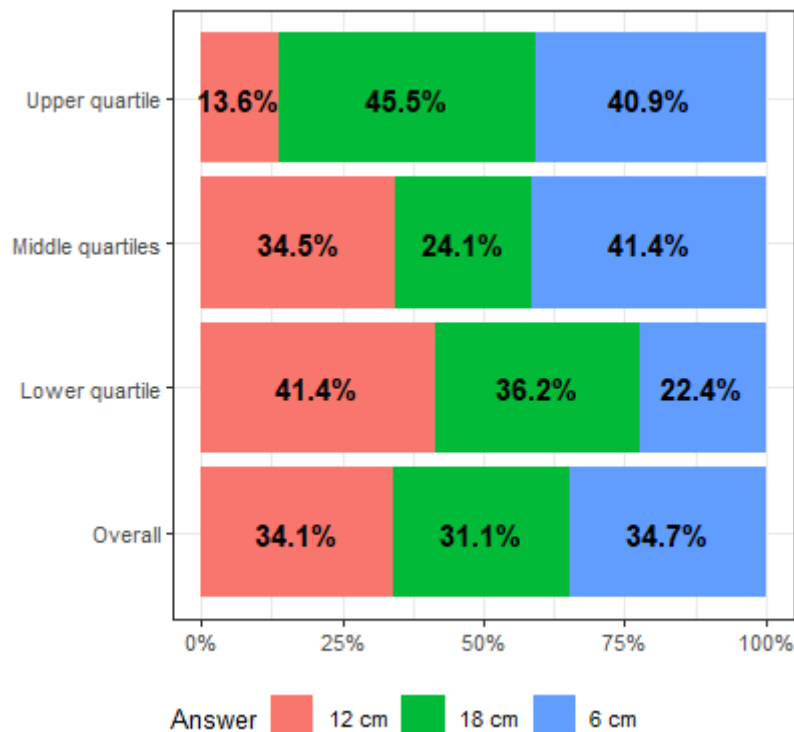
Table 2.3.4.1

Item M041268 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
12 cm	24	30	3	57	41.4%	34.5%	13.6%	34.1%
18 cm	21	21	10	52	36.2%	24.1%	45.5%	31.1%
6 cm	13	36	9	58	22.4%	41.4%	40.9%	34.7%
Overall	58	87	22	167	100.0%	100.0%	100.0%	100.0%

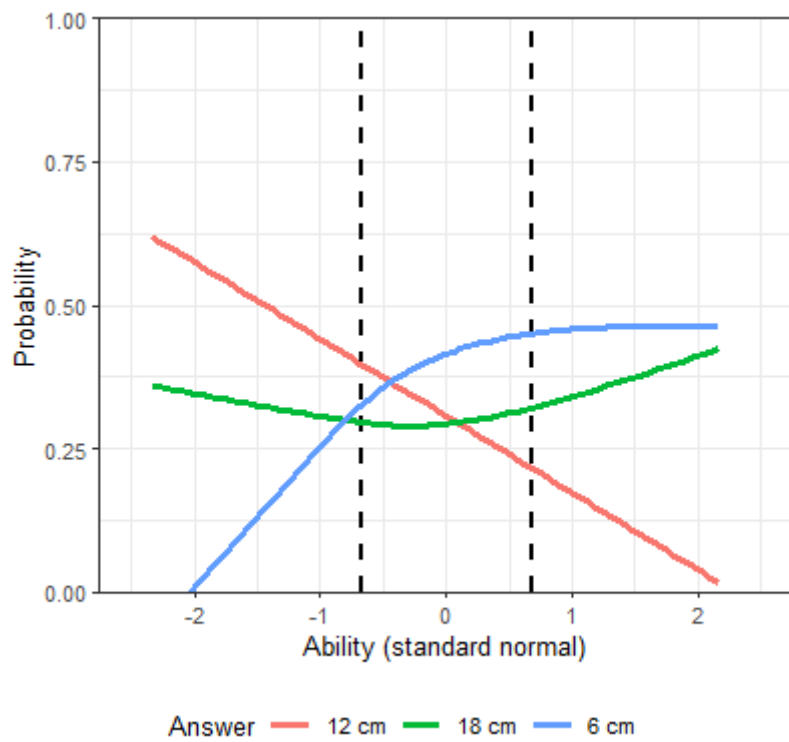
Graph 2.3.4.1

Item M041268 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.3.4.2

Item M041268 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.3.5. Answering time:

Graph 2.3.5.1

Item M041268 answering time distribution in groups of different ability level

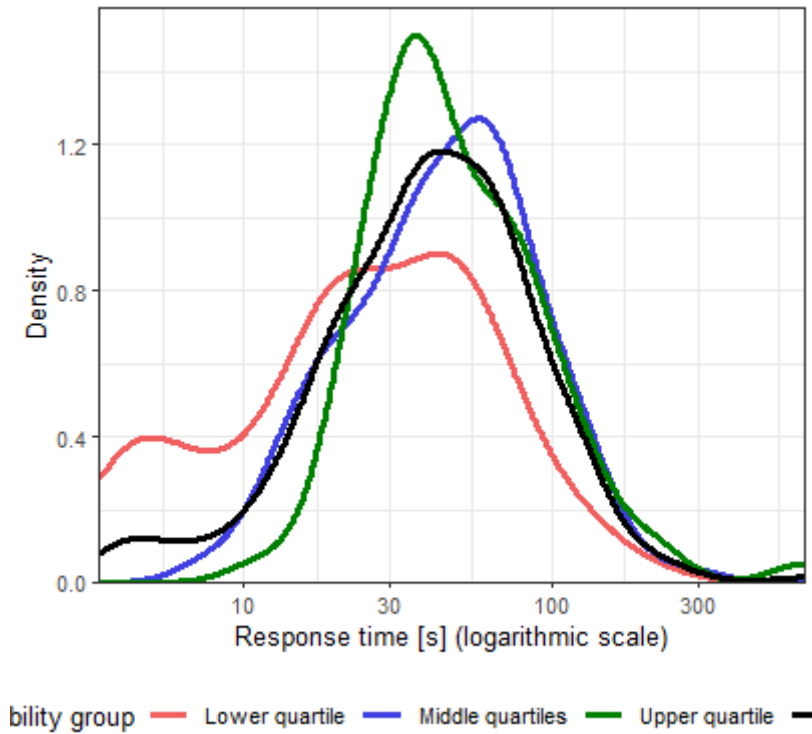


Table 2.3.5.1

Item M041268 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.41	14.55	25.82	48.23	196.89	3.18	0.98
Middle quartiles	7.45	27.26	46.98	70.01	293.62	3.79	0.70
Upper quartile	11.21	32.12	42.35	74.47	663.77	3.90	0.67
Overall	3.41	23.81	41.41	66.68	663.77	3.66	0.82

2.4. M090000 (LLM)

2.4.1. Item fit:

Graph 2.4.1.1

Item M090000 ICC and nonparametric trace line

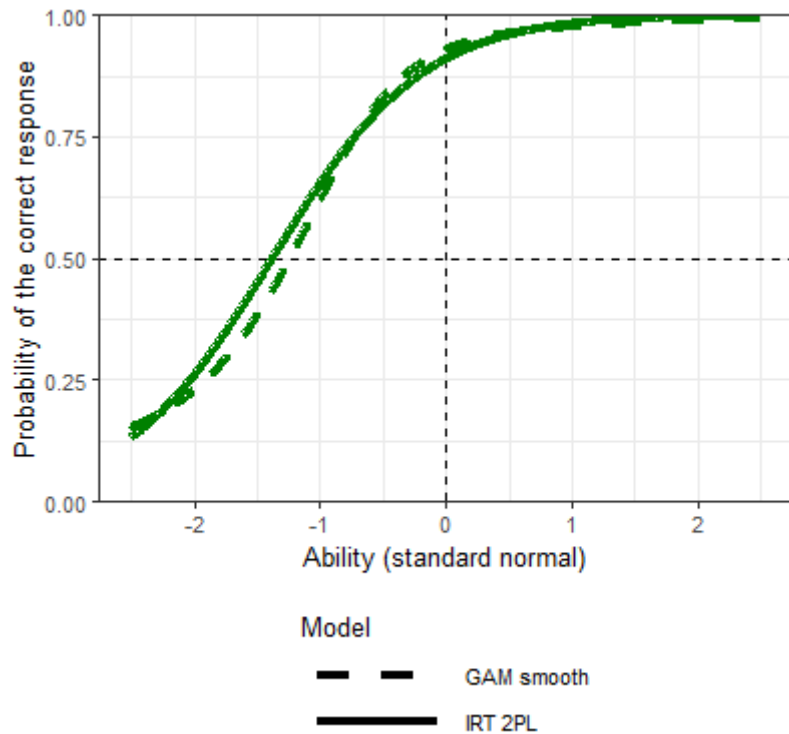


Table 2.4.1.1

Item M090000 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	83.9%	304	MC	0.47	0.36	1.68	-1.38	0.000	0.439

2.4.2. Gender DIF:

Table 2.4.2.1

Item M090000 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
7.30	0.026	1.000	0.028	

2.4.3. Frequency of answers:

Table 2.4.3.1

Item M090000 answer frequency

Answer	Frequency	Percent
7	12	3.9%
12 (correct)	255	83.9%
16	27	8.9%
24	10	3.3%
Overall	304	100.0%

2.4.4. Distractors functioning:

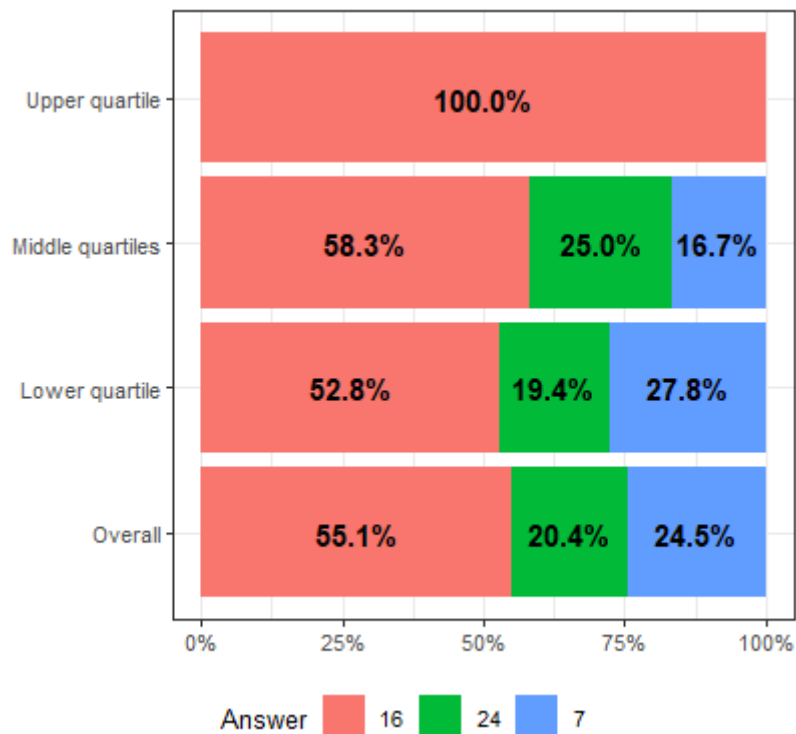
Table 2.4.4.1

Item M090000 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
16	19	7	1	27	52.8%	58.3%	100.0%	55.1%
24	7	3	0	10	19.4%	25.0%	0.0%	20.4%
7	10	2	0	12	27.8%	16.7%	0.0%	24.5%
Overall	36	12	1	49	100.0%	100.0%	100.0%	100.0%

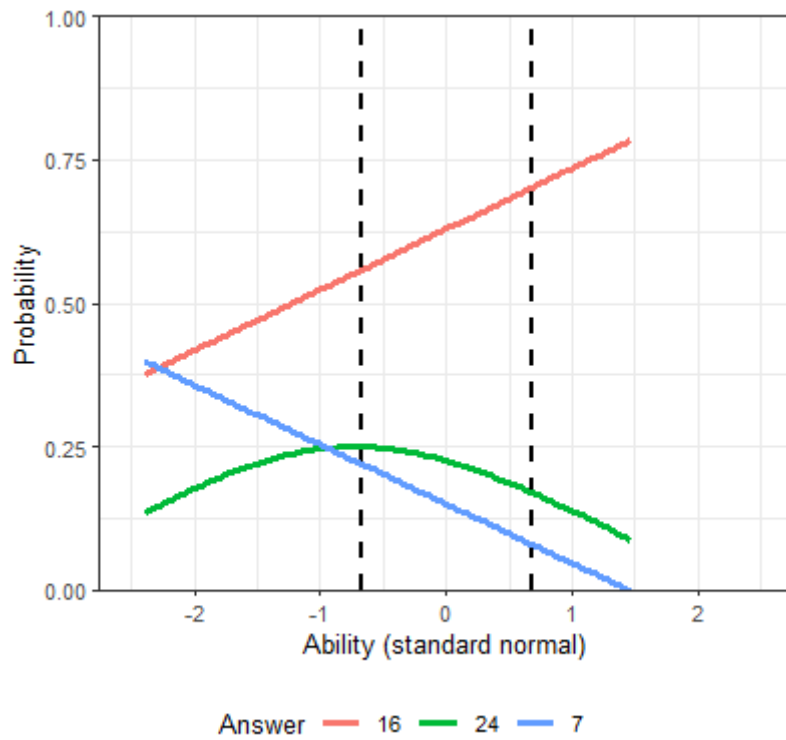
Graph 2.4.4.1

Item M090000 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.4.4.2

Item M090000 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.4.5. Answering time:

Graph 2.4.5.1

Item M090000 answering time distribution in groups of different ability level

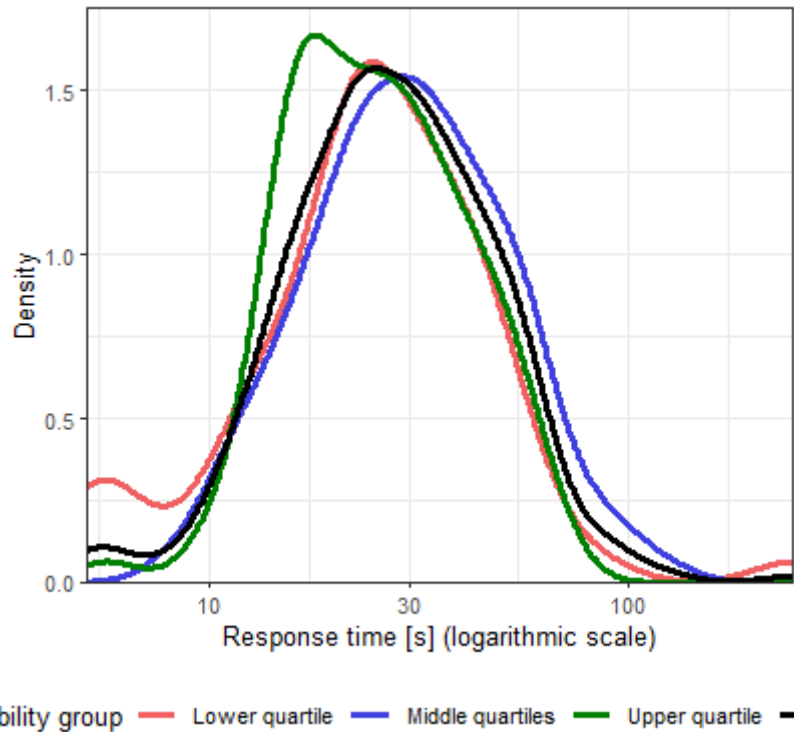


Table 2.4.5.1

Item M090000 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.13	17.38	24.52	36.47	246.94	3.17	0.68
Middle quartiles	8.07	20.91	29.75	44.15	124.03	3.39	0.55
Upper quartile	5.69	16.78	24.24	35.55	65.97	3.21	0.48
Overall	5.13	18.87	27.43	39.42	246.94	3.29	0.57

2.5. M890030 (LLM)

2.5.1. Item fit:

Graph 2.5.1.1

Item M890030 ICC and nonparametric trace line

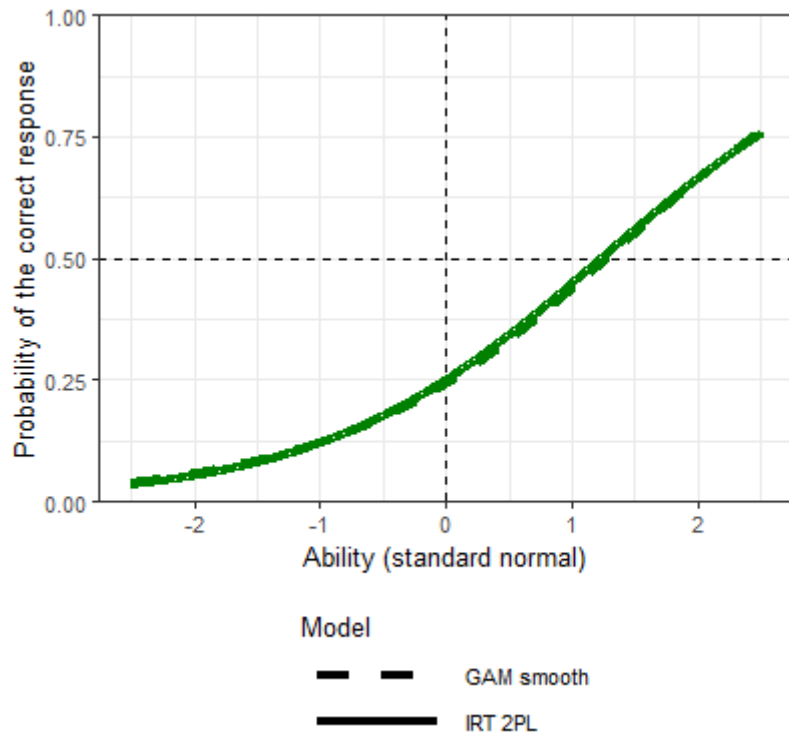


Table 2.5.1.1

Item M890030 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	28.5%	319	MC	0.37	0.24	0.89	1.23	0.016	0.240

2.5.2. Gender DIF:

Table 2.5.2.1

Item M890030 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.56	0.459	1.000		0.005

2.5.3. Frequency of answers:

Table 2.5.3.1

Item M890030 answer frequency

Answer	Frequency	Percent
13	123	38.6%
20	53	16.6%
30	52	16.3%
40 (correct)	91	28.5%
Overall	319	100.0%

2.5.4. Distractors functioning:

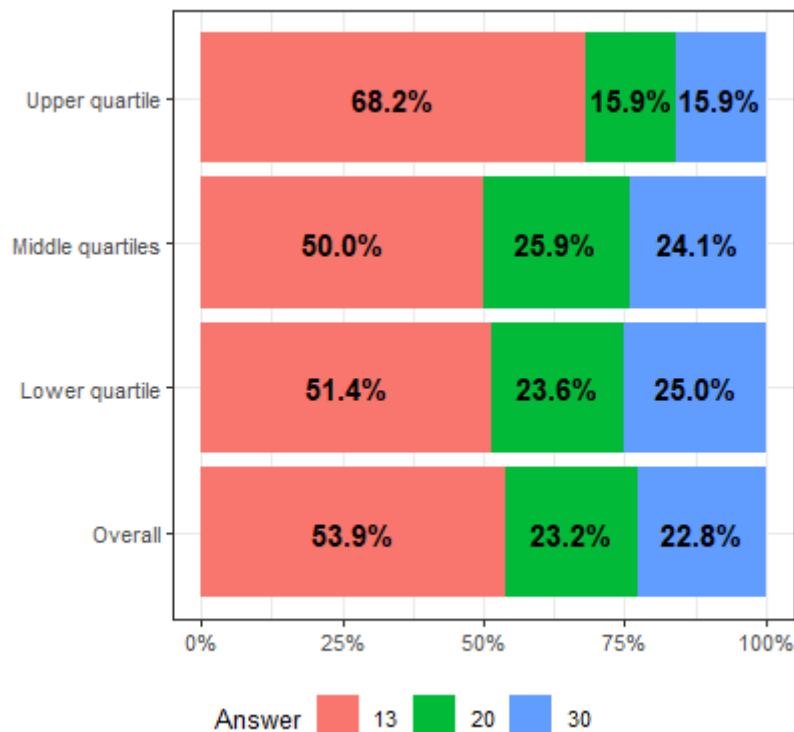
Table 2.5.4.1

Item M890030 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
13	37	56	30	123	51.4%	50.0%	68.2%	53.9%
20	17	29	7	53	23.6%	25.9%	15.9%	23.2%
30	18	27	7	52	25.0%	24.1%	15.9%	22.8%
Overall	72	112	44	228	100.0%	100.0%	100.0%	100.0%

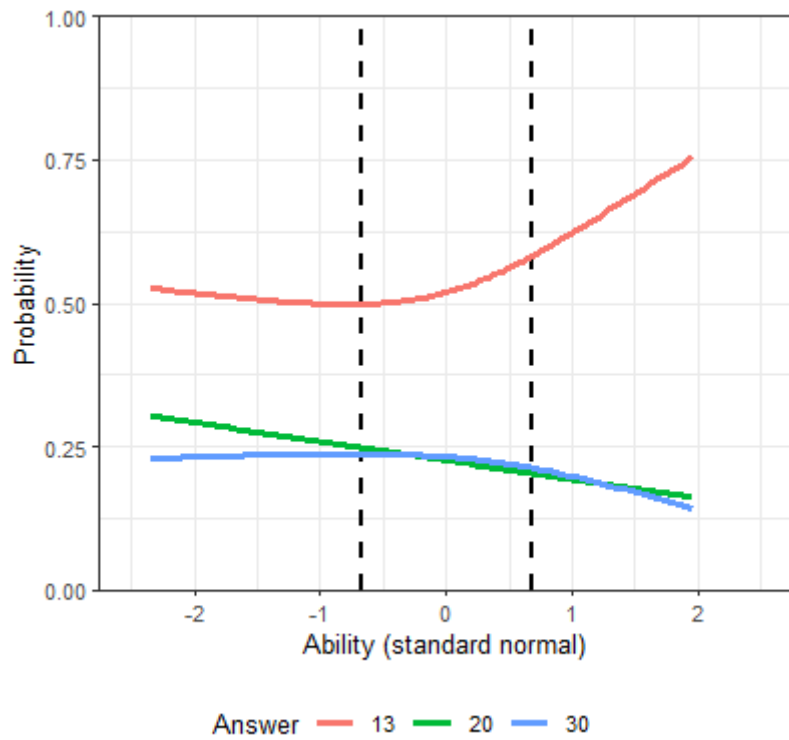
Graph 2.5.4.1

Item M890030 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.5.4.2

Item M890030 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.5.5. Answering time:

Graph 2.5.5.1

Item M890030 answering time distribution in groups of different ability level

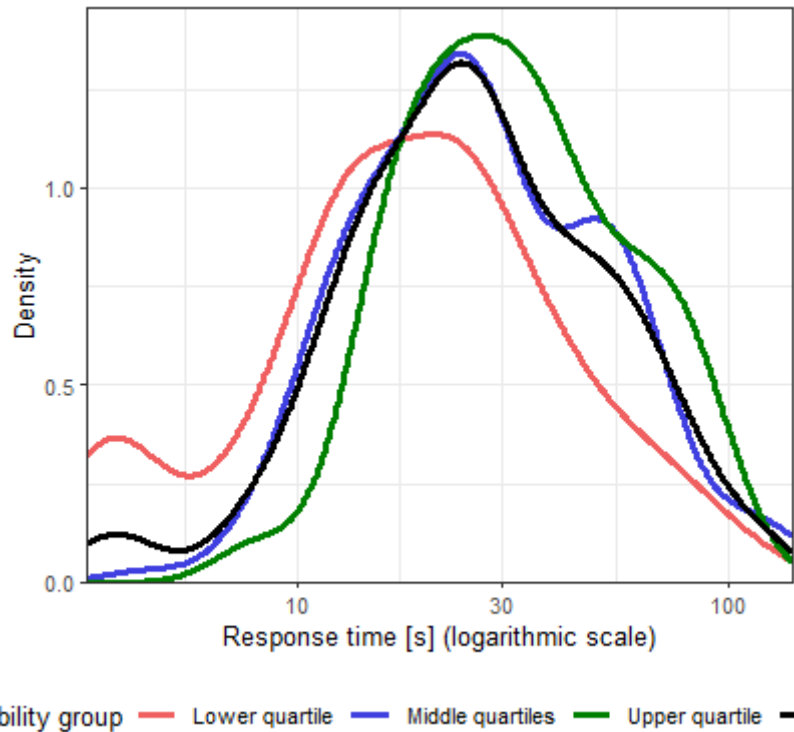


Table 2.5.5.1

Item M890030 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.26	11.76	19.36	29.88	117.99	2.90	0.83
Middle quartiles	4.42	15.98	25.77	45.67	141.09	3.30	0.66
Upper quartile	7.84	21.38	30.73	51.49	108.72	3.46	0.59
Overall	3.26	16.07	24.92	42.56	141.09	3.24	0.72

2.6. MP71041 (TIMSS)

2.6.1. Item fit:

Graph 2.6.1.1

Item MP71041 ICC and nonparametric trace line

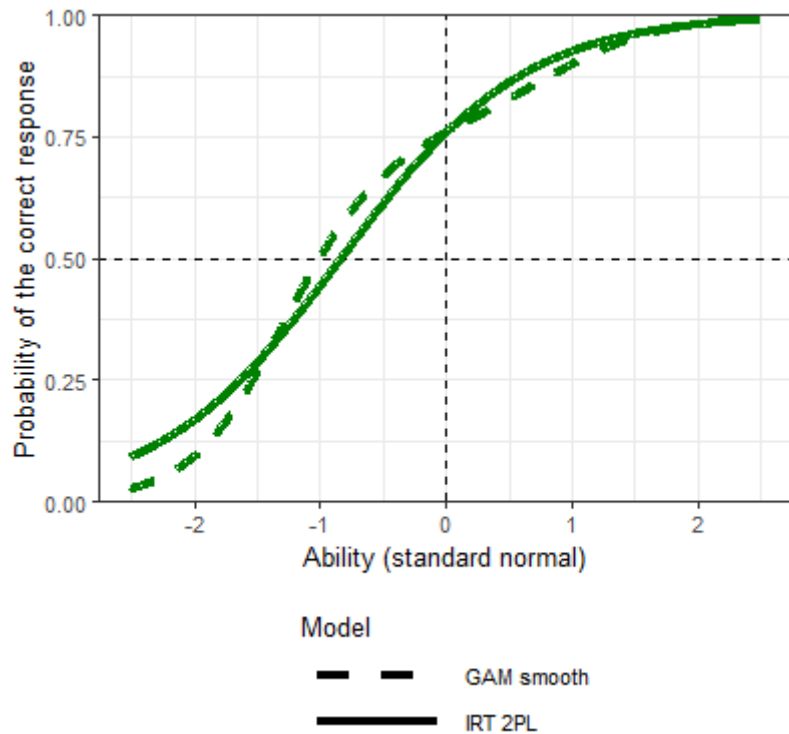


Table 2.6.1.1

Item MP71041 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	71.1%	294	MC	0.48	0.51	1.37	-0.84	0.000	0.574

2.6.2. Gender DIF:

Table 2.6.2.1

Item MP71041 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.45	0.797	1.000		0.001

2.6.3. Frequency of answers:

Table 2.6.3.1

Item MP71041 answer frequency

Answer	Frequency	Percent
48 + 4	16	5.4%
48 - 4	36	12.2%
48 × 4	33	11.2%
48 ÷ 4 (correct)	209	71.1%
Overall	294	100.0%

2.6.4. Distractors functioning:

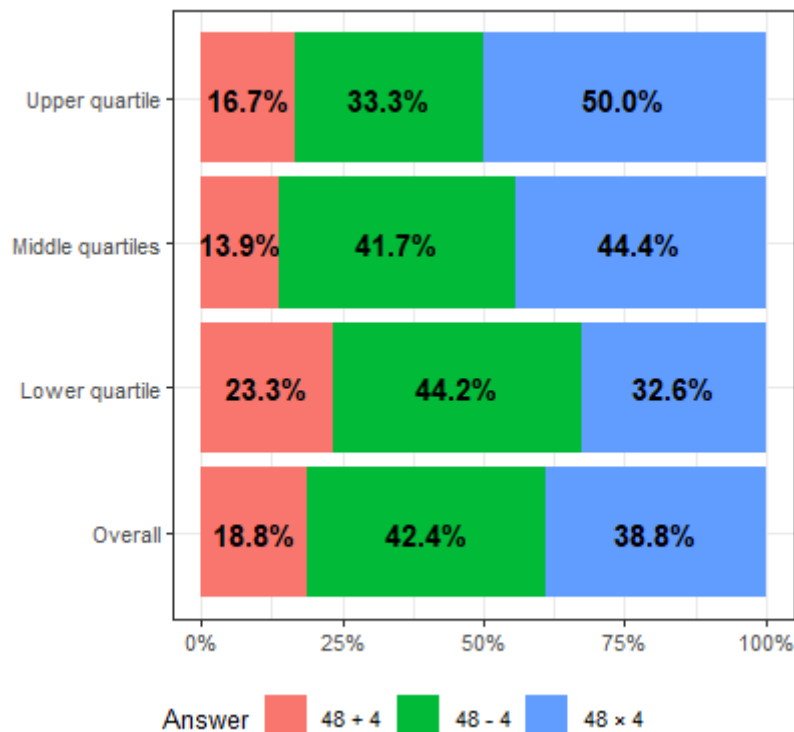
Table 2.6.4.1

Item MP71041 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
48 + 4	10	5	1	16	23.3%	13.9%	16.7%	18.8%
48 - 4	19	15	2	36	44.2%	41.7%	33.3%	42.4%
48 × 4	14	16	3	33	32.6%	44.4%	50.0%	38.8%
Overall	43	36	6	85	100.0%	100.0%	100.0%	100.0%

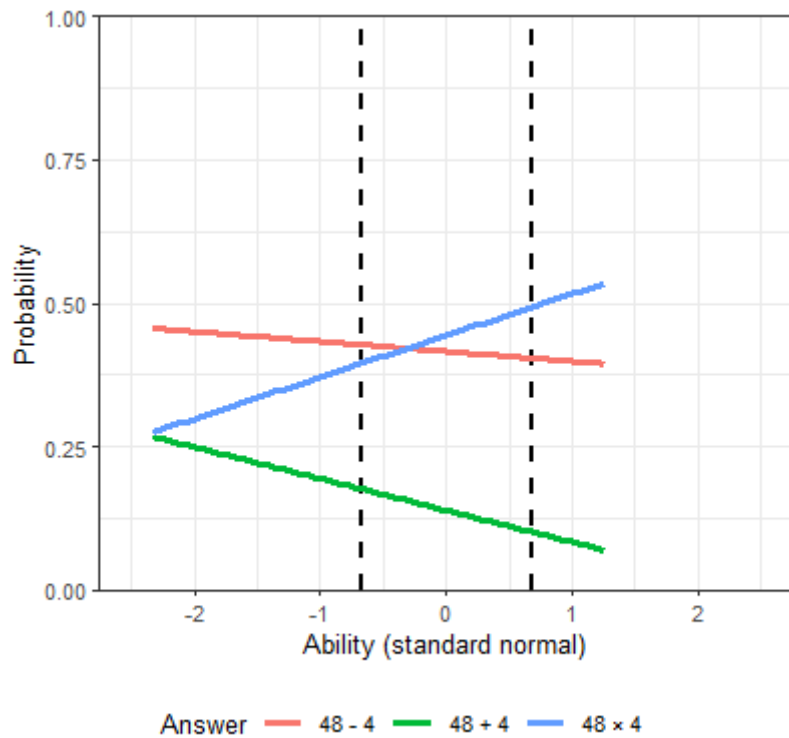
Graph 2.6.4.1

Item MP71041 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.6.4.2

Item MP71041 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.6.5. Answering time:

Graph 2.6.5.1

Item MP71041 answering time distribution in groups of different ability level

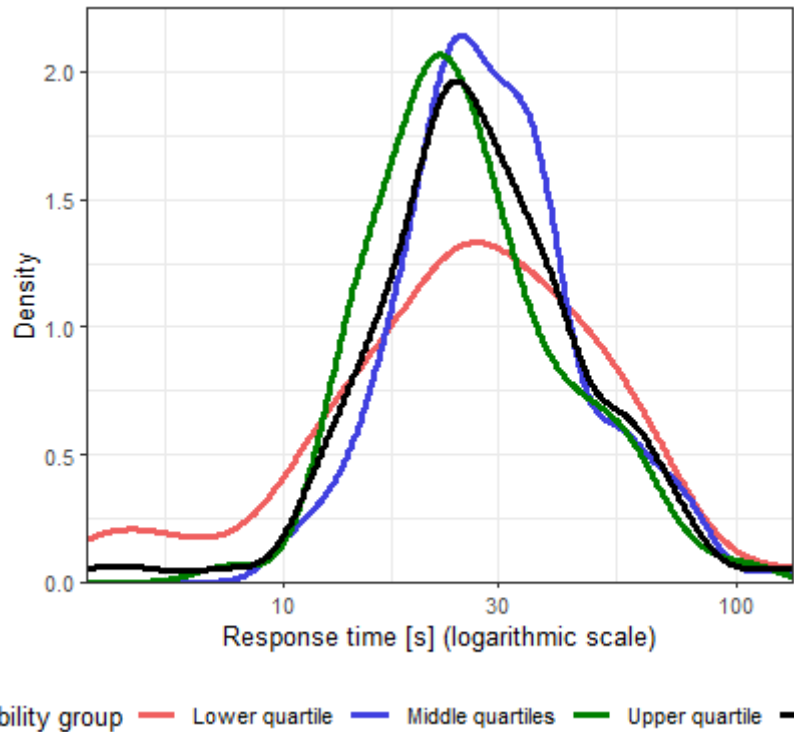


Table 2.6.5.1

Item MP71041 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.71	17.04	26.26	42.28	133.47	3.21	0.72
Middle quartiles	10.18	21.88	28.17	36.89	128.03	3.37	0.46
Upper quartile	7.62	18.32	23.73	33.08	106.57	3.24	0.48
Overall	3.71	19.94	25.97	37.17	133.47	3.29	0.54

2.7. M041191 (TIMSS)

2.7.1. Item fit:

Graph 2.7.1.1

Item M041191 ICC and nonparametric trace line

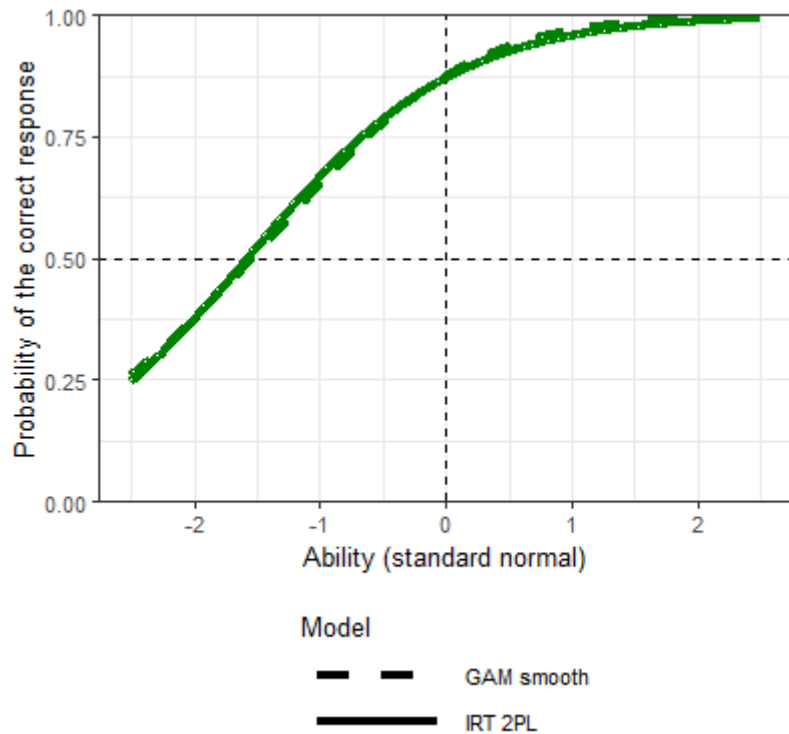


Table 2.7.1.1

Item M041191 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	82.7%	294	MC	0.42	0.39	1.21	-1.58	0.020	0.153

2.7.2. Gender DIF:

Table 2.7.2.1

Item M041191 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.57	0.754	1.000		0.002

2.7.3. Frequency of answers:

Table 2.7.3.1

Item M041191 answer frequency

Answer	Frequency	Percent
Między 10 a 11.	14	4.8%
Między 11 a 12.	24	8.2%
Między 12 a 13.	13	4.4%
Między 13 a 14. (correct)	243	82.7%
Overall	294	100.0%

2.7.4. Distractors functioning:

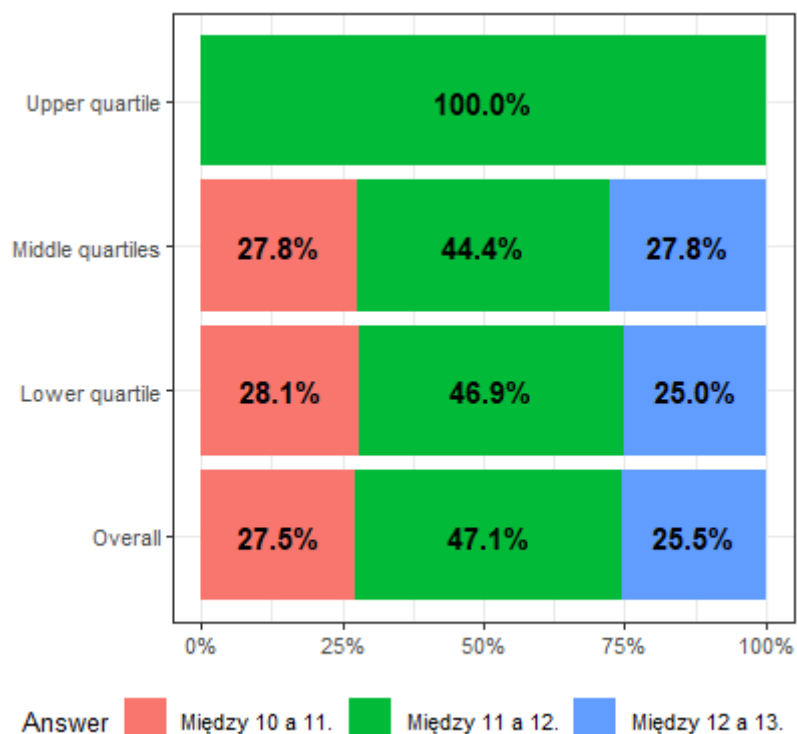
Table 2.7.4.1

Item M041191 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Między 10 a 11.	9	5	0	14	28.1%	27.8%	0.0%	27.5%
Między 11 a 12.	15	8	1	24	46.9%	44.4%	100.0%	47.1%
Między 12 a 13.	8	5	0	13	25.0%	27.8%	0.0%	25.5%
Overall	32	18	1	51	100.0%	100.0%	100.0%	100.0%

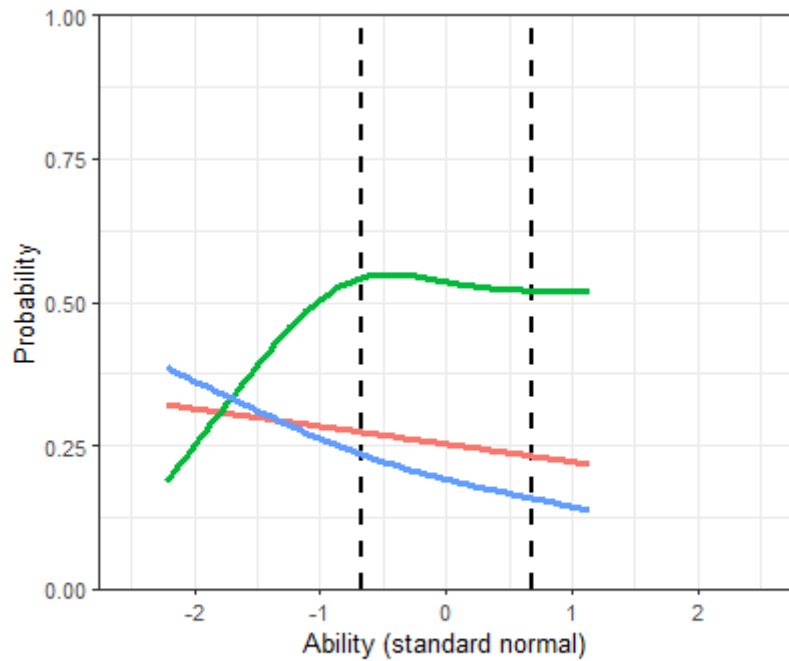
Graph 2.7.4.1

Item M041191 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.7.4.2

Item M041191 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



Answer — Między 10 a 11. — Między 11 a 12. — Między 12 a 13.

2.7.5. Answering time:

Graph 2.7.5.1

Item M041191 answering time distribution in groups of different ability level

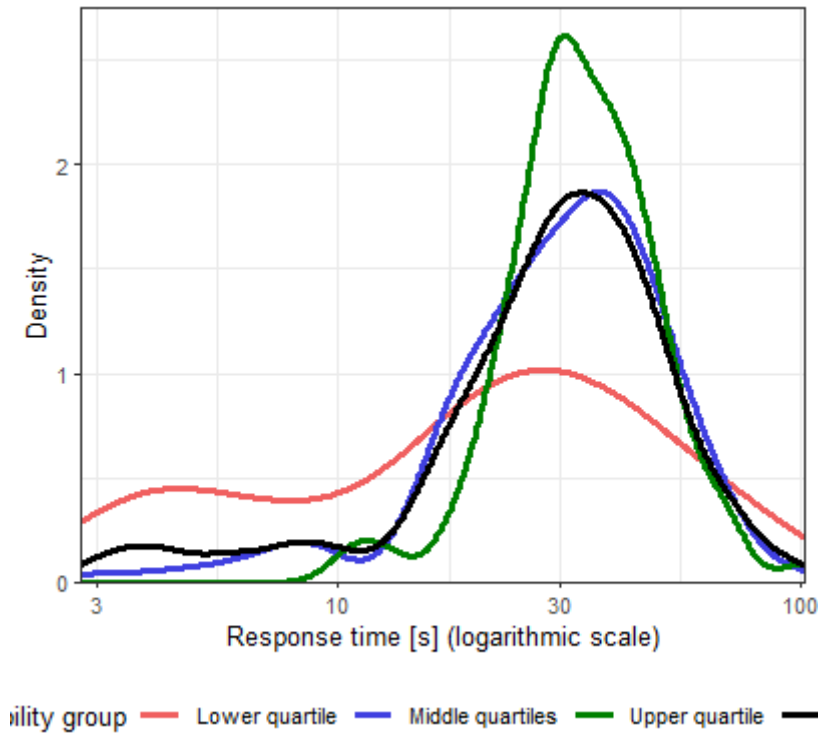


Table 2.7.5.1

Item M041191 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.79	9.23	22.37	36.91	89.71	2.94	0.95
Middle quartiles	3.12	22.59	31.54	42.58	97.40	3.38	0.57
Upper quartile	10.45	27.77	32.86	42.74	101.45	3.51	0.38
Overall	2.79	21.79	30.42	42.22	101.45	3.31	0.67

2.8. M061106 (TIMSS)

2.8.1. Item fit:

Graph 2.8.1.1

Item M061106 ICC and nonparametric trace line

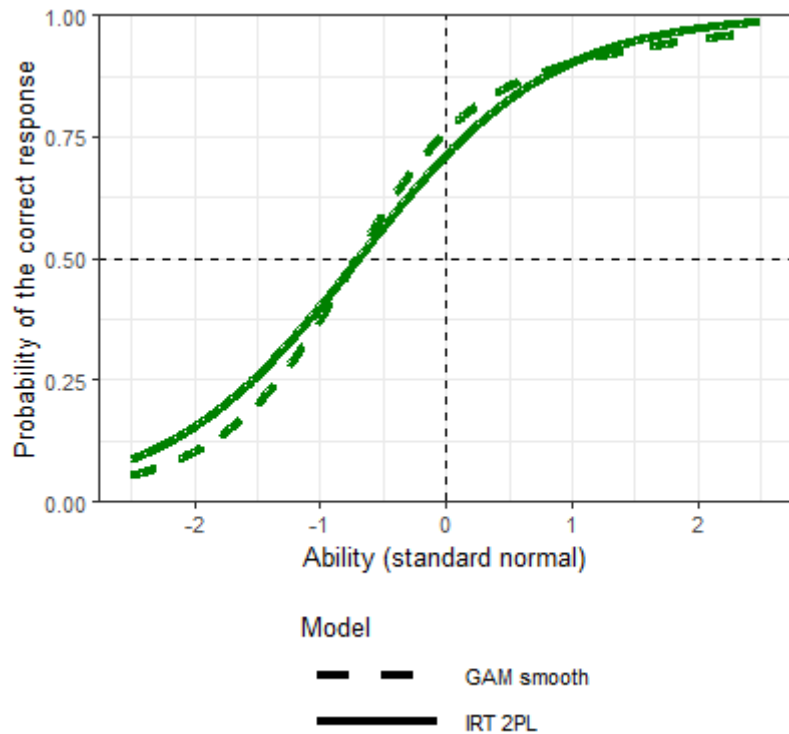


Table 2.8.1.1

Item M061106 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	67.4%	299	MC	0.49	0.46	1.31	-0.69	0.018	0.186

2.8.2. Gender DIF:

Table 2.8.2.1

Item M061106 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
6.21	0.045	1.000		0.018

2.8.3. Frequency of answers:

Table 2.8.3.1

Item M061106 answer frequency

Answer	Frequency	Percent
Rysunek A (correct)	201	67.4%
Rysunek B	37	12.4%
Rysunek C	37	12.4%
Rysunek D	23	7.7%
Overall	298	100.0%

2.8.4. Distractors functioning:

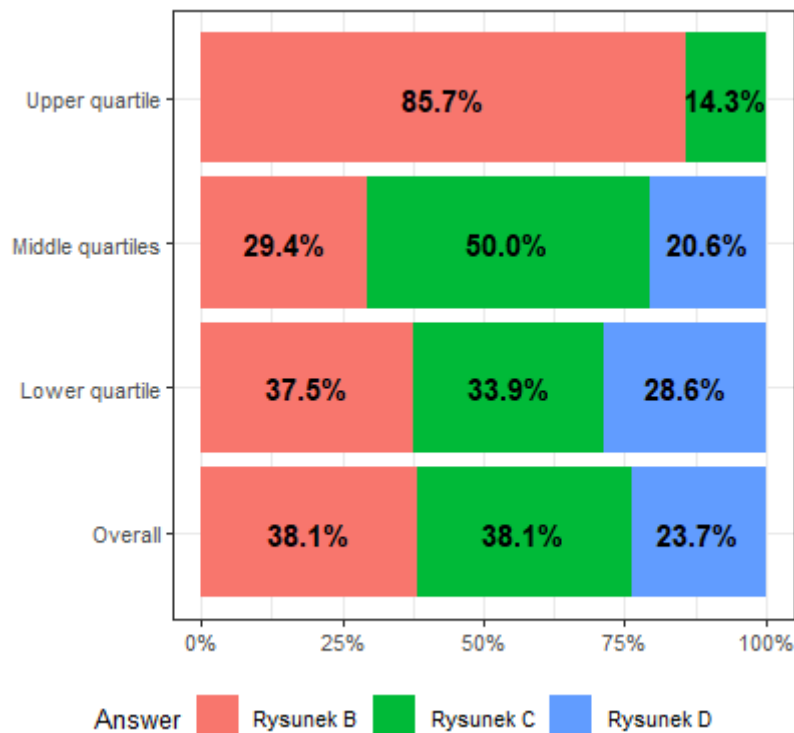
Table 2.8.4.1

Item M061106 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Rysunek B	21	10	6	37	37.5%	29.4%	85.7%	38.1%
Rysunek C	19	17	1	37	33.9%	50.0%	14.3%	38.1%
Rysunek D	16	7	0	23	28.6%	20.6%	0.0%	23.7%
Overall	56	34	7	97	100.0%	100.0%	100.0%	100.0%

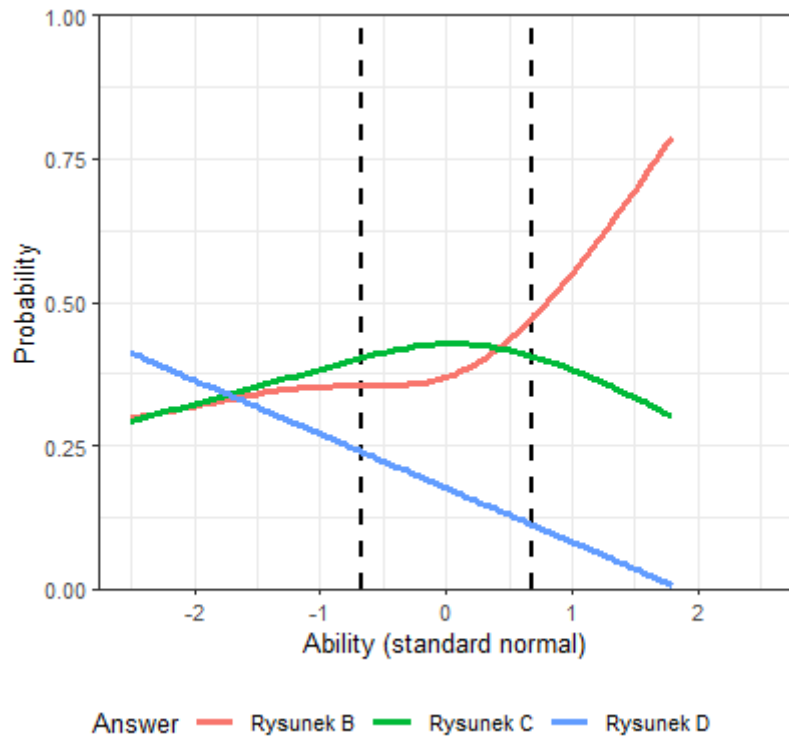
Graph 2.8.4.1

Item M061106 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.8.4.2

Item M061106 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.8.5. Answering time:

Graph 2.8.5.1

Item M061106 answering time distribution in groups of different ability level

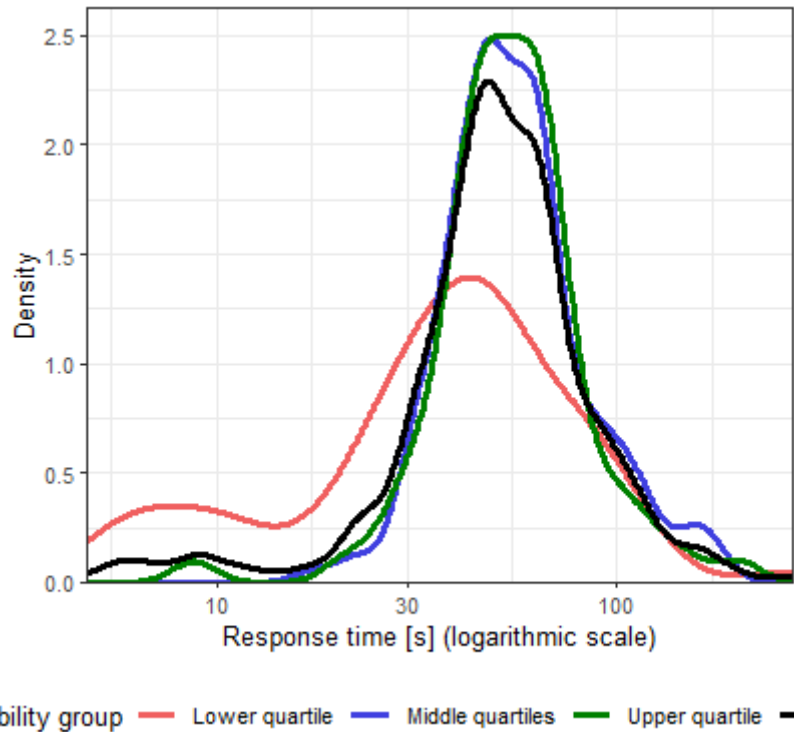


Table 2.8.5.1

Item M061106 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.77	24.43	41.26	58.97	275.37	3.55	0.82
Middle quartiles	17.68	42.58	52.98	67.00	181.49	4.02	0.41
Upper quartile	8.82	43.42	54.20	67.78	203.06	3.99	0.44
Overall	4.77	39.28	50.29	66.14	275.37	3.90	0.58

2.9. M041280 (TIMSS)

2.9.1. Item fit:

Graph 2.9.1.1

Item M041280 ICC and nonparametric trace line

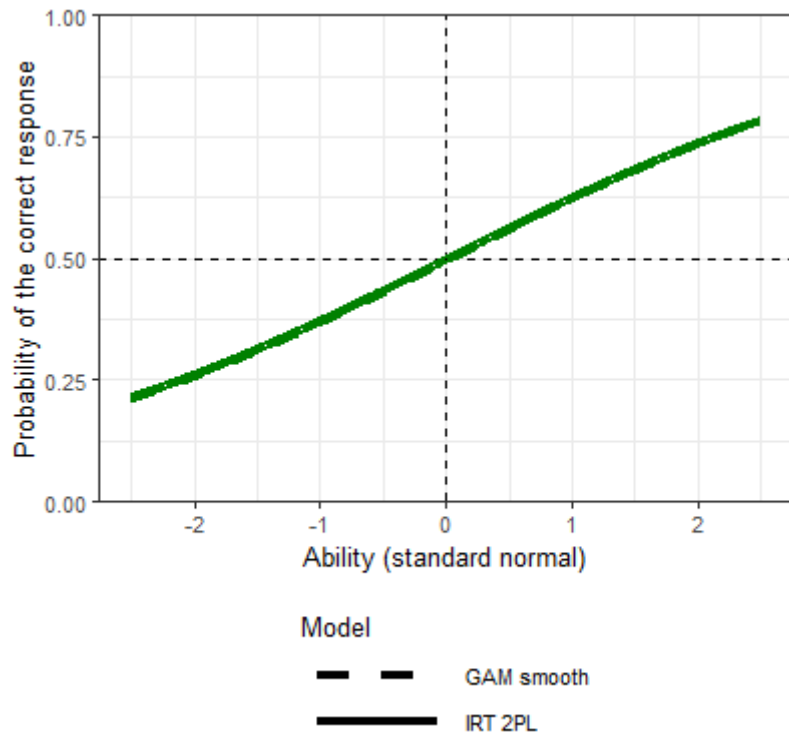


Table 2.9.1.1

Item M041280 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	49.3%	304	MC	0.25	0.23	0.52	0.02	0.000	0.768

2.9.2. Gender DIF:

Table 2.9.2.1

Item M041280 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.03	0.596	1.000	0.003	

2.9.3. Frequency of answers:

Table 2.9.3.1

Item M041280 answer frequency

Answer	Frequency	Percent
4	12	3.9%
16	38	12.5%
40 (correct)	150	49.3%
400	104	34.2%
Overall	304	100.0%

2.9.4. Distractors functioning:

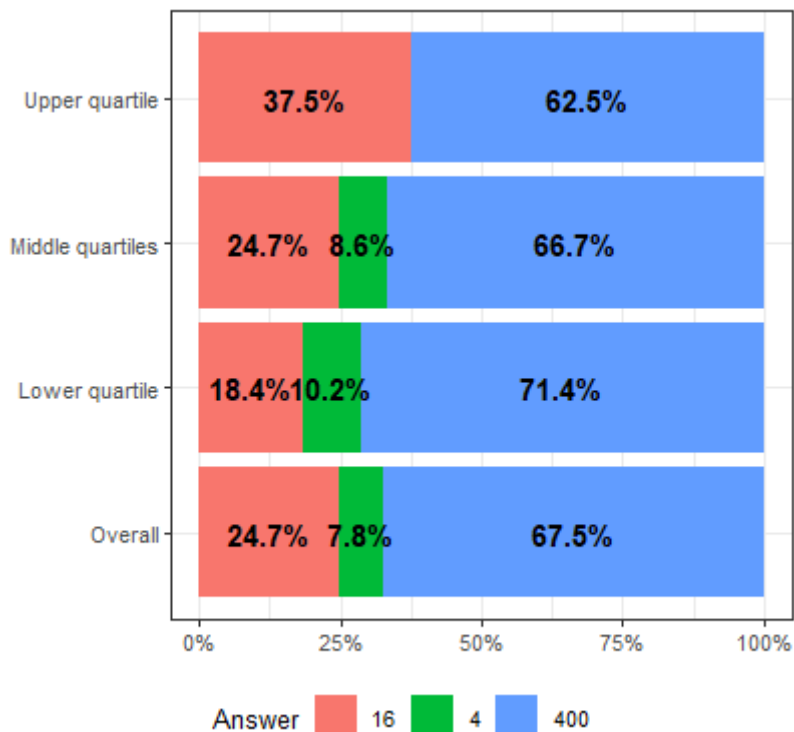
Table 2.9.4.1

Item M041280 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
16	9	20	9	38	18.4%	24.7%	37.5%	24.7%
4	5	7	0	12	10.2%	8.6%	0.0%	7.8%
400	35	54	15	104	71.4%	66.7%	62.5%	67.5%
Overall	49	81	24	154	100.0%	100.0%	100.0%	100.0%

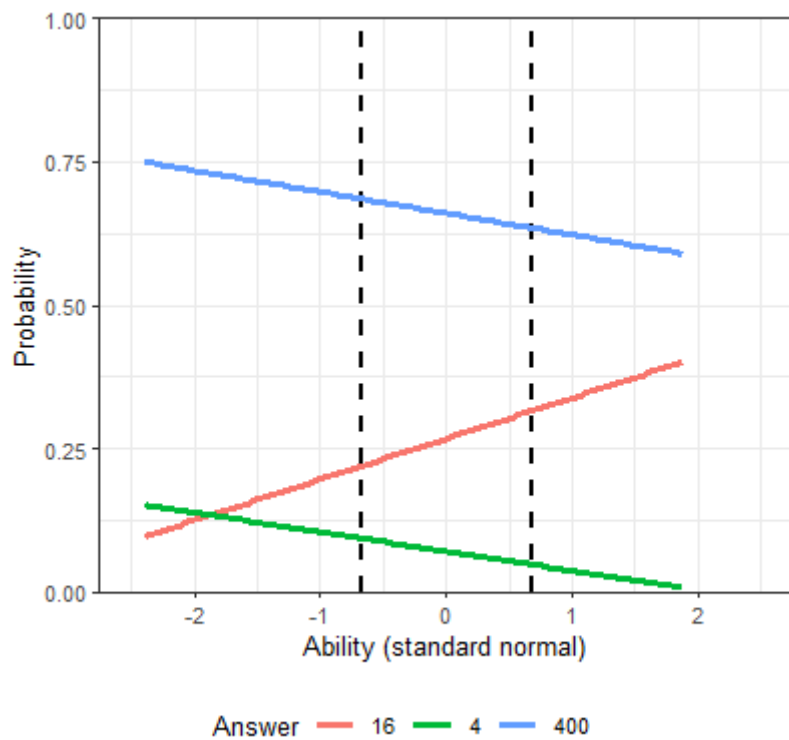
Graph 2.9.4.1

Item M041280 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.9.4.2

Item M041280 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.9.5. Answering time:

Graph 2.9.5.1

Item M041280 answering time distribution in groups of different ability level

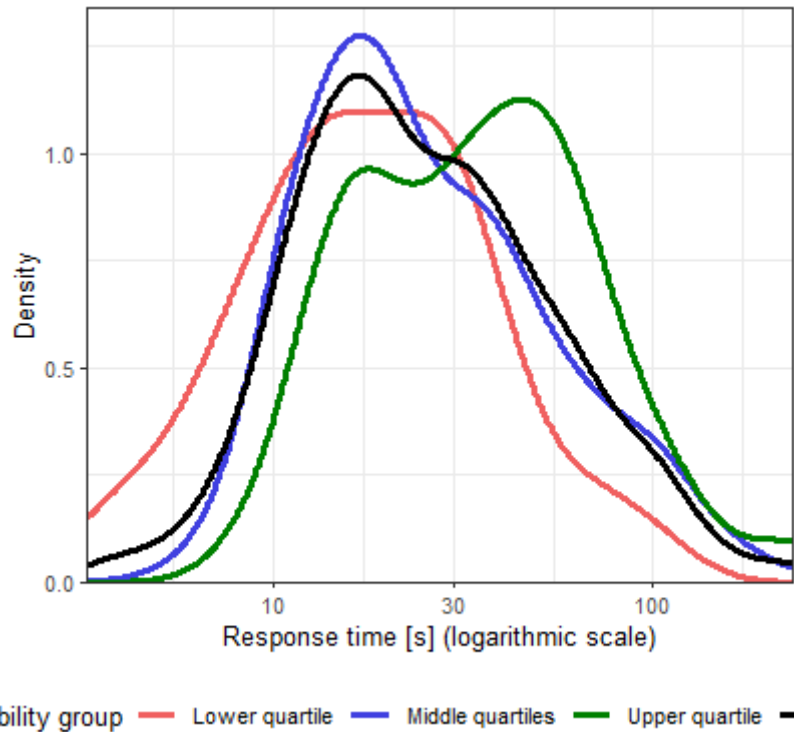


Table 2.9.5.1

Item M041280 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.25	10.13	18.04	29.19	101.60	2.88	0.75
Middle quartiles	5.63	14.58	21.64	40.03	205.31	3.25	0.74
Upper quartile	8.51	18.65	35.49	56.45	233.39	3.54	0.72
Overall	3.25	14.11	22.18	41.26	233.39	3.22	0.77

2.10.M090055 (LLM)

2.10.1. Item fit:

Graph 2.10.1.1

Item M090055 ICC and nonparametric trace line

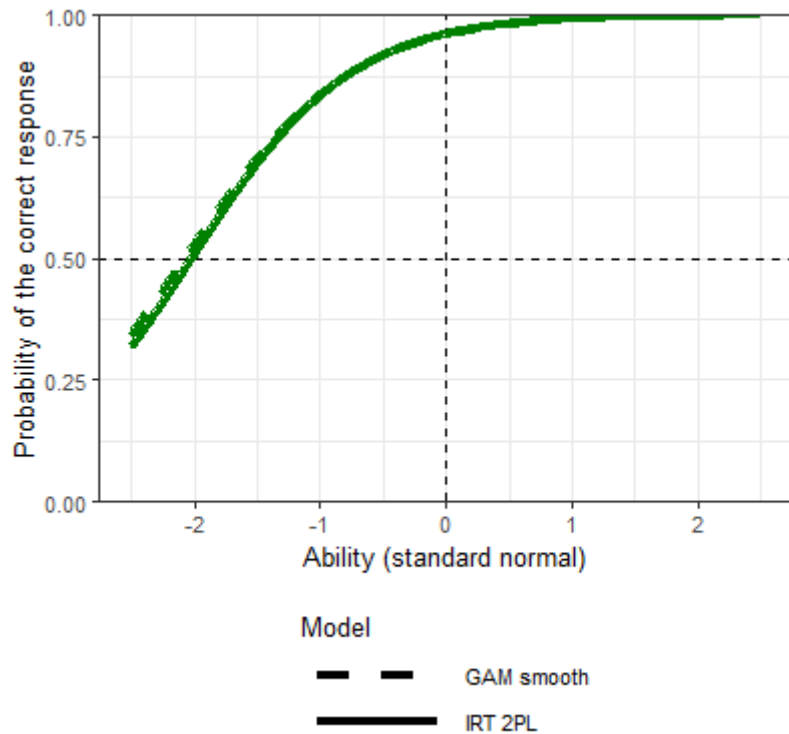


Table 2.10.1.1

Item M090055 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	91.4%	304	MC	0.37	0.26	1.59	-2.02	0.000	0.694

2.10.2. Gender DIF:

Table 2.10.2.1

Item M090055 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.34	0.845	1.000		0.002

2.10.3. Frequency of answers:

Table 2.10.3.1

Item M090055 answer frequency

Answer	Frequency	Percent
11	18	5.9%
18	7	2.3%
19	1	0.3%
24 (correct)	278	91.4%
Overall	304	100.0%

2.10.4. Distractors functioning:

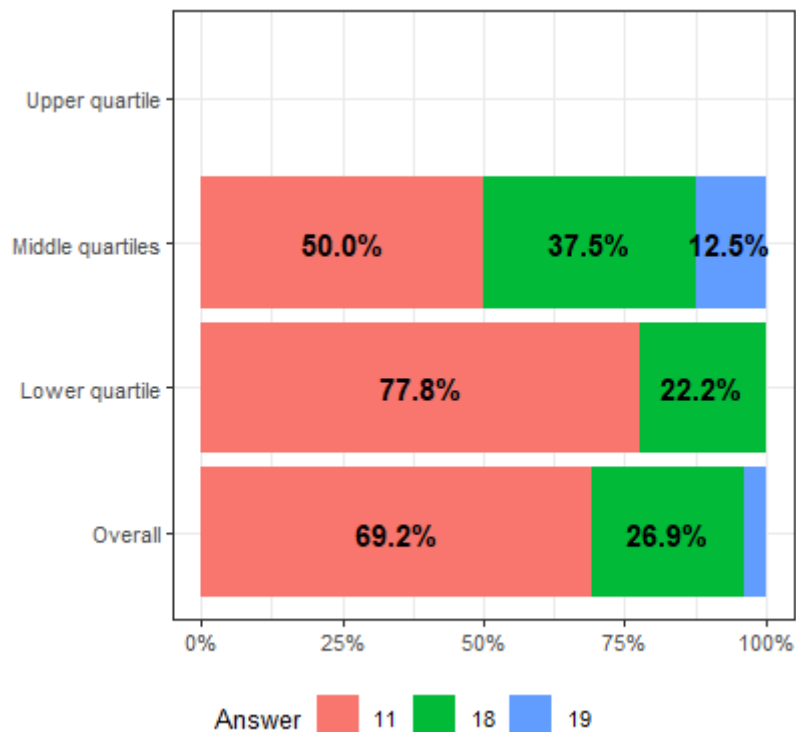
Table 2.10.4.1

Item M090055 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
11	14	4	0	18	77.8%	50.0%	0.0%	69.2%
18	4	3	0	7	22.2%	37.5%	0.0%	26.9%
Overall	18	8	0	26	100.0%	100.0%	0.0%	100.0%
19	0	1	0	1	0.0%	12.5%	0.0%	3.8%

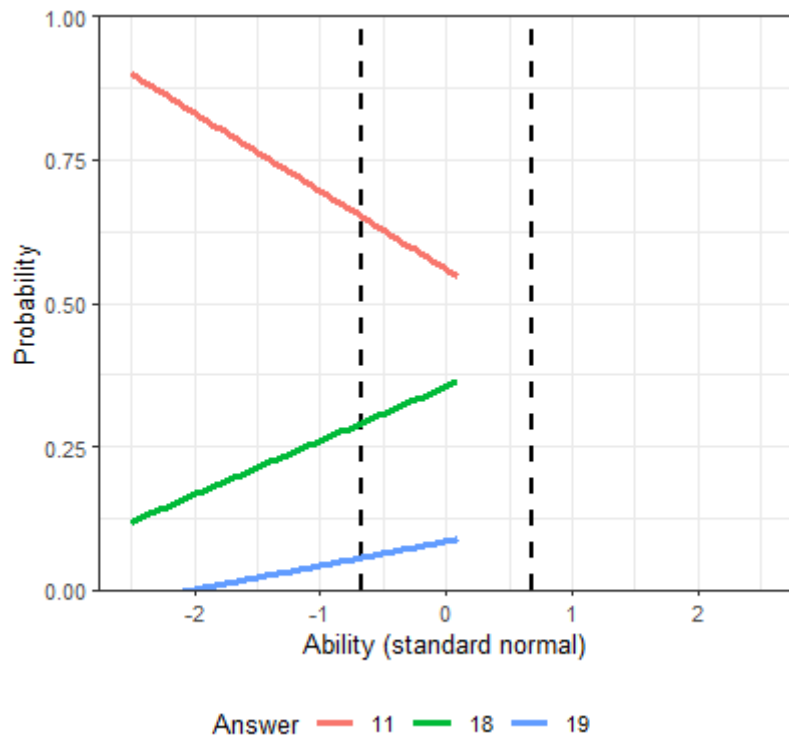
Graph 2.10.4.1

Item M090055 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.10.4.2

Item M090055 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.10.5. Answering time:

Graph 2.10.5.1

Item M090055 answering time distribution in groups of different ability level

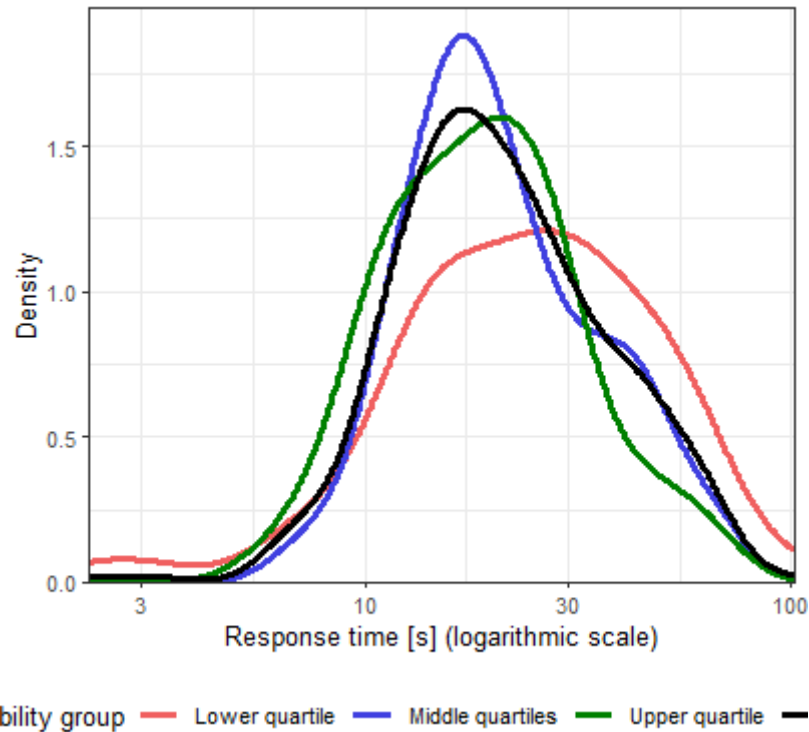


Table 2.10.5.1

Item M090055 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.27	15.27	24.13	37.59	101.58	3.15	0.71
Middle quartiles	6.64	14.70	19.36	30.42	71.55	3.04	0.52
Upper quartile	5.75	12.60	18.54	26.36	68.58	2.93	0.53
Overall	2.27	14.11	19.88	31.11	101.58	3.04	0.57

2.11.M090006 (LLM)

2.11.1. Item fit:

Graph 2.11.1.1

Item M090006 ICC and nonparametric trace line

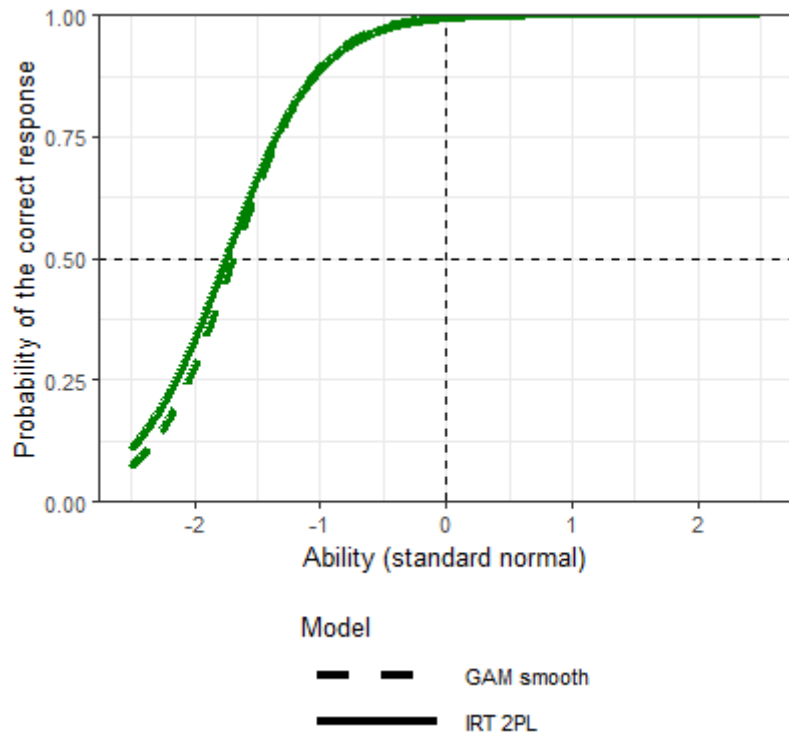


Table 2.11.1.1

Item M090006 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	93.1%	304	MC	0.48	0.27	2.77	-1.75	0.000	0.768

2.11.2. Gender DIF:

Table 2.11.2.1

Item M090006 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.13	0.937	1.000		0.001

2.11.3. Frequency of answers:

Table 2.11.3.1

Item M090006 answer frequency

Answer	Frequency	Percent
384	5	1.6%
385	6	2.0%
386 (correct)	283	93.1%
390	10	3.3%
Overall	304	100.0%

2.11.4. Distractors functioning:

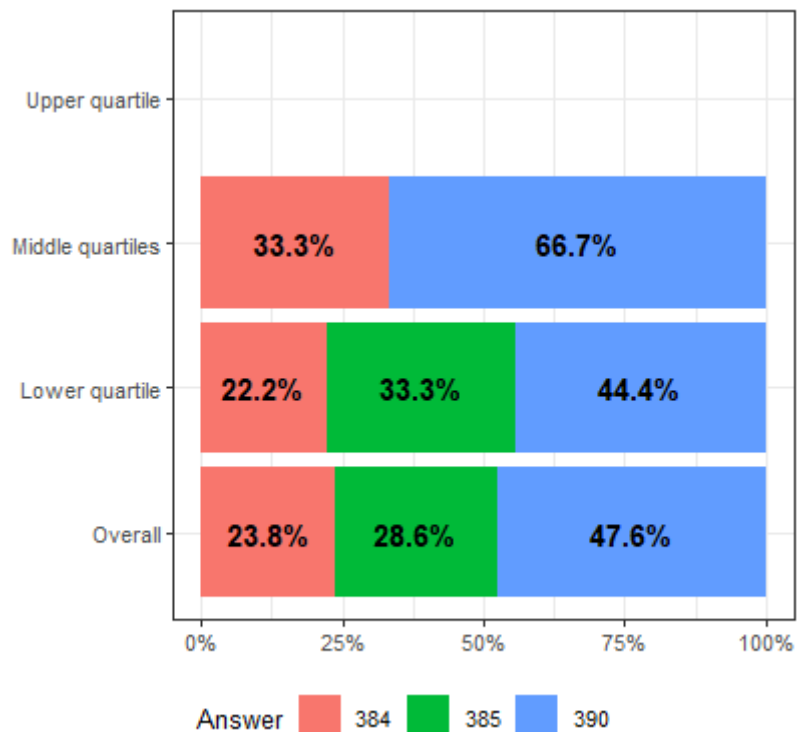
Table 2.11.4.1

Item M090006 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
384	4	1	0	5	22.2%	33.3%	0.0%	23.8%
385	6	0	0	6	33.3%	0.0%	0.0%	28.6%
390	8	2	0	10	44.4%	66.7%	0.0%	47.6%
Overall	18	3	0	21	100.0%	100.0%	0.0%	100.0%

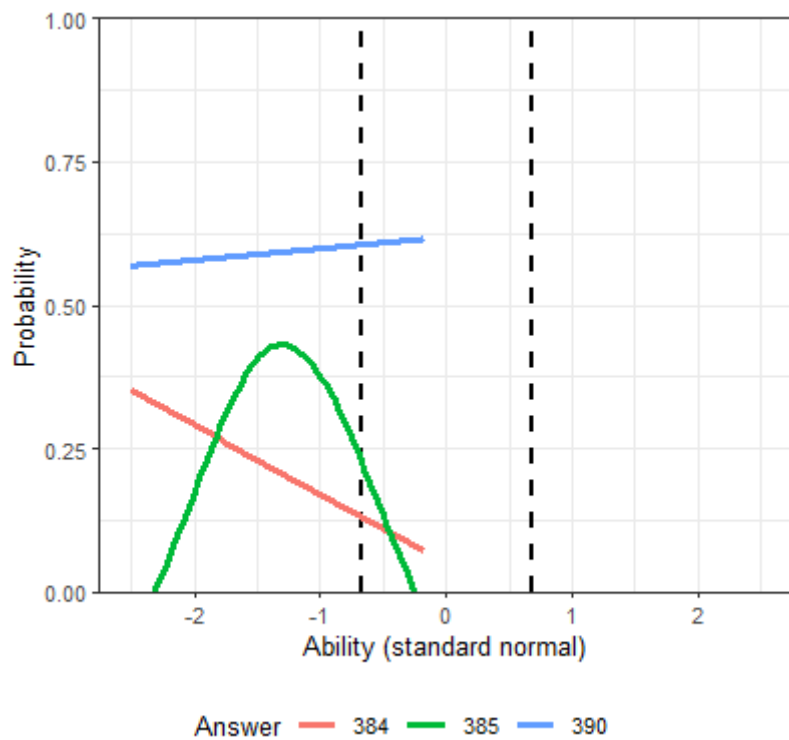
Graph 2.11.4.1

Item M090006 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.11.4.2

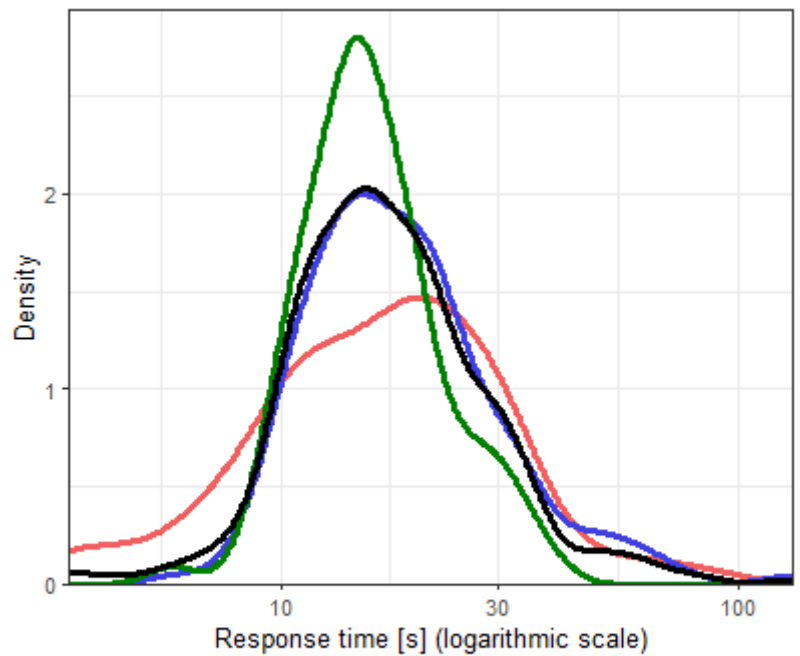
Item M090006 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.11.5. Answering time:

Graph 2.11.5.1

Item M090006 answering time distribution in groups of different ability level



Ability group — Lower quartile — Middle quartiles — Upper quartile —

Table 2.11.5.1

Item M090006 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.46	11.10	17.18	24.83	83.49	2.79	0.62
Middle quartiles	5.87	13.36	17.02	23.62	131.42	2.92	0.49
Upper quartile	5.83	12.40	15.22	19.38	39.04	2.76	0.35
Overall	3.46	12.41	16.52	22.28	131.42	2.85	0.49

2.12.M090059 (LLM)

2.12.1. Item fit:

Graph 2.12.1.1

Item M090059 ICC and nonparametric trace line

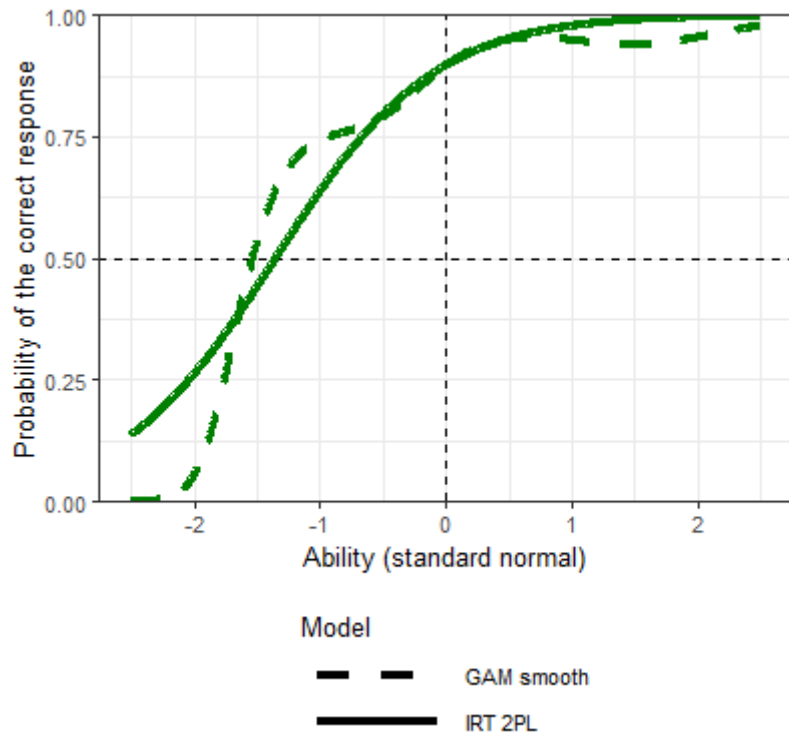


Table 2.12.1.1

Item M090059 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	82.9%	304	MC	0.42	0.30	1.60	-1.36	0.000	0.772

2.12.2. Gender DIF:

Table 2.12.2.1

Item M090059 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.85	0.655	1.000		0.003

2.12.3. Frequency of answers:

Table 2.12.3.1

Item M090059 answer frequency

Answer	Frequency	Percent
Koszykówka	2	0.7%
Piłka nożna	47	15.5%
Pływanie	3	1.0%
Siatkówka (correct)	252	82.9%
Overall	304	100.0%

2.12.4. Distractors functioning:

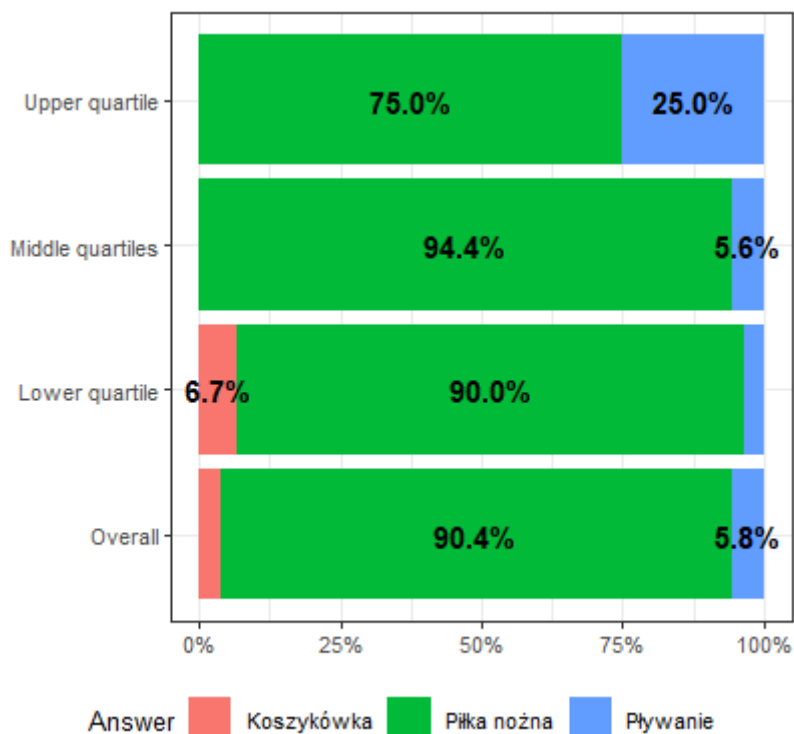
Table 2.12.4.1

Item M090059 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Koszykówka	2	0	0	2	6.7%	0.0%	0.0%	3.8%
Piłka nożna	27	17	3	47	90.0%	94.4%	75.0%	90.4%
Pływanie	1	1	1	3	3.3%	5.6%	25.0%	5.8%
Overall	30	18	4	52	100.0%	100.0%	100.0%	100.0%

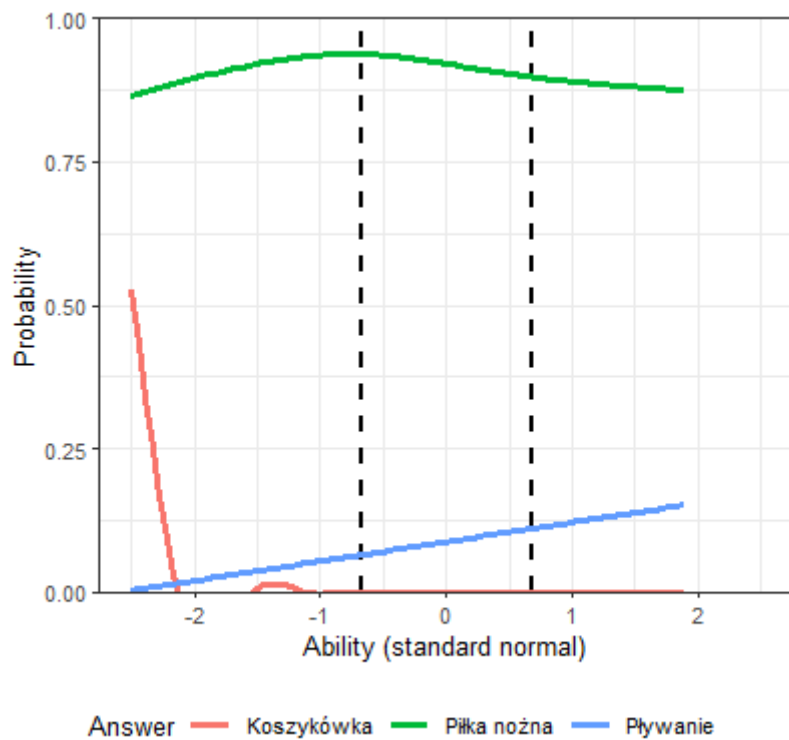
Graph 2.12.4.1

Item M090059 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.12.4.2

Item M090059 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.12.5. Answering time:

Graph 2.12.5.1

Item M090059 answering time distribution in groups of different ability level

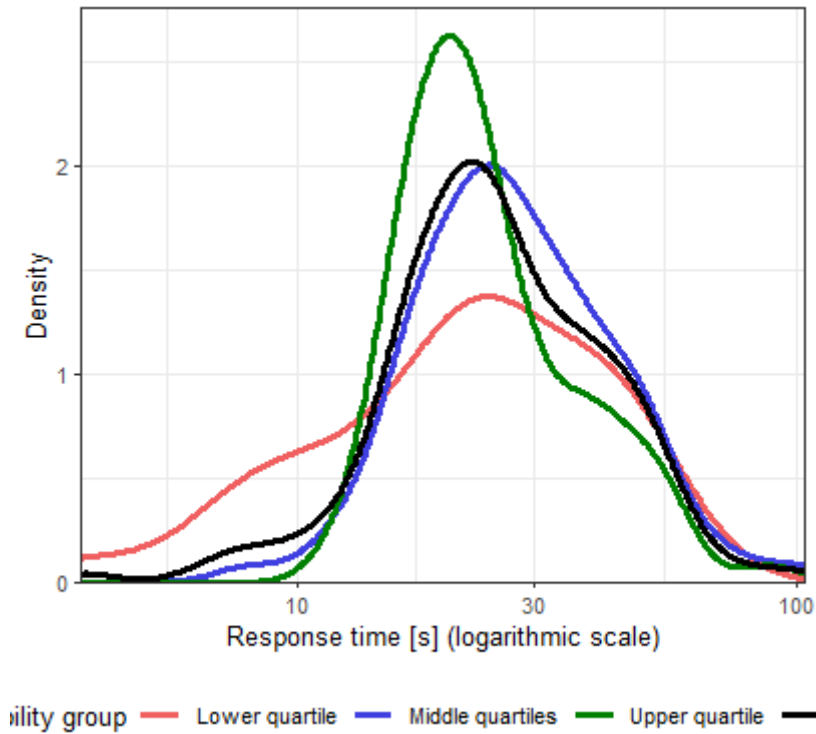


Table 2.12.5.1

Item M090059 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.71	14.59	23.44	36.34	63.54	3.06	0.66
Middle quartiles	7.71	19.65	26.16	36.83	104.11	3.30	0.45
Upper quartile	12.09	18.06	22.12	30.12	89.01	3.19	0.40
Overall	3.71	18.30	24.14	35.24	104.11	3.22	0.50

2.13.M090017 (LLM)

2.13.1. Item fit:

Graph 2.13.1.1

Item M090017 ICC and nonparametric trace line

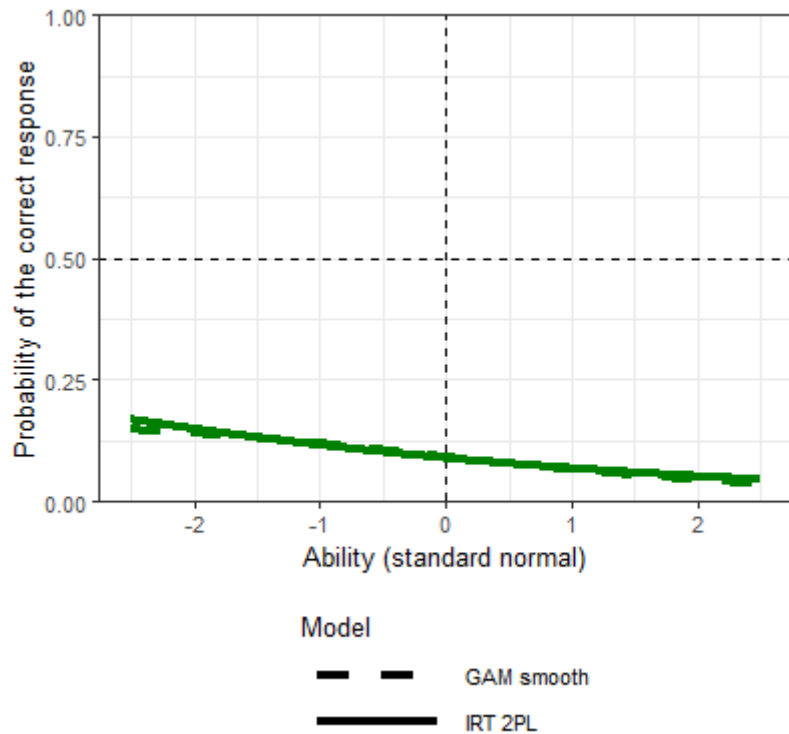


Table 2.13.1.1

Item M090017 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	9.3%	281	MC	-0.09	-0.10	-0.29	-7.97	0.000	0.905

2.13.2. Gender DIF:

Table 2.13.2.1

Item M090017 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.62	0.733	1.000		0.004

2.13.3. Frequency of answers:

Table 2.13.3.1

Item M090017 answer frequency

Answer	Frequency	Percent
18 cm ³	146	52.1%
27 cm ³ (correct)	26	9.3%
36 cm ³	19	6.8%
9 cm ³	89	31.8%
Overall	280	100.0%

2.13.4. Distractors functioning:

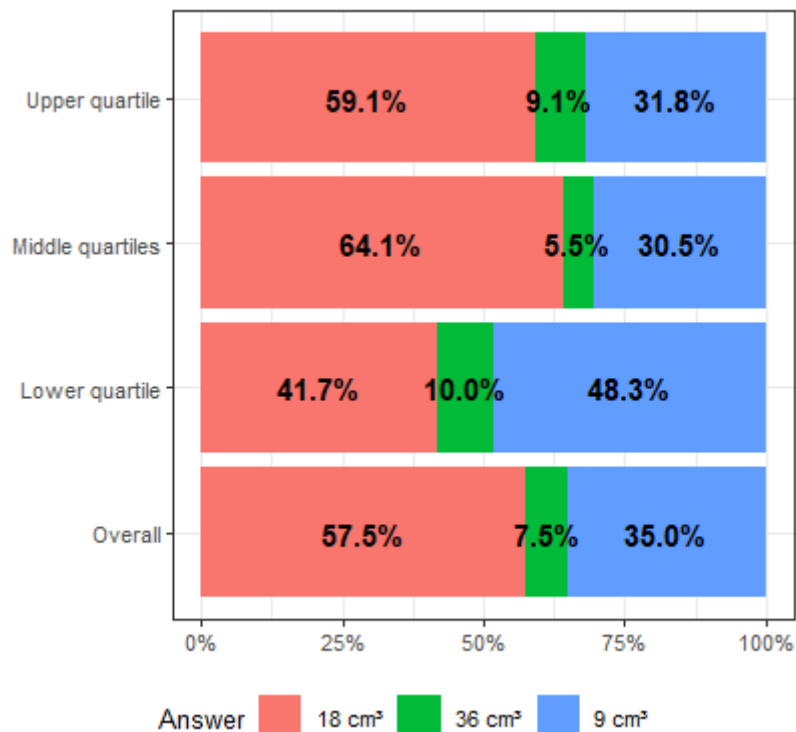
Table 2.13.4.1

Item M090017 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
18 cm ³	25	82	39	146	41.7%	64.1%	59.1%	57.5%
36 cm ³	6	7	6	19	10.0%	5.5%	9.1%	7.5%
9 cm ³	29	39	21	89	48.3%	30.5%	31.8%	35.0%
Overall	60	128	66	254	100.0%	100.0%	100.0%	100.0%

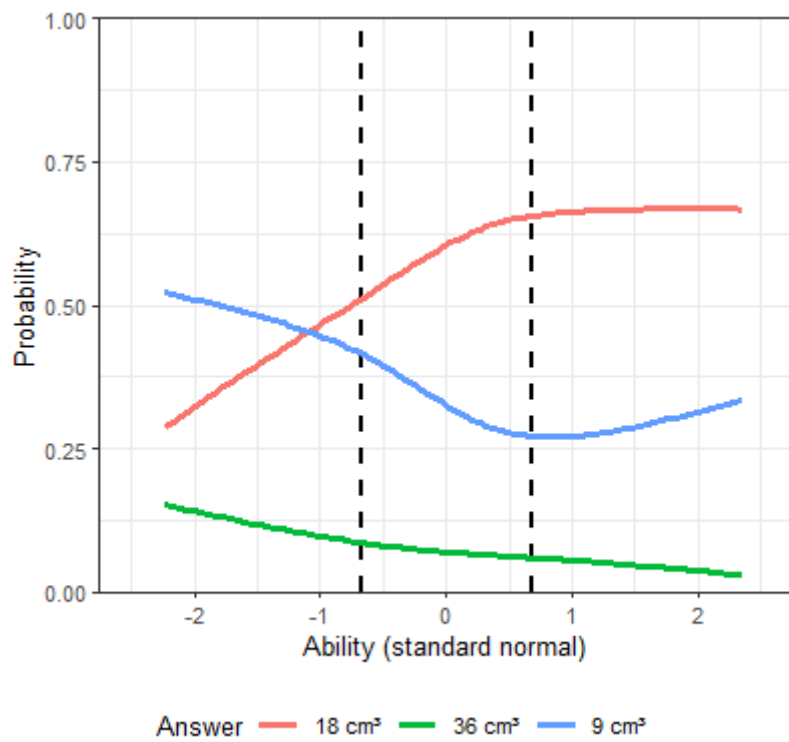
Graph 2.13.4.1

Item M090017 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.13.4.2

Item M090017 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.13.5. Answering time:

Graph 2.13.5.1

Item M090017 answering time distribution in groups of different ability level

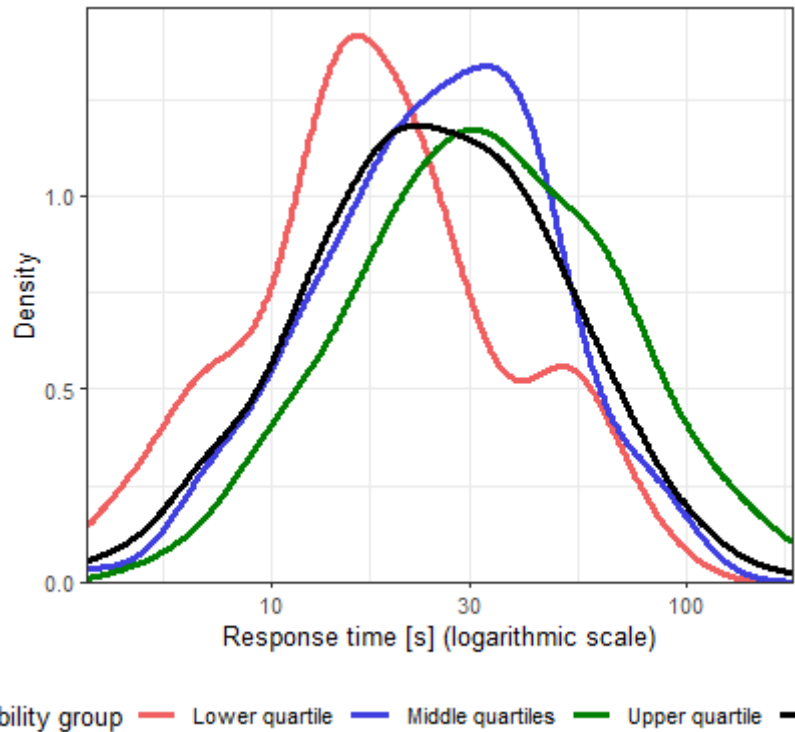


Table 2.13.5.1

Item M090017 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.59	12.34	17.16	26.82	88.22	2.89	0.72
Middle quartiles	3.64	16.44	26.33	40.15	101.89	3.21	0.65
Upper quartile	5.74	20.02	33.16	58.85	181.41	3.48	0.72
Overall	3.59	14.95	24.60	40.44	181.41	3.19	0.72

2.14.M890029 (LLM)

2.14.1. Item fit:

Graph 2.14.1.1

Item M890029 ICC and nonparametric trace line

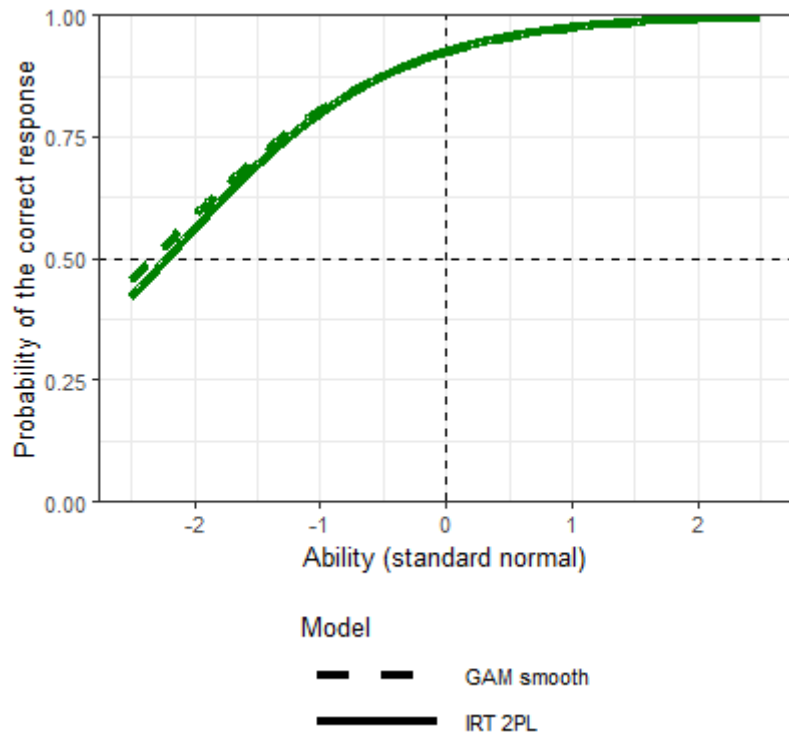


Table 2.14.1.1

Item M890029 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	88.7%	319	MC	0.30	0.19	1.13	-2.22	0.012	0.306

2.14.2. Gender DIF:

Table 2.14.2.1

Item M890029 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.77	0.250	1.000	0.013	

2.14.3. Frequency of answers:

Table 2.14.3.1

Item M890029 answer frequency

Answer	Frequency	Percent
17 cm	10	3.1%
18 cm	14	4.4%
22 cm (correct)	283	88.7%
26 cm	12	3.8%
Overall	319	100.0%

2.14.4. Distractors functioning:

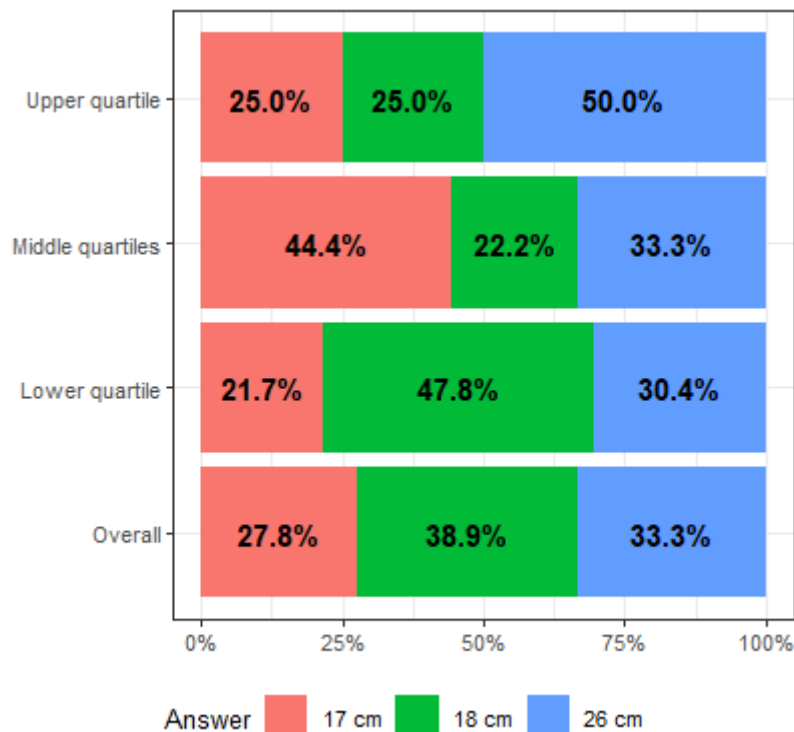
Table 2.14.4.1

Item M890029 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
17 cm	5	4	1	10	21.7%	44.4%	25.0%	27.8%
18 cm	11	2	1	14	47.8%	22.2%	25.0%	38.9%
26 cm	7	3	2	12	30.4%	33.3%	50.0%	33.3%
Overall	23	9	4	36	100.0%	100.0%	100.0%	100.0%

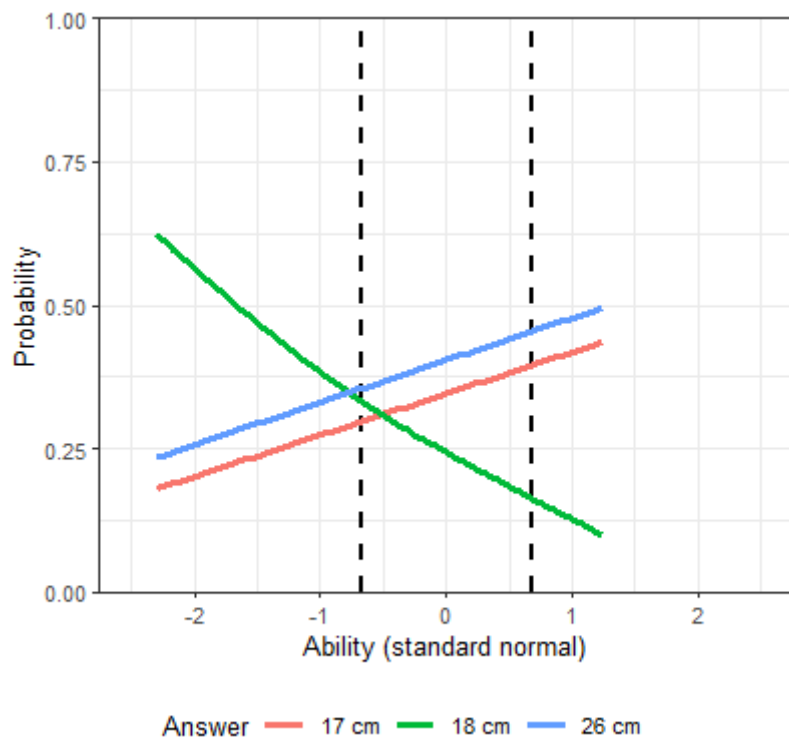
Graph 2.14.4.1

Item M890029 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.14.4.2

Item M890029 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.14.5. Answering time:

Graph 2.14.5.1

Item M890029 answering time distribution in groups of different ability level

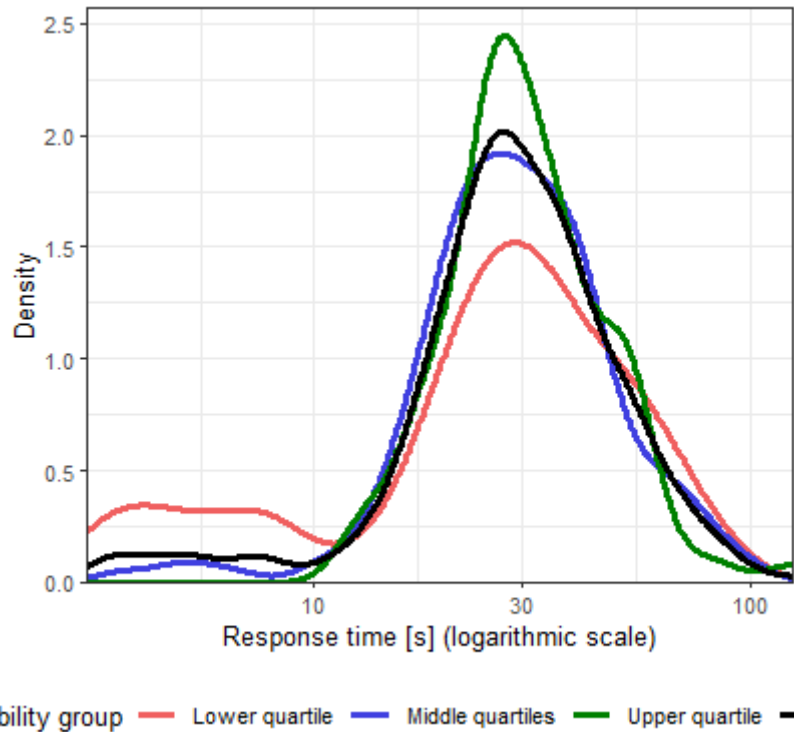


Table 2.14.5.1

Item M890029 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.02	18.76	27.62	39.79	87.45	3.16	0.84
Middle quartiles	3.58	22.05	29.11	39.73	99.72	3.36	0.53
Upper quartile	12.42	24.03	28.73	39.05	125.02	3.42	0.41
Overall	3.02	22.05	28.60	39.69	125.02	3.32	0.60

2.15.M890026 (LLM)

2.15.1. Item fit:

Graph 2.15.1.1

Item M890026 ICC and nonparametric trace line

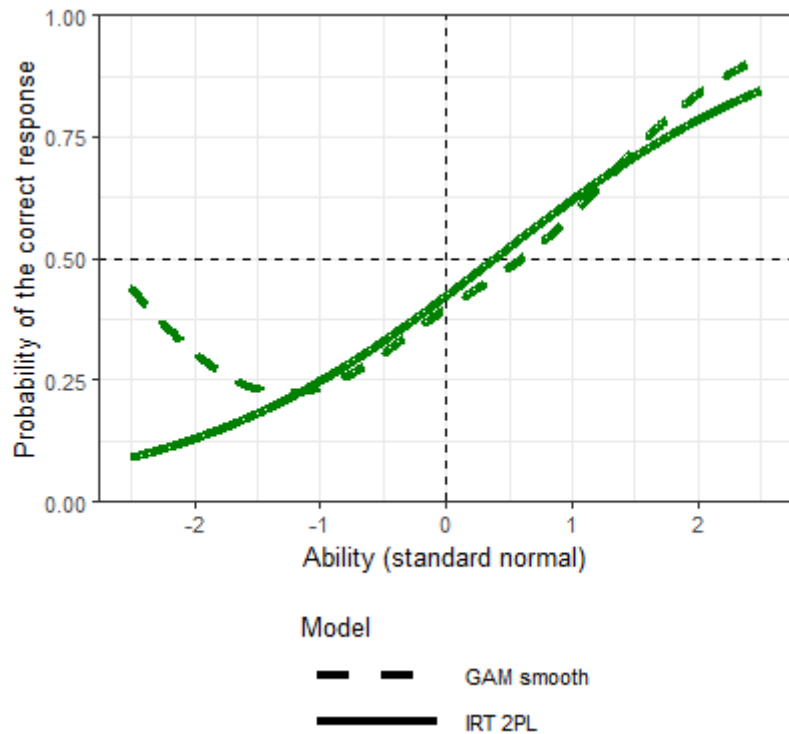


Table 2.15.1.1

Item M890026 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	43.6%	319	MC	0.33	0.25	0.80	0.39	0.000	0.628

2.15.2. Gender DIF:

Table 2.15.2.1

Item M890026 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.86	0.651	1.000		0.002

2.15.3. Frequency of answers:

Table 2.15.3.1

Item M890026 answer frequency

Answer	Frequency	Percent
120° (correct)	139	43.6%
30°	44	13.8%
60°	72	22.6%
90°	64	20.1%
Overall	319	100.0%

2.15.4. Distractors functioning:

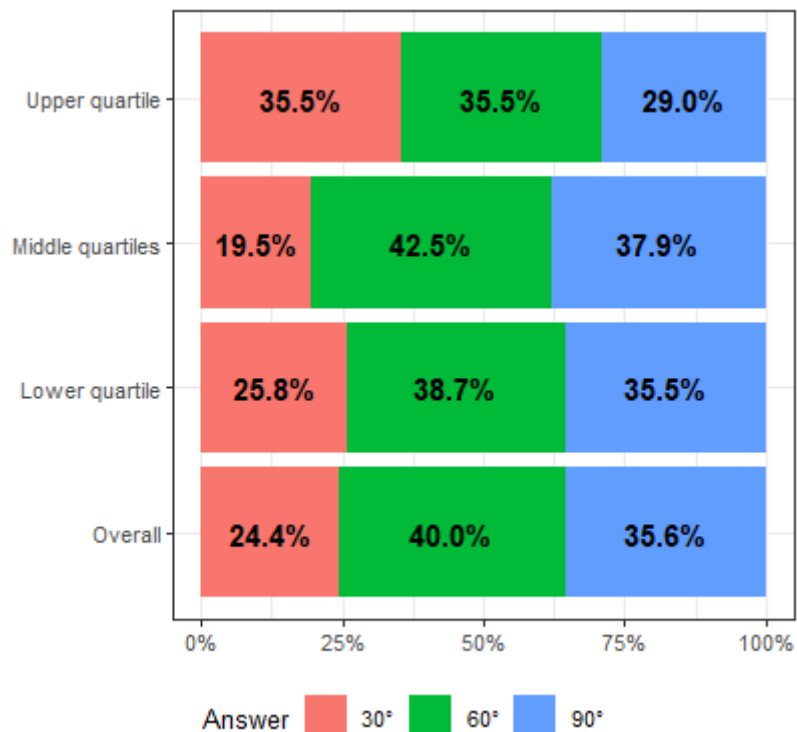
Table 2.15.4.1

Item M890026 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
30°	16	17	11	44	25.8%	19.5%	35.5%	24.4%
60°	24	37	11	72	38.7%	42.5%	35.5%	40.0%
90°	22	33	9	64	35.5%	37.9%	29.0%	35.6%
Overall	62	87	31	180	100.0%	100.0%	100.0%	100.0%

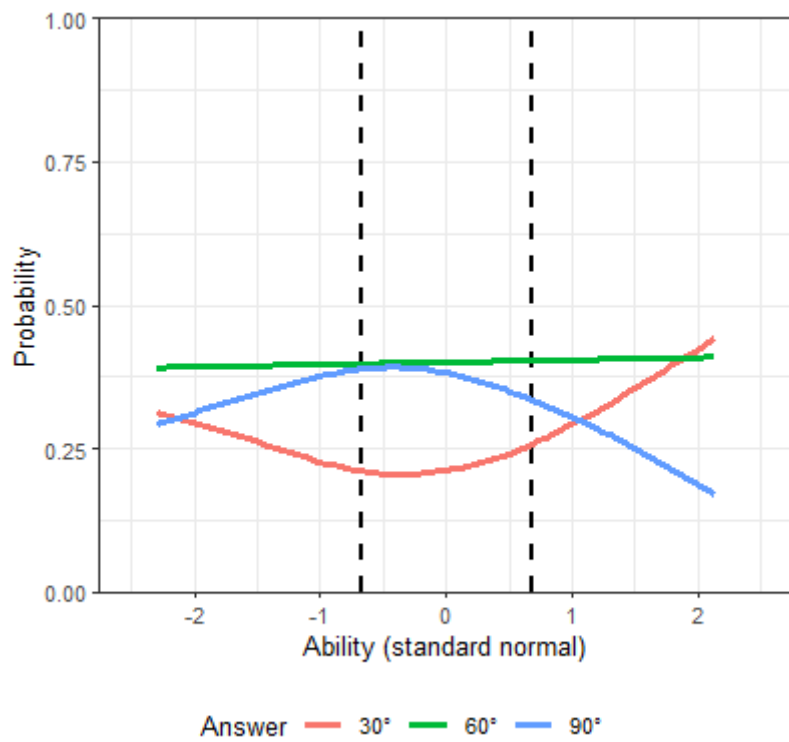
Graph 2.15.4.1

Item M890026 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.15.4.2

Item M890026 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.15.5. Answering time:

Graph 2.15.5.1

Item M890026 answering time distribution in groups of different ability level

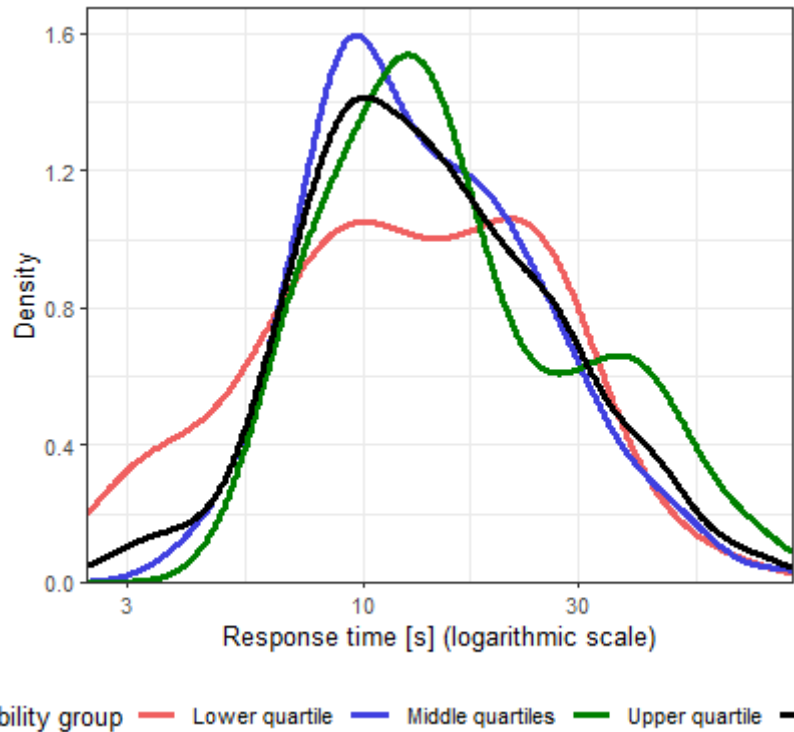


Table 2.15.5.1

Item M890026 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.45	7.47	12.93	23.00	67.10	2.51	0.73
Middle quartiles	3.99	9.04	13.08	20.41	89.90	2.63	0.59
Upper quartile	6.22	9.88	13.90	25.88	74.55	2.78	0.64
Overall	2.45	8.95	13.15	21.55	89.90	2.64	0.65

2.16.M090051 (LLM)

2.16.1. Item fit:

Graph 2.16.1.1

Item M090051 ICC and nonparametric trace line

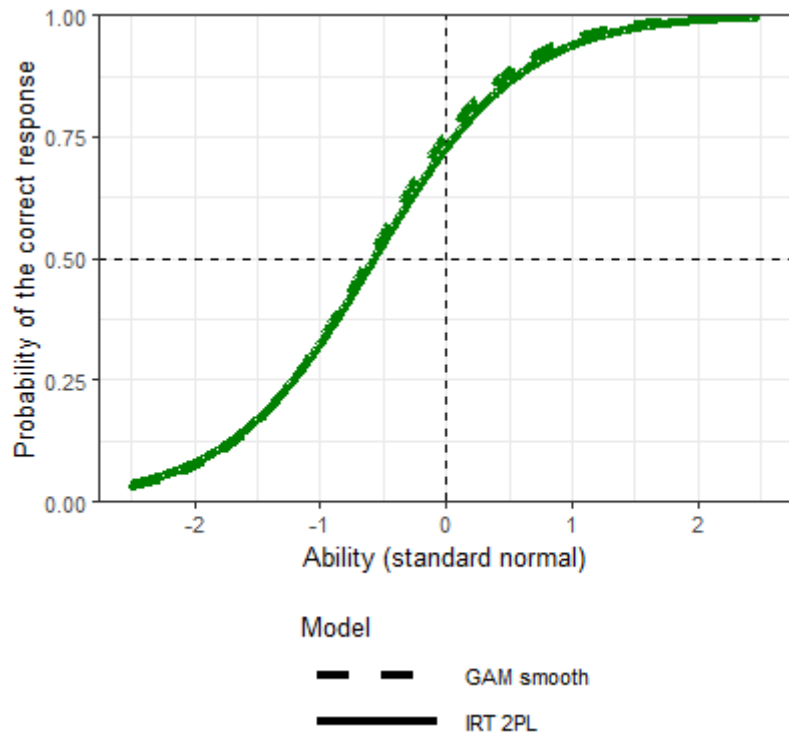


Table 2.16.1.1

Item M090051 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	65.1%	299	MC	0.56	0.43	1.72	-0.57	0.000	0.556

2.16.2. Gender DIF:

Table 2.16.2.1

Item M090051 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.48	0.785	1.000	0.001	

2.16.3. Frequency of answers:

Table 2.16.3.1

Item M090051 answer frequency

Answer	Frequency	Percent
A (correct)	194	65.1%
B	42	14.1%
C	40	13.4%
D	22	7.4%
Overall	298	100.0%

2.16.4. Distractors functioning:

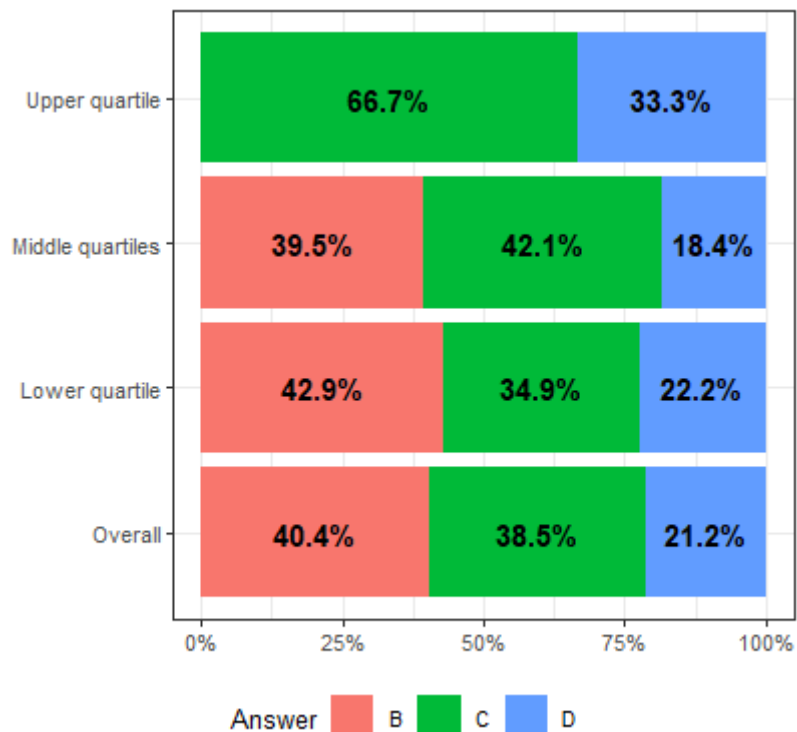
Table 2.16.4.1

Item M090051 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
B	27	15	0	42	42.9%	39.5%	0.0%	40.4%
C	22	16	2	40	34.9%	42.1%	66.7%	38.5%
D	14	7	1	22	22.2%	18.4%	33.3%	21.2%
Overall	63	38	3	104	100.0%	100.0%	100.0%	100.0%

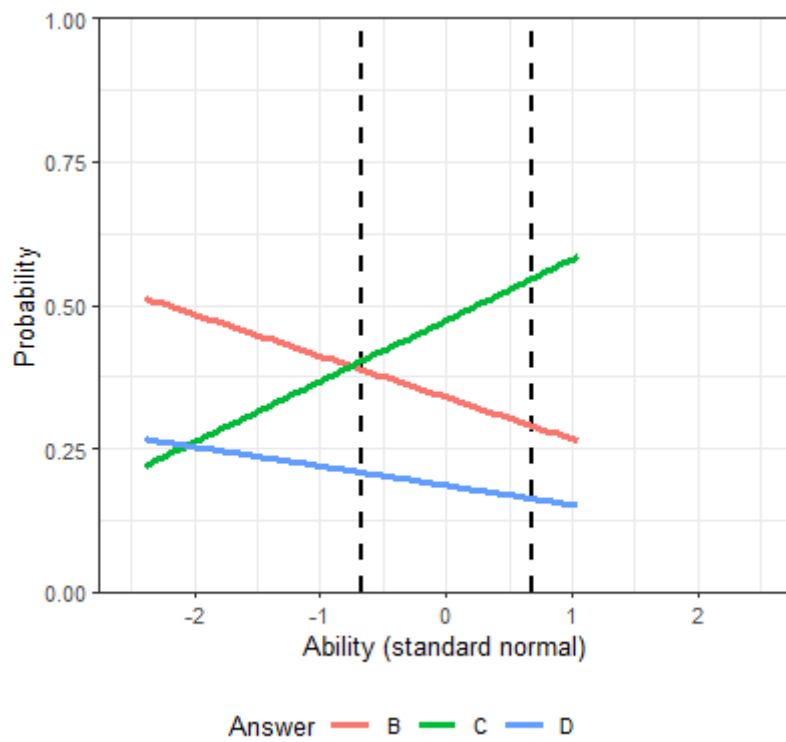
Graph 2.16.4.1

Item M090051 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.16.4.2

Item M090051 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.16.5. Answering time:

Graph 2.16.5.1

Item M090051 answering time distribution in groups of different ability level

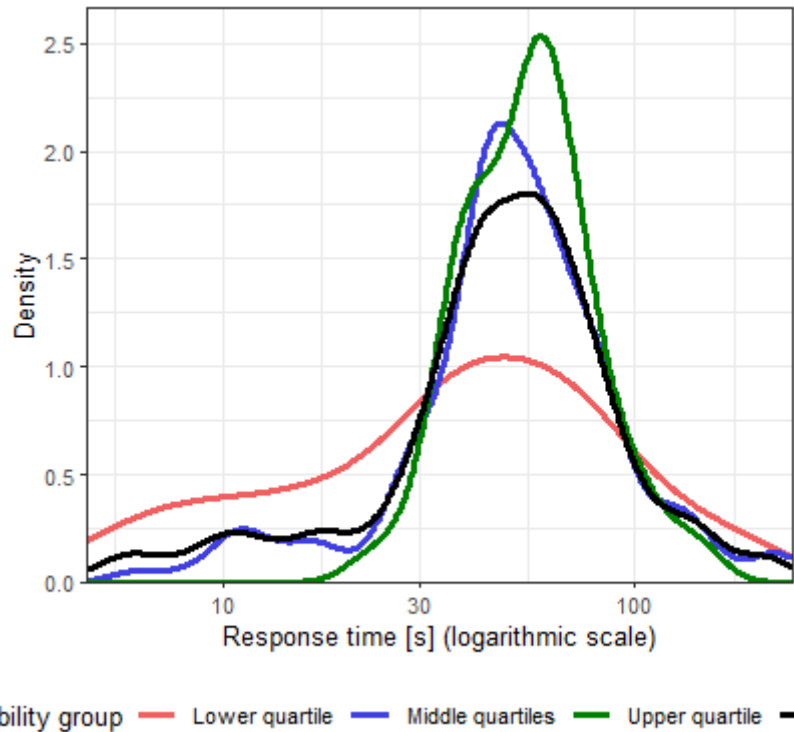


Table 2.16.5.1

Item M090051 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.71	19.53	39.48	68.10	206.70	3.58	0.92
Middle quartiles	6.07	40.26	51.05	68.34	240.53	3.90	0.62
Upper quartile	22.45	41.73	56.15	68.36	144.95	4.01	0.37
Overall	4.71	35.59	51.01	68.40	240.53	3.83	0.69

2.17.M090044 (LLM)

2.17.1. Item fit:

Graph 2.17.1.1

Item M090044 ICC and nonparametric trace line

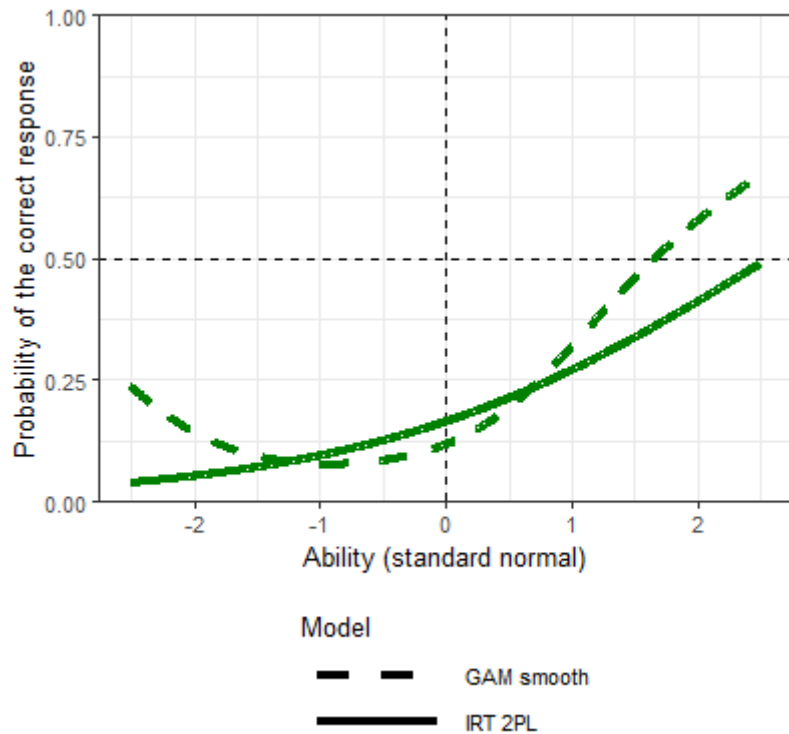


Table 2.17.1.1

Item M090044 parameters and fit statistics

					Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	18.1%	299	MC	0.29	0.15	0.63	2.56	0.030	0.035	

2.17.2. Gender DIF:

Table 2.17.2.1

Item M090044 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.69	0.708	1.000		0.003

2.17.3. Frequency of answers:

Table 2.17.3.1

Item M090044 answer frequency

Answer	Frequency	Percent
Prostokąt	65	21.8%
Romb (correct)	54	18.1%
Równoległobok	162	54.4%
Trapez	17	5.7%
Overall	298	100.0%

2.17.4. Distractors functioning:

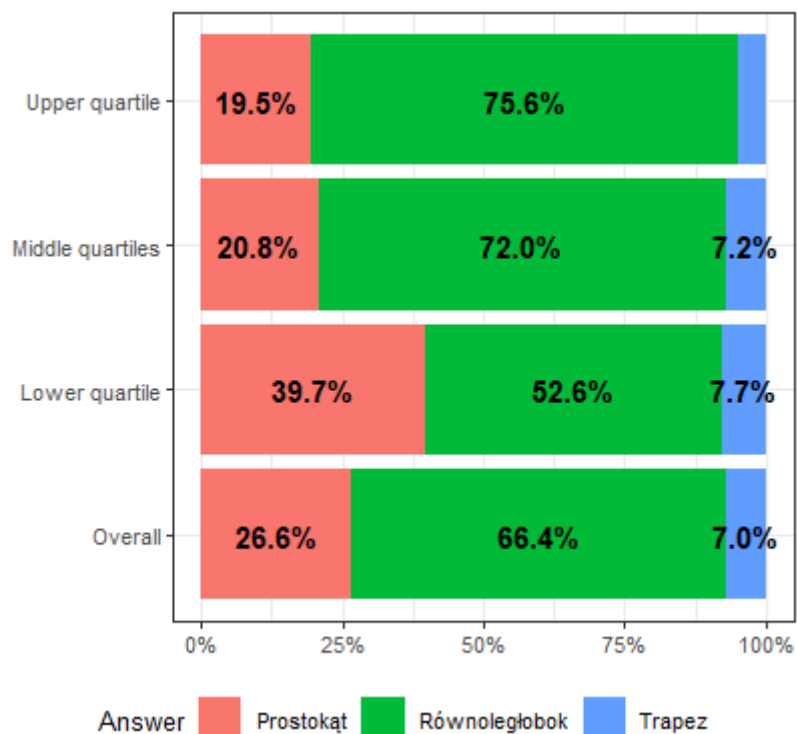
Table 2.17.4.1

Item M090044 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Prostokąt	31	26	8	65	39.7%	20.8%	19.5%	26.6%
Równoległobok	41	90	31	162	52.6%	72.0%	75.6%	66.4%
Trapez	6	9	2	17	7.7%	7.2%	4.9%	7.0%
Overall	78	125	41	244	100.0%	100.0%	100.0%	100.0%

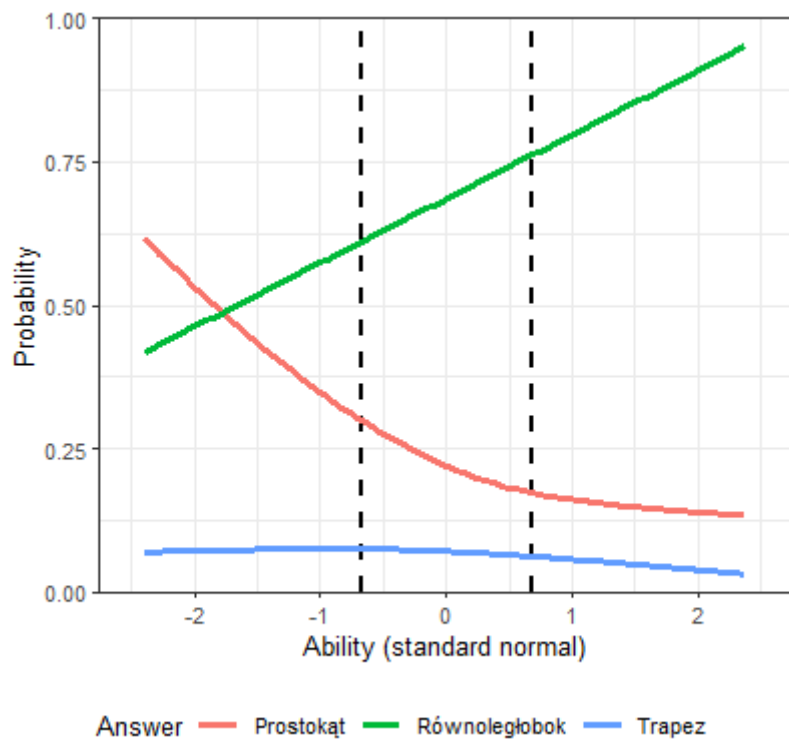
Graph 2.17.4.1

Item M090044 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.17.4.2

Item M090044 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.17.5. Answering time:

Graph 2.17.5.1

Item M090044 answering time distribution in groups of different ability level

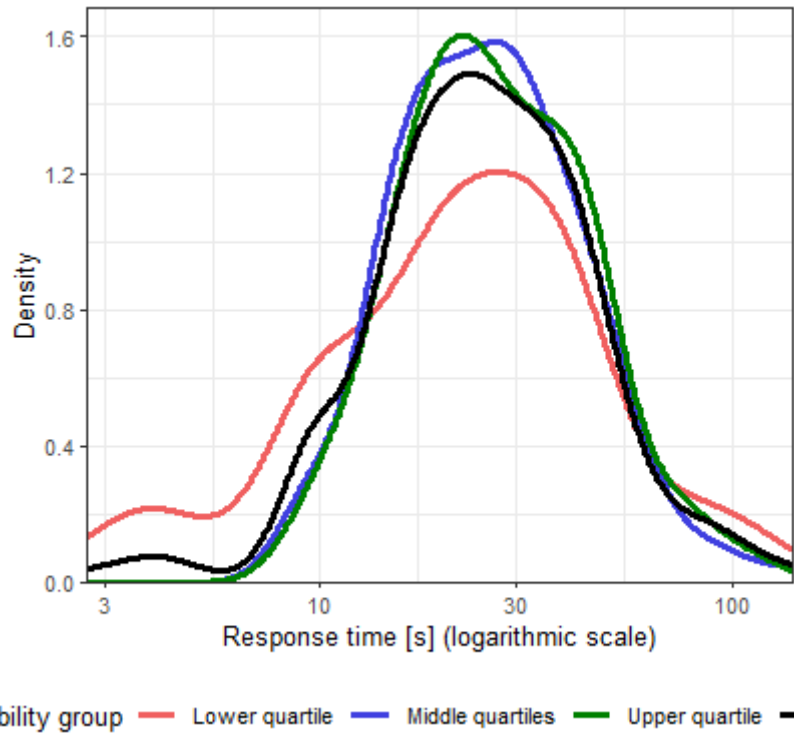


Table 2.17.5.1

Item M090044 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.73	13.81	22.98	36.21	140.49	3.06	0.81
Middle quartiles	8.50	17.65	25.21	36.42	135.69	3.25	0.52
Upper quartile	9.54	18.47	25.30	38.45	110.59	3.28	0.52
Overall	2.73	16.75	24.78	36.85	140.49	3.20	0.62

2.18.M090016 (LLM)

2.18.1. Item fit:

Graph 2.18.1.1

Item M090016 ICC and nonparametric trace line

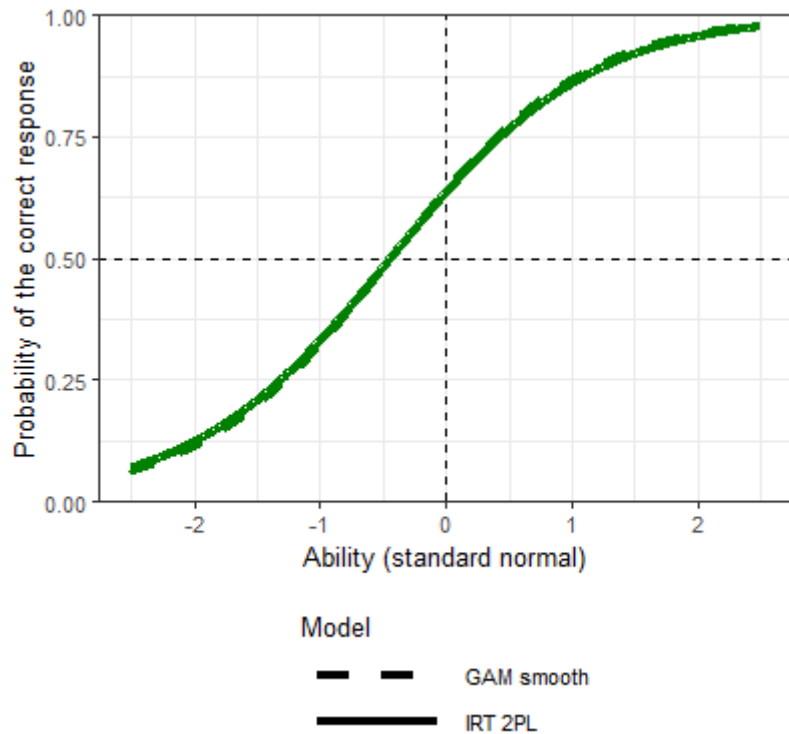


Table 2.18.1.1

Item M090016 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	60.4%	281	MC	0.49	0.34	1.26	-0.44	0.000	0.806

2.18.2. Gender DIF:

Table 2.18.2.1

Item M090016 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
8.18	0.017	1.000	0.024	

2.18.3. Frequency of answers:

Table 2.18.3.1

Item M090016 answer frequency

Answer	Frequency	Percent
16	54	19.3%
17	36	12.9%
18 (correct)	169	60.4%
19	21	7.5%
Overall	280	100.0%

2.18.4. Distractors functioning:

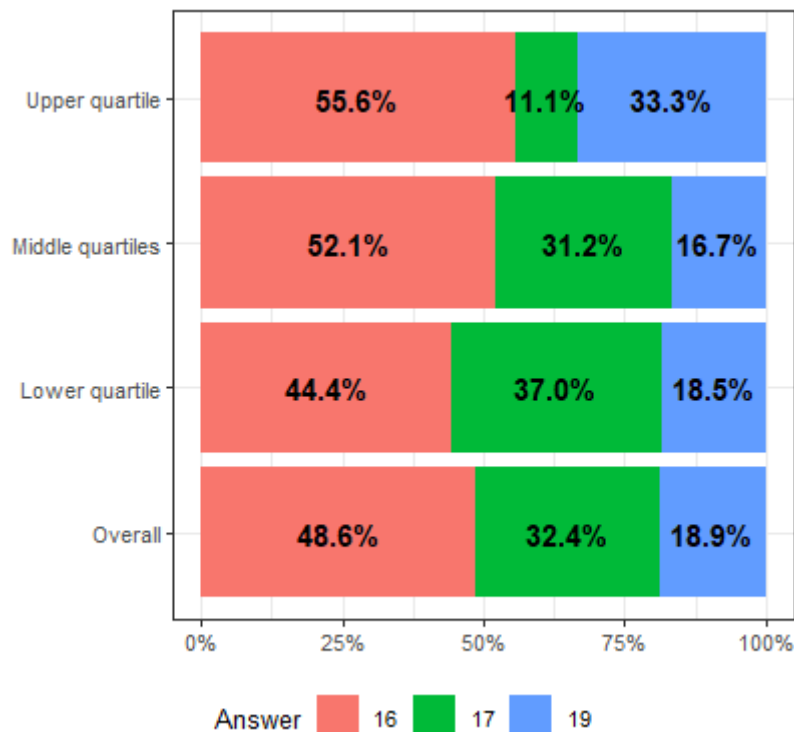
Table 2.18.4.1

Item M090016 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
16	24	25	5	54	44.4%	52.1%	55.6%	48.6%
17	20	15	1	36	37.0%	31.2%	11.1%	32.4%
19	10	8	3	21	18.5%	16.7%	33.3%	18.9%
Overall	54	48	9	111	100.0%	100.0%	100.0%	100.0%

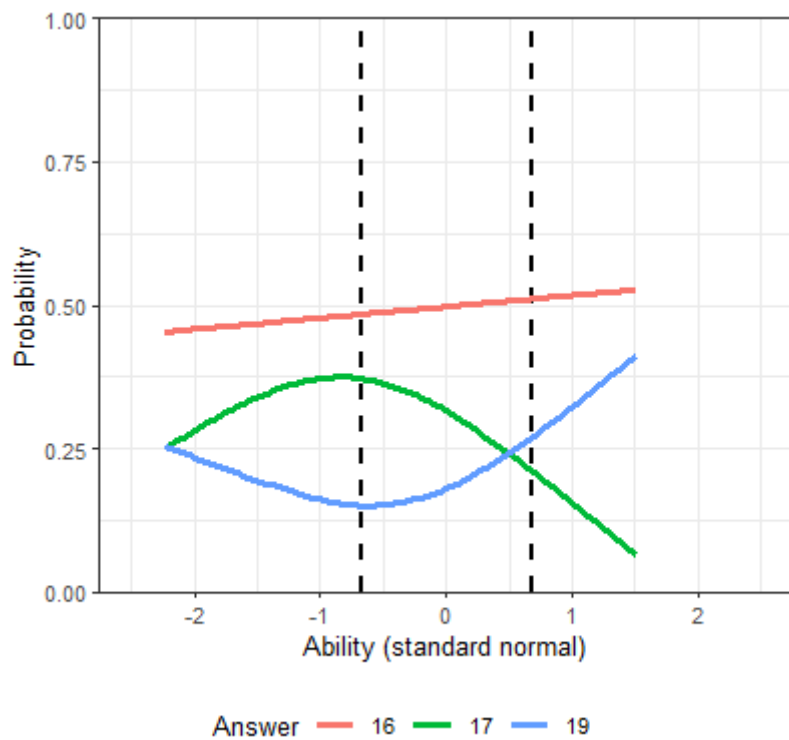
Graph 2.18.4.1

Item M090016 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.18.4.2

Item M090016 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.18.5. Answering time:

Graph 2.18.5.1

Item M090016 answering time distribution in groups of different ability level

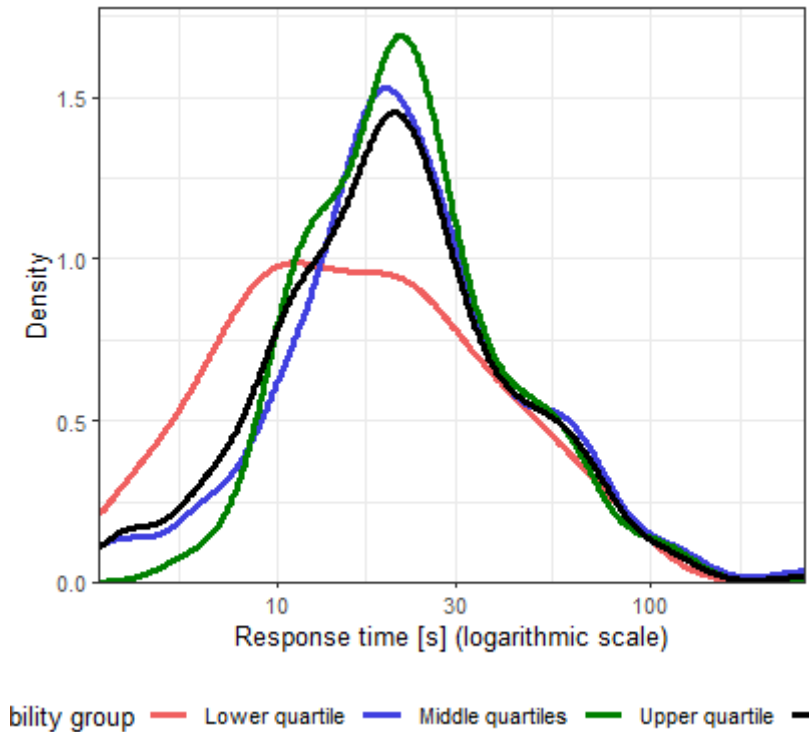


Table 2.18.5.1

Item M090016 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.60	9.21	16.86	28.53	82.97	2.79	0.79
Middle quartiles	3.35	14.36	20.59	31.62	258.33	3.08	0.73
Upper quartile	5.88	14.43	21.34	29.64	111.85	3.10	0.59
Overall	3.35	12.65	20.07	29.95	258.33	3.01	0.73

2.19.M041333 (TIMSS)

2.19.1. Item fit:

Graph 2.19.1.1

Item M041333 ICC and nonparametric trace line

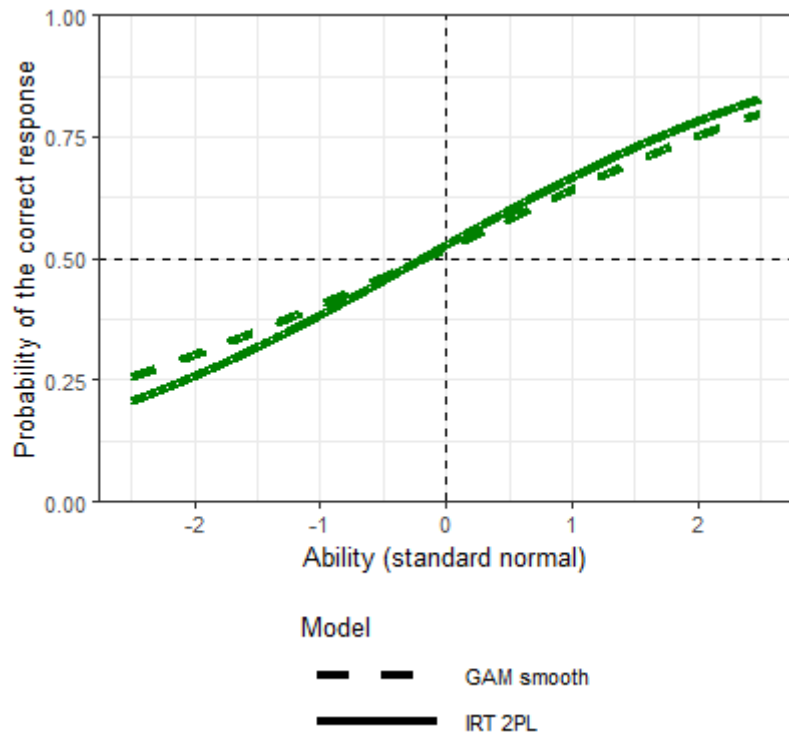


Table 2.19.1.1

Item M041333 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	52.0%	304	MC	0.24	0.31	0.58	-0.18	0.009	0.366	

2.19.2. Gender DIF:

Table 2.19.2.1

Item M041333 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
8.70	0.013	1.000	0.024	

2.19.3. Frequency of answers:

Table 2.19.3.1

Item M041333 answer frequency

Answer	Frequency	Percent
10	13	4.3%
26	40	13.2%
30 (correct)	158	52.0%
31	93	30.6%
Overall	304	100.0%

2.19.4. Distractors functioning:

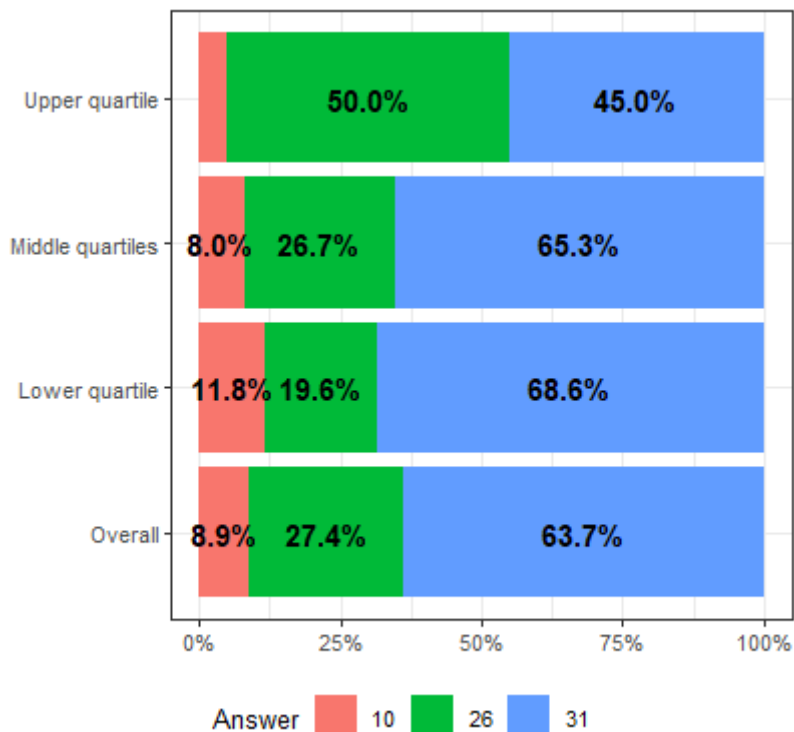
Table 2.19.4.1

Item M041333 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
10	6	6	1	13	11.8%	8.0%	5.0%	8.9%
26	10	20	10	40	19.6%	26.7%	50.0%	27.4%
31	35	49	9	93	68.6%	65.3%	45.0%	63.7%
Overall	51	75	20	146	100.0%	100.0%	100.0%	100.0%

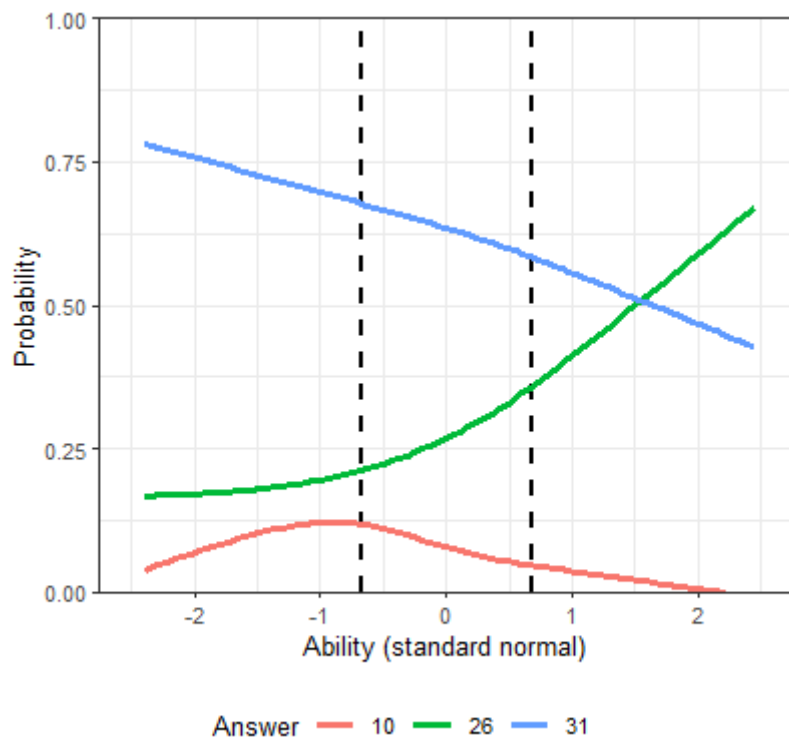
Graph 2.19.4.1

Item M041333 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.19.4.2

Item M041333 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.19.5. Answering time:

Graph 2.19.5.1

Item M041333 answering time distribution in groups of different ability level

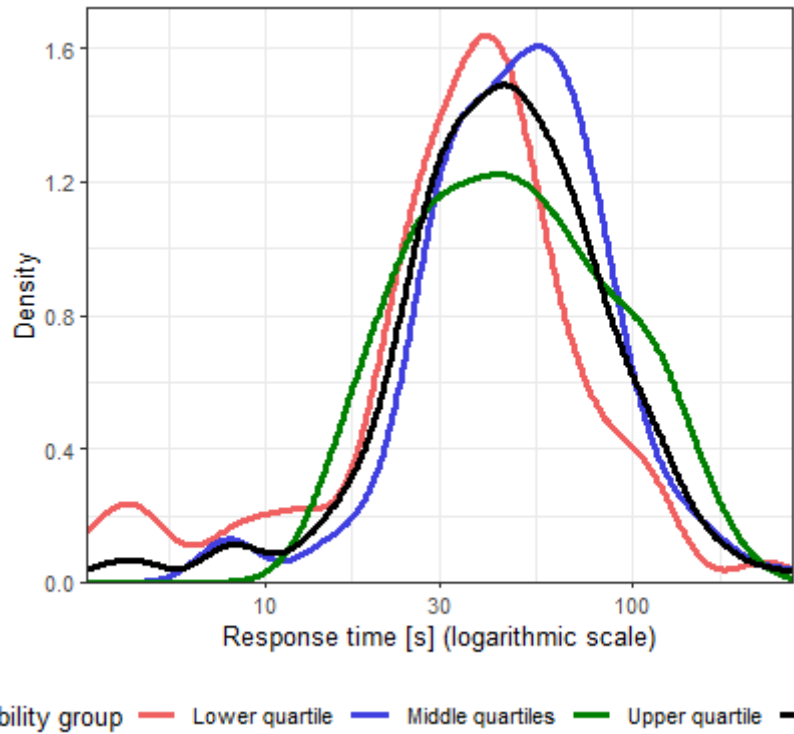


Table 2.19.5.1

Item M041333 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.30	25.80	37.51	51.27	231.78	3.50	0.81
Middle quartiles	7.37	32.97	48.42	67.95	273.13	3.87	0.59
Upper quartile	15.79	28.69	45.45	74.65	172.59	3.85	0.62
Overall	3.30	30.30	45.00	65.56	273.13	3.77	0.68

2.20.M890022 (LLM)

2.20.1. Item fit:

Graph 2.20.1.1

Item M890022 ICC and nonparametric trace line

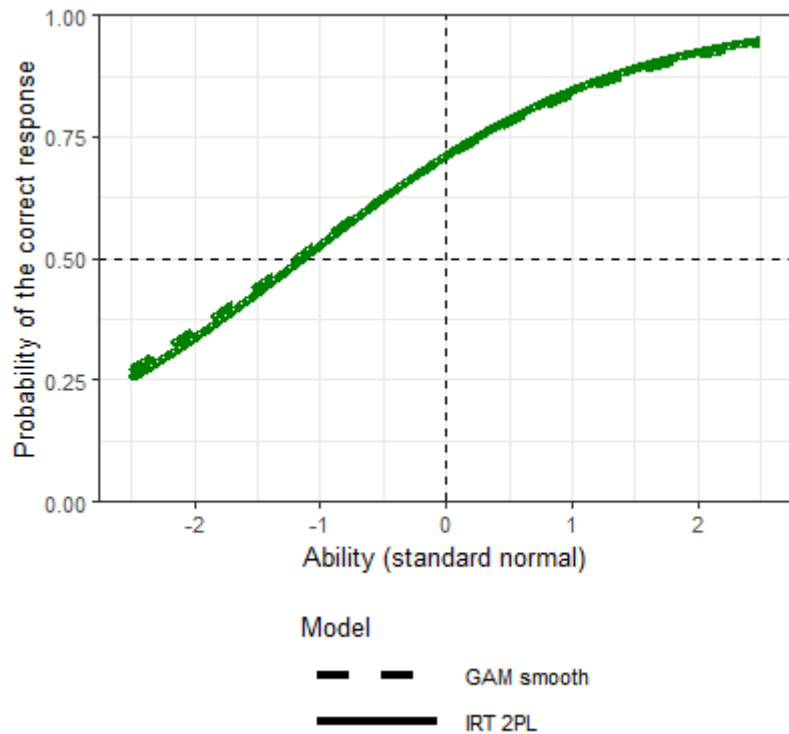


Table 2.20.1.1

Item M890022 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	69.0%	319	MC	0.33	0.20	0.79	-1.14	0.031	0.026

2.20.2. Gender DIF:

Table 2.20.2.1

Item M890022 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.26	0.877	1.000		0.001

2.20.3. Frequency of answers:

Table 2.20.3.1

Item M890022 answer frequency

Answer	Frequency	Percent
54	44	13.8%
56 (correct)	220	69.0%
58	32	10.0%
60	23	7.2%
Overall	319	100.0%

2.20.4. Distractors functioning:

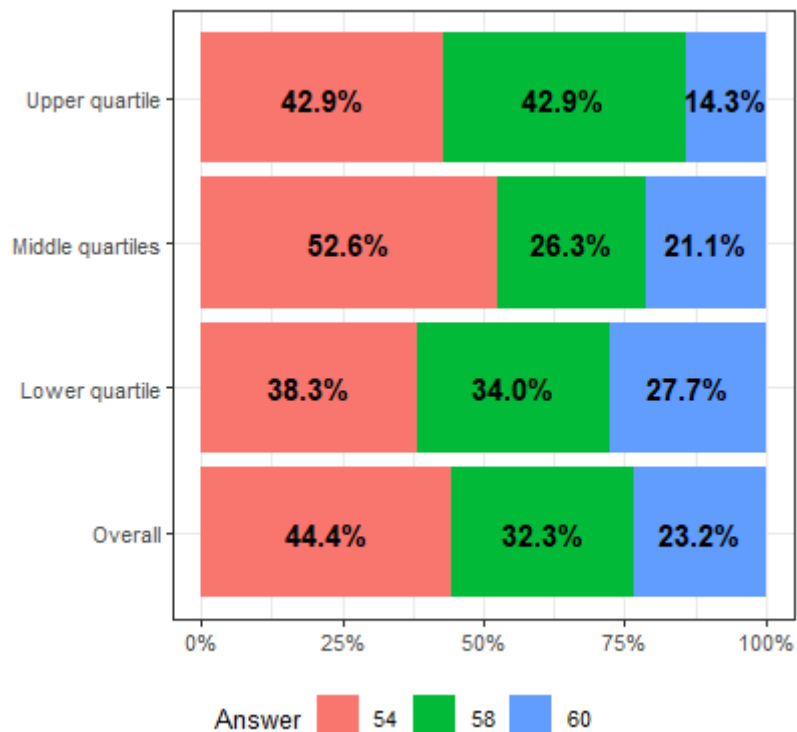
Table 2.20.4.1

Item M890022 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
54	18	20	6	44	38.3%	52.6%	42.9%	44.4%
58	16	10	6	32	34.0%	26.3%	42.9%	32.3%
60	13	8	2	23	27.7%	21.1%	14.3%	23.2%
Overall	47	38	14	99	100.0%	100.0%	100.0%	100.0%

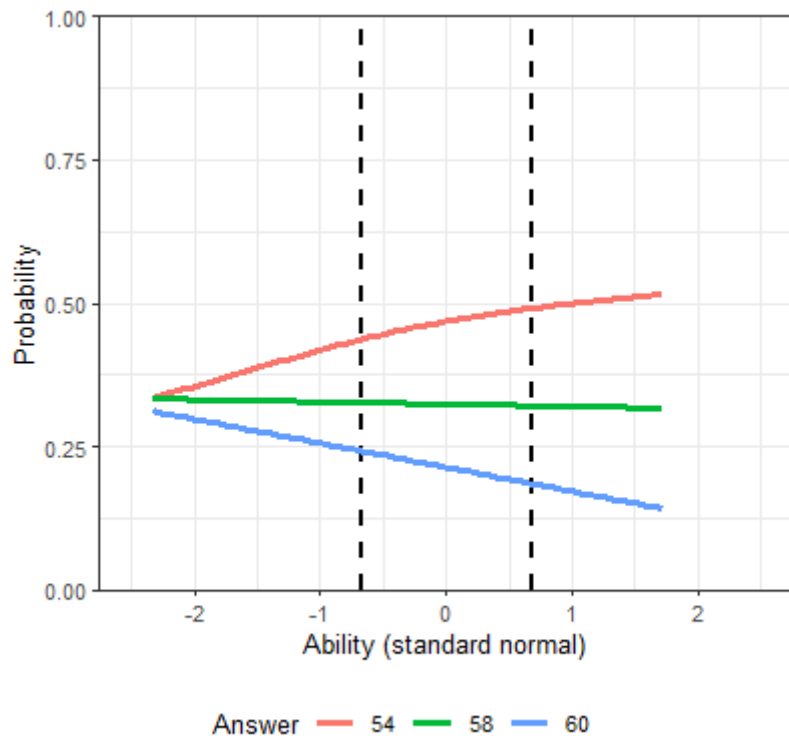
Graph 2.20.4.1

Item M890022 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.20.4.2

Item M890022 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.20.5. Answering time:

Graph 2.20.5.1

Item M890022 answering time distribution in groups of different ability level

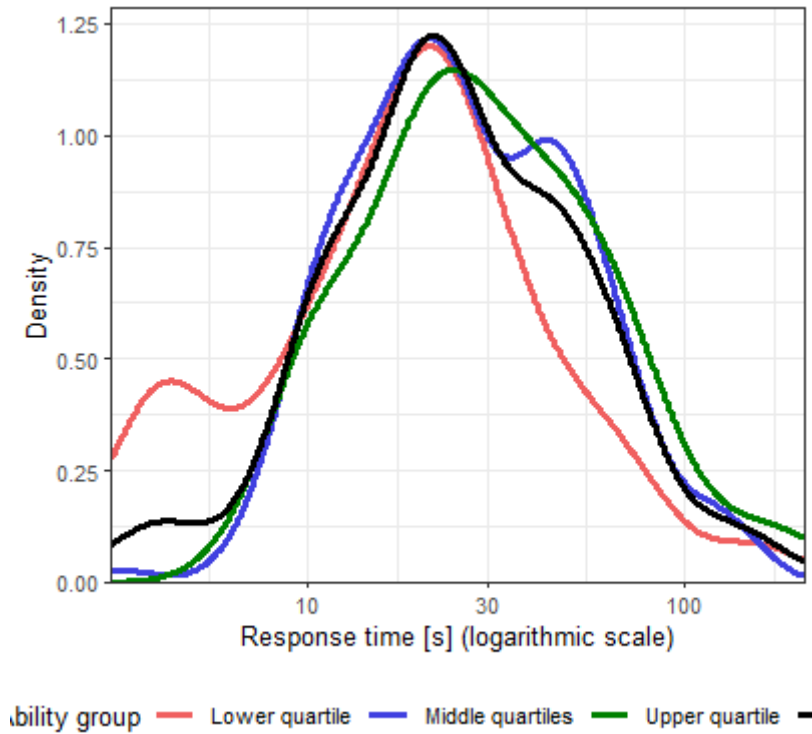


Table 2.20.5.1

Item M890022 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.04	11.18	20.16	30.01	159.90	2.89	0.89
Middle quartiles	3.19	16.50	25.34	44.81	141.91	3.27	0.70
Upper quartile	6.55	18.15	28.74	48.88	208.19	3.38	0.74
Overall	3.04	15.12	24.11	43.81	208.19	3.20	0.78

2.21.M061052 (TIMSS)

2.21.1. Item fit:

Graph 2.21.1.1

Item M061052 ICC and nonparametric trace line

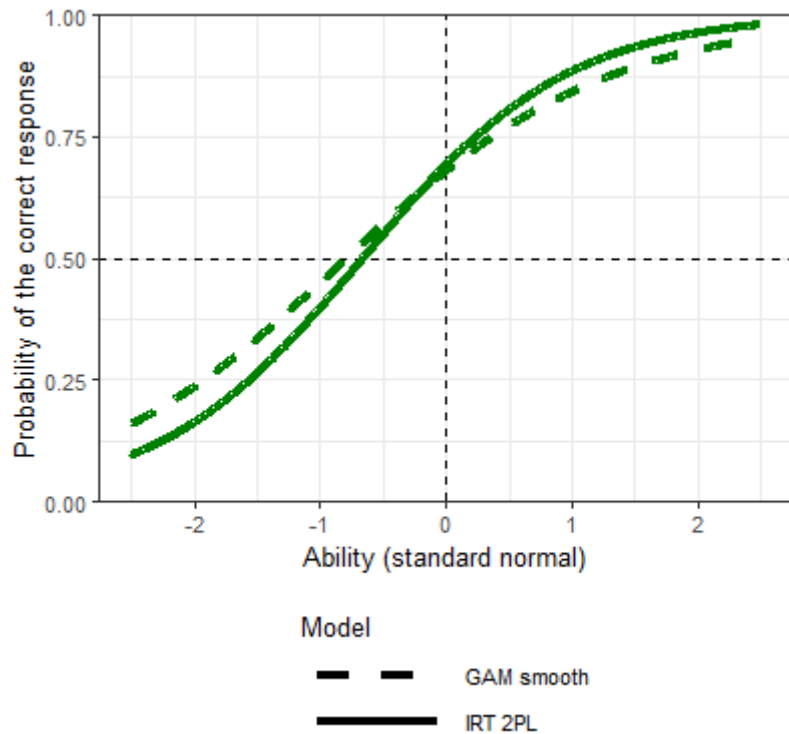


Table 2.21.1.1

Item M061052 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	66.3%	294	MC	0.40	0.48	1.22	-0.67	0.019	0.182	

2.21.2. Gender DIF:

Table 2.21.2.1

Item M061052 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.95	0.377	1.000		0.006

2.21.3. Frequency of answers:

Table 2.21.3.1

Item M061052 answer frequency

Answer	Frequency	Percent
$(12 + 2) \times 3$	15	5.1%
$(12 + 3) + (12 + 3)$	34	11.6%
$12 + (2 + 3)$	50	17.0%
$12 + (2 \times 3)$ (correct)	195	66.3%
Overall	294	100.0%

2.21.4. Distractors functioning:

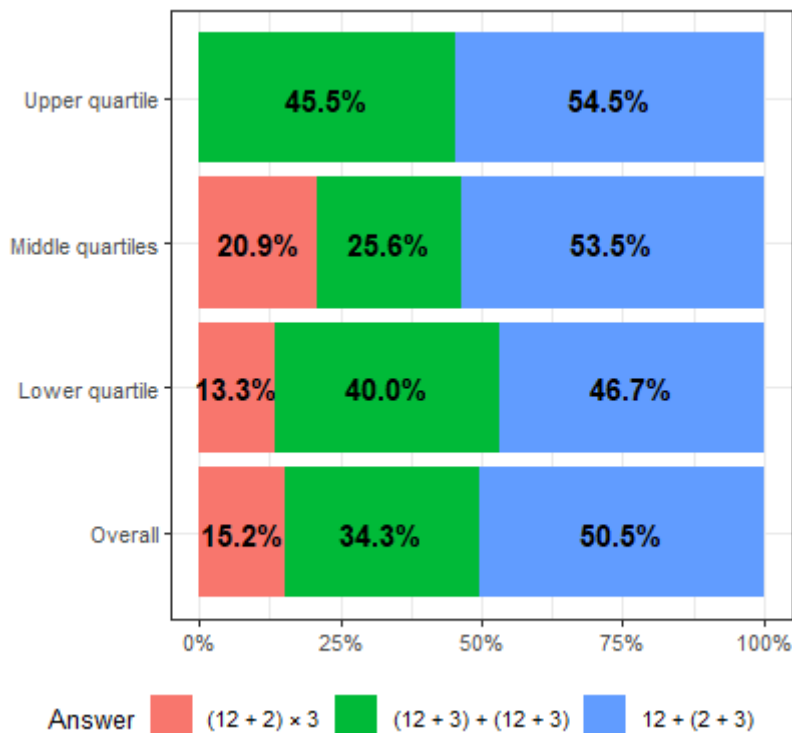
Table 2.21.4.1

Item M061052 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
$(12 + 2) \times 3$	6	9	0	15	13.3%	20.9%	0.0%	15.2%
$(12 + 3) + (12 + 3)$	18	11	5	34	40.0%	25.6%	45.5%	34.3%
$12 + (2 + 3)$	21	23	6	50	46.7%	53.5%	54.5%	50.5%
Overall	45	43	11	99	100.0%	100.0%	100.0%	100.0%

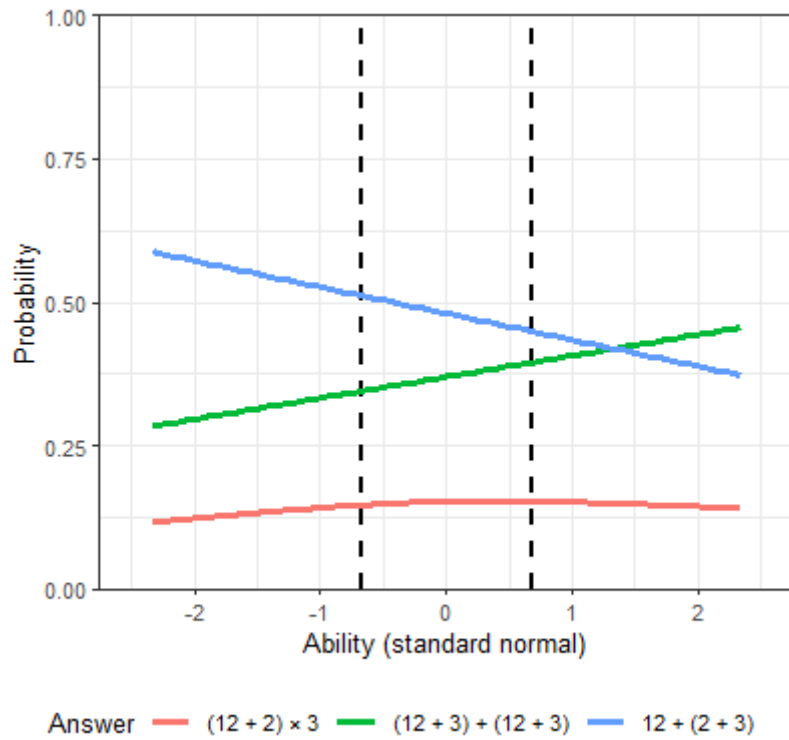
Graph 2.21.4.1

Item M061052 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.21.4.2

Item M061052 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.21.5. Answering time:

Graph 2.21.5.1

Item M061052 answering time distribution in groups of different ability level

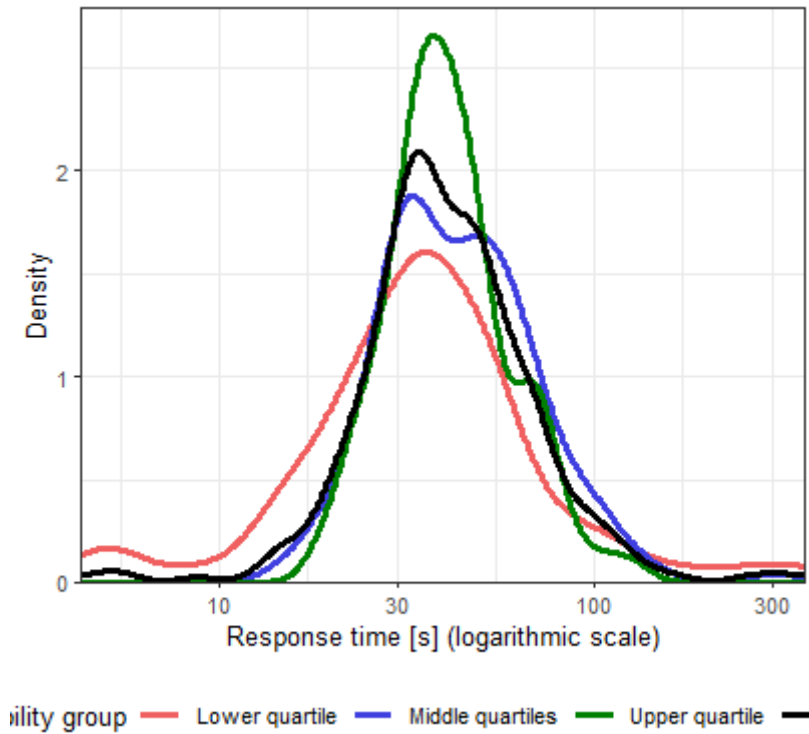


Table 2.21.5.1

Item M061052 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.30	23.88	34.72	49.09	366.81	3.55	0.76
Middle quartiles	14.87	31.27	41.48	58.84	307.43	3.78	0.48
Upper quartile	18.82	32.33	39.55	49.83	127.31	3.72	0.37
Overall	4.30	30.68	38.85	53.85	366.81	3.71	0.54

2.22.M061029 (TIMSS)

2.22.1. Item fit:

Graph 2.22.1.1

Item M061029 ICC and nonparametric trace line

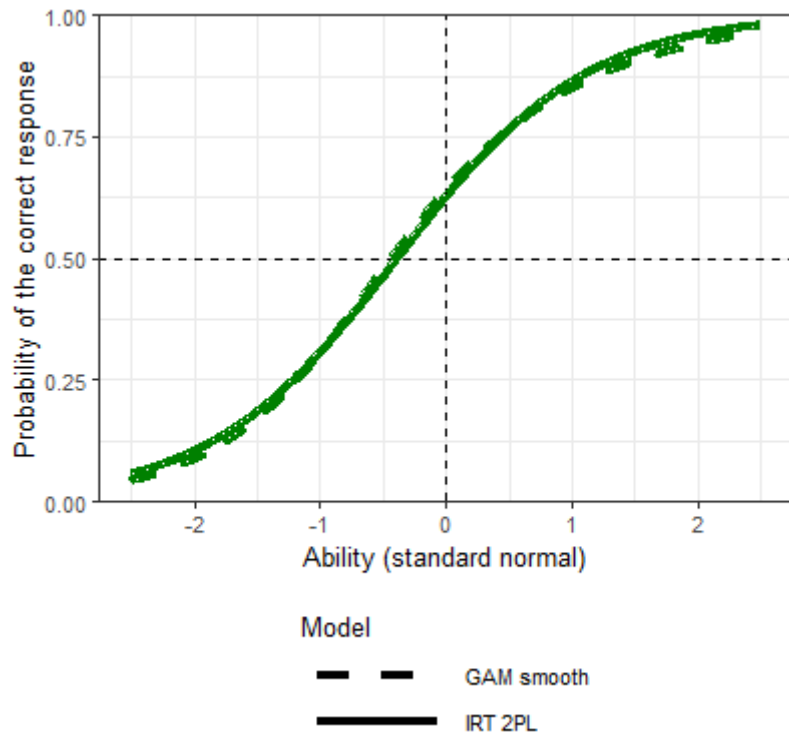


Table 2.22.1.1

Item M061029 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	58.9%	304	MC	0.49	0.53	1.33	-0.39	0.009	0.354

2.22.2. Gender DIF:

Table 2.22.2.1

Item M061029 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.04	0.981	1.000		0.000

2.22.3. Frequency of answers:

Table 2.22.3.1

Item M061029 answer frequency

Answer	Frequency	Percent
2708	47	15.5%
4733	43	14.1%
8726 (correct)	179	58.9%
9718	35	11.5%
Overall	304	100.0%

2.22.4. Distractors functioning:

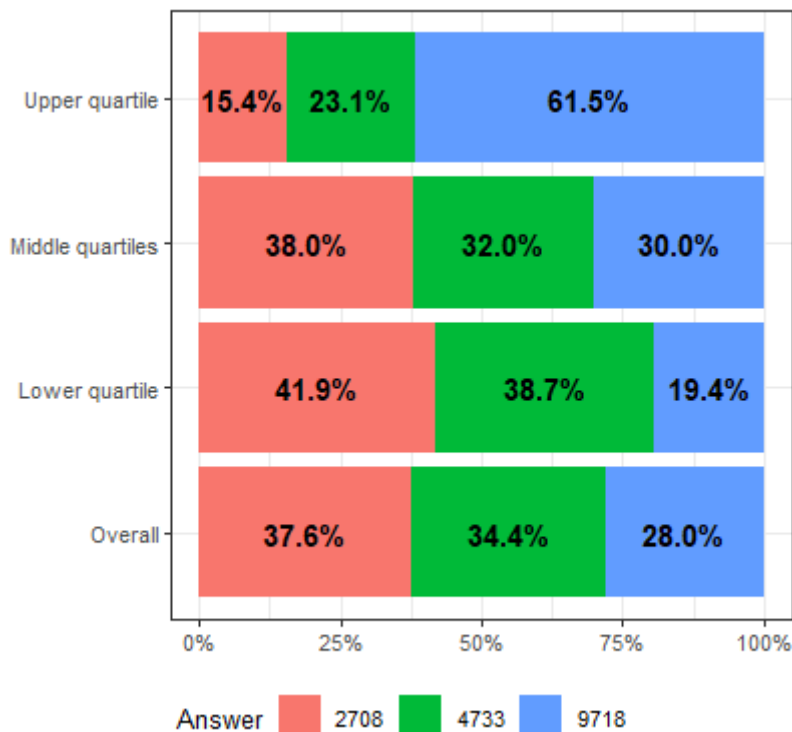
Table 2.22.4.1

Item M061029 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
2708	26	19	2	47	41.9%	38.0%	15.4%	37.6%
4733	24	16	3	43	38.7%	32.0%	23.1%	34.4%
9718	12	15	8	35	19.4%	30.0%	61.5%	28.0%
Overall	62	50	13	125	100.0%	100.0%	100.0%	100.0%

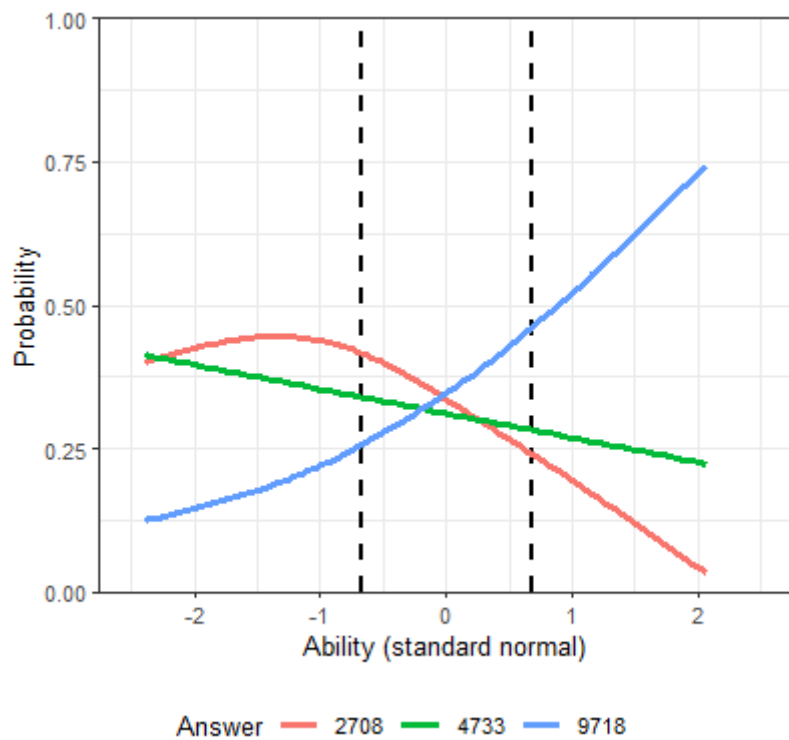
Graph 2.22.4.1

Item M061029 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.22.4.2

Item M061029 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.22.5. Answering time:

Graph 2.22.5.1

Item M061029 answering time distribution in groups of different ability level

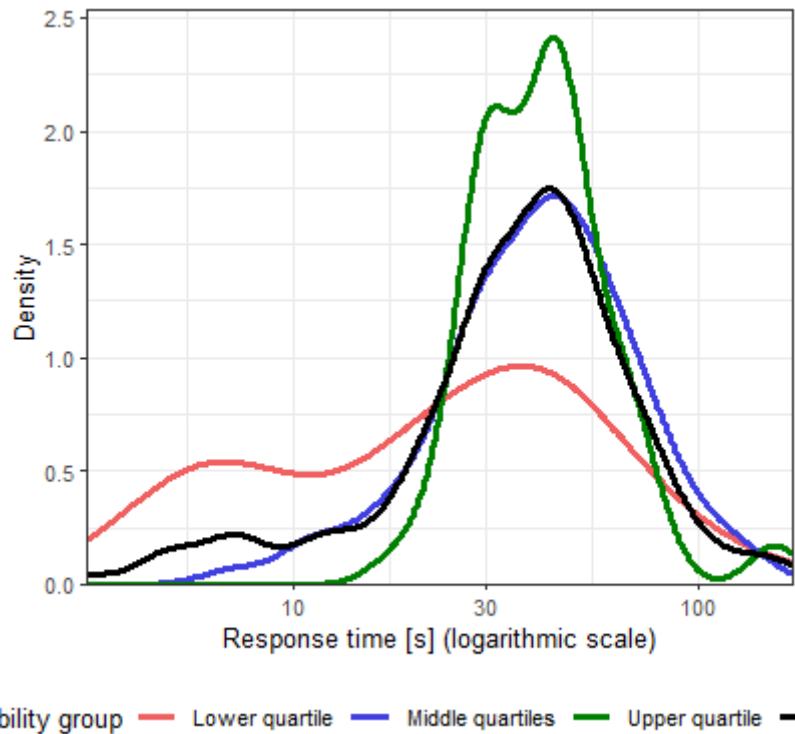


Table 2.22.5.1

Item M061029 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.11	10.04	25.38	45.61	170.81	3.11	0.96
Middle quartiles	6.73	28.49	41.17	56.59	146.18	3.68	0.57
Upper quartile	17.27	30.16	41.99	50.13	158.46	3.72	0.39
Overall	3.11	26.20	38.87	52.93	170.81	3.54	0.71

2.23.M041125 (TIMSS)

2.23.1. Item fit:

Graph 2.23.1.1

Item M041125 ICC and nonparametric trace line

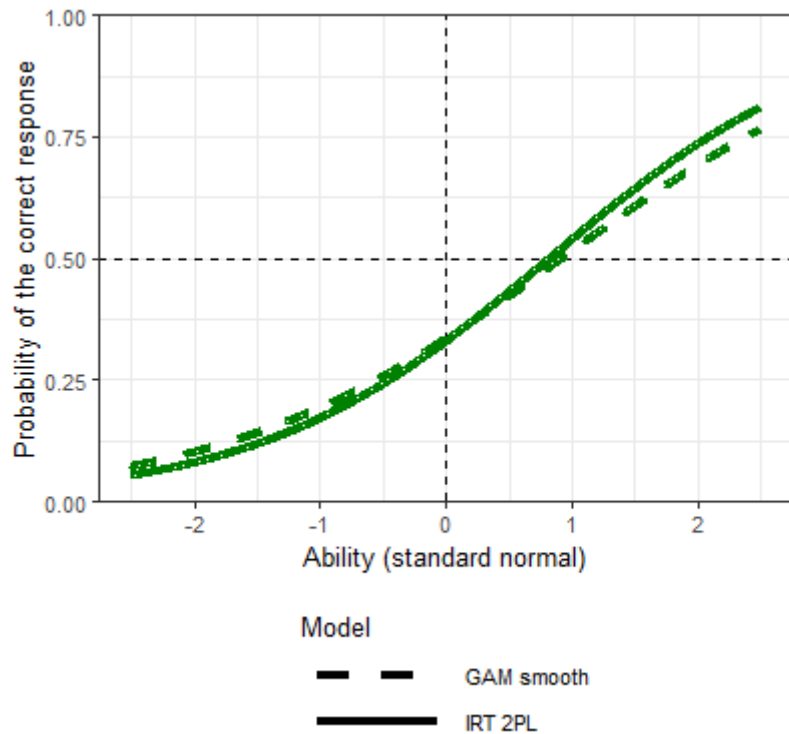


Table 2.23.1.1

Item M041125 parameters and fit statistics

					Corr. with latent ability estimates	IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	34.4%	306	MC	0.32	0.39	0.86	0.82	0.000	0.622

2.23.2. Gender DIF:

Table 2.23.2.1

Item M041125 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.06	0.969	1.000		0.000

2.23.3. Frequency of answers:

Table 2.23.3.1

Item M041125 answer frequency

Answer	Frequency	Percent
Pomnóż liczbę w kolumnie A przez 2.	34	11.1%
Pomnóż liczbę w kolumnie A przez 3 i odejmij 1.	114	37.4%
Pomnóż liczbę w kolumnie A przez nią samą i dodaj 1. (correct)	105	34.4%
Pomnóż liczbę w kolumnie A przez nią samą i odejmij 1.	52	17.0%
Overall	305	100.0%

2.23.4. Distractors functioning:

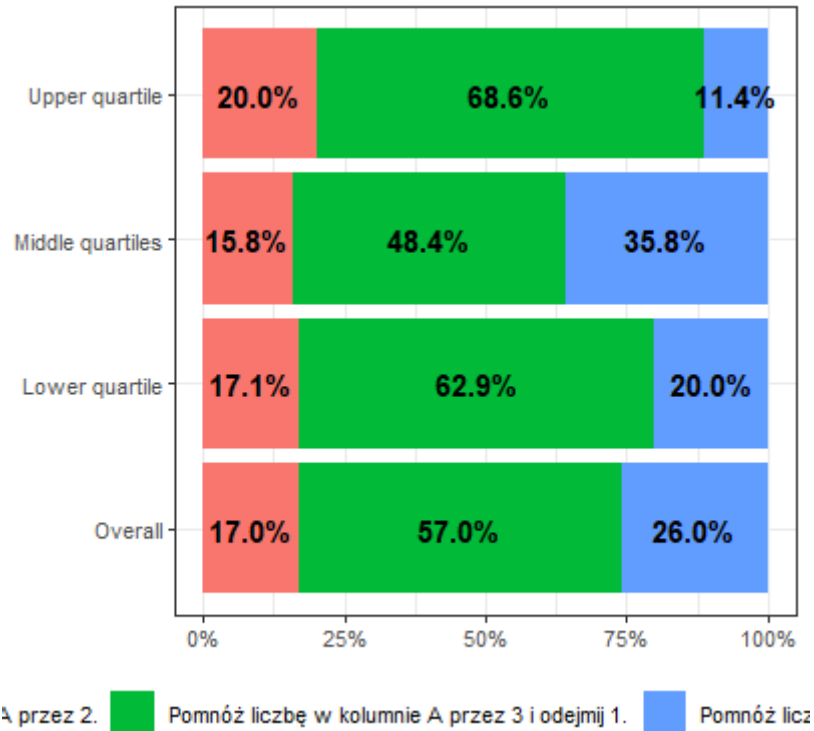
Table 2.23.4.1

Item M041125 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Pomnóż liczbę w kolumnie A przez 2.	12	15	7	34	17.1%	15.8%	20.0%	17.0%
Pomnóż liczbę w kolumnie A przez 3 i odejmij 1.	44	46	24	114	62.9%	48.4%	68.6%	57.0%
Pomnóż liczbę w kolumnie A przez nią samą i odejmij 1.	14	34	4	52	20.0%	35.8%	11.4%	26.0%
Overall	70	95	35	200	100.0%	100.0%	100.0%	100.0%

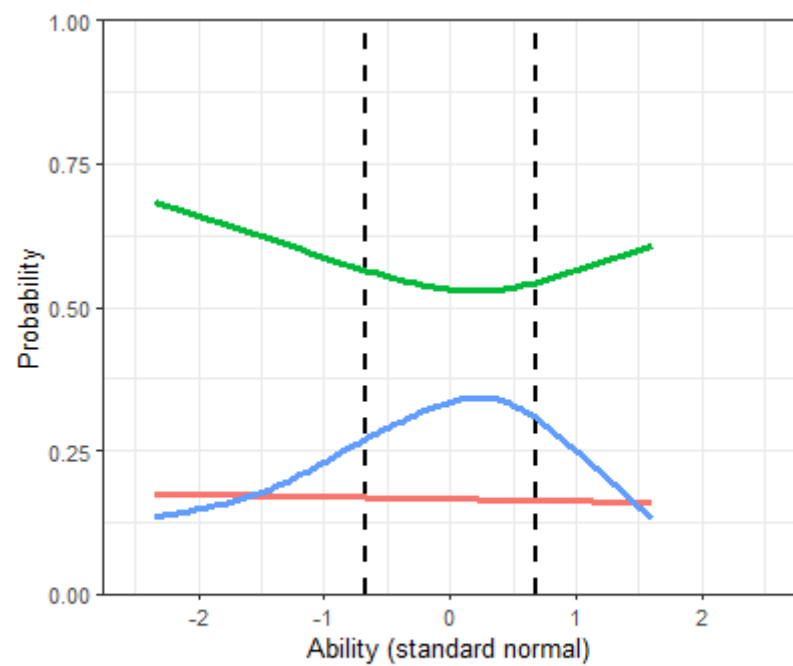
Graph 2.23.4.1

Item M041125 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.23.4.2

Item M041125 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



A przez 2. — Pomnóż liczbę w kolumnie A przez 3 i odejmij 1. — Pomnóż liczbę

2.23.5. Answering time:

Graph 2.23.5.1

Item M041125 answering time distribution in groups of different ability level

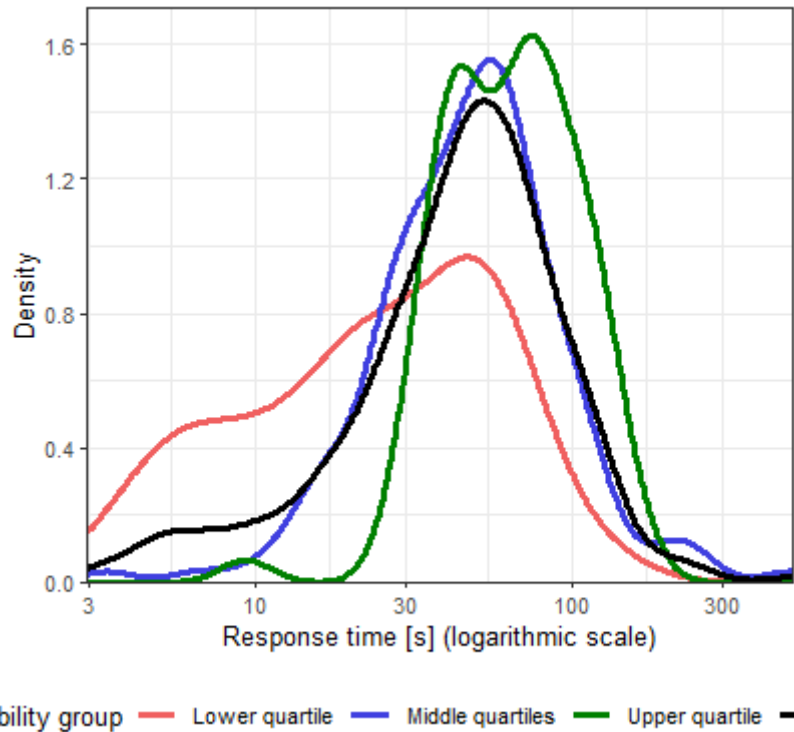


Table 2.23.5.1

Item M041125 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.98	11.26	27.27	50.36	134.07	3.15	0.92
Middle quartiles	3.43	31.15	50.05	67.35	496.99	3.86	0.68
Upper quartile	9.40	43.49	65.47	90.98	164.01	4.15	0.49
Overall	2.98	28.46	47.17	70.24	496.99	3.73	0.81

2.24.MP71219 (TIMSS)

2.24.1. Item fit:

Graph 2.24.1.1

Item MP71219 ICC and nonparametric trace line

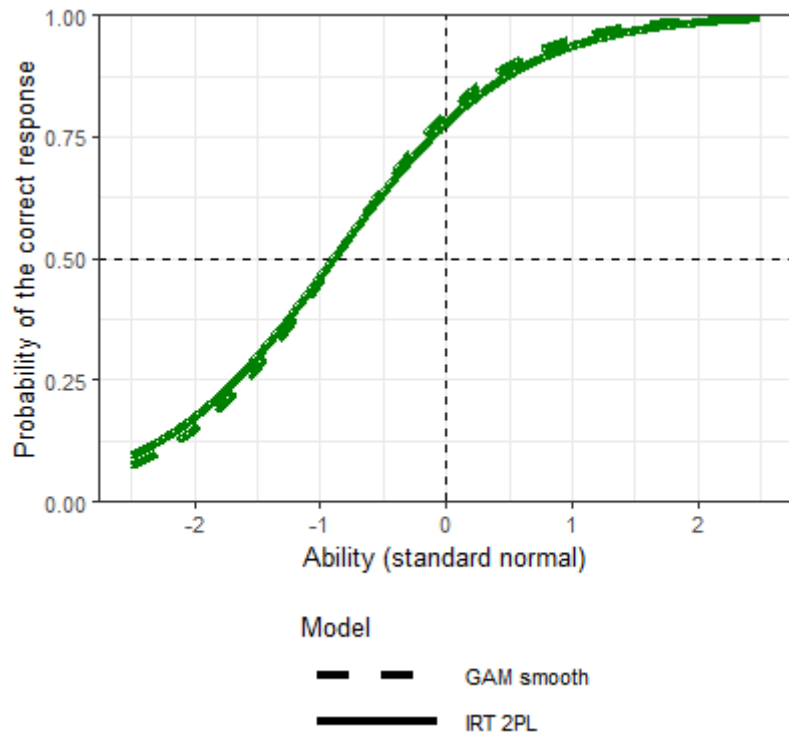


Table 2.24.1.1

Item MP71219 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	72.5%	299	MC	0.50	0.47	1.41	-0.89	0.000	0.822

2.24.2. Gender DIF:

Table 2.24.2.1

Item MP71219 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.47	0.792	1.000		0.001

2.24.3. Frequency of answers:

Table 2.24.3.1

Item MP71219 answer frequency

Answer	Frequency	Percent
167	20	6.7%
176	45	15.1%
716 (correct)	216	72.5%
761	17	5.7%
Overall	298	100.0%

2.24.4. Distractors functioning:

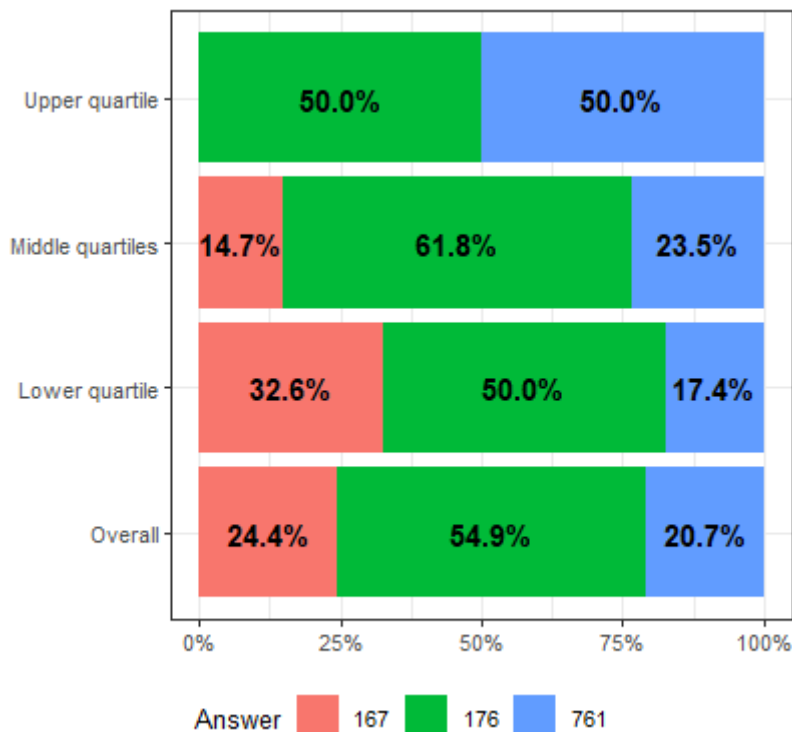
Table 2.24.4.1

Item MP71219 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
167	15	5	0	20	32.6%	14.7%	0.0%	24.4%
176	23	21	1	45	50.0%	61.8%	50.0%	54.9%
761	8	8	1	17	17.4%	23.5%	50.0%	20.7%
Overall	46	34	2	82	100.0%	100.0%	100.0%	100.0%

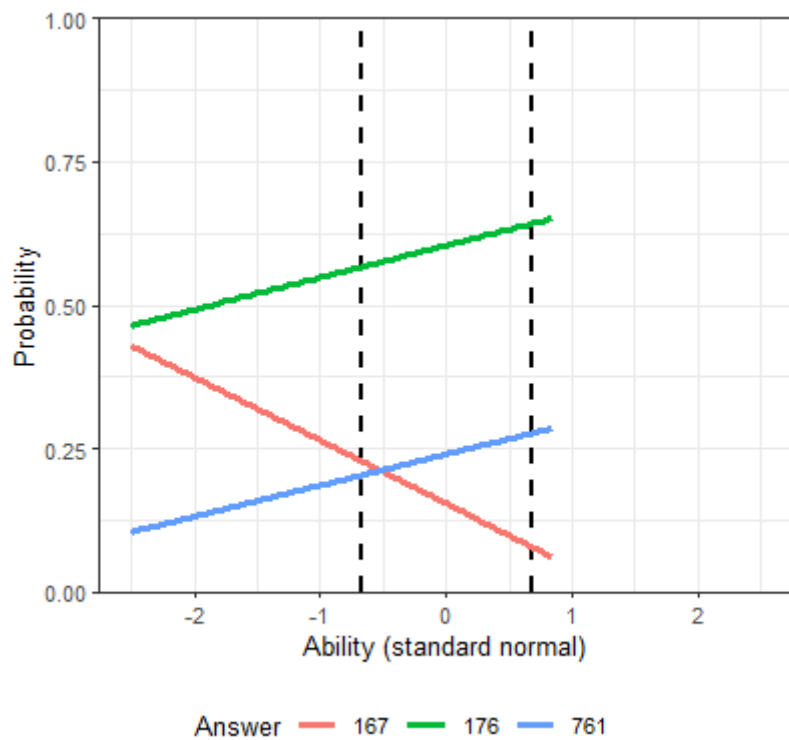
Graph 2.24.4.1

Item MP71219 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.24.4.2

Item MP71219 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.24.5. Answering time:

Graph 2.24.5.1

Item MP71219 answering time distribution in groups of different ability level

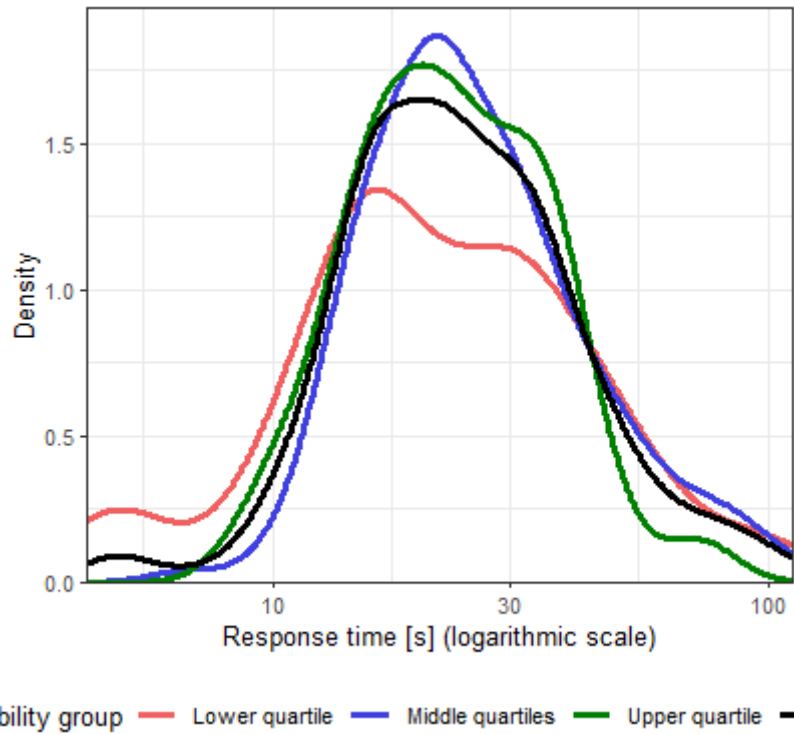


Table 2.24.5.1

Item MP71219 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.22	14.53	21.16	33.67	110.53	3.07	0.69
Middle quartiles	6.66	17.59	23.45	33.56	112.20	3.25	0.51
Upper quartile	8.72	16.42	21.99	33.04	73.78	3.13	0.45
Overall	4.22	16.52	23.07	33.56	112.20	3.17	0.55

2.25.M041298 (TIMSS)

2.25.1. Item fit:

Graph 2.25.1.1

Item M041298 ICC and nonparametric trace line

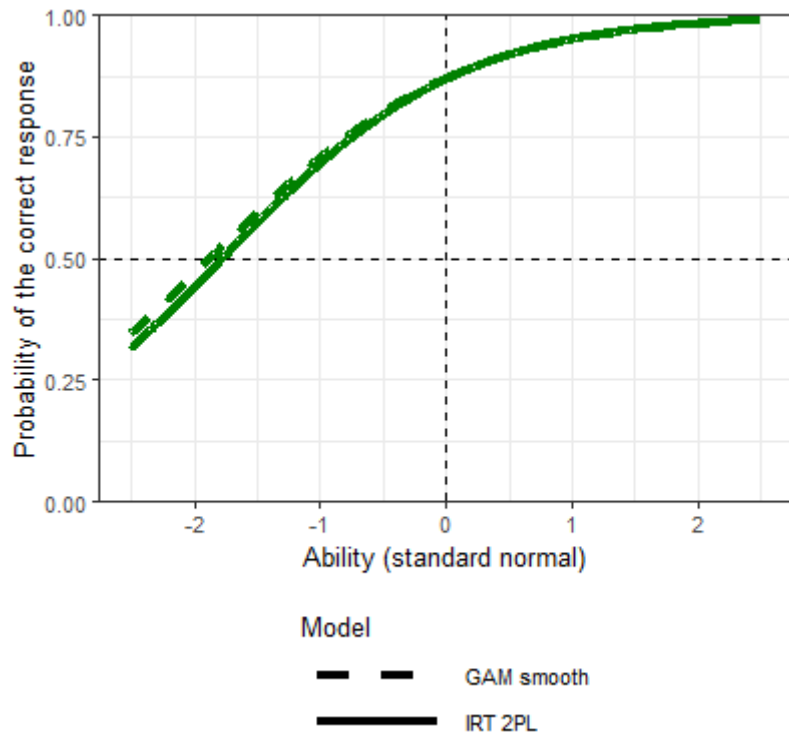


Table 2.25.1.1

Item M041298 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	83.2%	299	MC	0.33	0.39	1.06	-1.78	0.000	0.606

2.25.2. Gender DIF:

Table 2.25.2.1

Item M041298 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.97	0.616	1.000		0.004

2.25.3. Frequency of answers:

Table 2.25.3.1

Item M041298 answer frequency

Answer	Frequency	Percent
Rysunek A	27	9.1%
Rysunek B	6	2.0%
Rysunek C	17	5.7%
Rysunek D (correct)	248	83.2%
Overall	298	100.0%

2.25.4. Distractors functioning:

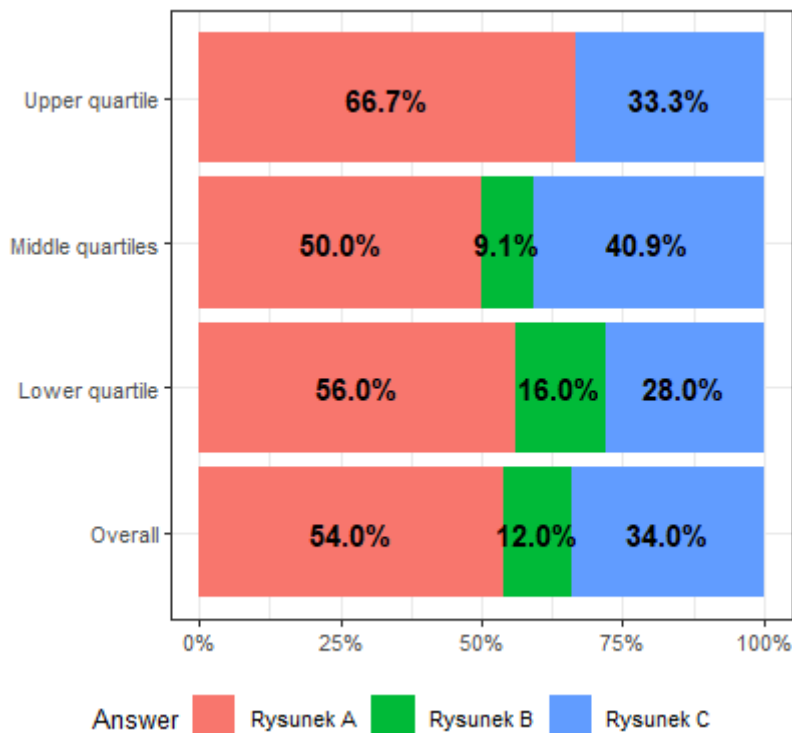
Table 2.25.4.1

Item M041298 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Rysunek A	14	11	2	27	56.0%	50.0%	66.7%	54.0%
Rysunek B	4	2	0	6	16.0%	9.1%	0.0%	12.0%
Rysunek C	7	9	1	17	28.0%	40.9%	33.3%	34.0%
Overall	25	22	3	50	100.0%	100.0%	100.0%	100.0%

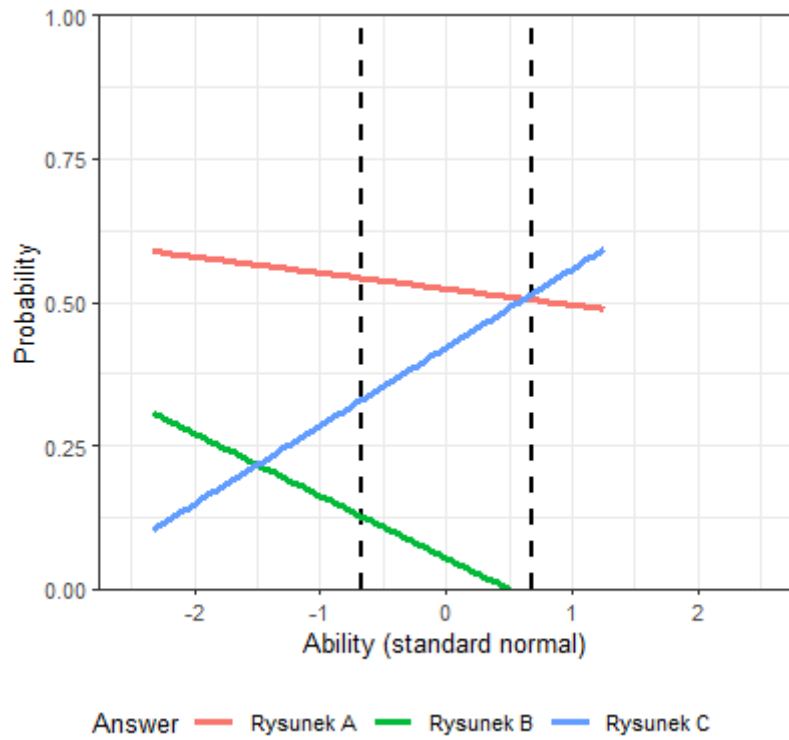
Graph 2.25.4.1

Item M041298 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.25.4.2

Item M041298 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.25.5. Answering time:

Graph 2.25.5.1

Item M041298 answering time distribution in groups of different ability level

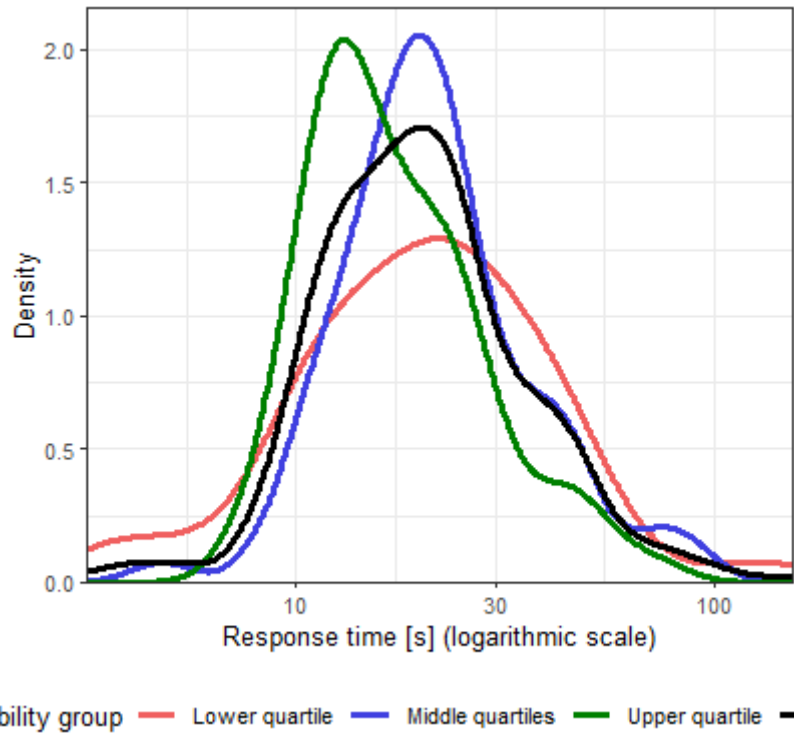


Table 2.25.5.1

Item M041298 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.17	12.33	21.35	32.63	153.81	2.99	0.71
Middle quartiles	4.38	15.49	20.44	27.34	96.24	3.06	0.53
Upper quartile	7.59	12.26	15.44	23.37	72.93	2.85	0.48
Overall	3.17	13.48	19.19	26.96	153.81	2.99	0.57

2.26.M100026 (LLM)

2.26.1. Item fit:

Graph 2.26.1.1

Item M100026 ICC and nonparametric trace line

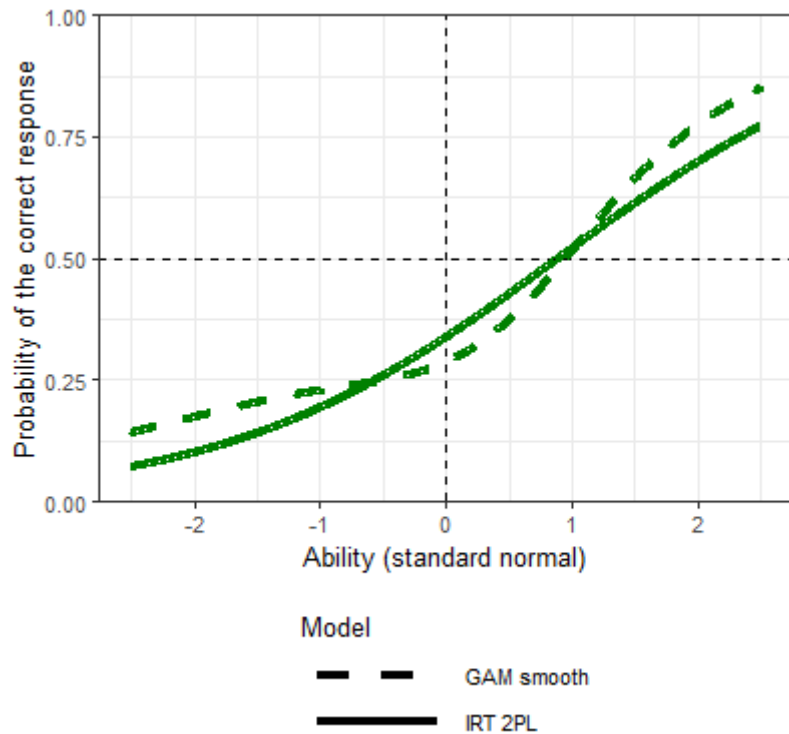


Table 2.26.1.1

Item M100026 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	35.9%	304	MC	0.32	0.27	0.76	0.88	0.035	0.011

2.26.2. Gender DIF:

Table 2.26.2.1

Item M100026 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.44	0.802	1.000		0.001

2.26.3. Frequency of answers:

Table 2.26.3.1

Item M100026 answer frequency

Answer	Frequency	Percent
6	41	13.5%
8	104	34.2%
10 (correct)	109	35.9%
12	50	16.4%
Overall	304	100.0%

2.26.4. Distractors functioning:

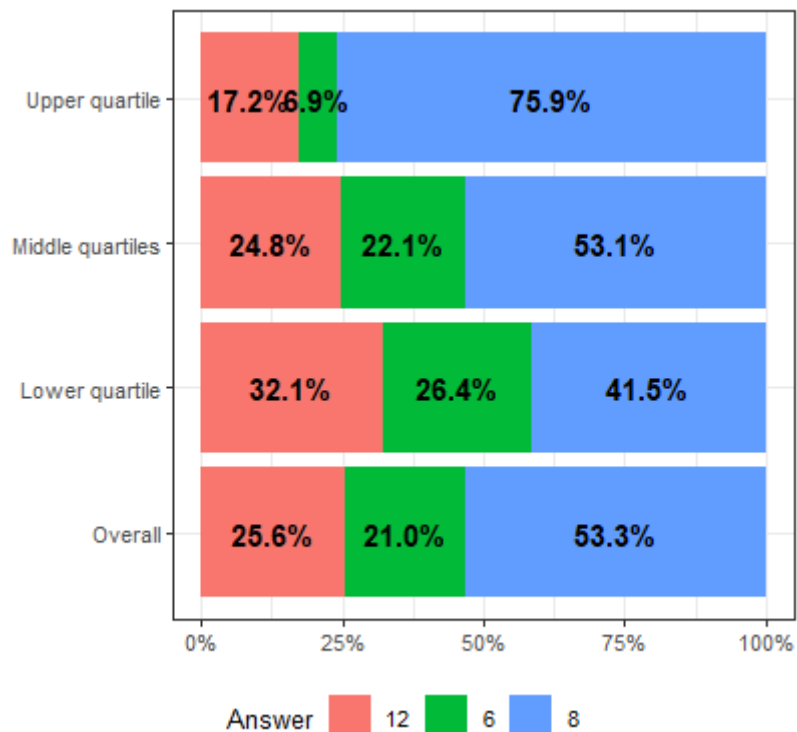
Table 2.26.4.1

Item M100026 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
12	17	28	5	50	32.1%	24.8%	17.2%	25.6%
6	14	25	2	41	26.4%	22.1%	6.9%	21.0%
8	22	60	22	104	41.5%	53.1%	75.9%	53.3%
Overall	53	113	29	195	100.0%	100.0%	100.0%	100.0%

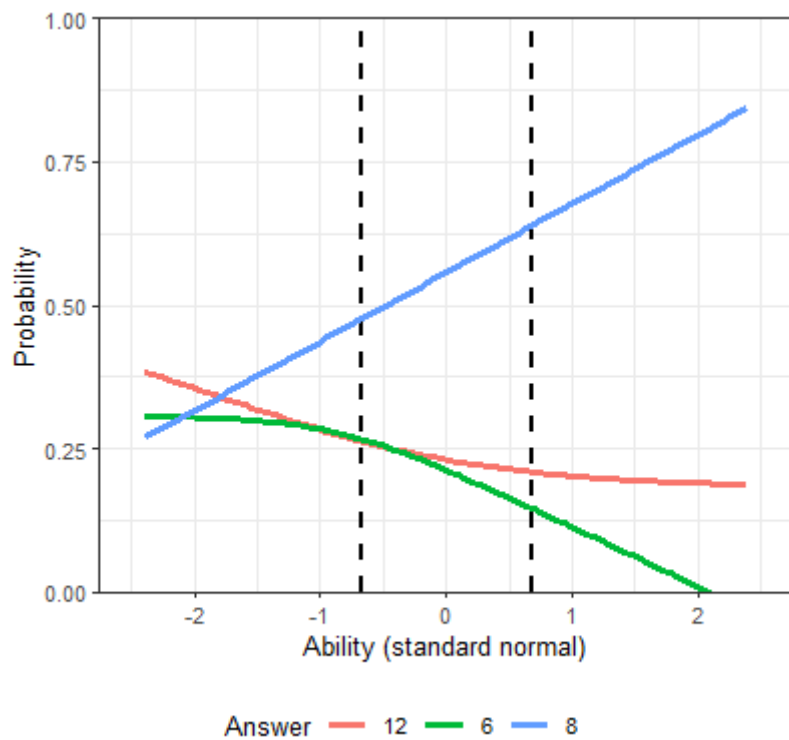
Graph 2.26.4.1

Item M100026 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.26.4.2

Item M100026 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.26.5. Answering time:

Graph 2.26.5.1

Item M100026 answering time distribution in groups of different ability level

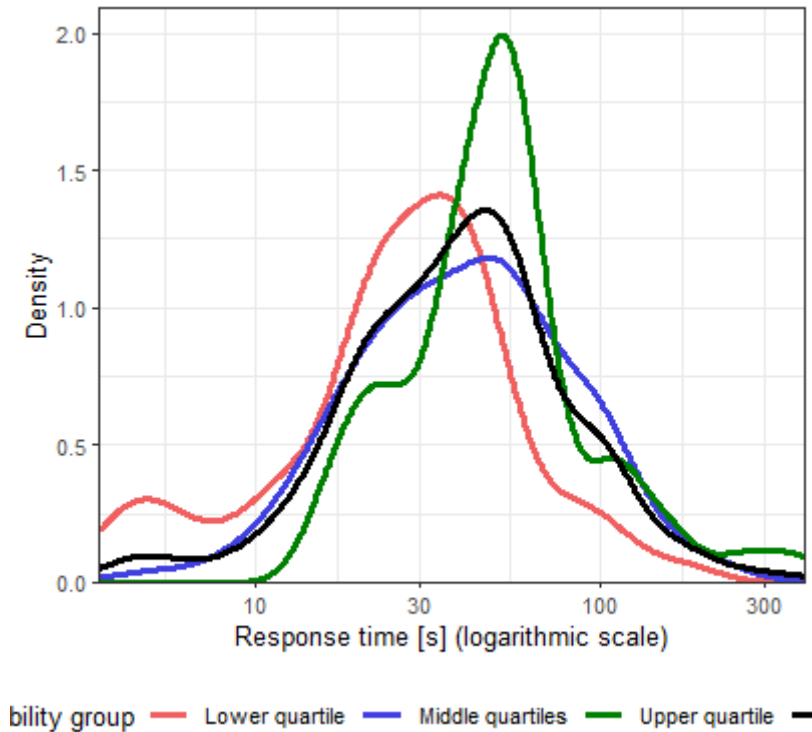


Table 2.26.5.1

Item M100026 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.55	18.79	29.54	41.58	175.80	3.26	0.81
Middle quartiles	4.53	24.08	40.99	63.56	247.47	3.69	0.72
Upper quartile	14.80	34.70	49.98	62.46	391.16	3.91	0.65
Overall	3.55	24.01	40.27	59.87	391.16	3.65	0.76

2.27.M061274 (TIMSS)

2.27.1. Item fit:

Graph 2.27.1.1

Item M061274 ICC and nonparametric trace line

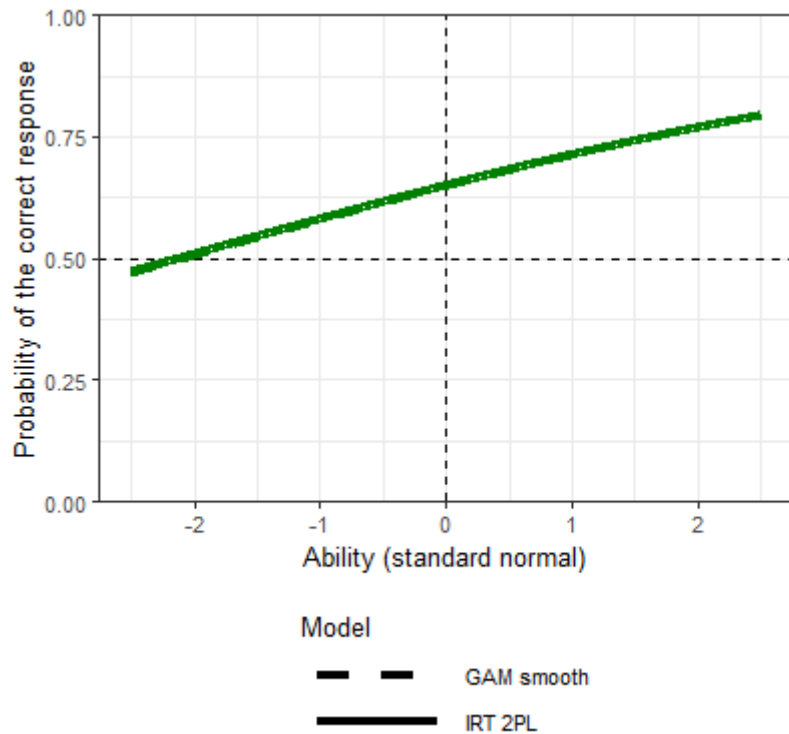


Table 2.27.1.1

Item M061274 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	64.5%	304	MC	0.14	0.17	0.29	-2.13	0.000	0.701	

2.27.2. Gender DIF:

Table 2.27.2.1

Item M061274 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.49	0.475	1.000		0.004

2.27.3. Frequency of answers:

Table 2.27.3.1

Item M061274 answer frequency

Answer	Frequency	Percent
13	11	3.6%
14	23	7.6%
134 (correct)	196	64.5%
149	74	24.3%
Overall	304	100.0%

2.27.4. Distractors functioning:

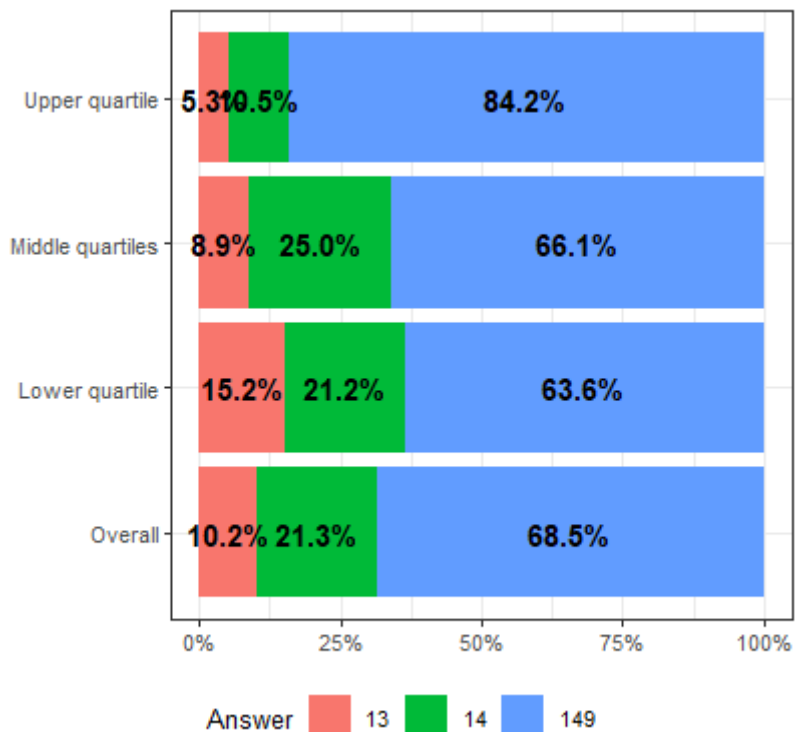
Table 2.27.4.1

Item M061274 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
13	5	5	1	11	15.2%	8.9%	5.3%	10.2%
14	7	14	2	23	21.2%	25.0%	10.5%	21.3%
149	21	37	16	74	63.6%	66.1%	84.2%	68.5%
Overall	33	56	19	108	100.0%	100.0%	100.0%	100.0%

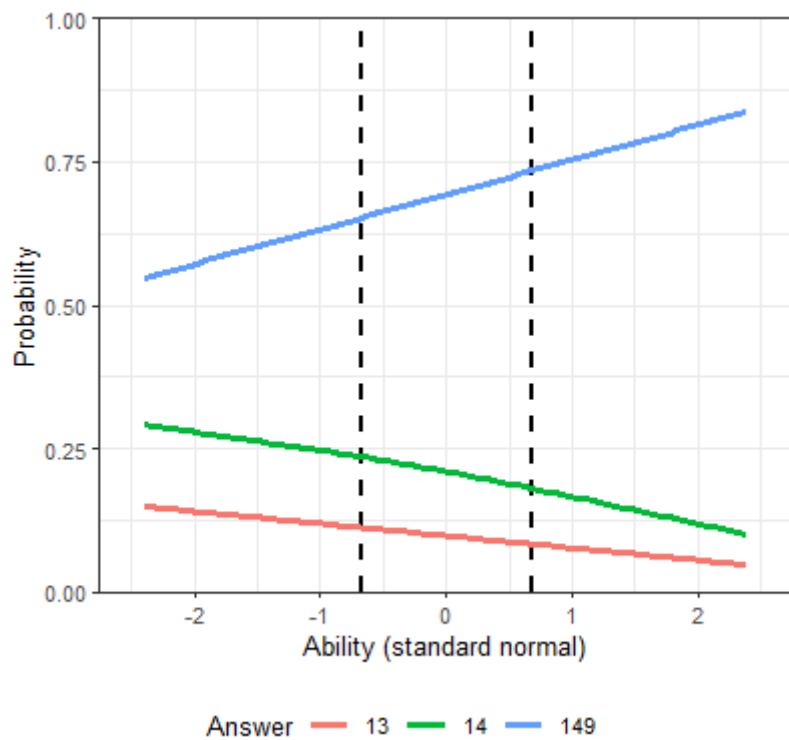
Graph 2.27.4.1

Item M061274 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.27.4.2

Item M061274 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.27.5. Answering time:

Graph 2.27.5.1

Item M061274 answering time distribution in groups of different ability level

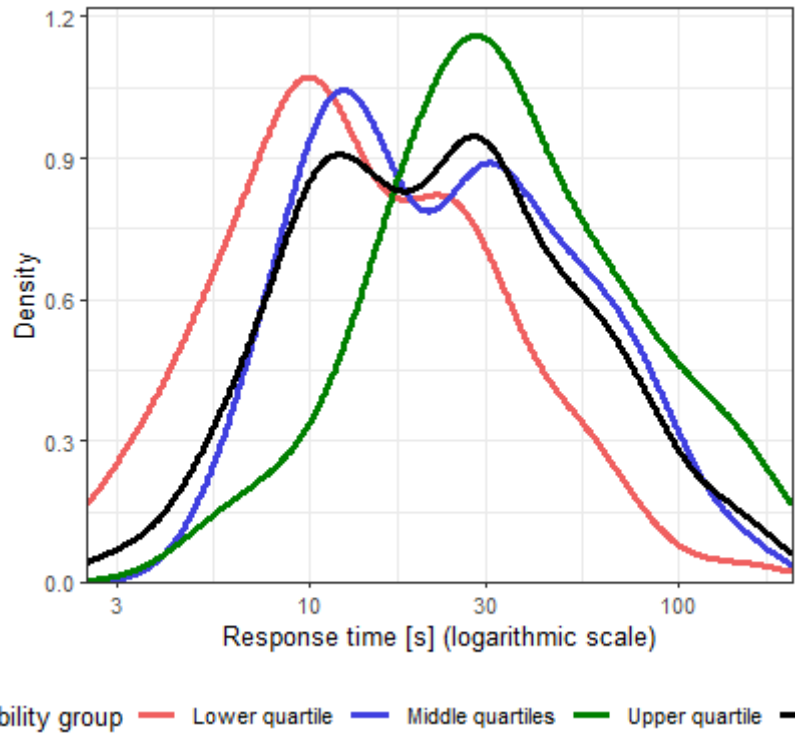


Table 2.27.5.1

Item M061274 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.50	8.28	11.43	24.69	148.68	2.63	0.84
Middle quartiles	5.08	11.91	23.98	42.44	160.67	3.15	0.81
Upper quartile	5.02	19.65	30.83	57.53	202.82	3.51	0.81
Overall	2.50	11.18	22.91	40.24	202.82	3.10	0.87

2.28.M061207 (TIMSS)

2.28.1. Item fit:

Graph 2.28.1.1

Item M061207 ICC and nonparametric trace line

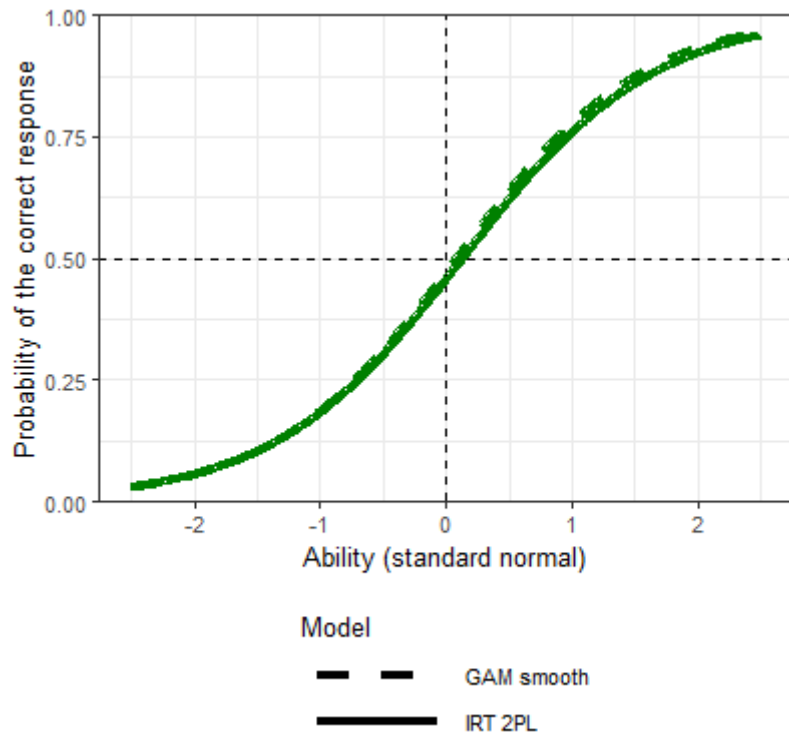


Table 2.28.1.1

Item M061207 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	48.0%	299	MC	0.50	0.45	1.32	0.13	0.015	0.255

2.28.2. Gender DIF:

Table 2.28.2.1

Item M061207 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.73	0.155	1.000		0.010

2.28.3. Frequency of answers:

Table 2.28.3.1

Item M061207 answer frequency

Answer	Frequency	Percent
3 (correct)	143	48.0%
3,5	88	29.5%
5,5	59	19.8%
7	8	2.7%
Overall	298	100.0%

2.28.4. Distractors functioning:

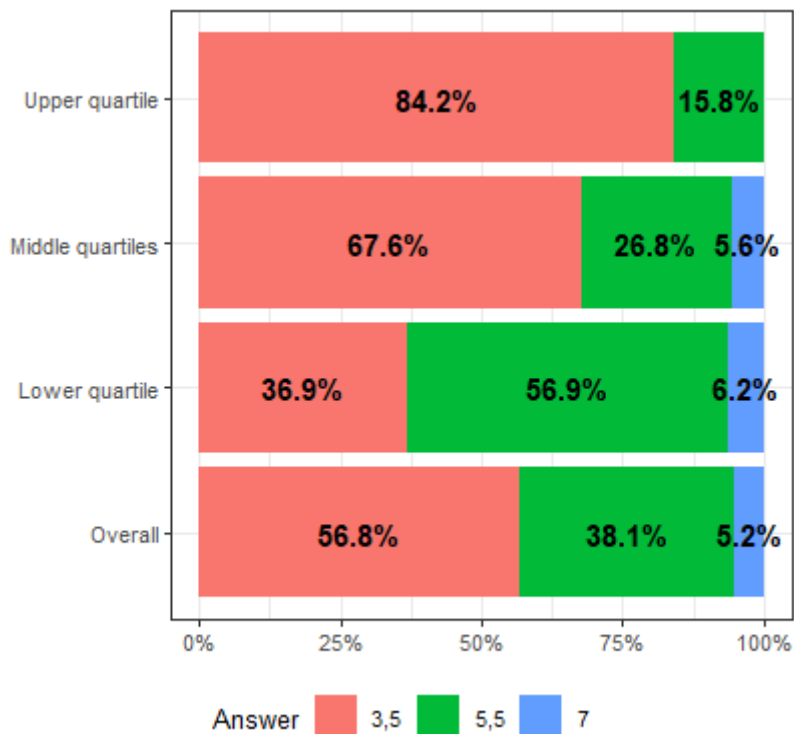
Table 2.28.4.1

Item M061207 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
3,5	24	48	16	88	36.9%	67.6%	84.2%	56.8%
5,5	37	19	3	59	56.9%	26.8%	15.8%	38.1%
7	4	4	0	8	6.2%	5.6%	0.0%	5.2%
Overall	65	71	19	155	100.0%	100.0%	100.0%	100.0%

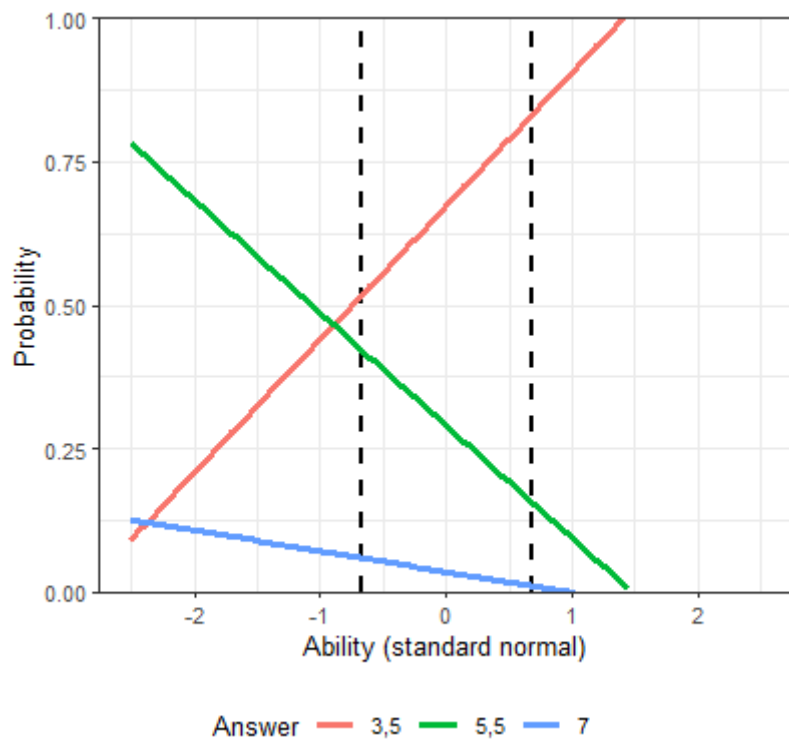
Graph 2.28.4.1

Item M061207 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.28.4.2

Item M061207 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.28.5. Answering time:

Graph 2.28.5.1

Item M061207 answering time distribution in groups of different ability level

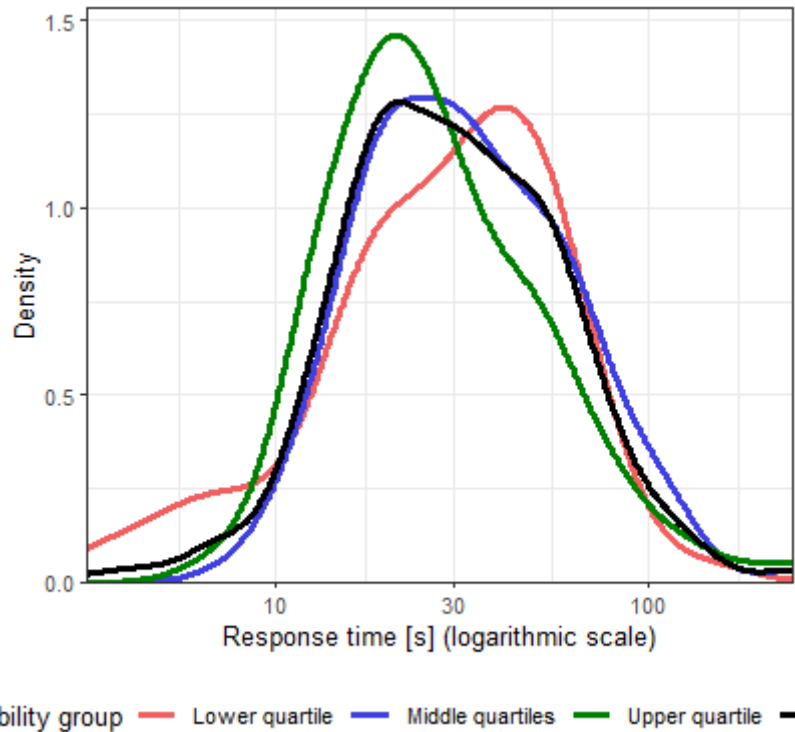


Table 2.28.5.1

Item M061207 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.13	18.07	31.40	48.21	143.72	3.31	0.75
Middle quartiles	7.43	20.32	30.73	51.72	242.25	3.47	0.63
Upper quartile	6.99	17.28	23.81	40.08	241.55	3.30	0.66
Overall	3.13	18.49	29.06	48.84	242.25	3.39	0.67

2.29.M100010 (LLM)

2.29.1. Item fit:

Graph 2.29.1.1

Item M100010 ICC and nonparametric trace line

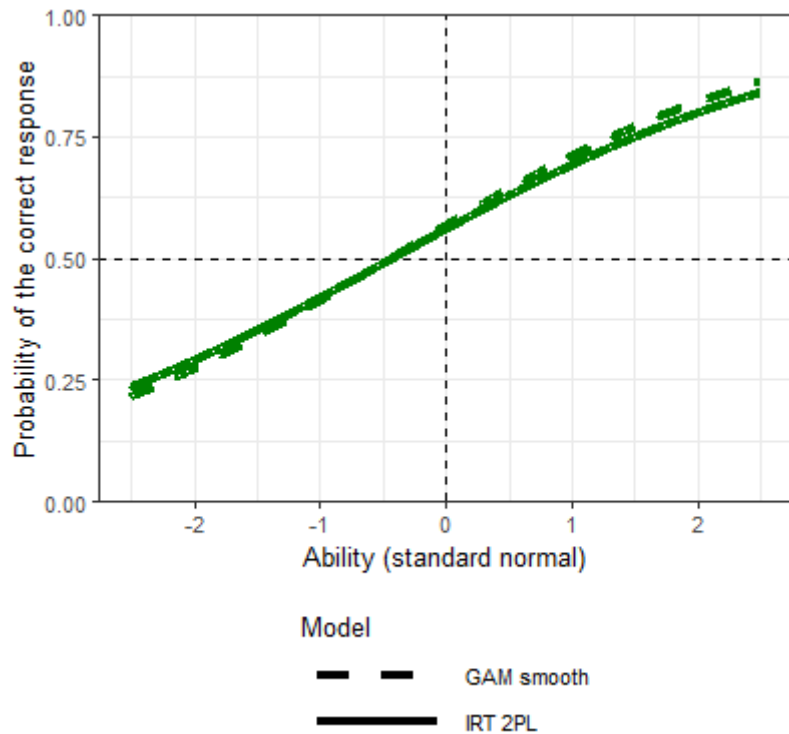


Table 2.29.1.1

Item M100010 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	55.4%	299	MC	0.29	0.19	0.57	-0.43	0.000	0.581

2.29.2. Gender DIF:

Table 2.29.2.1

Item M100010 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
5.12	0.077	1.000		0.014

2.29.3. Frequency of answers:

Table 2.29.3.1

Item M100010 answer frequency

Answer	Frequency	Percent
12 (correct)	165	55.4%
16	123	41.3%
24	8	2.7%
48	2	0.7%
Overall	298	100.0%

2.29.4. Distractors functioning:

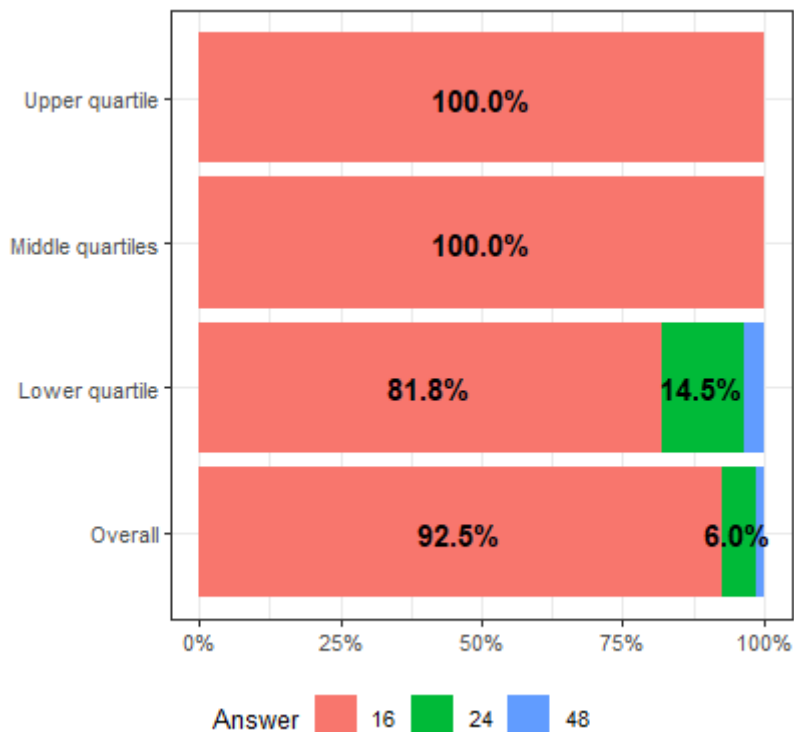
Table 2.29.4.1

Item M100010 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
16	45	62	16	123	81.8%	100.0%	100.0%	92.5%
24	8	0	0	8	14.5%	0.0%	0.0%	6.0%
48	2	0	0	2	3.6%	0.0%	0.0%	1.5%
Overall	55	62	16	133	100.0%	100.0%	100.0%	100.0%

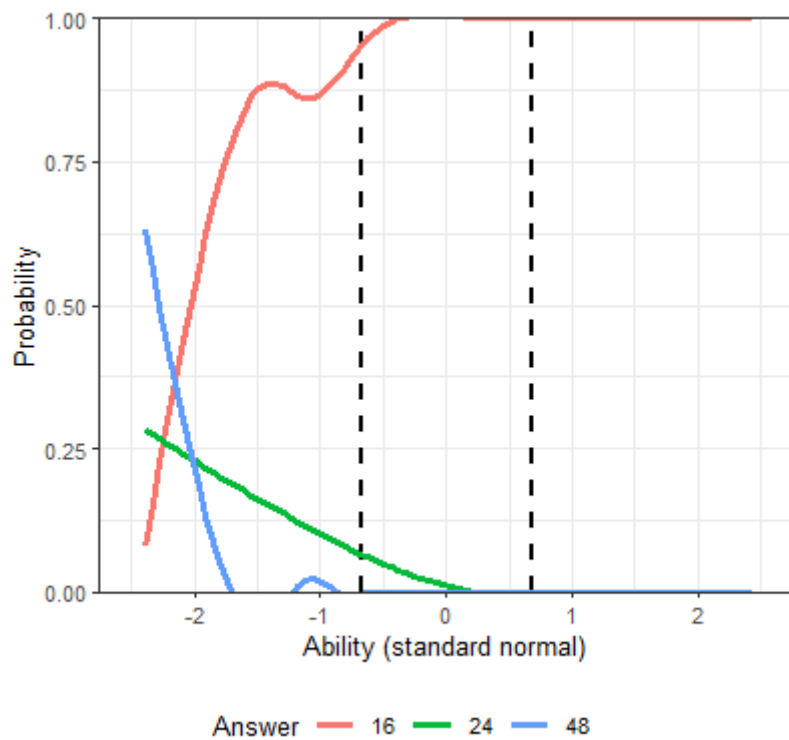
Graph 2.29.4.1

Item M100010 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.29.4.2

Item M100010 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.29.5. Answering time:

Graph 2.29.5.1

Item M100010 answering time distribution in groups of different ability level

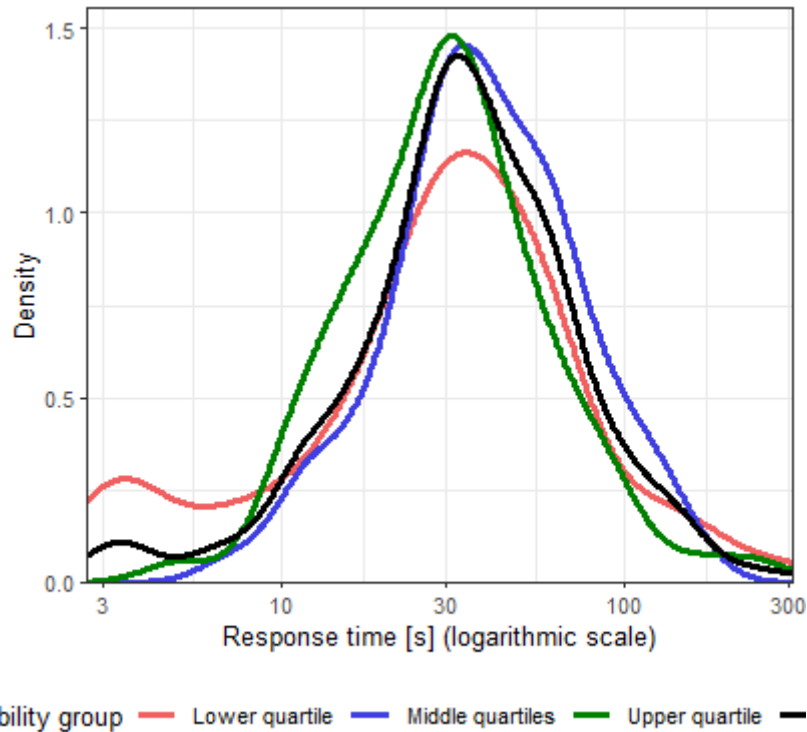


Table 2.29.5.1

Item M100010 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.71	18.11	30.86	53.15	307.65	3.32	1.01
Middle quartiles	6.51	26.60	38.40	59.05	173.92	3.65	0.65
Upper quartile	5.03	20.20	30.60	45.72	241.69	3.42	0.68
Overall	2.71	22.90	33.79	55.52	307.65	3.50	0.79

2.30.MP71021 (TIMSS)

2.30.1. Item fit:

Graph 2.30.1.1

Item MP71021 ICC and nonparametric trace line

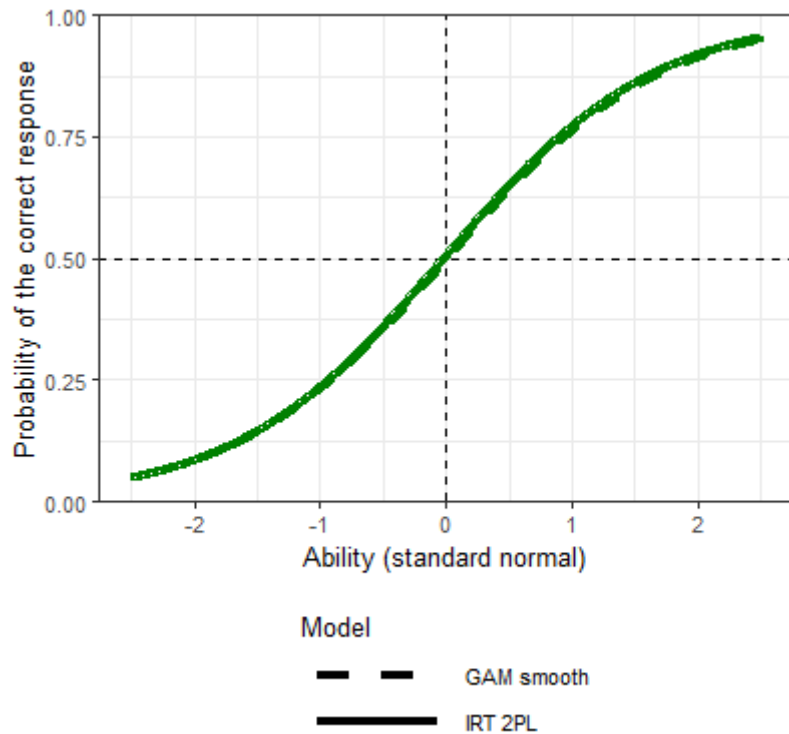


Table 2.30.1.1

Item MP71021 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	51.7%	294	MC	0.49	0.47	1.20	-0.02	0.000	0.538

2.30.2. Gender DIF:

Table 2.30.2.1

Item MP71021 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.63	0.730	1.000		0.002

2.30.3. Frequency of answers:

Table 2.30.3.1

Item MP71021 answer frequency

Answer	Frequency	Percent
18	74	25.2%
19 (correct)	152	51.7%
20	18	6.1%
24	50	17.0%
Overall	294	100.0%

2.30.4. Distractors functioning:

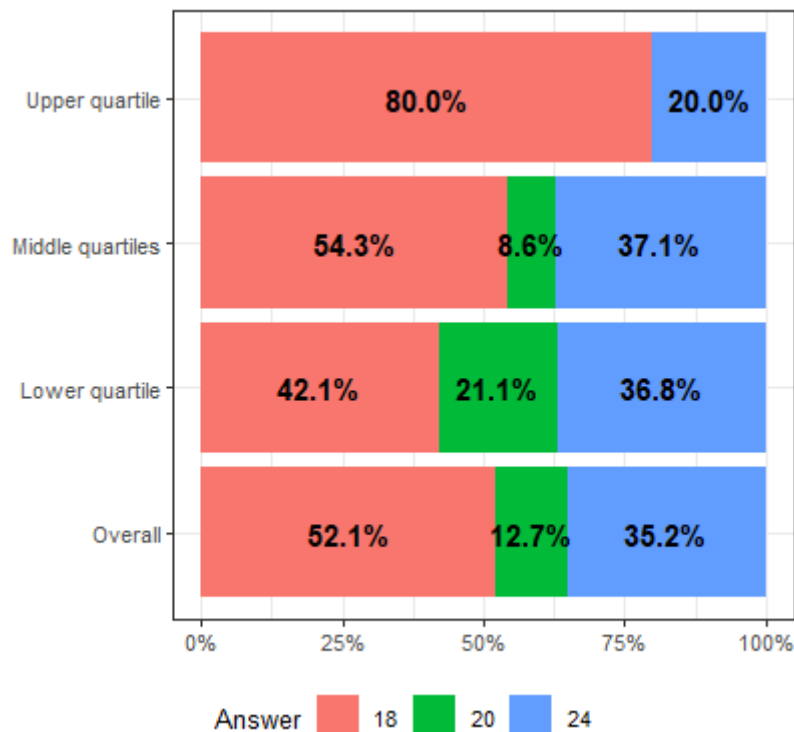
Table 2.30.4.1

Item MP71021 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
18	24	38	12	74	42.1%	54.3%	80.0%	52.1%
20	12	6	0	18	21.1%	8.6%	0.0%	12.7%
24	21	26	3	50	36.8%	37.1%	20.0%	35.2%
Overall	57	70	15	142	100.0%	100.0%	100.0%	100.0%

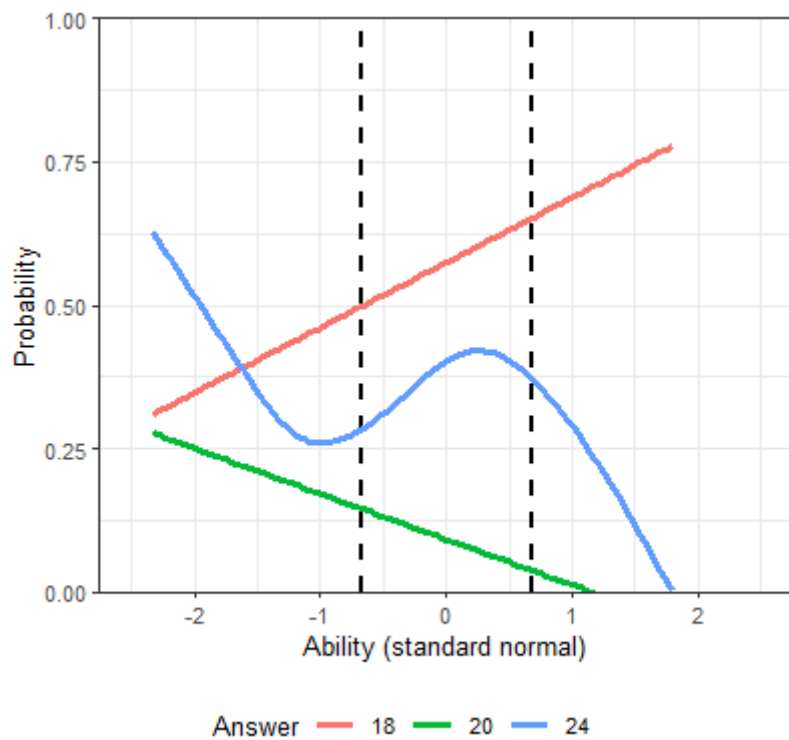
Graph 2.30.4.1

Item MP71021 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.30.4.2

Item MP71021 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.30.5. Answering time:

Graph 2.30.5.1

Item MP71021 answering time distribution in groups of different ability level

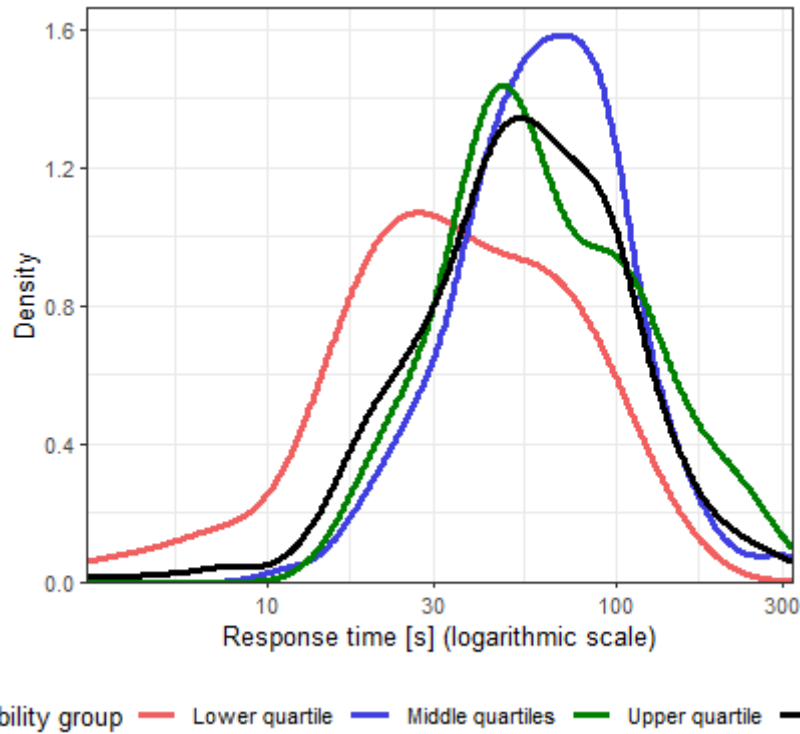


Table 2.30.5.1

Item MP71021 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.07	20.56	31.59	60.73	145.53	3.52	0.79
Middle quartiles	11.75	43.17	62.12	90.66	321.95	4.12	0.57
Upper quartile	17.01	40.48	60.38	100.04	276.88	4.13	0.64
Overall	3.07	36.00	55.26	88.44	321.95	3.98	0.70

2.31.MP71090 (TIMSS)

2.31.1. Item fit:

Graph 2.31.1.1

Item MP71090 ICC and nonparametric trace line

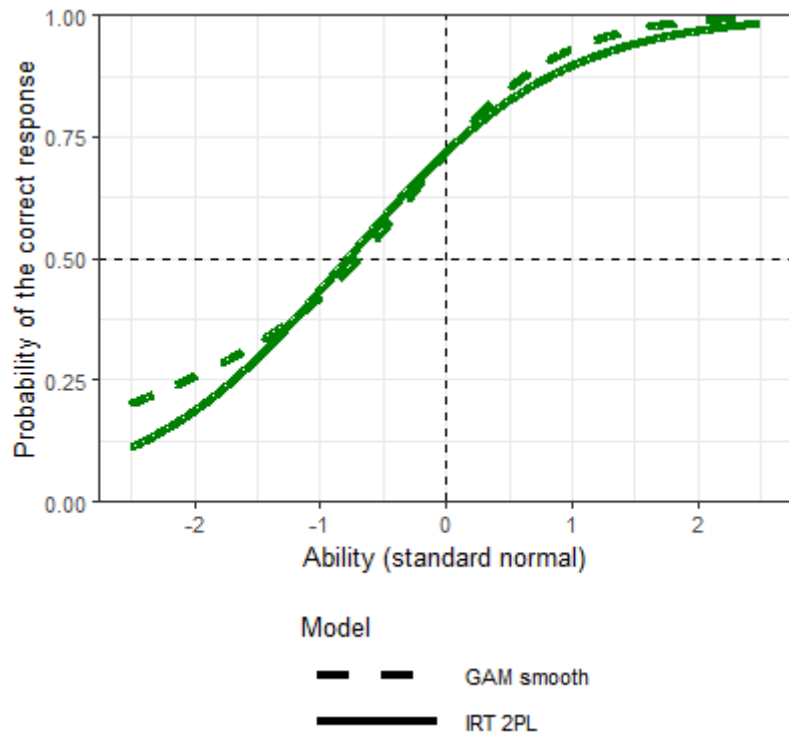


Table 2.31.1.1

Item MP71090 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	68.5%	299	MC	0.46	0.46	1.21	-0.78	0.011	0.333

2.31.2. Gender DIF:

Table 2.31.2.1

Item MP71090 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.40	0.817	1.000		0.001

2.31.3. Frequency of answers:

Table 2.31.3.1

Item MP71090 answer frequency

Answer	Frequency	Percent
120 gramów (correct)	204	68.5%
240 gramów	62	20.8%
480 gramów	11	3.7%
60 gramów	21	7.0%
Overall	298	100.0%

2.31.4. Distractors functioning:

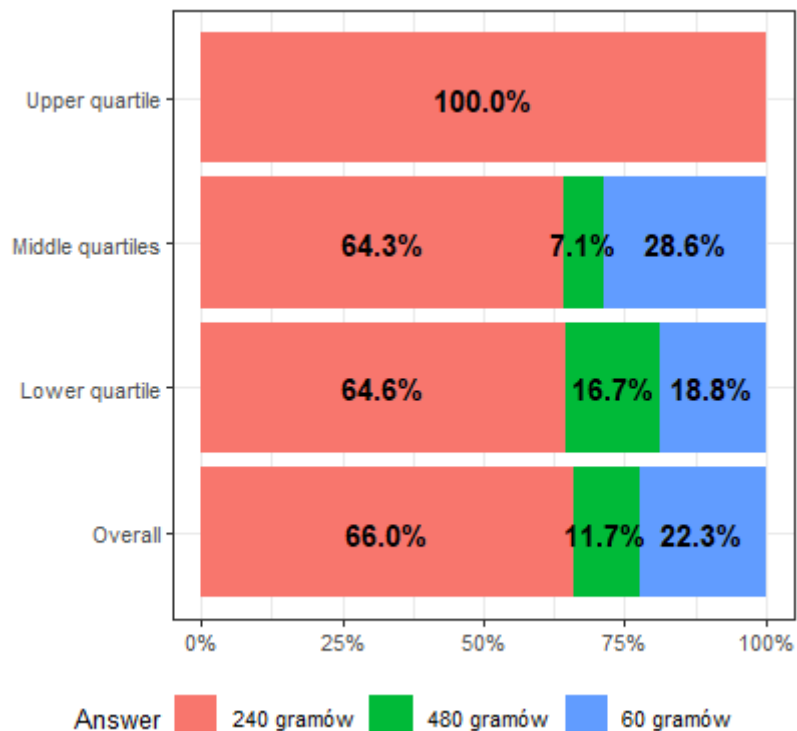
Table 2.31.4.1

Item MP71090 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
240 gramów	31	27	4	62	64.6%	64.3%	100.0%	66.0%
480 gramów	8	3	0	11	16.7%	7.1%	0.0%	11.7%
60 gramów	9	12	0	21	18.8%	28.6%	0.0%	22.3%
Overall	48	42	4	94	100.0%	100.0%	100.0%	100.0%

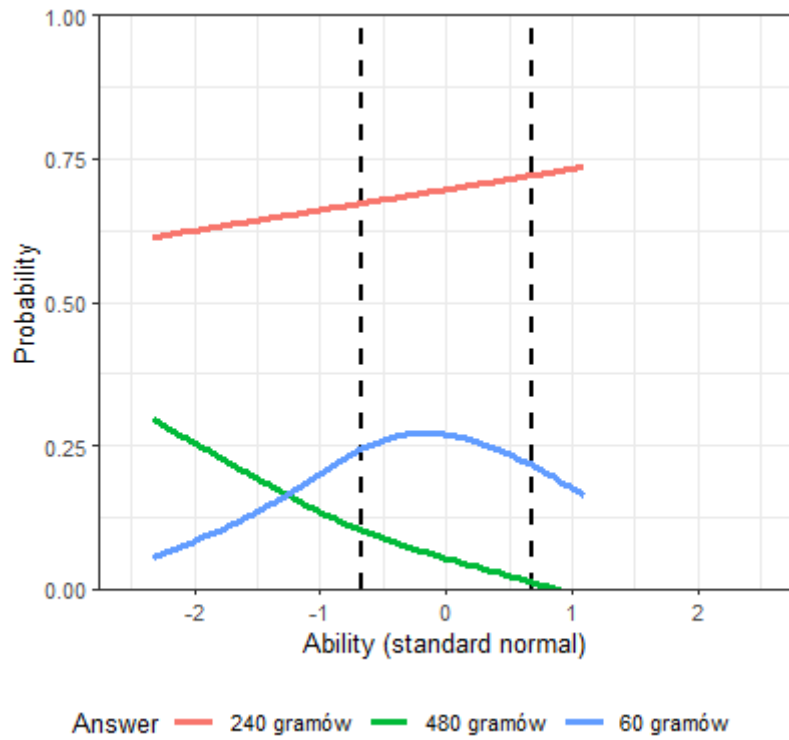
Graph 2.31.4.1

Item MP71090 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.31.4.2

Item MP71090 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.31.5. Answering time:

Graph 2.31.5.1

Item MP71090 answering time distribution in groups of different ability level

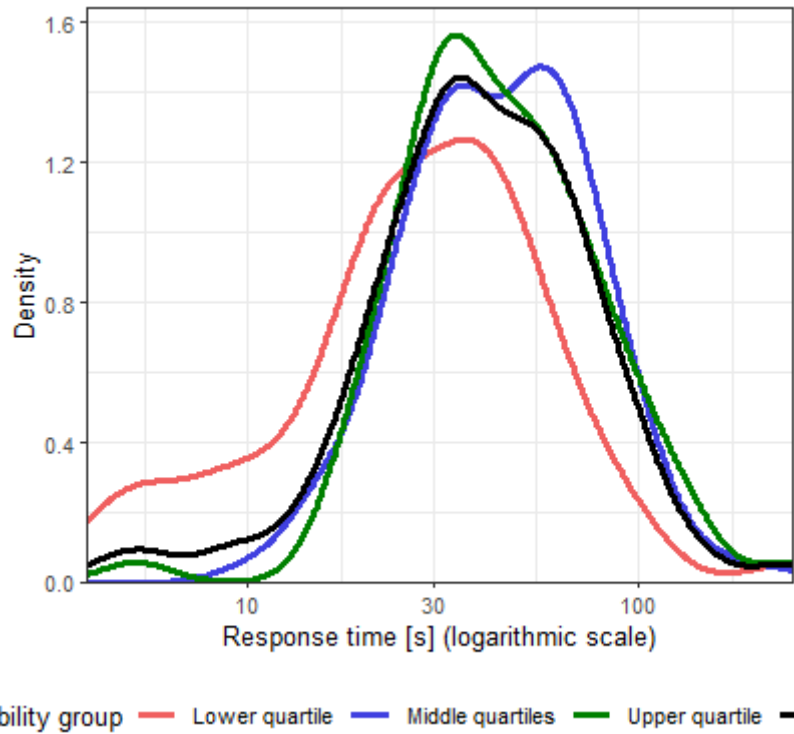


Table 2.31.5.1

Item MP71090 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.89	18.43	29.75	43.01	241.30	3.29	0.80
Middle quartiles	9.70	30.16	43.20	66.71	227.38	3.78	0.55
Upper quartile	5.17	29.83	40.82	63.00	247.17	3.77	0.59
Overall	3.89	26.31	38.75	60.22	247.17	3.65	0.67

2.32.M090012 (LLM)

2.32.1. Item fit:

Graph 2.32.1.1

Item M090012 ICC and nonparametric trace line

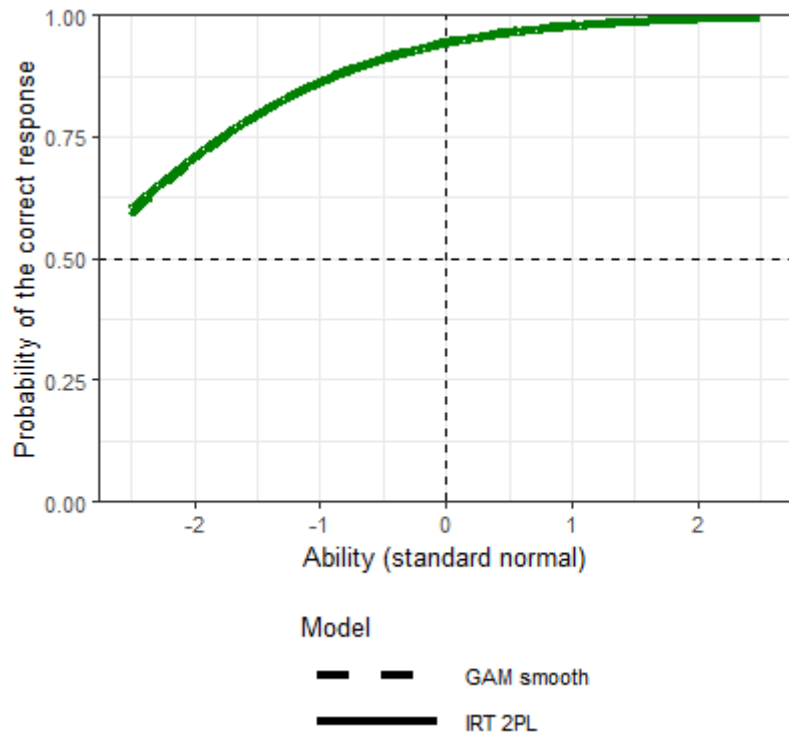


Table 2.32.1.1

Item M090012 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	91.8%	281	MC	0.26	0.13	0.94	-2.94	0.000	0.696

2.32.2. Gender DIF:

Table 2.32.2.1

Item M090012 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.58	0.750	1.000		0.004

2.32.3. Frequency of answers:

Table 2.32.3.1

Item M090012 answer frequency

Answer	Frequency	Percent
24 (correct)	257	91.8%
25	13	4.6%
29	8	2.9%
31	2	0.7%
Overall	280	100.0%

2.32.4. Distractors functioning:

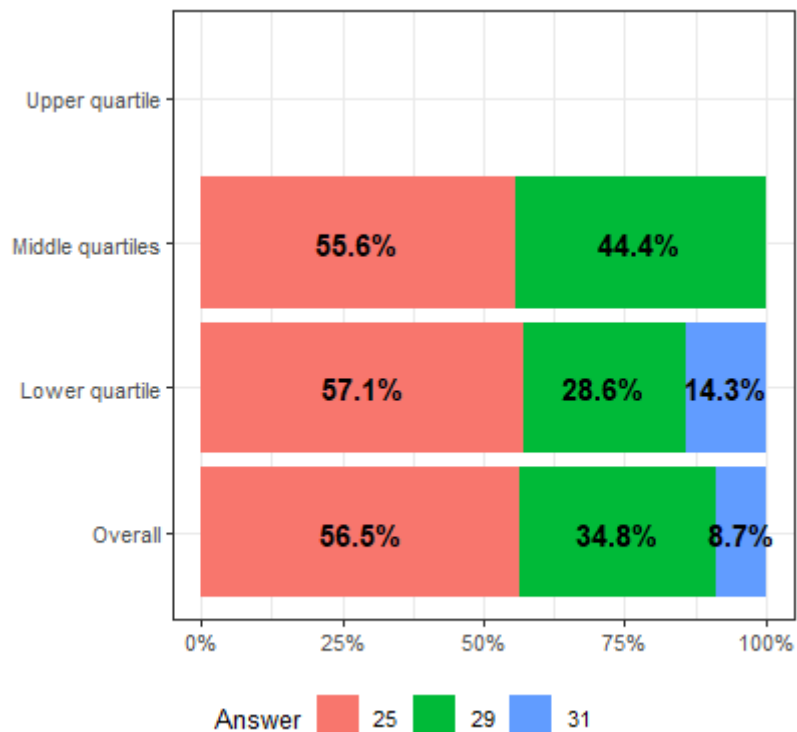
Table 2.32.4.1

Item M090012 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
25	8	5	0	13	57.1%	55.6%	0.0%	56.5%
29	4	4	0	8	28.6%	44.4%	0.0%	34.8%
31	2	0	0	2	14.3%	0.0%	0.0%	8.7%
Overall	14	9	0	23	100.0%	100.0%	0.0%	100.0%

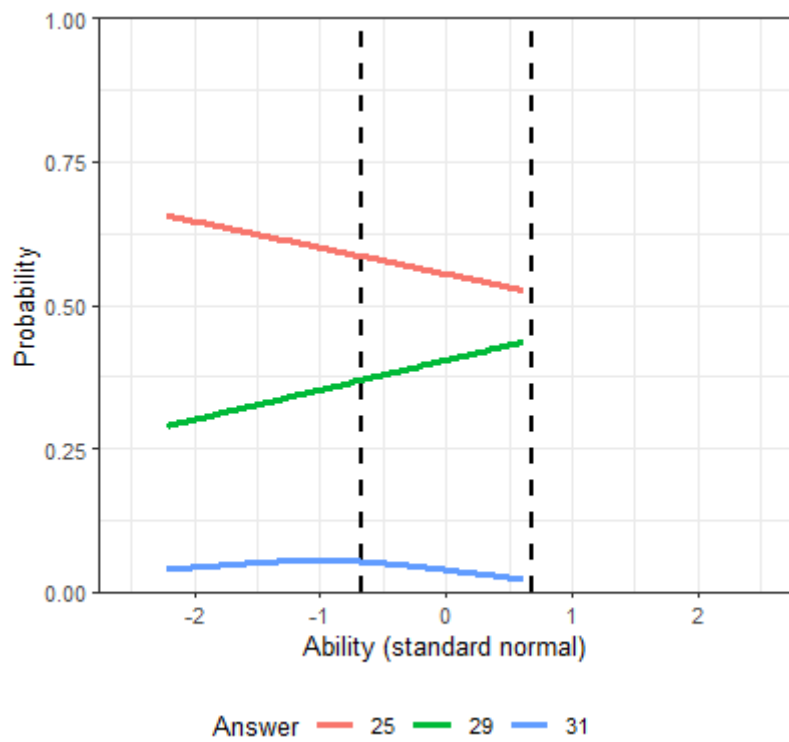
Graph 2.32.4.1

Item M090012 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.32.4.2

Item M090012 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.32.5. Answering time:

Graph 2.32.5.1

Item M090012 answering time distribution in groups of different ability level

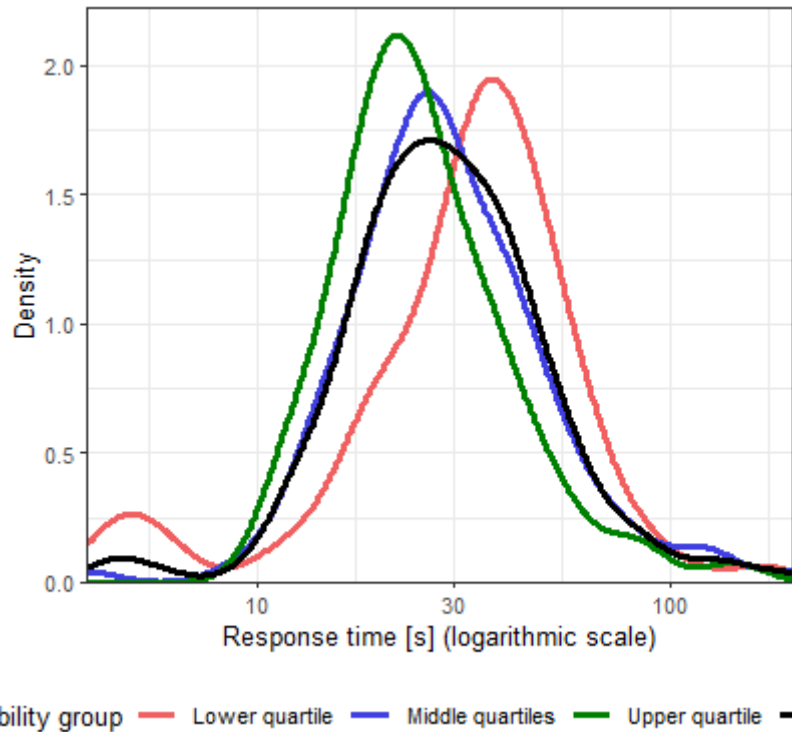


Table 2.32.5.1

Item M090012 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.60	21.99	34.14	44.99	167.15	3.43	0.67
Middle quartiles	3.88	20.32	27.52	38.72	197.62	3.36	0.56
Upper quartile	10.93	18.08	23.32	32.98	142.55	3.22	0.49
Overall	3.88	20.21	27.96	39.65	197.62	3.34	0.58

2.33.M041264 (TIMSS)

2.33.1. Item fit:

Graph 2.33.1.1

Item M041264 ICC and nonparametric trace line

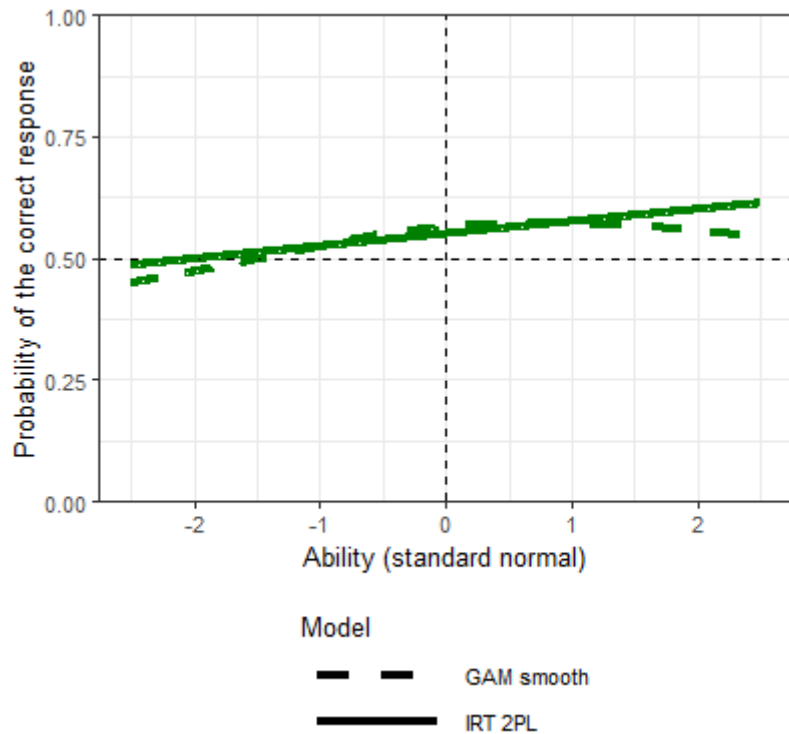


Table 2.33.1.1

Item M041264 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	54.9%	304	MC	0.04	0.12	0.10	-1.96	0.000	0.785

2.33.2. Gender DIF:

Table 2.33.2.1

Item M041264 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.42	0.812	1.000	0.001	

2.33.3. Frequency of answers:

Table 2.33.3.1

Item M041264 answer frequency

Answer	Frequency	Percent
4,5 centymetrów kwadratowych (correct)	167	54.9%
6 centymetrów kwadratowych	55	18.1%
9 centymetrów kwadratowych	73	24.0%
9,5 centymetrów kwadratowych	9	3.0%
Overall	304	100.0%

2.33.4. Distractors functioning:

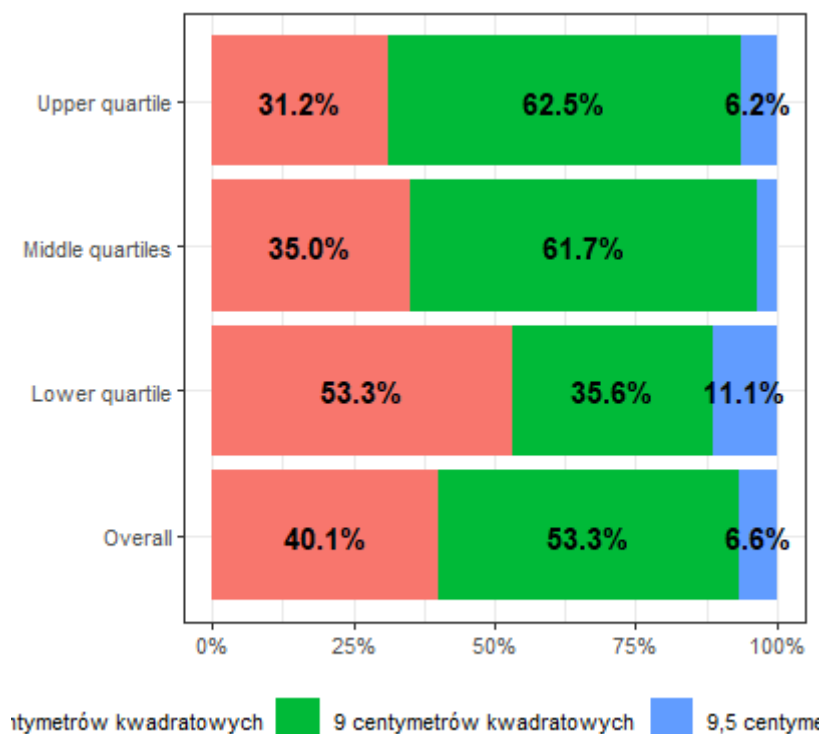
Table 2.33.4.1

Item M041264 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
6 centymetrów kwadratowych	24	21	10	55	53.3%	35.0%	31.2%	40.1%
9 centymetrów kwadratowych	16	37	20	73	35.6%	61.7%	62.5%	53.3%
9,5 centymetrów kwadratowych	5	2	2	9	11.1%	3.3%	6.2%	6.6%
Overall	45	60	32	137	100.0%	100.0%	100.0%	100.0%

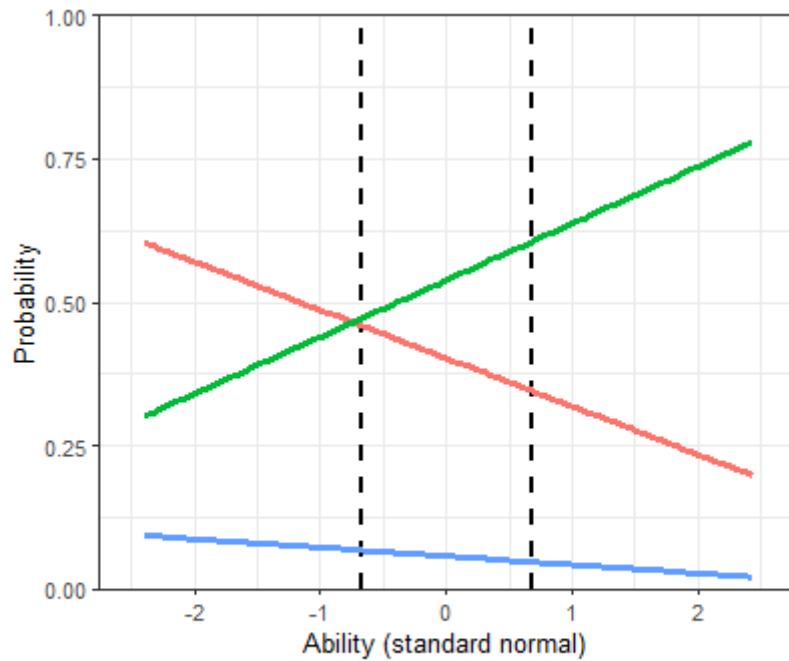
Graph 2.33.4.1

Item M041264 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.33.4.2

Item M041264 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



metrytrów kwadratowych — 9 centymetrów kwadratowych — 9,5 centym

2.33.5. Answering time:

Graph 2.33.5.1

Item M041264 answering time distribution in groups of different ability level

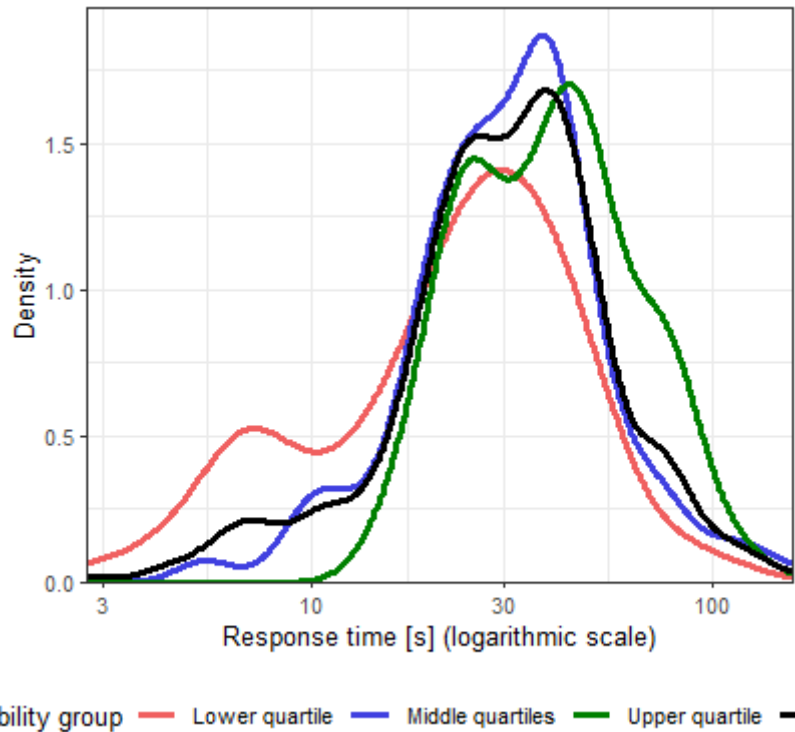


Table 2.33.5.1

Item M041264 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.75	14.47	25.00	35.84	108.66	3.07	0.75
Middle quartiles	5.16	22.07	31.33	41.63	158.16	3.42	0.57
Upper quartile	15.11	25.51	40.06	52.36	123.61	3.66	0.48
Overall	2.75	21.75	31.17	43.55	158.16	3.39	0.64

2.34.M100037 (LLM)

2.34.1. Item fit:

Graph 2.34.1.1

Item M100037 ICC and nonparametric trace line

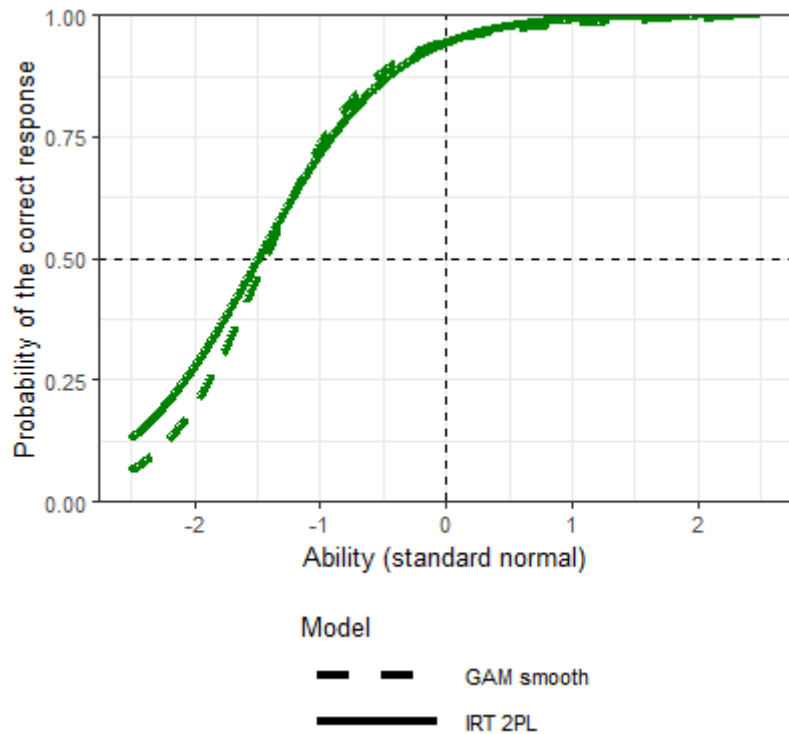


Table 2.34.1.1

Item M100037 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	86.8%	304	MC	0.47	0.32	1.88	-1.49	0.000	0.878

2.34.2. Gender DIF:

Table 2.34.2.1

Item M100037 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.38	0.827	1.000		0.002

2.34.3. Frequency of answers:

Table 2.34.3.1

Item M100037 answer frequency

Answer	Frequency	Percent
W klasie 1	3	1.0%
W klasie 2 (correct)	264	86.8%
W klasie 3	25	8.2%
W klasie 4	12	3.9%
Overall	304	100.0%

2.34.4. Distractors functioning:

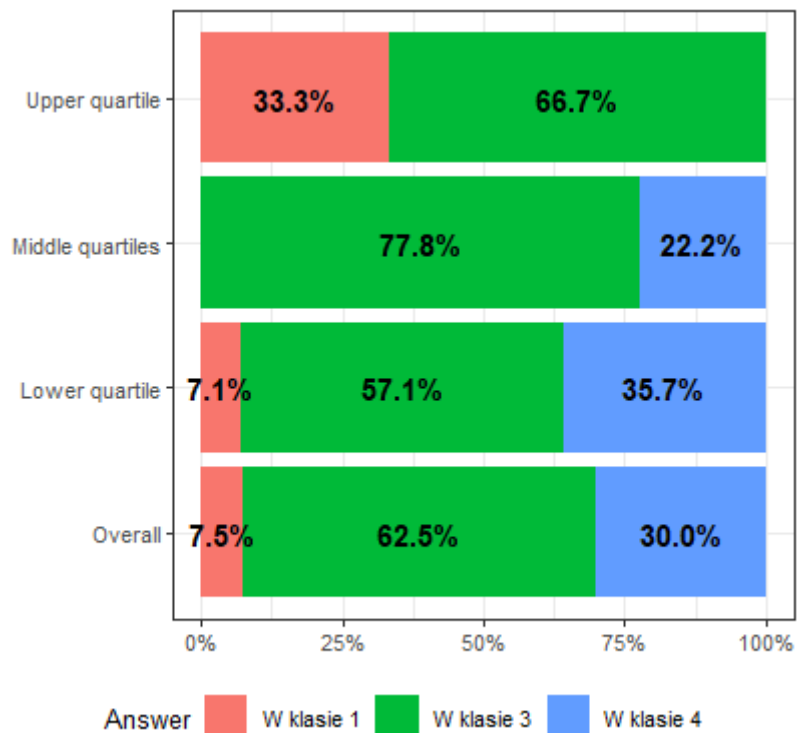
Table 2.34.4.1

Item M100037 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
W klasie 1	2	0	1	3	7.1%	0.0%	33.3%	7.5%
W klasie 3	16	7	2	25	57.1%	77.8%	66.7%	62.5%
W klasie 4	10	2	0	12	35.7%	22.2%	0.0%	30.0%
Overall	28	9	3	40	100.0%	100.0%	100.0%	100.0%

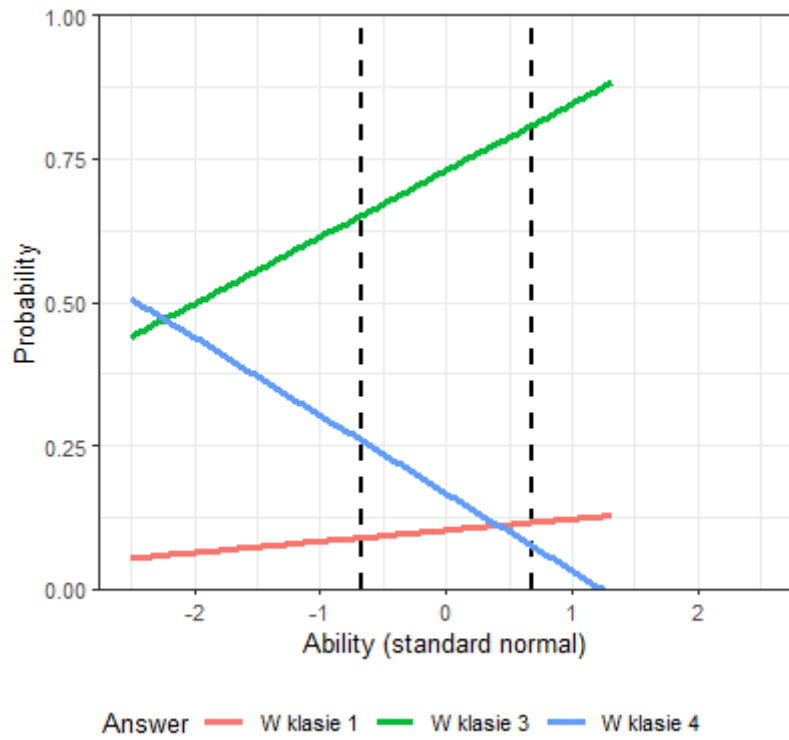
Graph 2.34.4.1

Item M100037 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.34.4.2

Item M100037 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.34.5. Answering time:

Graph 2.34.5.1

Item M100037 answering time distribution in groups of different ability level

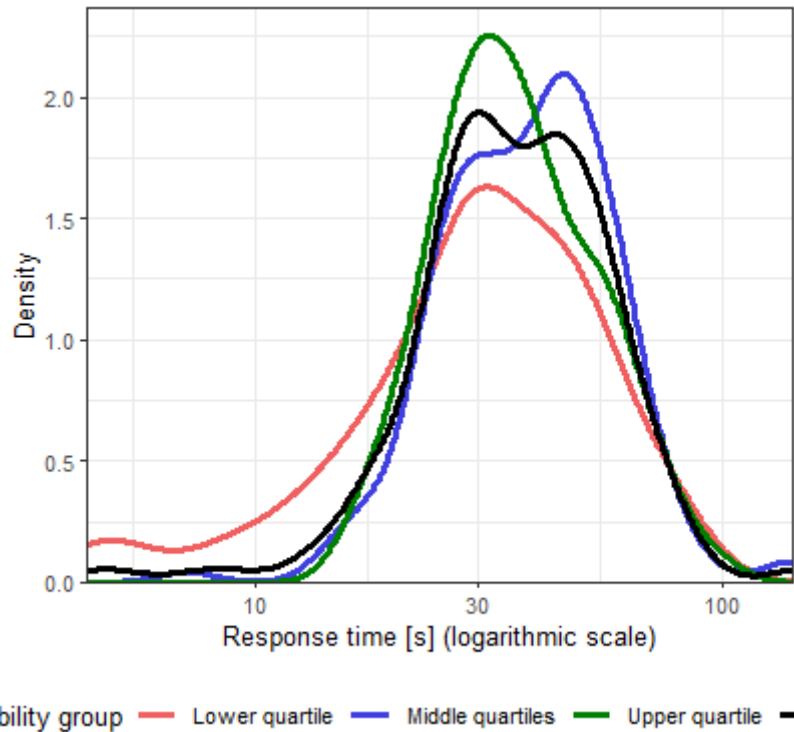


Table 2.34.5.1

Item M100037 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.38	21.78	30.30	44.62	83.72	3.37	0.64
Middle quartiles	7.15	28.35	39.12	51.05	140.53	3.64	0.43
Upper quartile	16.86	27.70	34.94	48.57	95.14	3.58	0.38
Overall	4.38	27.18	35.31	48.65	140.53	3.56	0.48

2.35.M061206 (TIMSS)

2.35.1. Item fit:

Graph 2.35.1.1

Item M061206 ICC and nonparametric trace line

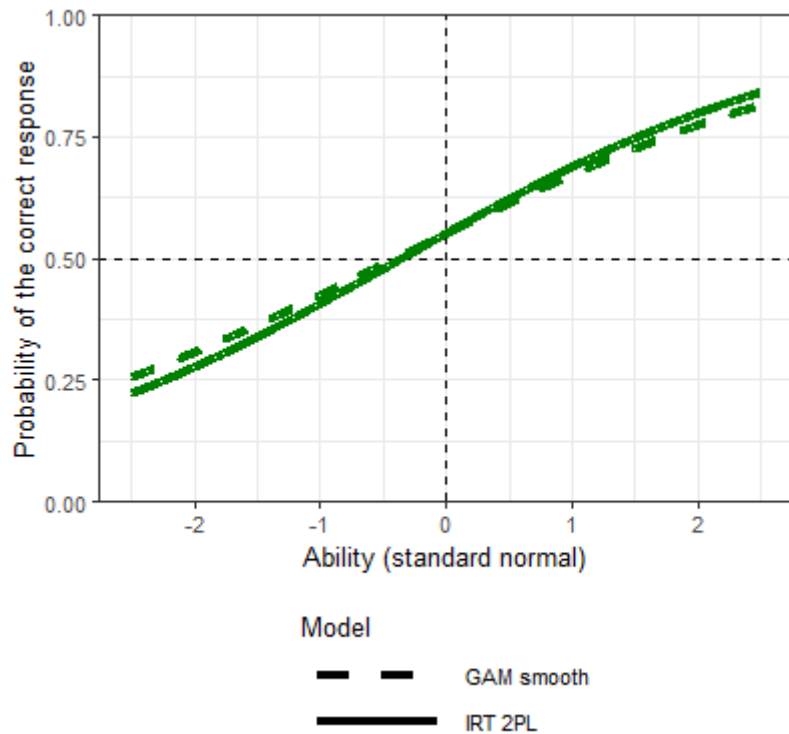


Table 2.35.1.1

Item M061206 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	54.1%	306	MC	0.24	0.27	0.58	-0.35	0.019	0.182

2.35.2. Gender DIF:

Table 2.35.2.1

Item M061206 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.10	0.576	1.000	0.003	

2.35.3. Frequency of answers:

Table 2.35.3.1

Item M061206 answer frequency

Answer	Frequency	Percent
100 m (correct)	165	54.1%
130 m	17	5.6%
40 m	7	2.3%
80 m	116	38.0%
Overall	305	100.0%

2.35.4. Distractors functioning:

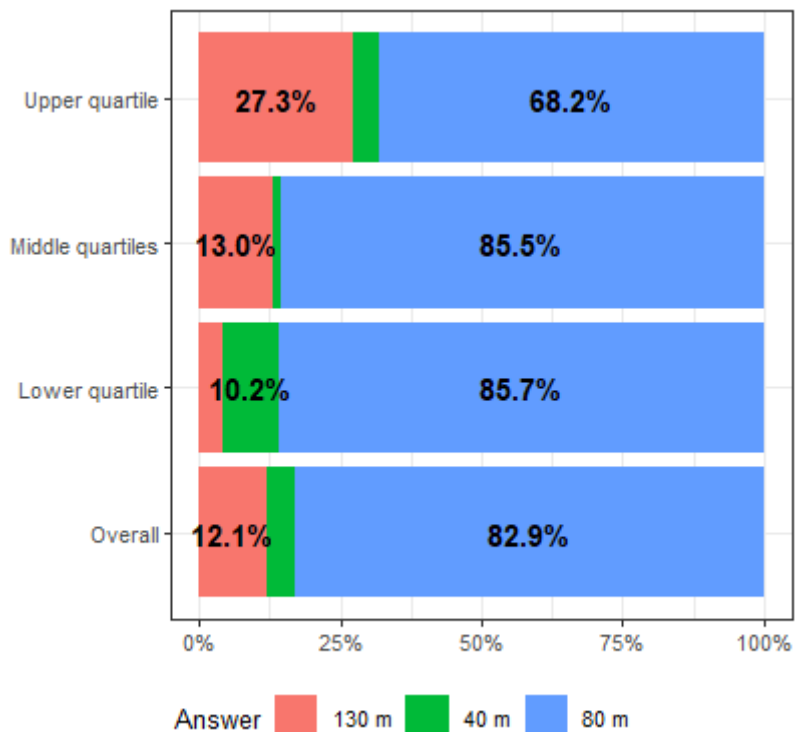
Table 2.35.4.1

Item M061206 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
130 m	2	9	6	17	4.1%	13.0%	27.3%	12.1%
40 m	5	1	1	7	10.2%	1.4%	4.5%	5.0%
80 m	42	59	15	116	85.7%	85.5%	68.2%	82.9%
Overall	49	69	22	140	100.0%	100.0%	100.0%	100.0%

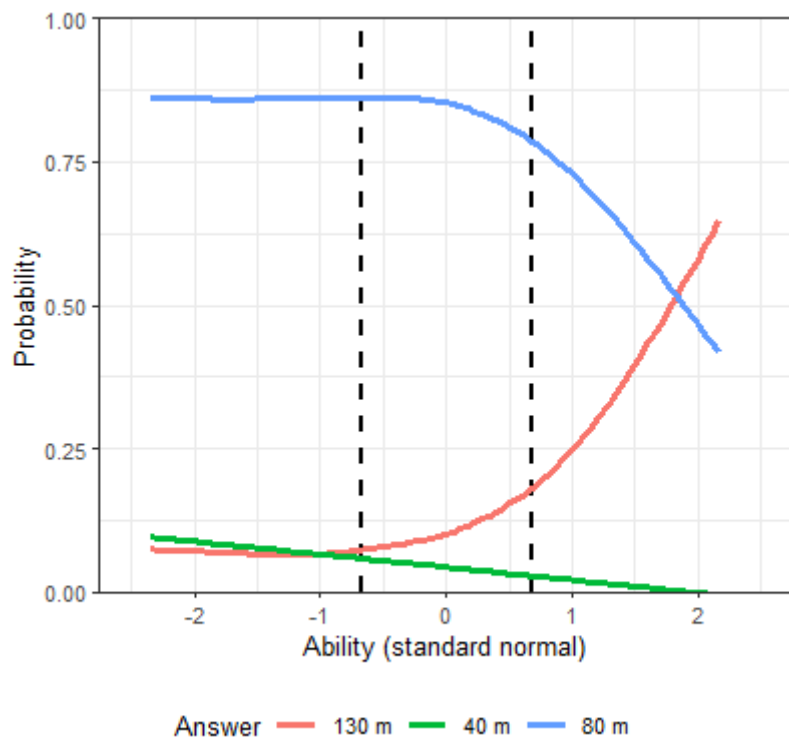
Graph 2.35.4.1

Item M061206 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.35.4.2

Item M061206 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.35.5. Answering time:

Graph 2.35.5.1

Item M061206 answering time distribution in groups of different ability level

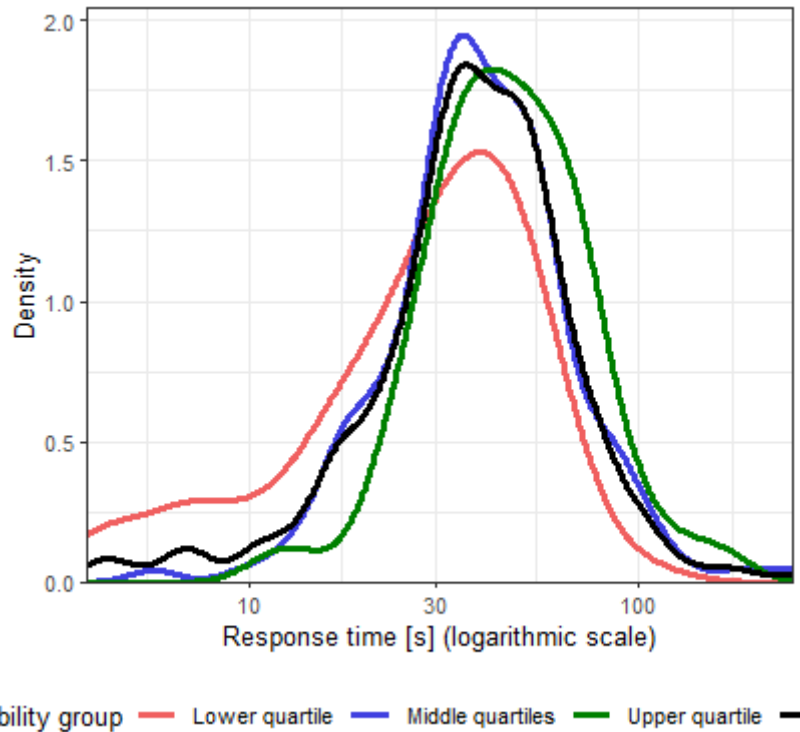


Table 2.35.5.1

Item M061206 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.87	18.75	31.73	45.19	104.95	3.29	0.72
Middle quartiles	5.74	29.39	38.61	52.73	247.48	3.67	0.54
Upper quartile	11.46	33.78	46.60	63.19	168.53	3.82	0.48
Overall	3.87	28.66	37.69	52.72	247.48	3.60	0.61

2.36.M041034 (TIMSS)

2.36.1. Item fit:

Graph 2.36.1.1

Item M041034 ICC and nonparametric trace line

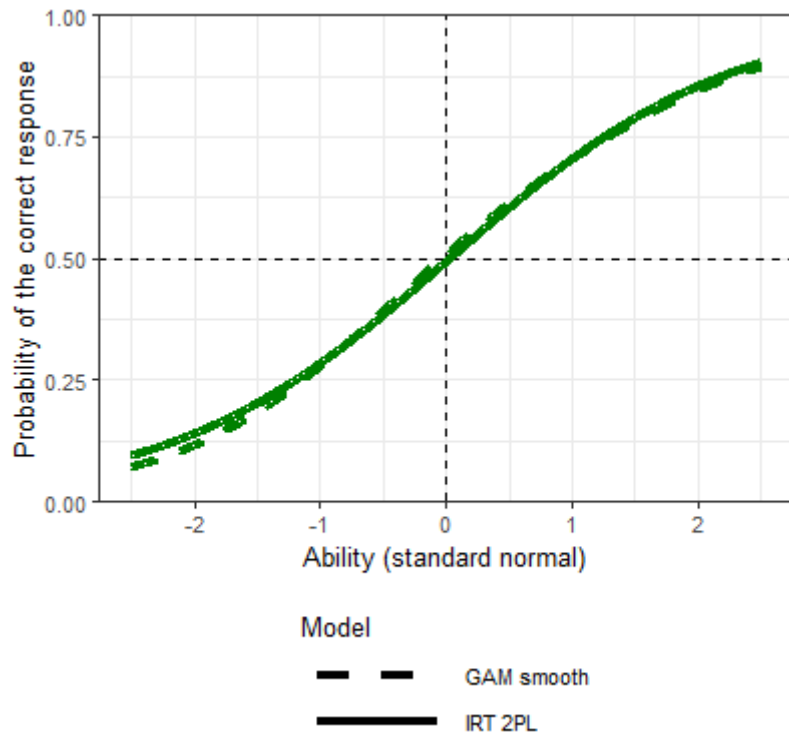


Table 2.36.1.1

Item M041034 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	48.5%	306	MC	0.40	0.44	0.90	0.03	0.011	0.330

2.36.2. Gender DIF:

Table 2.36.2.1

Item M041034 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.16	0.560	1.000	0.003	

2.36.3. Frequency of answers:

Table 2.36.3.1

Item M041034 answer frequency

Answer	Frequency	Percent
3, 13, 23	89	29.2%
31, 32, 33	43	14.1%
6, 15, 21 (correct)	148	48.5%
9, 15, 26	25	8.2%
Overall	305	100.0%

2.36.4. Distractors functioning:

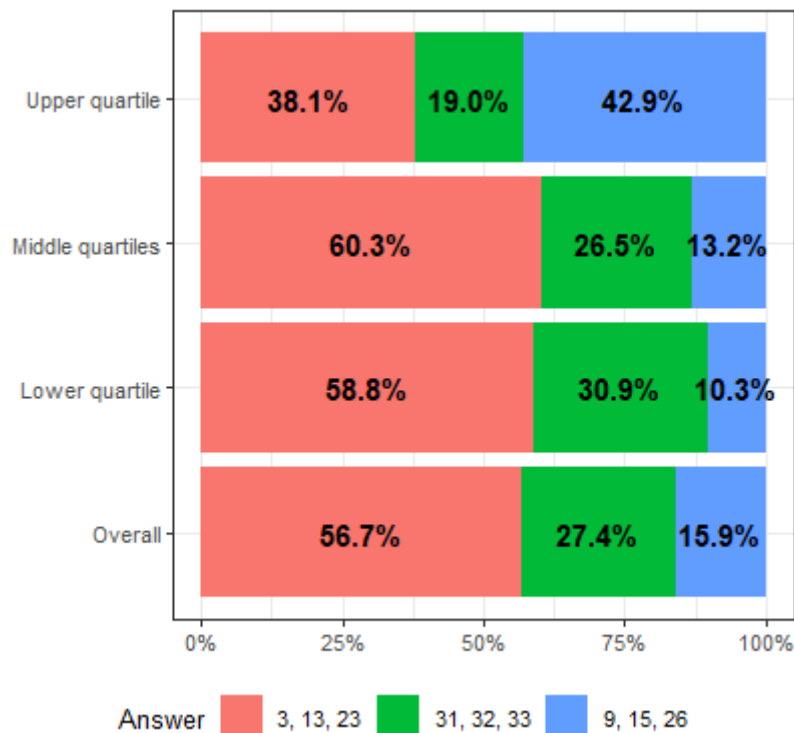
Table 2.36.4.1

Item M041034 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
3, 13, 23	40	41	8	89	58.8%	60.3%	38.1%	56.7%
31, 32, 33	21	18	4	43	30.9%	26.5%	19.0%	27.4%
9, 15, 26	7	9	9	25	10.3%	13.2%	42.9%	15.9%
Overall	68	68	21	157	100.0%	100.0%	100.0%	100.0%

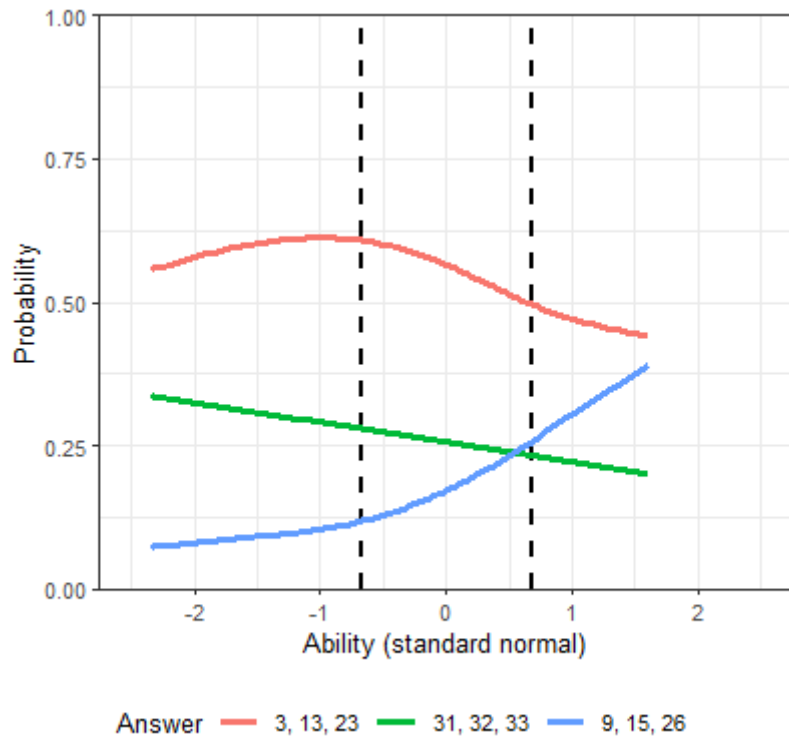
Graph 2.36.4.1

Item M041034 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.36.4.2

Item M041034 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.36.5. Answering time:

Graph 2.36.5.1

Item M041034 answering time distribution in groups of different ability level

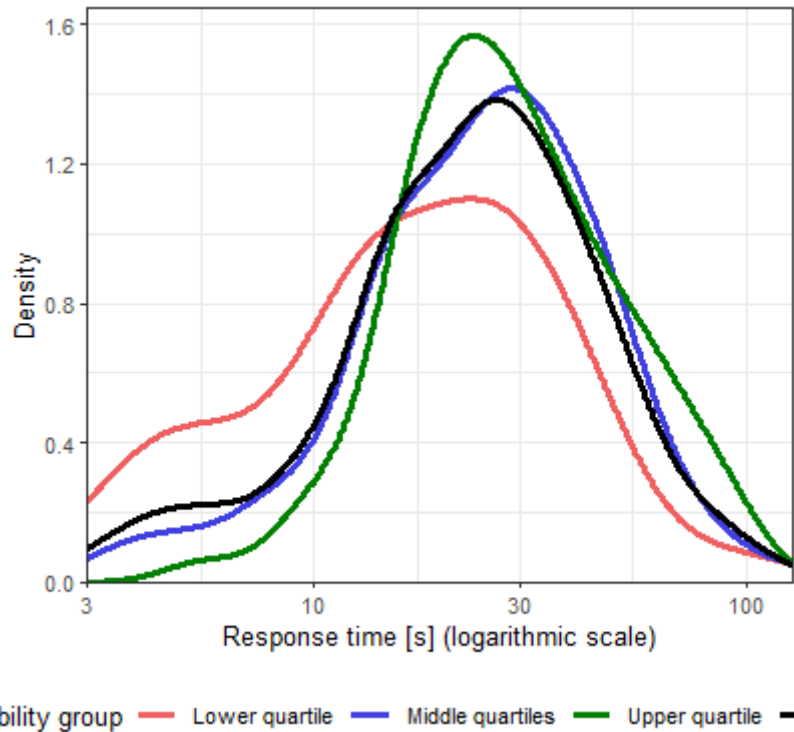


Table 2.36.5.1

Item M041034 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.00	10.27	17.79	29.29	111.44	2.81	0.80
Middle quartiles	3.33	15.51	25.33	37.06	128.20	3.18	0.67
Upper quartile	5.60	18.97	26.70	40.18	99.62	3.34	0.58
Overall	3.00	14.96	24.16	36.28	128.20	3.11	0.71

2.37.M051129 (TIMSS)

2.37.1. Item fit:

Graph 2.37.1.1

Item M051129 ICC and nonparametric trace line

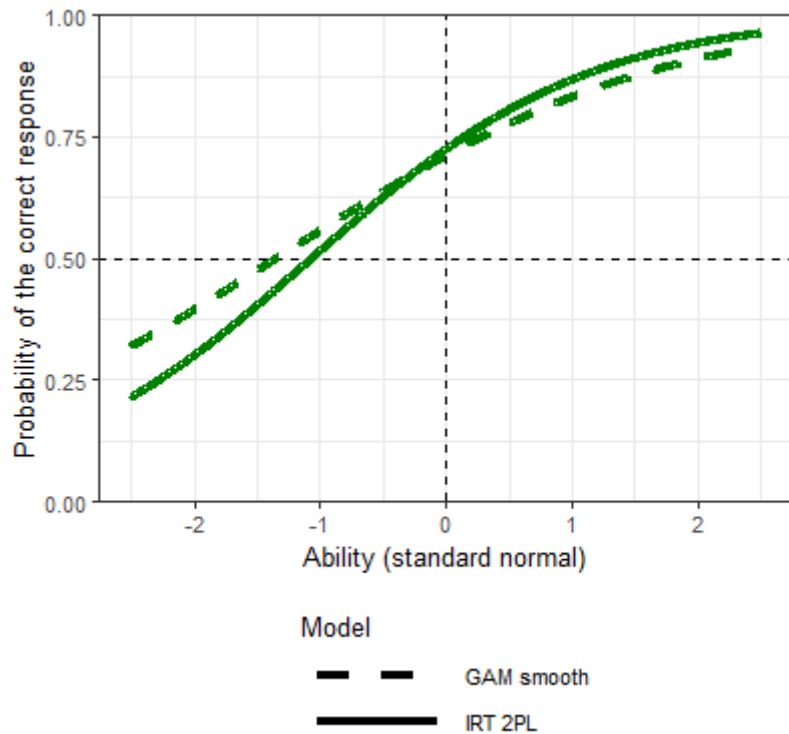


Table 2.37.1.1

Item M051129 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	70.4%	294	MC	0.30	0.31	0.91	-1.07	0.000	0.907

2.37.2. Gender DIF:

Table 2.37.2.1

Item M051129 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.52	0.769	1.000		0.002

2.37.3. Frequency of answers:

Table 2.37.3.1

Item M051129 answer frequency

Answer	Frequency	Percent
Bryła A.	30	10.2%
Bryła B. (correct)	207	70.4%
Bryła C.	49	16.7%
Bryła D.	8	2.7%
Overall	294	100.0%

2.37.4. Distractors functioning:

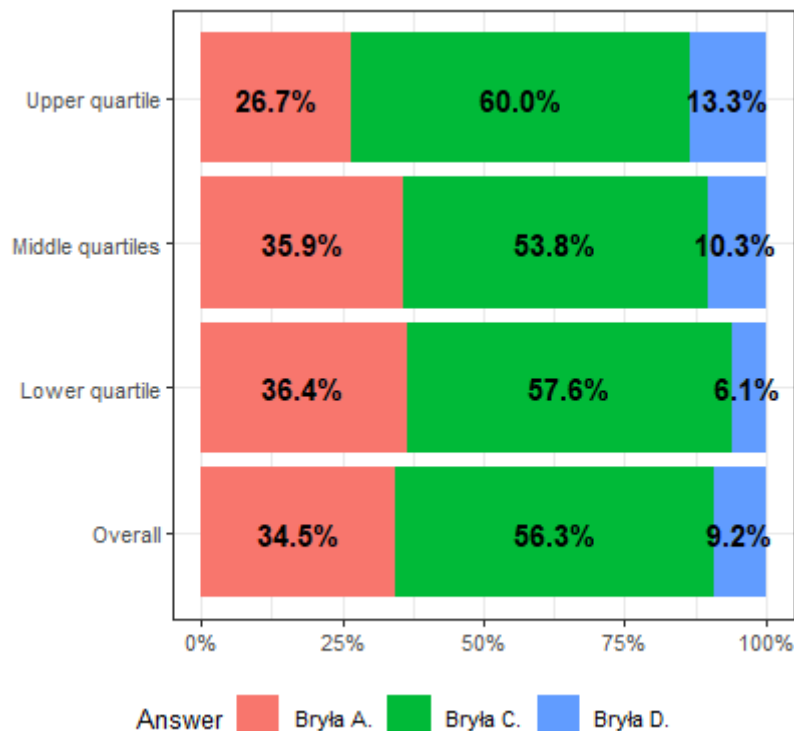
Table 2.37.4.1

Item M051129 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Bryła A.	12	14	4	30	36.4%	35.9%	26.7%	34.5%
Bryła C.	19	21	9	49	57.6%	53.8%	60.0%	56.3%
Bryła D.	2	4	2	8	6.1%	10.3%	13.3%	9.2%
Overall	33	39	15	87	100.0%	100.0%	100.0%	100.0%

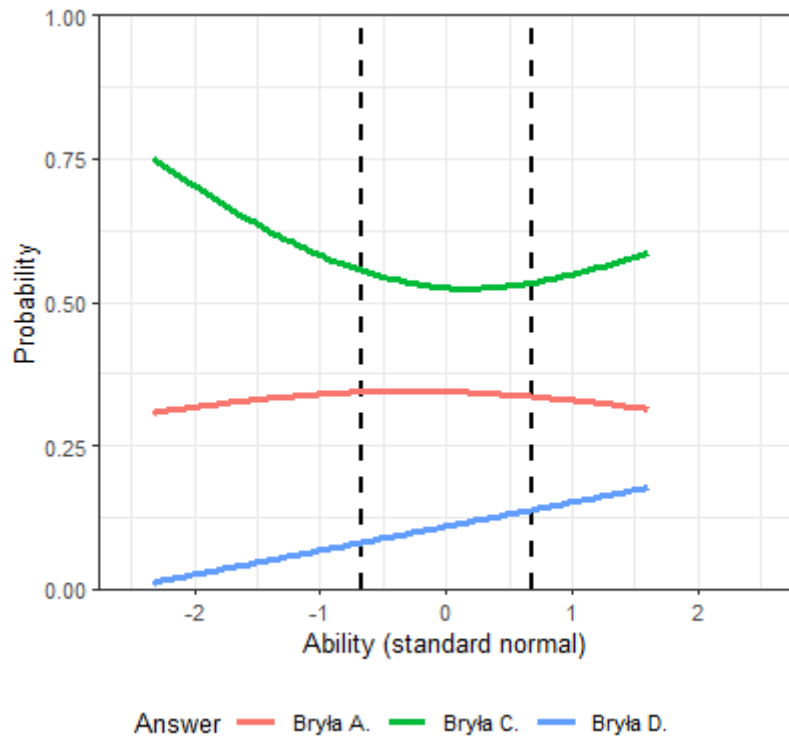
Graph 2.37.4.1

Item M051129 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.37.4.2

Item M051129 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.37.5. Answering time:

Graph 2.37.5.1

Item M051129 answering time distribution in groups of different ability level

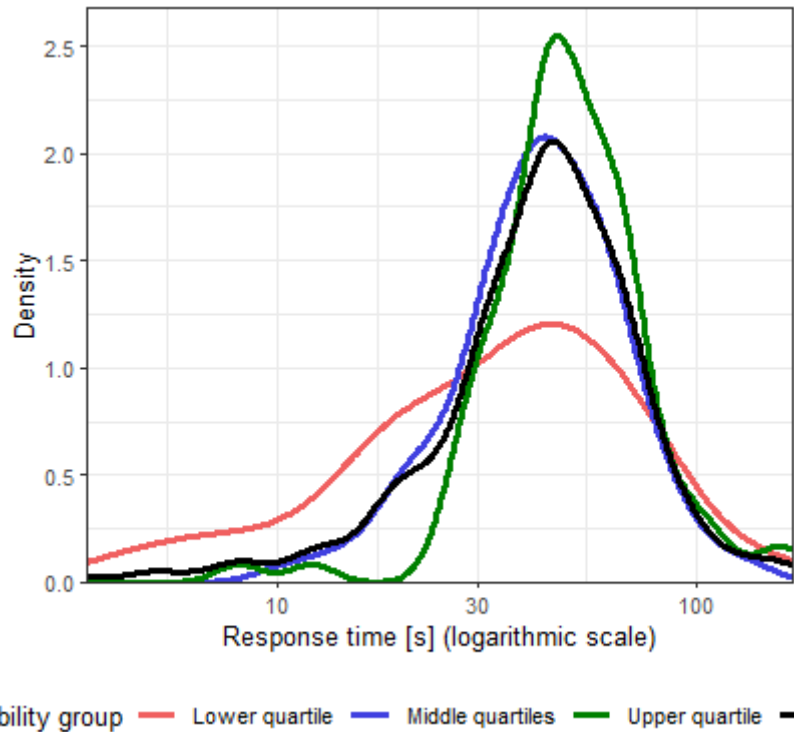


Table 2.37.5.1

Item M051129 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.54	19.74	36.84	55.17	169.51	3.47	0.80
Middle quartiles	9.92	32.75	43.88	59.36	138.79	3.74	0.46
Upper quartile	8.13	40.43	48.26	63.79	162.80	3.89	0.44
Overall	3.54	32.02	44.34	59.83	169.51	3.72	0.58

2.38.M051077 (TIMSS)

2.38.1. Item fit:

Graph 2.38.1.1

Item M051077 ICC and nonparametric trace line

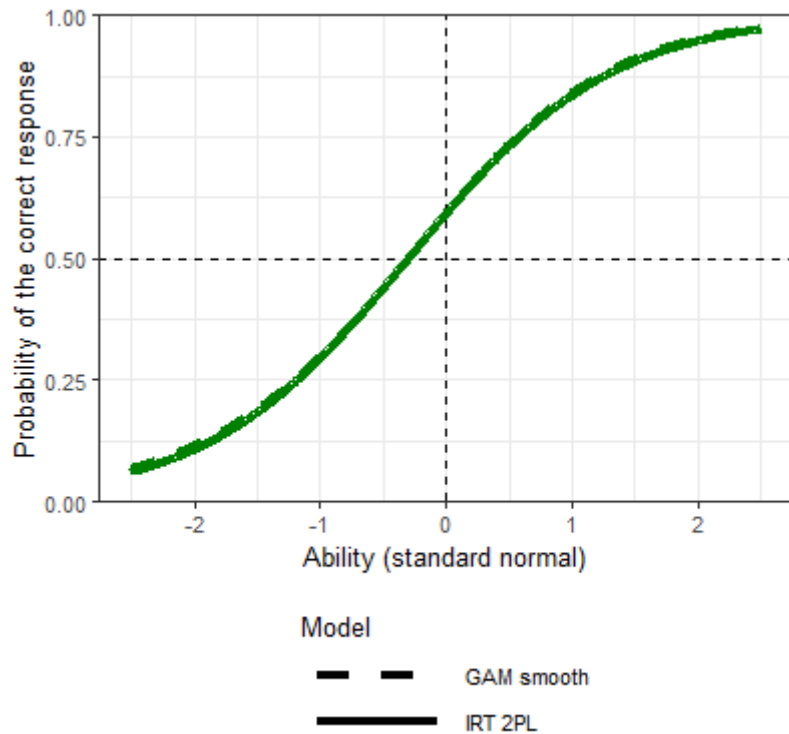


Table 2.38.1.1

Item M051077 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	56.1%	306	MC	0.48	0.52	1.25	-0.30	0.010	0.344

2.38.2. Gender DIF:

Table 2.38.2.1

Item M051077 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.02	0.221	1.000		0.008

2.38.3. Frequency of answers:

Table 2.38.3.1

Item M051077 answer frequency

Answer	Frequency	Percent
40	73	23.9%
60	41	13.4%
80 (correct)	171	56.1%
100	20	6.6%
Overall	305	100.0%

2.38.4. Distractors functioning:

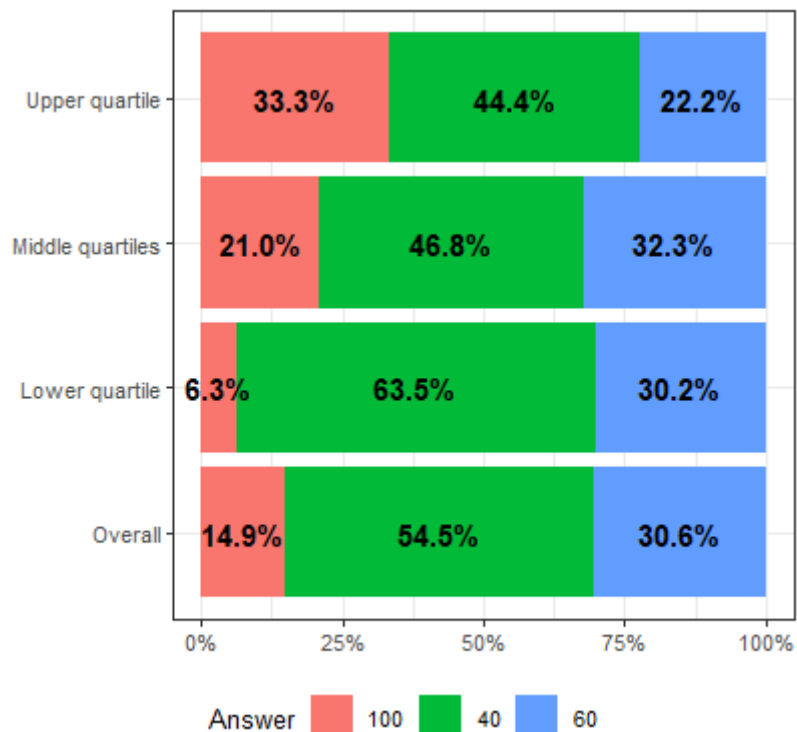
Table 2.38.4.1

Item M051077 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
100	4	13	3	20	6.3%	21.0%	33.3%	14.9%
40	40	29	4	73	63.5%	46.8%	44.4%	54.5%
60	19	20	2	41	30.2%	32.3%	22.2%	30.6%
Overall	63	62	9	134	100.0%	100.0%	100.0%	100.0%

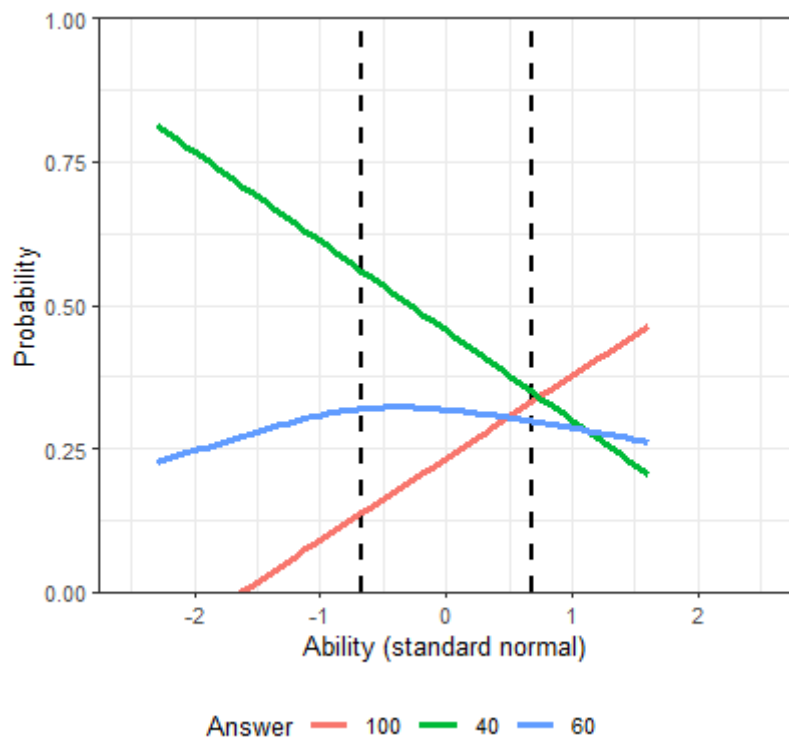
Graph 2.38.4.1

Item M051077 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.38.4.2

Item M051077 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.38.5. Answering time:

Graph 2.38.5.1

Item M051077 answering time distribution in groups of different ability level

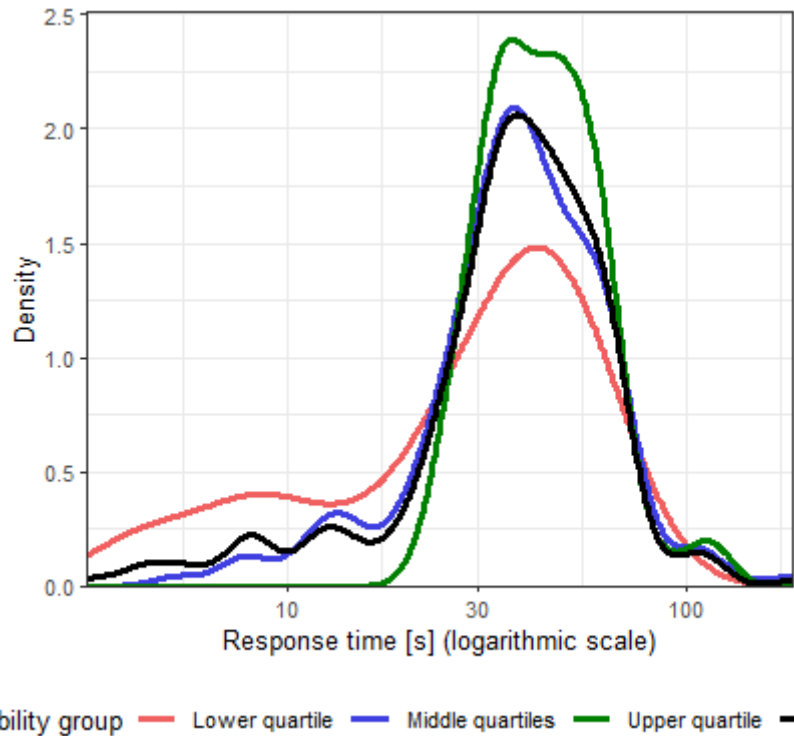


Table 2.38.5.1

Item M051077 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.15	17.95	34.08	48.06	89.62	3.27	0.82
Middle quartiles	5.32	29.50	38.05	53.02	185.04	3.61	0.55
Upper quartile	22.61	34.35	43.12	54.19	117.29	3.77	0.33
Overall	3.15	28.98	38.62	51.18	185.04	3.56	0.62

2.39.M100008 (LLM)

2.39.1. Item fit:

Graph 2.39.1.1

Item M100008 ICC and nonparametric trace line

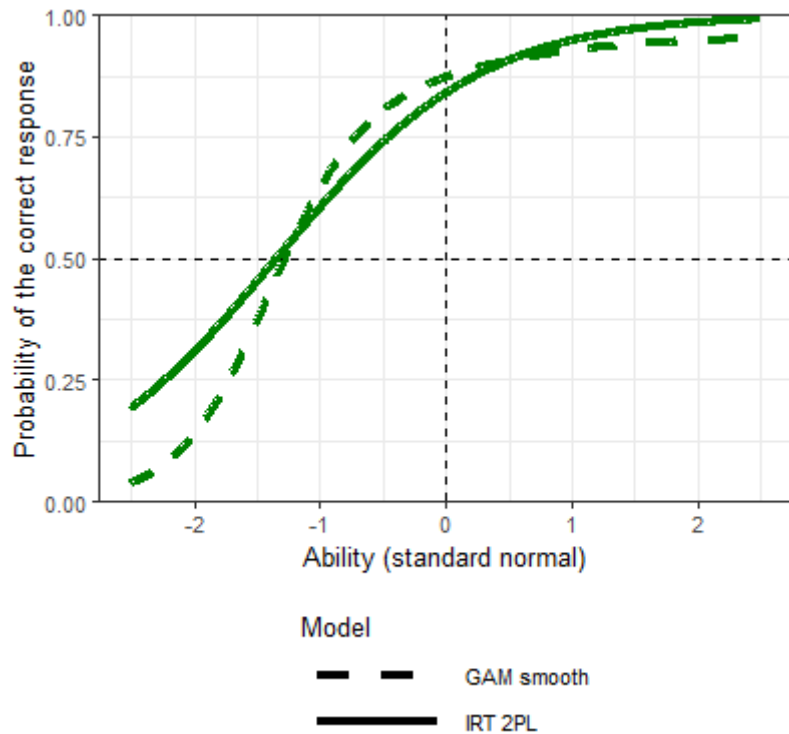


Table 2.39.1.1

Item M100008 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	78.2%	299	MC	0.41	0.28	1.23	-1.35	0.031	0.028

2.39.2. Gender DIF:

Table 2.39.2.1

Item M100008 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.96	0.618	1.000		0.003

2.39.3. Frequency of answers:

Table 2.39.3.1

Item M100008 answer frequency

Answer	Frequency	Percent
48	14	4.7%
54	33	11.1%
56 (correct)	233	78.2%
64	18	6.0%
Overall	298	100.0%

2.39.4. Distractors functioning:

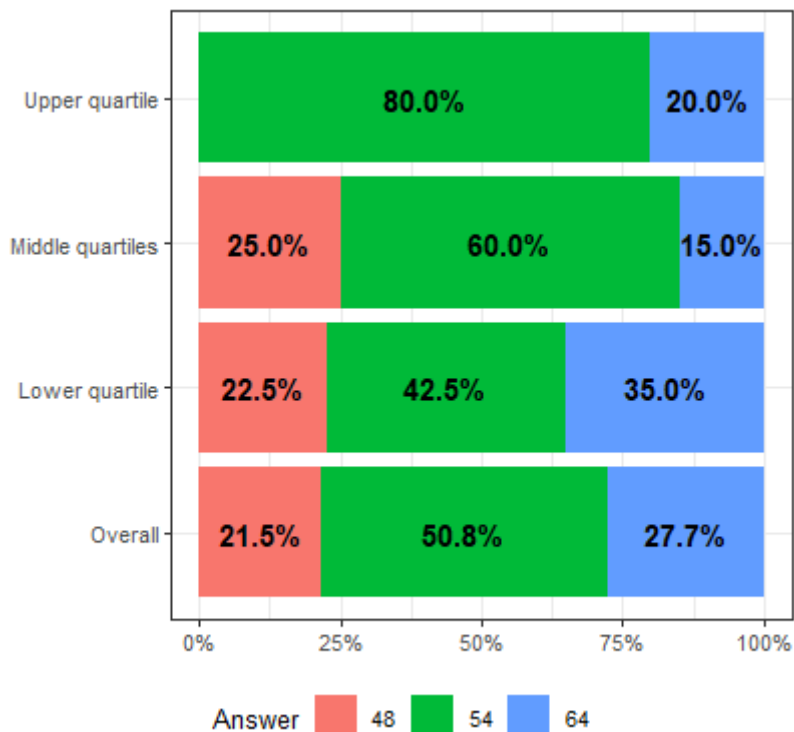
Table 2.39.4.1

Item M100008 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
48	9	5	0	14	22.5%	25.0%	0.0%	21.5%
54	17	12	4	33	42.5%	60.0%	80.0%	50.8%
64	14	3	1	18	35.0%	15.0%	20.0%	27.7%
Overall	40	20	5	65	100.0%	100.0%	100.0%	100.0%

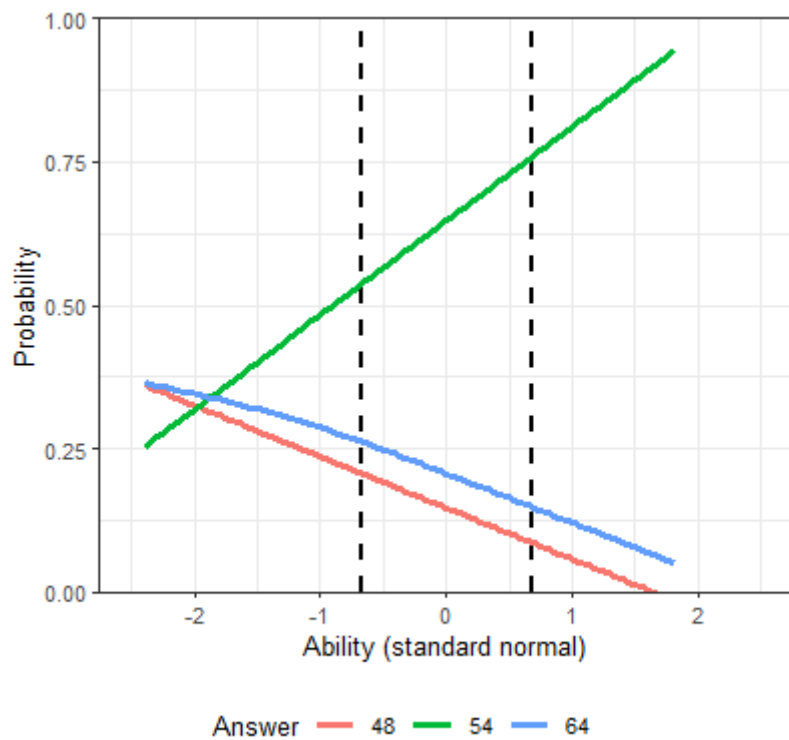
Graph 2.39.4.1

Item M100008 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.39.4.2

Item M100008 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.39.5. Answering time:

Graph 2.39.5.1

Item M100008 answering time distribution in groups of different ability level

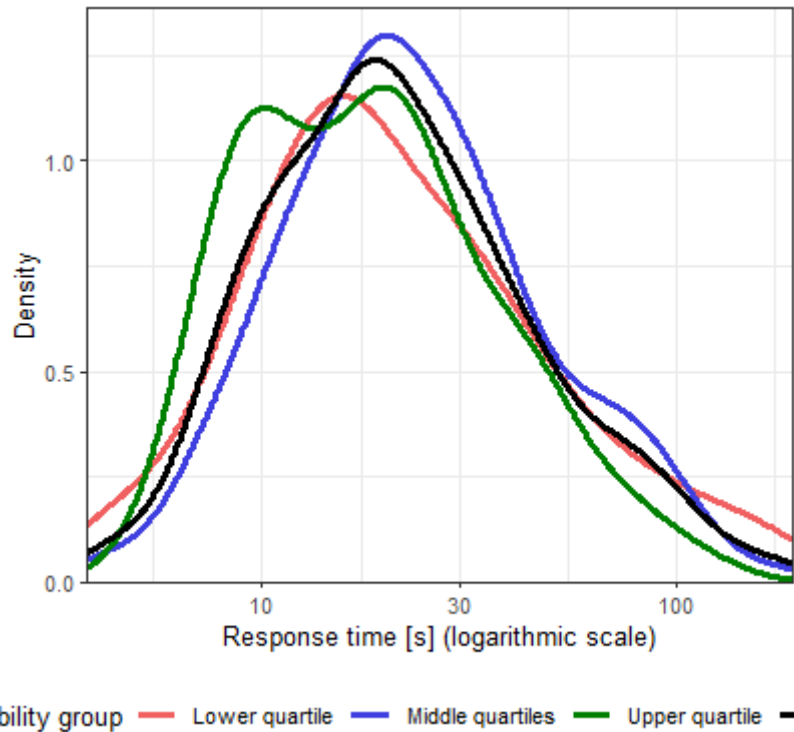


Table 2.39.5.1

Item M100008 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.80	12.10	18.70	33.54	191.11	3.06	0.84
Middle quartiles	4.09	13.97	21.69	34.97	175.98	3.14	0.72
Upper quartile	5.88	10.19	18.31	26.66	111.59	2.91	0.69
Overall	3.80	12.19	19.78	32.73	191.11	3.06	0.75

2.40.M041048 (TIMSS)

2.40.1. Item fit:

Graph 2.40.1.1

Item M041048 ICC and nonparametric trace line

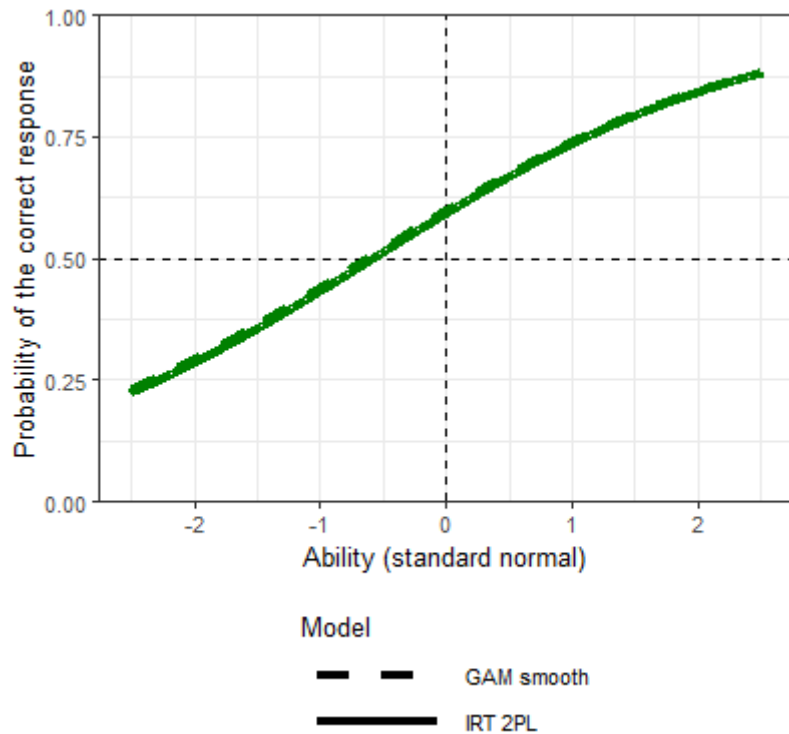


Table 2.40.1.1

Item M041048 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	59.1%	299	MC	0.29	0.32	0.65	-0.58	0.021	0.140

2.40.2. Gender DIF:

Table 2.40.2.1

Item M041048 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.82	0.148	1.000	0.011	

2.40.3. Frequency of answers:

Table 2.40.3.1

Item M041048 answer frequency

Answer	Frequency	Percent
100 cm	39	13.1%
140 cm	30	10.1%
40 cm	53	17.8%
80 cm (correct)	176	59.1%
Overall	298	100.0%

2.40.4. Distractors functioning:

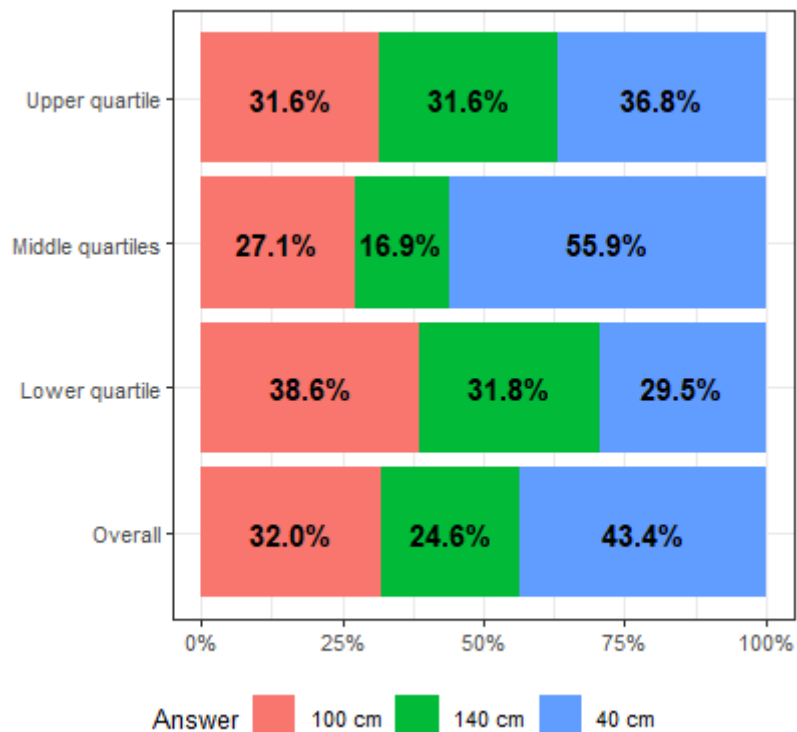
Table 2.40.4.1

Item M041048 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
100 cm	17	16	6	39	38.6%	27.1%	31.6%	32.0%
140 cm	14	10	6	30	31.8%	16.9%	31.6%	24.6%
40 cm	13	33	7	53	29.5%	55.9%	36.8%	43.4%
Overall	44	59	19	122	100.0%	100.0%	100.0%	100.0%

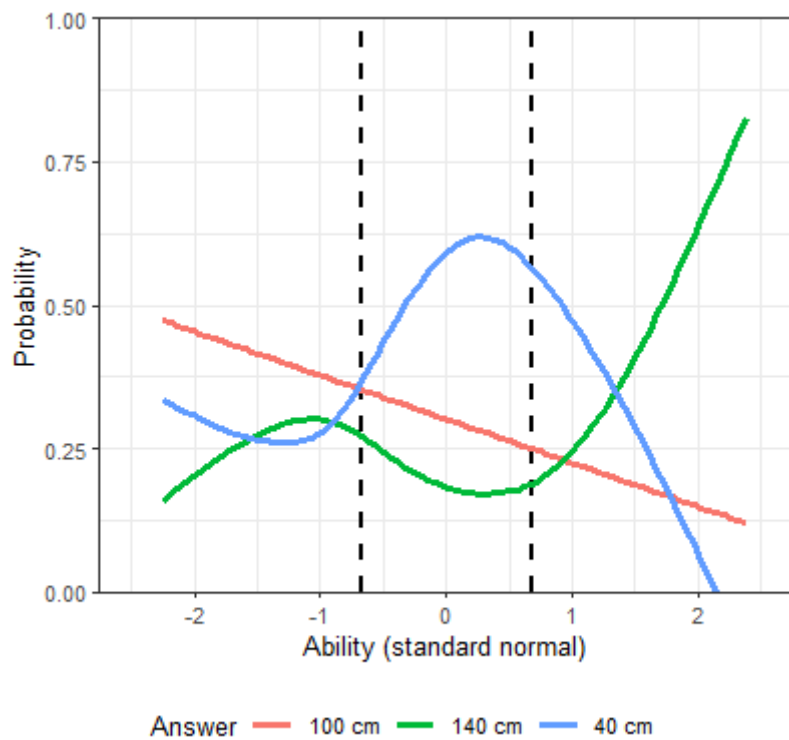
Graph 2.40.4.1

Item M041048 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.40.4.2

Item M041048 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.40.5. Answering time:

Graph 2.40.5.1

Item M041048 answering time distribution in groups of different ability level

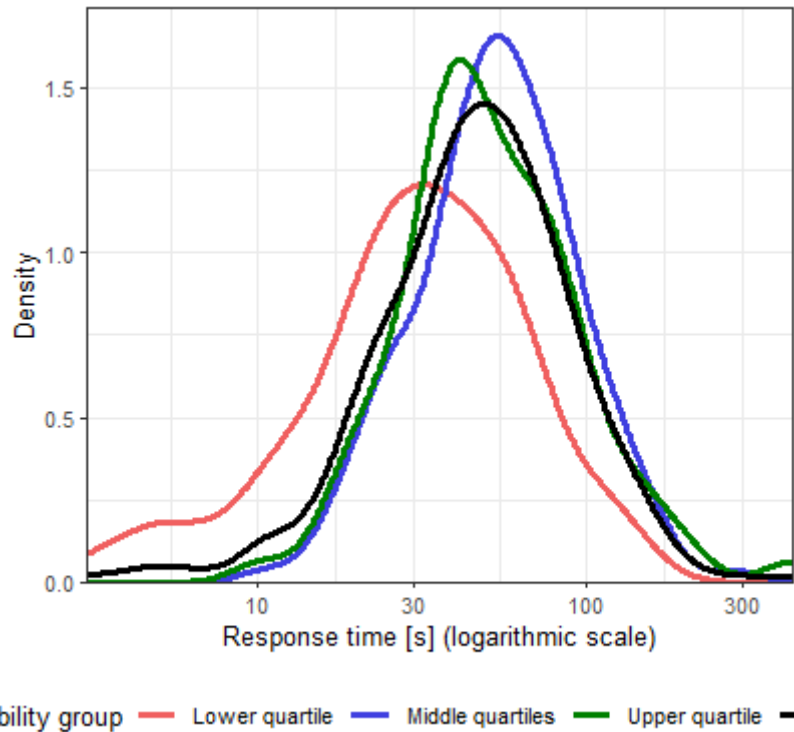


Table 2.40.5.1

Item M041048 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.05	20.41	31.91	50.33	139.42	3.39	0.80
Middle quartiles	10.56	37.89	54.04	77.36	287.54	3.98	0.56
Upper quartile	10.37	35.58	47.30	71.80	426.45	3.93	0.63
Overall	3.05	30.59	47.64	70.81	426.45	3.82	0.69

2.41.M890039 (LLM)

2.41.1. Item fit:

Graph 2.41.1.1

Item M890039 ICC and nonparametric trace line

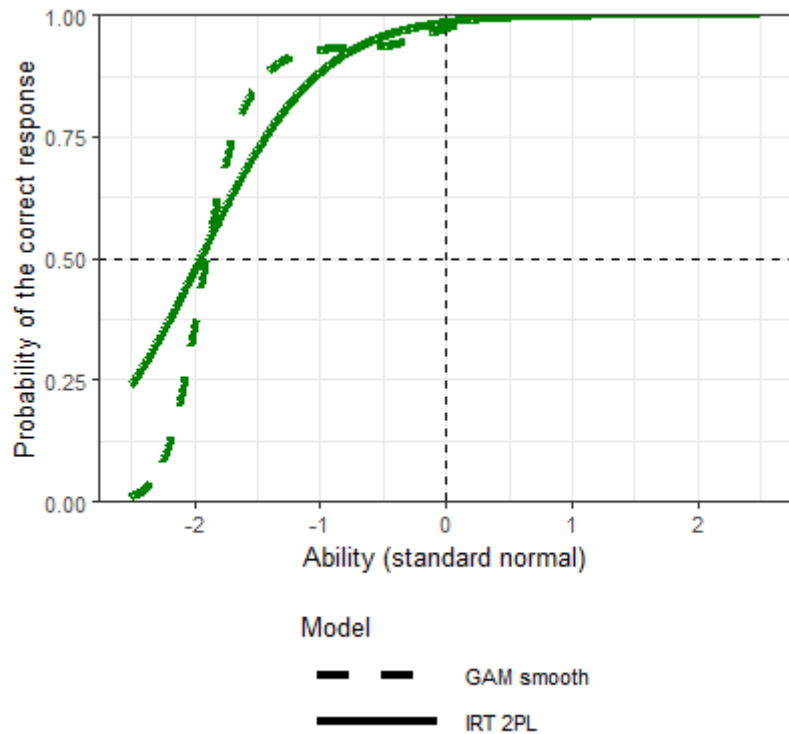


Table 2.41.1.1

Item M890039 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	93.2%	281	MC	0.41	0.27	2.11	-1.95	0.000	0.956

2.41.2. Gender DIF:

Table 2.41.2.1

Item M890039 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.97	0.373	1.000		0.014

2.41.3. Frequency of answers:

Table 2.41.3.1

Item M890039 answer frequency

Answer	Frequency	Percent
Czytanie	6	2.1%
Nauka (correct)	261	93.2%
Sport	12	4.3%
Zabawa z przyjaciółmi	1	0.4%
Overall	280	100.0%

2.41.4. Distractors functioning:

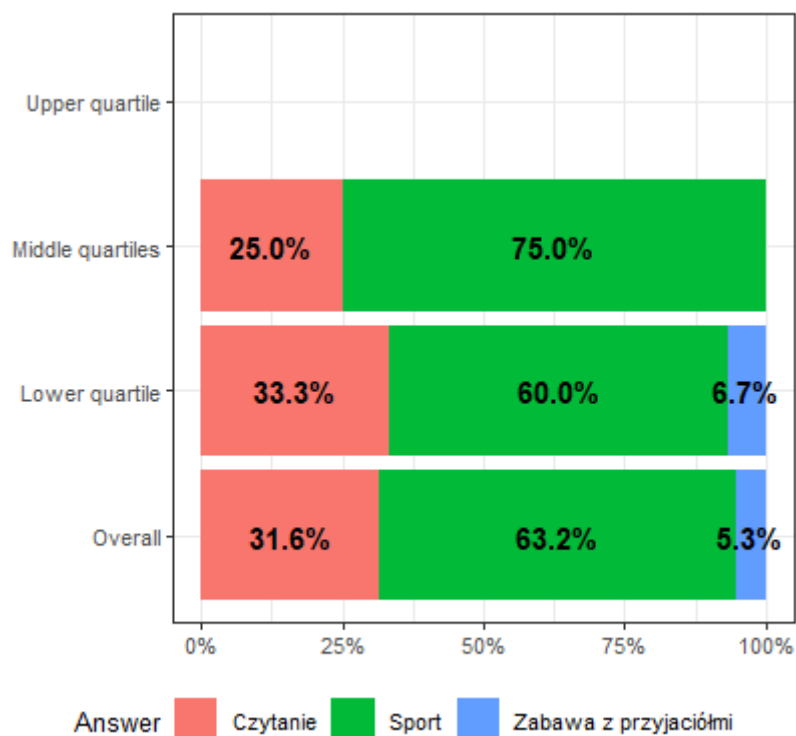
Table 2.41.4.1

Item M890039 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Czytanie	5	1	0	6	33.3%	25.0%	0.0%	31.6%
Sport	9	3	0	12	60.0%	75.0%	0.0%	63.2%
Zabawa z przyjaciółmi	1	0	0	1	6.7%	0.0%	0.0%	5.3%
Overall	15	4	0	19	100.0%	100.0%	0.0%	100.0%

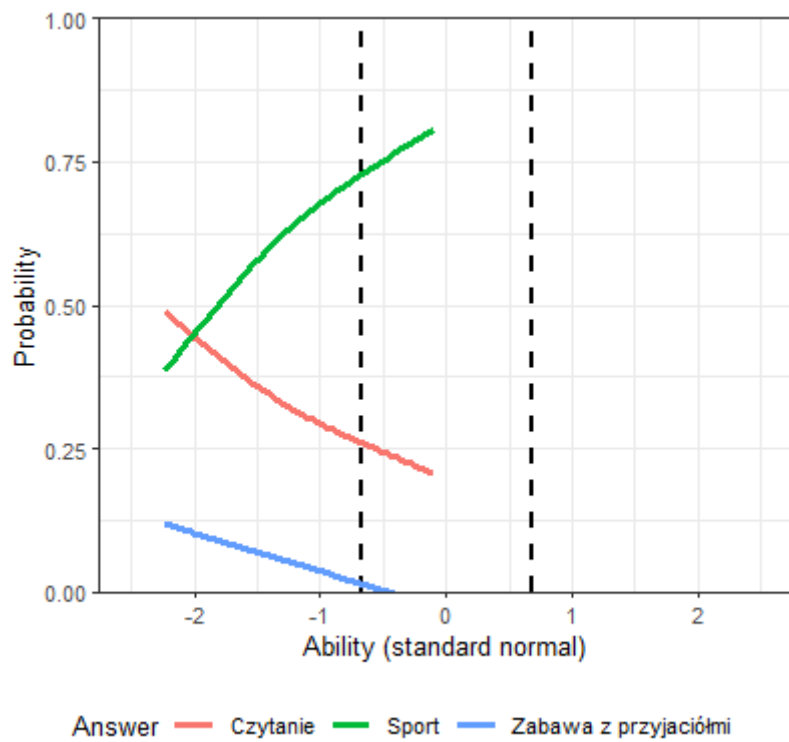
Graph 2.41.4.1

Item M890039 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.41.4.2

Item M890039 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.41.5. Answering time:

Graph 2.41.5.1

Item M890039 answering time distribution in groups of different ability level

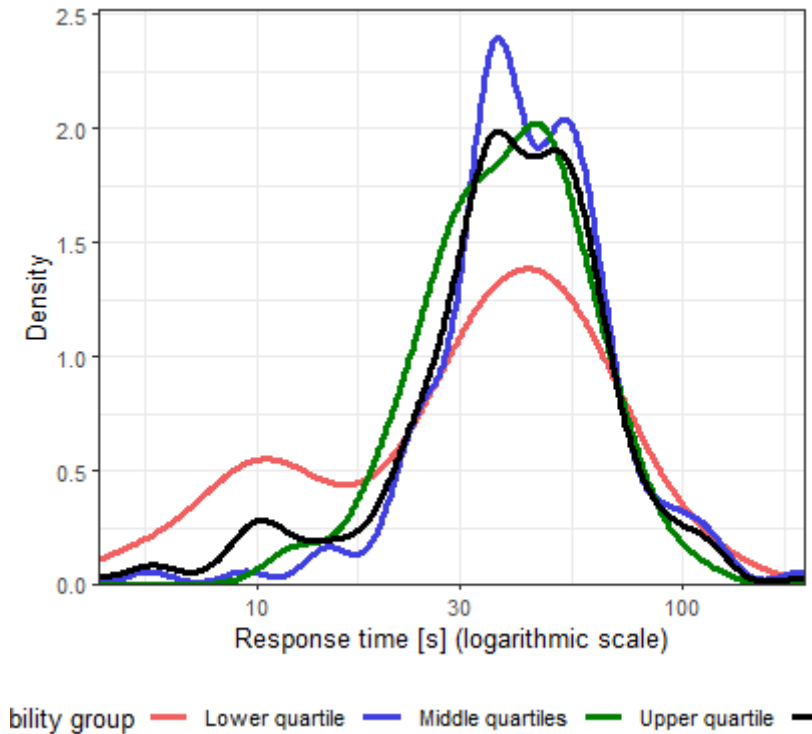


Table 2.41.5.1

Item M890039 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.28	19.03	36.54	53.83	114.06	3.41	0.77
Middle quartiles	5.60	34.22	41.89	55.02	192.91	3.75	0.47
Upper quartile	12.34	28.24	40.07	51.66	104.99	3.65	0.43
Overall	4.28	30.55	39.57	53.80	192.91	3.63	0.57

2.42.M041169 (TIMSS)

2.42.1. Item fit:

Graph 2.42.1.1

Item M041169 ICC and nonparametric trace line

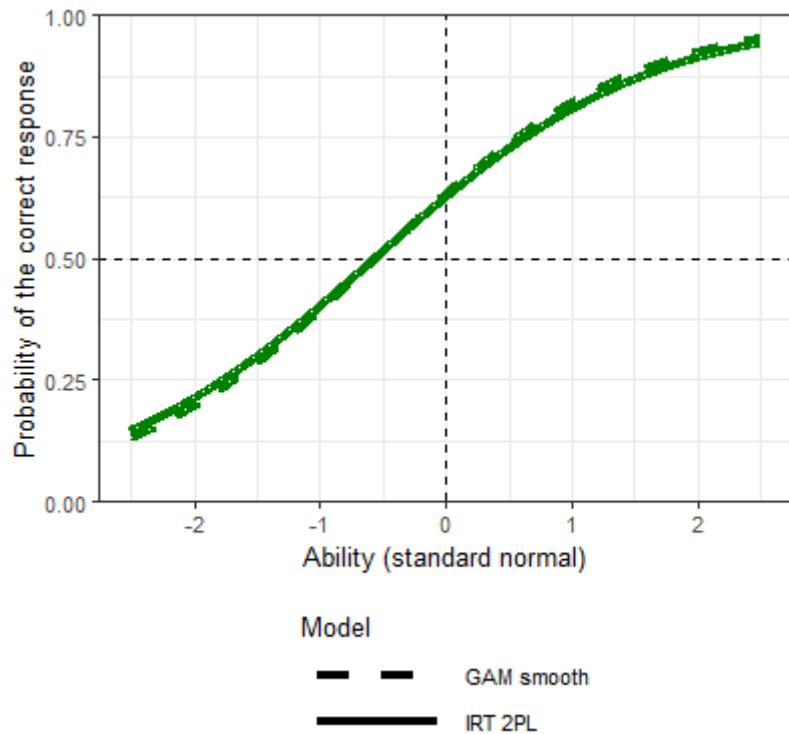


Table 2.42.1.1

Item M041169 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	60.0%	306	MC	0.41	0.40	0.91	-0.57	0.016	0.238

2.42.2. Gender DIF:

Table 2.42.2.1

Item M041169 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.50	0.473	1.000		0.004

2.42.3. Frequency of answers:

Table 2.42.3.1

Item M041169 answer frequency

Answer	Frequency	Percent
Rysunek A (correct)	183	60.0%
Rysunek B	28	9.2%
Rysunek C	59	19.3%
Rysunek D	35	11.5%
Overall	305	100.0%

2.42.4. Distractors functioning:

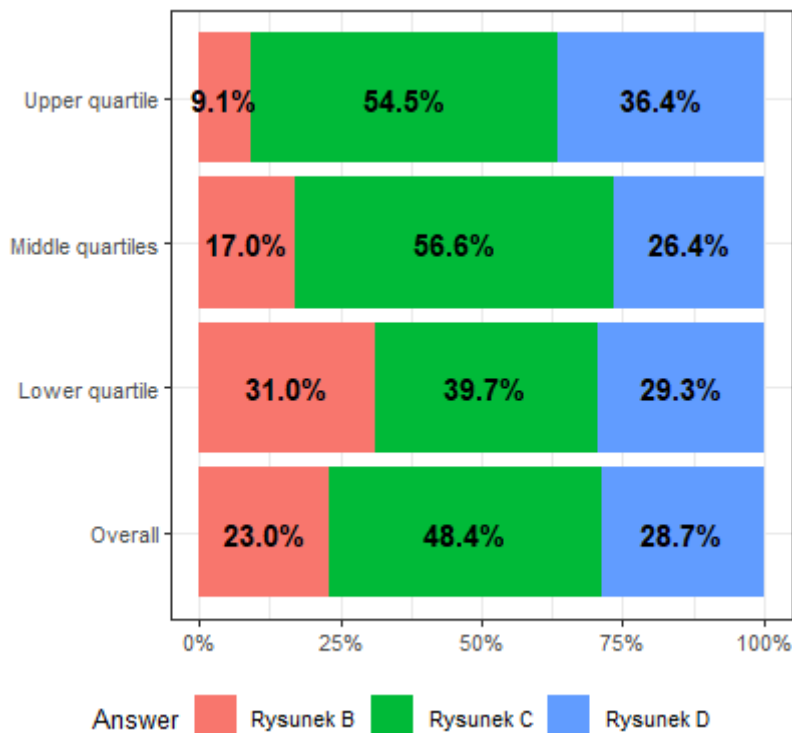
Table 2.42.4.1

Item M041169 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Rysunek B	18	9	1	28	31.0%	17.0%	9.1%	23.0%
Rysunek C	23	30	6	59	39.7%	56.6%	54.5%	48.4%
Rysunek D	17	14	4	35	29.3%	26.4%	36.4%	28.7%
Overall	58	53	11	122	100.0%	100.0%	100.0%	100.0%

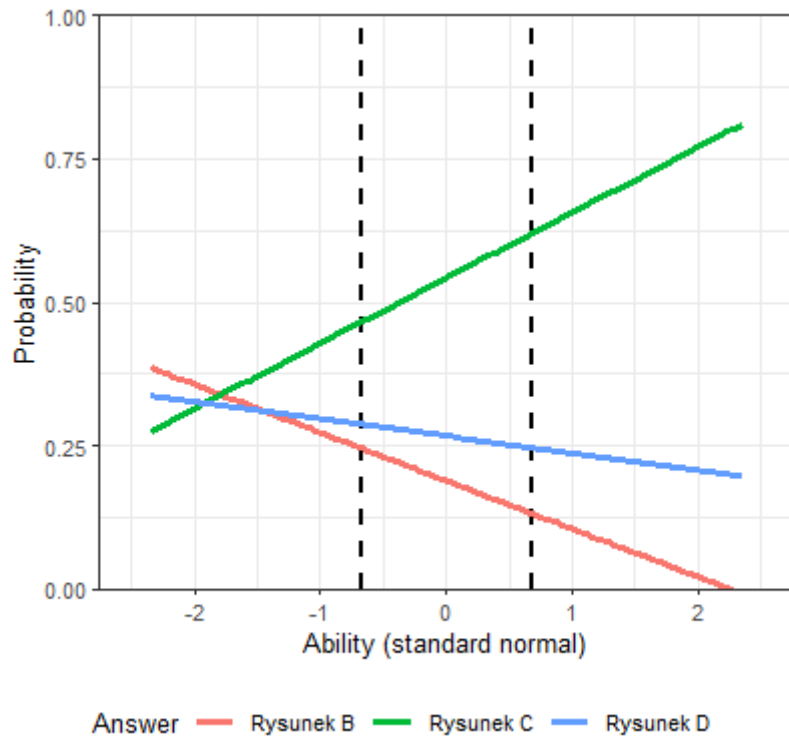
Graph 2.42.4.1

Item M041169 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.42.4.2

Item M041169 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.42.5. Answering time:

Graph 2.42.5.1

Item M041169 answering time distribution in groups of different ability level

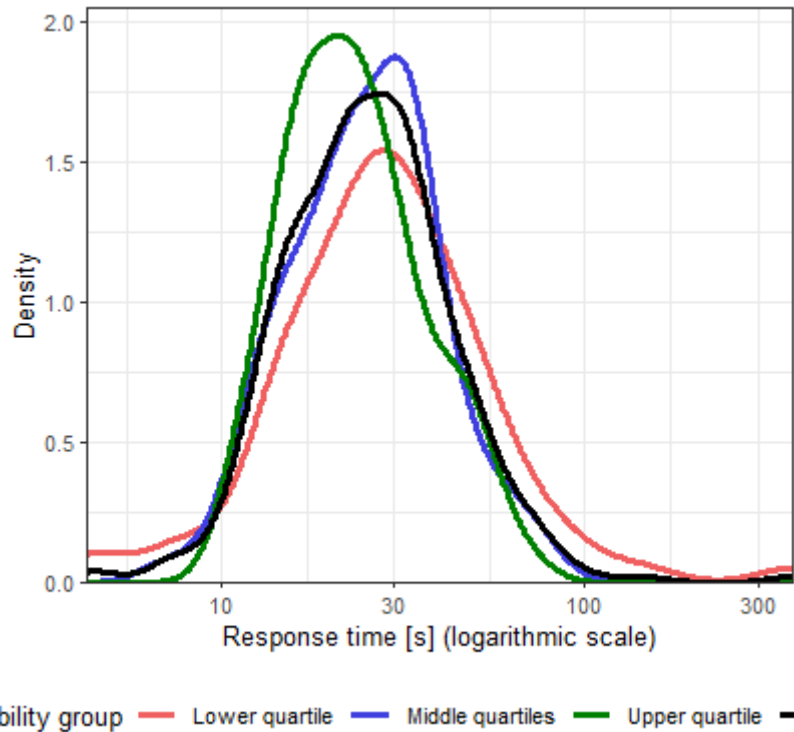


Table 2.42.5.1

Item M041169 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.29	19.66	27.49	42.93	373.43	3.33	0.69
Middle quartiles	6.72	17.96	25.20	33.91	82.79	3.22	0.48
Upper quartile	11.00	16.62	22.49	30.28	69.41	3.15	0.43
Overall	4.29	17.66	24.73	34.73	373.43	3.23	0.54

2.43.M890025 (LLM)

2.43.1. Item fit:

Graph 2.43.1.1

Item M890025 ICC and nonparametric trace line

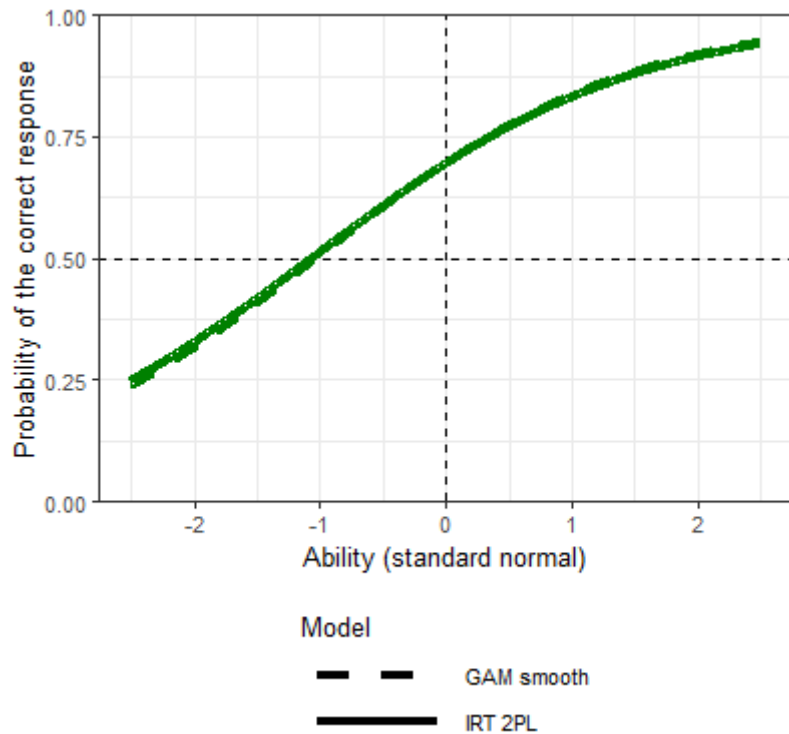


Table 2.43.1.1

Item M890025 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	67.7%	319	MC	0.35	0.23	0.77	-1.07	0.000	0.502

2.43.2. Gender DIF:

Table 2.43.2.1

Item M890025 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.83	0.400	1.000	0.005	

2.43.3. Frequency of answers:

Table 2.43.3.1

Item M890025 answer frequency

Answer	Frequency	Percent
Kat 120° (correct)	216	67.7%
Kat 45°	19	6.0%
Kat 85°	14	4.4%
Kat 90°	70	21.9%
Overall	319	100.0%

2.43.4. Distractors functioning:

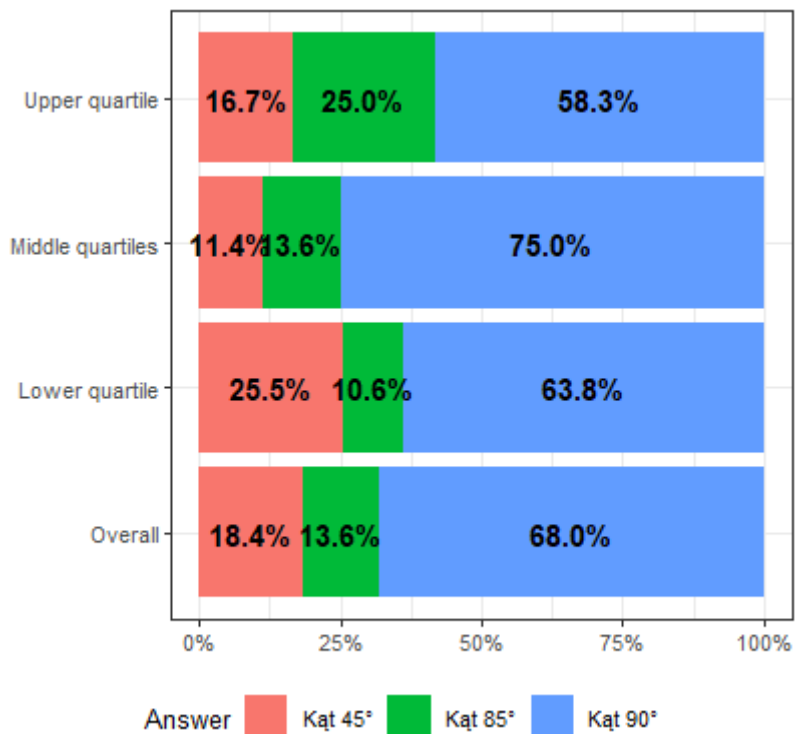
Table 2.43.4.1

Item M890025 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Kat 45°	12	5	2	19	25.5%	11.4%	16.7%	18.4%
Kat 85°	5	6	3	14	10.6%	13.6%	25.0%	13.6%
Kat 90°	30	33	7	70	63.8%	75.0%	58.3%	68.0%
Overall	47	44	12	103	100.0%	100.0%	100.0%	100.0%

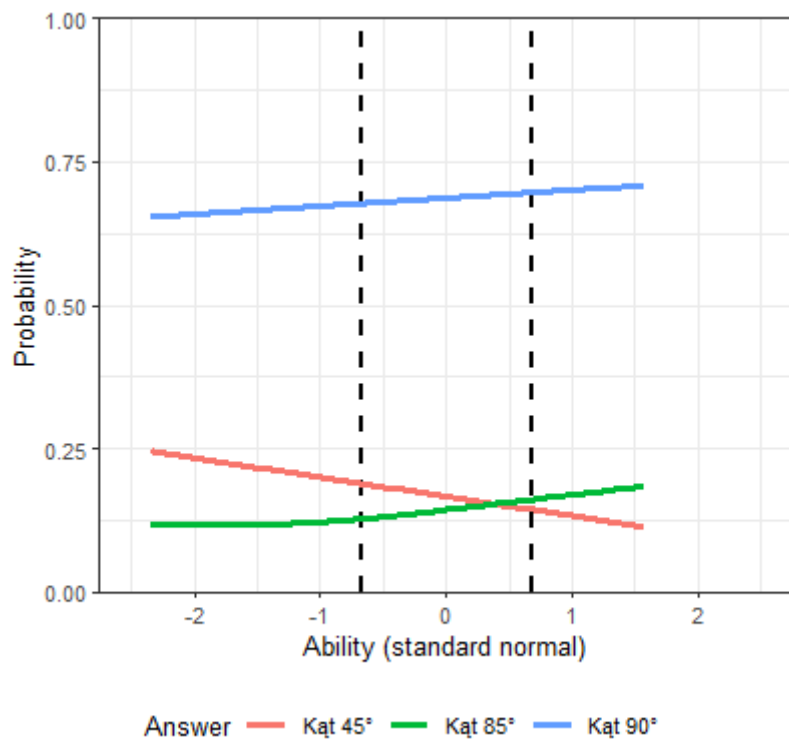
Graph 2.43.4.1

Item M890025 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.43.4.2

Item M890025 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.43.5. Answering time:

Graph 2.43.5.1

Item M890025 answering time distribution in groups of different ability level

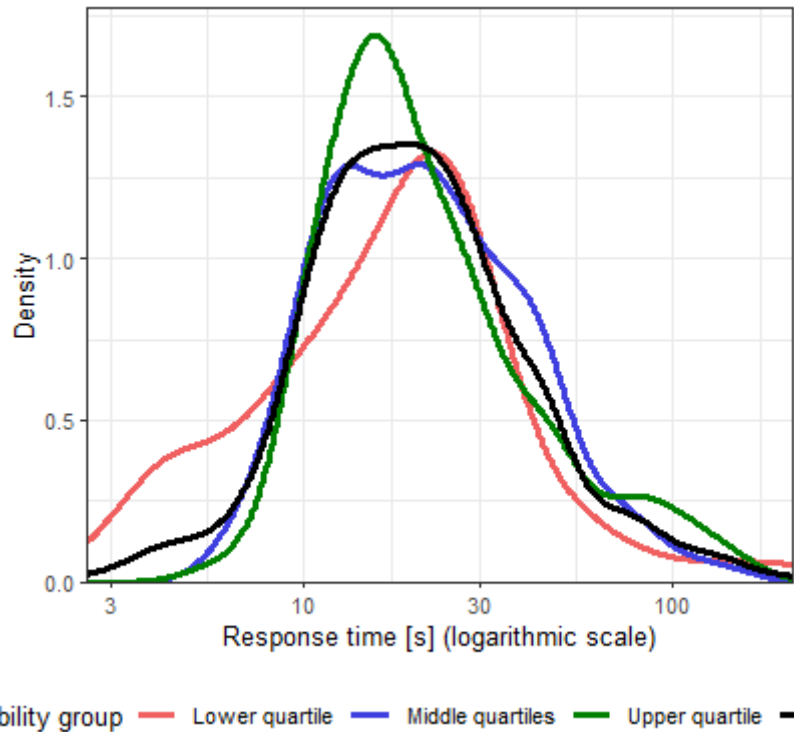


Table 2.43.5.1

Item M890025 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.60	9.97	18.91	26.29	210.15	2.82	0.82
Middle quartiles	6.17	12.57	20.47	31.64	139.14	3.06	0.62
Upper quartile	5.91	13.61	17.52	29.40	145.48	3.07	0.65
Overall	2.60	12.54	19.68	30.06	210.15	3.00	0.69

2.44.M100020 (LLM)

2.44.1. Item fit:

Graph 2.44.1.1

Item M100020 ICC and nonparametric trace line

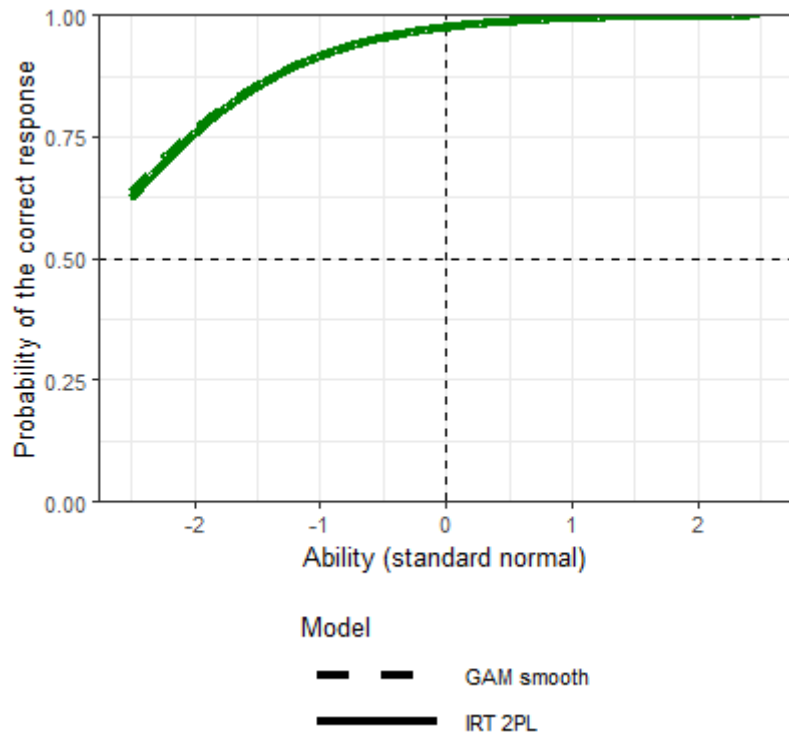


Table 2.44.1.1

Item M100020 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	95.0%	299	MC	0.23	0.20	1.25	-2.90	0.016	0.244

2.44.2. Gender DIF:

Table 2.44.2.1

Item M100020 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.05	0.217	1.000	0.026	

2.44.3. Frequency of answers:

Table 2.44.3.1

Item M100020 answer frequency

Answer	Frequency	Percent
Klasa 1	3	1.0%
Klasa 2	5	1.7%
Klasa 3	7	2.3%
Klasa 4 (correct)	283	95.0%
Overall	298	100.0%

2.44.4. Distractors functioning:

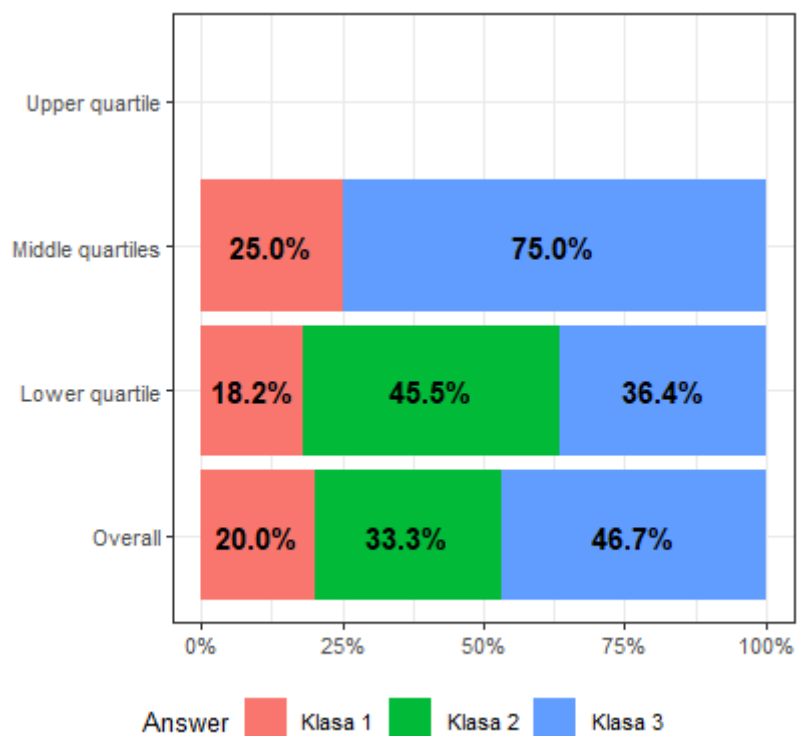
Table 2.44.4.1

Item M100020 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Klasa 1	2	1	0	3	18.2%	25.0%	0.0%	20.0%
Klasa 2	5	0	0	5	45.5%	0.0%	0.0%	33.3%
Klasa 3	4	3	0	7	36.4%	75.0%	0.0%	46.7%
Overall	11	4	0	15	100.0%	100.0%	0.0%	100.0%

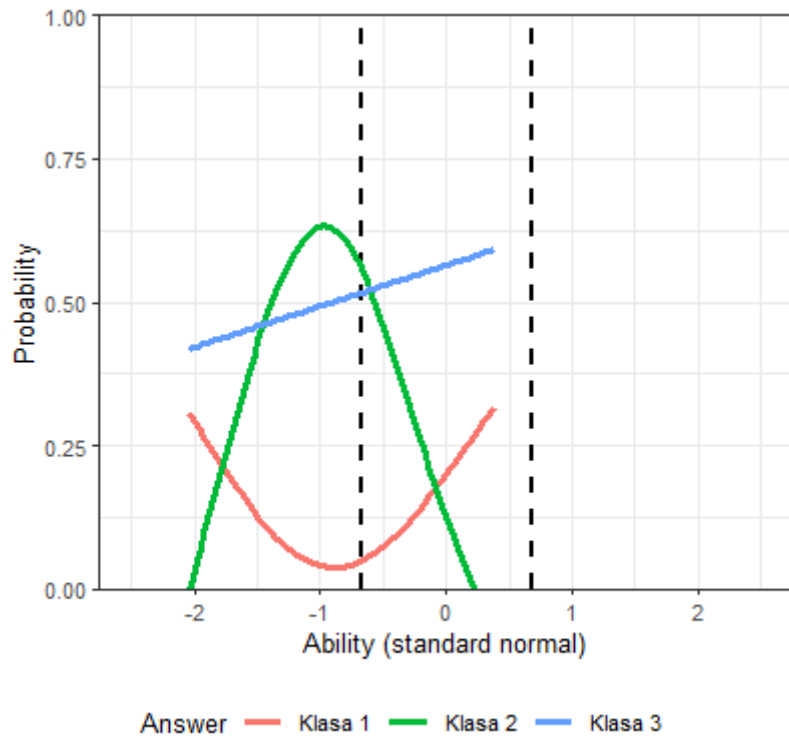
Graph 2.44.4.1

Item M100020 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.44.4.2

Item M100020 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.44.5. Answering time:

Graph 2.44.5.1

Item M100020 answering time distribution in groups of different ability level

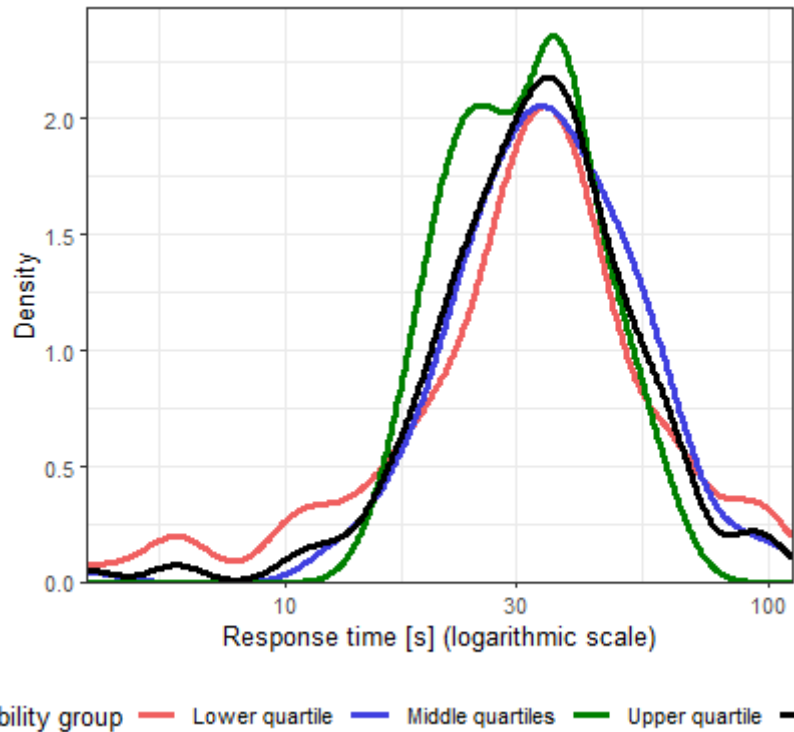


Table 2.44.5.1

Item M100020 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.92	23.40	32.41	41.84	99.83	3.42	0.63
Middle quartiles	3.88	25.62	34.46	46.16	111.99	3.54	0.46
Upper quartile	15.37	23.65	32.38	38.81	63.67	3.43	0.34
Overall	3.88	24.81	33.55	43.43	111.99	3.48	0.50

2.45.M041151 (TIMSS)

2.45.1. Item fit:

Graph 2.45.1.1

Item M041151 ICC and nonparametric trace line

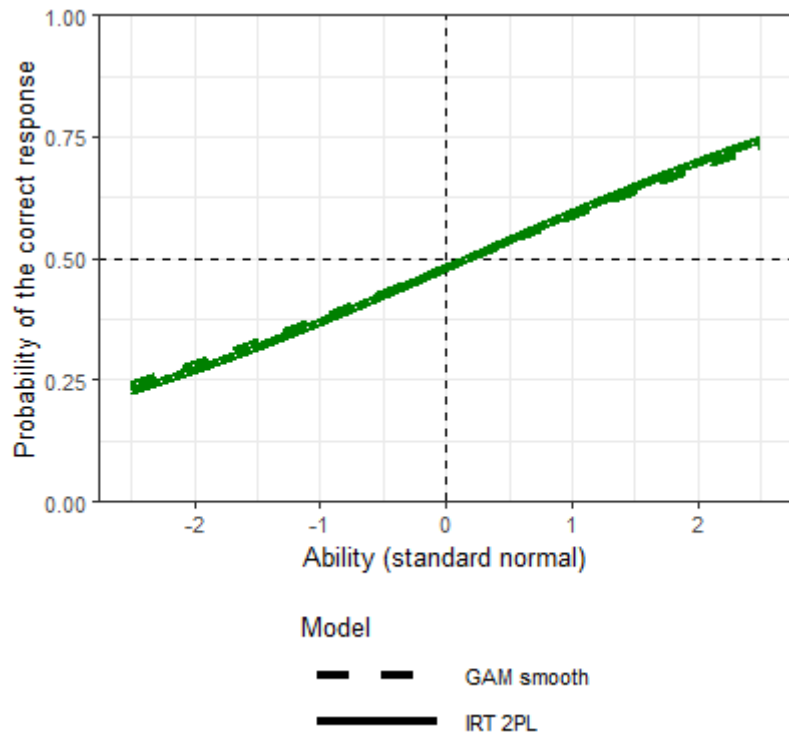


Table 2.45.1.1

Item M041151 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	47.5%	306	MC	0.21	0.21	0.46	0.18	0.010	0.338

2.45.2. Gender DIF:

Table 2.45.2.1

Item M041151 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.25	0.536	1.000	0.003	

2.45.3. Frequency of answers:

Table 2.45.3.1

Item M041151 answer frequency

Answer	Frequency	Percent
Siatka A	47	15.4%
Siatka B	63	20.7%
Siatka C (correct)	145	47.5%
Siatka D	50	16.4%
Overall	305	100.0%

2.45.4. Distractors functioning:

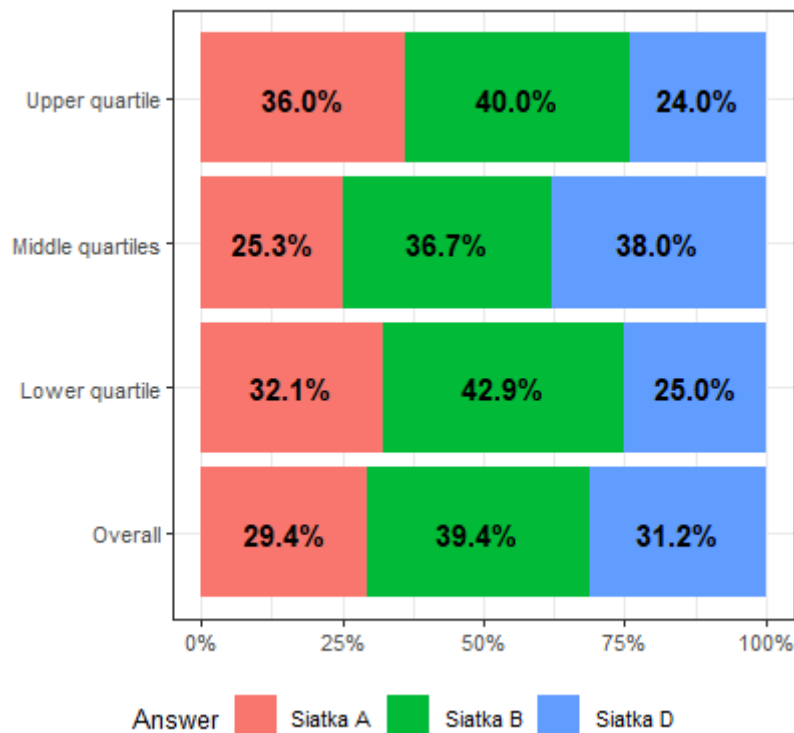
Table 2.45.4.1

Item M041151 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Siatka A	18	20	9	47	32.1%	25.3%	36.0%	29.4%
Siatka B	24	29	10	63	42.9%	36.7%	40.0%	39.4%
Siatka D	14	30	6	50	25.0%	38.0%	24.0%	31.2%
Overall	56	79	25	160	100.0%	100.0%	100.0%	100.0%

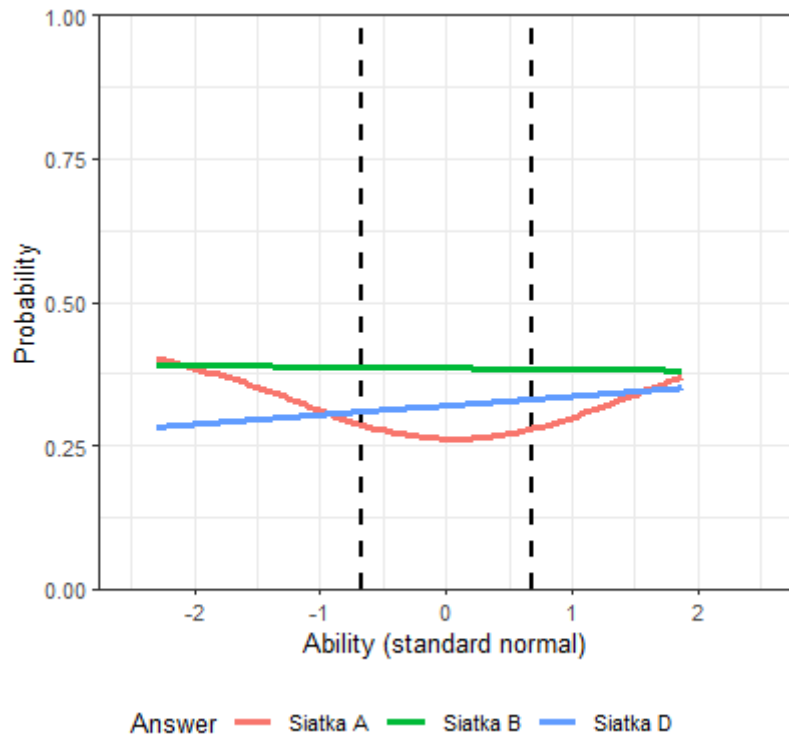
Graph 2.45.4.1

Item M041151 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.45.4.2

Item M041151 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.45.5. Answering time:

Graph 2.45.5.1

Item M041151 answering time distribution in groups of different ability level

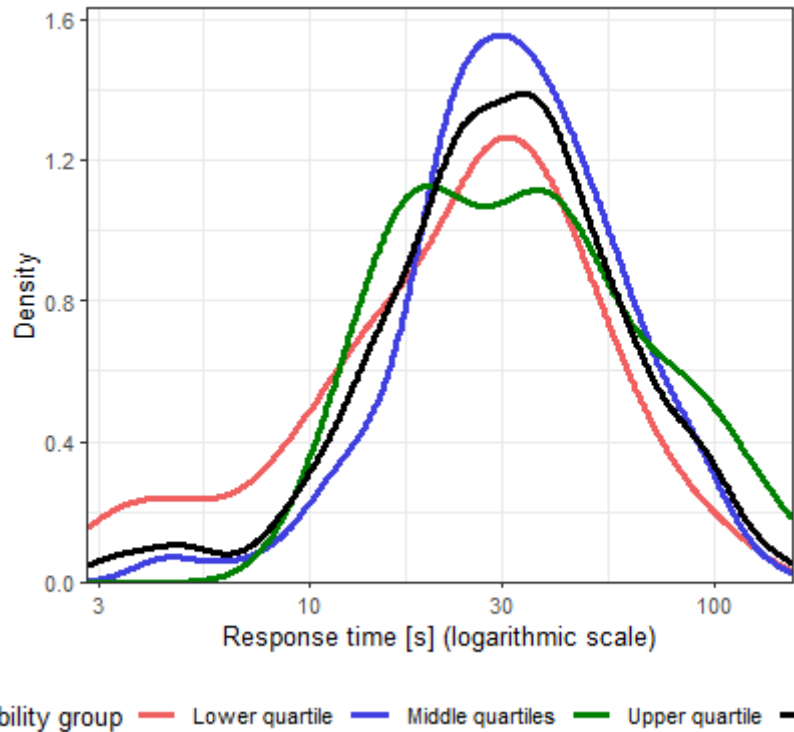


Table 2.45.5.1

Item M041151 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.83	14.69	26.18	38.93	108.09	3.13	0.82
Middle quartiles	4.29	22.38	31.40	47.20	131.10	3.46	0.60
Upper quartile	10.08	18.66	34.03	54.60	156.31	3.50	0.68
Overall	2.83	20.22	30.52	46.02	156.31	3.38	0.70

2.46.M100004 (LLM)

2.46.1. Item fit:

Graph 2.46.1.1

Item M100004 ICC and nonparametric trace line

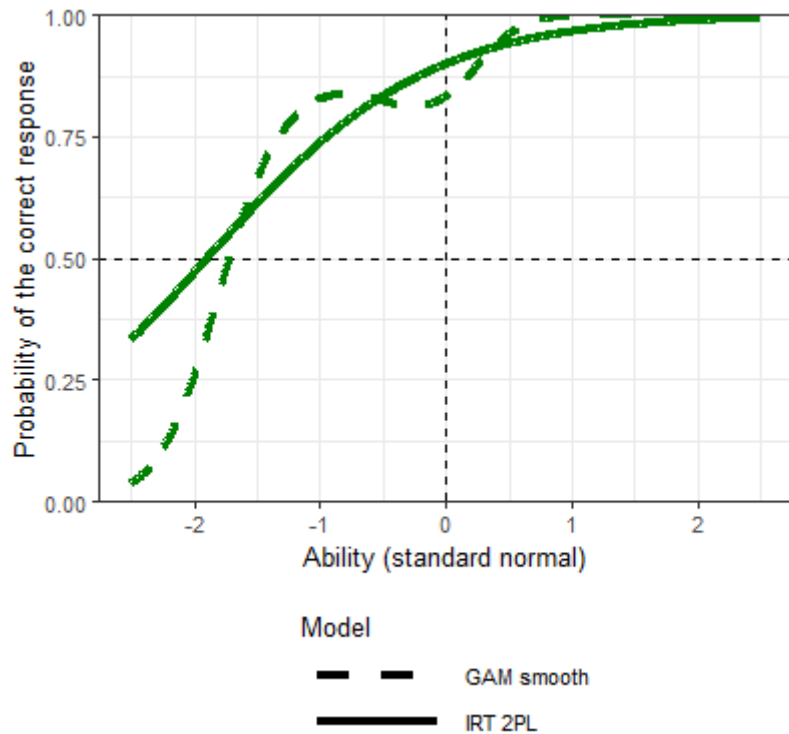


Table 2.46.1.1

Item M100004 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	85.2%	299	MC	0.36	0.18	1.15	-1.90	0.019	0.175

2.46.2. Gender DIF:

Table 2.46.2.1

Item M100004 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.10	0.951	1.000	0.000	

2.46.3. Frequency of answers:

Table 2.46.3.1

Item M100004 answer frequency

Answer	Frequency	Percent
15	8	2.7%
20	16	5.4%
25 (correct)	254	85.2%
30	20	6.7%
Overall	298	100.0%

2.46.4. Distractors functioning:

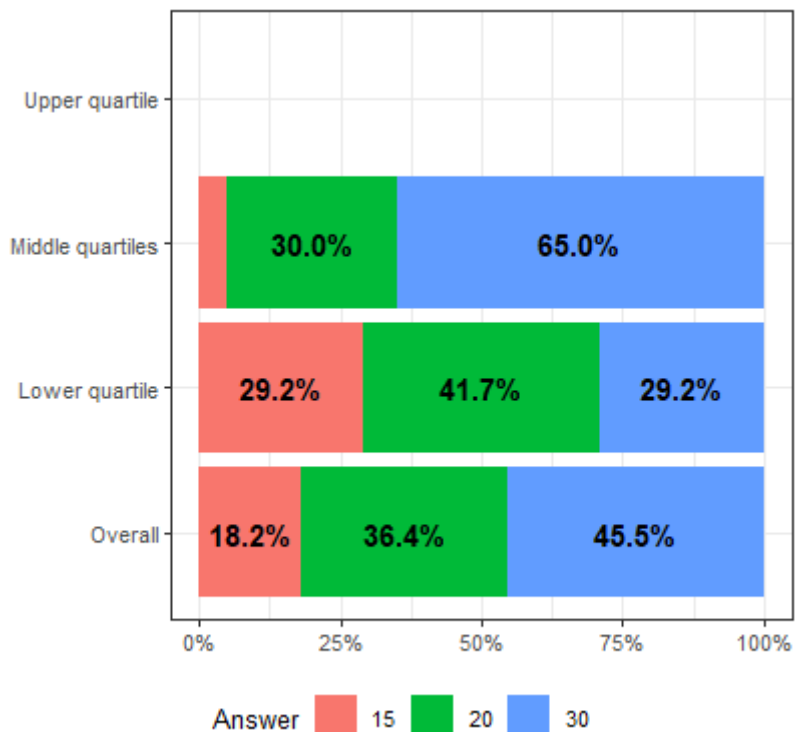
Table 2.46.4.1

Item M100004 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
15	7	1	0	8	29.2%	5.0%	0.0%	18.2%
20	10	6	0	16	41.7%	30.0%	0.0%	36.4%
30	7	13	0	20	29.2%	65.0%	0.0%	45.5%
Overall	24	20	0	44	100.0%	100.0%	0.0%	100.0%

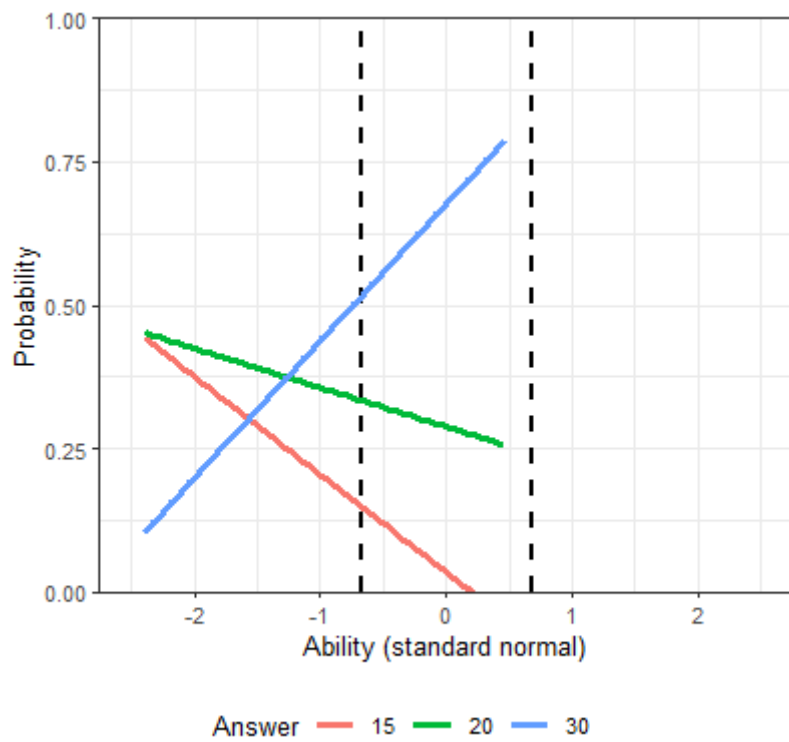
Graph 2.46.4.1

Item M100004 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.46.4.2

Item M100004 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.46.5. Answering time:

Graph 2.46.5.1

Item M100004 answering time distribution in groups of different ability level

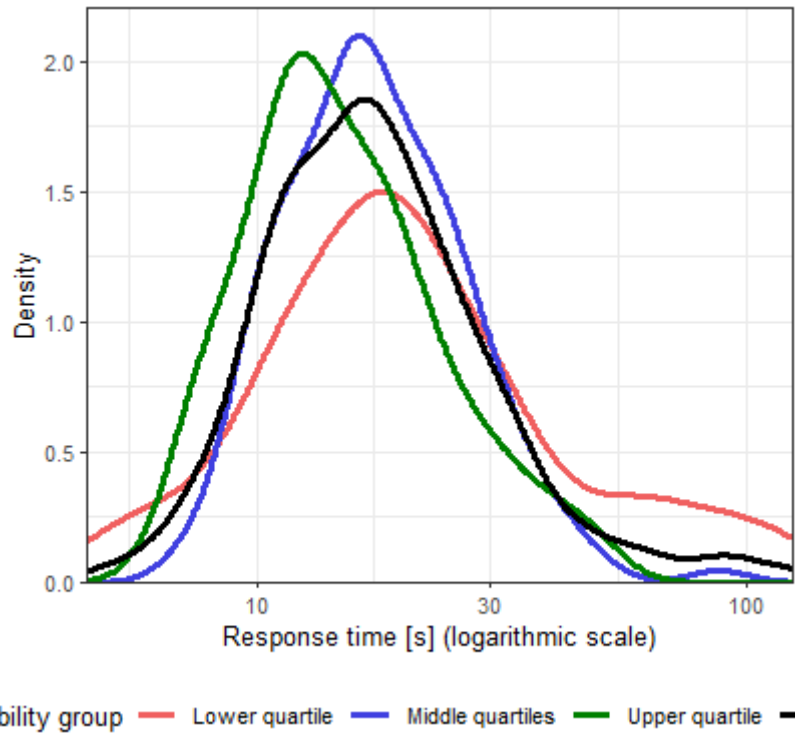


Table 2.46.5.1

Item M100004 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.51	12.79	18.68	30.06	124.37	3.02	0.72
Middle quartiles	7.11	12.73	16.78	23.17	88.38	2.86	0.43
Upper quartile	6.77	10.80	13.59	19.28	47.52	2.71	0.46
Overall	4.51	12.09	16.78	23.52	124.37	2.87	0.54

2.47.M061185 (TIMSS)

2.47.1. Item fit:

Graph 2.47.1.1

Item M061185 ICC and nonparametric trace line

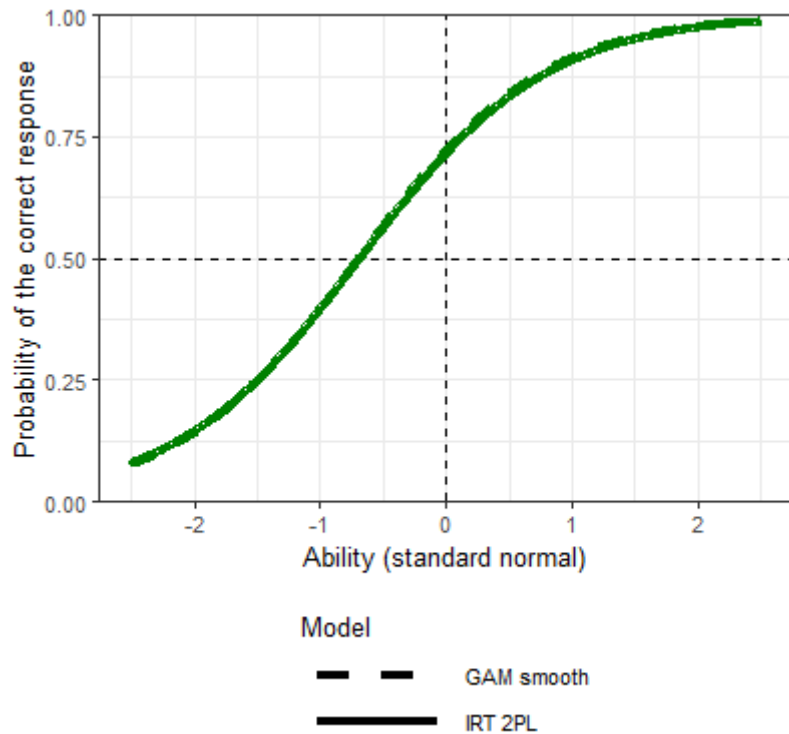


Table 2.47.1.1

Item M061185 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	65.6%	306	MC	0.50	0.45	1.35	-0.69	0.000	0.638	

2.47.2. Gender DIF:

Table 2.47.2.1

Item M061185 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.36	0.835	1.000		0.001

2.47.3. Frequency of answers:

Table 2.47.3.1

Item M061185 answer frequency

Answer	Frequency	Percent
3:15	51	16.7%
3:45	35	11.5%
9:00 (correct)	200	65.6%
9:45	19	6.2%
Overall	305	100.0%

2.47.4. Distractors functioning:

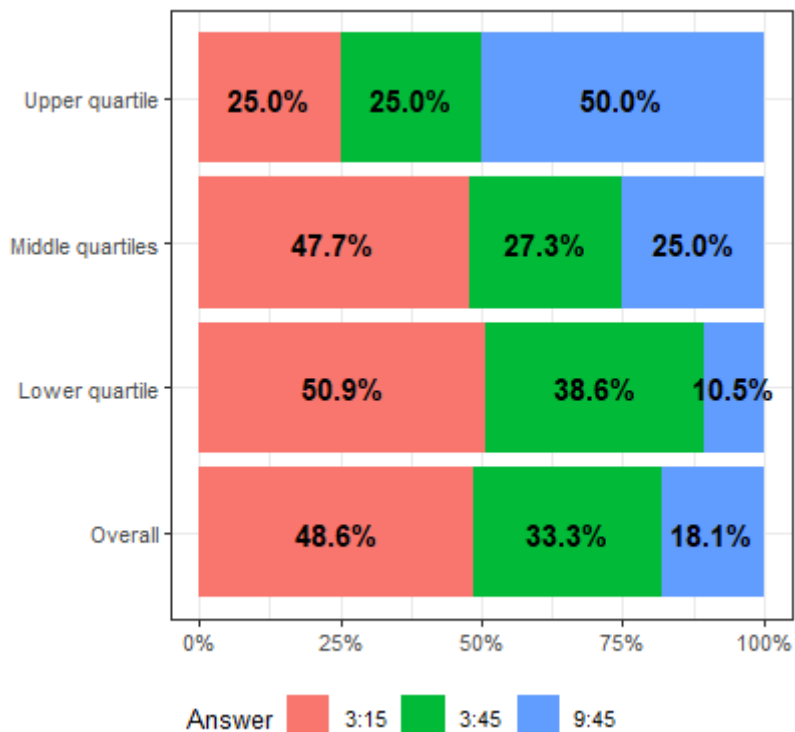
Table 2.47.4.1

Item M061185 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
3:15	29	21	1	51	50.9%	47.7%	25.0%	48.6%
3:45	22	12	1	35	38.6%	27.3%	25.0%	33.3%
9:45	6	11	2	19	10.5%	25.0%	50.0%	18.1%
Overall	57	44	4	105	100.0%	100.0%	100.0%	100.0%

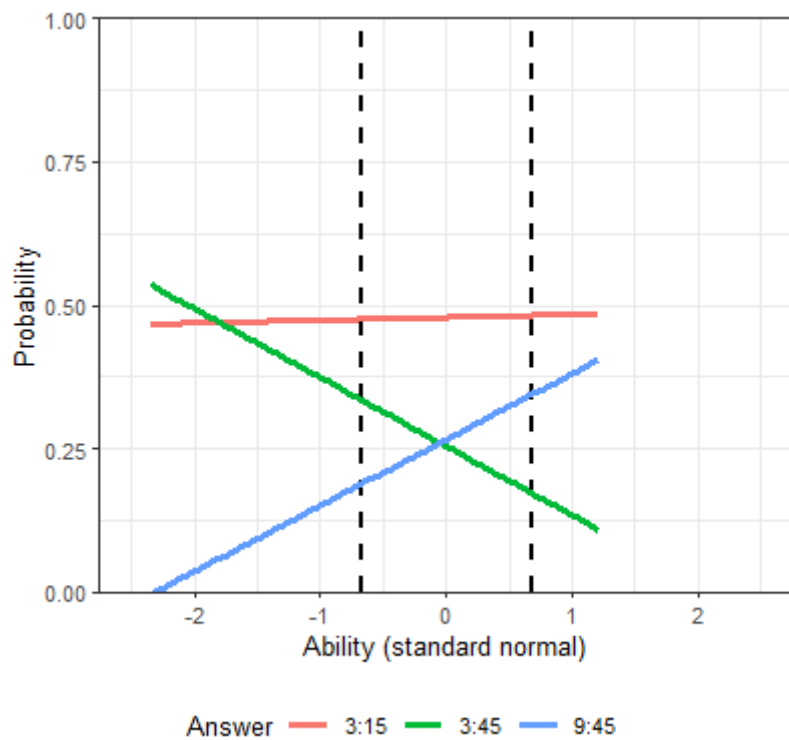
Graph 2.47.4.1

Item M061185 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.47.4.2

Item M061185 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.47.5. Answering time:

Graph 2.47.5.1

Item M061185 answering time distribution in groups of different ability level

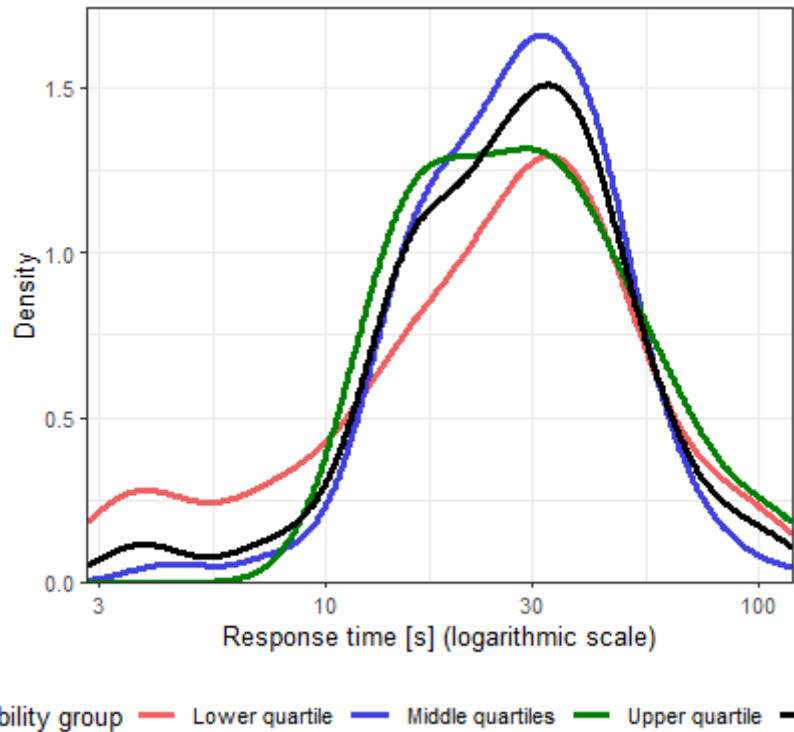


Table 2.47.5.1

Item M061185 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.82	15.22	26.41	39.20	119.06	3.12	0.85
Middle quartiles	3.93	18.93	28.32	39.67	116.41	3.30	0.54
Upper quartile	10.15	17.42	27.97	42.15	119.06	3.35	0.59
Overall	2.82	17.28	28.08	40.01	119.06	3.26	0.65

2.48.M051070 (TIMSS)

2.48.1. Item fit:

Graph 2.48.1.1

Item M051070 ICC and nonparametric trace line

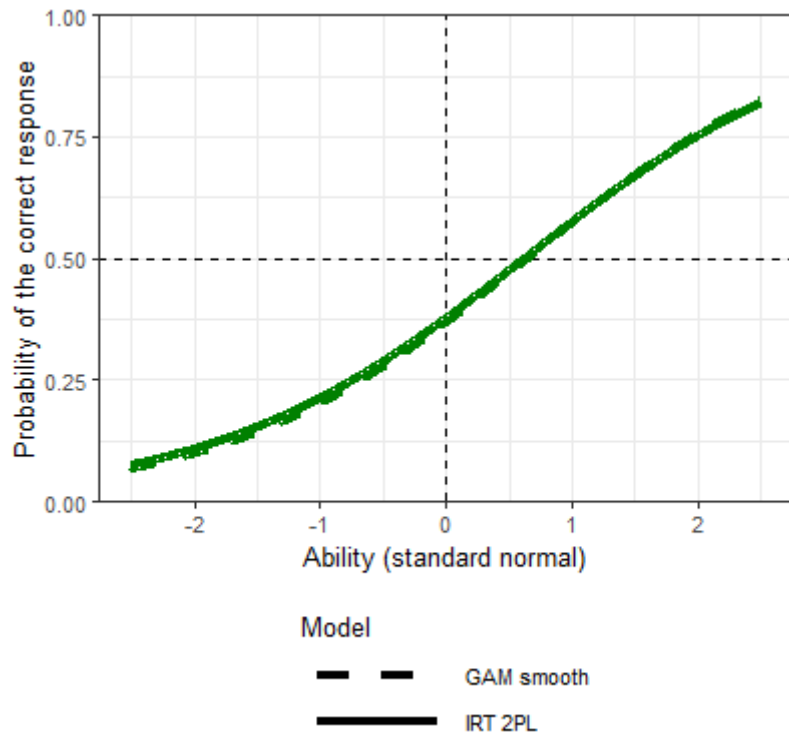


Table 2.48.1.1

Item M051070 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	40.1%	294	MC	0.37	0.38	0.80	0.62	0.000	0.489

2.48.2. Gender DIF:

Table 2.48.2.1

Item M051070 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.71	0.258	1.000		0.008

2.48.3. Frequency of answers:

Table 2.48.3.1

Item M051070 answer frequency

Answer	Frequency	Percent
13,65 zedów (correct)	118	40.1%
14,65 zedów	104	35.4%
16,35 zedów	15	5.1%
6,35 zedów	57	19.4%
Overall	294	100.0%

2.48.4. Distractors functioning:

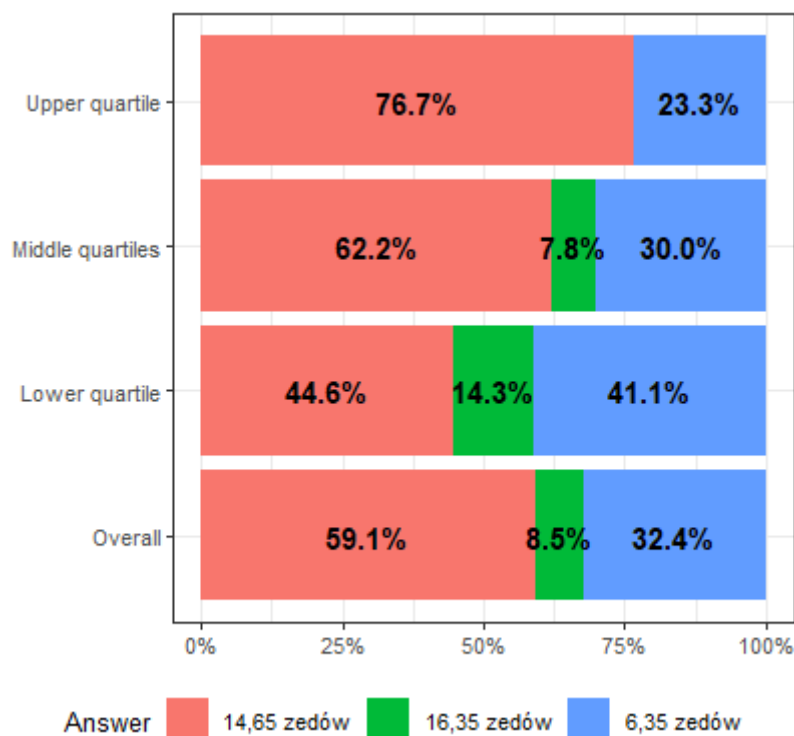
Table 2.48.4.1

Item M051070 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
14,65 zedów	25	56	23	104	44.6%	62.2%	76.7%	59.1%
16,35 zedów	8	7	0	15	14.3%	7.8%	0.0%	8.5%
6,35 zedów	23	27	7	57	41.1%	30.0%	23.3%	32.4%
Overall	56	90	30	176	100.0%	100.0%	100.0%	100.0%

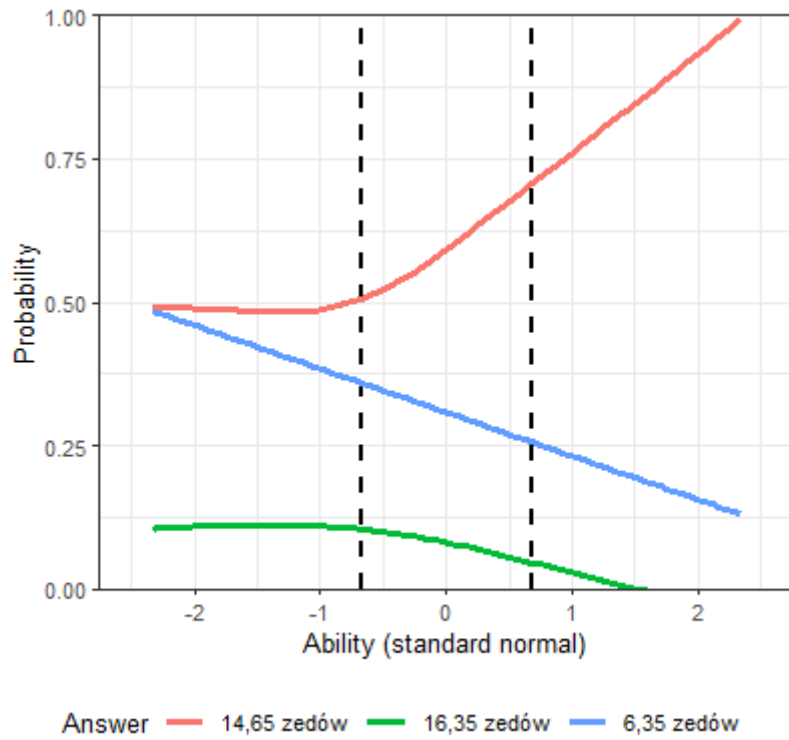
Graph 2.48.4.1

Item M051070 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.48.4.2

Item M051070 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.48.5. Answering time:

Graph 2.48.5.1

Item M051070 answering time distribution in groups of different ability level

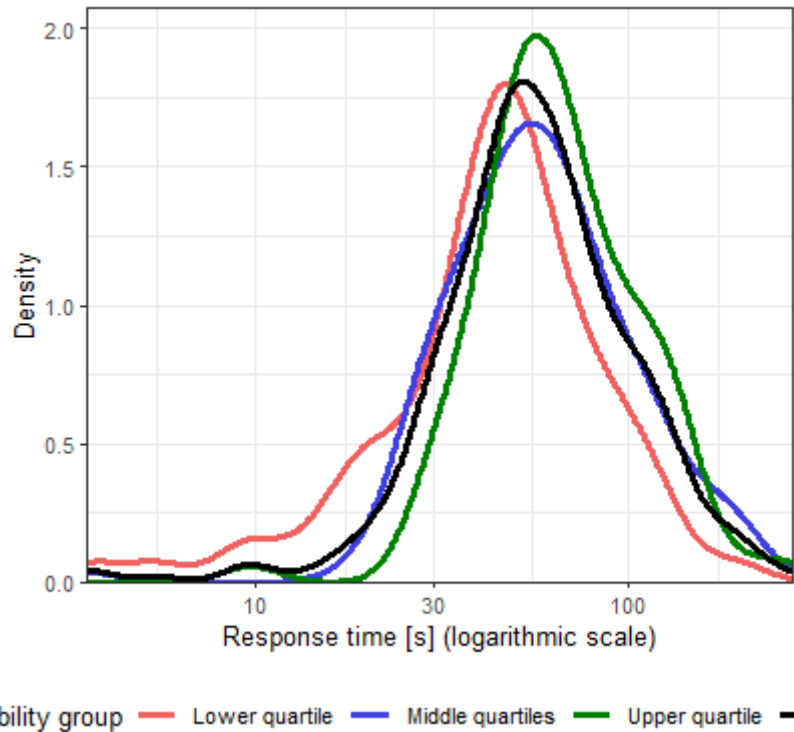


Table 2.48.5.1

Item M051070 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.60	32.44	45.43	62.93	194.03	3.74	0.70
Middle quartiles	3.55	39.20	56.78	81.85	228.02	4.05	0.58
Upper quartile	9.73	47.42	62.44	91.52	274.18	4.16	0.50
Overall	3.55	40.03	55.59	79.75	274.18	4.01	0.61

2.49.M061050 (TIMSS)

2.49.1. Item fit:

Graph 2.49.1.1

Item M061050 ICC and nonparametric trace line

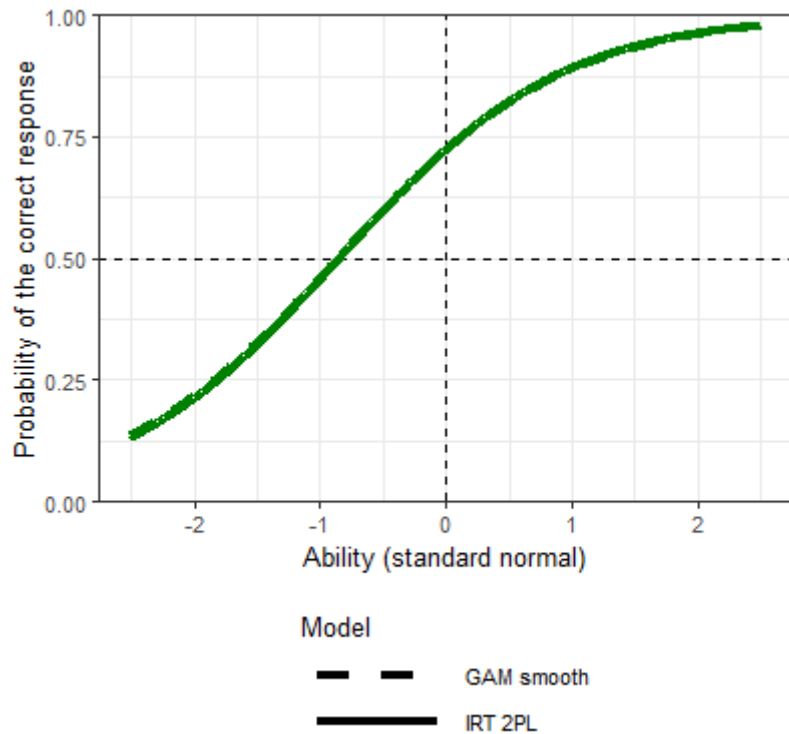


Table 2.49.1.1

Item M061050 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	67.8%	304	MC	0.43	0.41	1.14	-0.85	0.000	0.750	

2.49.2. Gender DIF:

Table 2.49.2.1

Item M061050 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.95	0.377	1.000	0.006	

2.49.3. Frequency of answers:

Table 2.49.3.1

Item M061050 answer frequency

Answer	Frequency	Percent
11 (correct)	206	67.8%
21	70	23.0%
25	11	3.6%
31	17	5.6%
Overall	304	100.0%

2.49.4. Distractors functioning:

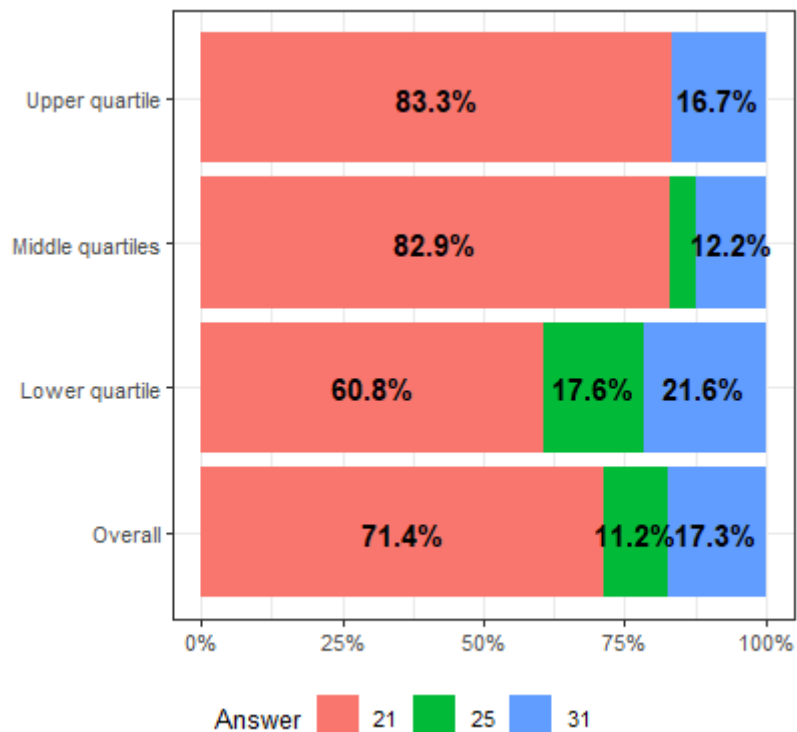
Table 2.49.4.1

Item M061050 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
21	31	34	5	70	60.8%	82.9%	83.3%	71.4%
25	9	2	0	11	17.6%	4.9%	0.0%	11.2%
31	11	5	1	17	21.6%	12.2%	16.7%	17.3%
Overall	51	41	6	98	100.0%	100.0%	100.0%	100.0%

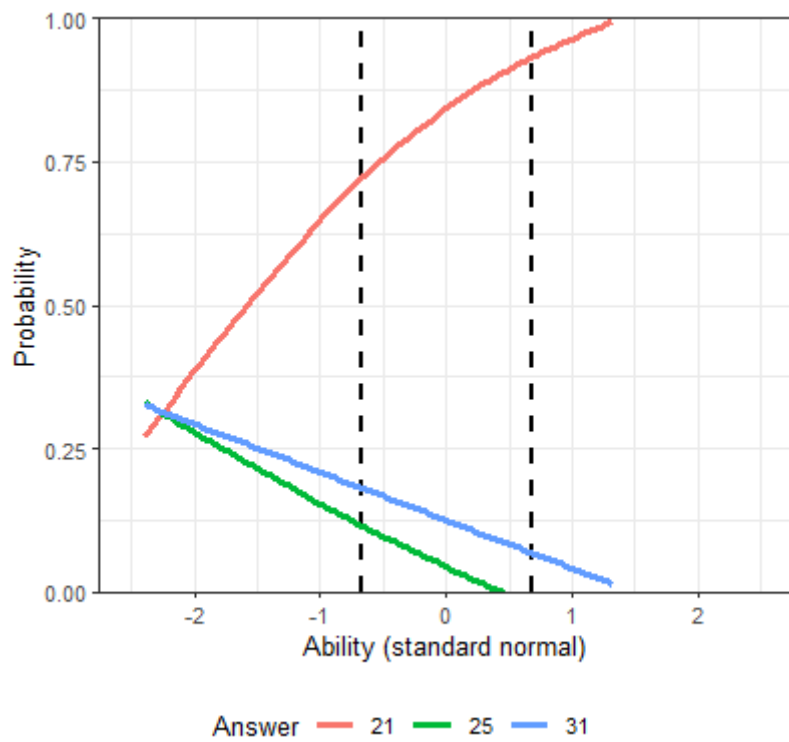
Graph 2.49.4.1

Item M061050 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.49.4.2

Item M061050 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.49.5. Answering time:

Graph 2.49.5.1

Item M061050 answering time distribution in groups of different ability level

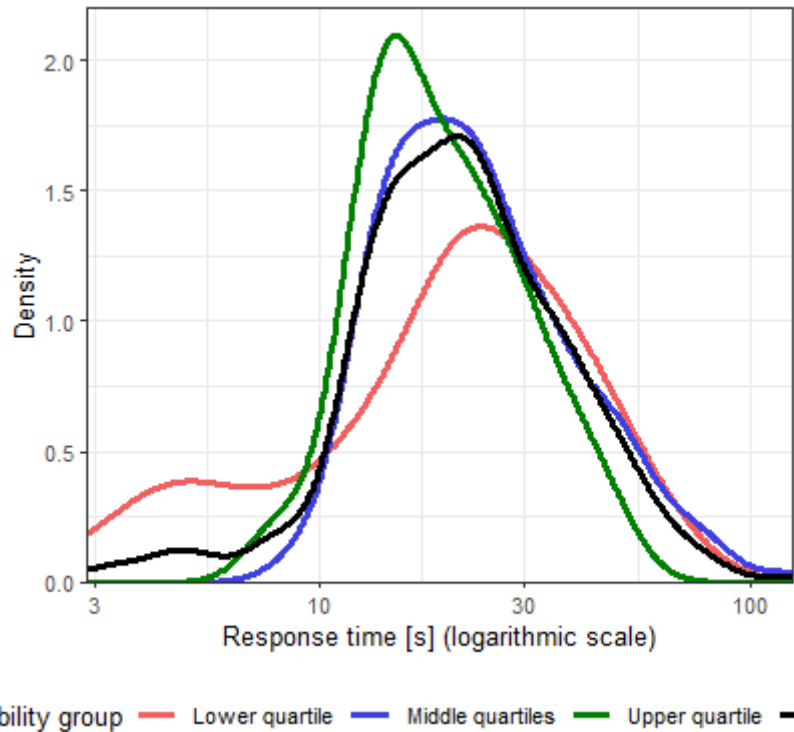


Table 2.49.5.1

Item M061050 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.90	12.40	22.04	33.61	63.59	2.93	0.77
Middle quartiles	8.57	15.90	22.80	32.70	125.36	3.16	0.50
Upper quartile	7.72	14.29	18.51	26.21	52.14	2.96	0.43
Overall	2.90	14.88	21.18	30.62	125.36	3.05	0.58

2.50.M041096 (TIMSS)

2.50.1. Item fit:

Graph 2.50.1.1

Item M041096 ICC and nonparametric trace line

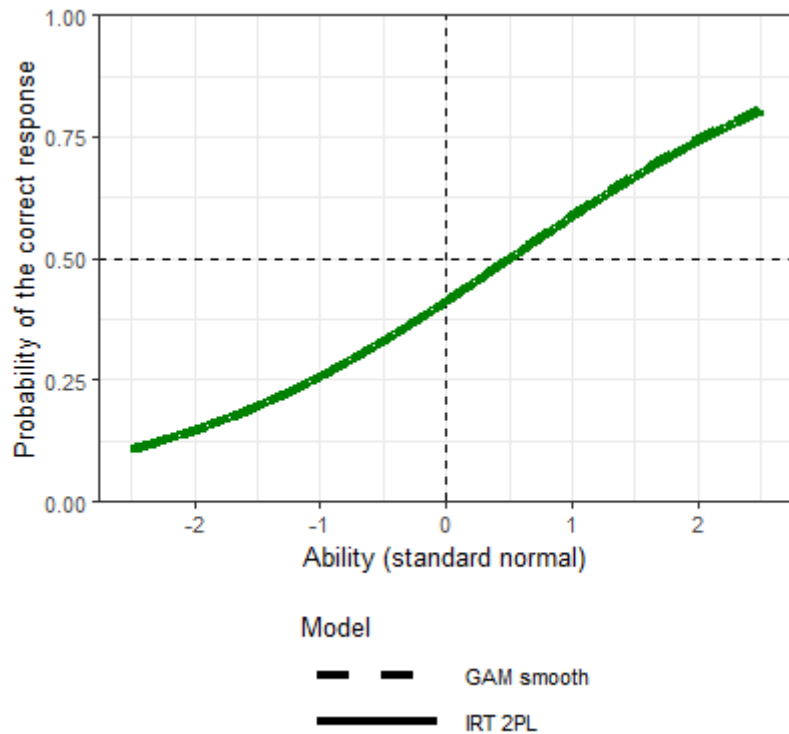


Table 2.50.1.1

Item M041096 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	41.3%	306	MC	0.32	0.33	0.70	0.51	0.000	0.733

2.50.2. Gender DIF:

Table 2.50.2.1

Item M041096 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.30	0.860	1.000	0.001	

2.50.3. Frequency of answers:

Table 2.50.3.1

Item M041096 answer frequency

Answer	Frequency	Percent
64	98	32.1%
100	63	20.7%
104	18	5.9%
110 (correct)	126	41.3%
Overall	305	100.0%

2.50.4. Distractors functioning:

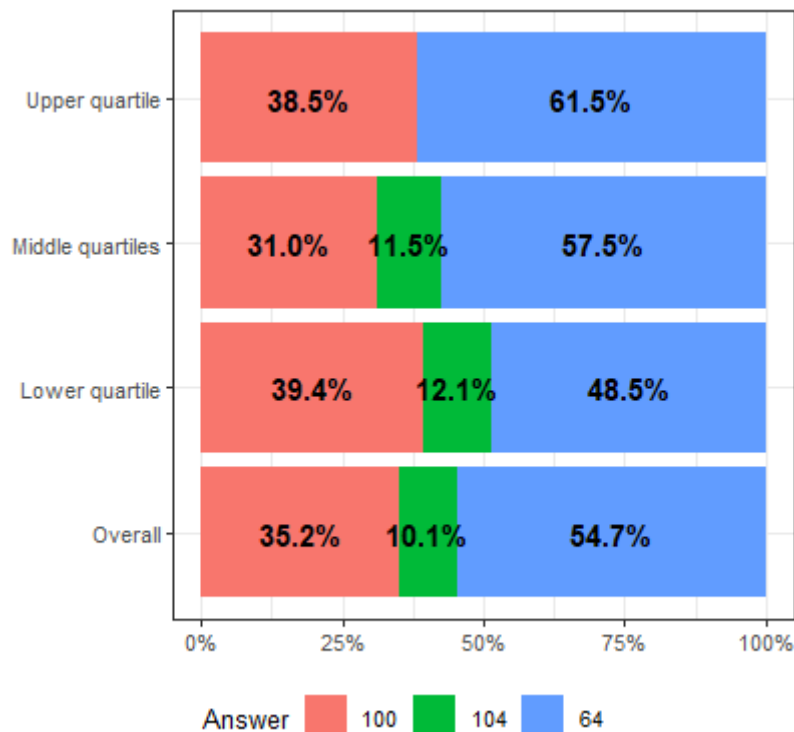
Table 2.50.4.1

Item M041096 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
100	26	27	10	63	39.4%	31.0%	38.5%	35.2%
104	8	10	0	18	12.1%	11.5%	0.0%	10.1%
64	32	50	16	98	48.5%	57.5%	61.5%	54.7%
Overall	66	87	26	179	100.0%	100.0%	100.0%	100.0%

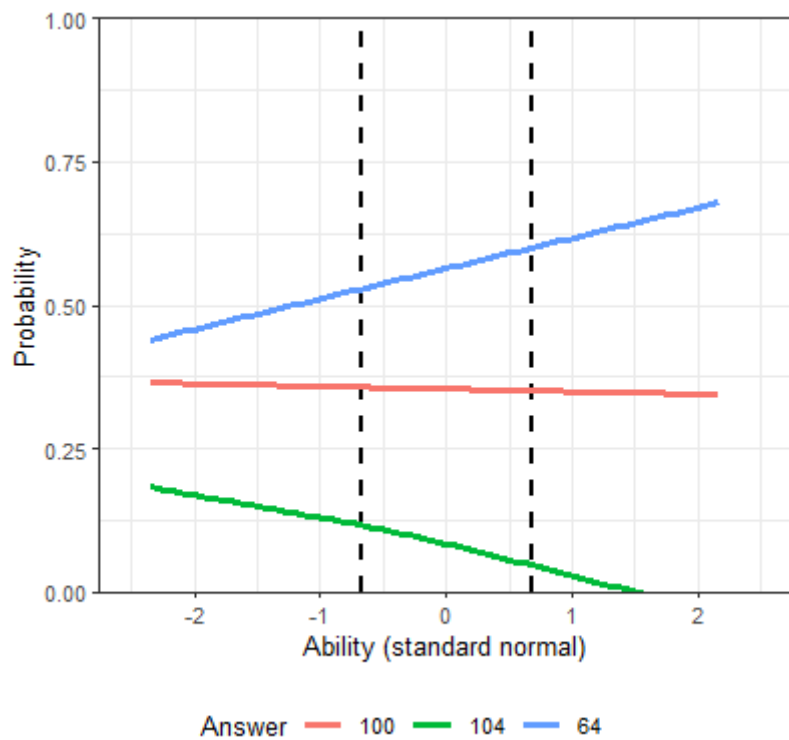
Graph 2.50.4.1

Item M041096 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.50.4.2

Item M041096 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.50.5. Answering time:

Graph 2.50.5.1

Item M041096 answering time distribution in groups of different ability level

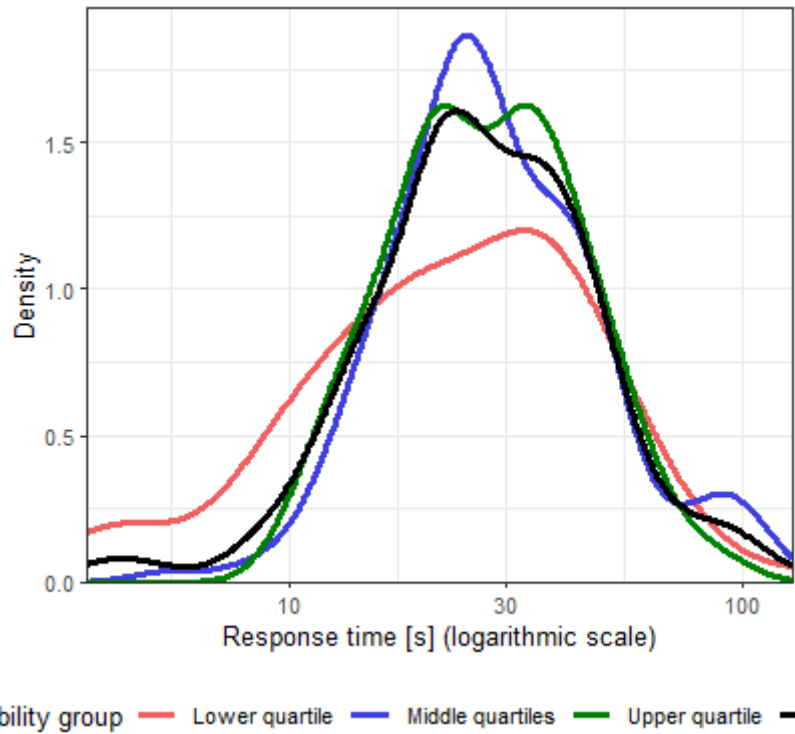


Table 2.50.5.1

Item M041096 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.59	14.09	24.30	37.83	128.67	3.10	0.74
Middle quartiles	5.35	20.36	26.20	40.48	114.35	3.34	0.54
Upper quartile	10.26	19.82	28.17	37.07	89.40	3.30	0.48
Overall	3.59	19.14	26.02	38.47	128.67	3.27	0.59

2.51.M051093 (TIMSS)

2.51.1. Item fit:

Graph 2.51.1.1

Item M051093 ICC and nonparametric trace line

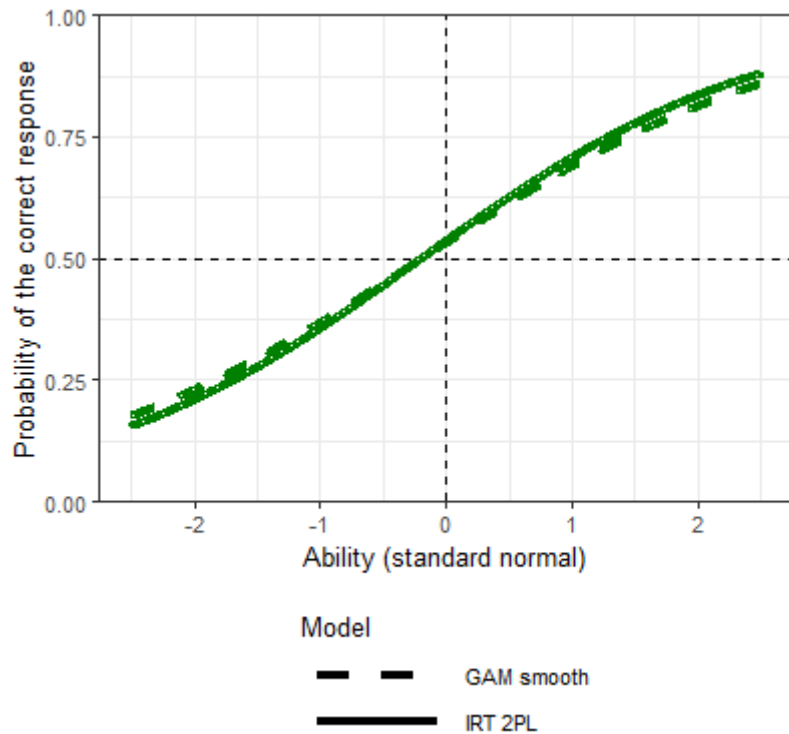


Table 2.51.1.1

Item M051093 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	54.1%	294	MC	0.32	0.30	0.74	-0.20	0.012	0.319

2.51.2. Gender DIF:

Table 2.51.2.1

Item M051093 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.08	0.961	1.000	0.000	

2.51.3. Frequency of answers:

Table 2.51.3.1

Item M051093 answer frequency

Answer	Frequency	Percent
28 cm	63	21.4%
32 cm (correct)	159	54.1%
36 cm	46	15.6%
40 cm	26	8.8%
Overall	294	100.0%

2.51.4. Distractors functioning:

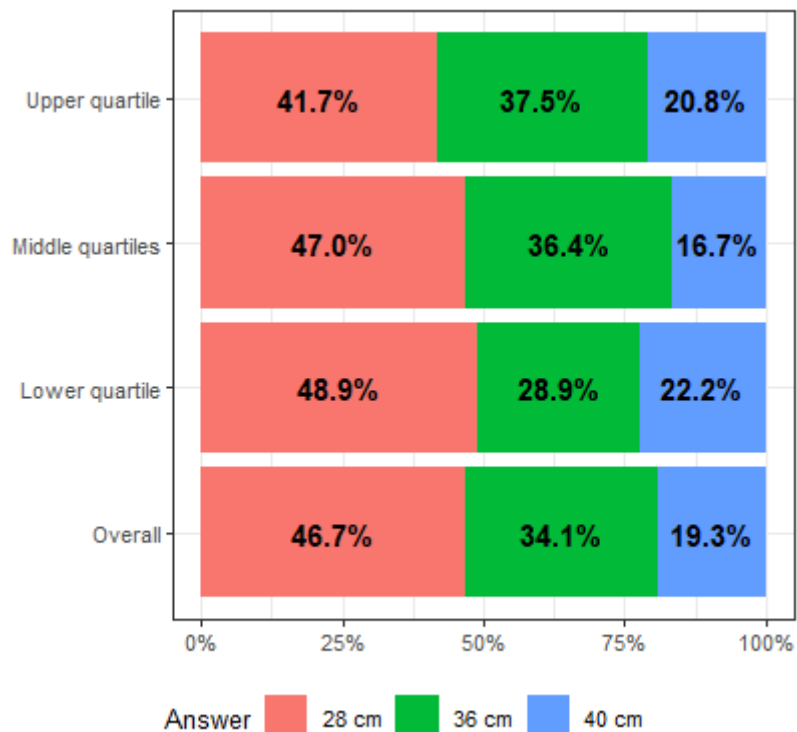
Table 2.51.4.1

Item M051093 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
28 cm	22	31	10	63	48.9%	47.0%	41.7%	46.7%
36 cm	13	24	9	46	28.9%	36.4%	37.5%	34.1%
40 cm	10	11	5	26	22.2%	16.7%	20.8%	19.3%
Overall	45	66	24	135	100.0%	100.0%	100.0%	100.0%

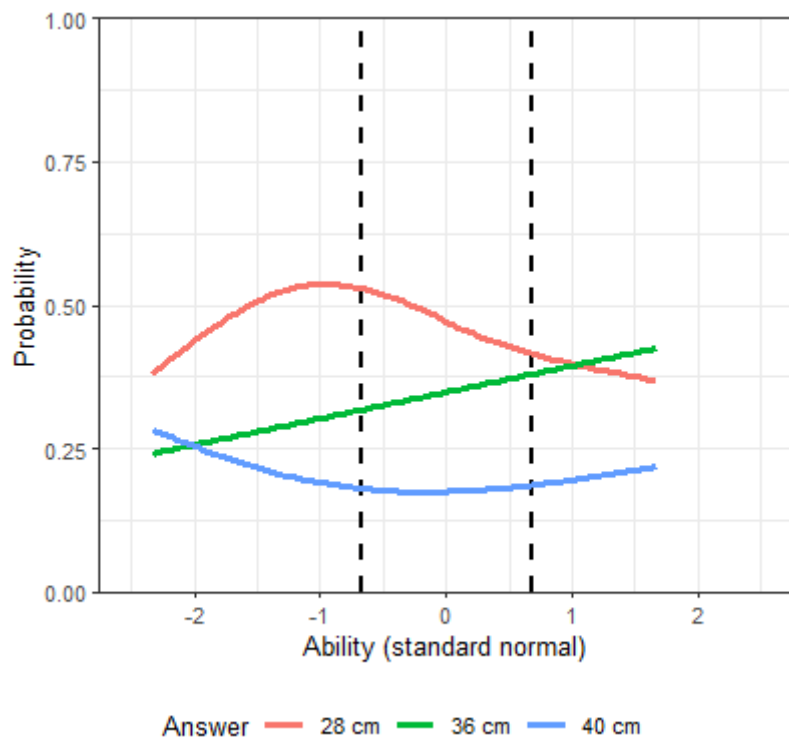
Graph 2.51.4.1

Item M051093 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.51.4.2

Item M051093 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.51.5. Answering time:

Graph 2.51.5.1

Item M051093 answering time distribution in groups of different ability level

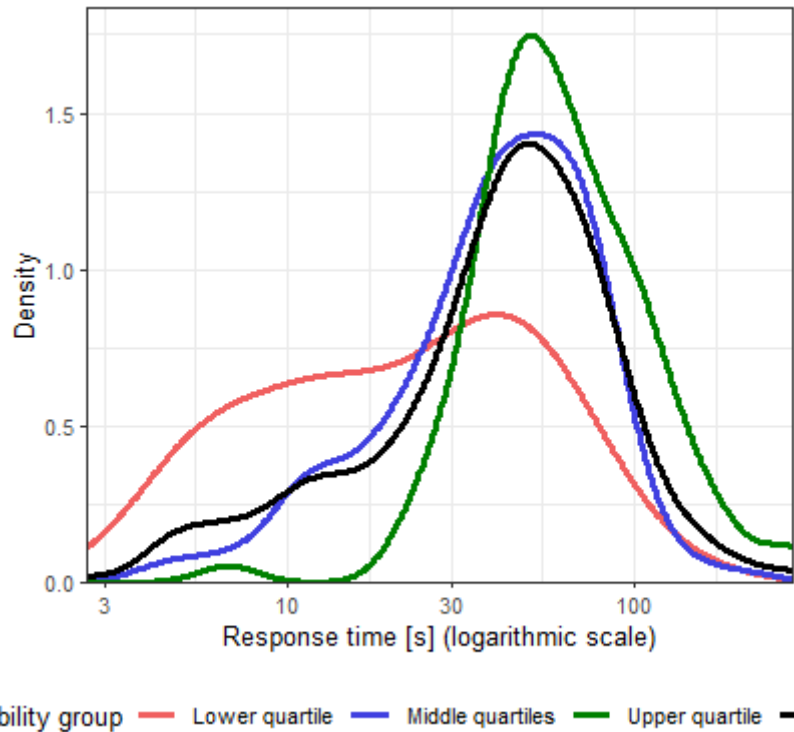


Table 2.51.5.1

Item M051093 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.67	9.91	22.18	46.48	156.30	3.06	0.95
Middle quartiles	4.27	26.65	43.34	65.15	207.55	3.66	0.69
Upper quartile	6.80	43.67	57.31	90.06	286.71	4.12	0.57
Overall	2.67	25.89	44.74	67.40	286.71	3.65	0.83

2.52.M041177 (TIMSS)

2.52.1. Item fit:

Graph 2.52.1.1

Item M041177 ICC and nonparametric trace line

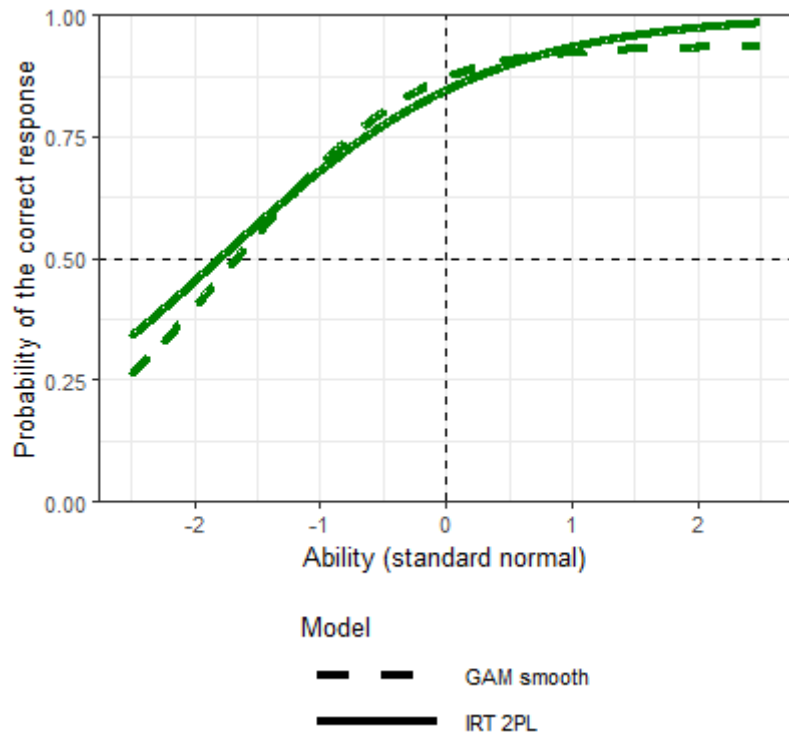


Table 2.52.1.1

Item M041177 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	81.5%	299	MC	0.32	0.25	0.94	-1.80	0.011	0.332

2.52.2. Gender DIF:

Table 2.52.2.1

Item M041177 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.29	0.318	1.000		0.009

2.52.3. Frequency of answers:

Table 2.52.3.1

Item M041177 answer frequency

Answer	Frequency	Percent
Jest starszy o 10 lat.	25	8.4%
Jest starszy o 15 lat. (correct)	243	81.5%
Jest starszy o 20 lat.	14	4.7%
Jest starszy o 5 lat.	16	5.4%
Overall	298	100.0%

2.52.4. Distractors functioning:

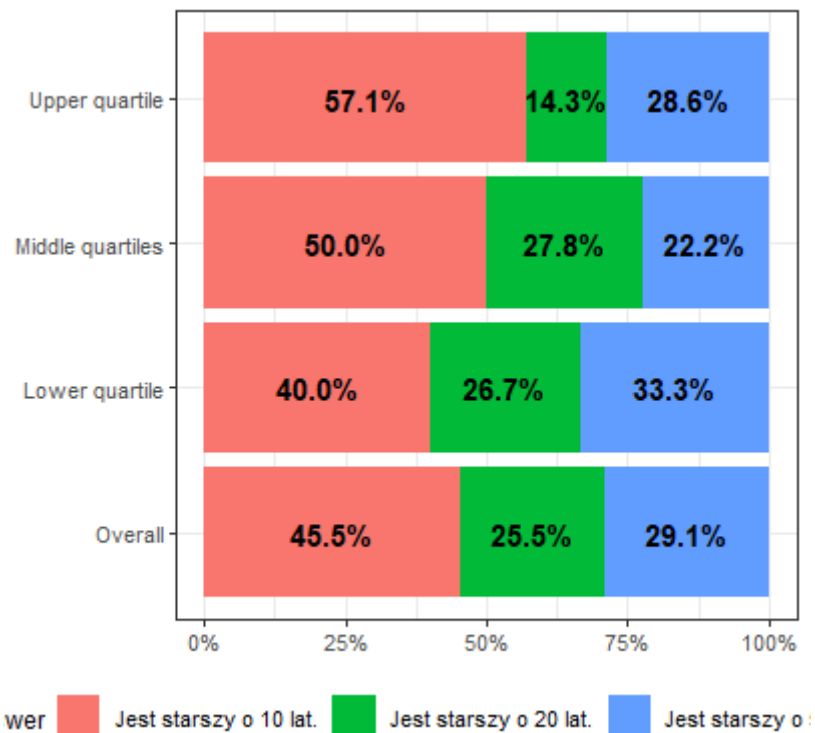
Table 2.52.4.1

Item M041177 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Jest starszy o 10 lat.	12	9	4	25	40.0%	50.0%	57.1%	45.5%
Jest starszy o 20 lat.	8	5	1	14	26.7%	27.8%	14.3%	25.5%
Jest starszy o 5 lat.	10	4	2	16	33.3%	22.2%	28.6%	29.1%
Overall	30	18	7	55	100.0%	100.0%	100.0%	100.0%

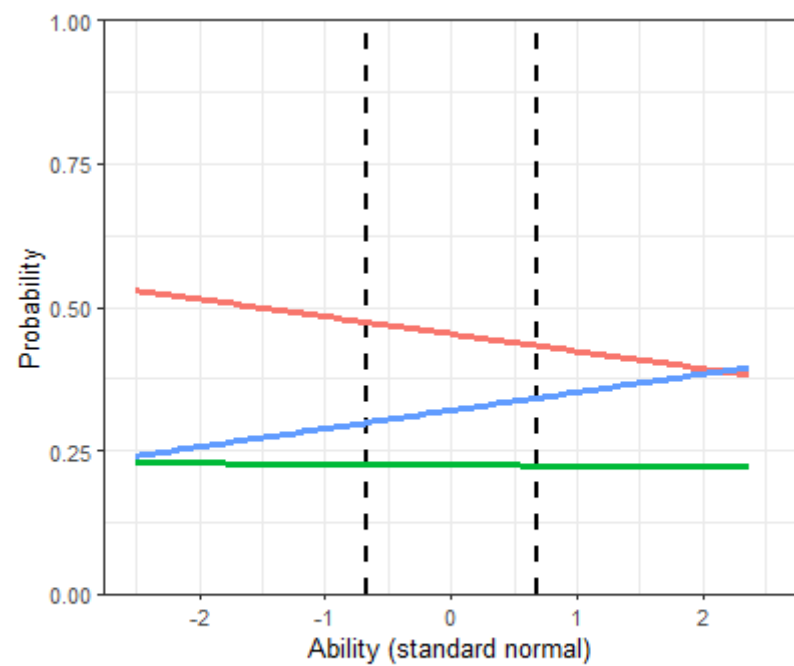
Graph 2.52.4.1

Item M041177 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.52.4.2

Item M041177 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



wer — Jest starszy o 10 lat. — Jest starszy o 20 lat. — Jest starszy o 30 lat.

2.52.5. Answering time:

Graph 2.52.5.1

Item M041177 answering time distribution in groups of different ability level

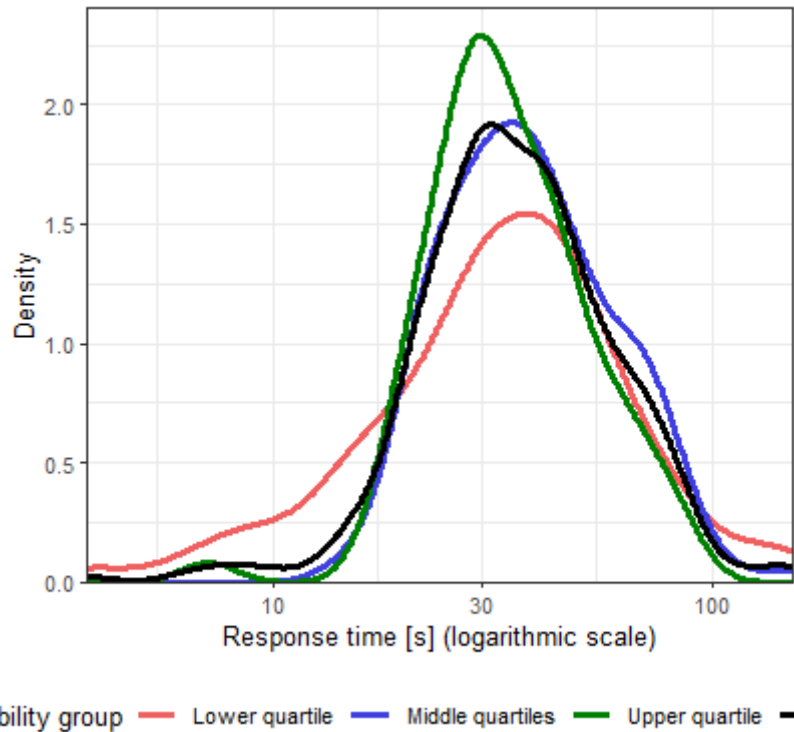


Table 2.52.5.1

Item M041177 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.80	22.61	33.37	47.48	146.83	3.48	0.68
Middle quartiles	14.08	27.48	37.73	52.26	152.45	3.64	0.44
Upper quartile	7.17	26.31	33.02	44.24	86.74	3.53	0.42
Overall	3.80	26.16	35.20	48.44	152.45	3.57	0.51

2.53.M100039 (LLM)

2.53.1. Item fit:

Graph 2.53.1.1

Item M100039 ICC and nonparametric trace line

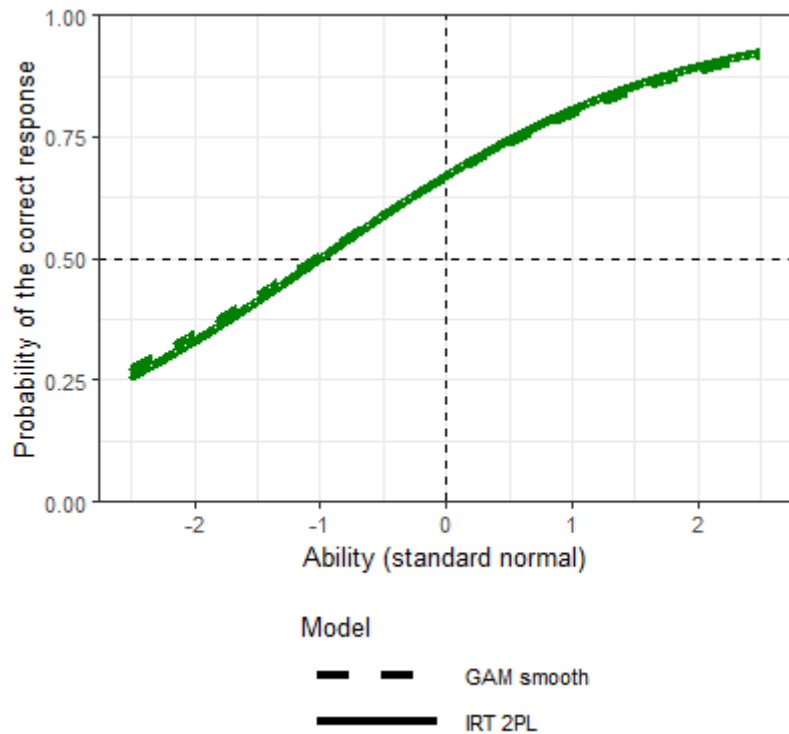


Table 2.53.1.1

Item M100039 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	65.5%	319	MC	0.31	0.21	0.71	-1.00	0.010	0.339	

2.53.2. Gender DIF:

Table 2.53.2.1

Item M100039 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.44	0.802	1.000		0.001

2.53.3. Frequency of answers:

Table 2.53.3.1

Item M100039 answer frequency

Answer	Frequency	Percent
Wykres A	19	6.0%
Wykres B	54	16.9%
Wykres C (correct)	209	65.5%
Wykres D	37	11.6%
Overall	319	100.0%

2.53.4. Distractors functioning:

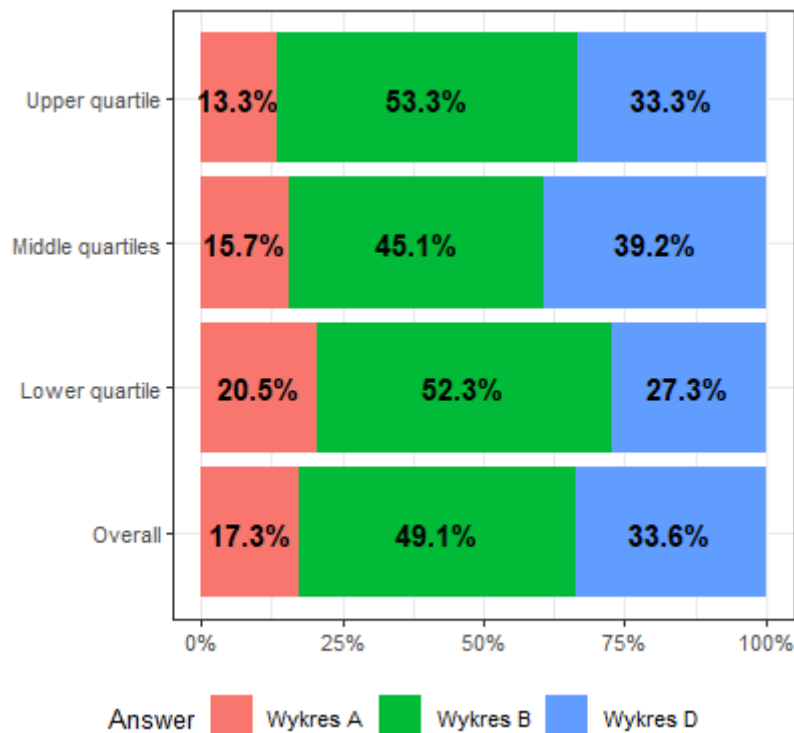
Table 2.53.4.1

Item M100039 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Wykres A	9	8	2	19	20.5%	15.7%	13.3%	17.3%
Wykres B	23	23	8	54	52.3%	45.1%	53.3%	49.1%
Wykres D	12	20	5	37	27.3%	39.2%	33.3%	33.6%
Overall	44	51	15	110	100.0%	100.0%	100.0%	100.0%

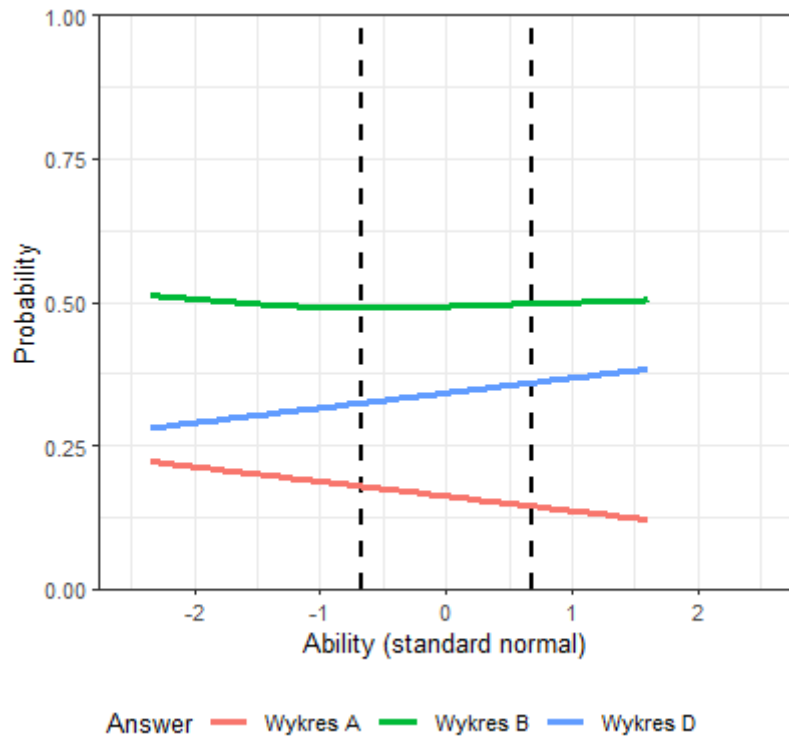
Graph 2.53.4.1

Item M100039 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.53.4.2

Item M100039 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.53.5. Answering time:

Graph 2.53.5.1

Item M100039 answering time distribution in groups of different ability level

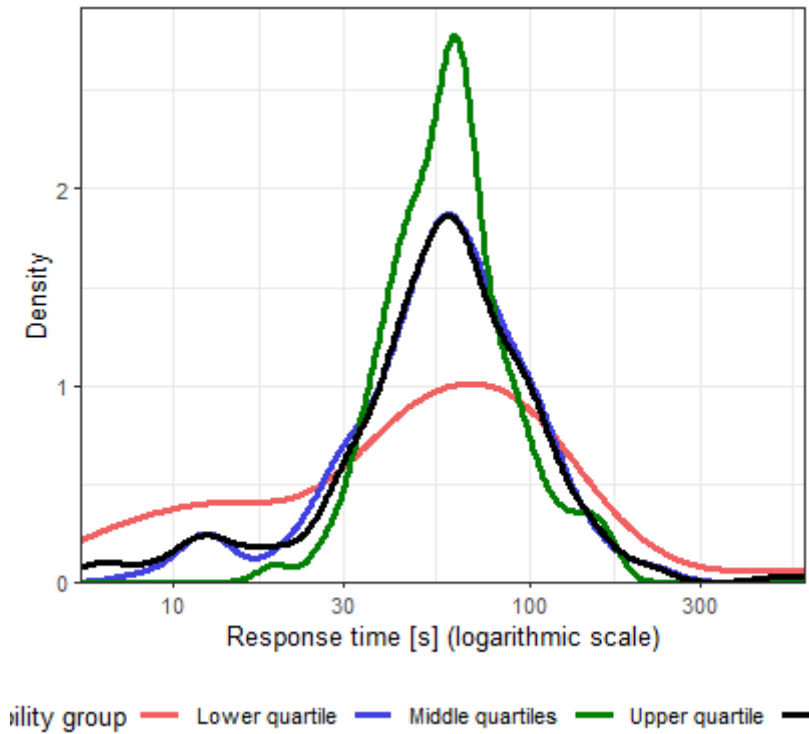


Table 2.53.5.1

Item M100039 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.54	24.13	51.80	93.17	587.84	3.81	1.00
Middle quartiles	8.08	42.72	57.93	82.47	218.01	4.01	0.60
Upper quartile	19.40	45.95	59.89	70.21	160.46	4.08	0.40
Overall	5.54	40.84	57.93	81.68	587.84	3.98	0.69

2.54.M041271 (TIMSS)

2.54.1. Item fit:

Graph 2.54.1.1

Item M041271 ICC and nonparametric trace line

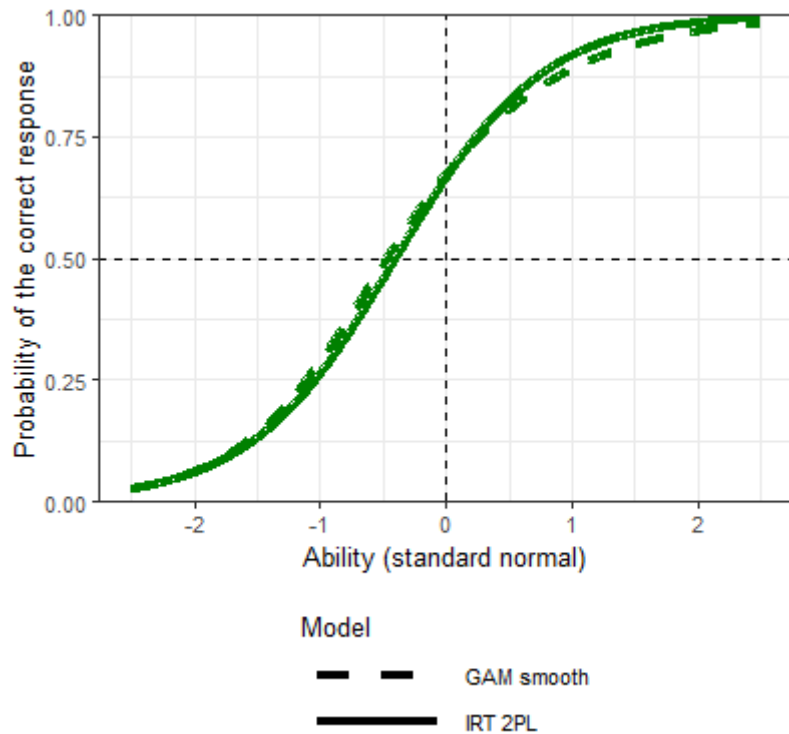


Table 2.54.1.1

Item M041271 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	60.5%	304	MC	0.53	0.57	1.72	-0.40	0.000	0.520

2.54.2. Gender DIF:

Table 2.54.2.1

Item M041271 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
8.59	0.014	1.000	0.022	

2.54.3. Frequency of answers:

Table 2.54.3.1

Item M041271 answer frequency

Answer	Frequency	Percent
Rysunek A	30	9.9%
Rysunek B	33	10.9%
Rysunek C	57	18.8%
Rysunek D (correct)	184	60.5%
Overall	304	100.0%

2.54.4. Distractors functioning:

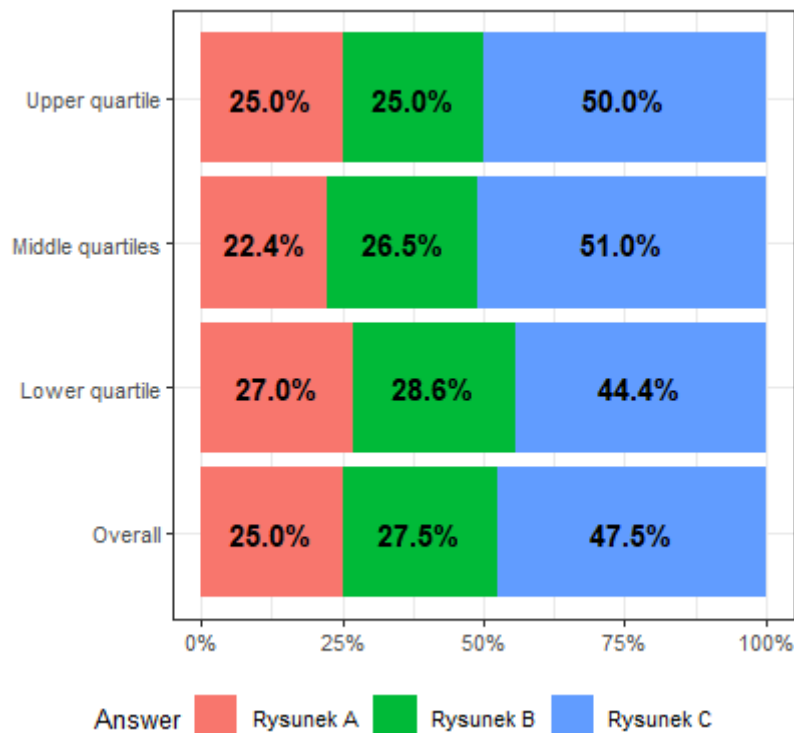
Table 2.54.4.1

Item M041271 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Rysunek A	17	11	2	30	27.0%	22.4%	25.0%	25.0%
Rysunek B	18	13	2	33	28.6%	26.5%	25.0%	27.5%
Rysunek C	28	25	4	57	44.4%	51.0%	50.0%	47.5%
Overall	63	49	8	120	100.0%	100.0%	100.0%	100.0%

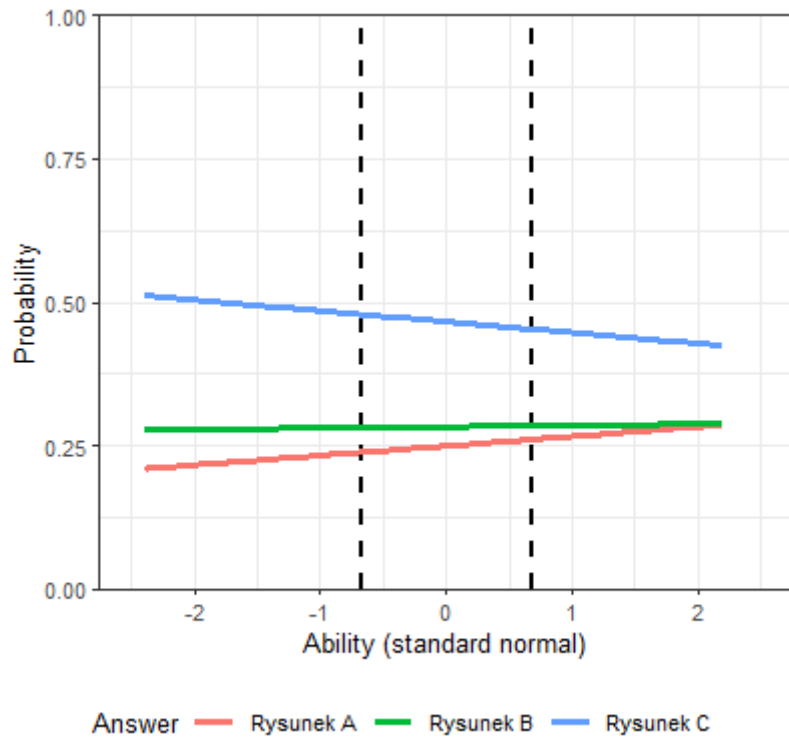
Graph 2.54.4.1

Item M041271 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.54.4.2

Item M041271 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.54.5. Answering time:

Graph 2.54.5.1

Item M041271 answering time distribution in groups of different ability level

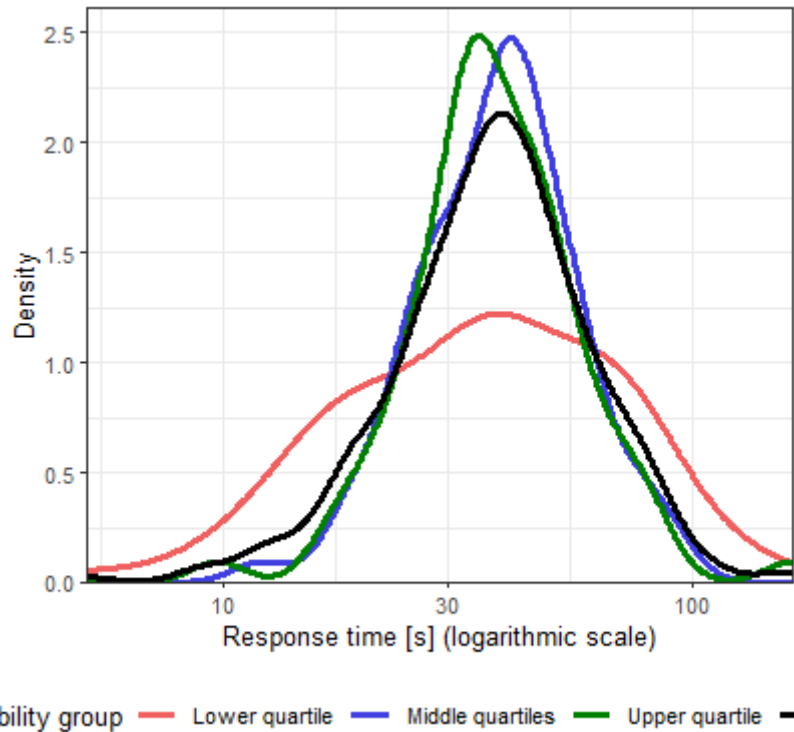


Table 2.54.5.1

Item M041271 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.13	21.21	37.25	59.25	154.62	3.55	0.67
Middle quartiles	11.31	29.61	38.72	48.79	97.04	3.65	0.39
Upper quartile	9.72	30.17	36.68	48.12	163.15	3.63	0.43
Overall	5.13	28.24	38.01	50.77	163.15	3.62	0.49

2.55.M061031 (TIMSS)

2.55.1. Item fit:

Graph 2.55.1.1

Item M061031 ICC and nonparametric trace line

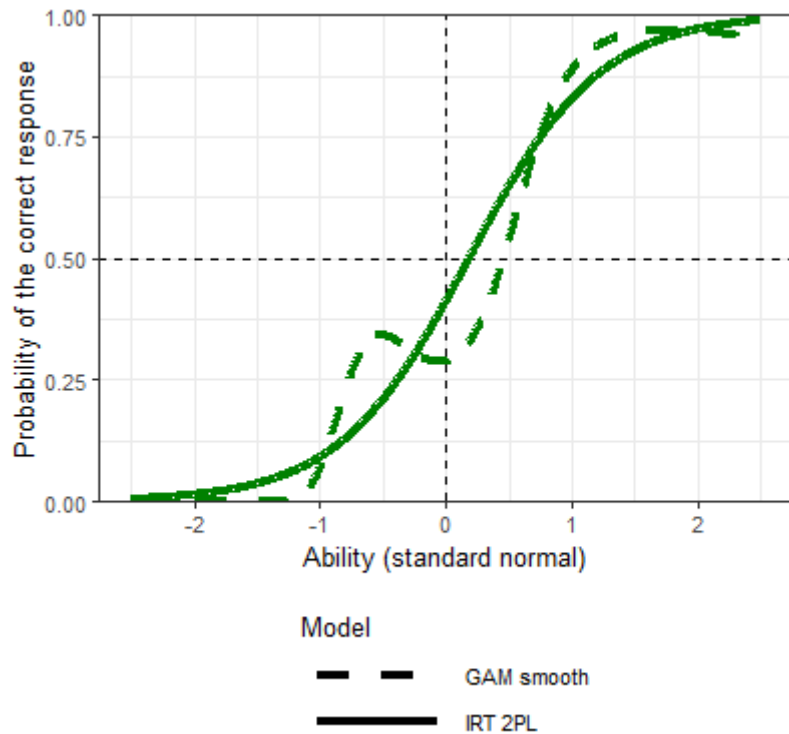


Table 2.55.1.1

Item M061031 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	46.3%	294	MC	0.61	0.65	1.93	0.18	0.027	0.061

2.55.2. Gender DIF:

Table 2.55.2.1

Item M061031 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.24	0.888	1.000		0.001

2.55.3. Frequency of answers:

Table 2.55.3.1

Item M061031 answer frequency

Answer	Frequency	Percent
4 (correct)	136	46.3%
5	28	9.5%
12	107	36.4%
40	23	7.8%
Overall	294	100.0%

2.55.4. Distractors functioning:

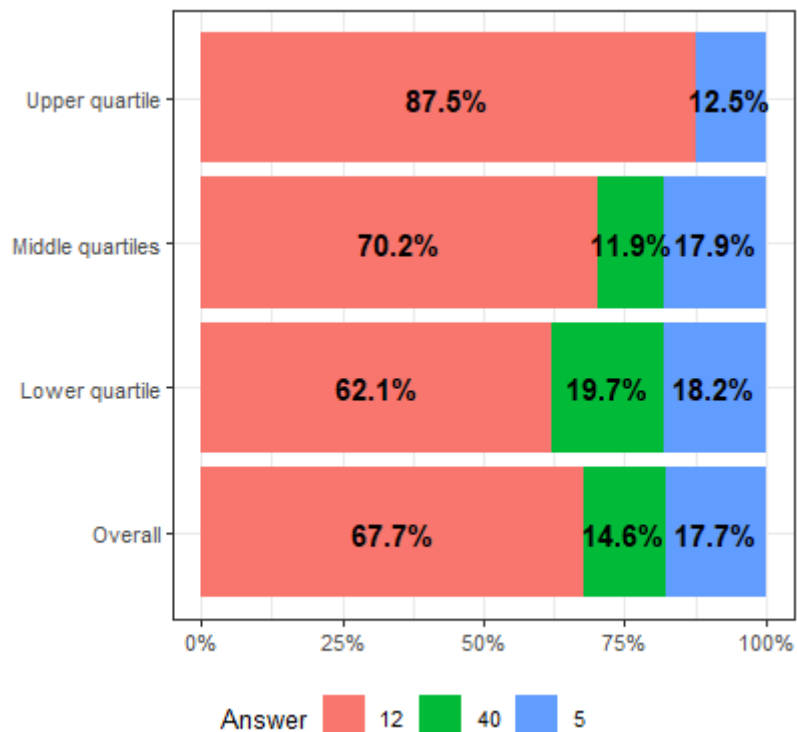
Table 2.55.4.1

Item M061031 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
12	41	59	7	107	62.1%	70.2%	87.5%	67.7%
40	13	10	0	23	19.7%	11.9%	0.0%	14.6%
5	12	15	1	28	18.2%	17.9%	12.5%	17.7%
Overall	66	84	8	158	100.0%	100.0%	100.0%	100.0%

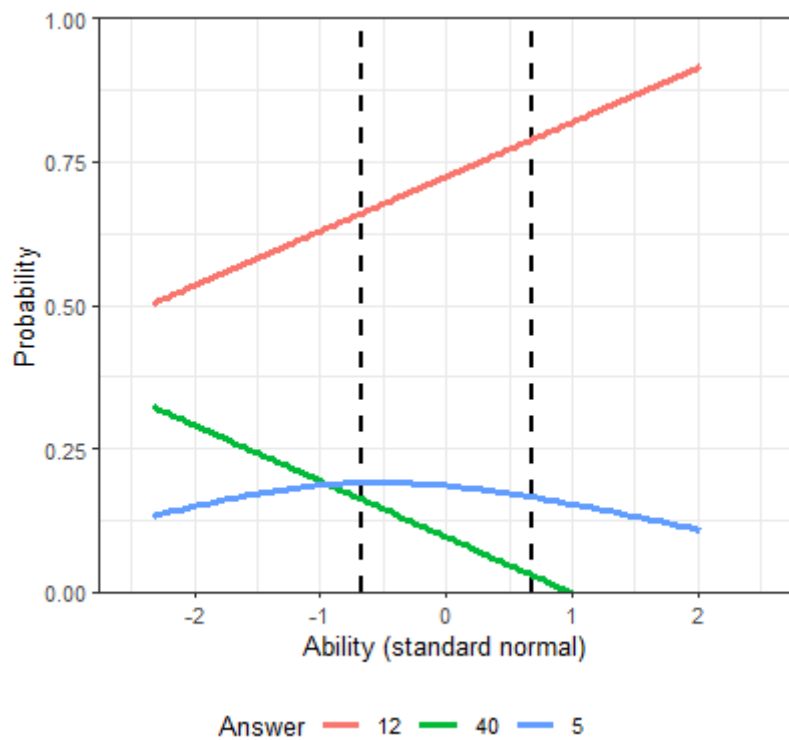
Graph 2.55.4.1

Item M061031 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.55.4.2

Item M061031 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.55.5. Answering time:

Graph 2.55.5.1

Item M061031 answering time distribution in groups of different ability level

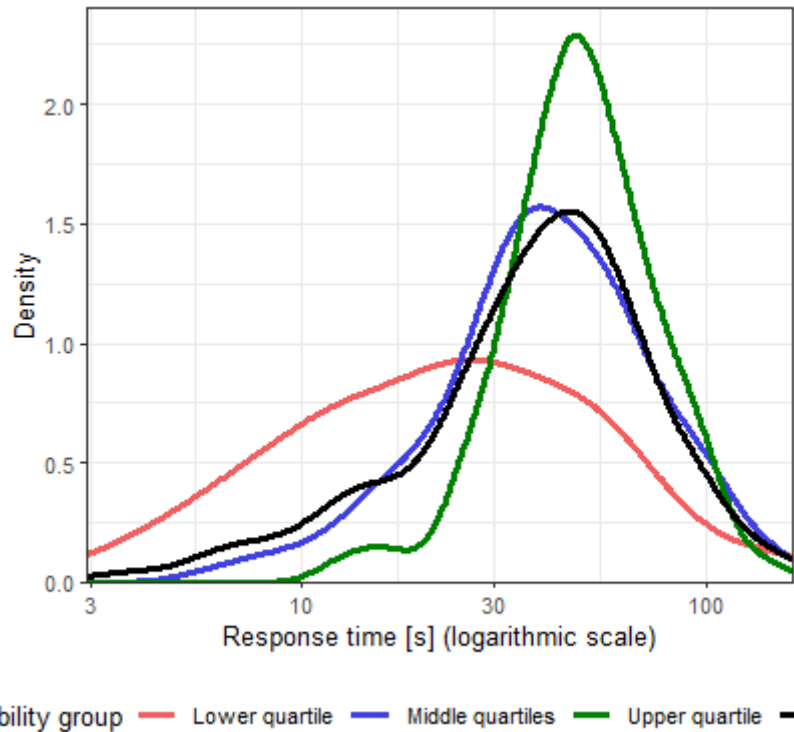


Table 2.55.5.1

Item M061031 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.96	12.38	24.26	42.48	162.88	3.10	0.88
Middle quartiles	5.88	28.07	40.58	59.11	162.95	3.67	0.62
Upper quartile	12.45	36.72	47.70	62.54	140.63	3.88	0.43
Overall	2.96	25.69	40.64	57.47	162.95	3.60	0.71

2.56.M890024 (LLM)

2.56.1. Item fit:

Graph 2.56.1.1

Item M890024 ICC and nonparametric trace line

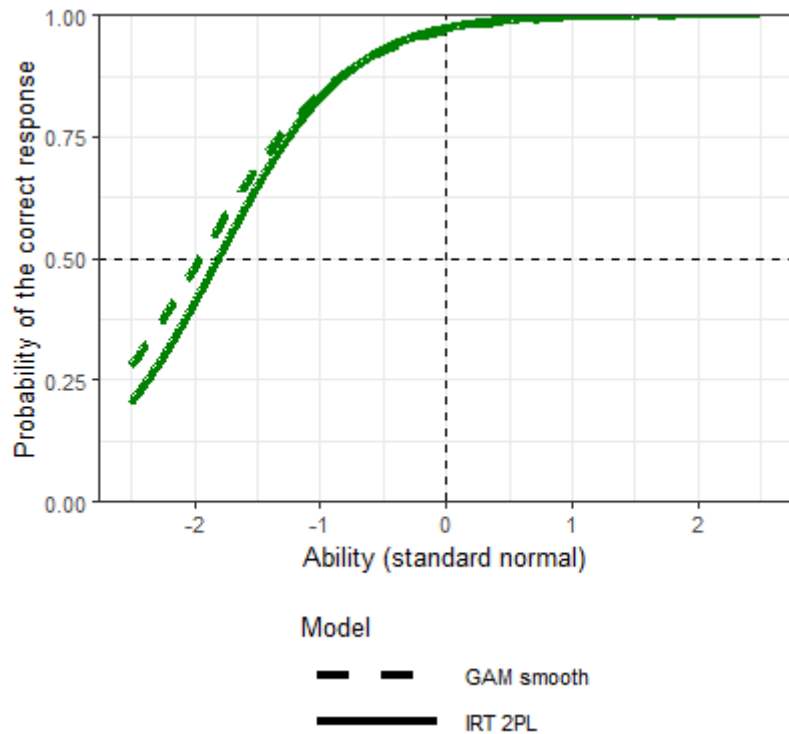


Table 2.56.1.1

Item M890024 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	91.1%	281	MC	0.40	0.29	1.96	-1.81	0.000	0.735

2.56.2. Gender DIF:

Table 2.56.2.1

Item M890024 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.69	0.429	1.000		0.010

2.56.3. Frequency of answers:

Table 2.56.3.1

Item M890024 answer frequency

Answer	Frequency	Percent
58	12	4.3%
68 (correct)	255	91.1%
74	7	2.5%
88	6	2.1%
Overall	280	100.0%

2.56.4. Distractors functioning:

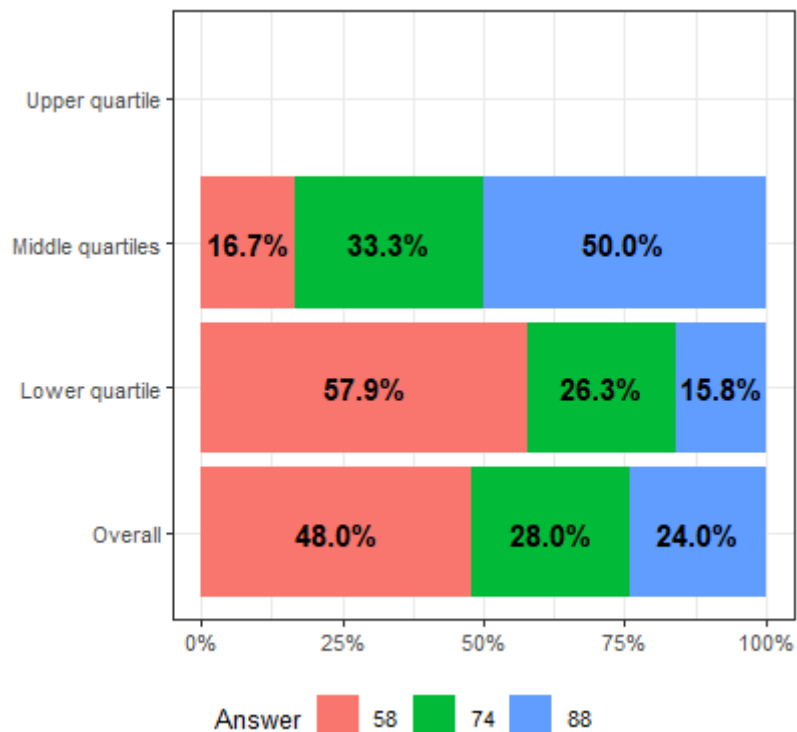
Table 2.56.4.1

Item M890024 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
58	11	1	0	12	57.9%	16.7%	0.0%	48.0%
74	5	2	0	7	26.3%	33.3%	0.0%	28.0%
88	3	3	0	6	15.8%	50.0%	0.0%	24.0%
Overall	19	6	0	25	100.0%	100.0%	0.0%	100.0%

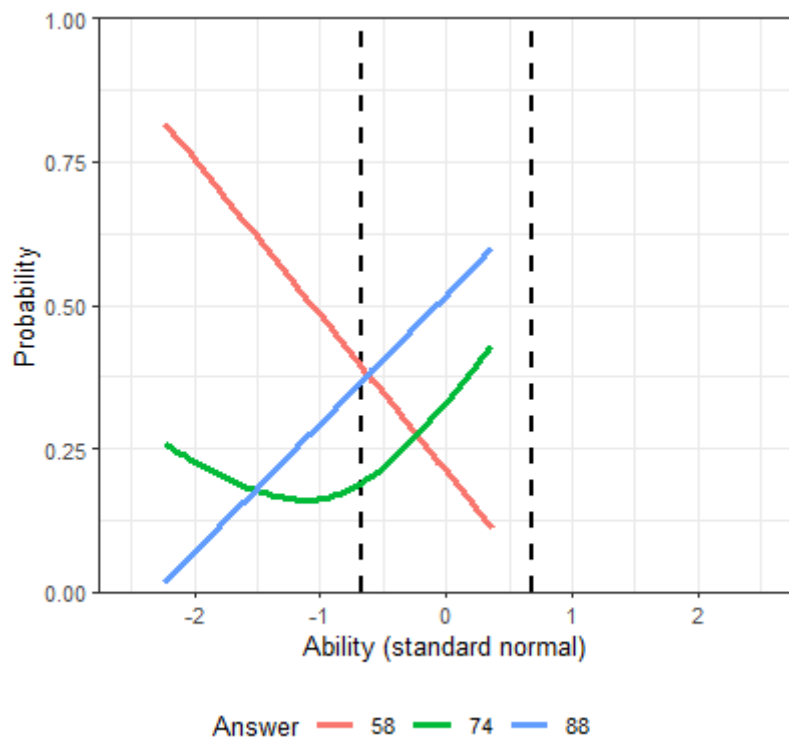
Graph 2.56.4.1

Item M890024 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.56.4.2

Item M890024 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.56.5. Answering time:

Graph 2.56.5.1

Item M890024 answering time distribution in groups of different ability level

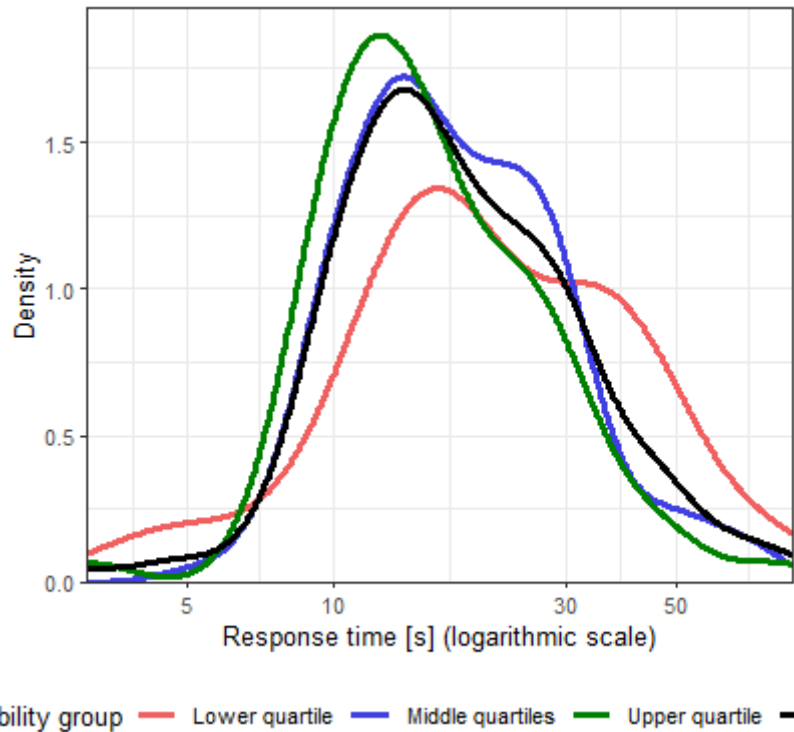


Table 2.56.5.1

Item M890024 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.14	13.37	19.16	33.72	86.75	3.01	0.69
Middle quartiles	5.19	12.39	16.55	25.81	72.49	2.88	0.51
Upper quartile	3.19	11.03	14.79	21.95	80.82	2.76	0.52
Overall	3.14	12.32	16.69	26.78	86.75	2.88	0.57

2.57.M100009 (LLM)

2.57.1. Item fit:

Graph 2.57.1.1

Item M100009 ICC and nonparametric trace line

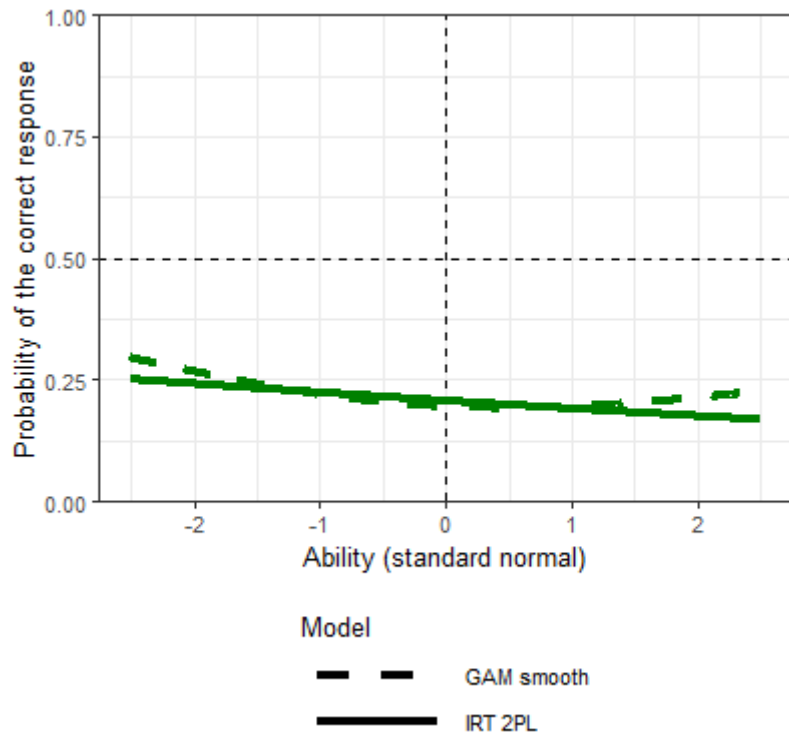


Table 2.57.1.1

Item M100009 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	20.7%	304	MC	-0.03	0.08	-0.10	-13.31	0.018	0.189

2.57.2. Gender DIF:

Table 2.57.2.1

Item M100009 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.98	0.225	1.000		0.011

2.57.3. Frequency of answers:

Table 2.57.3.1

Item M100009 answer frequency

Answer	Frequency	Percent
Kwadrat o boku 4 cm	6	2.0%
Kwadrat o boku 5 cm (correct)	63	20.7%
Prostokąt o wymiarach 3 cm x 8 cm	176	57.9%
Prostokąt o wymiarach 4 cm x 6 cm	59	19.4%
Overall	304	100.0%

2.57.4. Distractors functioning:

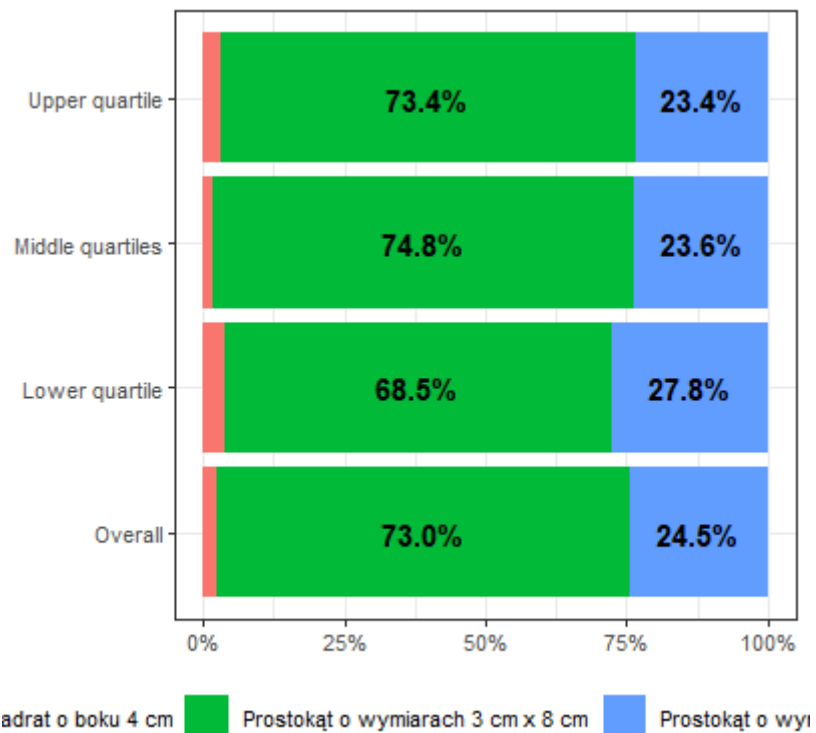
Table 2.57.4.1

Item M100009 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Kwadrat o boku 4 cm	2	2	2	6	3.7%	1.6%	3.1%	2.5%
Prostokąt o wymiarach 3 cm x 8 cm	37	92	47	176	68.5%	74.8%	73.4%	73.0%
Prostokąt o wymiarach 4 cm x 6 cm	15	29	15	59	27.8%	23.6%	23.4%	24.5%
Overall	54	123	64	241	100.0%	100.0%	100.0%	100.0%

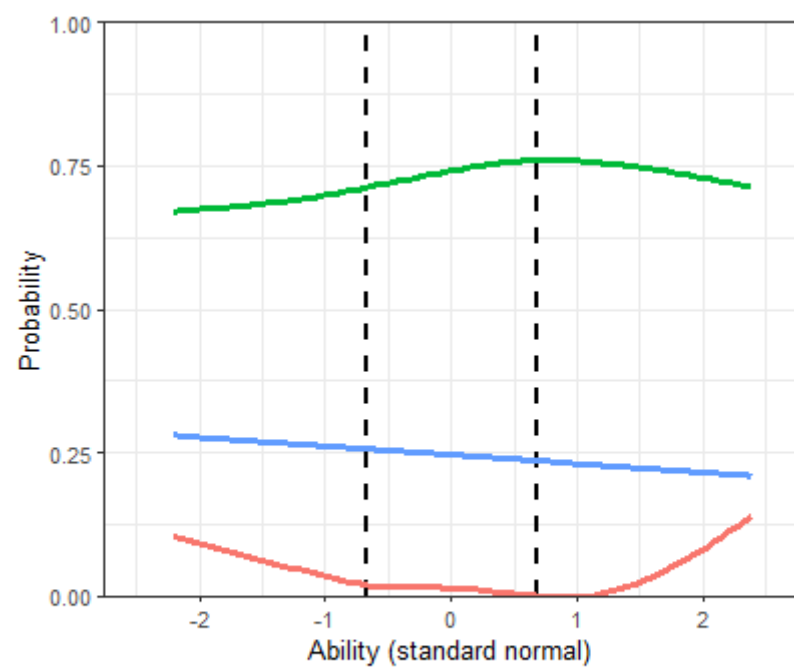
Graph 2.57.4.1

Item M100009 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.57.4.2

Item M100009 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



adnat o boku 4 cm Prostokąt o wymiarach 3 cm x 8 cm Prostokąt o wymiarach 3 cm x 4 cm

2.57.5. Answering time:

Graph 2.57.5.1

Item M100009 answering time distribution in groups of different ability level

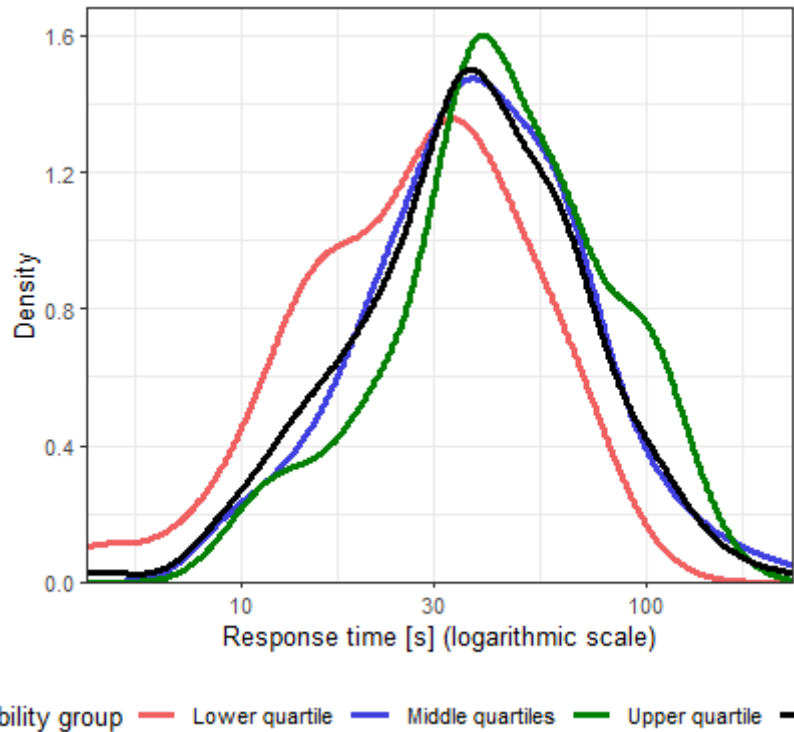


Table 2.57.5.1

Item M100009 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.19	16.84	29.25	42.41	93.46	3.28	0.66
Middle quartiles	9.11	25.67	37.87	60.10	230.19	3.64	0.62
Upper quartile	9.34	31.50	42.02	63.53	151.33	3.76	0.62
Overall	4.19	24.06	37.06	58.30	230.19	3.59	0.65

2.58.M061179 (TIMSS)

2.58.1. Item fit:

Graph 2.58.1.1

Item M061179 ICC and nonparametric trace line

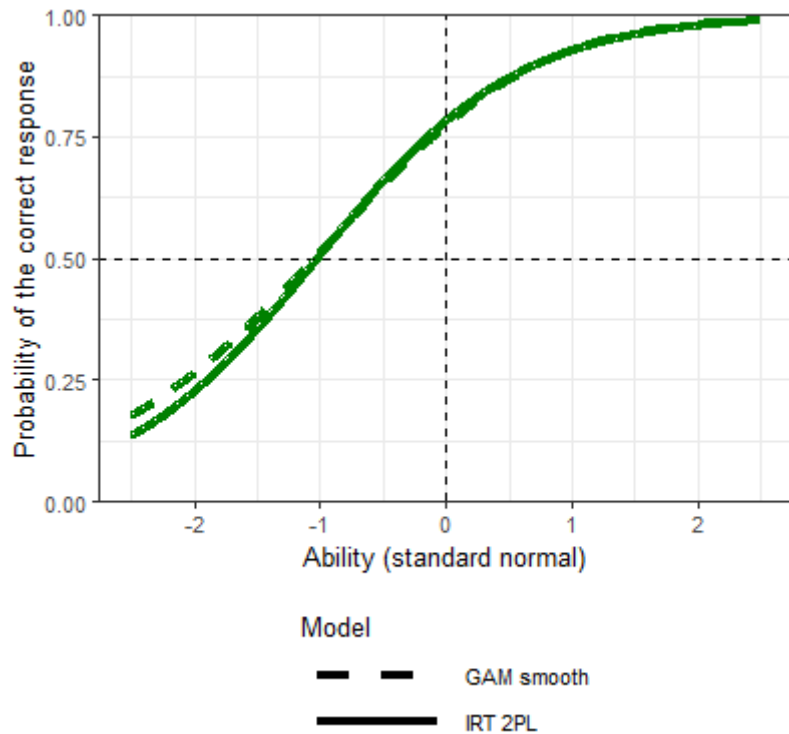


Table 2.58.1.1

Item M061179 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	72.4%	304	MC	0.43	0.51	1.25	-1.02	0.000	0.593

2.58.2. Gender DIF:

Table 2.58.2.1

Item M061179 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.42	0.491	1.000		0.004

2.58.3. Frequency of answers:

Table 2.58.3.1

Item M061179 answer frequency

Answer	Frequency	Percent
+	49	16.1%
-	22	7.2%
× (correct)	220	72.4%
÷	13	4.3%
Overall	304	100.0%

2.58.4. Distractors functioning:

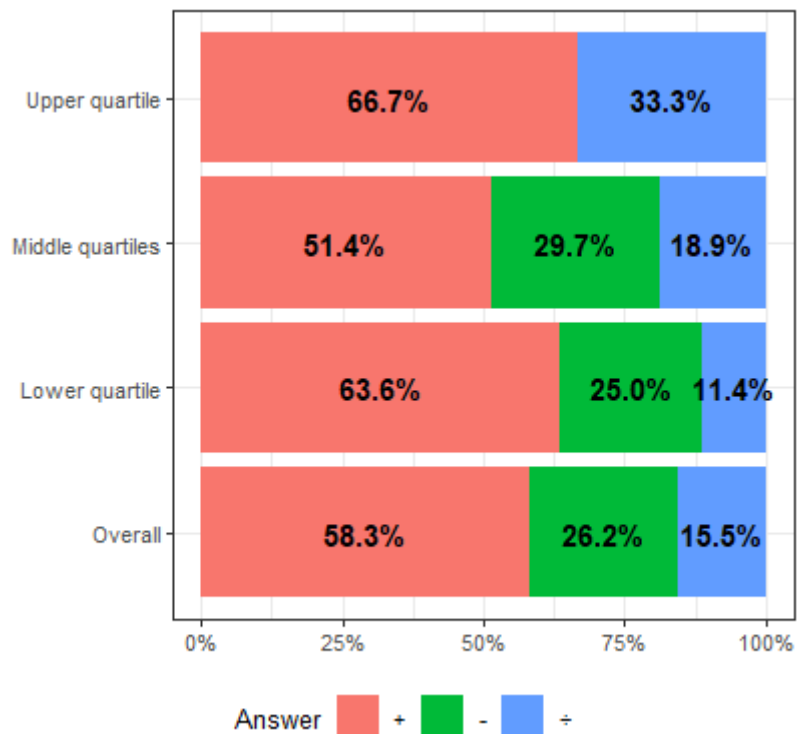
Table 2.58.4.1

Item M061179 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
+	28	19	2	49	63.6%	51.4%	66.7%	58.3%
-	11	11	0	22	25.0%	29.7%	0.0%	26.2%
÷	5	7	1	13	11.4%	18.9%	33.3%	15.5%
Overall	44	37	3	84	100.0%	100.0%	100.0%	100.0%

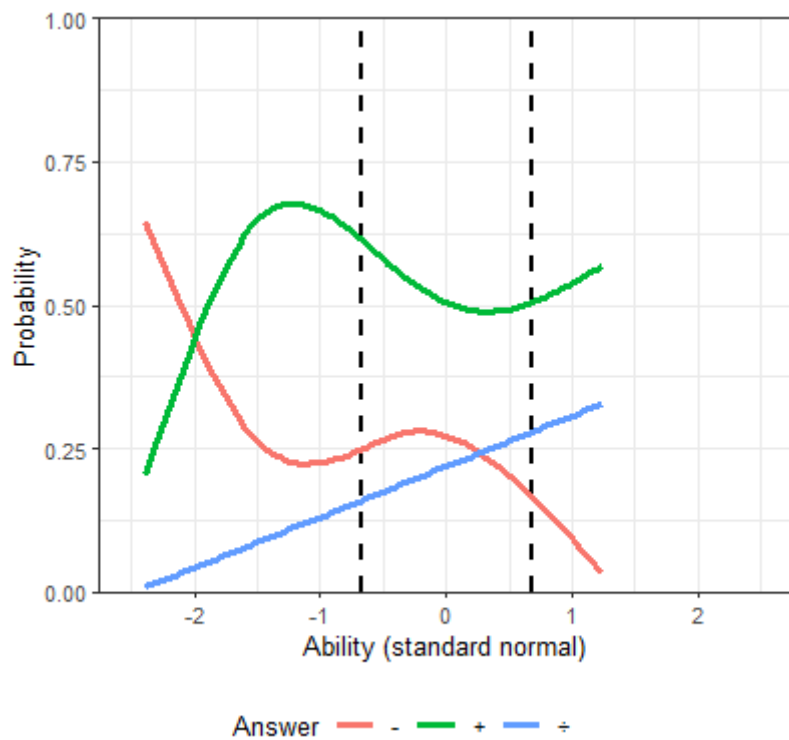
Graph 2.58.4.1

Item M061179 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 2.58.4.2

Item M061179 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



2.58.5. Answering time:

Graph 2.58.5.1

Item M061179 answering time distribution in groups of different ability level

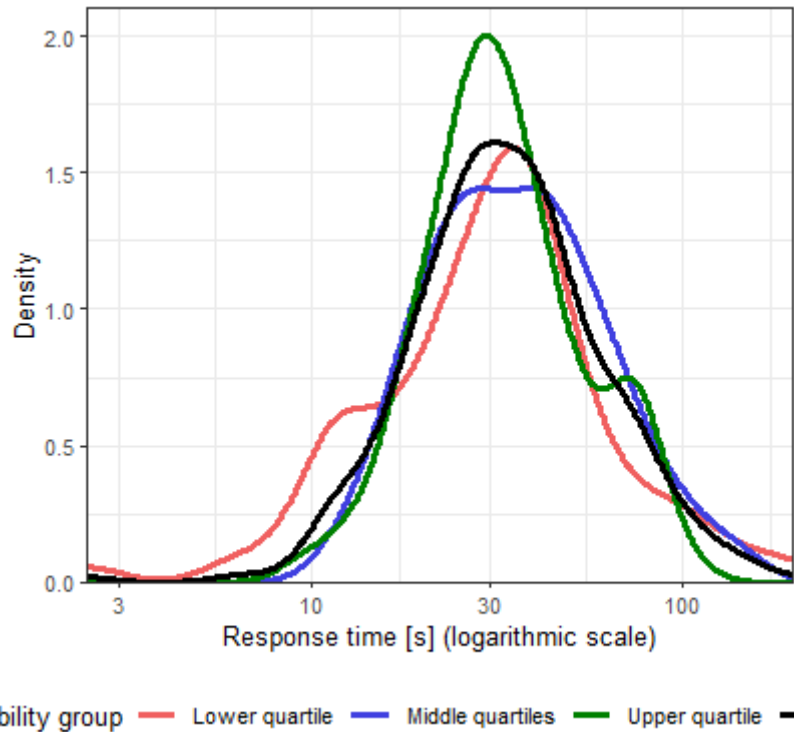


Table 2.58.5.1

Item M061179 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.48	20.25	32.88	42.59	197.70	3.40	0.73
Middle quartiles	11.10	23.70	35.41	50.81	147.07	3.58	0.55
Upper quartile	9.57	24.00	30.66	43.24	101.25	3.49	0.49
Overall	2.48	23.26	33.56	48.08	197.70	3.51	0.59

2.59.M061272 (TIMSS)

2.59.1. Item fit:

Graph 2.59.1.1

Item M061272 ICC and nonparametric trace line

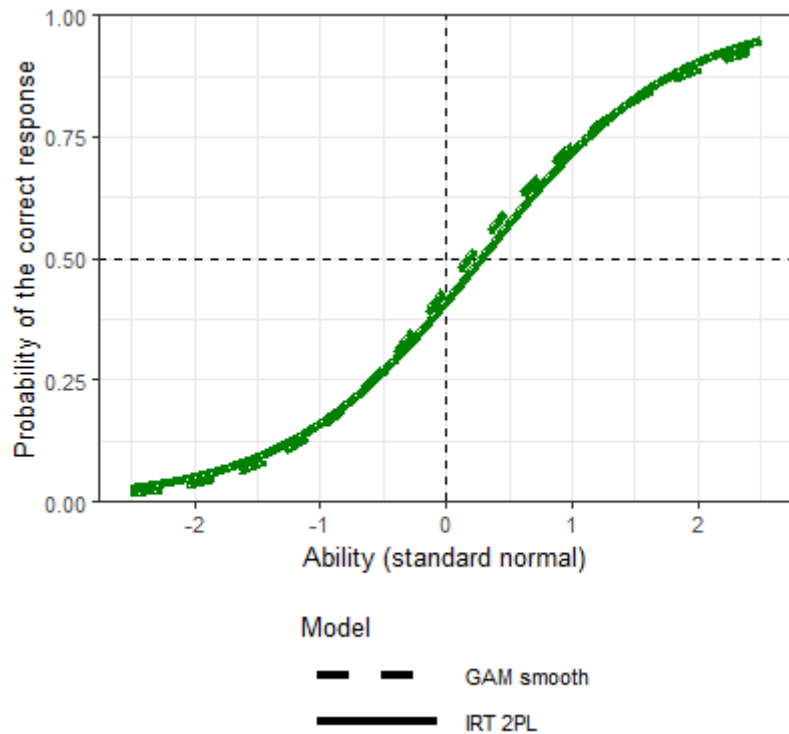


Table 2.59.1.1

Item M061272 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	44.3%	299	CR	0.49	0.47	1.29	0.28	0.016	0.231

2.59.2. Gender DIF:

Table 2.59.2.1

Item M061272 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.99	0.610	1.000	0.003	

2.59.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.59.4. Answering time:

Graph 2.59.4.1

Item M061272 answering time distribution in groups of different ability level

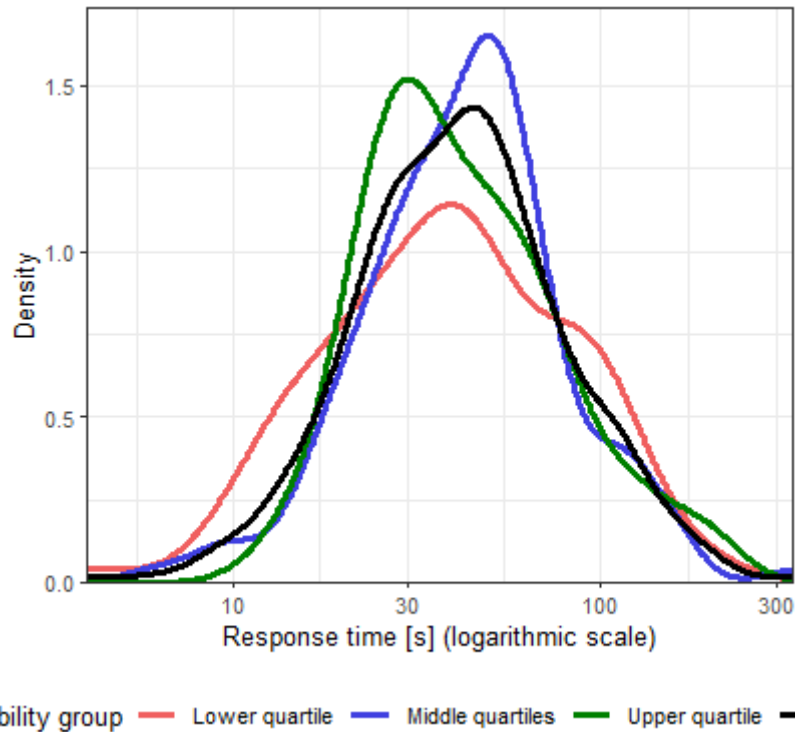


Table 2.59.4.1

Item M061272 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.04	23.95	40.95	67.84	199.30	3.64	0.76
Middle quartiles	6.04	29.01	44.37	59.53	333.16	3.75	0.63
Upper quartile	12.44	27.30	38.24	59.96	202.31	3.74	0.61
Overall	4.04	27.07	41.78	61.04	333.16	3.72	0.66

2.60.M090052 (LLM)

2.60.1. Item fit:

Graph 2.60.1.1

Item M090052 ICC and nonparametric trace line

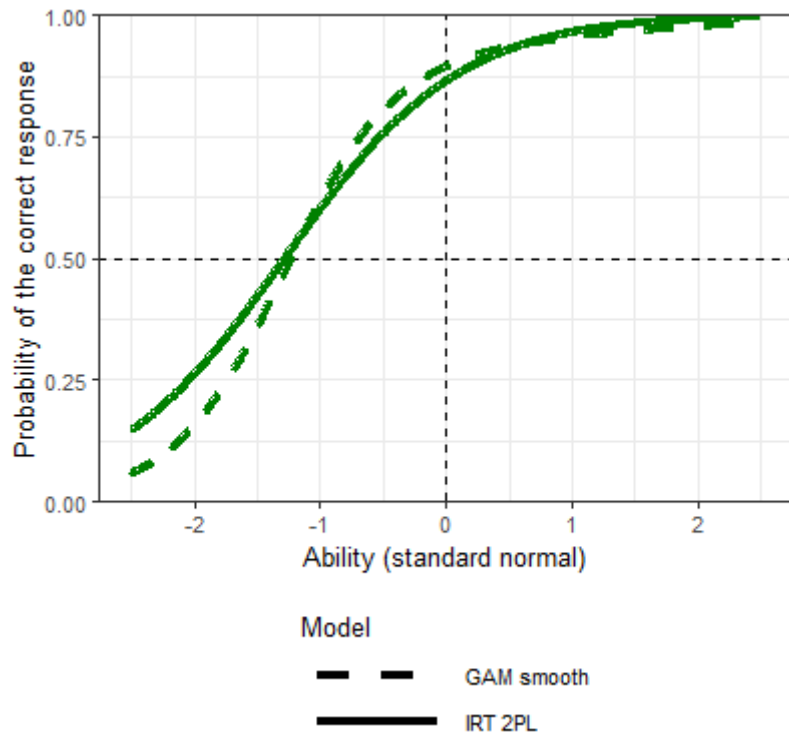


Table 2.60.1.1

Item M090052 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	79.2%	300	CR	0.45	0.34	1.45	-1.29	0.034	0.015

2.60.2. Gender DIF:

Table 2.60.2.1

Item M090052 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.04	0.978	1.000	0.000	

2.60.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.60.4. Answering time:

Graph 2.60.4.1

Item M090052 answering time distribution in groups of different ability level

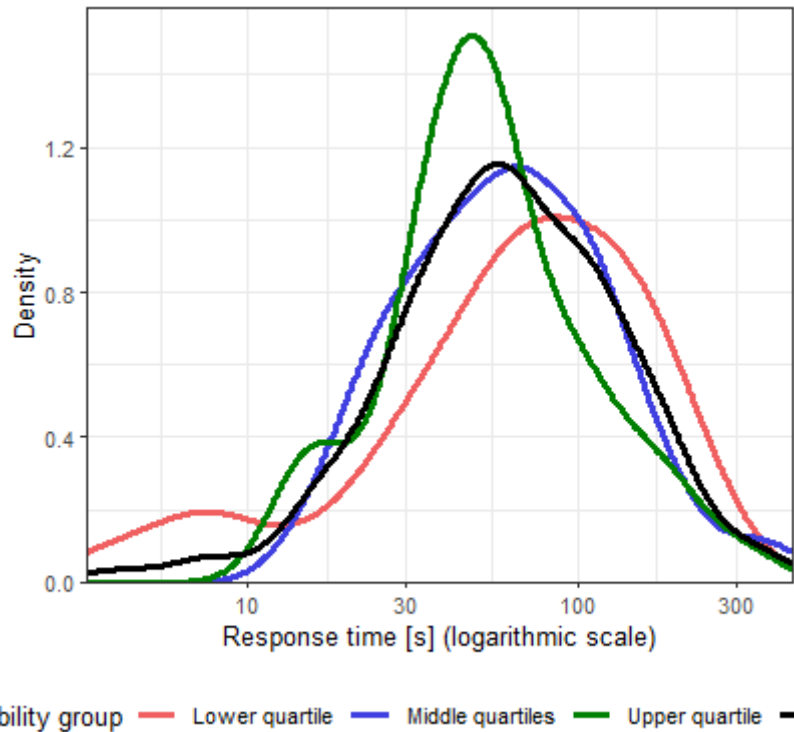


Table 2.60.4.1

Item M090052 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.27	36.24	72.47	127.98	287.28	4.09	1.01
Middle quartiles	13.16	37.00	63.06	104.88	444.43	4.12	0.73
Upper quartile	13.25	35.44	51.40	84.57	345.50	3.98	0.71
Overall	3.27	35.60	60.51	103.87	444.43	4.08	0.81

2.61.M090013 (LLM)

2.61.1. Item fit:

Graph 2.61.1.1

Item M090013 ICC and nonparametric trace line

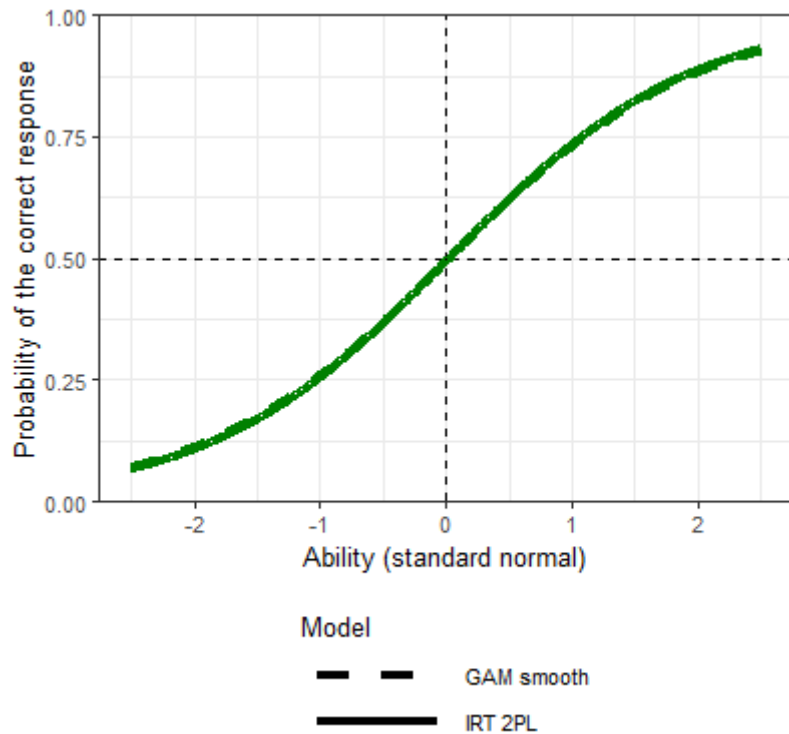


Table 2.61.1.1

Item M090013 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	49.3%	281	CR	0.42	0.32	1.04	0.02	0.015	0.258

2.61.2. Gender DIF:

Table 2.61.2.1

Item M090013 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.53	0.466	1.000	0.004	

2.61.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.61.4. Answering time:

Graph 2.61.4.1

Item M090013 answering time distribution in groups of different ability level

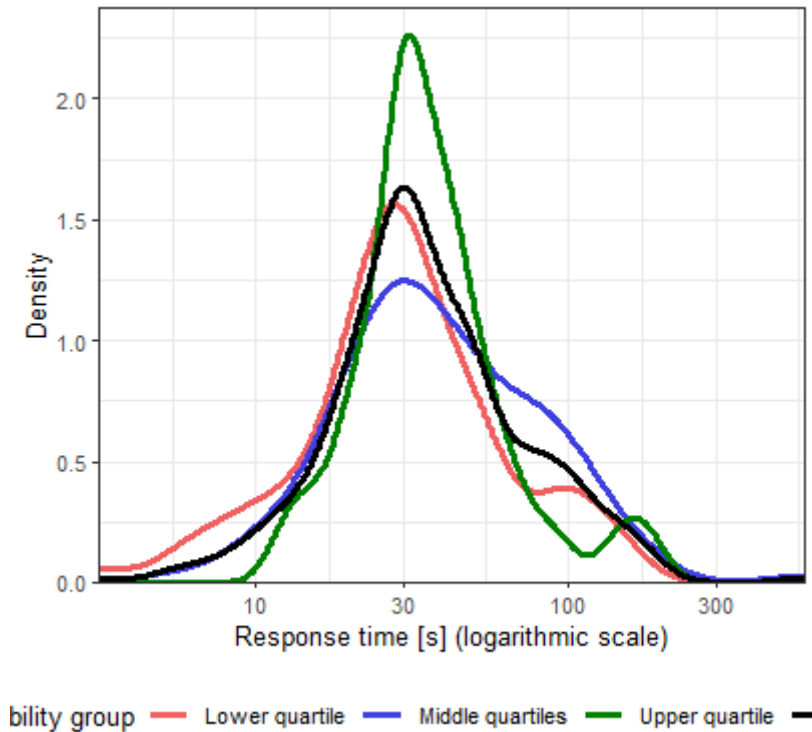


Table 2.61.4.1

Item M090013 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.18	20.00	29.04	44.28	146.07	3.38	0.76
Middle quartiles	5.16	23.62	35.92	70.07	570.24	3.66	0.75
Upper quartile	12.34	27.26	33.09	45.06	187.19	3.59	0.55
Overall	3.18	23.51	32.26	51.33	570.24	3.57	0.71

2.62.M051039 (TIMSS)

2.62.1. Item fit:

Graph 2.62.1.1

Item M051039 ICC and nonparametric trace line

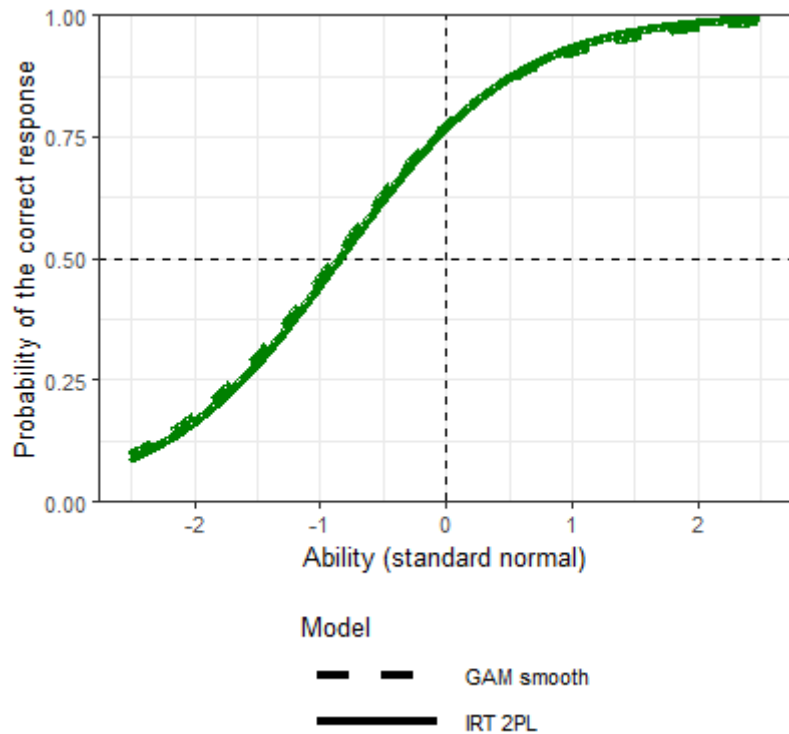


Table 2.62.1.1

Item M051039 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	69.5%	306	CR	0.48	0.51	1.41	-0.84	0.008	0.374	

2.62.2. Gender DIF:

Table 2.62.2.1

Item M051039 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.64	0.162	1.000	0.010	

2.62.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.62.4. Answering time:

Graph 2.62.4.1

Item M051039 answering time distribution in groups of different ability level

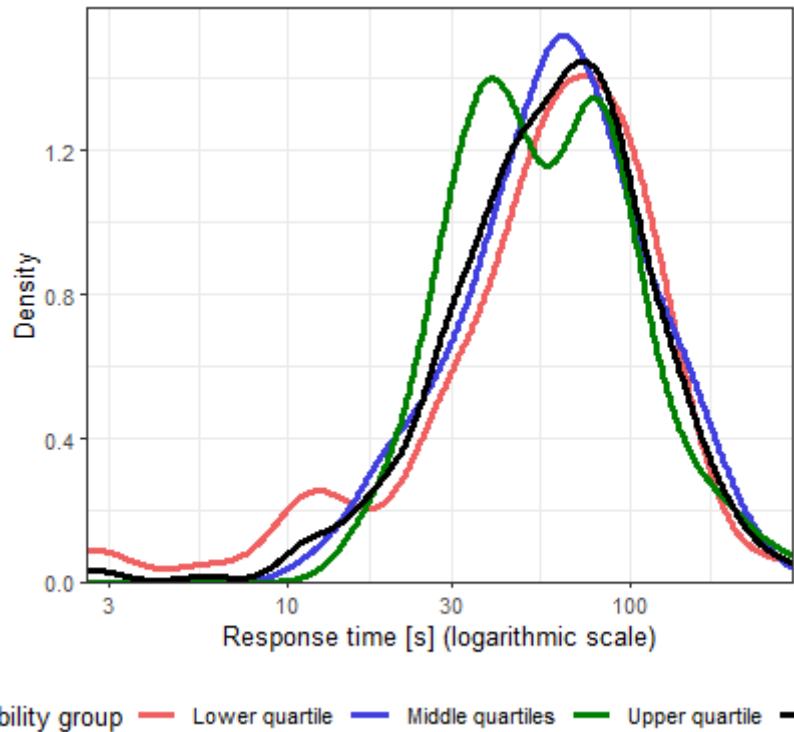


Table 2.62.4.1

Item M051039 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.60	38.98	61.84	93.36	292.99	3.97	0.85
Middle quartiles	11.73	41.88	62.65	90.62	258.34	4.10	0.62
Upper quartile	17.27	35.71	52.87	84.71	298.80	4.04	0.59
Overall	2.60	39.35	61.65	89.47	298.80	4.05	0.69

2.63.M100011 (LLM)

2.63.1. Item fit:

Graph 2.63.1.1

Item M100011 ICC and nonparametric trace line

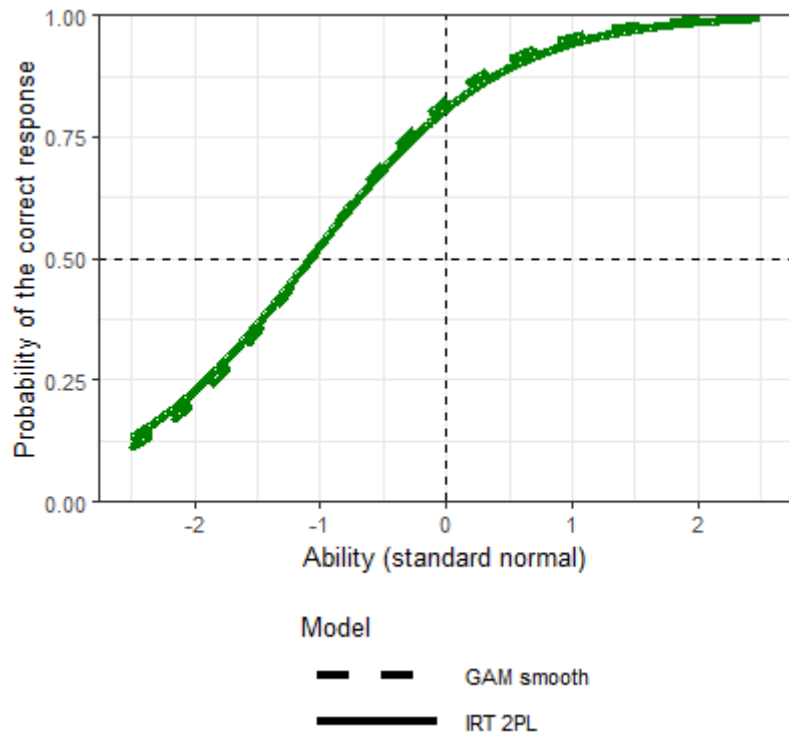


Table 2.63.1.1

Item M100011 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	74.2%	299	CR	0.46	0.35	1.33	-1.08	0.016	0.240

2.63.2. Gender DIF:

Table 2.63.2.1

Item M100011 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.65	0.724	1.000	0.002	

2.63.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.63.4. Answering time:

Graph 2.63.4.1

Item M100011 answering time distribution in groups of different ability level

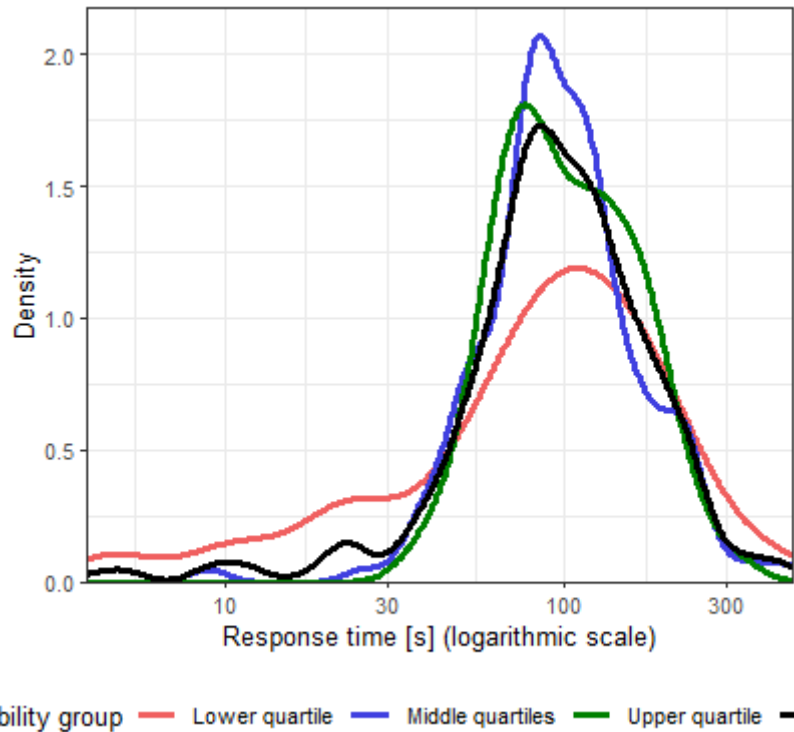


Table 2.63.4.1

Item M100011 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.95	52.38	94.89	149.34	437.89	4.34	0.98
Middle quartiles	8.95	74.03	94.32	125.73	468.17	4.57	0.53
Upper quartile	37.80	72.03	97.94	135.93	319.67	4.62	0.46
Overall	3.95	69.56	94.93	134.74	468.17	4.52	0.69

2.64.M890006 (LLM)

2.64.1. Item fit:

Graph 2.64.1.1

Item M890006 ICC and nonparametric trace line

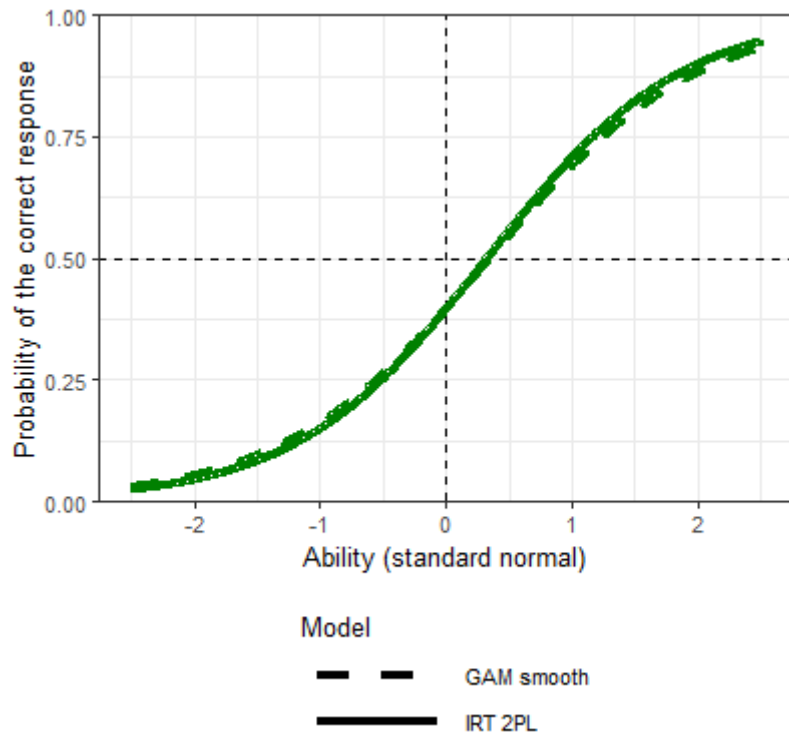


Table 2.64.1.1

Item M890006 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	41.8%	281	CR	0.46	0.32	1.31	0.32	0.000	0.612	

2.64.2. Gender DIF:

Table 2.64.2.1

Item M890006 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.02	0.364	1.000	0.006	

2.64.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.64.4. Answering time:

Graph 2.64.4.1

Item M890006 answering time distribution in groups of different ability level

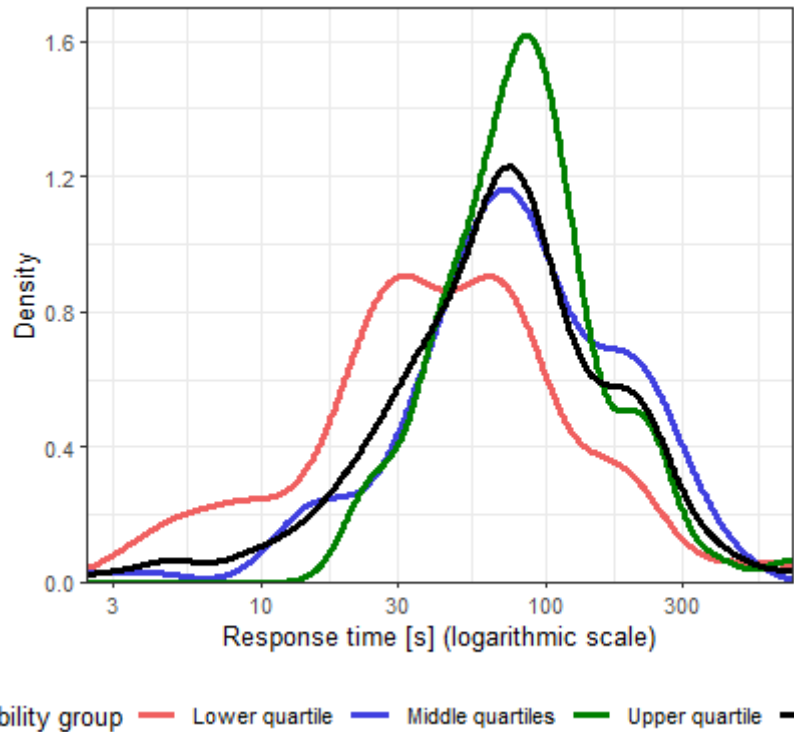


Table 2.64.4.1

Item M890006 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.17	24.64	40.41	75.27	723.75	3.75	1.06
Middle quartiles	2.46	48.67	78.65	142.73	440.00	4.32	0.89
Upper quartile	21.36	56.06	82.96	113.82	715.36	4.42	0.66
Overall	2.46	39.73	70.89	114.26	723.75	4.20	0.93

2.65.M061039 (TIMSS)

2.65.1. Item fit:

Graph 2.65.1.1

Item M061039 ICC and nonparametric trace line

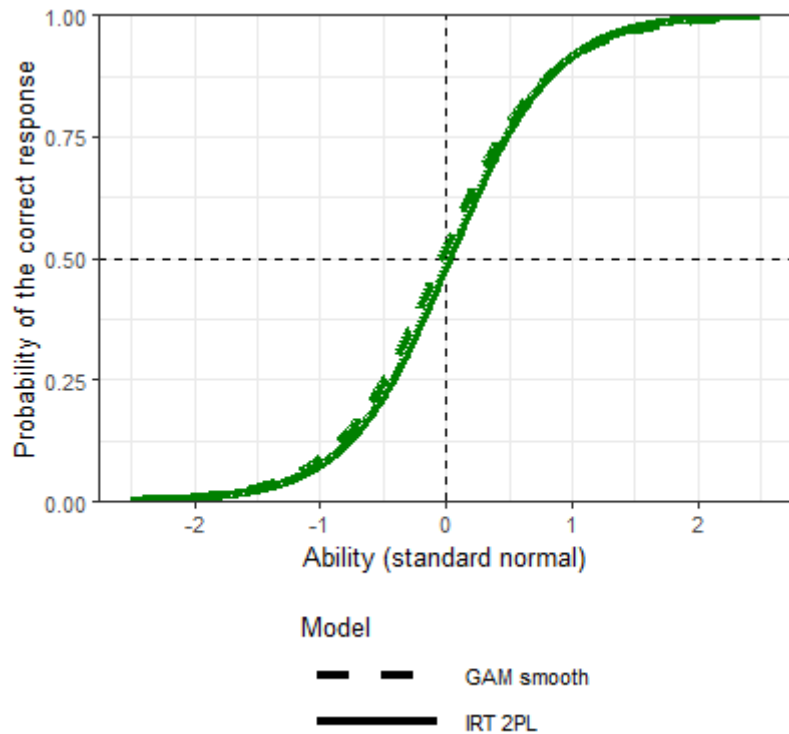


Table 2.65.1.1

Item M061039 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	50.7%	299	CR	0.64	0.72	2.44	0.03	0.023	0.115

2.65.2. Gender DIF:

Table 2.65.2.1

Item M061039 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.63	0.268	1.000	0.006	

2.65.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.65.4. Answering time:

Graph 2.65.4.1

Item M061039 answering time distribution in groups of different ability level

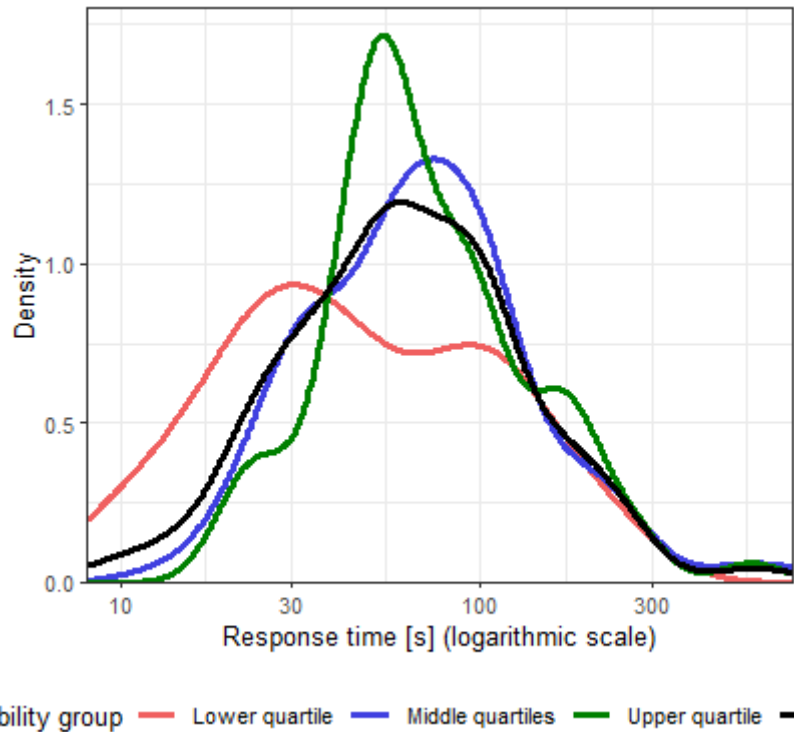


Table 2.65.4.1

Item M061039 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	8.14	23.34	42.39	96.73	257.52	3.83	0.87
Middle quartiles	12.17	40.41	65.72	103.69	734.94	4.22	0.71
Upper quartile	19.73	48.38	61.08	98.20	568.39	4.26	0.65
Overall	8.14	36.55	61.28	100.20	734.94	4.13	0.76

2.66.M100002 (LLM)

2.66.1. Item fit:

Graph 2.66.1.1

Item M100002 ICC and nonparametric trace lines

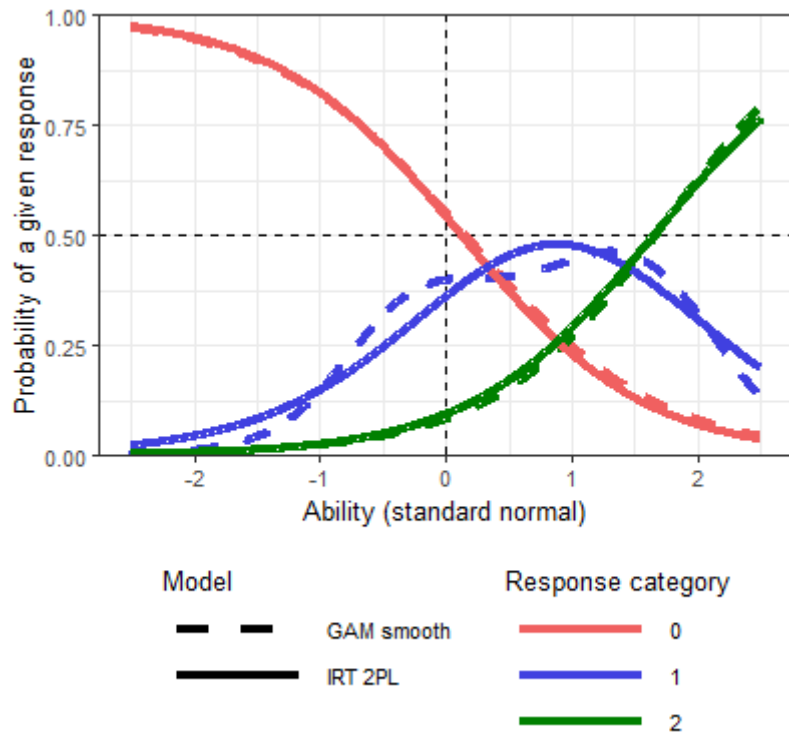


Table 2.66.1.1

Item M100002 parameters and fit statistics

					IRT model parameters and fit statistic							
					Corr. with latent ability estimates							
Max points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	Category 1 difficulty	Category 2 difficulty	RMS EA	RMS EA p-value	
2	31.3%	319	CR	0.56	0.40	1.37	0.88	0.13	1.64	0.010	0.335	

2.66.2. Gender DIF:

Table 2.66.2.1

Item M100002 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.02	0.990	1.000	0.000	

2.66.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.66.4. Answering time:

Graph 2.66.4.1

Item M100002 answering time distribution in groups of different ability level

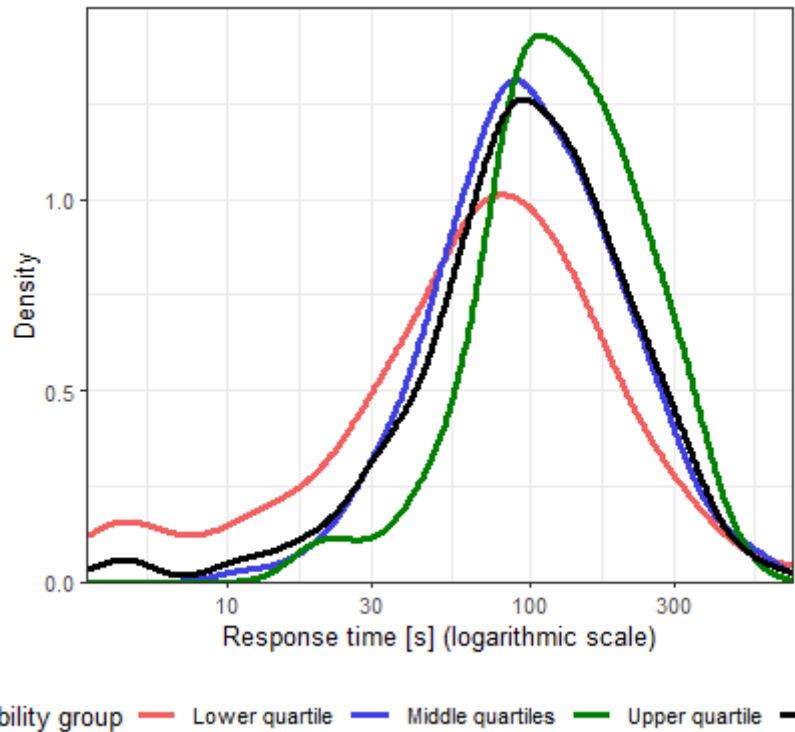


Table 2.66.4.1

Item M100002 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.49	36.77	72.88	124.93	730.33	4.14	1.07
Middle quartiles	11.63	62.45	95.43	151.56	558.79	4.59	0.70
Upper quartile	19.02	88.08	132.86	195.09	464.48	4.83	0.63
Overall	3.49	61.91	98.70	159.84	730.33	4.54	0.83

2.67.M090047 (LLM)

2.67.1. Item fit:

Graph 2.67.1.1

Item M090047 ICC and nonparametric trace lines

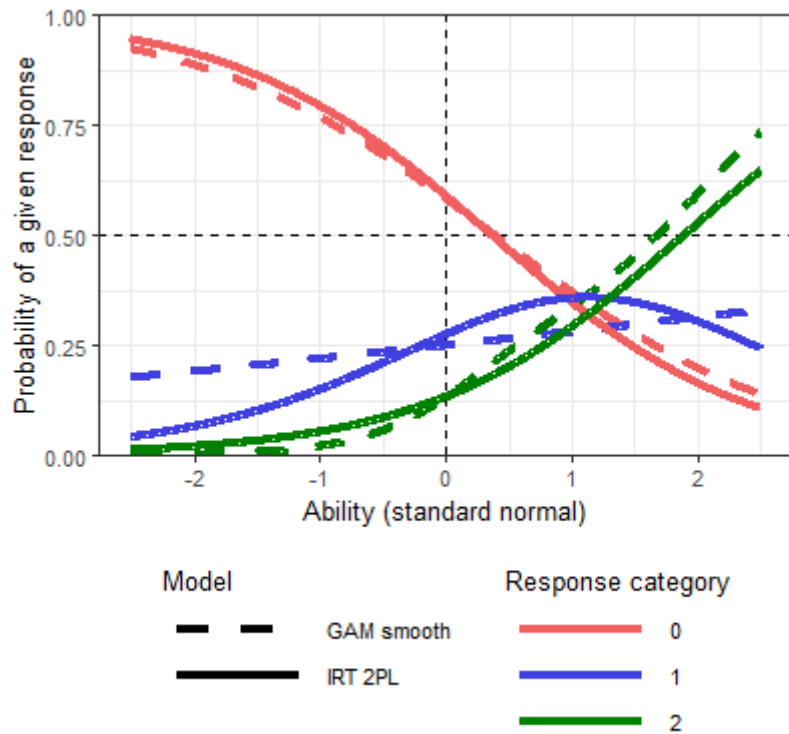


Table 2.67.1.1

Item M090047 parameters and fit statistics

					IRT model parameters and fit statistic							
				Corr. with latent ability estimates								
Max points	Easiness	Number of obs.	Format	All items	TIMS S items only	Discrimination	Difficulty	Category 1 difficulty	Category 2 difficulty	RMS EA	RMS EA p-value	
2	29.2%	300	CR	0.44	0.30	0.99	1.13	0.37	1.88	0.029	0.009	

2.67.2. Gender DIF:

Table 2.67.2.1

Item M090047 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.87	0.238	1.000	0.008	

2.67.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.67.4. Answering time:

Graph 2.67.4.1

Item M090047 answering time distribution in groups of different ability level

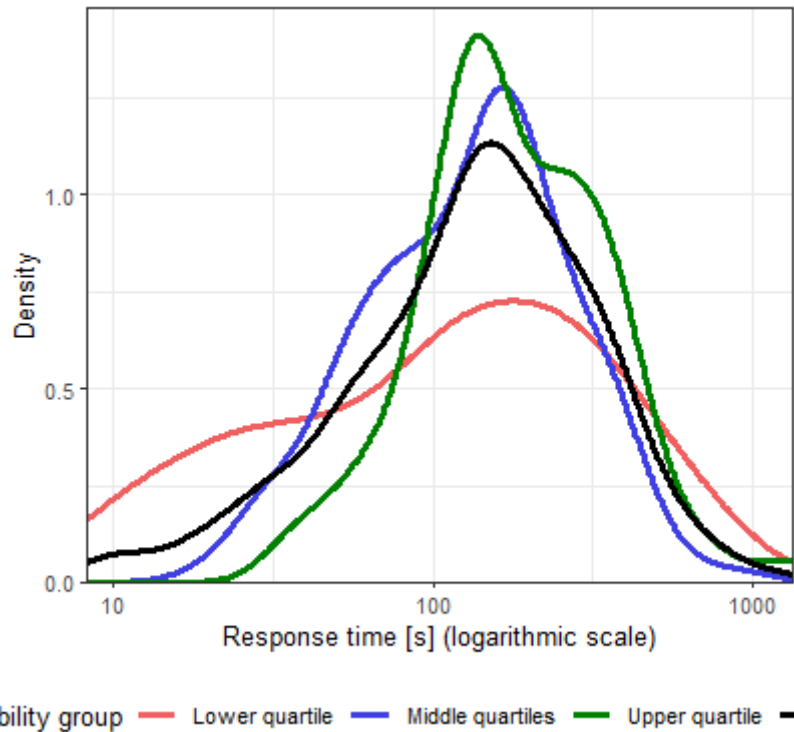


Table 2.67.4.1

Item M090047 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	8.30	40.38	118.75	246.51	913.98	4.63	1.20
Middle quartiles	19.80	78.28	146.15	208.39	922.48	4.86	0.74
Upper quartile	37.13	120.97	159.28	276.89	1335.13	5.18	0.68
Overall	8.30	78.16	145.91	241.77	1335.13	4.87	0.90

2.68.M100013 (LLM)

2.68.1. Item fit:

Graph 2.68.1.1

Item M100013 ICC and nonparametric trace line

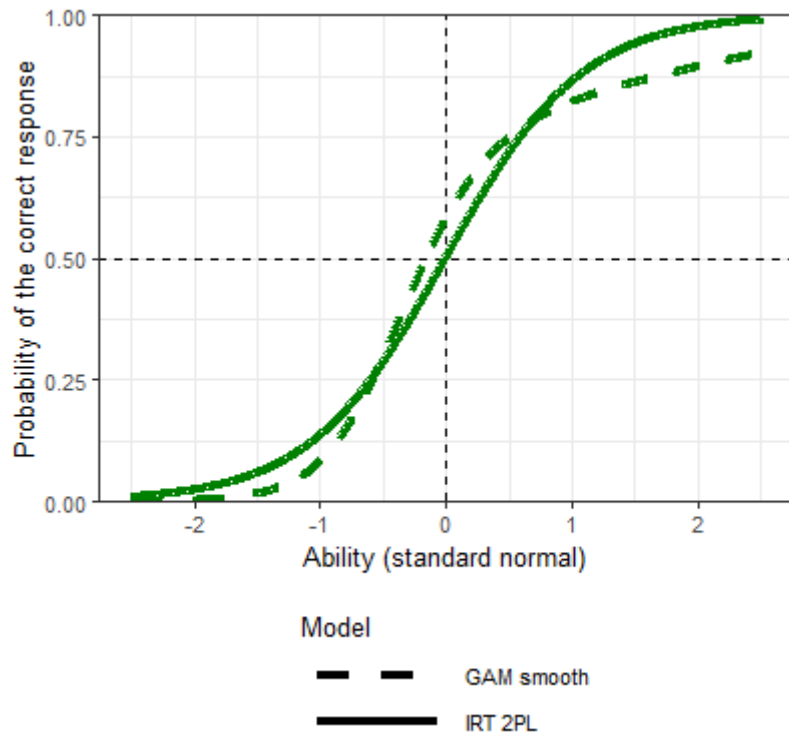


Table 2.68.1.1

Item M100013 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	51.3%	304	CR	0.56	0.46	1.84	-0.01	0.018	0.205

2.68.2. Gender DIF:

Table 2.68.2.1

Item M100013 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.55	0.758	1.000	0.001	

2.68.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.68.4. Answering time:

Graph 2.68.4.1

Item M100013 answering time distribution in groups of different ability level

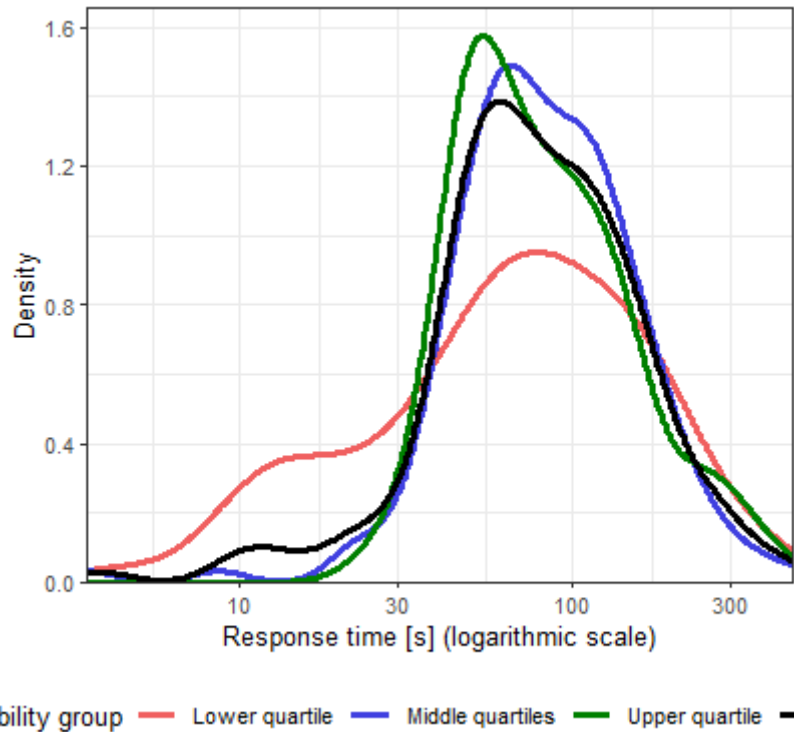


Table 2.68.4.1

Item M100013 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.23	37.60	68.39	129.19	436.28	4.13	0.97
Middle quartiles	3.50	56.92	80.35	121.08	458.48	4.40	0.64
Upper quartile	24.86	51.45	73.20	118.52	416.16	4.40	0.59
Overall	3.50	51.69	75.65	121.24	458.48	4.34	0.73

2.69.M100007 (LLM)

2.69.1. Item fit:

Graph 2.69.1.1

Item M100007 ICC and nonparametric trace line

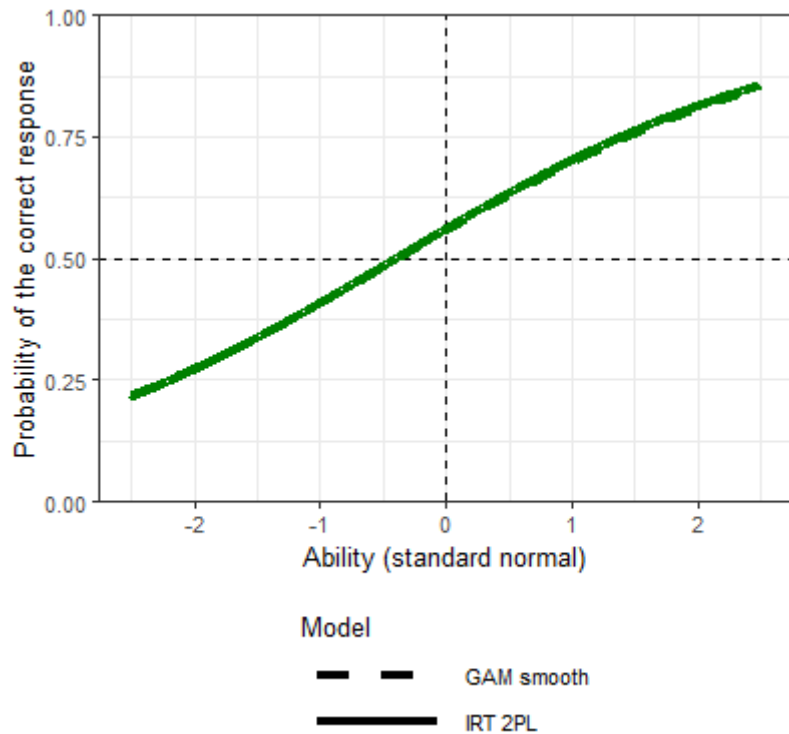


Table 2.69.1.1

Item M100007 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	55.9%	304	CR	0.28	0.12	0.61	-0.40	0.000	0.454

2.69.2. Gender DIF:

Table 2.69.2.1

Item M100007 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.04	0.979	1.000	0.000	

2.69.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.69.4. Answering time:

Graph 2.69.4.1

Item M100007 answering time distribution in groups of different ability level

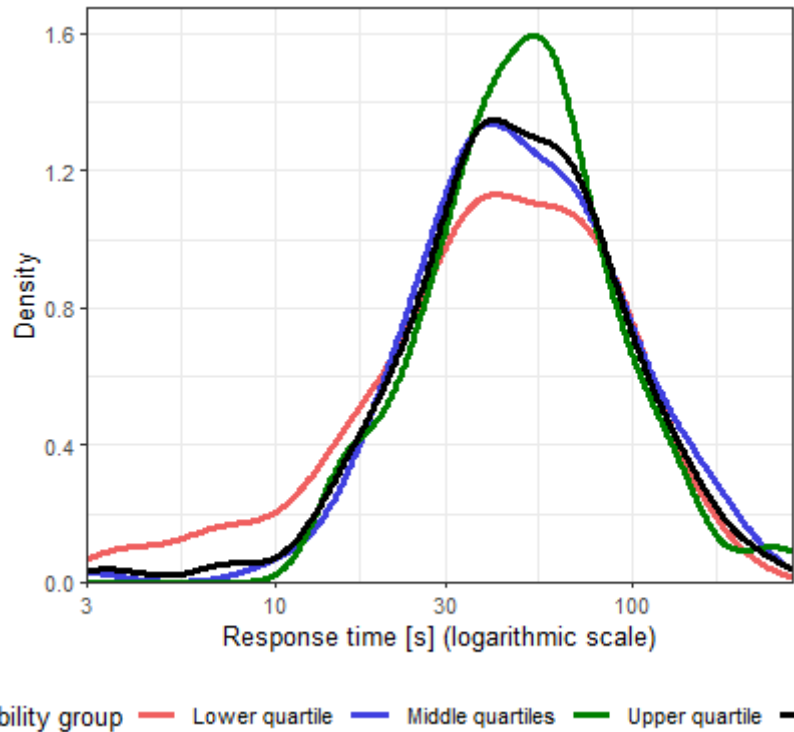


Table 2.69.4.1

Item M100007 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.37	26.89	41.89	69.40	180.18	3.67	0.83
Middle quartiles	3.00	31.77	46.14	74.16	220.18	3.88	0.67
Upper quartile	14.90	33.82	50.29	67.22	281.29	3.90	0.60
Overall	3.00	31.15	46.14	73.82	281.29	3.84	0.69

2.70.M090042 (LLM)

2.70.1. Item fit:

Graph 2.70.1.1

Item M090042 ICC and nonparametric trace line

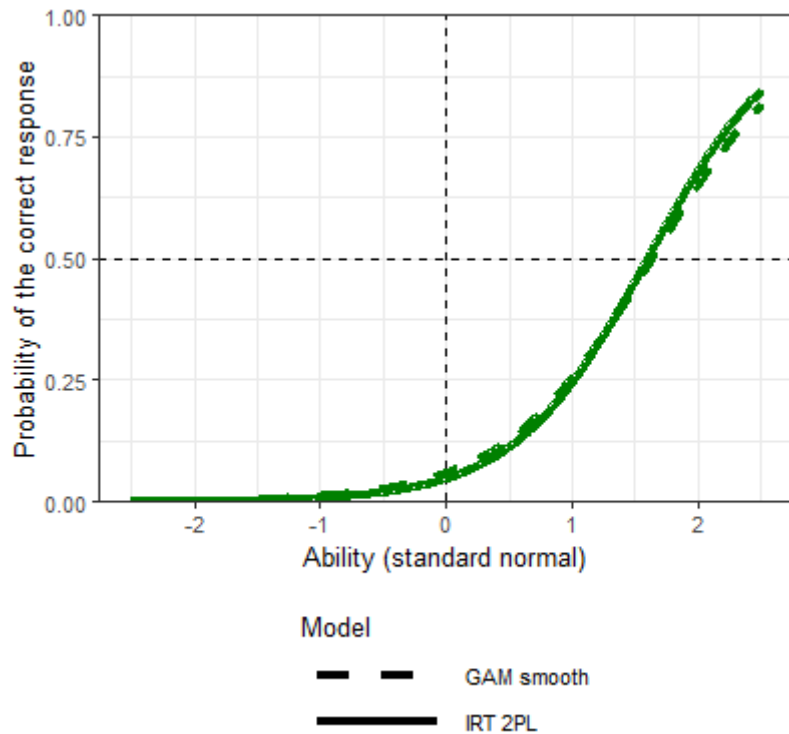


Table 2.70.1.1

Item M090042 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	12.1%	298	CR	0.43	0.27	1.88	1.60	0.011	0.324

2.70.2. Gender DIF:

Table 2.70.2.1

Item M090042 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
5.37	0.068	1.000	0.025	

2.70.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.70.4. Answering time:

Graph 2.70.4.1

Item M090042 answering time distribution in groups of different ability level

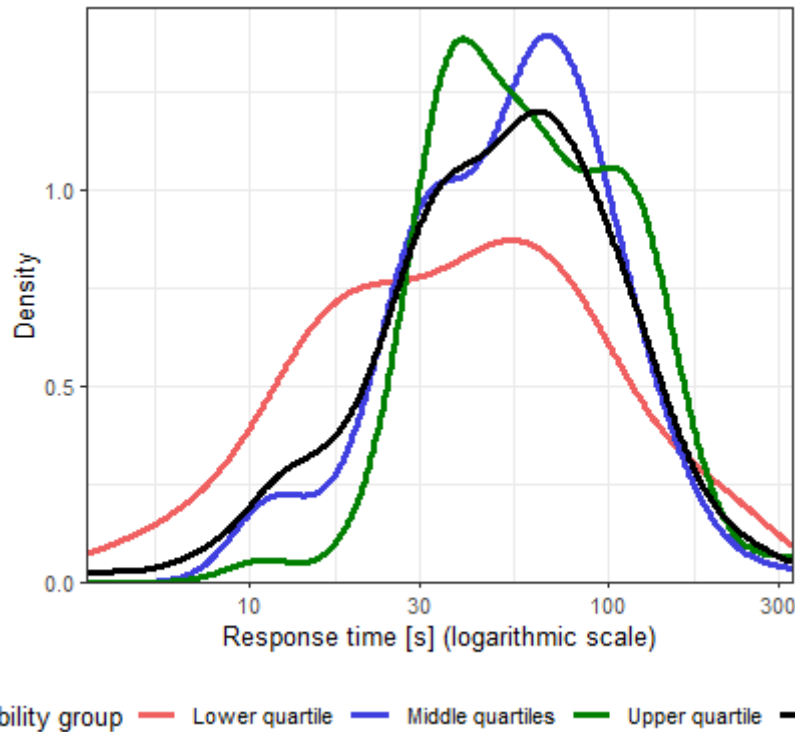


Table 2.70.4.1

Item M090042 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.54	18.23	41.40	72.98	257.27	3.63	0.95
Middle quartiles	9.78	32.84	58.19	84.22	323.56	3.96	0.67
Upper quartile	10.97	36.57	58.31	101.11	326.94	4.11	0.61
Overall	3.54	30.78	52.51	84.77	326.94	3.90	0.77

2.71.M041174 (TIMSS)

2.71.1. Item fit:

Graph 2.71.1.1

Item M041174 ICC and nonparametric trace line

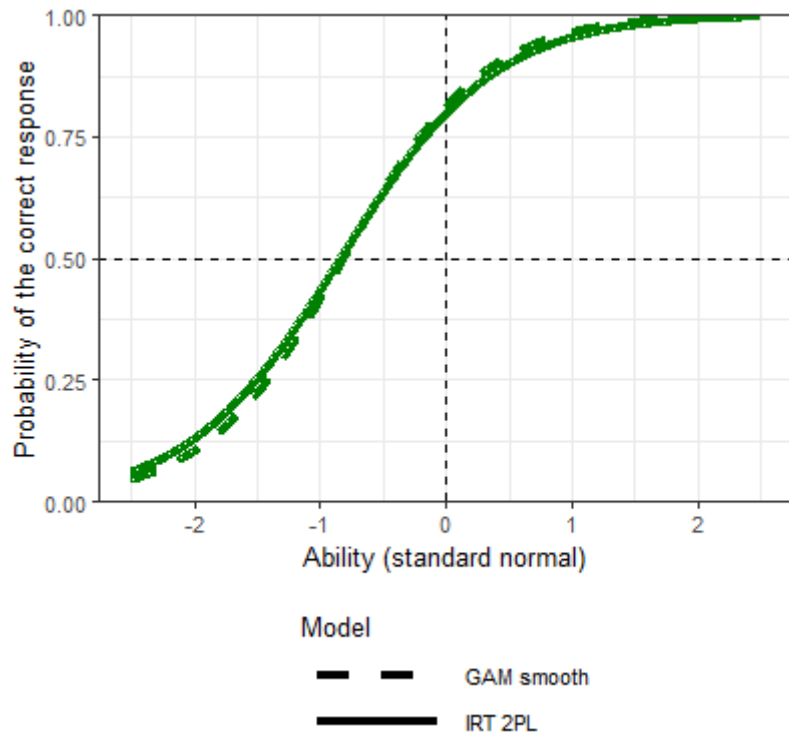


Table 2.71.1.1

Item M041174 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	71.4%	304	CR	0.54	0.49	1.64	-0.84	0.020	0.162

2.71.2. Gender DIF:

Table 2.71.2.1

Item M041174 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.16	0.339	1.000	0.006	

2.71.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.71.4. Answering time:

Graph 2.71.4.1

Item M041174 answering time distribution in groups of different ability level

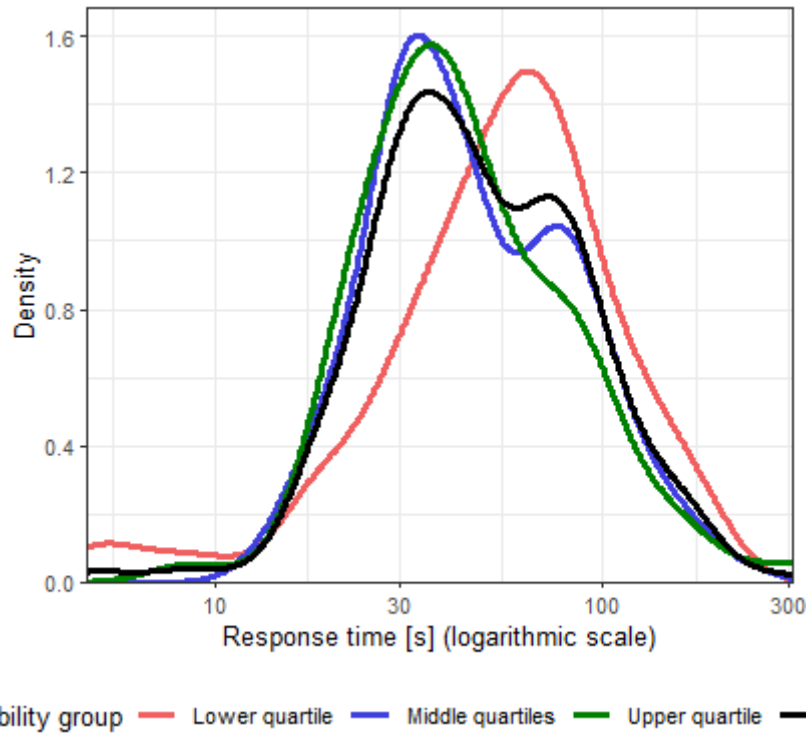


Table 2.71.4.1

Item M041174 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.71	36.62	58.95	81.42	181.72	3.96	0.74
Middle quartiles	13.39	30.67	42.24	75.33	236.37	3.84	0.59
Upper quartile	8.66	29.14	40.02	68.94	307.76	3.79	0.61
Overall	4.71	30.77	45.26	76.15	307.76	3.86	0.64

2.72.M890011 (LLM)

2.72.1. Item fit:

Graph 2.72.1.1

Item M890011 ICC and nonparametric trace line

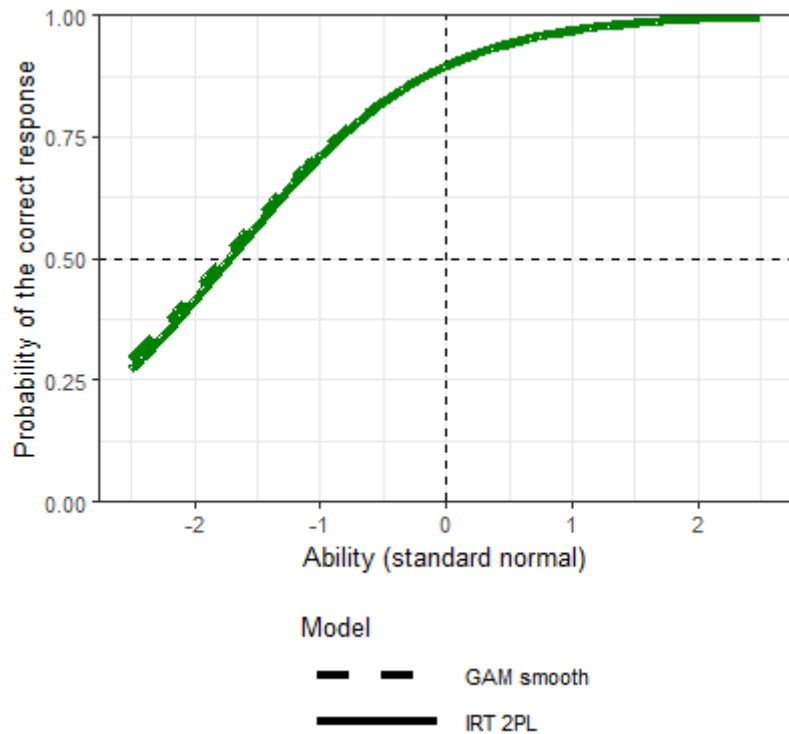


Table 2.72.1.1

Item M890011 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	84.3%	319	CR	0.38	0.29	1.25	-1.71	0.019	0.168

2.72.2. Gender DIF:

Table 2.72.2.1

Item M890011 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.91	0.384	1.000	0.007	

2.72.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.72.4. Answering time:

Graph 2.72.4.1

Item M890011 answering time distribution in groups of different ability level

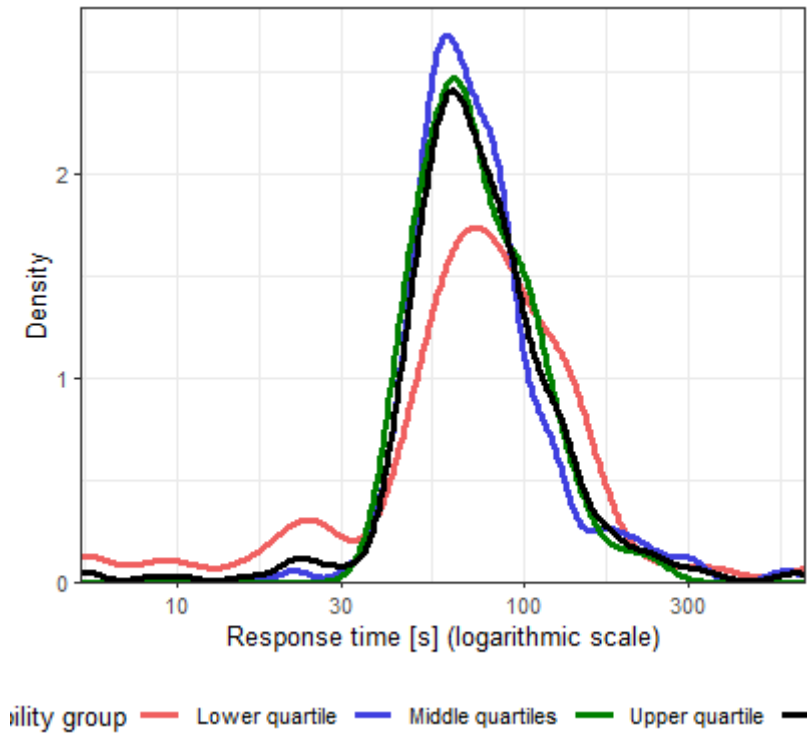


Table 2.72.4.1

Item M890011 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.35	56.10	76.15	105.79	643.89	4.24	0.79
Middle quartiles	21.95	56.32	68.67	88.29	572.24	4.31	0.45
Upper quartile	38.37	55.64	67.30	95.72	237.78	4.30	0.37
Overall	5.35	56.07	70.37	94.70	643.89	4.29	0.54

2.73.M100017 (LLM)

2.73.1. Item fit:

Graph 2.73.1.1

Item M100017 ICC and nonparametric trace line

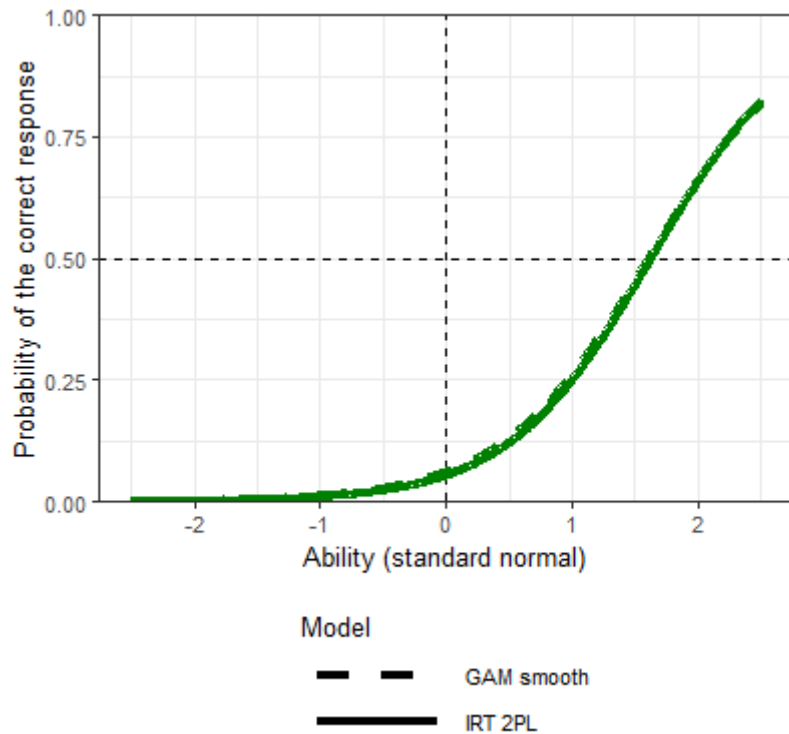


Table 2.73.1.1

Item M100017 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	12.4%	299	CR	0.43	0.27	1.76	1.63	0.021	0.145

2.73.2. Gender DIF:

Table 2.73.2.1

Item M100017 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.81	0.666	1.000	0.004	

2.73.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.73.4. Answering time:

Graph 2.73.4.1

Item M100017 answering time distribution in groups of different ability level

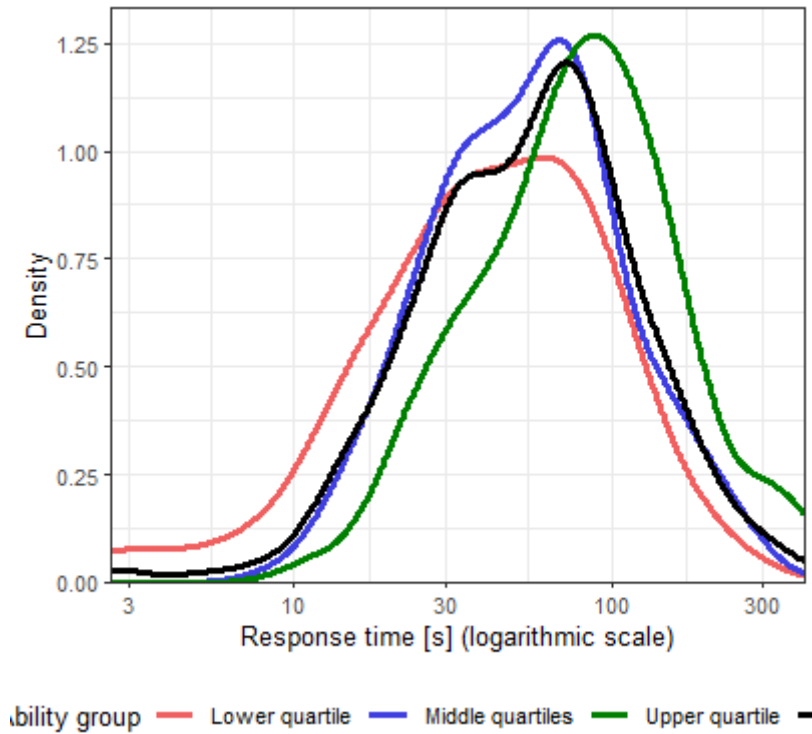


Table 2.73.4.1

Item M100017 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.66	22.31	40.96	74.54	253.99	3.68	0.89
Middle quartiles	9.09	31.98	56.99	84.13	313.62	3.99	0.70
Upper quartile	11.98	49.75	78.34	122.70	406.31	4.34	0.73
Overall	2.66	31.98	58.82	88.98	406.31	3.98	0.80

2.74.M890004 (LLM)

2.74.1. Item fit:

Graph 2.74.1.1

Item M890004 ICC and nonparametric trace line

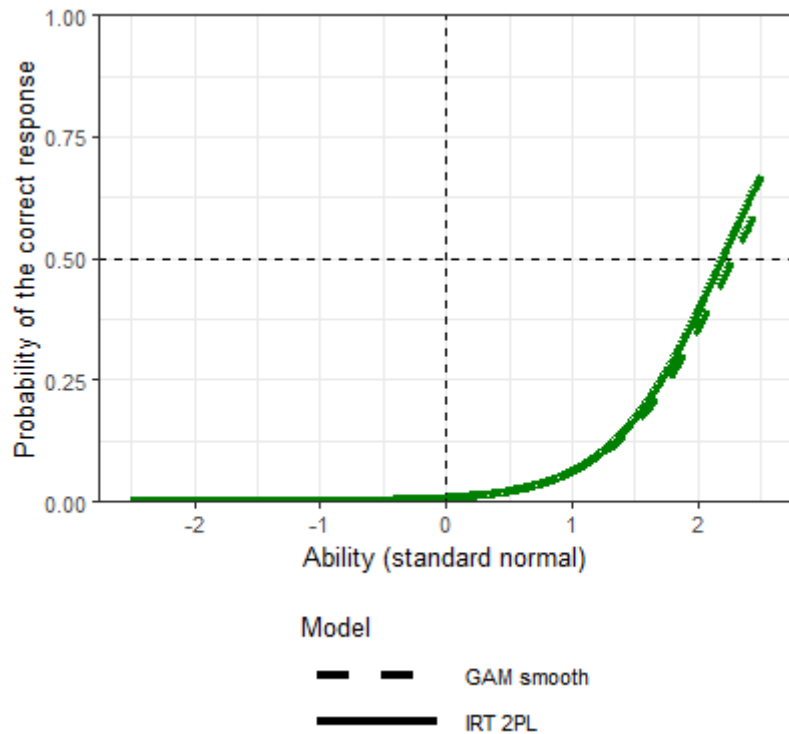


Table 2.74.1.1

Item M890004 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	3.6%	281	CR	0.27	0.15	2.27	2.19	0.000	0.883	

2.74.2. Gender DIF:

Table 2.74.2.1

Item M890004 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.89	0.235	1.000	0.034	

2.74.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.74.4. Answering time:

Graph 2.74.4.1

Item M890004 answering time distribution in groups of different ability level

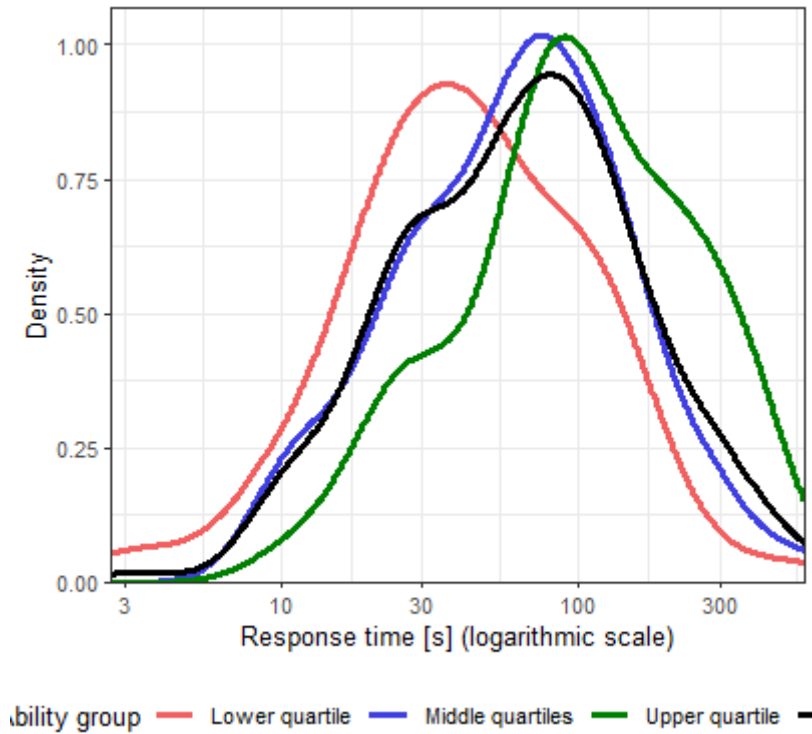


Table 2.74.4.1

Item M890004 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.71	22.22	43.85	90.59	536.23	3.73	0.96
Middle quartiles	8.42	32.62	66.92	106.99	578.53	4.11	0.89
Upper quartile	10.29	59.62	103.07	190.32	485.07	4.56	0.90
Overall	2.71	30.91	67.40	120.95	578.53	4.13	0.96

2.75.M041059 (TIMSS)

2.75.1. Item fit:

Graph 2.75.1.1

Item M041059 ICC and nonparametric trace line

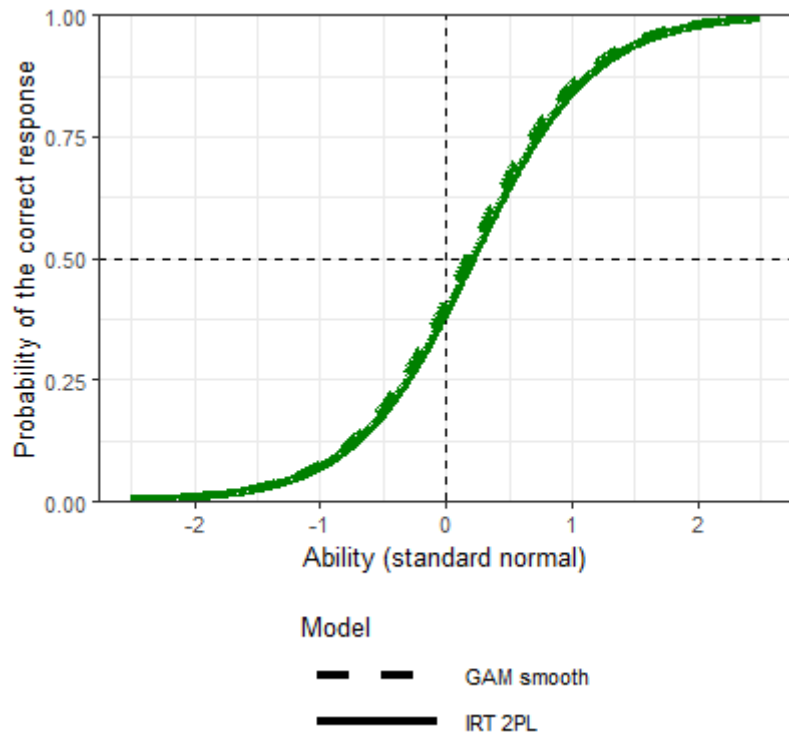


Table 2.75.1.1

Item M041059 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	45.0%	299	CR	0.62	0.61	2.12	0.21	0.029	0.043

2.75.2. Gender DIF:

Table 2.75.2.1

Item M041059 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
5.81	0.055	1.000	0.014	

2.75.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.75.4. Answering time:

Graph 2.75.4.1

Item M041059 answering time distribution in groups of different ability level

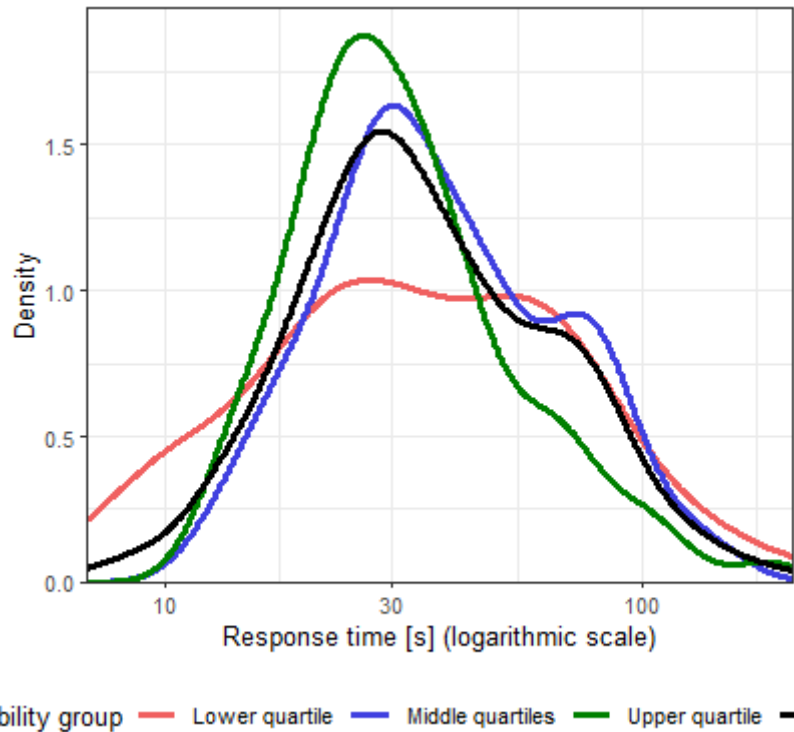


Table 2.75.4.1

Item M041059 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	6.88	20.43	32.16	59.53	206.89	3.51	0.76
Middle quartiles	12.42	25.75	35.19	55.51	147.92	3.64	0.56
Upper quartile	13.20	21.68	29.34	40.79	185.05	3.46	0.54
Overall	6.88	23.13	32.33	55.07	206.89	3.56	0.62

2.76.M090057 (LLM)

2.76.1. Item fit:

Graph 2.76.1.1

Item M090057 ICC and nonparametric trace line

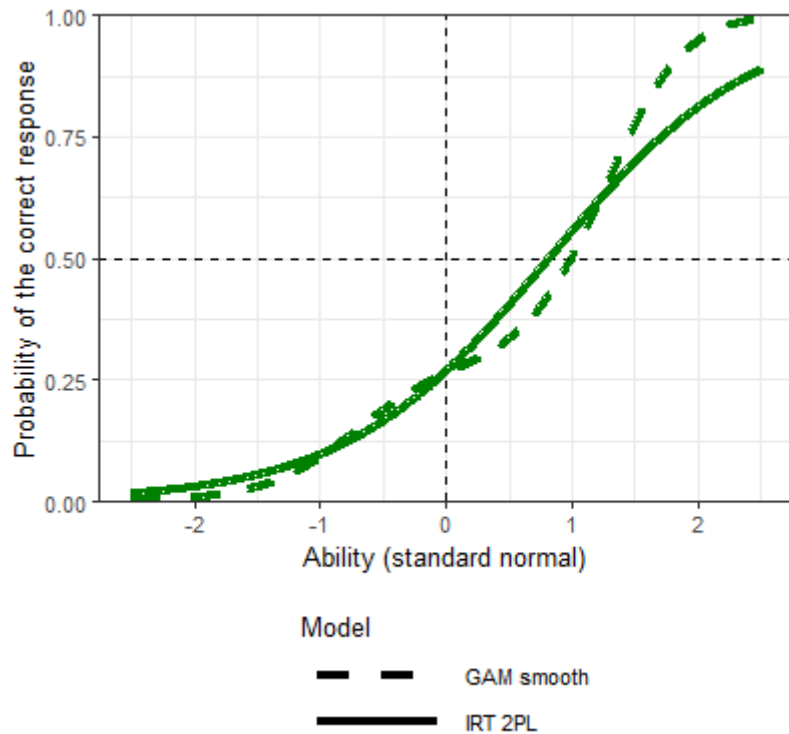


Table 2.76.1.1

Item M090057 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	31.9%	304	CR	0.47	0.32	1.23	0.81	0.019	0.175

2.76.2. Gender DIF:

Table 2.76.2.1

Item M090057 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.68	0.261	1.000	0.008	

2.76.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.76.4. Answering time:

Graph 2.76.4.1

Item M090057 answering time distribution in groups of different ability level

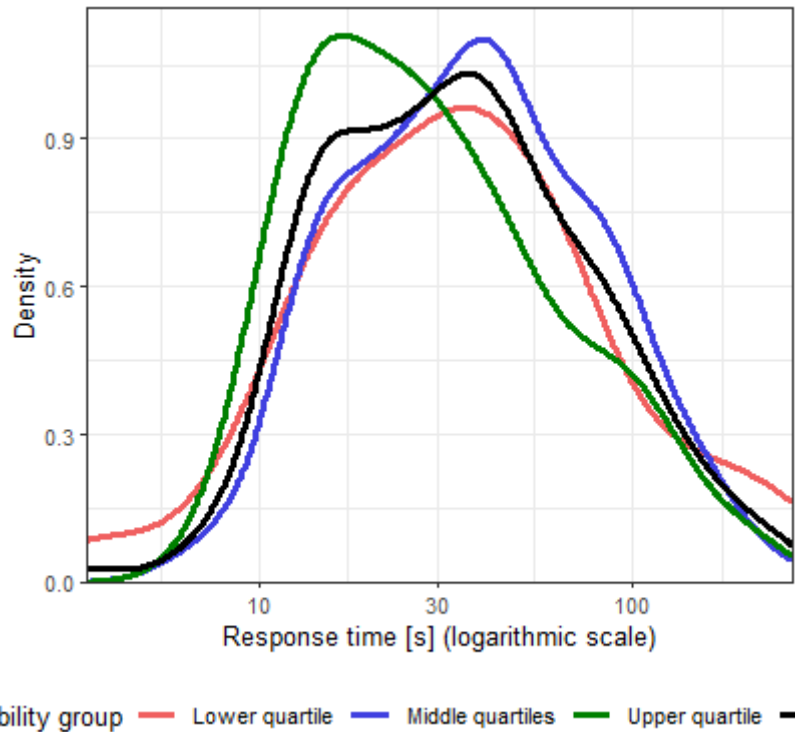


Table 2.76.4.1

Item M090057 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.49	18.20	34.26	60.97	267.18	3.52	0.93
Middle quartiles	6.40	20.51	37.86	67.29	257.27	3.62	0.75
Upper quartile	7.61	14.93	26.04	46.01	202.38	3.37	0.78
Overall	3.49	18.11	33.74	59.30	267.18	3.53	0.81

2.77.MP71162 (TIMSS)

2.77.1. Item fit:

Graph 2.77.1.1

Item MP71162 ICC and nonparametric trace line

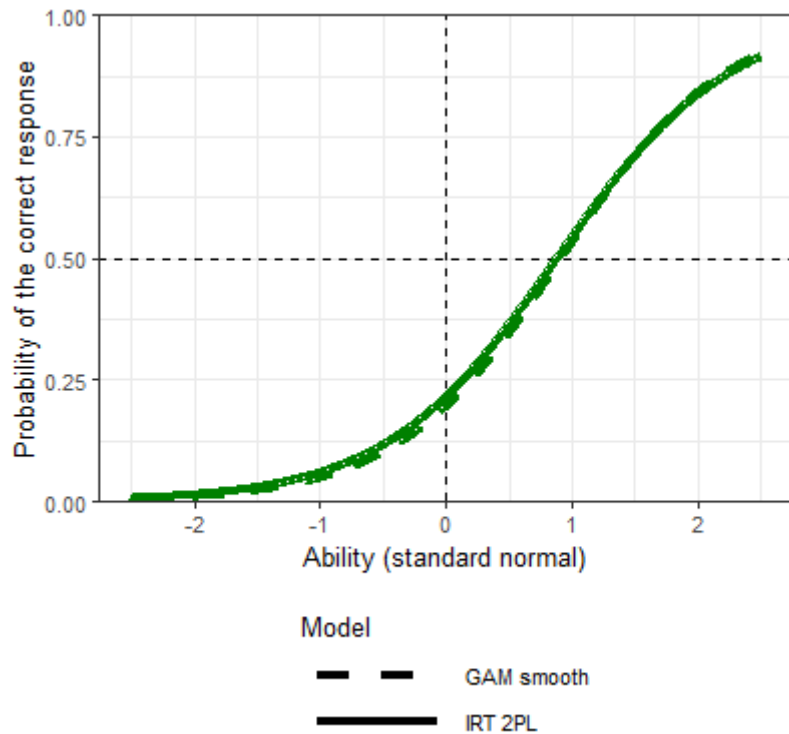


Table 2.77.1.1

Item MP71162 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	29.6%	294	CR	0.52	0.43	1.46	0.88	0.000	0.453

2.77.2. Gender DIF:

Table 2.77.2.1

Item MP71162 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.44	0.801	1.000	0.001	

2.77.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.77.4. Answering time:

Graph 2.77.4.1

Item MP71162 answering time distribution in groups of different ability level

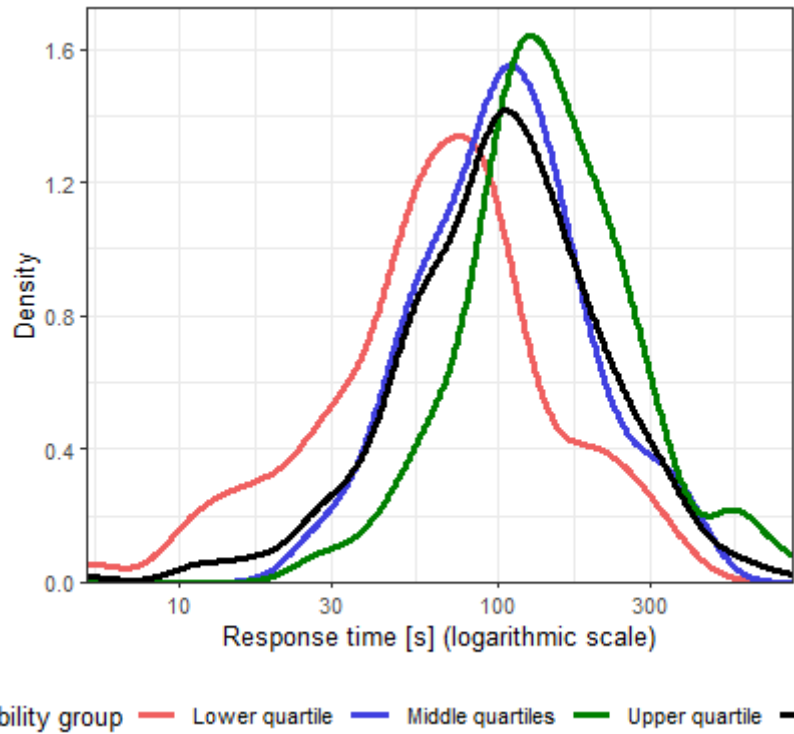


Table 2.77.4.1

Item MP71162 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.19	41.86	65.29	95.91	354.47	4.14	0.83
Middle quartiles	25.67	68.08	105.75	155.22	417.68	4.65	0.61
Upper quartile	26.37	102.25	140.16	205.39	829.71	4.96	0.63
Overall	5.19	63.69	103.65	156.94	829.71	4.62	0.74

2.78.M051205 (TIMSS)

2.78.1. Item fit:

Graph 2.78.1.1

Item M051205 ICC and nonparametric trace line

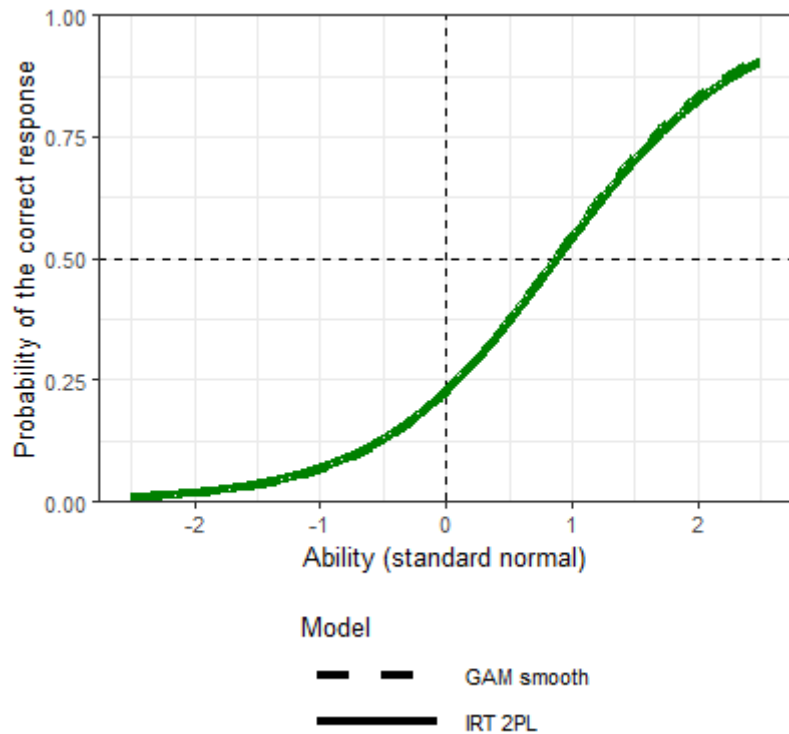


Table 2.78.1.1

Item M051205 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	27.9%	306	CR	0.48	0.47	1.38	0.88	0.000	0.768

2.78.2. Gender DIF:

Table 2.78.2.1

Item M051205 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
4.50	0.105	1.000	0.013	

2.78.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.78.4. Answering time:

Graph 2.78.4.1

Item M051205 answering time distribution in groups of different ability level

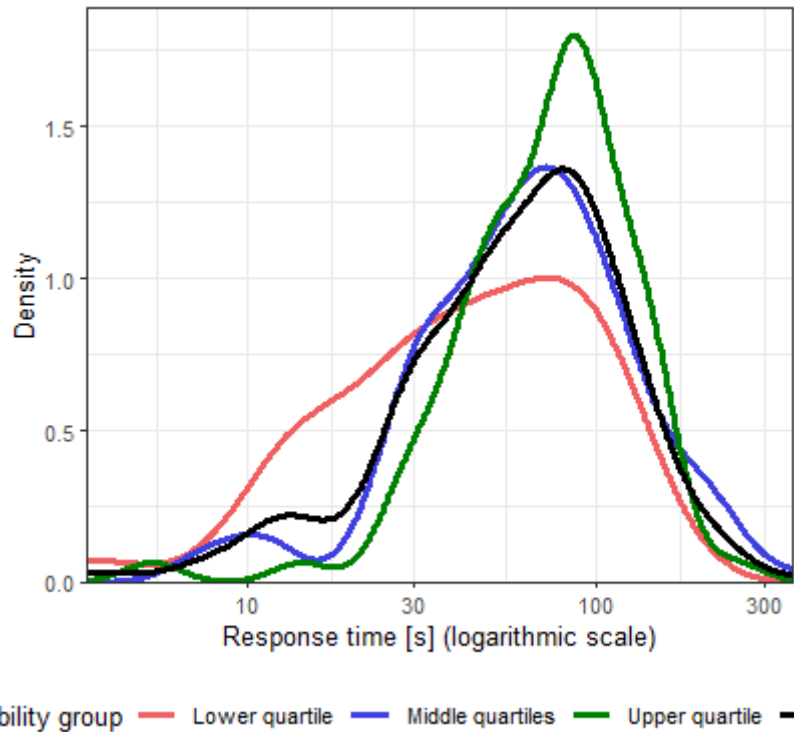


Table 2.78.4.1

Item M051205 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.48	24.02	44.81	80.16	162.67	3.72	0.84
Middle quartiles	6.97	40.19	64.40	97.53	362.60	4.12	0.72
Upper quartile	5.33	51.49	80.37	100.85	246.61	4.25	0.59
Overall	3.48	36.34	63.41	95.85	362.60	4.04	0.76

2.79.M890003 (LLM)

2.79.1. Item fit:

Graph 2.79.1.1

Item M890003 ICC and nonparametric trace line

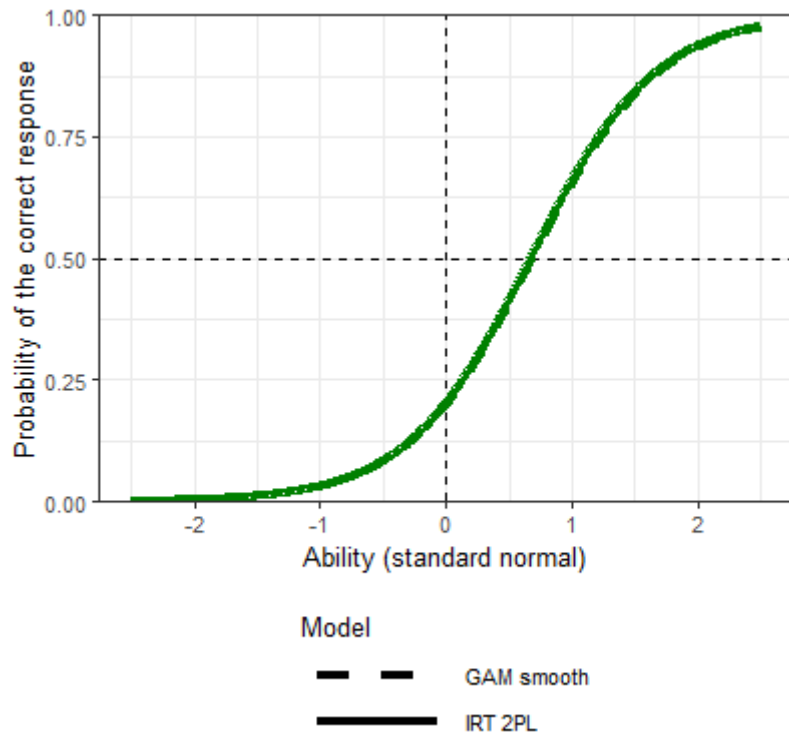


Table 2.79.1.1

Item M890003 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	30.0%	281	CR	0.56	0.36	2.03	0.67	0.014	0.282

2.79.2. Gender DIF:

Table 2.79.2.1

Item M890003 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.49	0.175	1.000	0.010	

2.79.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.79.4. Answering time:

Graph 2.79.4.1

Item M890003 answering time distribution in groups of different ability level

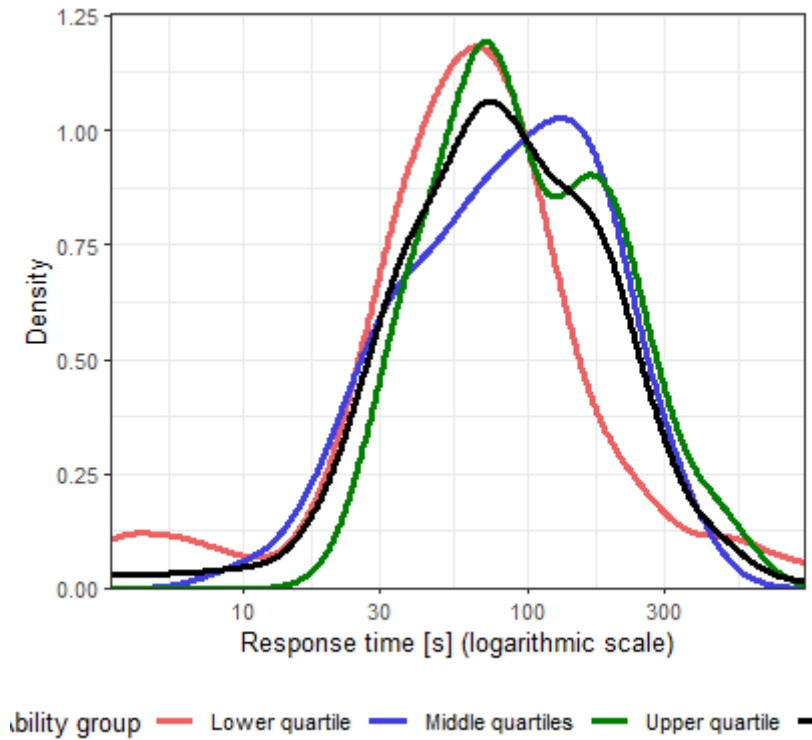


Table 2.79.4.1

Item M890003 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.45	38.02	63.14	101.30	928.32	4.11	1.01
Middle quartiles	8.91	42.72	88.29	156.52	431.76	4.41	0.81
Upper quartile	25.92	59.85	83.97	164.45	521.30	4.58	0.72
Overall	3.45	43.76	78.33	152.94	928.32	4.38	0.86

2.80.M100024 (LLM)

2.80.1. Item fit:

Graph 2.80.1.1

Item M100024 ICC and nonparametric trace line

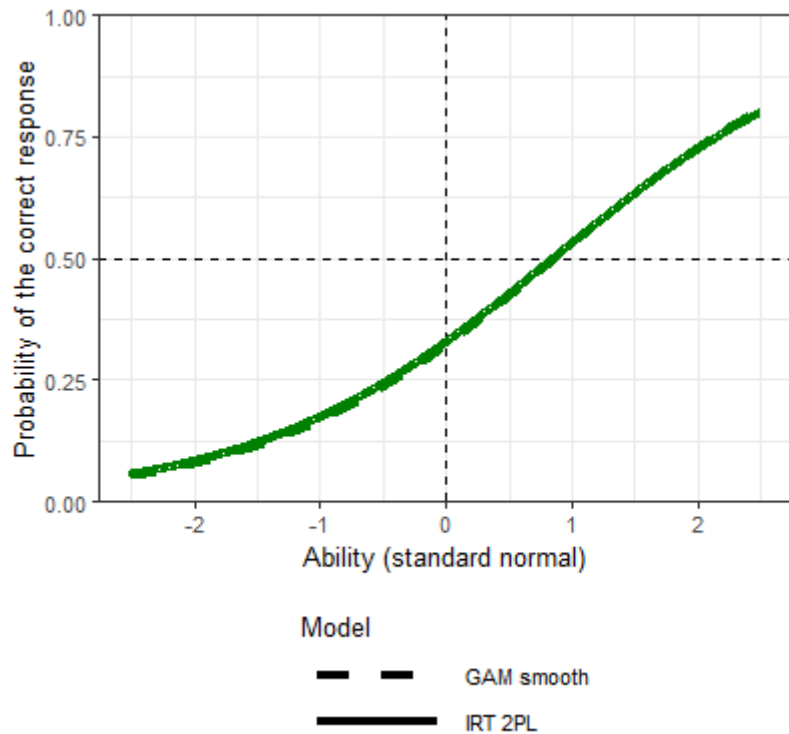


Table 2.80.1.1

Item M100024 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	35.4%	319	CR	0.38	0.25	0.84	0.85	0.021	0.147

2.80.2. Gender DIF:

Table 2.80.2.1

Item M100024 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.26	0.880	1.000	0.001	

2.80.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.80.4. Answering time:

Graph 2.80.4.1

Item M100024 answering time distribution in groups of different ability level

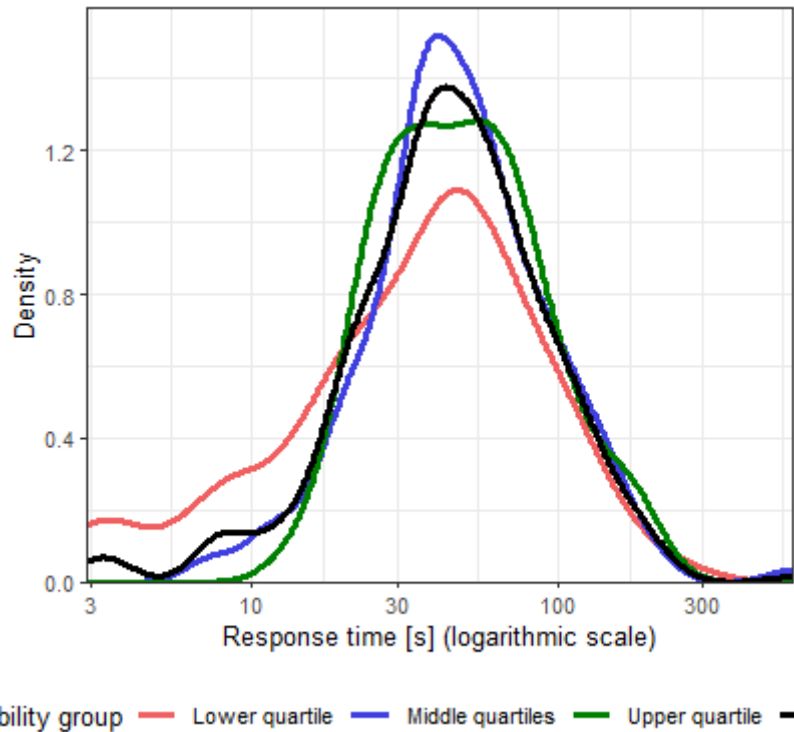


Table 2.80.4.1

Item M100024 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.92	20.06	40.35	63.86	234.77	3.50	0.97
Middle quartiles	7.09	33.70	47.43	71.56	586.97	3.86	0.68
Upper quartile	13.43	30.17	47.80	74.31	199.65	3.89	0.60
Overall	2.92	28.54	45.04	69.54	586.97	3.78	0.76

2.81.M100028 (LLM)

2.81.1. Item fit:

Graph 2.81.1.1

Item M100028 ICC and nonparametric trace line

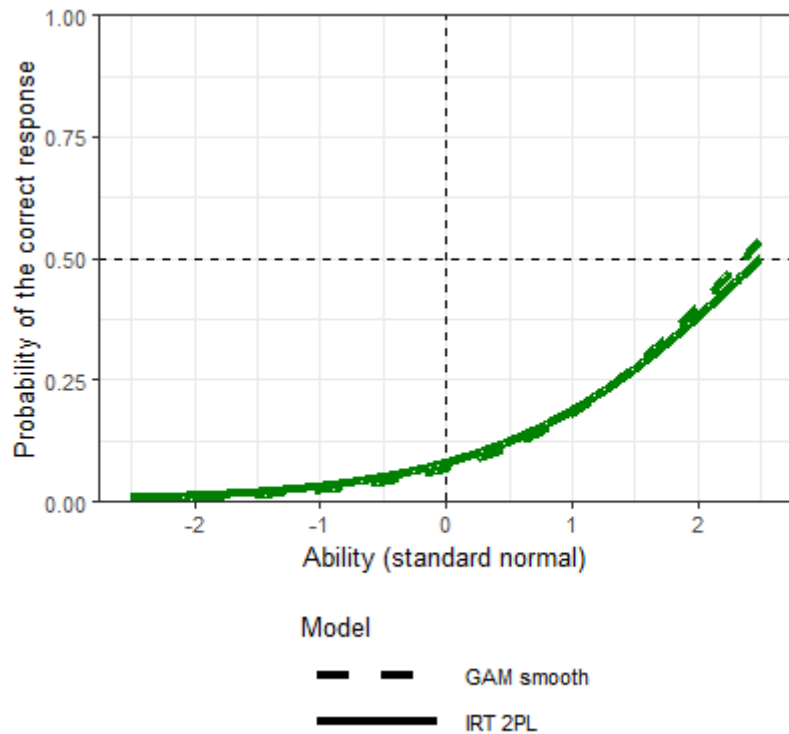


Table 2.81.1.1

Item M100028 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	10.9%	304	CR	0.31	0.22	0.98	2.50	0.000	0.465

2.81.2. Gender DIF:

Table 2.81.2.1

Item M100028 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.25	0.324	1.000	0.011	

2.81.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.81.4. Answering time:

Graph 2.81.4.1

Item M100028 answering time distribution in groups of different ability level

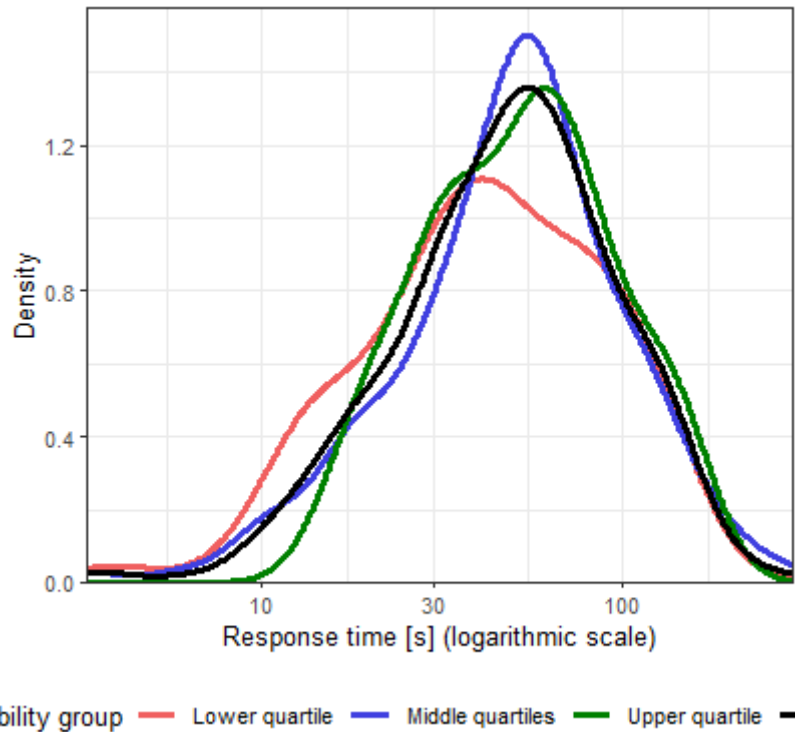


Table 2.81.4.1

Item M100028 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.88	24.72	43.80	77.17	143.96	3.72	0.76
Middle quartiles	3.30	31.57	51.32	72.82	293.82	3.87	0.73
Upper quartile	15.48	32.62	52.47	79.39	167.21	3.94	0.61
Overall	3.30	30.96	50.74	75.37	293.82	3.85	0.71

2.82.M090048 (LLM)

2.82.1. Item fit:

Graph 2.82.1.1

Item M090048 ICC and nonparametric trace line

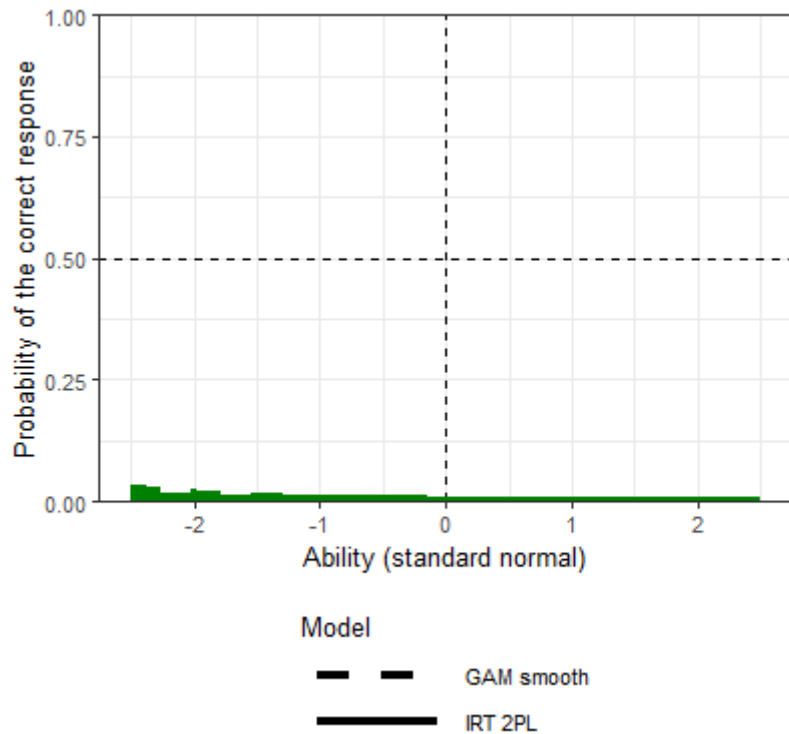


Table 2.82.1.1

Item M090048 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	0.3%	298	CR	-0.06	-0.06	-0.47	-12.40	0.008	0.370

2.82.2. Gender DIF:

Table 2.82.2.1

Item M090048 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.43	0.489	1.000	0.107	

2.82.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.82.4. Answering time:

Graph 2.82.4.1

Item M090048 answering time distribution in groups of different ability level

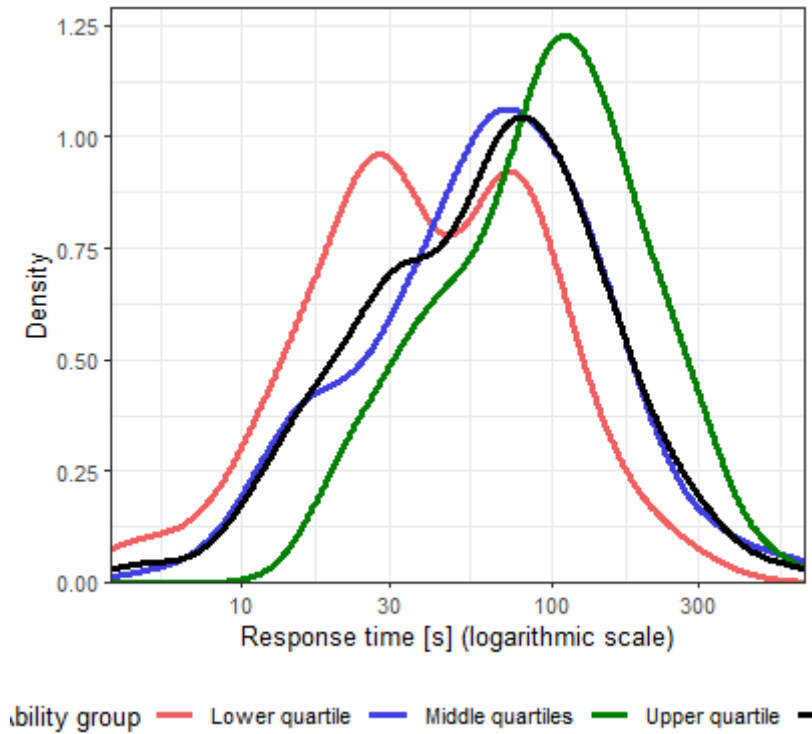


Table 2.82.4.1

Item M090048 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.81	22.24	34.37	75.75	289.40	3.67	0.87
Middle quartiles	5.31	34.35	64.57	111.19	655.97	4.11	0.88
Upper quartile	19.84	56.80	100.33	153.28	498.93	4.53	0.74
Overall	3.81	31.59	65.44	109.97	655.97	4.08	0.90

2.83.M890002 (LLM)

2.83.1. Item fit:

Graph 2.83.1.1

Item M890002 ICC and nonparametric trace line

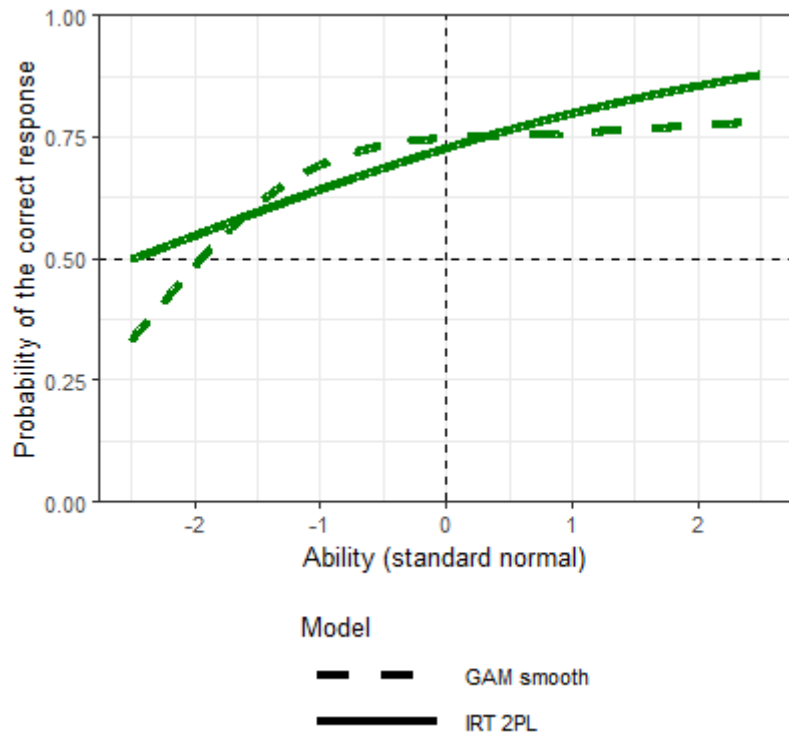


Table 2.83.1.1

Item M890002 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	71.8%	281	CR	0.14	0.02	0.39	-2.47	0.000	0.874

2.83.2. Gender DIF:

Table 2.83.2.1

Item M890002 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.20	0.550	1.000	0.004	

2.83.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.83.4. Answering time:

Graph 2.83.4.1

Item M890002 answering time distribution in groups of different ability level

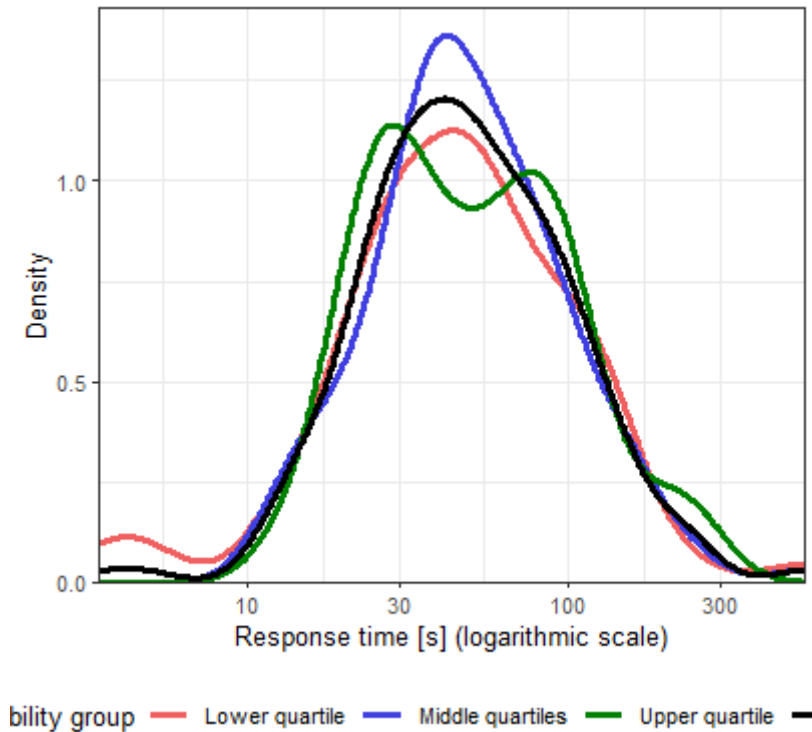


Table 2.83.4.1

Item M890002 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.48	27.61	44.94	76.01	544.88	3.79	0.87
Middle quartiles	10.75	31.38	47.61	76.92	539.11	3.90	0.69
Upper quartile	13.09	26.50	46.77	83.18	249.92	3.91	0.71
Overall	3.48	29.20	46.31	79.78	544.88	3.87	0.75

2.84.M090007 (LLM)

2.84.1. Item fit:

Graph 2.84.1.1

Item M090007 ICC and nonparametric trace line

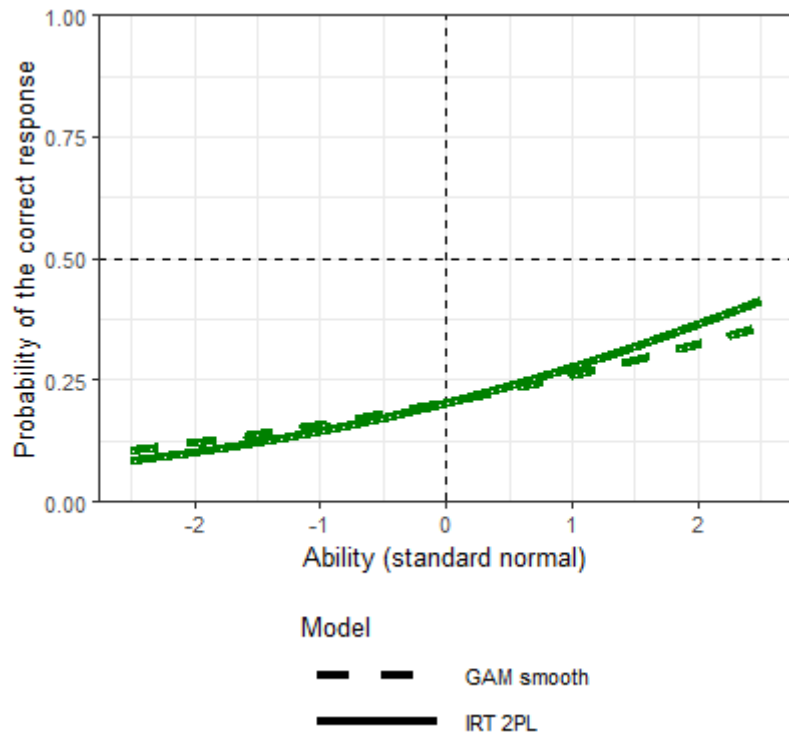


Table 2.84.1.1

Item M090007 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	21.1%	304	CR	0.13	0.11	0.41	3.37	0.031	0.029	

2.84.2. Gender DIF:

Table 2.84.2.1

Item M090007 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
5.06	0.080	1.000	0.018	

2.84.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.84.4. Answering time:

Graph 2.84.4.1

Item M090007 answering time distribution in groups of different ability level

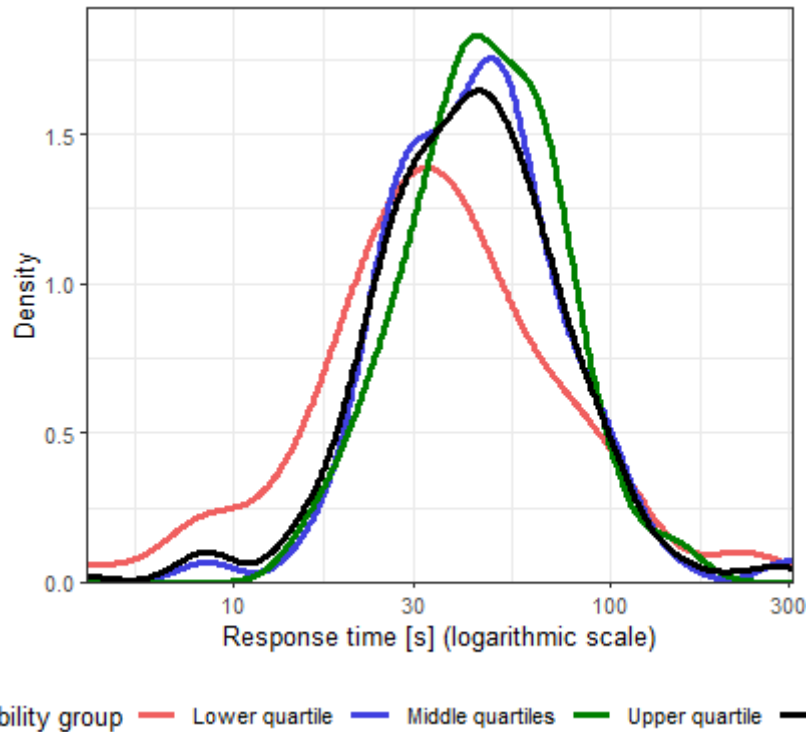


Table 2.84.4.1

Item M090007 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.10	21.93	34.83	51.18	254.33	3.55	0.75
Middle quartiles	8.04	29.77	44.42	58.81	305.44	3.78	0.54
Upper quartile	15.94	33.67	45.09	64.87	152.05	3.83	0.47
Overall	4.10	28.91	43.05	60.62	305.44	3.74	0.59

2.85.M051061 (TIMSS)

2.85.1. Item fit:

Graph 2.85.1.1

Item M051061 ICC and nonparametric trace line

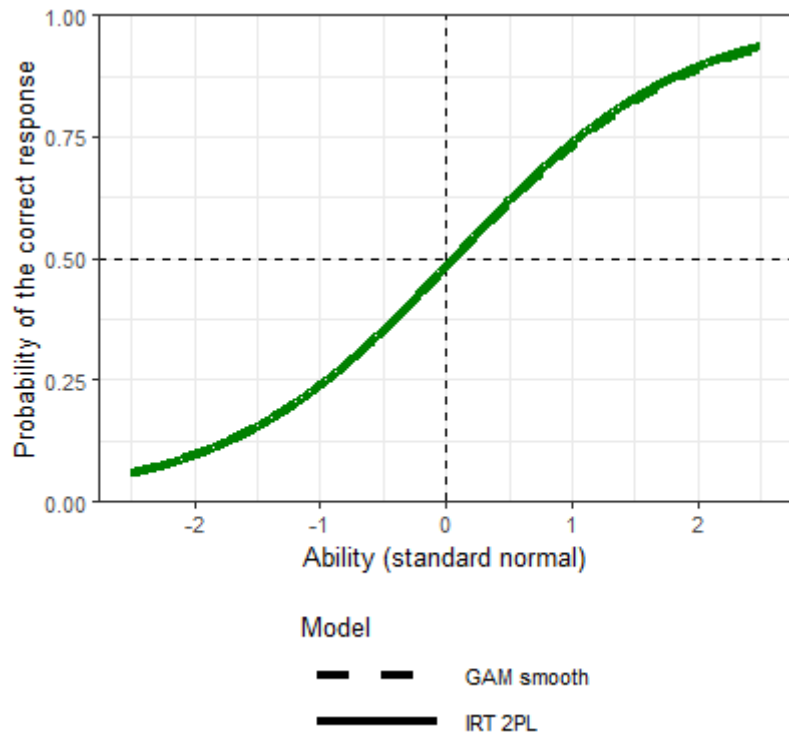


Table 2.85.1.1

Item M051061 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	48.0%	304	CR	0.44	0.45	1.09	0.05	0.000	0.631

2.85.2. Gender DIF:

Table 2.85.2.1

Item M051061 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
10.02	0.007	0.614	0.026	

2.85.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.85.4. Answering time:

Graph 2.85.4.1

Item M051061 answering time distribution in groups of different ability level

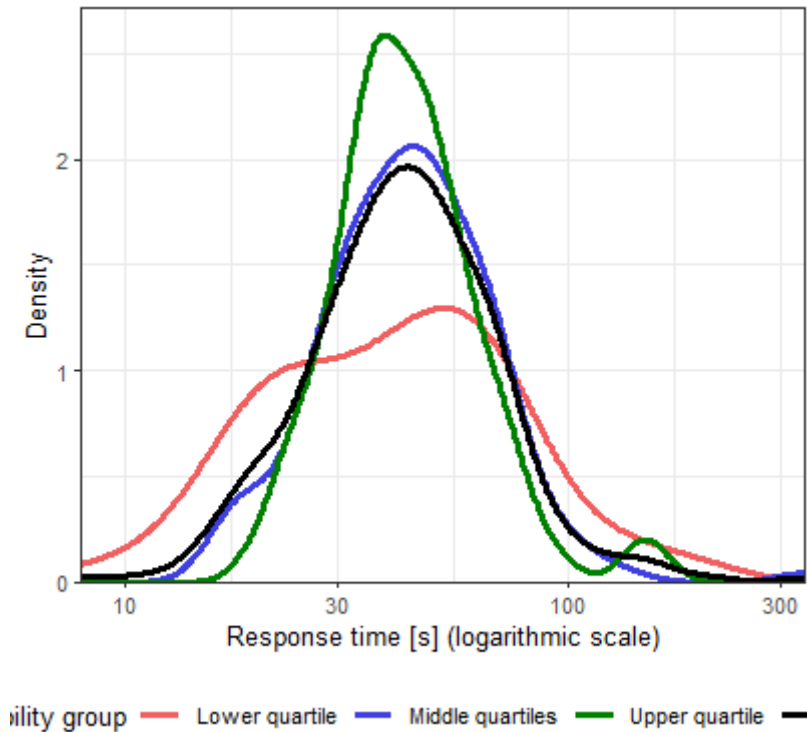


Table 2.85.4.1

Item M051061 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	8.00	25.03	41.44	62.35	208.99	3.68	0.65
Middle quartiles	15.88	32.33	43.42	57.20	338.60	3.77	0.45
Upper quartile	19.77	34.76	41.88	52.59	153.91	3.77	0.38
Overall	8.00	30.81	42.98	57.38	338.60	3.75	0.50

2.86.M890010 (LLM)

2.86.1. Item fit:

Graph 2.86.1.1

Item M890010 ICC and nonparametric trace line

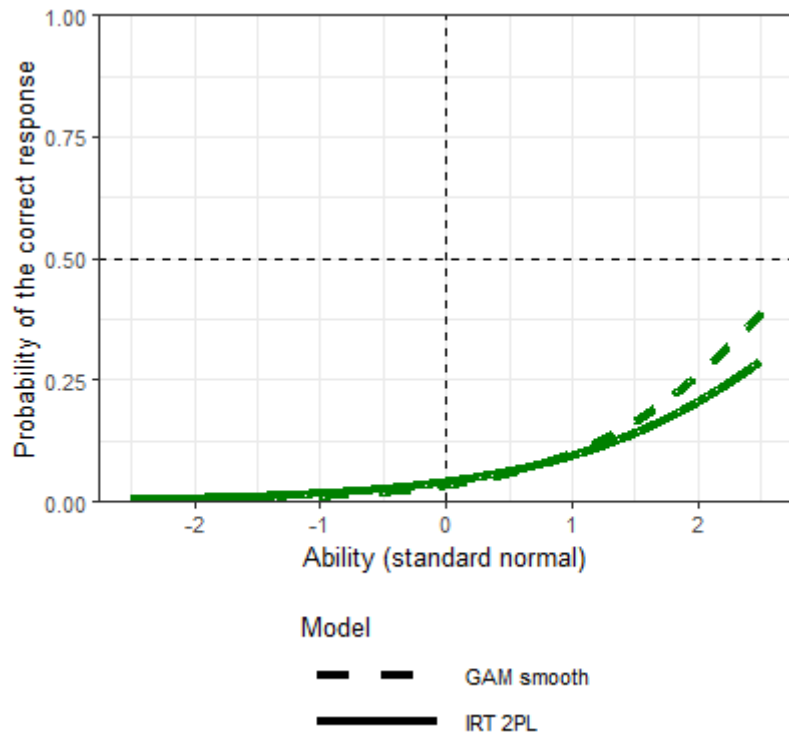


Table 2.86.1.1

Item M890010 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	5.4%	281	CR	0.22	0.16	0.91	3.49	0.000	0.910	

2.86.2. Gender DIF:

Table 2.86.2.1

Item M890010 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.80	0.149	1.000	0.034	

2.86.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.86.4. Answering time:

Graph 2.86.4.1

Item M890010 answering time distribution in groups of different ability level

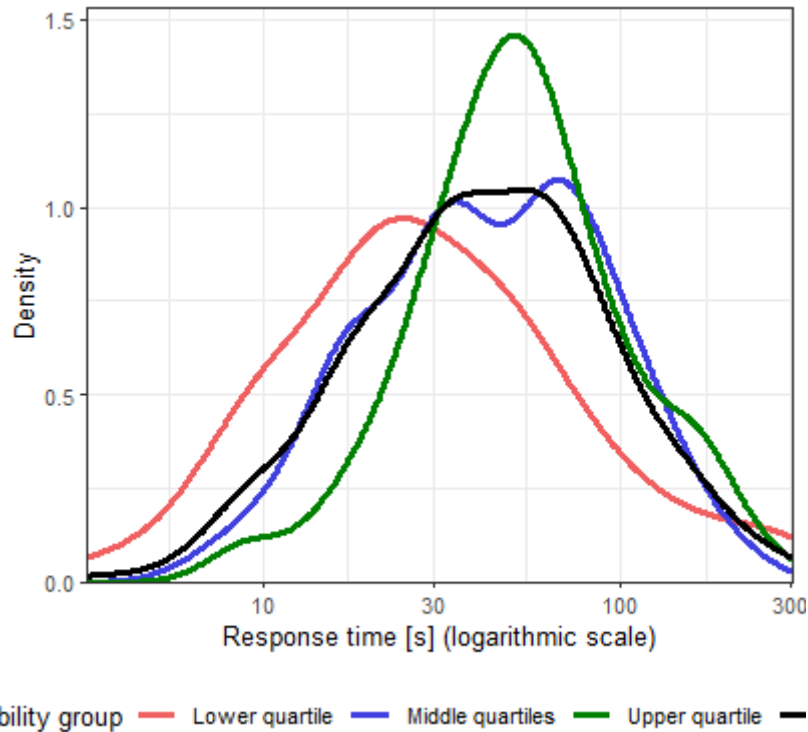


Table 2.86.4.1

Item M890010 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.25	16.46	27.56	52.72	302.76	3.38	0.95
Middle quartiles	6.53	27.52	41.26	74.07	224.51	3.76	0.76
Upper quartile	8.65	33.93	52.44	79.54	260.03	3.95	0.68
Overall	3.25	22.85	40.61	70.88	302.76	3.71	0.82

2.87.M061167 (TIMSS)

2.87.1. Item fit:

Graph 2.87.1.1

Item M061167 ICC and nonparametric trace line

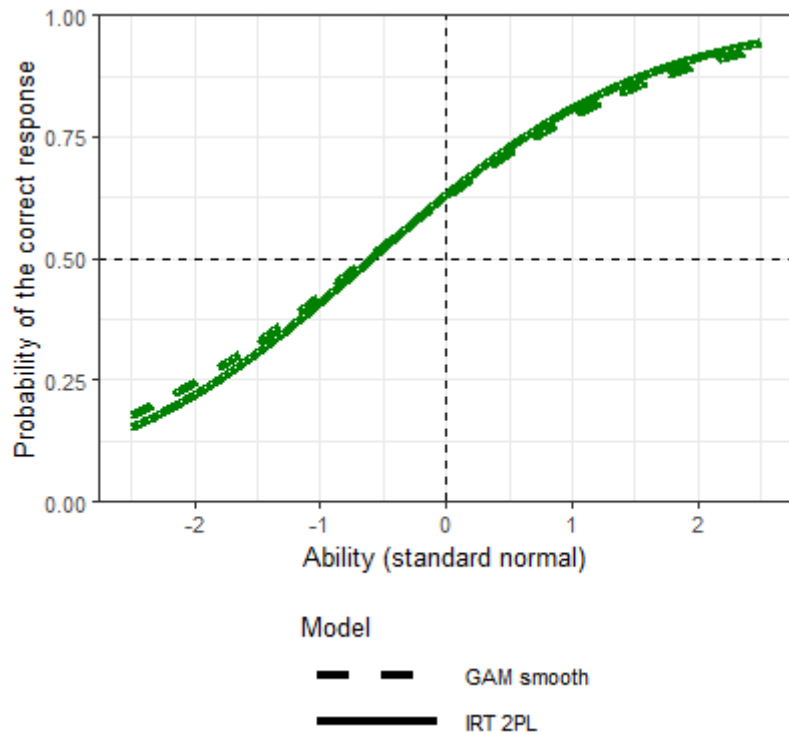


Table 2.87.1.1

Item M061167 parameters and fit statistics

Max. points	Easiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	60.5%	304	CR	0.36	0.34	0.90	-0.59	0.000	0.850

2.87.2. Gender DIF:

Table 2.87.2.1

Item M061167 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
7.06	0.029	1.000	0.019	

2.87.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.87.4. Answering time:

Graph 2.87.4.1

Item M061167 answering time distribution in groups of different ability level

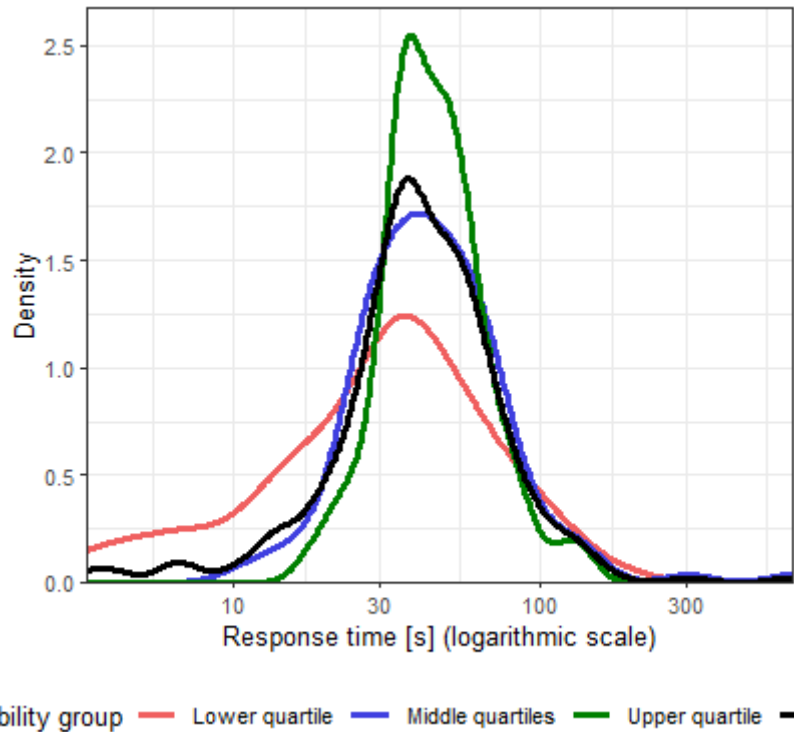


Table 2.87.4.1

Item M061167 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.36	18.50	33.78	53.59	174.51	3.38	0.86
Middle quartiles	10.18	30.28	41.80	61.11	664.97	3.78	0.56
Upper quartile	17.74	35.56	44.26	54.92	138.03	3.81	0.38
Overall	3.36	30.13	39.64	57.31	664.97	3.68	0.65

2.88.M041276 (TIMSS)

2.88.1. Item fit:

Graph 2.88.1.1

Item M041276 ICC and nonparametric trace line

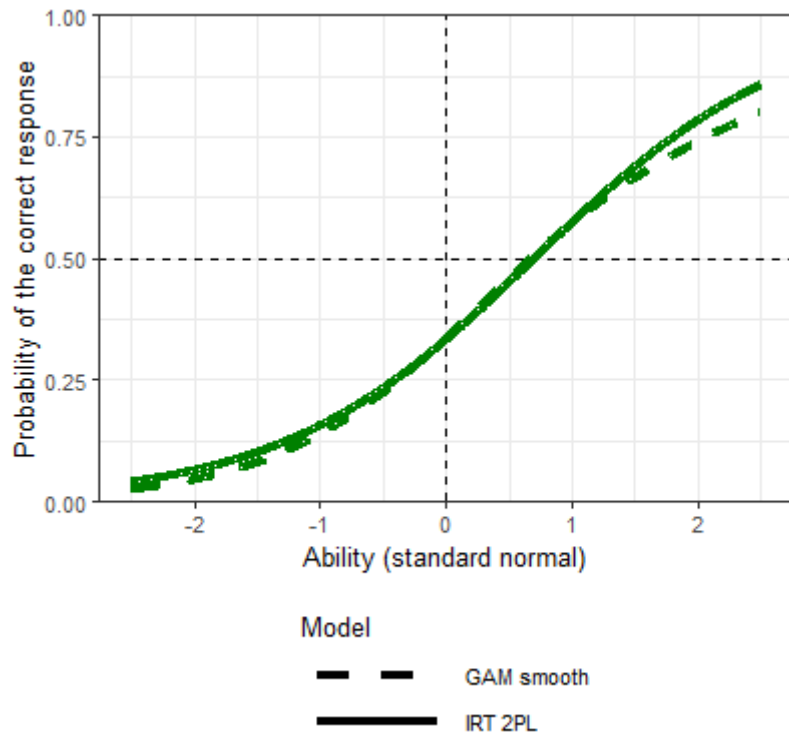


Table 2.88.1.1

Item M041276 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	37.1%	294	CR	0.42	0.43	0.99	0.70	0.000	0.486

2.88.2. Gender DIF:

Table 2.88.2.1

Item M041276 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.06	0.972	1.000	0.000	

2.88.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.88.4. Answering time:

Graph 2.88.4.1

Item M041276 answering time distribution in groups of different ability level

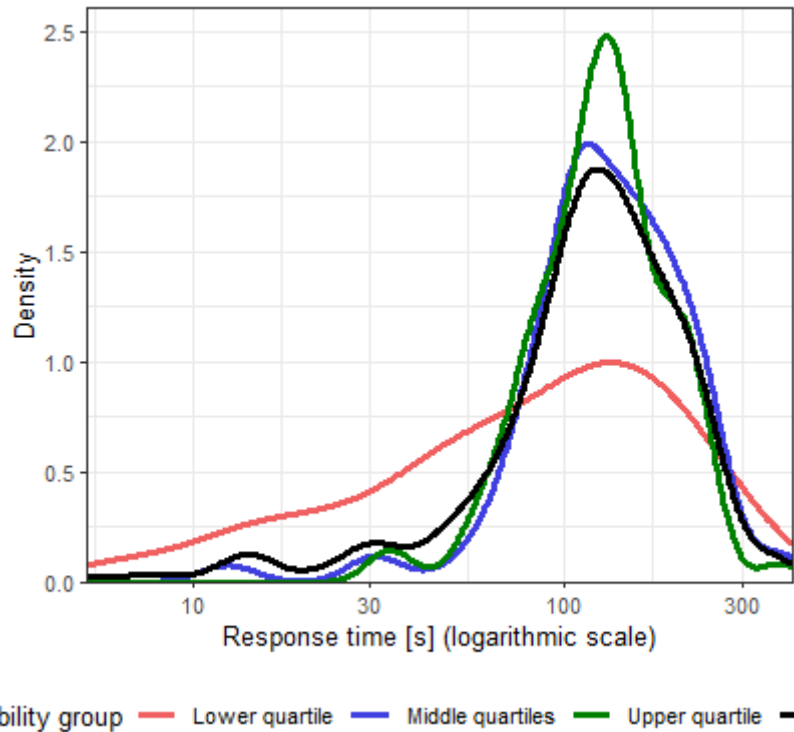


Table 2.88.4.1

Item M041276 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.21	46.30	98.87	163.80	328.45	4.32	0.98
Middle quartiles	11.41	101.17	132.39	182.56	410.04	4.85	0.53
Upper quartile	31.94	99.51	127.66	157.07	380.12	4.82	0.42
Overall	5.21	88.10	122.52	172.19	410.04	4.71	0.68

2.89.M061236 (TIMSS)

2.89.1. Item fit:

Graph 2.89.1.1

Item M061236 ICC and nonparametric trace line

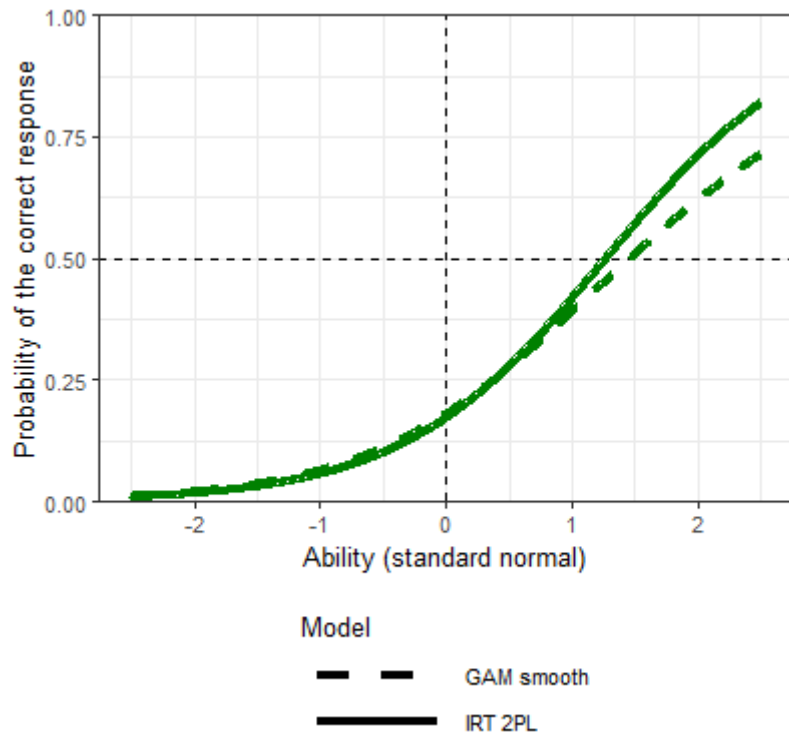


Table 2.89.1.1

Item M061236 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	22.0%	304	CR	0.39	0.42	1.23	1.27	0.019	0.182

2.89.2. Gender DIF:

Table 2.89.2.1

Item M061236 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.51	0.173	1.000	0.012	

2.89.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.89.4. Answering time:

Graph 2.89.4.1

Item M061236 answering time distribution in groups of different ability level

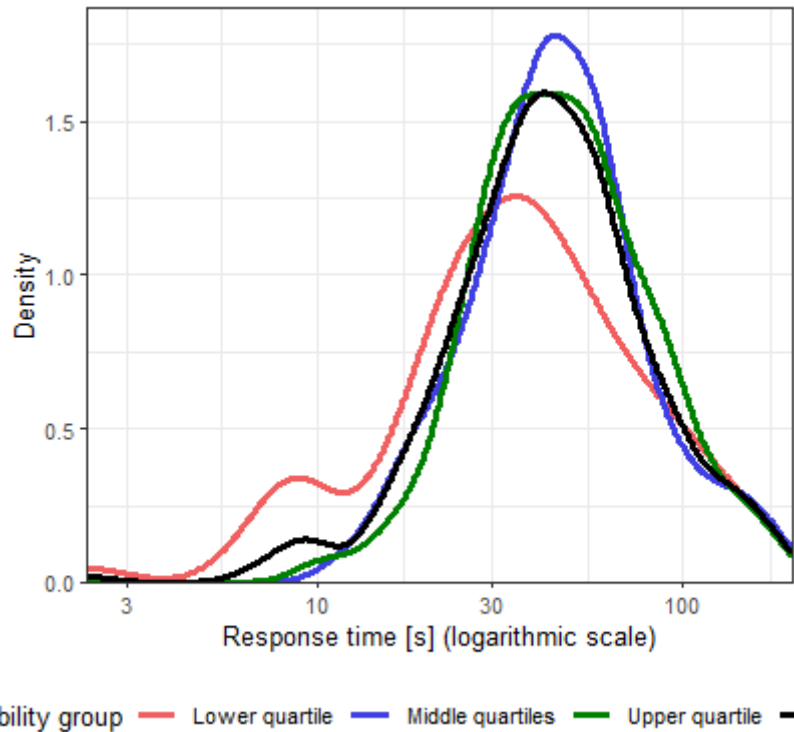


Table 2.89.4.1

Item M061236 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.35	23.34	36.50	57.56	184.20	3.55	0.81
Middle quartiles	11.37	31.92	43.95	62.09	199.72	3.81	0.56
Upper quartile	10.55	33.15	45.38	62.46	167.08	3.84	0.55
Overall	2.35	29.24	42.81	62.20	199.72	3.75	0.64

2.90.M051236 (TIMSS)

2.90.1. Item fit:

Graph 2.90.1.1

Item M051236 ICC and nonparametric trace line

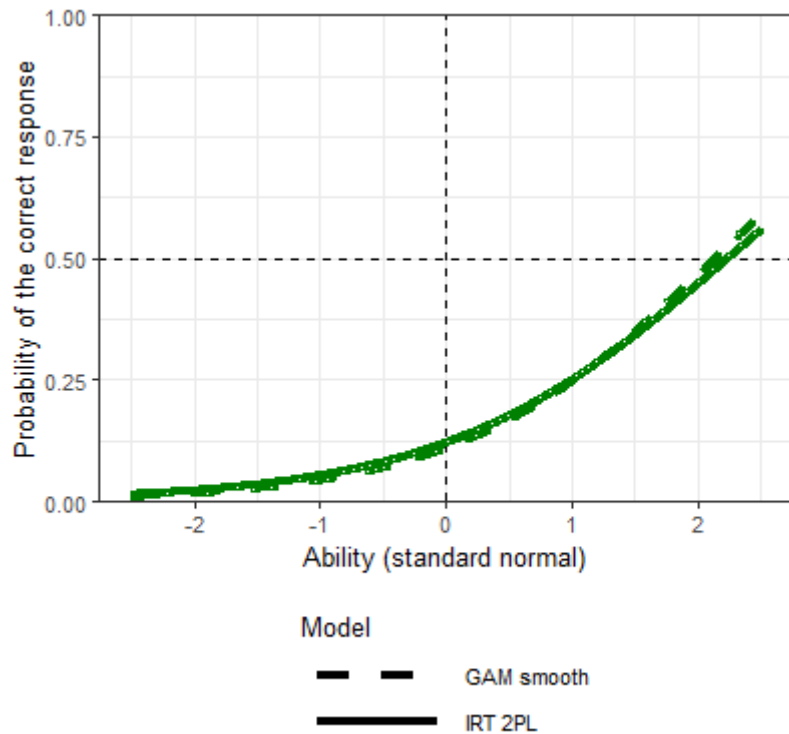


Table 2.90.1.1

Item M051236 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	15.6%	294	CR	0.32	0.32	0.89	2.23	0.000	0.948

2.90.2. Gender DIF:

Table 2.90.2.1

Item M051236 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.56	0.278	1.000	0.011	

2.90.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.90.4. Answering time:

Graph 2.90.4.1

Item M051236 answering time distribution in groups of different ability level

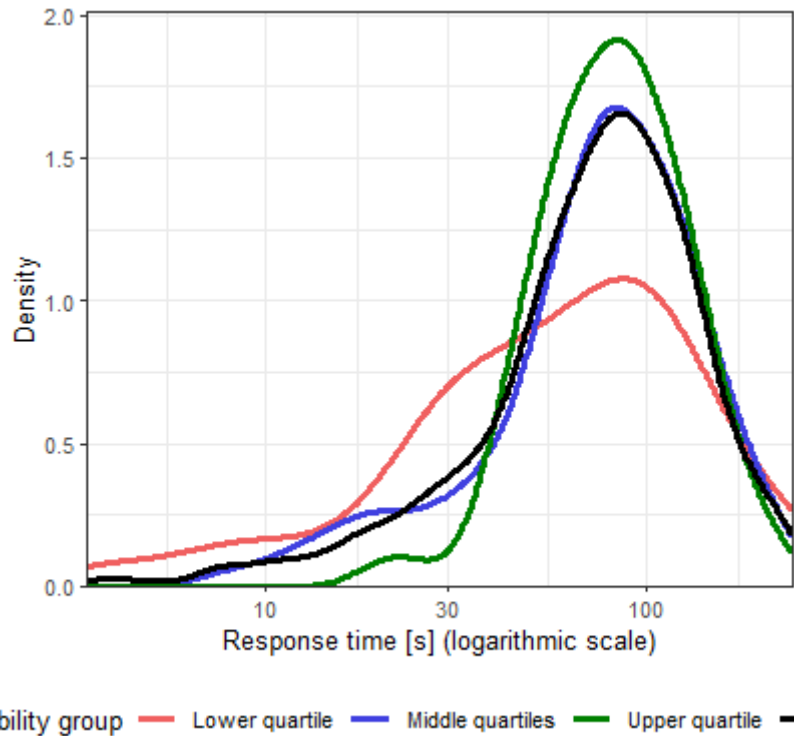


Table 2.90.4.1

Item M051236 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.40	32.92	62.75	100.97	240.73	4.00	0.91
Middle quartiles	7.77	53.87	78.87	115.46	231.19	4.26	0.67
Upper quartile	19.85	60.46	83.34	110.05	225.70	4.39	0.45
Overall	3.40	52.30	77.86	110.18	240.73	4.24	0.70

2.91.M100027 (LLM)

2.91.1. Item fit:

Graph 2.91.1.1

Item M100027 ICC and nonparametric trace line

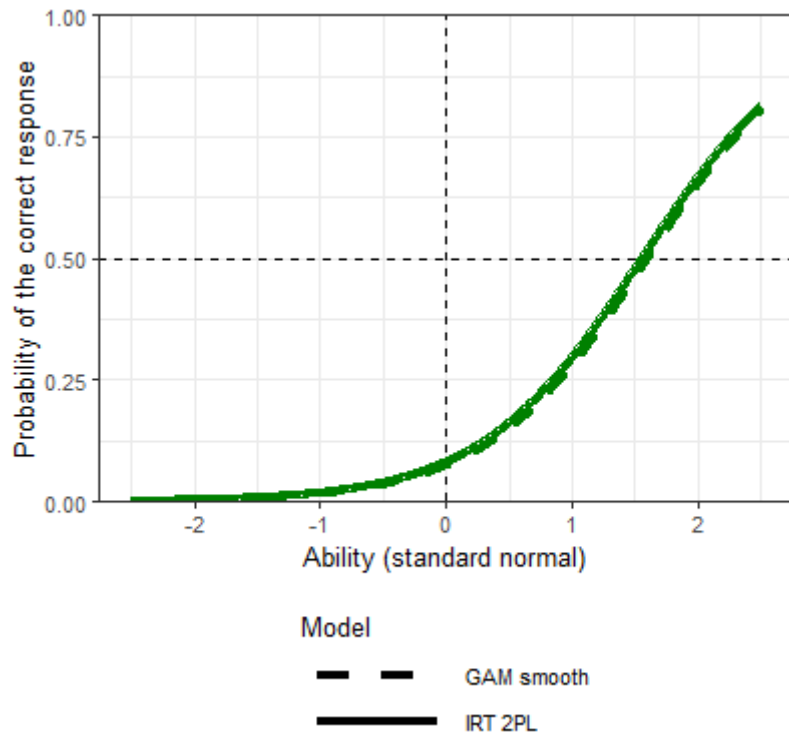


Table 2.91.1.1

Item M100027 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	15.7%	319	CR	0.46	0.24	1.55	1.55	0.000	0.875

2.91.2. Gender DIF:

Table 2.91.2.1

Item M100027 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.49	0.783	1.000	0.002	

2.91.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.91.4. Answering time:

Graph 2.91.4.1

Item M100027 answering time distribution in groups of different ability level

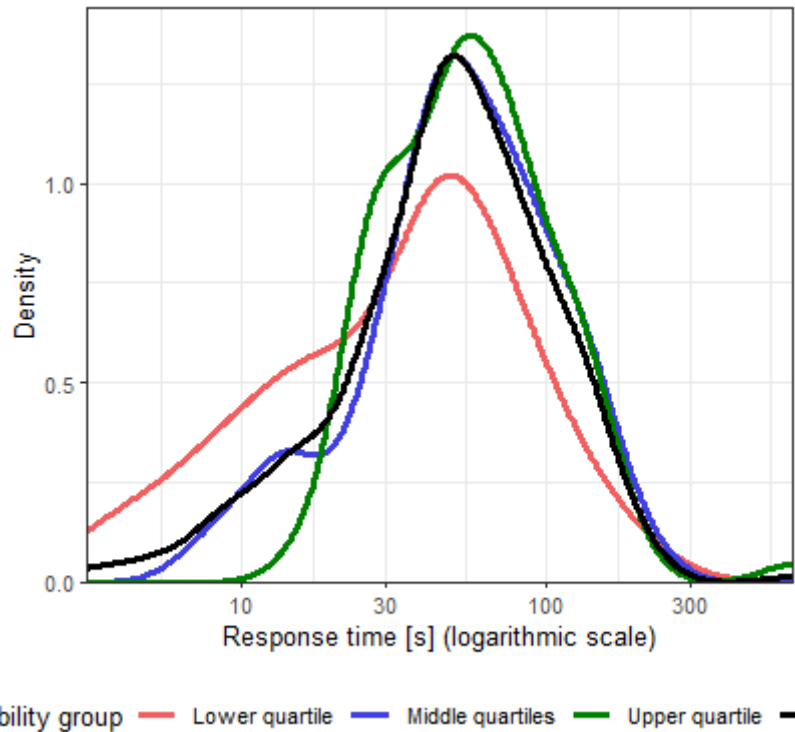


Table 2.91.4.1

Item M100027 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.16	16.64	40.16	61.16	206.05	3.45	0.97
Middle quartiles	6.70	33.71	51.87	85.47	234.69	3.93	0.74
Upper quartile	15.54	34.80	56.42	83.26	644.96	4.04	0.63
Overall	3.16	29.81	49.81	78.98	644.96	3.84	0.81

2.92.MP71217 (TIMSS)

2.92.1. Item fit:

Graph 2.92.1.1

Item MP71217 ICC and nonparametric trace line

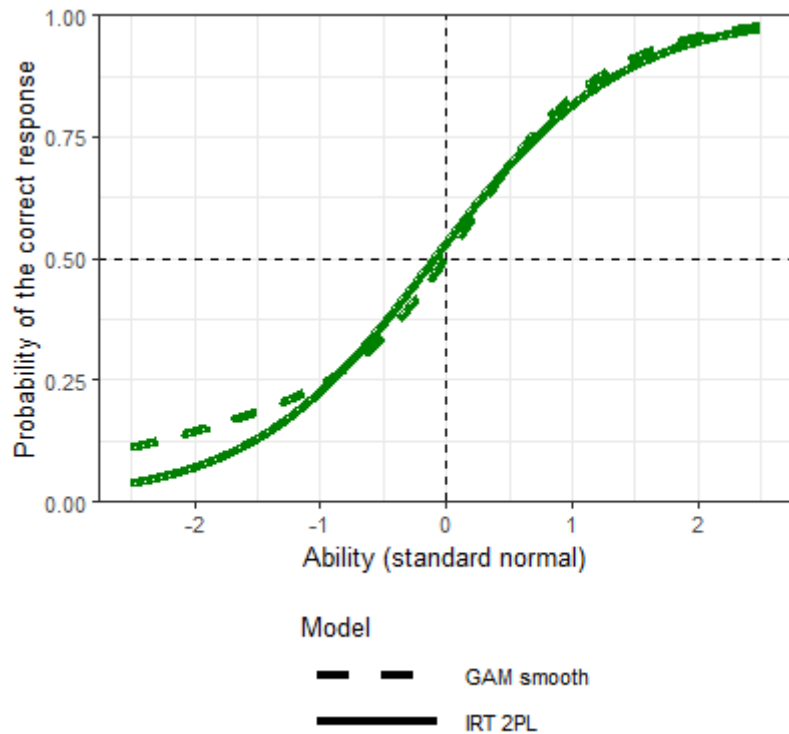


Table 2.92.1.1

Item MP71217 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	51.1%	306	CR	0.49	0.55	1.35	-0.09	0.007	0.384	

2.92.2. Gender DIF:

Table 2.92.2.1

Item MP71217 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
8.56	0.014	1.000	0.022	

2.92.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.92.4. Answering time:

Graph 2.92.4.1

Item MP71217 answering time distribution in groups of different ability level

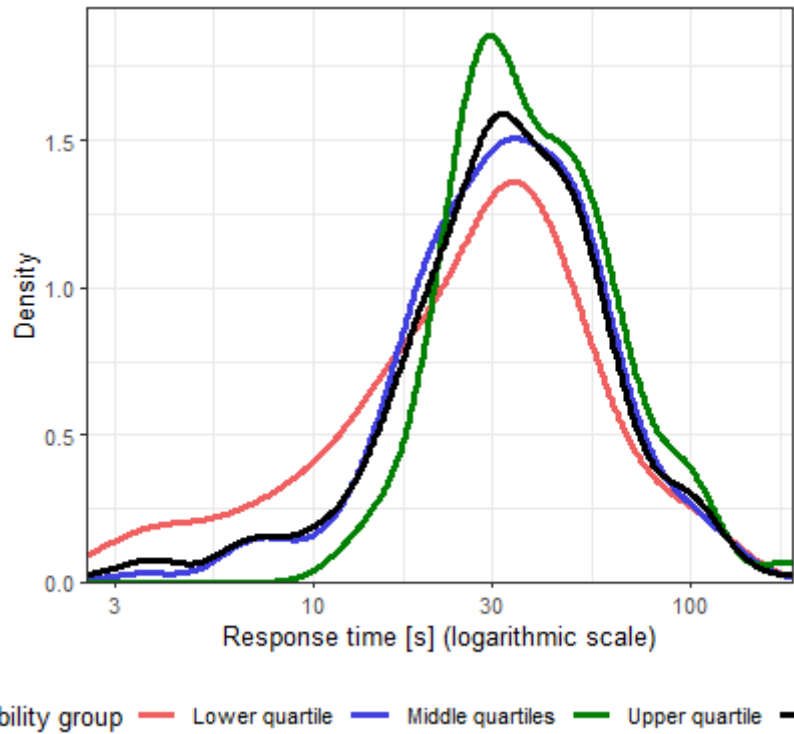


Table 2.92.4.1

Item MP71217 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.54	16.60	29.10	42.48	119.69	3.22	0.82
Middle quartiles	3.56	21.31	33.08	49.26	138.65	3.47	0.61
Upper quartile	12.52	27.50	35.66	51.60	186.18	3.65	0.50
Overall	2.54	21.80	32.30	48.40	186.18	3.44	0.67

2.93.M061248 (TIMSS)

2.93.1. Item fit:

Graph 2.93.1.1

Item M061248 ICC and nonparametric trace lines

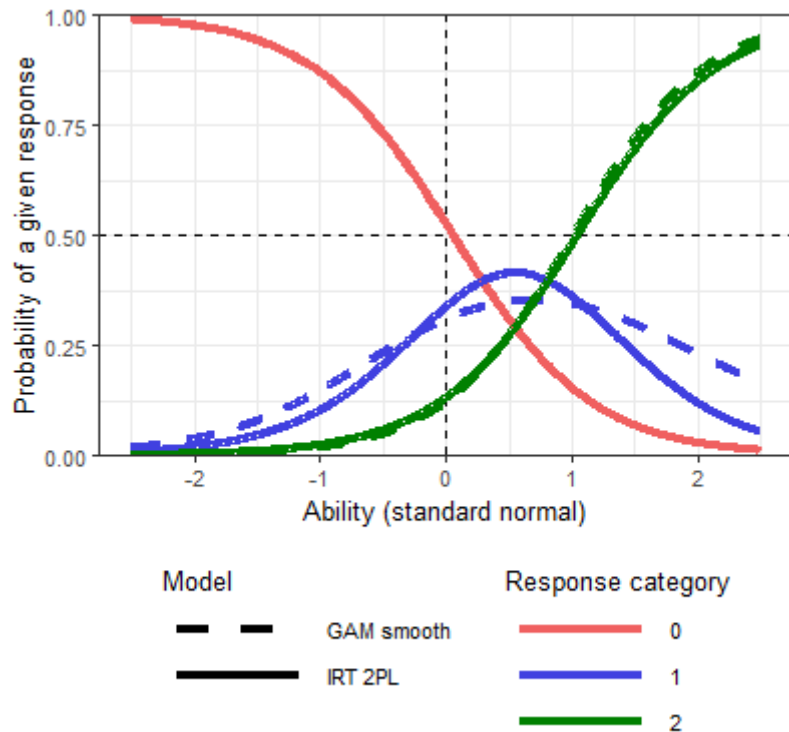


Table 2.93.1.1

Item M061248 parameters and fit statistics

					IRT model parameters and fit statistic							
Max points	Easiness	Number of obs.	Format	Corr. with latent ability estimates								
				All items	TIMS S items only	Discriminat ion	Difficu lty	Catego ry 1 difficult y	Catego ry 2 difficult y	RMS EA	RMS EA p- value	
2	34.3%	306	CR	0.6 3	0.62	1.81	0.55	0.06	1.04	0.000	0.561	

2.93.2. Gender DIF:

Table 2.93.2.1

Item M061248 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
11.59	0.003	0.286	0.028	

2.93.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.93.4. Answering time:

Graph 2.93.4.1

Item M061248 answering time distribution in groups of different ability level

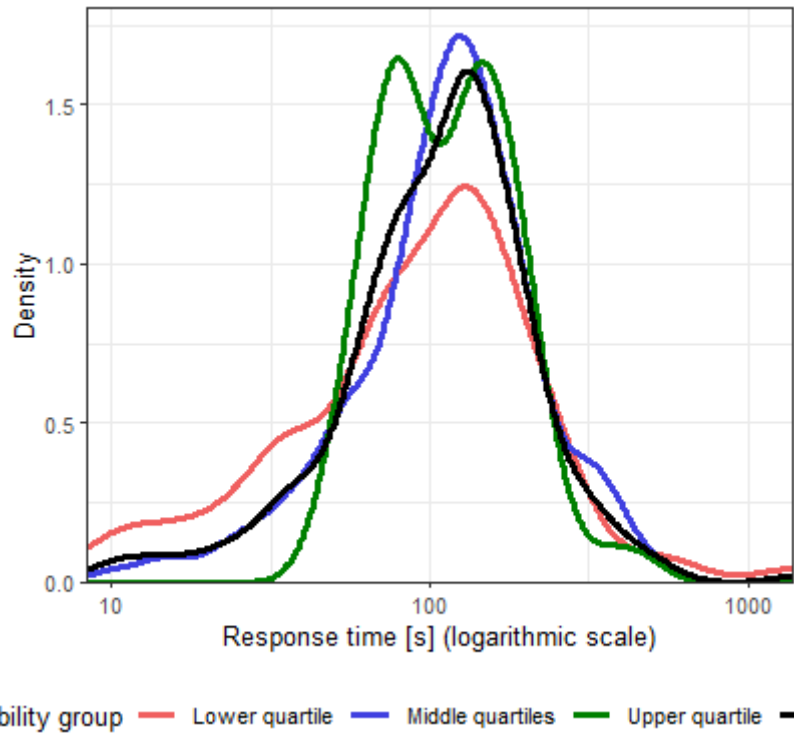


Table 2.93.4.1

Item M061248 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	8.45	60.06	111.60	153.17	1375.10	4.49	0.91
Middle quartiles	10.17	79.05	120.64	160.76	481.24	4.70	0.68
Upper quartile	47.49	76.38	116.18	158.11	459.43	4.73	0.48
Overall	8.45	72.44	116.07	159.34	1375.10	4.65	0.72

2.94.M890009 (LLM)

2.94.1. Item fit:

Graph 2.94.1.1

Item M890009 ICC and nonparametric trace lines

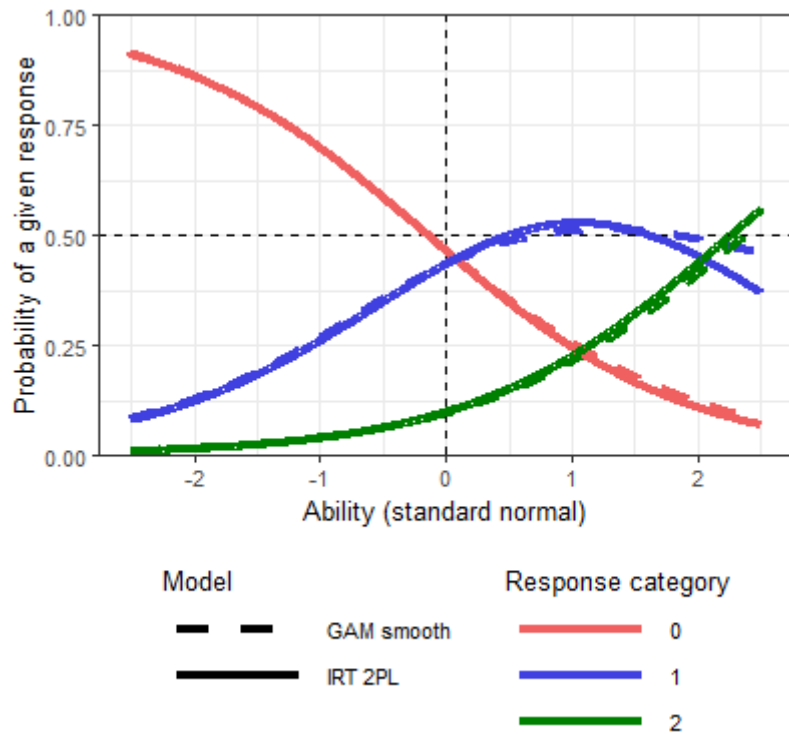


Table 2.94.1.1

Item M890009 parameters and fit statistics

					IRT model parameters and fit statistic							
					Corr. with latent ability estimates							
Max points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	Category 1 difficulty	Category 2 difficulty	RMS EA	RMS EA p-value	
2	33.2%	319	CR	0.45	0.28	0.98	1.06	-0.14	2.26	0.021	0.068	

2.94.2. Gender DIF:

Table 2.94.2.1

Item M890009 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.78	0.678	1.000	0.002	

2.94.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.94.4. Answering time:

Graph 2.94.4.1

Item M890009 answering time distribution in groups of different ability level

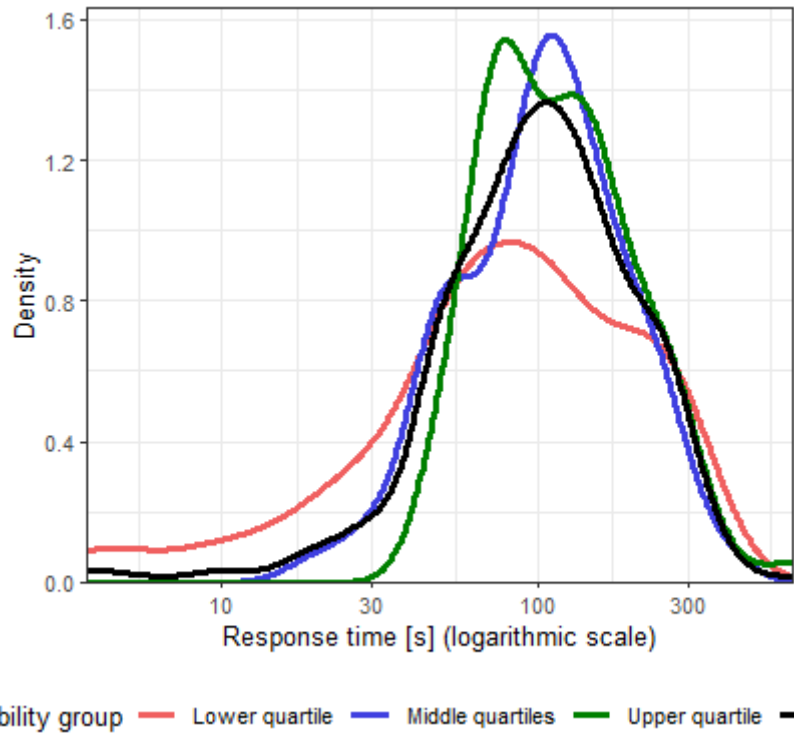


Table 2.94.4.1

Item M890009 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.75	48.94	85.97	153.74	313.12	4.33	1.02
Middle quartiles	18.83	65.48	107.08	156.74	409.27	4.63	0.61
Upper quartile	46.39	75.89	113.19	163.38	644.73	4.77	0.54
Overall	3.75	65.09	103.95	159.16	644.73	4.59	0.74

2.95.M890005 (LLM)

2.95.1. Item fit:

Graph 2.95.1.1

Item M890005 ICC and nonparametric trace line

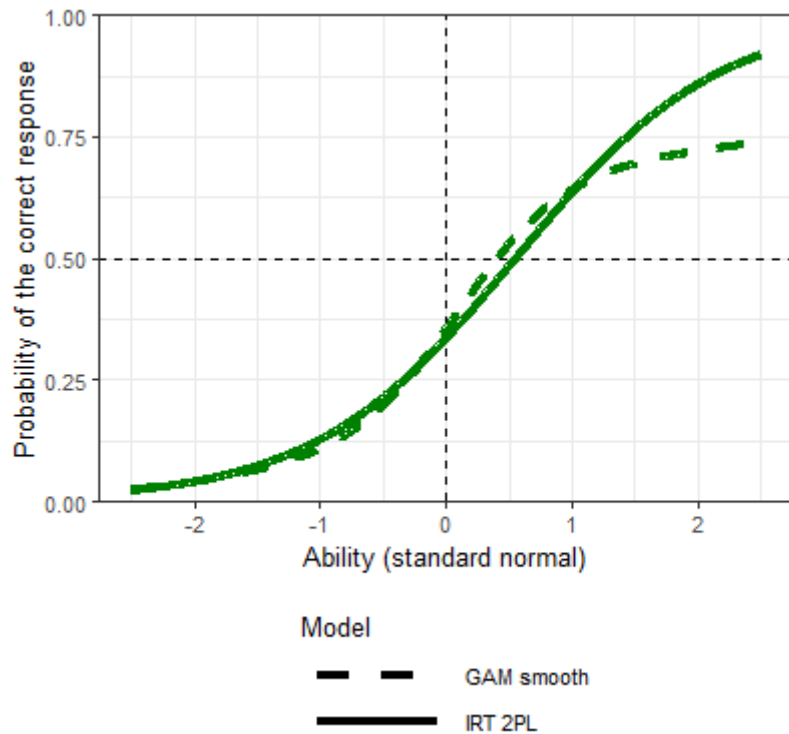


Table 2.95.1.1

Item M890005 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	All items	TIMSS items only	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	36.8%	281	CR	0.44	0.29	1.24	0.55	0.024	0.094	

2.95.2. Gender DIF:

Table 2.95.2.1

Item M890005 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
11.32	0.003	0.324	0.033	

2.95.3. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

2.95.4. Answering time:

Graph 2.95.4.1

Item M890005 answering time distribution in groups of different ability level

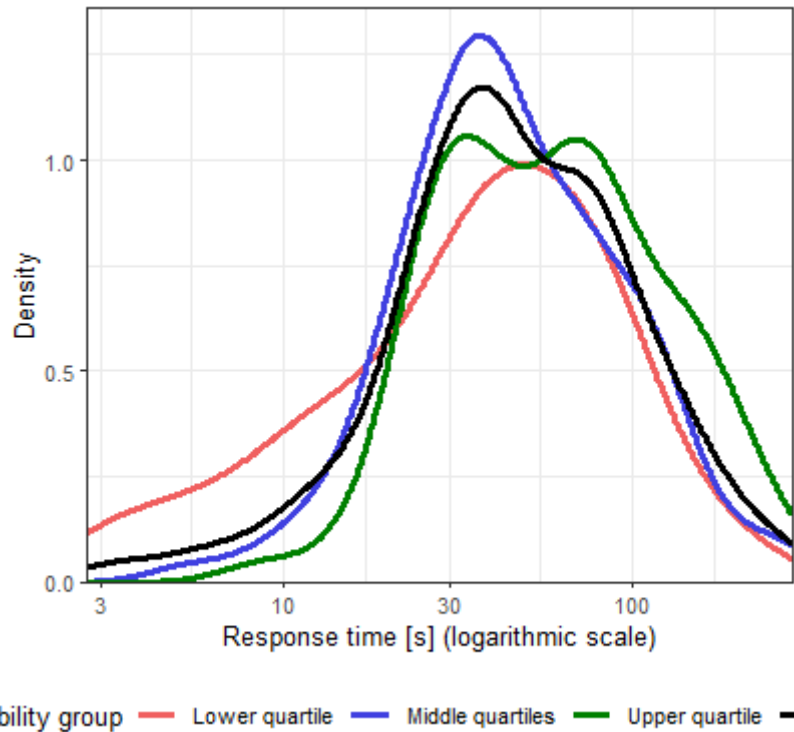


Table 2.95.4.1

Item M890005 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.75	17.94	40.13	71.91	226.82	3.51	0.99
Middle quartiles	5.01	27.88	42.11	72.90	278.24	3.80	0.73
Upper quartile	8.89	32.69	59.68	90.45	288.94	4.07	0.73
Overall	2.75	27.28	43.59	78.38	288.94	3.79	0.83

3. Science items

3.1.1. S090041 (LLM)

3.1.2. Item fit:

Graph 3.1.1.1

Item S090041 ICC and nonparametric trace line

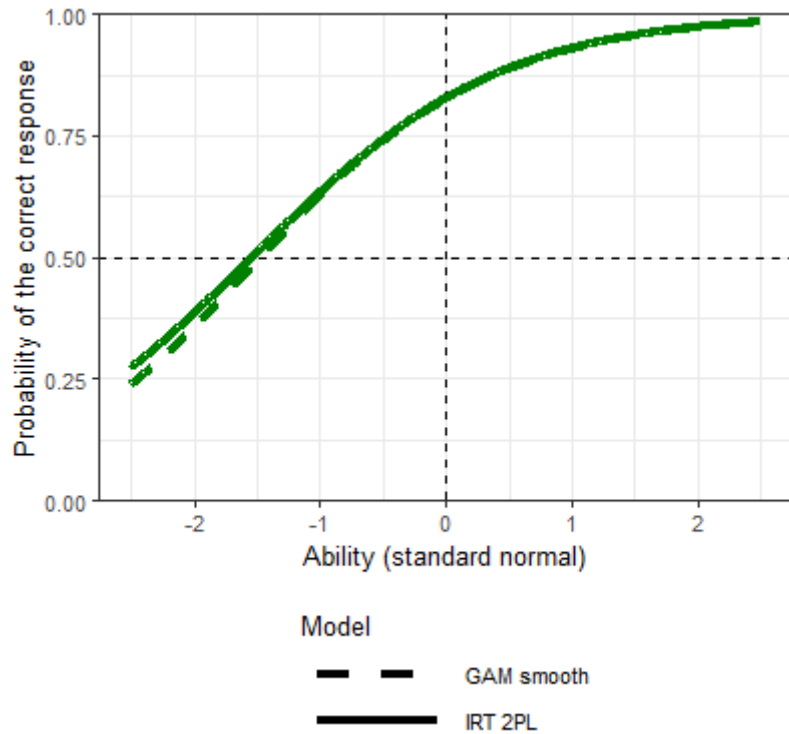


Table 3.1.1.1

Item S090041 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	79.2%	299	MC	0.362701 5	0.2544767	1.02	-1.55	0.017	0.217

3.1.3. Gender DIF:

Table 3.1.2.1

Item S090041 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
6.67	0.036	1.000	0.024	

3.1.4. Frequency of answers:

answer	Frequency	Percent
Cukier rozpuści się w tym samym tempie w obu kubkach.	22	7.4%
Cukier w ciepłej wodzie rozpuści się szybciej. (correct)	236	79.2%
Cukier w obu kubkach nie rozpuści się.	24	8.1%
Cukier w zimnej wodzie rozpuści się szybciej.	16	5.4%
Overall	298	100.0%

3.1.5. Distractors functioning:

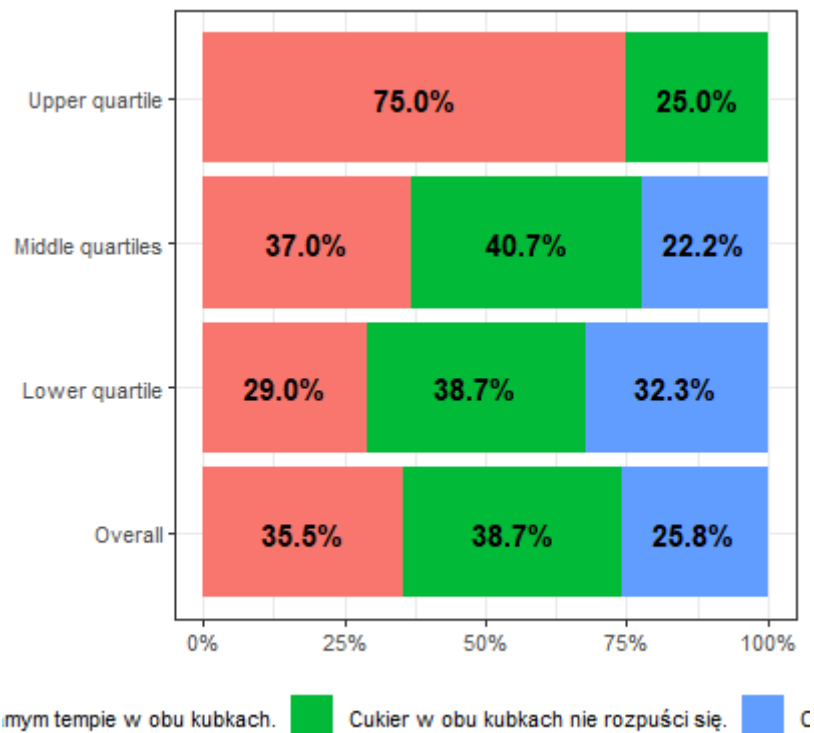
Table 3.1.4.1

Item S090041 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Cukier rozpuści się w tym samym tempie w obu kubkach.	9	10	3	22	29.0%	37.0%	75.0%	35.5%
Cukier w obu kubkach nie rozpuści się.	12	11	1	24	38.7%	40.7%	25.0%	38.7%
Cukier w zimnej wodzie rozpuści się szybciej.	10	6	0	16	32.3%	22.2%	0.0%	25.8%
Overall	31	27	4	62	100.0%	100.0%	100.0%	100.0%

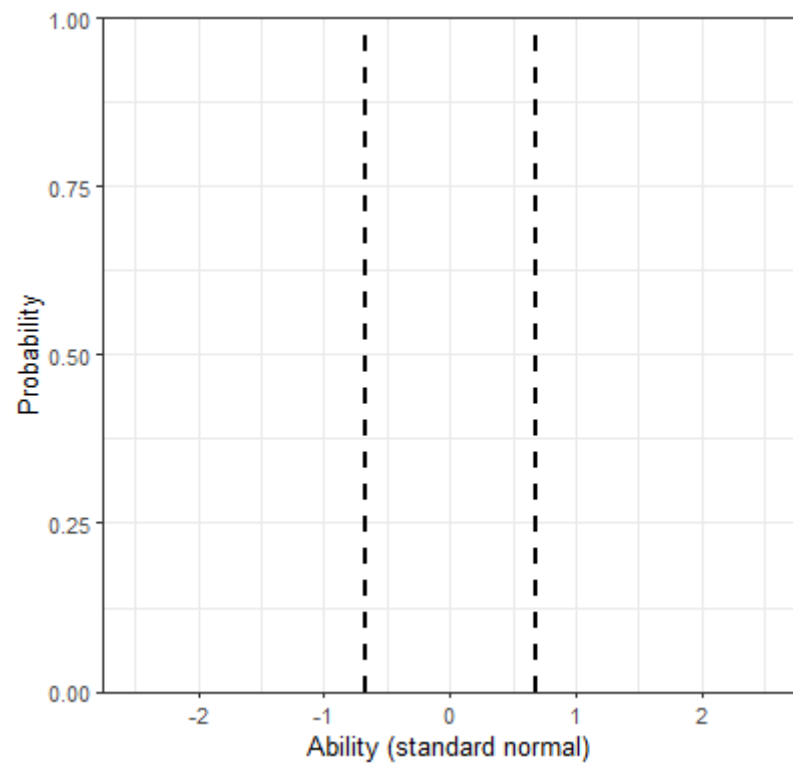
Graph 3.1.4.1

Item S090041 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.1.4.2

Item S090041 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.6. Answering time:

Graph 3.1.5.1

Item S090041 answering time distribution in groups of different ability level

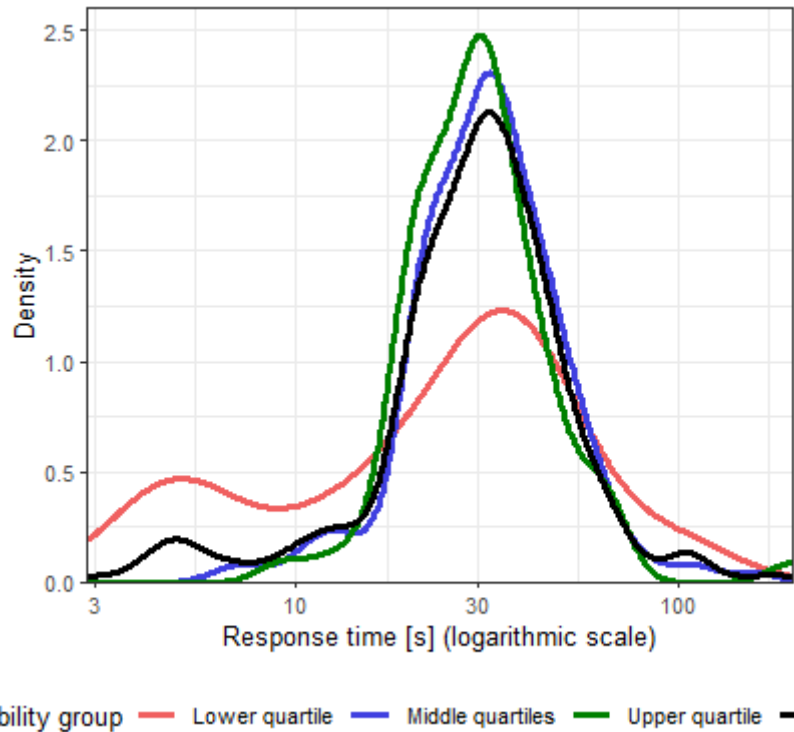


Table 3.1.5.1

Item S090041 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.86	12.65	28.33	41.34	106.62	3.10	0.92
Middle quartiles	6.63	24.13	31.91	41.31	158.68	3.45	0.46
Upper quartile	9.23	22.15	30.30	36.36	198.79	3.41	0.44
Overall	2.86	22.16	31.03	41.19	198.79	3.36	0.61

3.1.7. SP71115 (TIMSS)

3.1.8. Item fit:

Graph 3.2.1.1

Item SP71115 ICC and nonparametric trace line

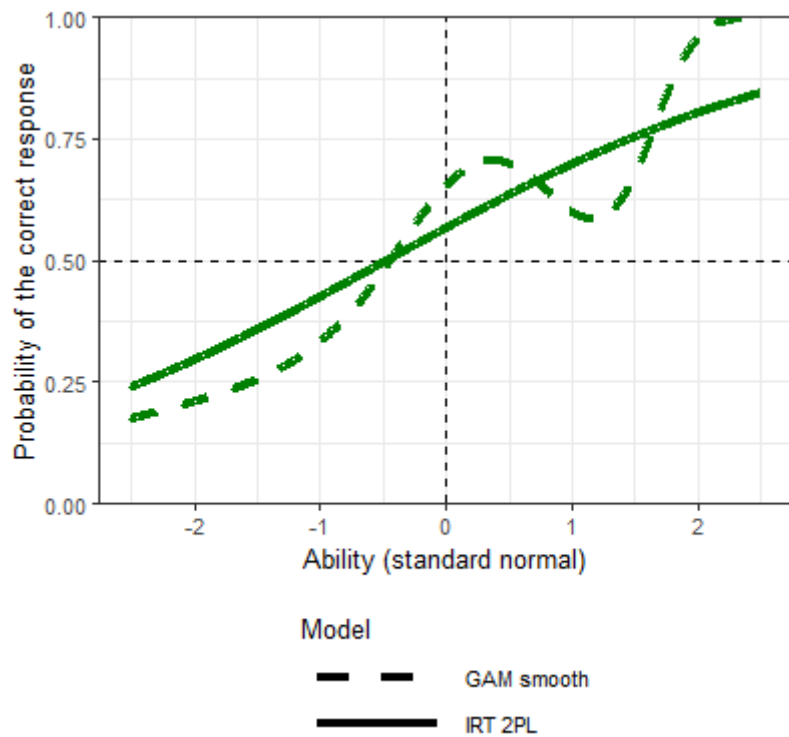


Table 3.2.1.1

Item SP71115 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	56.7%	299	MC	0.308718 1	0.1984706	0.57	-0.47	0.017	0.208

3.1.9. Gender DIF:

Table 3.2.2.1

Item SP71115 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.85	0.397	1.000	0.005	

3.1.10. Frequency of answers:

answer	Frequency	Percent
Palenie drewna.	65	21.8%
Pieczenie chleba.	20	6.7%
Rdzewienie metalu.	44	14.8%
Rozciąganie gumy. (correct)	169	56.7%
Overall	298	100.0%

3.1.11. Distractors functioning:

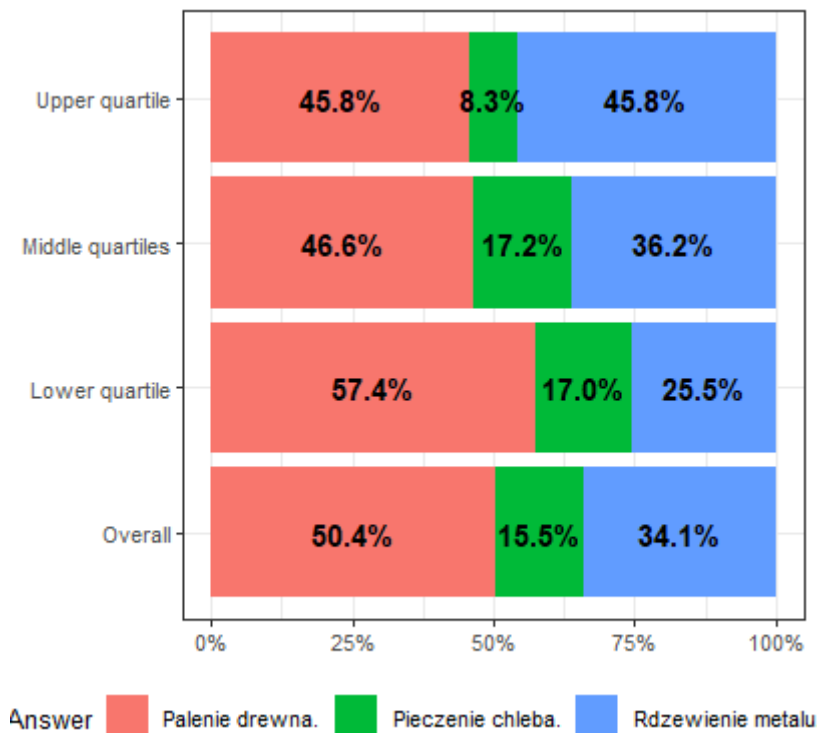
Table 3.2.4.1

Item SP71115 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Palenie drewna.	27	27	11	65	57.4%	46.6%	45.8%	50.4%
Pieczenie chleba.	8	10	2	20	17.0%	17.2%	8.3%	15.5%
Rdzewienie metalu.	12	21	11	44	25.5%	36.2%	45.8%	34.1%
Overall	47	58	24	129	100.0%	100.0%	100.0%	100.0%

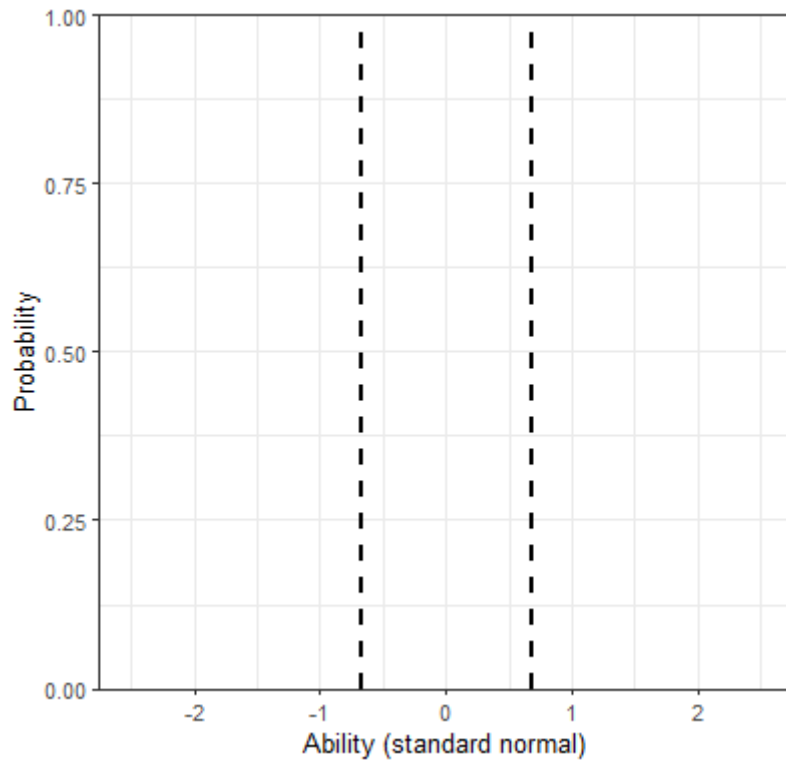
Graph 3.2.4.1

Item SP71115 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.2.4.2

Item SP71115 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.12. Answering time:

Graph 3.2.5.1

Item SP71115 answering time distribution in groups of different ability level

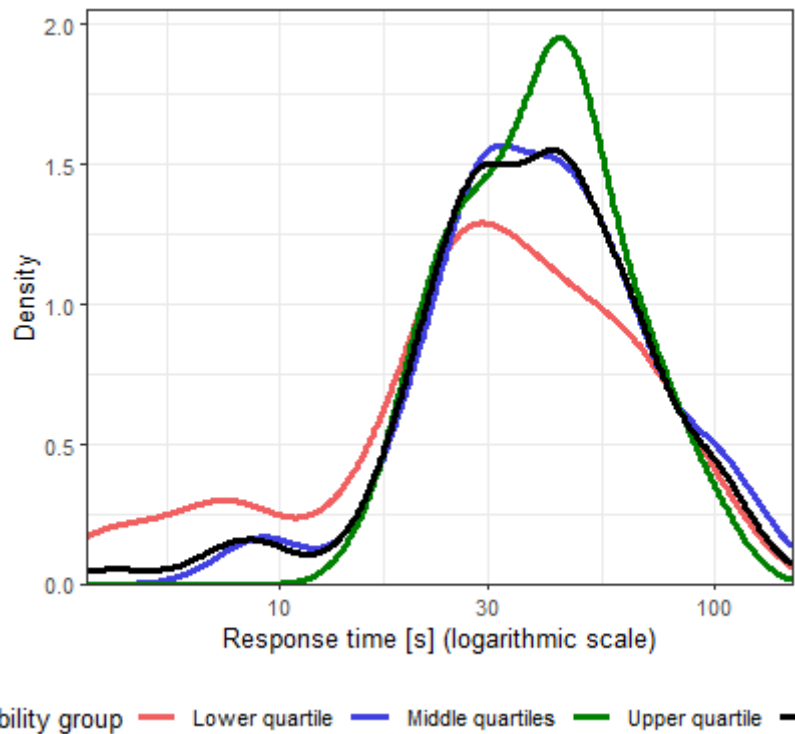


Table 3.2.5.1

Item SP71115 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.61	21.73	31.69	51.24	104.78	3.37	0.82
Middle quartiles	7.09	26.91	39.75	57.13	150.60	3.66	0.58
Upper quartile	15.55	28.62	41.67	51.64	110.60	3.68	0.44
Overall	3.61	26.10	38.18	55.82	150.60	3.60	0.62

3.1.13. S061098 (TIMSS)

3.1.14. Item fit:

Graph 3.3.1.1

Item S061098 ICC and nonparametric trace line

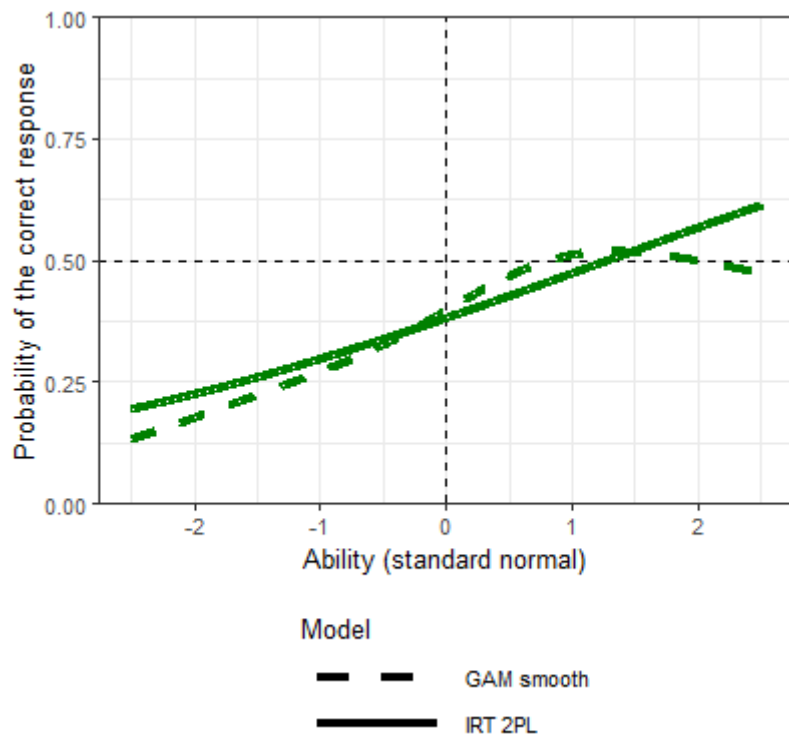


Table 3.3.1.1

Item S061098 parameters and fit statistics

Max. points	Easeiness	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic				
				thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	38.0%	306	MC	0.214325	0.1257496	0.38	1.29	0.008	0.373	

3.1.15. Gender DIF:

Table 3.3.2.1

Item S061098 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.17	0.557	1.000	0.003	

3.1.16. Frequency of answers:

answer	Frequency	Percent
Wiatr na pustyni był gorący i topił skały.	44	14.4%
Wiatr niósł ze sobą wilgoć, która wymywała skały.	71	23.3%
Wiatr niósł ze sobą ziarenka piasku, które tarły o skałę. (correct)	116	38.0%
Wiatr ochładzał skały, które następnie pękały.	74	24.3%
Overall	305	100.0%

3.1.17. Distractors functioning:

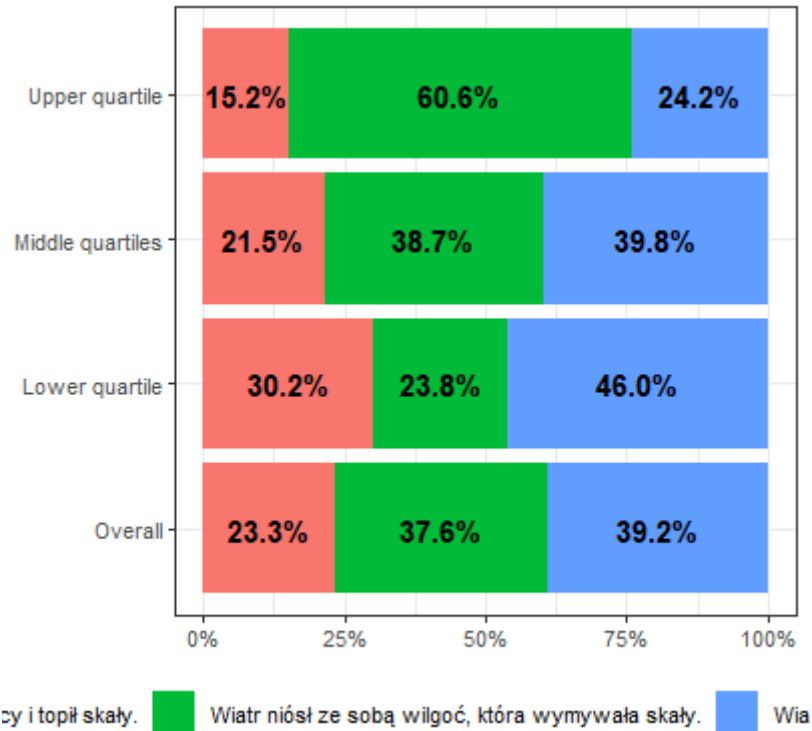
Table 3.3.4.1

Item S061098 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Wiatr na pustyni był gorący i topił skały.	19	20	5	44	30.2%	21.5%	15.2%	23.3%
Wiatr niósł ze sobą wilgoć, która wymywała skały.	15	36	20	71	23.8%	38.7%	60.6%	37.6%
Wiatr ochładzał skały, które następnie pękały.	29	37	8	74	46.0%	39.8%	24.2%	39.2%
Overall	63	93	33	189	100.0%	100.0%	100.0%	100.0%

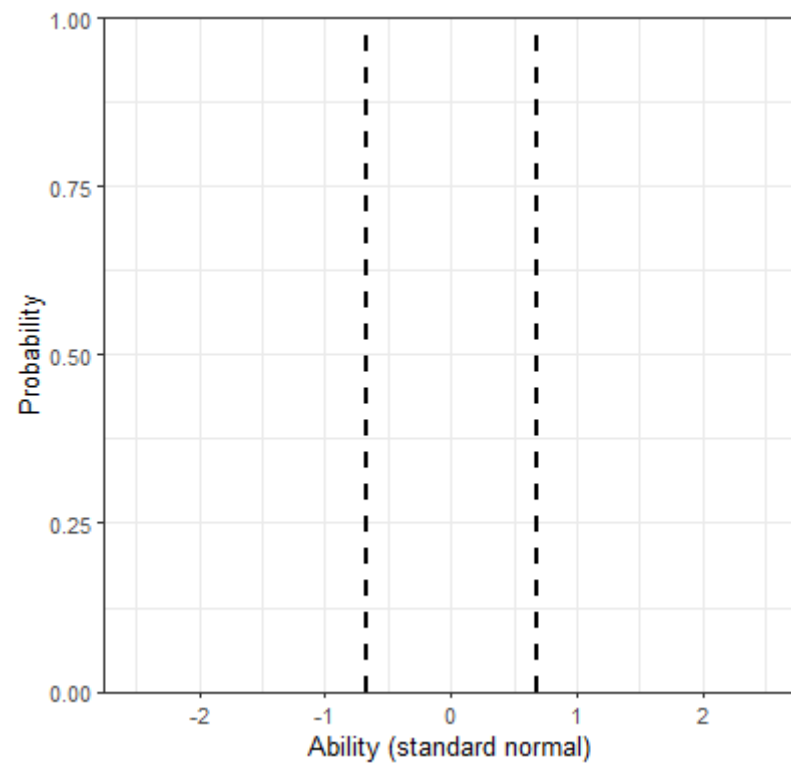
Graph 3.3.4.1

Item S061098 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.3.4.2

Item S061098 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.18. Answering time:

Graph 3.3.5.1

Item S061098 answering time distribution in groups of different ability level

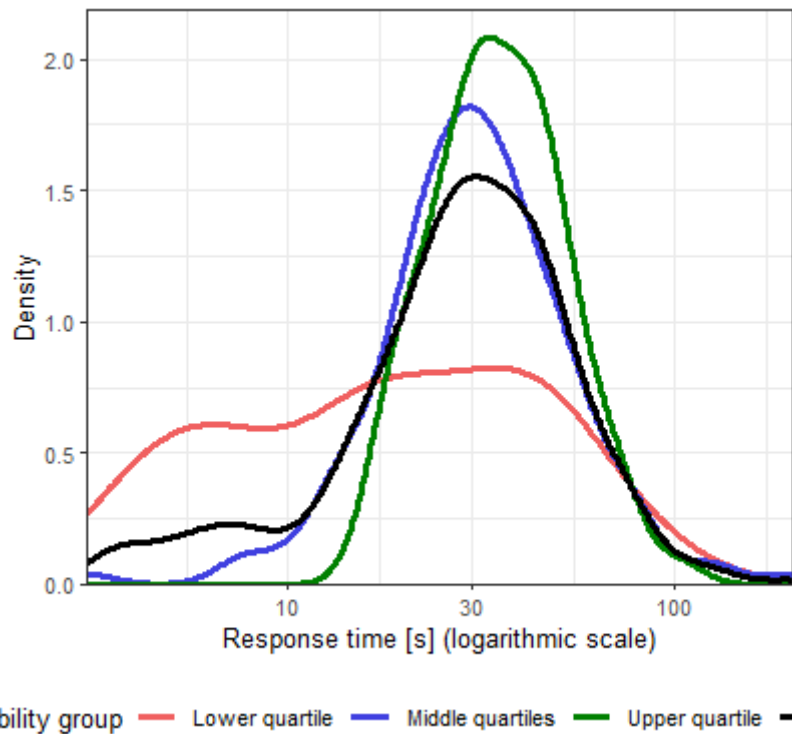


Table 3.3.5.1

Item S061098 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.39	7.50	18.18	39.62	117.04	2.88	0.93
Middle quartiles	3.04	22.33	30.13	42.99	201.69	3.42	0.57
Upper quartile	16.42	26.24	33.64	44.84	102.04	3.56	0.39
Overall	3.04	19.53	29.70	43.04	201.69	3.30	0.71

3.1.19. S090052 (LLM)

3.1.20. Item fit:

Graph 3.4.1.1

Item S090052 ICC and nonparametric trace line

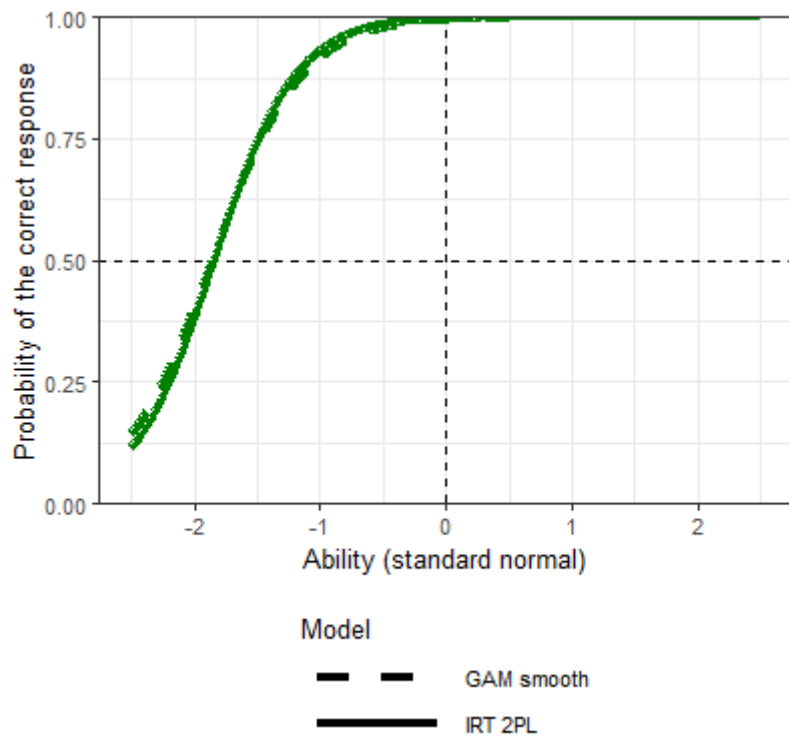


Table 3.4.1.1

Item S090052 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	94.6%	299	MC	0.414958 3	0.1815103	3.10	-1.84	0.000	0.895

3.1.21. Gender DIF:

Table 3.4.2.1

Item S090052 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.76	0.153	1.000		0.031

3.1.22. Frequency of answers:

answer	Frequency	Percent
koza	4	1.3%
krowa	7	2.3%
królik	5	1.7%
lew (correct)	282	94.6%
Overall	298	100.0%

3.1.23. Distractors functioning:

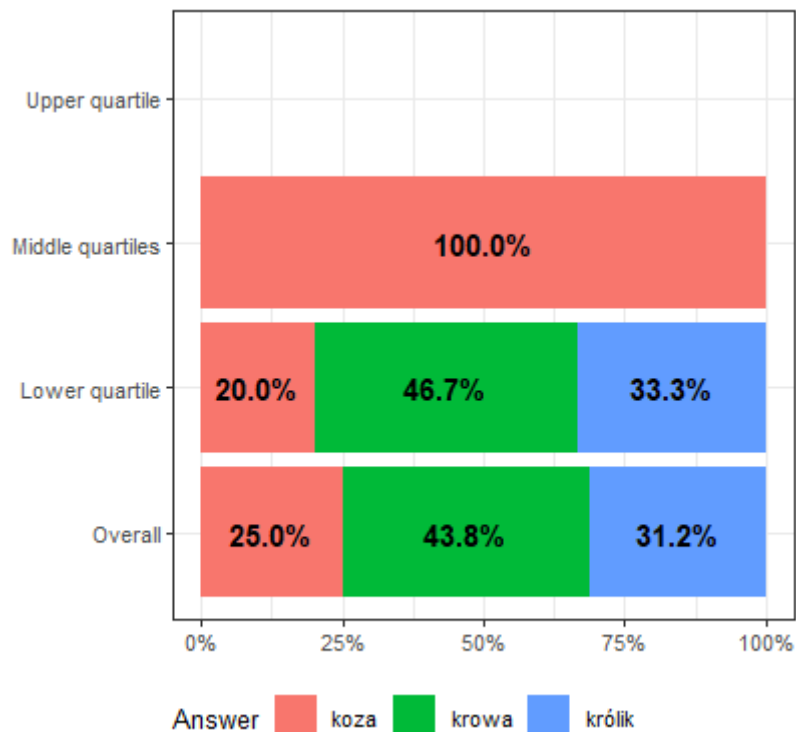
Table 3.4.4.1

Item S090052 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
koza	3	1	0	4	20.0%	100.0%	0.0%	25.0%
krowa	7	0	0	7	46.7%	0.0%	0.0%	43.8%
królik	5	0	0	5	33.3%	0.0%	0.0%	31.2%
Overall	15	1	0	16	100.0%	100.0%	0.0%	100.0%

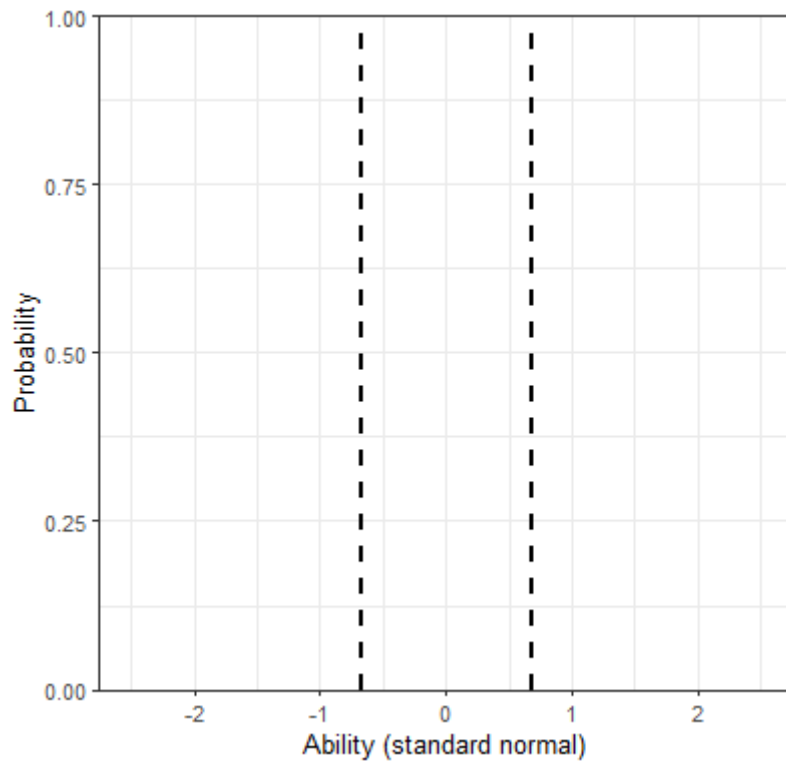
Graph 3.4.4.1

Item S090052 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.4.4.2

Item S090052 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.24. Answering time:

Graph 3.4.5.1

Item S090052 answering time distribution in groups of different ability level

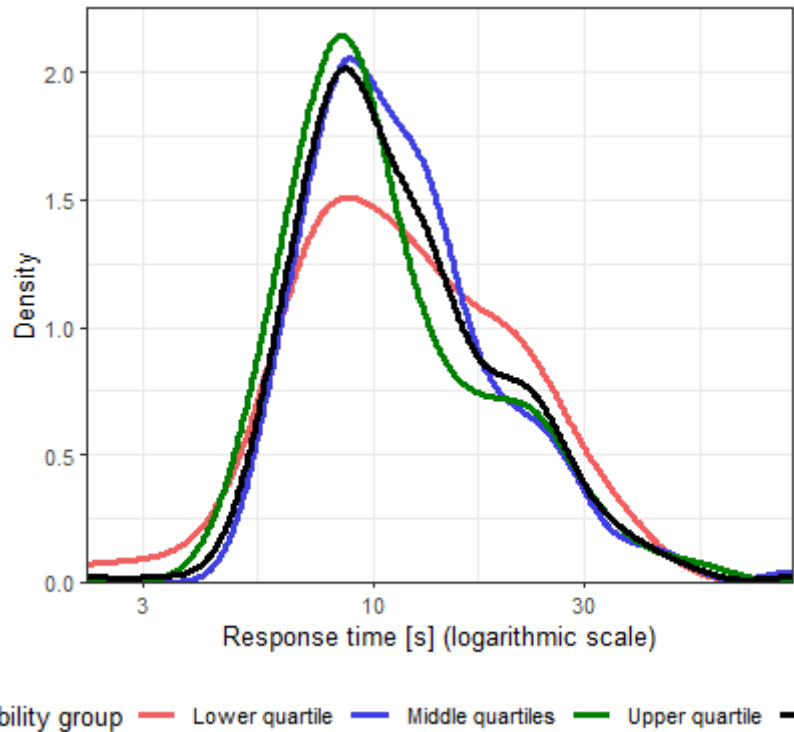


Table 3.4.5.1

Item S090052 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.26	7.73	11.64	18.17	38.72	2.46	0.57
Middle quartiles	5.57	8.29	10.77	15.03	88.77	2.47	0.49
Upper quartile	4.95	7.60	9.24	14.71	53.51	2.39	0.52
Overall	2.26	8.02	10.34	15.68	88.77	2.44	0.52

3.1.25. S061065 (LLM)

3.1.26. Item fit:

Graph 3.5.1.1

Item S061065 ICC and nonparametric trace line

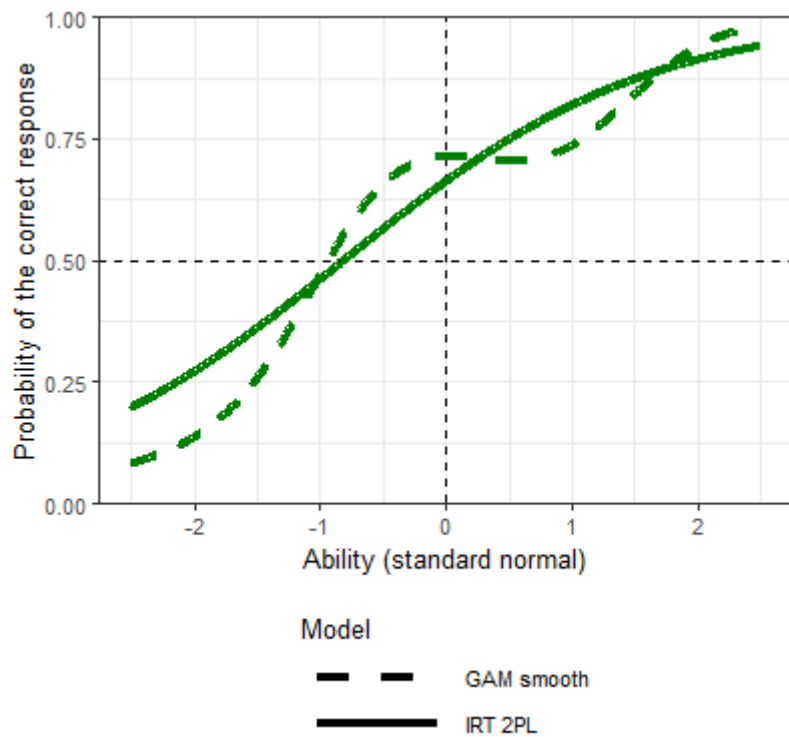


Table 3.5.1.1

Item S061065 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic				
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value	
1	63.8%	305	MC	0.349420 5	0.32023	0.83	-0.82	0.015	0.261	

3.1.27. Gender DIF:

Table 3.5.2.1

Item S061065 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
4.80	0.091	1.000		0.014

3.1.28. Frequency of answers:

answer	Frequency	Percent
Autobus na benzynę.	45	14.8%
Pociąg na ropę	43	14.1%
Samochód elektryczny. (correct)	194	63.8%
Samochód na benzynę.	22	7.2%
Overall	304	100.0%

3.1.29. Distractors functioning:

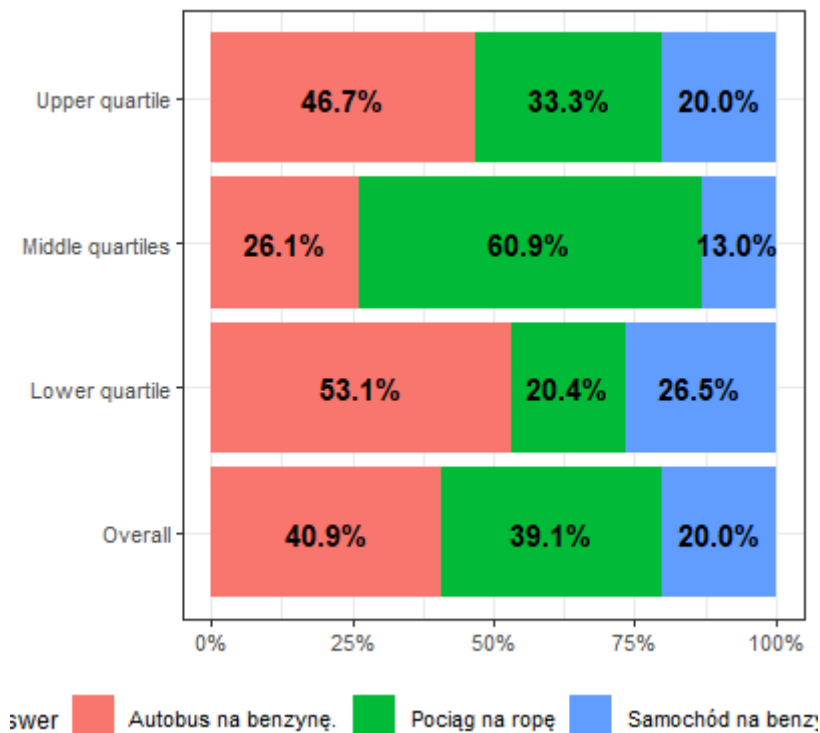
Table 3.5.4.1

Item S061065 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Autobus na benzinę.	26	12	7	45	53.1%	26.1%	46.7%	40.9%
Pociąg na ropę	10	28	5	43	20.4%	60.9%	33.3%	39.1%
Samochód na benzinę.	13	6	3	22	26.5%	13.0%	20.0%	20.0%
Overall	49	46	15	110	100.0%	100.0%	100.0%	100.0%

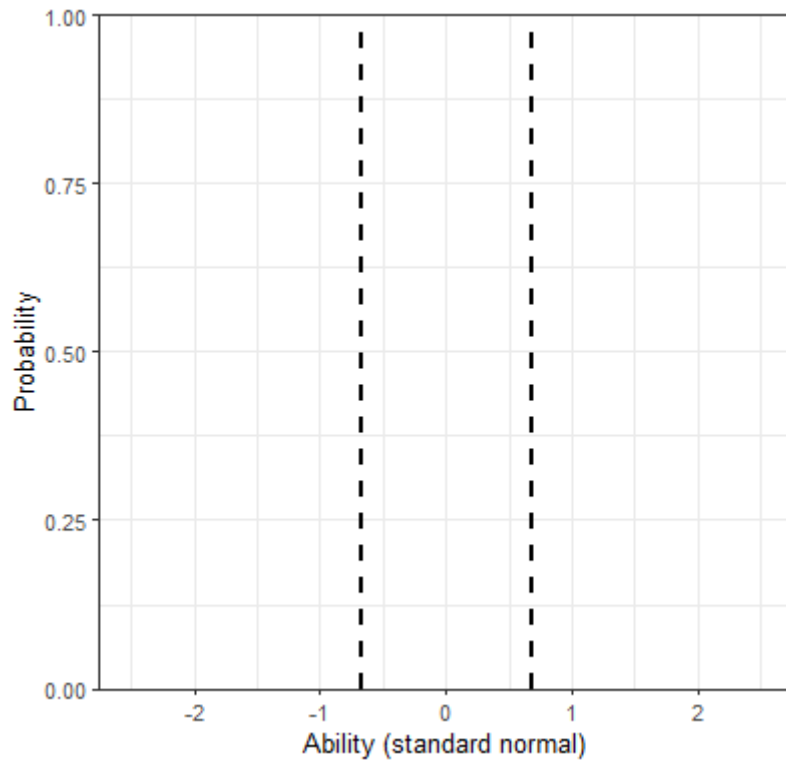
Graph 3.5.4.1

Item S061065 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.5.4.2

Item S061065 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.30. Answering time:

Graph 3.5.5.1

Item S061065 answering time distribution in groups of different ability level

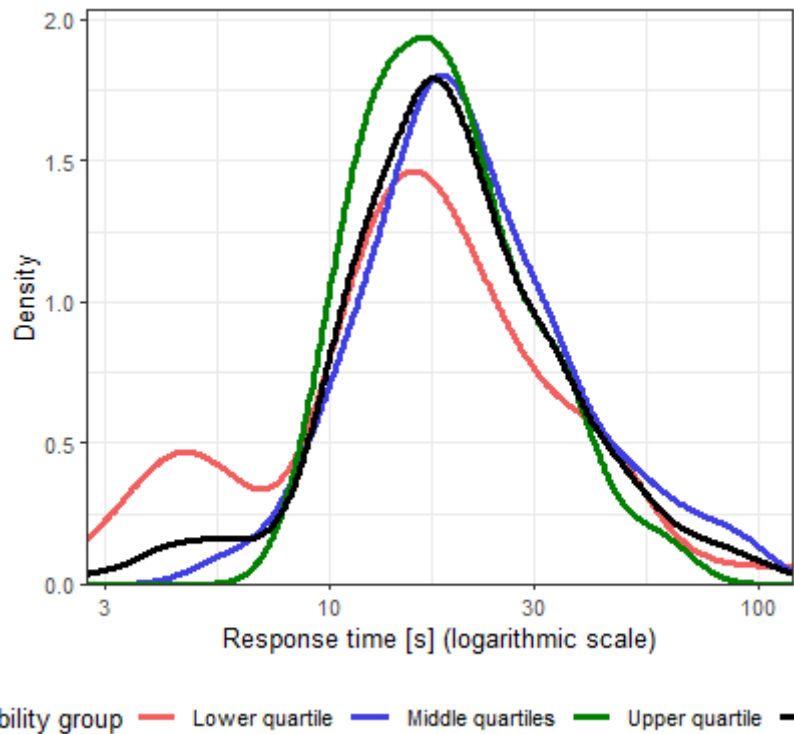


Table 3.5.5.1

Item S061065 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.74	11.25	16.34	24.82	120.29	2.75	0.76
Middle quartiles	5.27	14.85	19.83	30.46	100.70	3.05	0.57
Upper quartile	8.71	13.15	17.84	24.26	62.17	2.93	0.45
Overall	2.74	13.28	18.39	27.13	120.29	2.95	0.61

3.1.31. S100002 (TIMSS)

3.1.32. Item fit:

Graph 3.6.1.1

Item S100002 ICC and nonparametric trace line

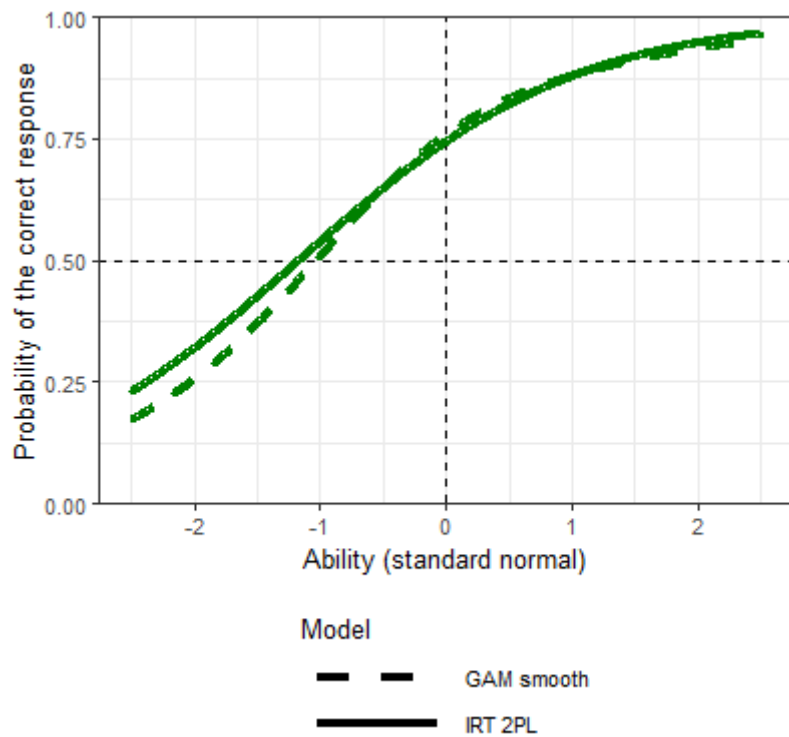


Table 3.6.1.1

Item S100002 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	71.8%	299	MC	0.378427 9	0.1967857	0.91	-1.18	0.022	0.118

3.1.33. Gender DIF:

Table 3.6.2.1

Item S100002 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.53	0.766	1.000		0.002

3.1.34. Frequency of answers:

answer	Frequency
Drzewo pobiera wodę z gleby.	56
Grzyb rozkłada martwą materię organiczną.	14
Roślina przekształca dwutlenek węgla i wodę w glukozę i tlen przy użyciu światła słonecznego. (correct)	214
Zwierzę zjada roślinę, aby uzyskać energię.	14
Overall	298

3.1.35. Distractors functioning:

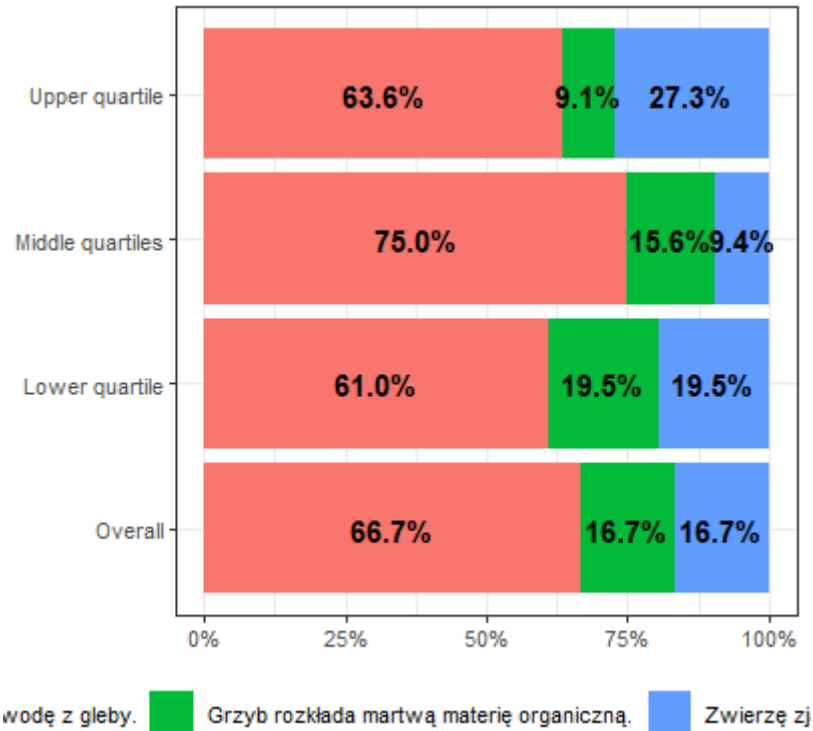
Table 3.6.4.1

Item S100002 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Drzewo pobiera wodę z gleby.	25	24	7	56	61.0%	75.0%	63.6%	66.7%
Grzyb rozkłada martwą materię organiczną.	8	5	1	14	19.5%	15.6%	9.1%	16.7%
Zwierzę zjada roślinę, aby uzyskać energię.	8	3	3	14	19.5%	9.4%	27.3%	16.7%
Overall	41	32	11	84	100.0%	100.0%	100.0%	100.0%

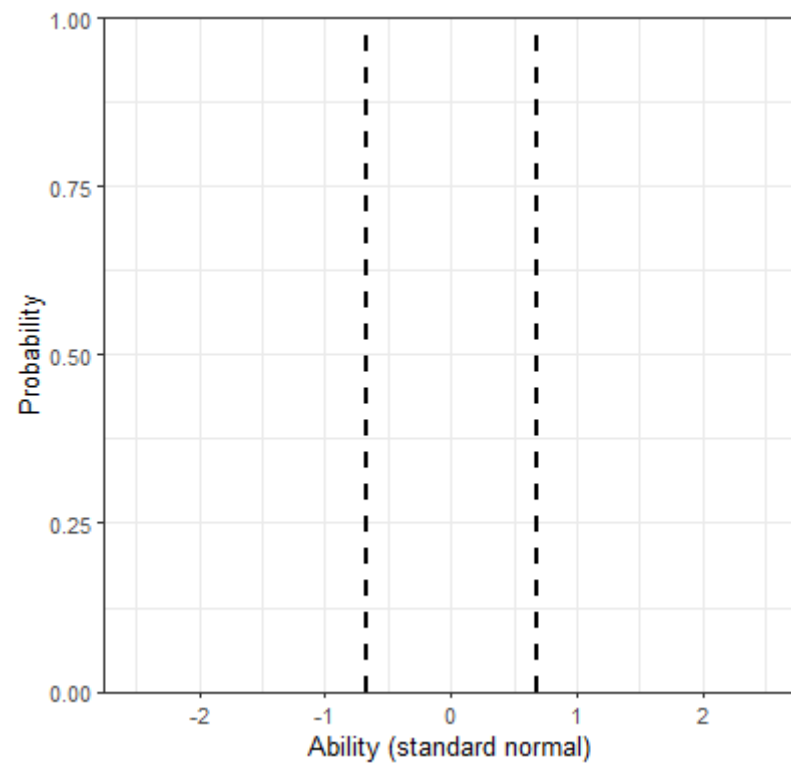
Graph 3.6.4.1

Item S100002 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.6.4.2

Item S100002 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.36. Answering time:

Graph 3.6.5.1

Item S100002 answering time distribution in groups of different ability level

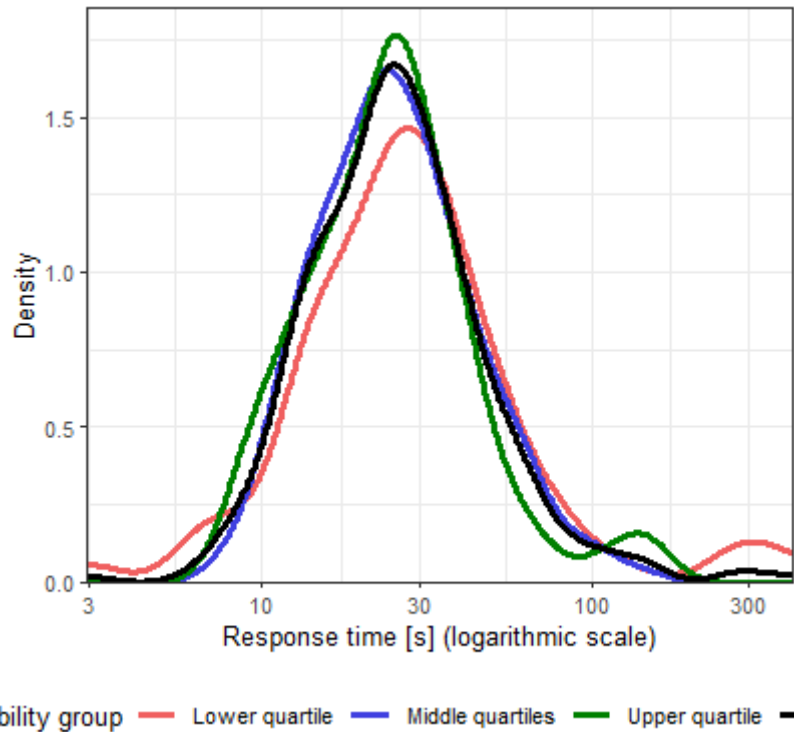


Table 3.6.5.1

Item S100002 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.96	17.99	27.30	39.79	405.68	3.33	0.82
Middle quartiles	7.66	17.09	24.25	36.17	141.18	3.24	0.55
Upper quartile	8.34	16.77	24.40	31.99	147.57	3.19	0.59
Overall	2.96	17.01	24.67	36.09	405.68	3.25	0.63

3.1.37. S090040 (TIMSS)

3.1.38. Item fit:

Graph 3.7.1.1

Item S090040 ICC and nonparametric trace line

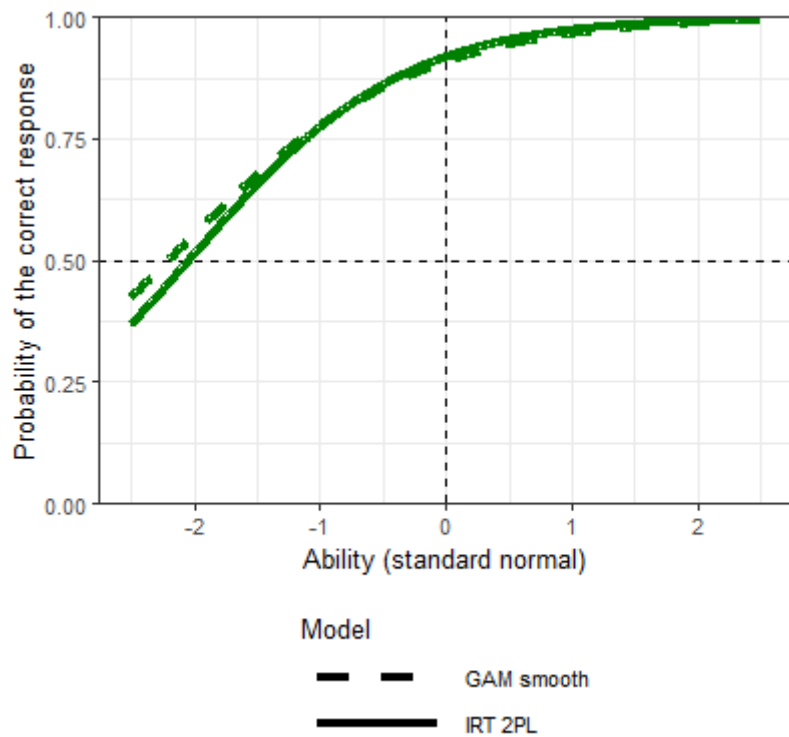


Table 3.7.1.1

Item S090040 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	87.9%	299	MC	0.305187 1	0.1997489	1.18	-2.05	0.000	0.680

3.1.39. Gender DIF:

Table 3.7.2.1

Item S090040 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.04	0.596	1.000	0.005	

3.1.40. Frequency of answers:

answer	Frequency	Percent
Kostka lodu odparuje.	15	5.0%
Kostka lodu pozostanie taka sama.	8	2.7%
Kostka lodu zamieni się w parę wodną.	13	4.4%
Kostka lodu zmieni się w wodę. (correct)	262	87.9%
Overall	298	100.0%

3.1.41. Distractors functioning:

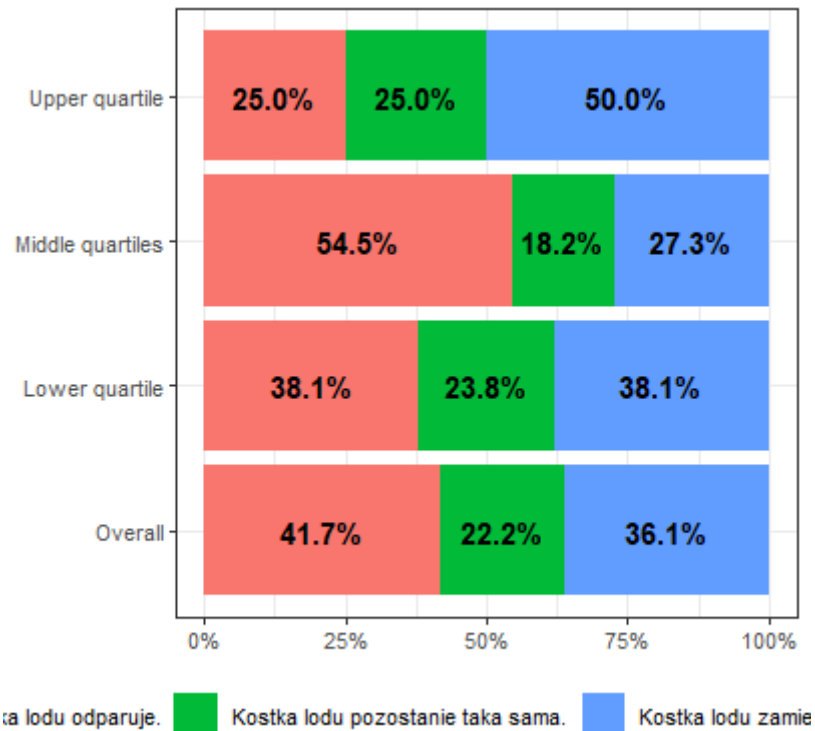
Table 3.7.4.1

Item S090040 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Kostka lodu odparuje.	8	6	1	15	38.1%	54.5%	25.0%	41.7%
Kostka lodu pozostanie taka sama.	5	2	1	8	23.8%	18.2%	25.0%	22.2%
Kostka lodu zamieni się w parę wodną.	8	3	2	13	38.1%	27.3%	50.0%	36.1%
Overall	21	11	4	36	100.0%	100.0%	100.0%	100.0%

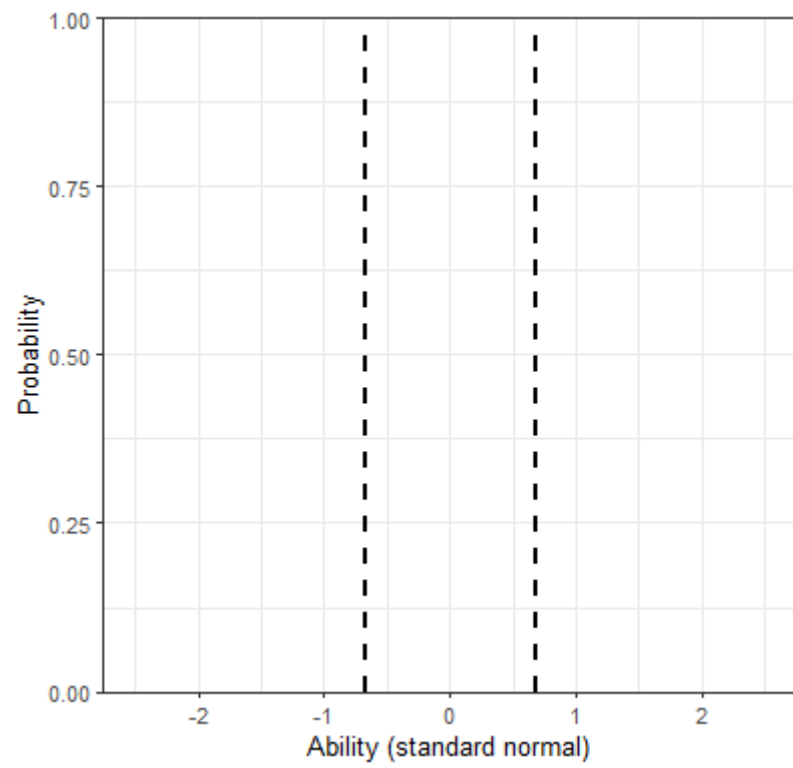
Graph 3.7.4.1

Item S090040 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.7.4.2

Item S090040 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.42. Answering time:

Graph 3.7.5.1

Item S090040 answering time distribution in groups of different ability level

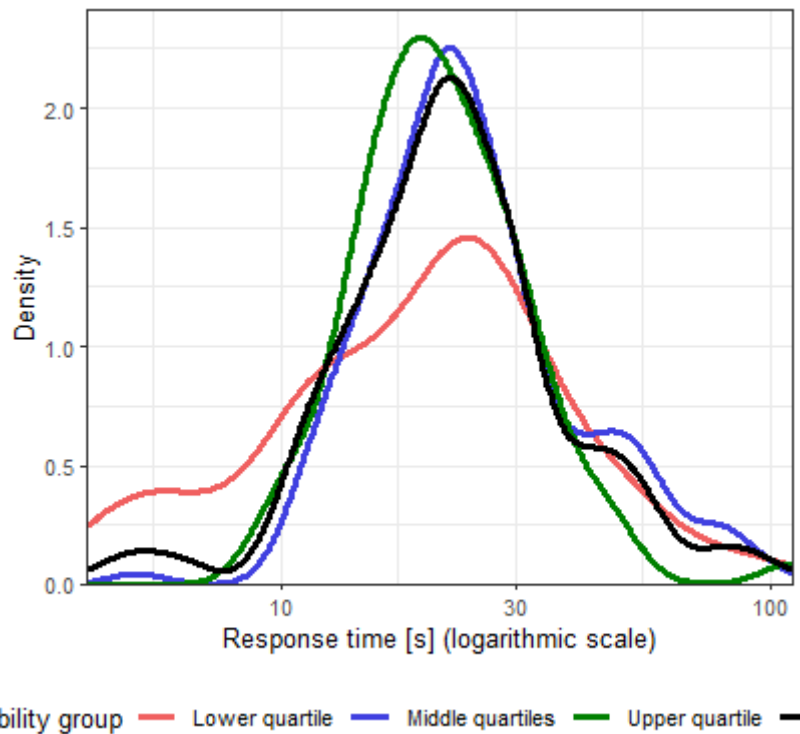


Table 3.7.5.1

Item S090040 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.01	11.91	21.79	29.25	90.80	2.94	0.70
Middle quartiles	5.07	17.65	22.88	30.35	100.90	3.19	0.49
Upper quartile	9.45	16.75	20.52	27.74	110.63	3.06	0.42
Overall	4.01	16.30	21.88	29.29	110.63	3.10	0.54

3.1.43. SP71017 (TIMSS)

3.1.44. Item fit:

Graph 3.8.1.1

Item SP71017 ICC and nonparametric trace line

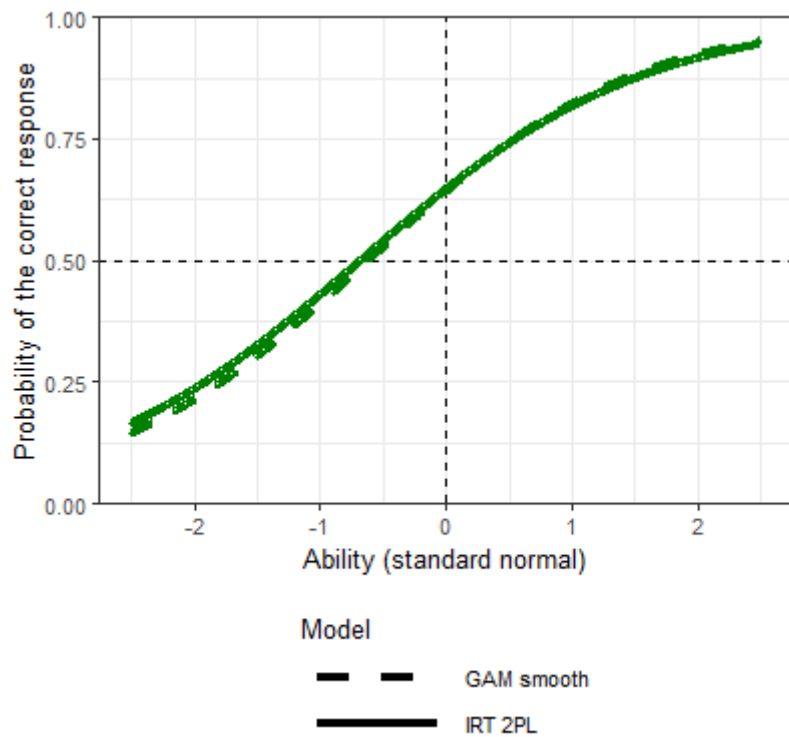


Table 3.8.1.1

Item SP71017 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	63.4%	299	MC	0.373370 1	0.3939692	0.89	-0.68	0.005	0.409

3.1.45. Gender DIF:

Table 3.8.2.1

Item SP71017 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.75	0.253	1.000	0.008	

3.1.46. Frequency of answers:

answer

[illegible]

answer

Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (B)

Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B)

Overall

3.1.47. Distractors functioning:

Table 3.8.4.1

Item SP71017 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A)	4	1	0	5	8.9%	2.1%	0.0%	4.6%
Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A)	1	0	1	2	2.2%	0.0%	6.2%	1.8%
Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B)	1	0	0	1	2.2%	0.0%	0.0%	0.9%
Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A)	1	0	0	1	2.2%	0.0%	0.0%	0.9%

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B)	1	0	0	1	2.2%	0.0%	0.0%	0.9%
Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A)	2	0	0	2	4.4%	0.0%	0.0%	1.8%
Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B)	1	0	0	1	2.2%	0.0%	0.0%	0.9%
Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Tylko żywa kaczka (B)	1	0	0	1	2.2%	0.0%	0.0%	0.9%
Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A)	1	0	0	1	2.2%	0.0%	0.0%	0.9%

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B)	4	3	2	9	8.9%	6.2%	12.5%	8.3%
Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B)	1	1	0	2	2.2%	2.1%	0.0%	1.8%
Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A)	1	0	0	1	2.2%	0.0%	0.0%	0.9%
Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Tylko żywa kaczka (B)	1	0	0	1	2.2%	0.0%	0.0%	0.9%
Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B)	1	0	1	2	2.2%	0.0%	6.2%	1.8%
Tylko żywa kaczka (B), Kaczka-zabawka i żywa	1	0	0	1	2.2%	0.0%	0.0%	0.9%

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
kaczka (A), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A)								
Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B)	1	2	0	3	2.2%	4.2%	0.0%	2.8%
Tylko żywa kaczka (B), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B)	1	2	0	3	2.2%	4.2%	0.0%	2.8%
Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A)	2	1	0	3	4.4%	2.1%	0.0%	2.8%
Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A)	3	0	0	3	6.7%	0.0%	0.0%	2.8%
Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B), Tylko żywa kaczka (B)	16	36	12	64	35.6%	75.0%	75.0%	58.7%

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Overall	45	48	16	109	100.0%	100.0%	100.0%	100.0%
Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A)	0	1	0	1	0.0%	2.1%	0.0%	0.9%
Tylko żywa kaczka (B), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A), Kaczka-zabawka i żywa kaczka (A)	0	1	0	1	0.0%	2.1%	0.0%	0.9%

Graph 3.8.4.1

Item SP71017 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

3.1.48. Answering time:

Graph 3.8.5.1

Item SP71017 answering time distribution in groups of different ability level

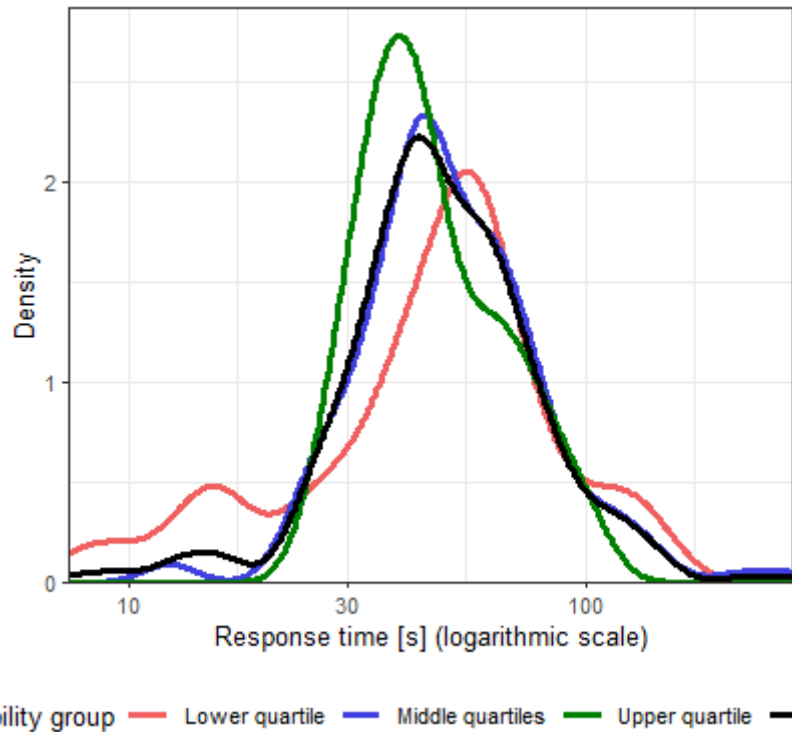


Table 3.8.5.1

Item SP71017 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	7.43	33.55	52.67	60.85	141.77	3.79	0.66
Middle quartiles	11.93	38.25	47.61	64.05	282.31	3.92	0.46
Upper quartile	26.20	35.67	42.92	59.94	103.05	3.83	0.35
Overall	7.43	36.53	46.66	63.42	282.31	3.87	0.49

3.1.49. S061071 (TIMSS)

3.1.50. Item fit:

Graph 3.9.1.1

Item S061071 ICC and nonparametric trace line

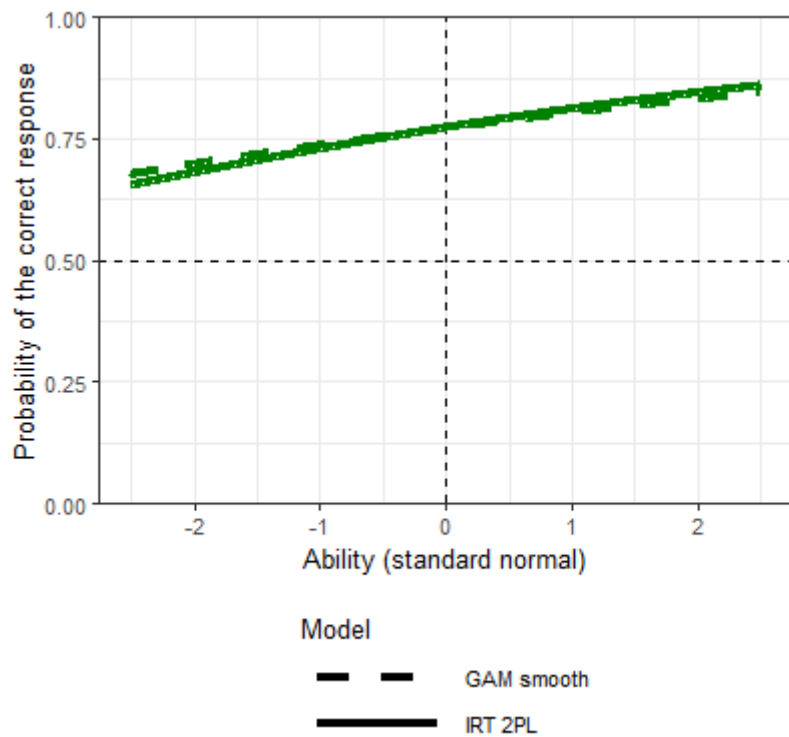


Table 3.9.1.1

Item S061071 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	77.2%	299	MC	0.075457 12	0.1023875	0.23	-5.24	0.000	0.840

3.1.51. Gender DIF:

Table 3.9.2.1

Item S061071 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
4.90	0.086	1.000		0.017

3.1.52. Frequency of answers:

answer	Frequency	Percent
Motyl.	21	7.0%
Ośmiornica.	19	6.4%
Pająk.	28	9.4%
Żaba. (correct)	230	77.2%
Overall	298	100.0%

3.1.53. Distractors functioning:

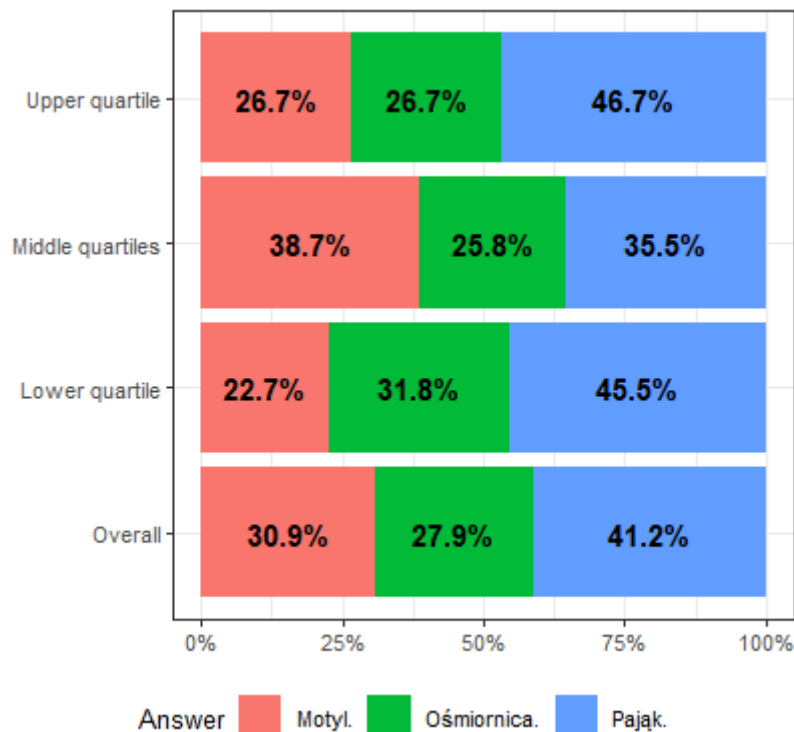
Table 3.9.4.1

Item S061071 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Motyl.	5	12	4	21	22.7%	38.7%	26.7%	30.9%
Ośmiornica.	7	8	4	19	31.8%	25.8%	26.7%	27.9%
Pająk.	10	11	7	28	45.5%	35.5%	46.7%	41.2%
Overall	22	31	15	68	100.0%	100.0%	100.0%	100.0%

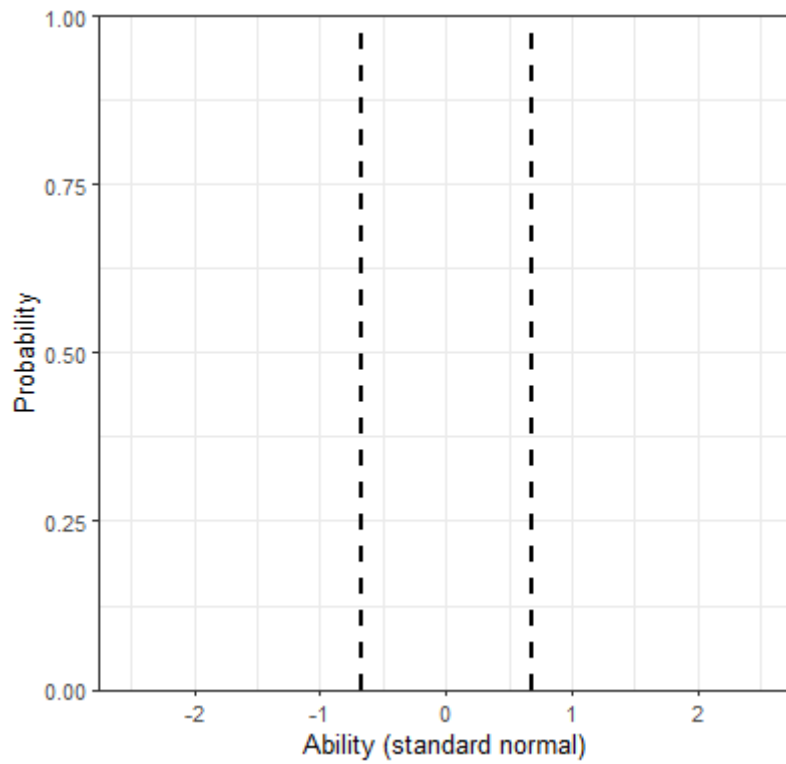
Graph 3.9.4.1

Item S061071 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.9.4.2

Item S061071 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.54. Answering time:

Graph 3.9.5.1

Item S061071 answering time distribution in groups of different ability level

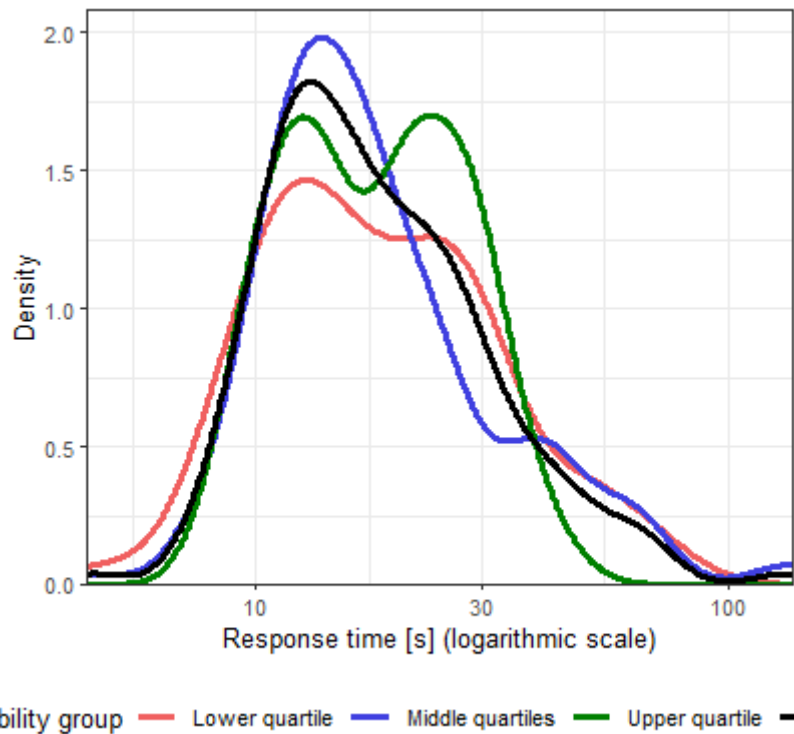


Table 3.9.5.1

Item S061071 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.60	11.88	17.11	27.31	71.15	2.90	0.58
Middle quartiles	4.40	12.15	16.02	24.30	136.60	2.90	0.57
Upper quartile	8.50	12.53	19.03	25.81	44.48	2.88	0.43
Overall	4.40	12.03	16.58	25.15	136.60	2.90	0.54

3.1.55. S090058 (LLM)

3.1.56. Item fit:

Graph 3.10.1.1

Item S090058 ICC and nonparametric trace line

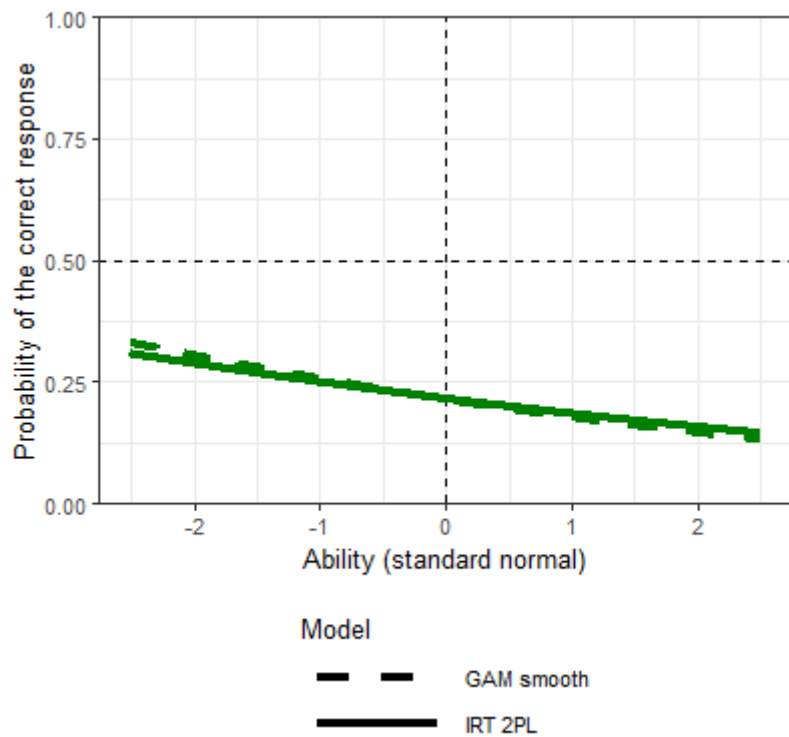


Table 3.10.1.1

Item S090058 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	21.8%	281	MC	0.100099 5	-0.07778607	-0.19	-6.68	0.037	0.008

3.1.57. Gender DIF:

Table 3.10.2.1

Item S090058 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.33	0.515	1.000		0.005

3.1.58. Frequency of answers:

answer	Frequency	Percent
Astenosfera	68	24.3%
Litosfera	49	17.5%
Plaszcz (correct)	61	21.8%
Skorupa	102	36.4%
Overall	280	100.0%

3.1.59. Distractors functioning:

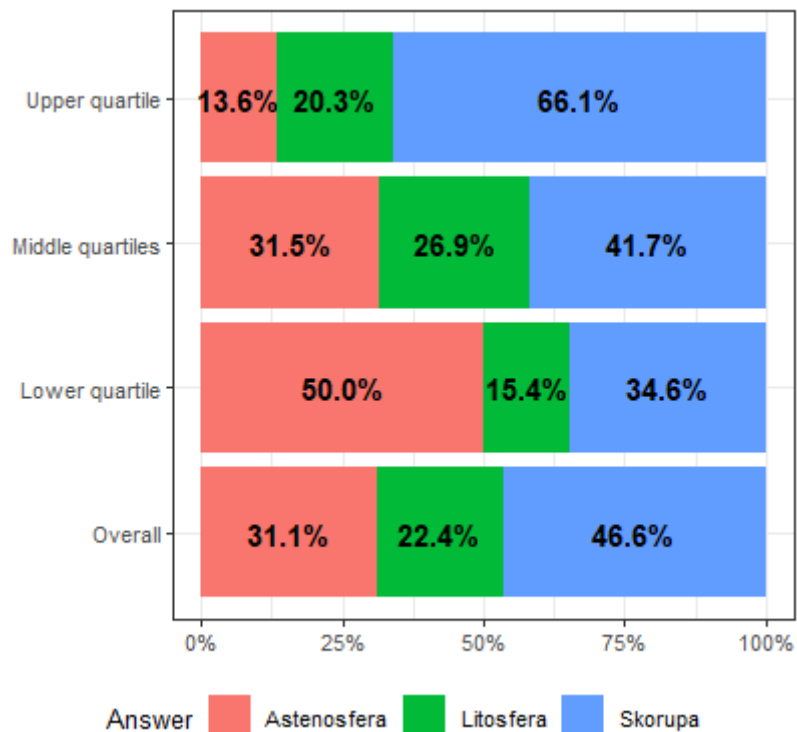
Table 3.10.4.1

Item S090058 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Astenosfera	26	34	8	68	50.0%	31.5%	13.6%	31.1%
Litosfera	8	29	12	49	15.4%	26.9%	20.3%	22.4%
Skorupa	18	45	39	102	34.6%	41.7%	66.1%	46.6%
Overall	52	108	59	219	100.0%	100.0%	100.0%	100.0%

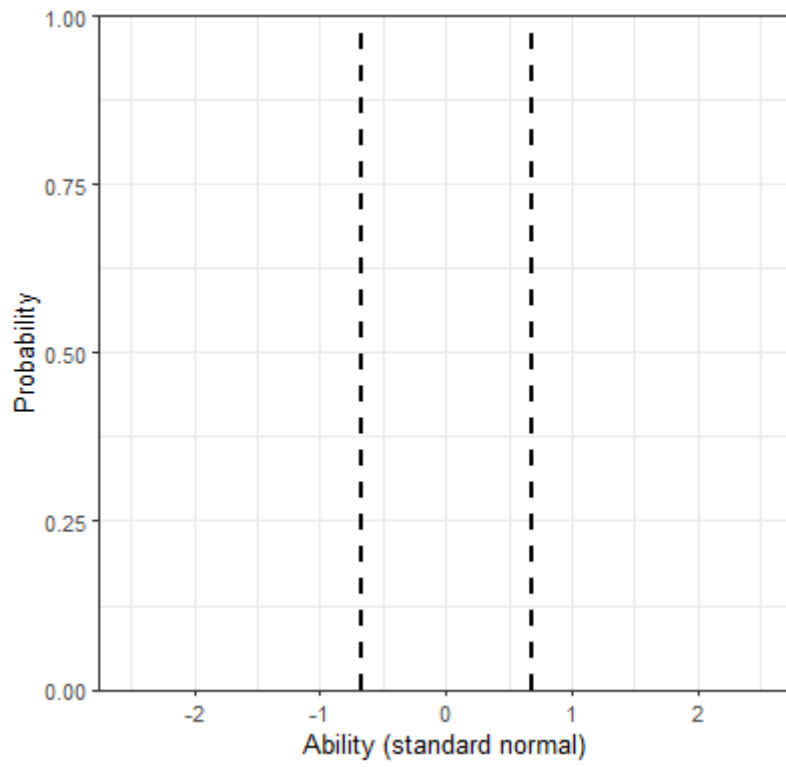
Graph 3.10.4.1

Item S090058 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.10.4.2

Item S090058 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.60. Answering time:

Graph 3.10.5.1

Item S090058 answering time distribution in groups of different ability level

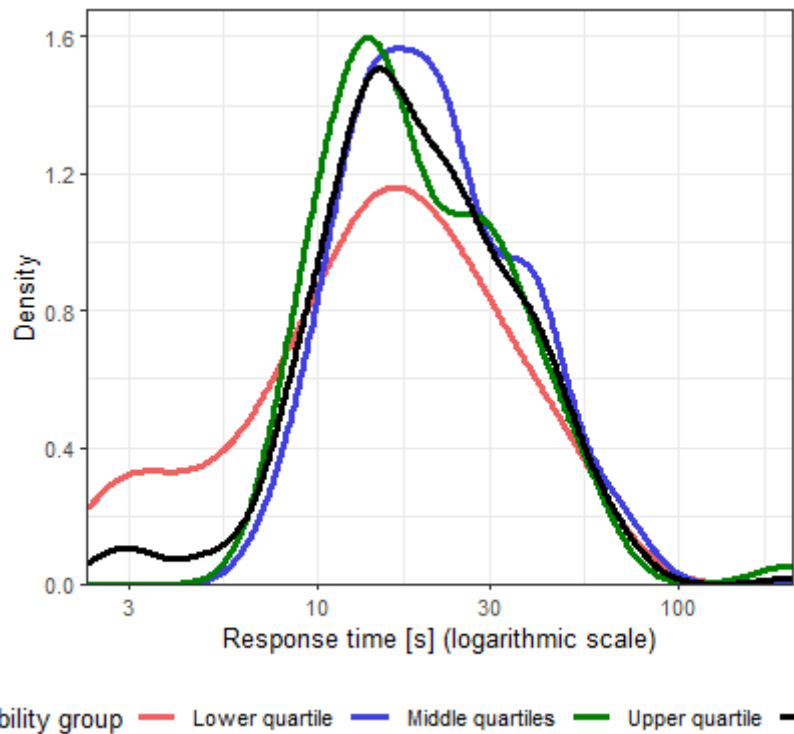


Table 3.10.5.1

Item S090058 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.30	9.00	15.31	24.81	65.17	2.67	0.81
Middle quartiles	6.79	13.69	20.04	31.43	79.33	3.03	0.54
Upper quartile	7.95	12.75	16.77	28.49	205.81	2.96	0.59
Overall	2.30	12.54	17.77	28.65	205.81	2.92	0.65

3.1.61. SP71147 (LLM)

3.1.62. Item fit:

Graph 3.11.1.1

Item SP71147 ICC and nonparametric trace line

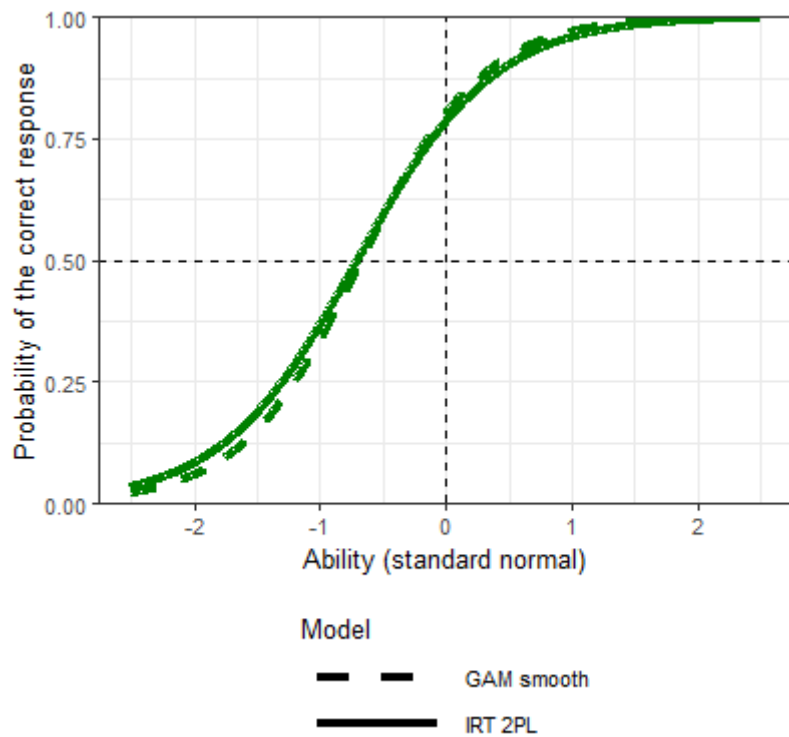


Table 3.11.1.1

Item SP71147 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	69.1%	305	MC	0.572084 2	0.5568899	1.84	-0.71	0.025	0.079

3.1.63. Gender DIF:

Table 3.11.2.1

Item SP71147 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
7.14	0.028	1.000	0.021	

3.1.64. Frequency of answers:

answer	Frequency	Percent
Grawitacja działająca na skrzynię Teresy jest dużo silniejsza.	14	4.6%
Kółka wózka zmniejszają siłę potrzebną do przeniesienia skrzyni Marysi. (correct)	210	69.1%
Opór powietrza działający na skrzynię Teresy jest dużo większy.	31	10.2%
Wózek zwiększa siłę magnetyczną działającą na skrzynię Marysi.	49	16.1%
Overall	304	100.0%

3.1.65. Distractors functioning:

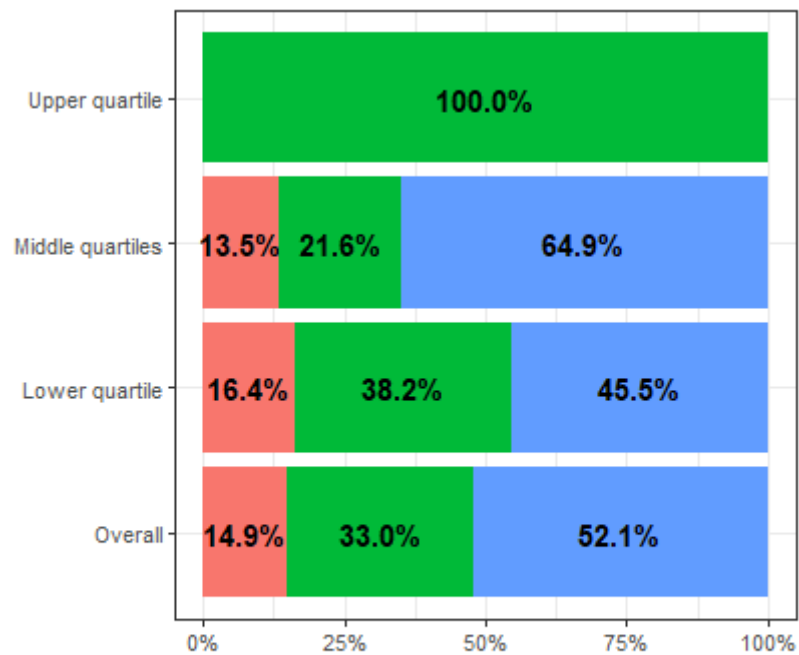
Table 3.11.4.1

Item SP71147 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Grawitacja działająca na skrzynię Teresy jest dużo silniejsza.	9	5	0	14	16.4%	13.5%	0.0%	14.9%
Opór powietrza działający na skrzynię Teresy jest dużo większy.	21	8	2	31	38.2%	21.6%	100.0%	33.0%
Wózek zwiększa siłę magnetyczną działającą na skrzynię Marysi.	25	24	0	49	45.5%	64.9%	0.0%	52.1%
Overall	55	37	2	94	100.0%	100.0%	100.0%	100.0%

Graph 3.11.4.1

Item SP71147 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

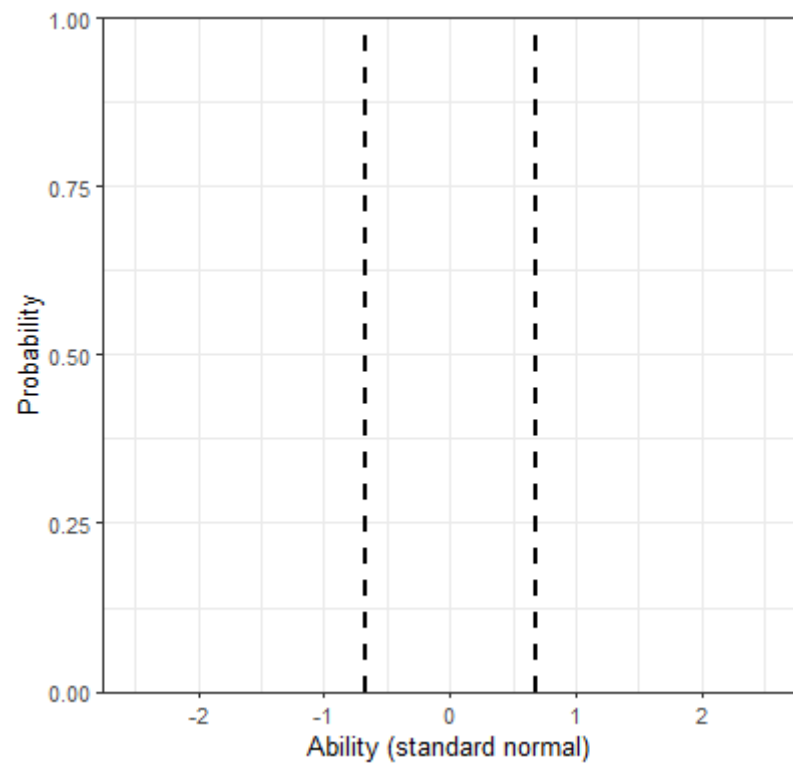


niejsza. ■ Opór powietrza działający na skrzynię Teresy jest dużo większy. ■

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Graph 3.11.4.2

Item SP71147 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.66. Answering time:

Graph 3.11.5.1

Item SP71147 answering time distribution in groups of different ability level

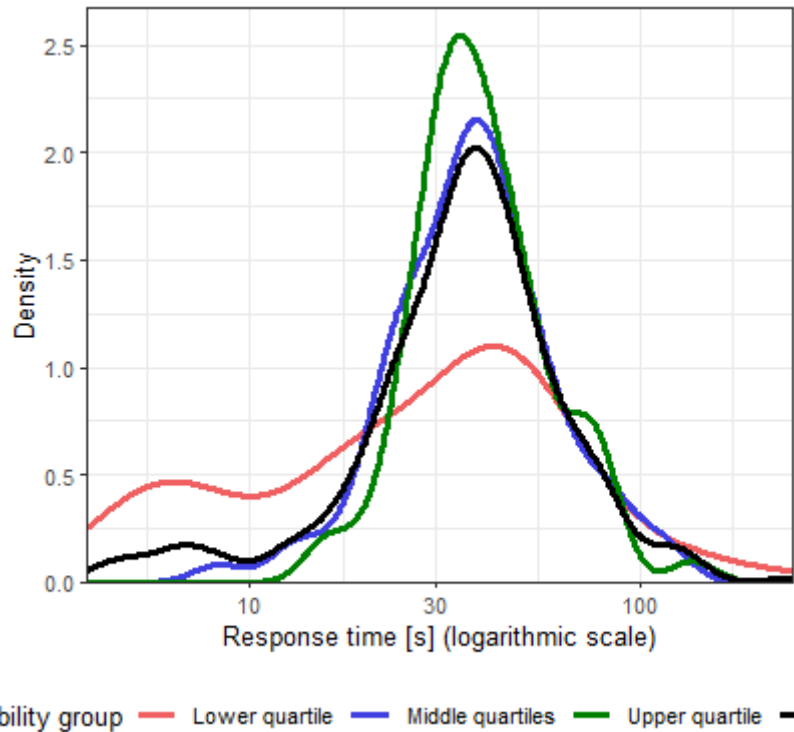


Table 3.11.5.1

Item SP71147 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.84	15.15	33.25	47.97	246.43	3.25	0.94
Middle quartiles	8.19	27.43	37.82	49.44	125.74	3.62	0.49
Upper quartile	15.41	30.99	38.19	49.33	137.25	3.67	0.40
Overall	3.84	25.81	37.00	48.94	246.43	3.54	0.63

3.1.67. S890038 (LLM)

3.1.68. Item fit:

Graph 3.12.1.1

Item S890038 ICC and nonparametric trace line

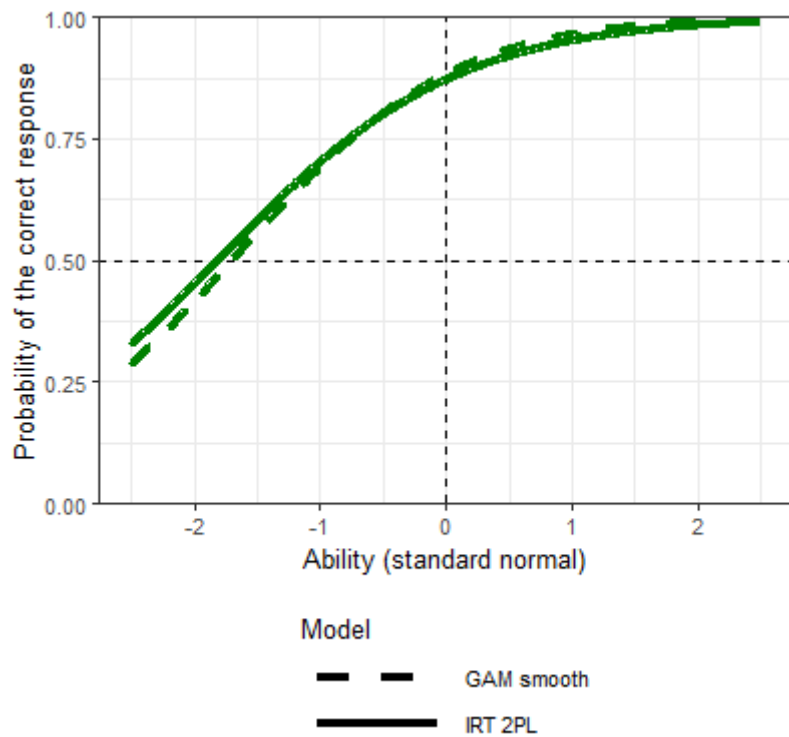


Table 3.12.1.1

Item S890038 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	82.9%	281	MC	0.395096 5	0.1925742	1.05	-1.82	0.000	0.948

3.1.69. Gender DIF:

Table 3.12.2.1

Item S890038 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
11.19	0.004	0.330	0.048	

3.1.70. Frequency of answers:

answer	Frequency	Percent
Drewniany kij	11	3.9%
Metalowy gwóźdź (correct)	232	82.9%
Plastikowa łyżka	26	9.3%
Szklana butelka	11	3.9%
Overall	280	100.0%

3.1.71. Distractors functioning:

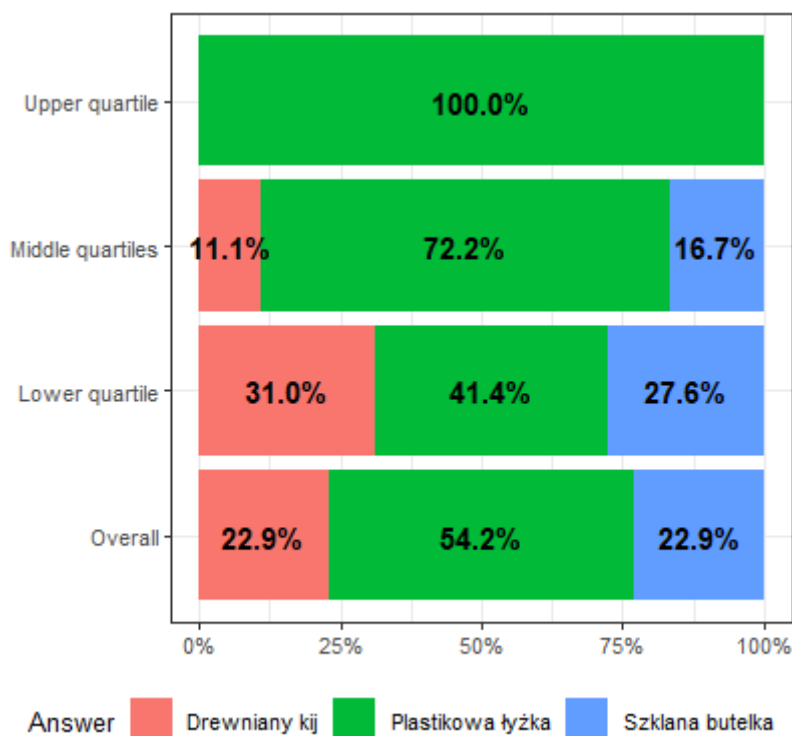
Table 3.12.4.1

Item S890038 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Drewniany kij	9	2	0	11	31.0%	11.1%	0.0%	22.9%
Plastikowa łyżka	12	13	1	26	41.4%	72.2%	100.0%	54.2%
Szklana butelka	8	3	0	11	27.6%	16.7%	0.0%	22.9%
Overall	29	18	1	48	100.0%	100.0%	100.0%	100.0%

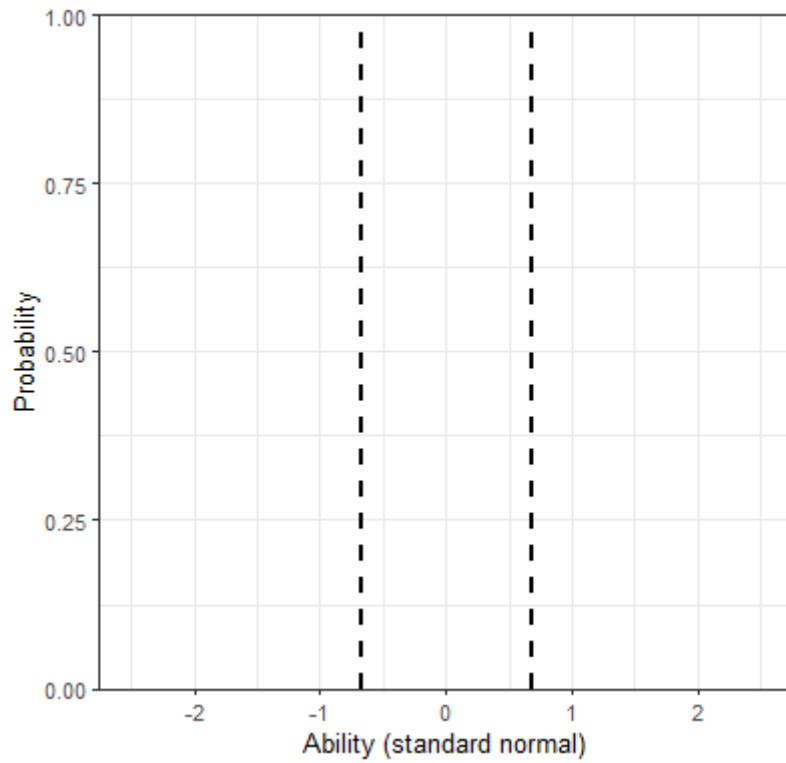
Graph 3.12.4.1

Item S890038 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.12.4.2

Item S890038 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.72. Answering time:

Graph 3.12.5.1

Item S890038 answering time distribution in groups of different ability level

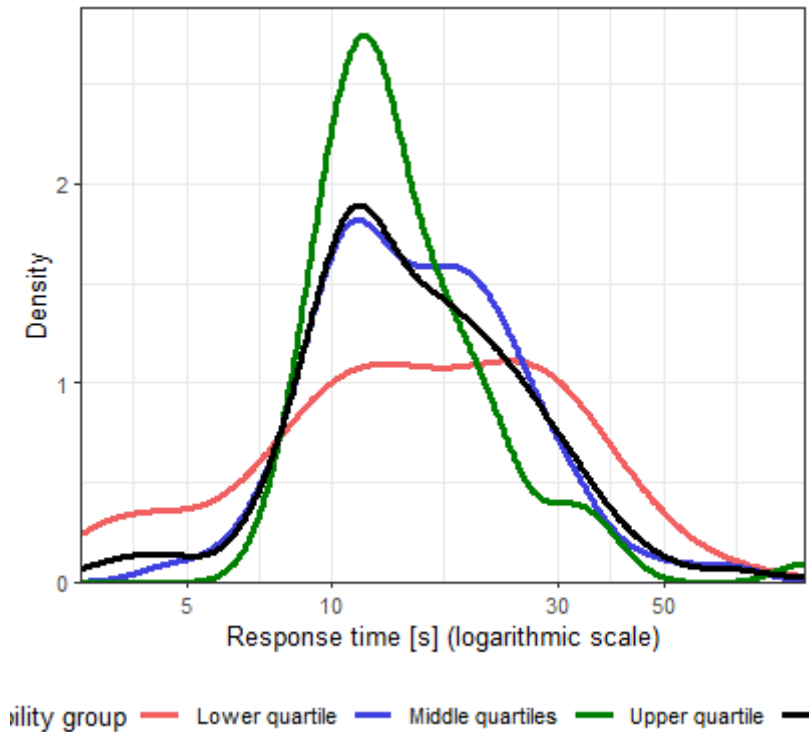


Table 3.12.5.1

Item S890038 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.01	9.46	15.66	26.64	72.10	2.71	0.72
Middle quartiles	4.54	10.94	14.60	21.27	71.63	2.73	0.49
Upper quartile	7.35	10.77	12.86	17.16	98.42	2.66	0.43
Overall	3.01	10.59	14.12	21.27	98.42	2.71	0.55

3.1.73. SP71268 (LLM)

3.1.74. Item fit:

Graph 3.13.1.1

Item SP71268 ICC and nonparametric trace line

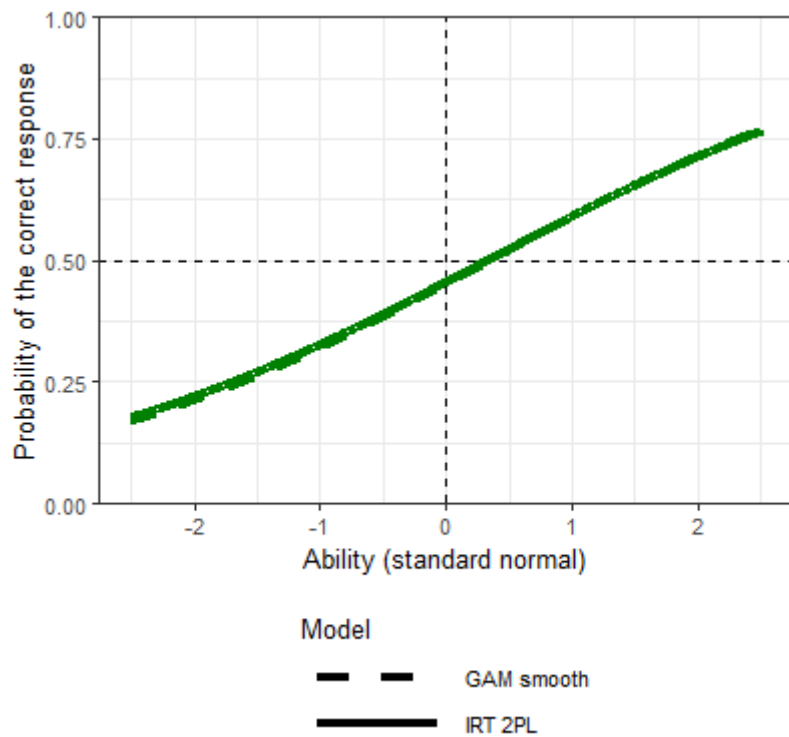


Table 3.13.1.1

Item SP71268 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	46.3%	299	MC	0.249993 3	0.1610844	0.54	0.33	0.000	0.762

3.1.75. Gender DIF:

Table 3.13.2.1

Item SP71268 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
6.83	0.033	1.000		0.019

3.1.76. Frequency of answers:

answer	Frequency	Percent
Rysunek A	39	13.1%
Rysunek B	81	27.2%
Rysunek C (correct)	138	46.3%
Rysunek D	40	13.4%
Overall	298	100.0%

3.1.77. Distractors functioning:

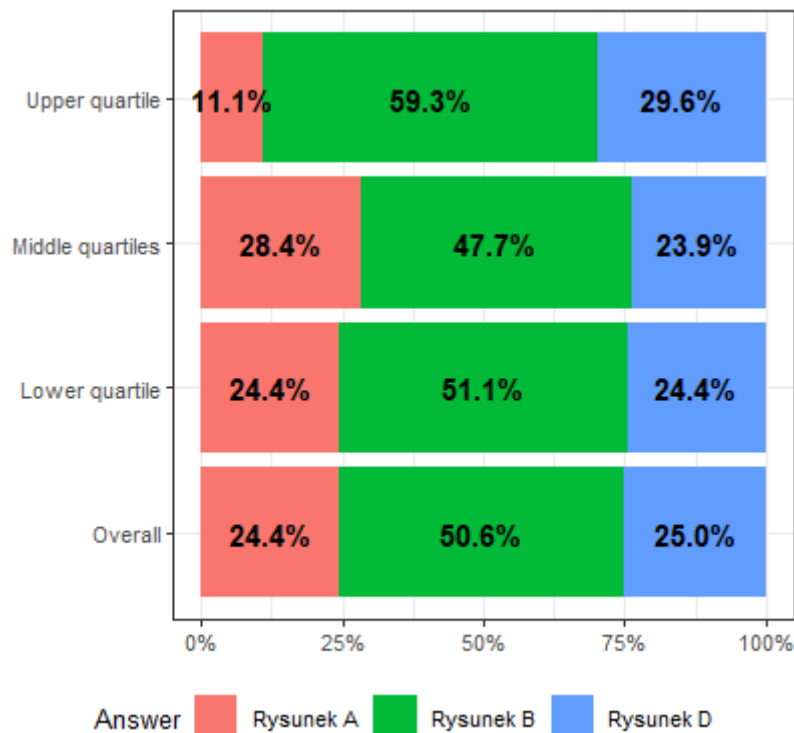
Table 3.13.4.1

Item SP71268 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Rysunek A	11	25	3	39	24.4%	28.4%	11.1%	24.4%
Rysunek B	23	42	16	81	51.1%	47.7%	59.3%	50.6%
Rysunek D	11	21	8	40	24.4%	23.9%	29.6%	25.0%
Overall	45	88	27	160	100.0%	100.0%	100.0%	100.0%

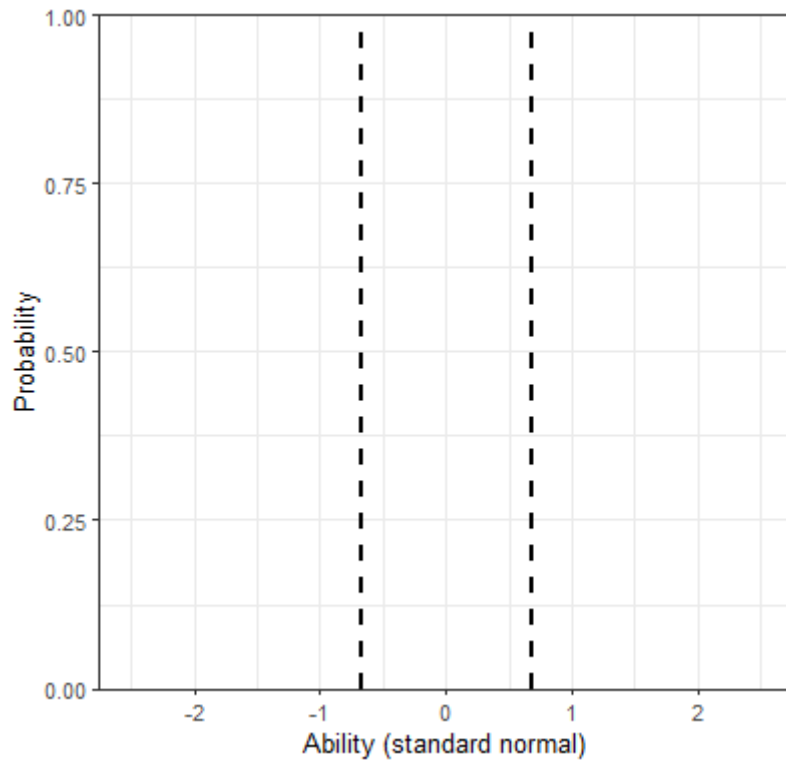
Graph 3.13.4.1

Item SP71268 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.13.4.2

Item SP71268 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.78. Answering time:

Graph 3.13.5.1

Item SP71268 answering time distribution in groups of different ability level

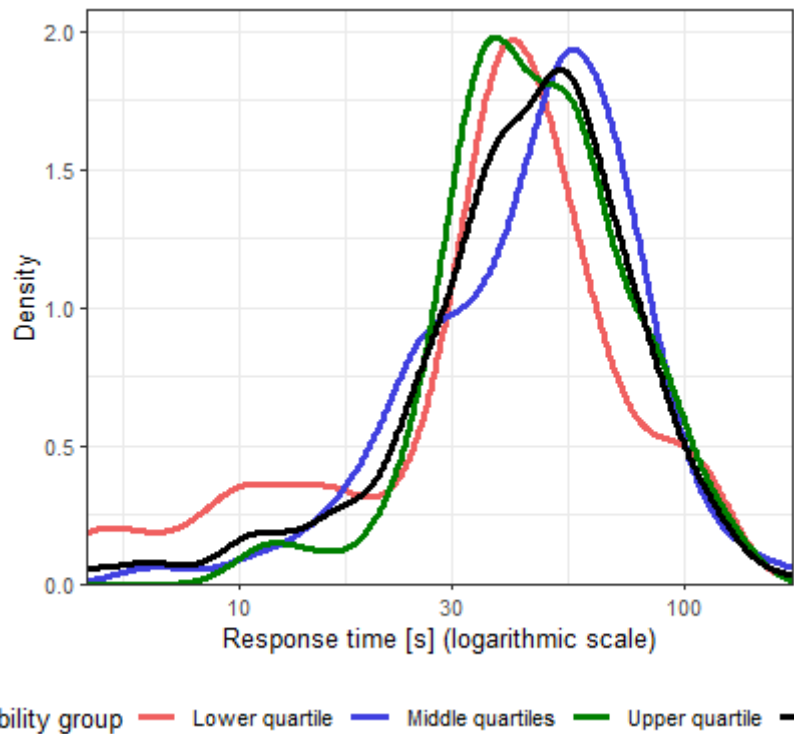


Table 3.13.5.1

Item SP71268 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.59	27.74	39.56	53.43	112.62	3.55	0.75
Middle quartiles	6.02	31.68	50.01	65.26	173.77	3.80	0.56
Upper quartile	10.98	34.43	44.21	60.21	127.86	3.82	0.47
Overall	4.59	32.35	46.78	61.62	173.77	3.75	0.60

3.1.79. S051188 (LLM)

3.1.80. Item fit:

Graph 3.14.1.1

Item S051188 ICC and nonparametric trace line

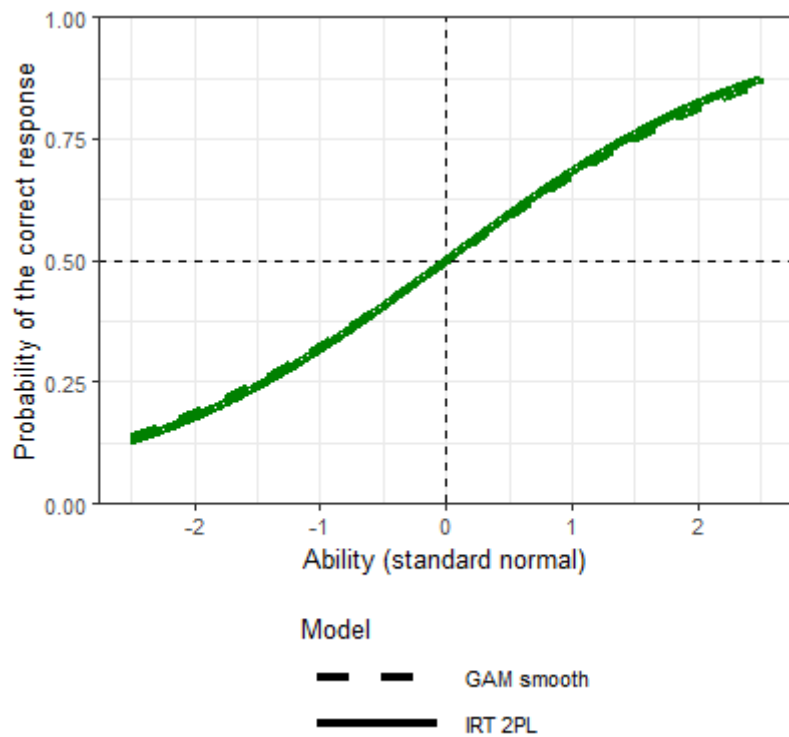


Table 3.14.1.1

Item S051188 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	51.0%	294	MC	0.323501 5	0.2833049	0.77	0.00	0.009	0.357

3.1.81. Gender DIF:

Table 3.14.2.1

Item S051188 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.69	0.261	1.000		0.008

3.1.82. Frequency of answers:

answer	Frequency	Percent
Nie, Nie, Nie, Nie, Nie	2	0.7%
Nie, Nie, Nie, Nie, Tak	6	2.0%
Nie, Nie, Tak, Nie, Nie	8	2.7%
Nie, Nie, Tak, Nie, Tak	36	12.2%
Nie, Nie, Tak, Tak, Nie	2	0.7%
Nie, Nie, Tak, Tak, Tak	2	0.7%
Nie, Tak, Nie, Nie, Tak	8	2.7%
Nie, Tak, Nie, Tak, Nie	3	1.0%
Nie, Tak, Tak, Nie, Nie	43	14.6%
Nie, Tak, Tak, Nie, Tak (correct)	150	51.0%
Nie, Tak, Tak, Tak, Nie	3	1.0%
Nie, Tak, Tak, Tak, Tak	9	3.1%
Tak, Nie, Nie, Nie, Tak	2	0.7%
Tak, Nie, Nie, Tak, Nie	1	0.3%
Tak, Nie, Nie, Tak, Tak	2	0.7%
Tak, Nie, Tak, Nie, Nie	2	0.7%
Tak, Nie, Tak, Nie, Tak	5	1.7%
Tak, Nie, Tak, Tak, Nie	1	0.3%
Tak, Nie, Tak, Tak, Tak	1	0.3%
Tak, Tak, Nie, Tak, Nie	1	0.3%
Tak, Tak, Tak, Nie, Nie	1	0.3%

answer	Frequency	Percent
Tak, Tak, Tak, Tak, Tak	6	2.0%
Overall	294	100.0%

3.1.83. Distractors functioning:

Table 3.14.4.1

Item S051188 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Nie, Nie, Nie, Nie, Tak	1	3	2	6	2.3%	3.9%	8.7%	4.2%
Nie, Nie, Tak, Nie, Nie	1	5	2	8	2.3%	6.5%	8.7%	5.6%
Nie, Nie, Tak, Nie, Tak	8	18	10	36	18.2%	23.4%	43.5%	25.0%
Nie, Nie, Tak, Tak, Nie	2	0	0	2	4.5%	0.0%	0.0%	1.4%
Nie, Nie, Tak, Tak, Tak	1	0	1	2	2.3%	0.0%	4.3%	1.4%
Nie, Tak, Nie, Nie, Tak	4	4	0	8	9.1%	5.2%	0.0%	5.6%
Nie, Tak, Nie, Tak, Nie	2	1	0	3	4.5%	1.3%	0.0%	2.1%
Nie, Tak, Tak, Nie, Nie	9	28	6	43	20.5%	36.4%	26.1%	29.9%
Nie, Tak, Tak, Tak, Nie	1	2	0	3	2.3%	2.6%	0.0%	2.1%
Nie, Tak, Tak, Tak, Tak	1	7	1	9	2.3%	9.1%	4.3%	6.2%

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Tak, Nie, Nie, Tak, Nie	1	0	0	1	2.3%	0.0%	0.0%	0.7%
Tak, Nie, Nie, Tak, Tak	2	0	0	2	4.5%	0.0%	0.0%	1.4%
Tak, Nie, Tak, Nie, Tak	3	2	0	5	6.8%	2.6%	0.0%	3.5%
Tak, Nie, Tak, Tak, Nie	1	0	0	1	2.3%	0.0%	0.0%	0.7%
Tak, Nie, Tak, Tak, Tak	1	0	0	1	2.3%	0.0%	0.0%	0.7%
Tak, Tak, Nie, Tak, Nie	1	0	0	1	2.3%	0.0%	0.0%	0.7%
Tak, Tak, Tak, Nie, Nie	1	0	0	1	2.3%	0.0%	0.0%	0.7%
Tak, Tak, Tak, Tak, Tak	4	1	1	6	9.1%	1.3%	4.3%	4.2%
Overall	44	77	23	144	100.0%	100.0%	100.0%	100.0%
Nie, Nie, Nie, Nie, Nie	0	2	0	2	0.0%	2.6%	0.0%	1.4%
Tak, Nie, Nie, Nie, Tak	0	2	0	2	0.0%	2.6%	0.0%	1.4%
Tak, Nie, Tak, Nie, Nie	0	2	0	2	0.0%	2.6%	0.0%	1.4%

Graph 3.14.4.1

Item S051188 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

3.1.84. Answering time:

Graph 3.14.5.1

Item S051188 answering time distribution in groups of different ability level

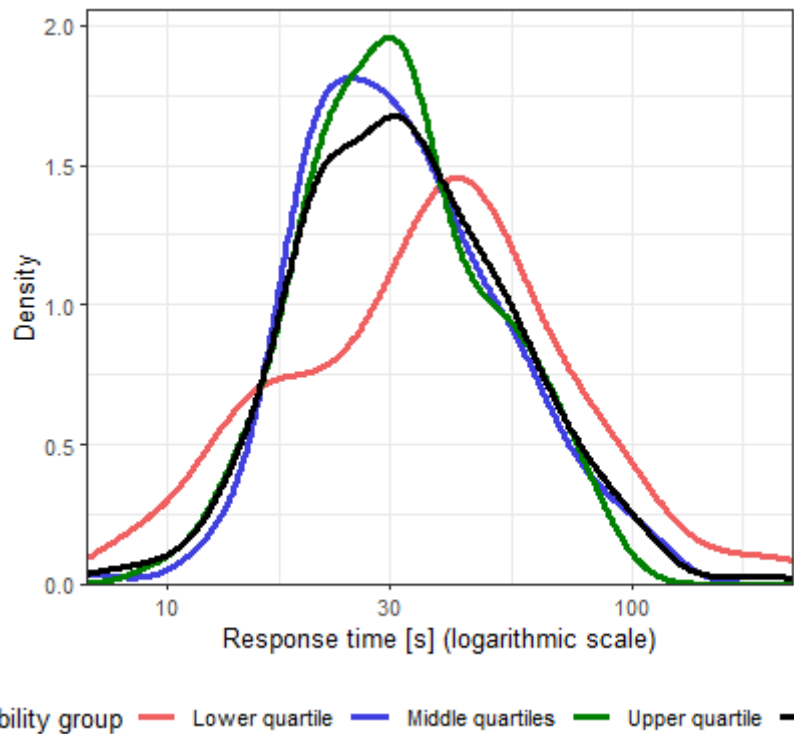


Table 3.14.5.1

Item S051188 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	7.95	23.34	39.55	53.81	220.67	3.59	0.68
Middle quartiles	6.72	21.78	30.37	43.54	113.63	3.46	0.49
Upper quartile	10.16	22.32	30.74	42.36	86.36	3.44	0.46
Overall	6.72	21.97	31.48	46.49	220.67	3.49	0.54

3.1.85. S051110 (LLM)

3.1.86. Item fit:

Graph 3.15.1.1

Item S051110 ICC and nonparametric trace line

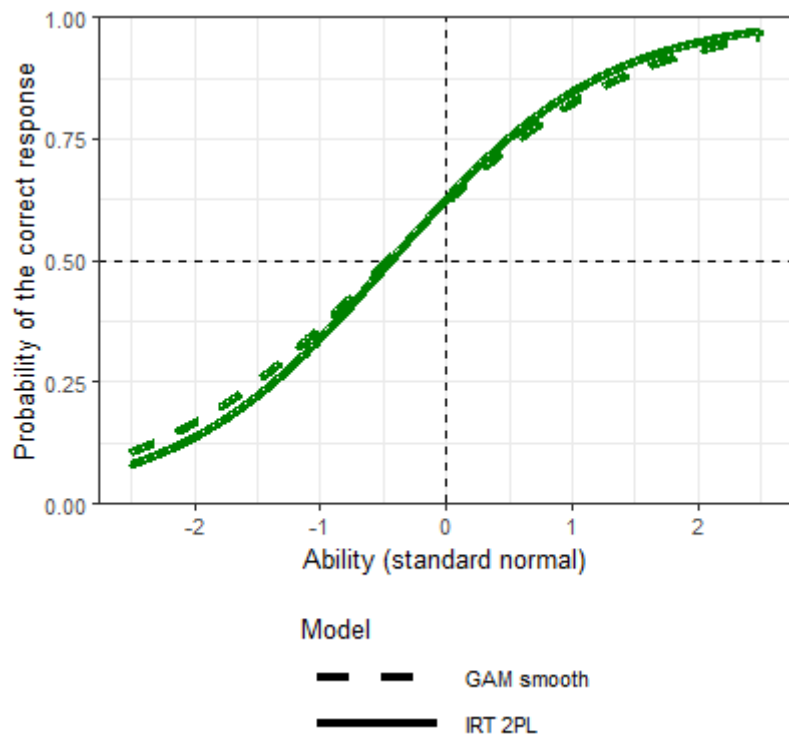


Table 3.15.1.1

Item S051110 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	61.2%	294	MC	0.4137199	0.4963837	1.18	-0.44	0.000	0.584

3.1.87. Gender DIF:

Table 3.15.2.1

Item S051110 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.31	0.191	1.000	0.010	

3.1.88. Frequency of answers:

answer	Frequency	Percent
Skorupiaki były stare, gdy umierały.	72	24.5%
Skorupiaki zjadały inne skorupiaki.	15	5.1%
Ta okolica była kiedyś pod wodą. (correct)	180	61.2%
W tej okolicy żyły różne gatunki roślin.	27	9.2%
Overall	294	100.0%

3.1.89. Distractors functioning:

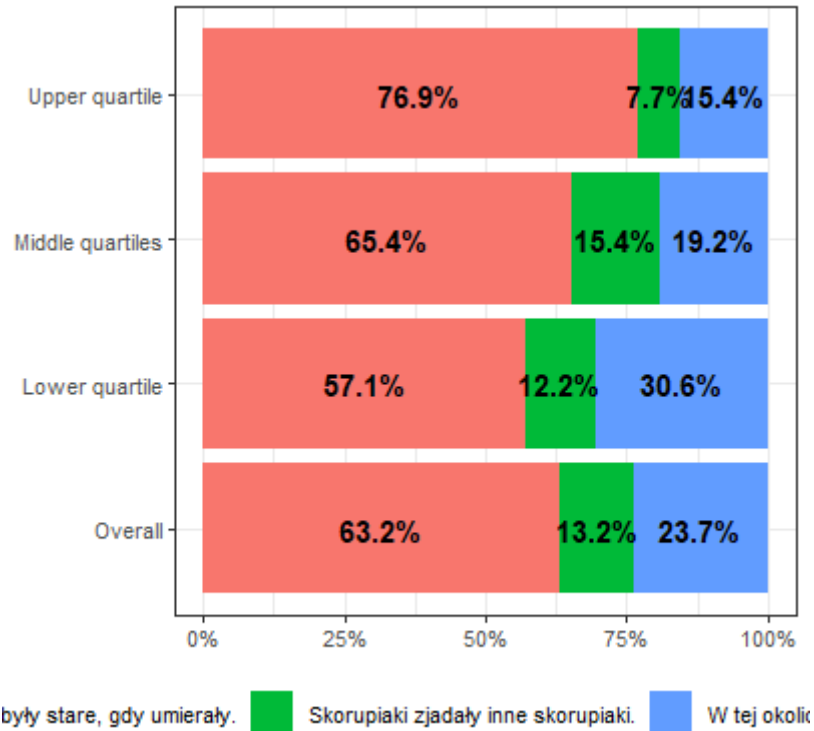
Table 3.15.4.1

Item S051110 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Skorupiaki były stare, gdy umierały.	28	34	10	72	57.1%	65.4%	76.9%	63.2%
Skorupiaki zjadały inne skorupiaki.	6	8	1	15	12.2%	15.4%	7.7%	13.2%
W tej okolicy żyły różne gatunki roślin.	15	10	2	27	30.6%	19.2%	15.4%	23.7%
Overall	49	52	13	114	100.0%	100.0%	100.0%	100.0%

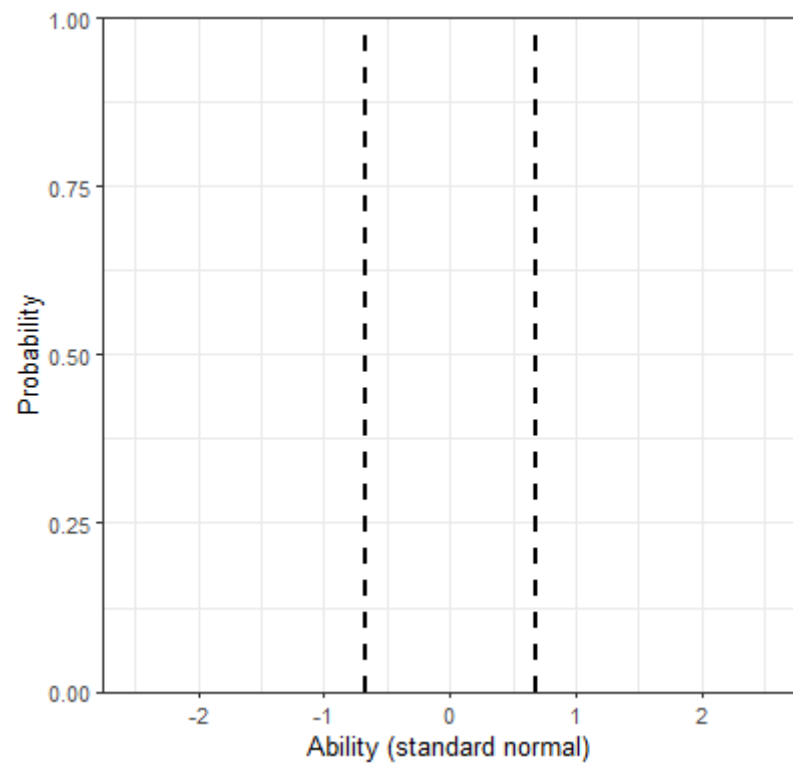
Graph 3.15.4.1

Item S051110 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.15.4.2

Item S051110 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.90. Answering time:

Graph 3.15.5.1

Item S051110 answering time distribution in groups of different ability level

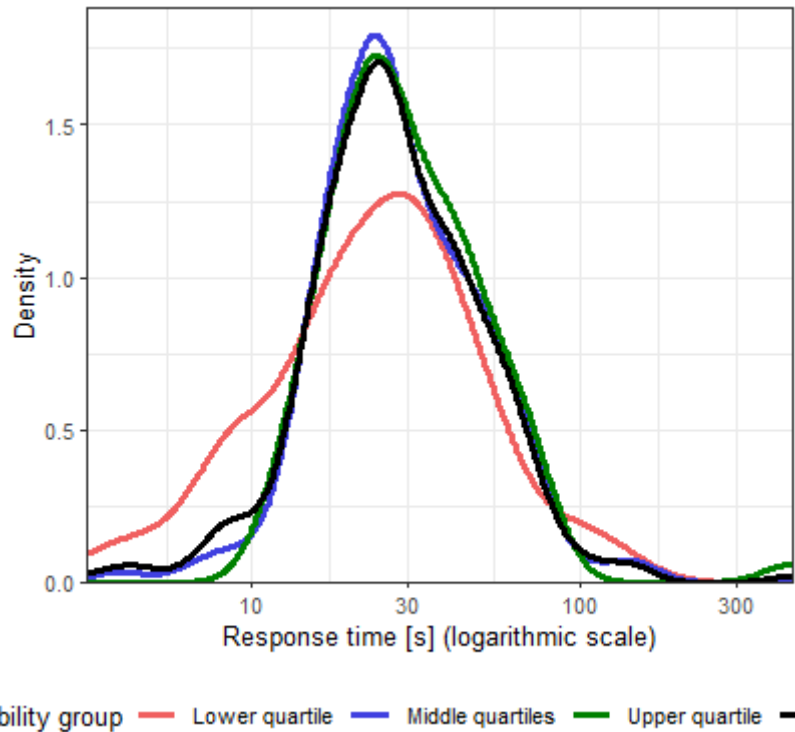


Table 3.15.5.1

Item S051110 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.15	15.30	25.12	37.49	135.33	3.14	0.76
Middle quartiles	3.92	19.52	26.28	40.44	146.60	3.34	0.56
Upper quartile	11.63	20.28	27.73	40.95	444.42	3.39	0.57
Overall	3.15	19.08	26.43	39.96	444.42	3.31	0.62

3.1.91. S090080 (LLM)

3.1.92. Item fit:

Graph 3.16.1.1

Item S090080 ICC and nonparametric trace line

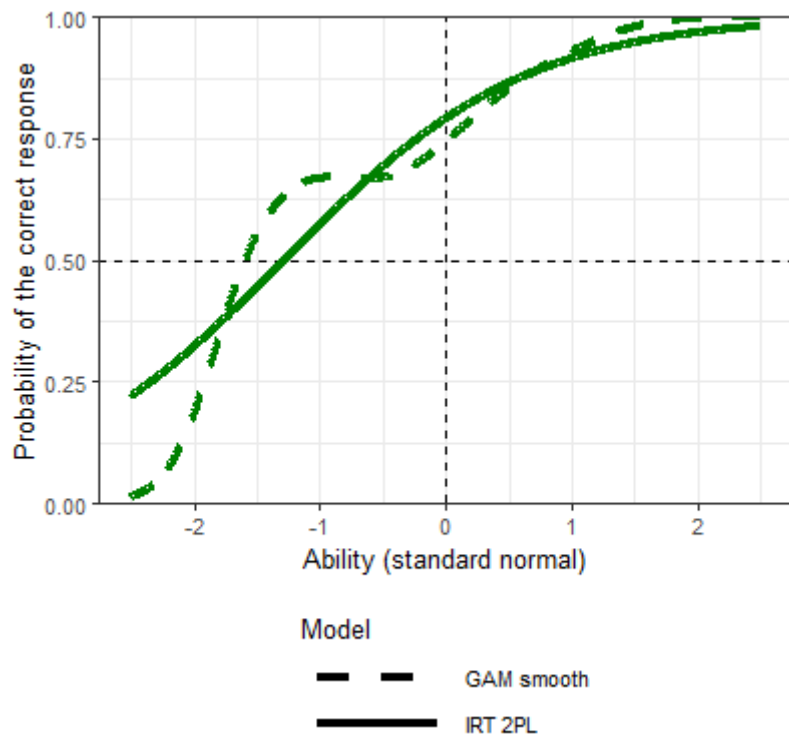


Table 3.16.1.1

Item S090080 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	75.0%	281	MC	0.3978574	0.2366779	1.04	-1.30	0.014	0.272

3.1.93. Gender DIF:

Table 3.16.2.1

Item S090080 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
7.15	0.028	1.000	0.026	

3.1.94. Frequency of answers:

answer	Frequency	Percent
Gumowa rękawica	24	8.6%
Plastikowa łyżka	26	9.3%
Srebrny widelec (correct)	210	75.0%
Szklana butelka	20	7.1%
Overall	280	100.0%

3.1.95. Distractors functioning:

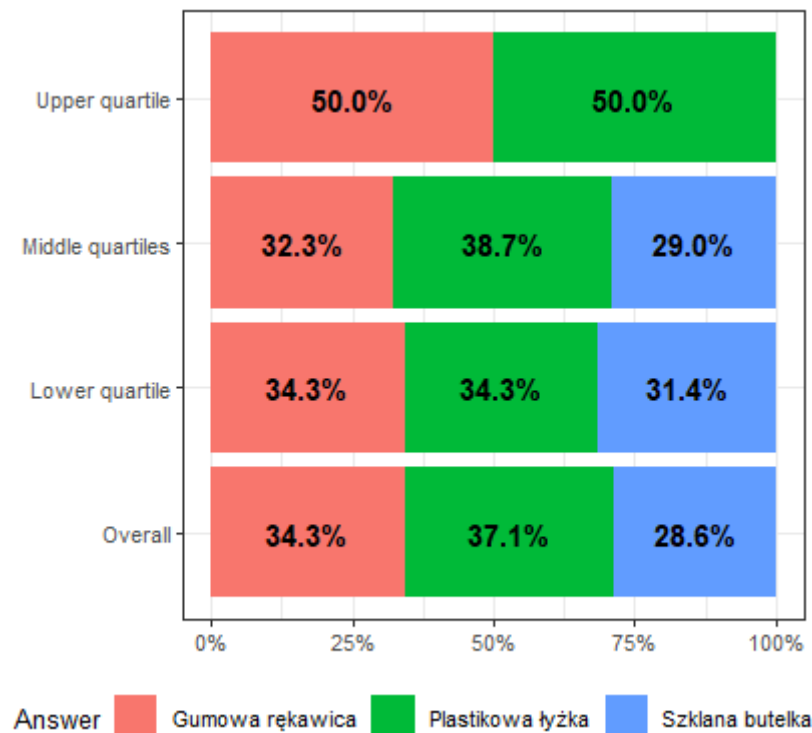
Table 3.16.4.1

Item S090080 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Gumowa rękawica	12	10	2	24	34.3%	32.3%	50.0%	34.3%
Plastikowa łyżka	12	12	2	26	34.3%	38.7%	50.0%	37.1%
Szklana butelka	11	9	0	20	31.4%	29.0%	0.0%	28.6%
Overall	35	31	4	70	100.0%	100.0%	100.0%	100.0%

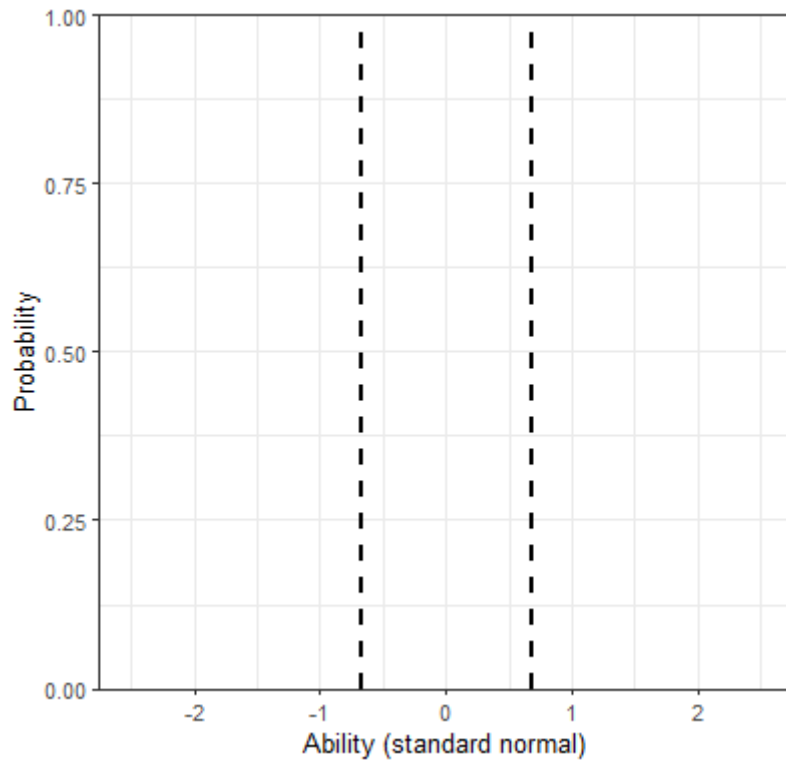
Graph 3.16.4.1

Item S090080 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.16.4.2

Item S090080 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.96. Answering time:

Graph 3.16.5.1

Item S090080 answering time distribution in groups of different ability level

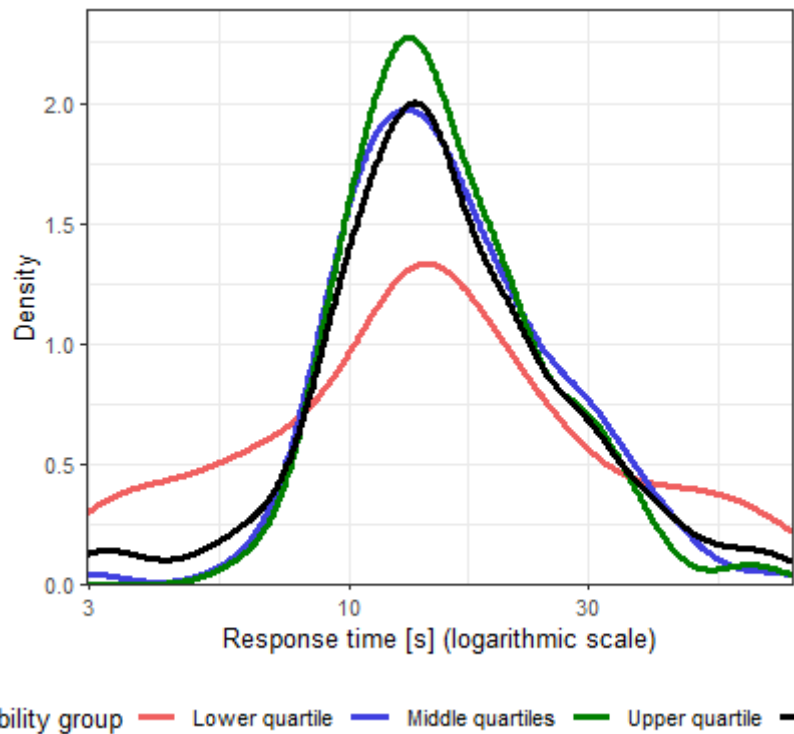


Table 3.16.5.1

Item S090080 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.04	8.79	13.82	22.14	77.29	2.65	0.80
Middle quartiles	2.98	11.24	14.66	21.06	71.97	2.76	0.49
Upper quartile	6.30	11.67	14.48	20.13	64.32	2.75	0.43
Overall	2.98	11.03	14.53	21.06	77.29	2.73	0.57

3.1.97. SP71140 (LLM)

3.1.98. Item fit:

Graph 3.17.1.1

Item SP71140 ICC and nonparametric trace line

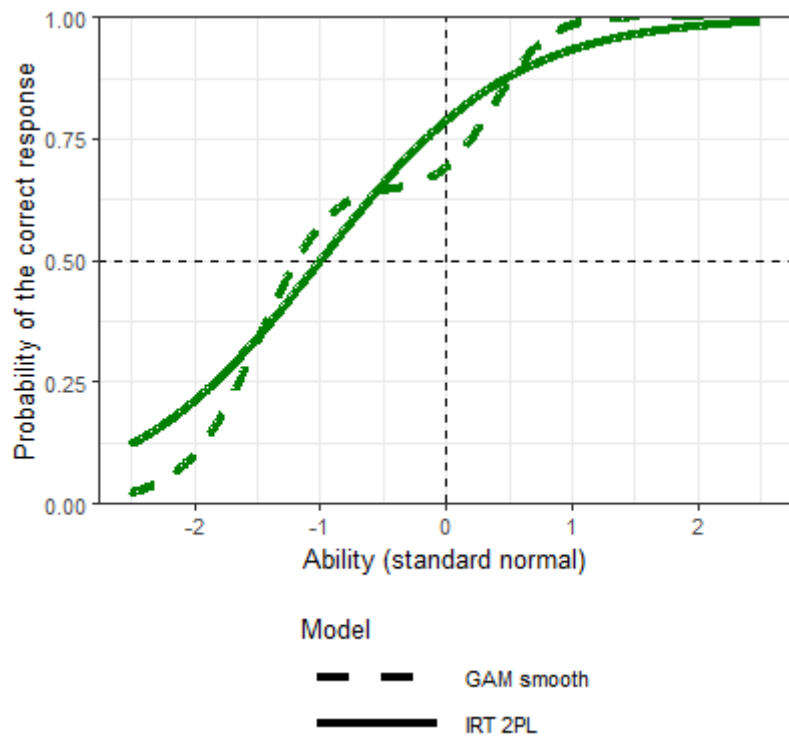


Table 3.17.1.1

Item SP71140 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	73.8%	299	MC	0.453141 7	0.483423	1.31	-1.00	0.000	0.546

3.1.99. Gender DIF:

Table 3.17.2.1

Item SP71140 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.11	0.575	1.000	0.004	

3.1.100. Frequency of answers:

answer	Frequency	Percent
Atmosfera Ziemi.	32	10.7%
Grawitacja Ziemi. (correct)	220	73.8%
Pole magnetyczne Ziemi.	38	12.8%
Ruch obrotowy Ziemi.	8	2.7%
Overall	298	100.0%

3.1.101. Distractors functioning:

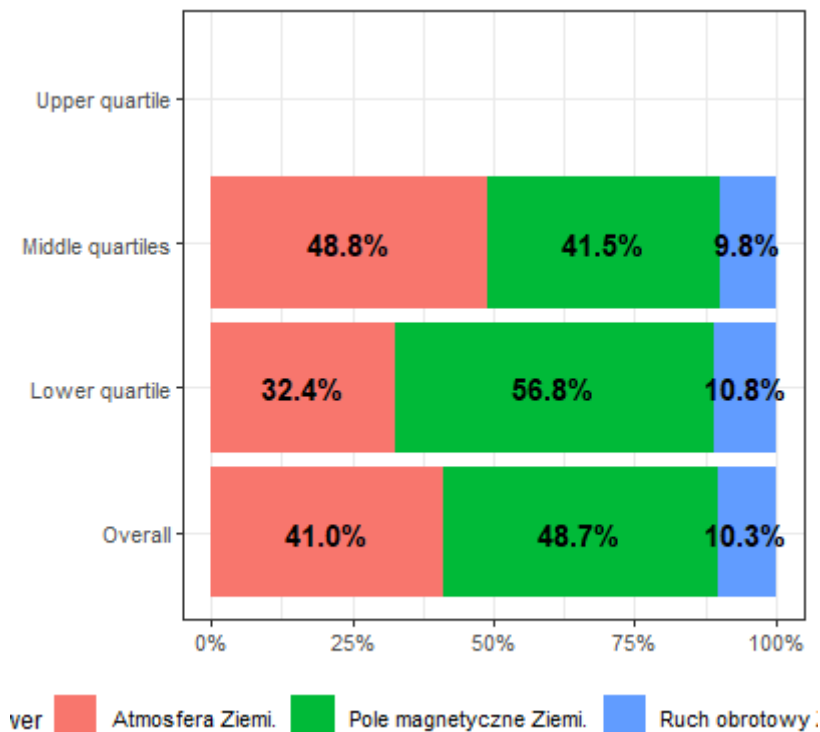
Table 3.17.4.1

Item SP71140 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Atmosfera Ziemi.	12	20	0	32	32.4%	48.8%	0.0%	41.0%
Pole magnetyczne Ziemi.	21	17	0	38	56.8%	41.5%	0.0%	48.7%
Ruch obrotowy Ziemi.	4	4	0	8	10.8%	9.8%	0.0%	10.3%
Overall	37	41	0	78	100.0%	100.0%	0.0%	100.0%

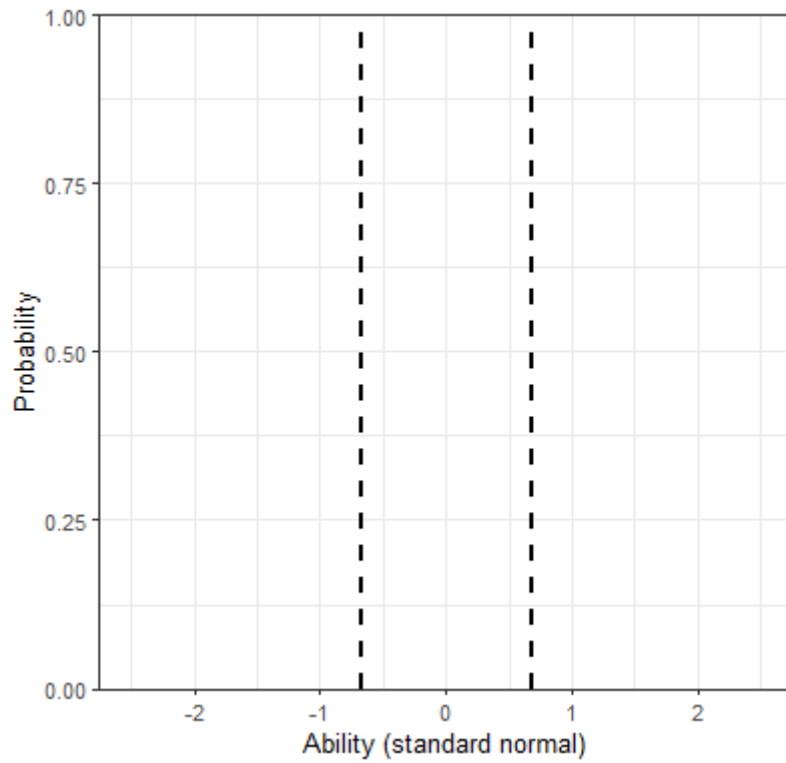
Graph 3.17.4.1

Item SP71140 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.17.4.2

Item SP71140 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.102. Answering time:

Graph 3.17.5.1

Item SP71140 answering time distribution in groups of different ability level

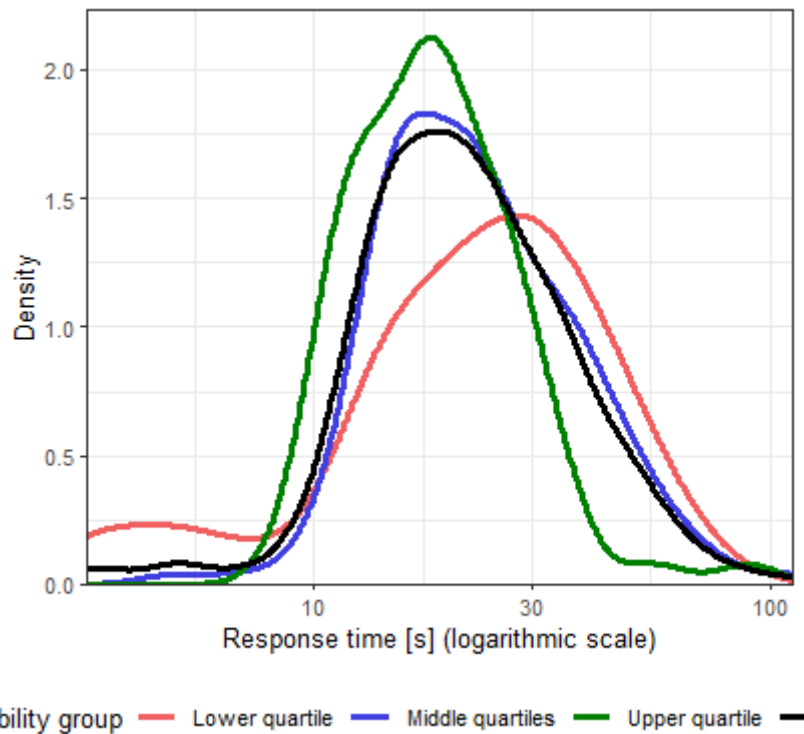


Table 3.17.5.1

Item SP71140 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.18	14.42	23.78	33.51	73.97	3.07	0.70
Middle quartiles	4.89	15.60	21.67	32.13	111.98	3.13	0.49
Upper quartile	8.68	13.02	17.90	23.87	89.66	2.91	0.41
Overall	3.18	15.12	20.87	30.08	111.98	3.06	0.54

3.1.103. S051105 (LLM)

3.1.104. Item fit:

Graph 3.18.1.1

Item S051105 ICC and nonparametric trace line

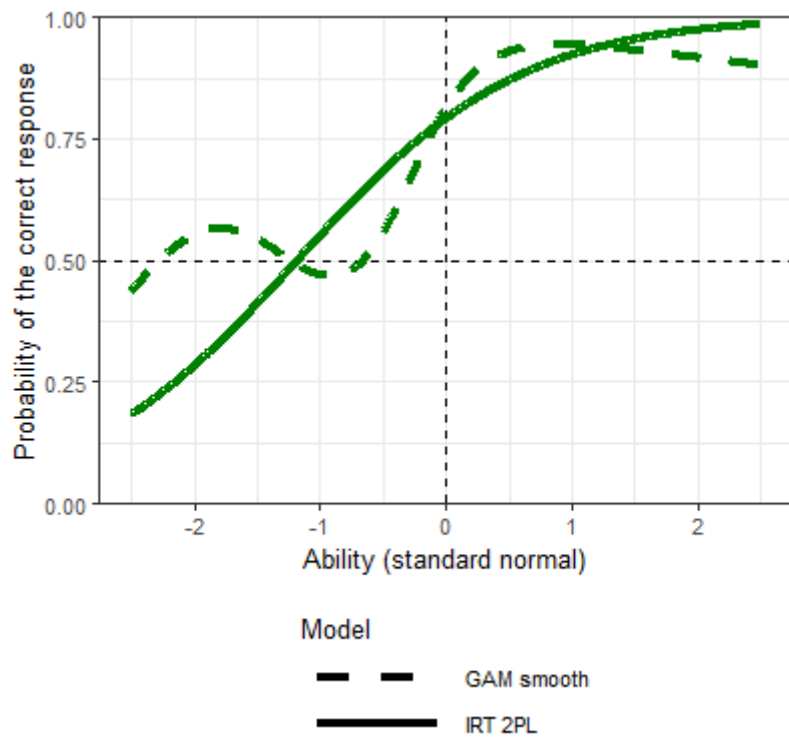


Table 3.18.1.1

Item S051105 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	73.8%	306	MC	0.383302 3	0.4400434	1.13	-1.19	0.016	0.231

3.1.105. Gender DIF:

Table 3.18.2.1

Item S051105 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
6.88	0.032	1.000		0.022

3.1.106. Frequency of answers:

answer	Frequency	Percent
Rozlała się na jezdnię.	28	9.2%
Uniosła się w powietrze. (correct)	225	73.8%
Zmieniła się w kurz.	26	8.5%
Zużyły ją drzewa.	26	8.5%
Overall	305	100.0%

3.1.107. Distractors functioning:

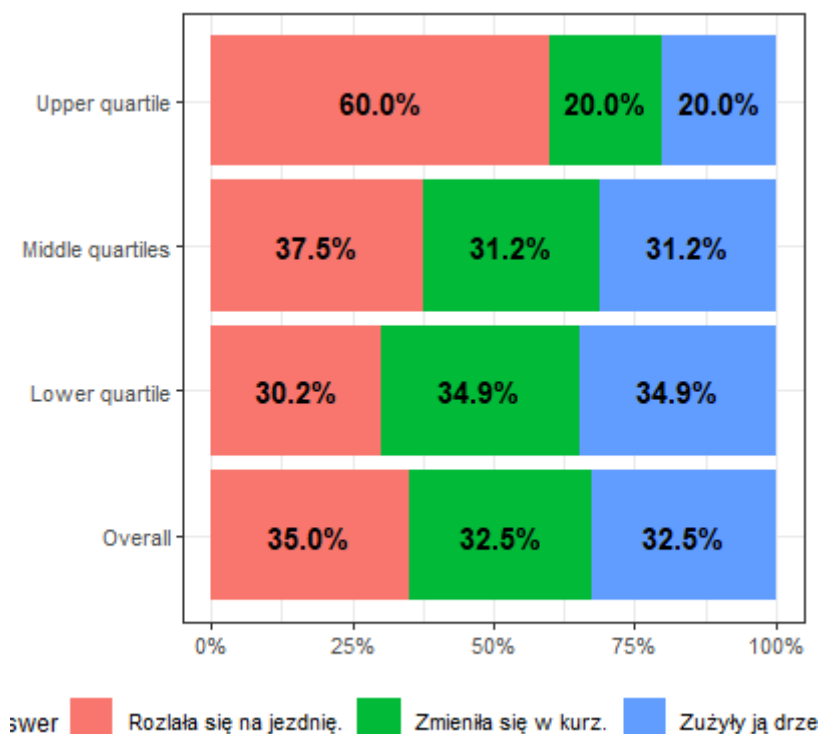
Table 3.18.4.1

Item S051105 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Rozlała się na jezdnię.	13	12	3	28	30.2%	37.5%	60.0%	35.0%
Zmieniła się w kurz.	15	10	1	26	34.9%	31.2%	20.0%	32.5%
Zużyły ją drzewa.	15	10	1	26	34.9%	31.2%	20.0%	32.5%
Overall	43	32	5	80	100.0%	100.0%	100.0%	100.0%

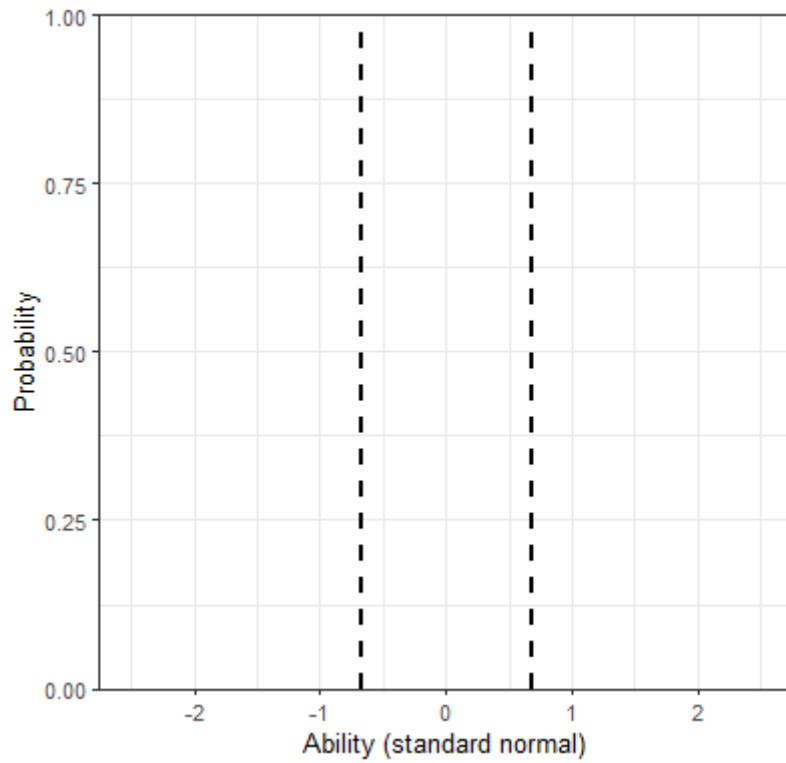
Graph 3.18.4.1

Item S051105 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.18.4.2

Item S051105 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.108. Answering time:

Graph 3.18.5.1

Item S051105 answering time distribution in groups of different ability level

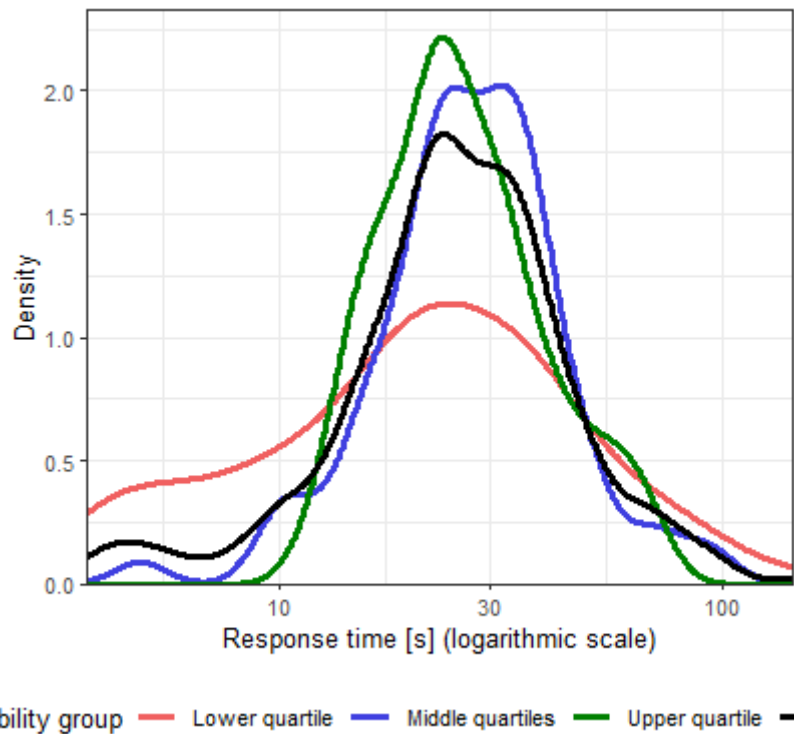


Table 3.18.5.1

Item S051105 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.72	12.18	21.66	35.30	142.96	3.01	0.83
Middle quartiles	4.76	20.52	27.43	35.66	95.20	3.29	0.50
Upper quartile	12.10	19.26	24.41	32.19	67.76	3.26	0.42
Overall	3.72	18.22	24.84	35.47	142.96	3.20	0.61

3.1.109. S890026 (TIMSS)

3.1.110. Item fit:

Graph 3.19.1.1

Item S890026 ICC and nonparametric trace line

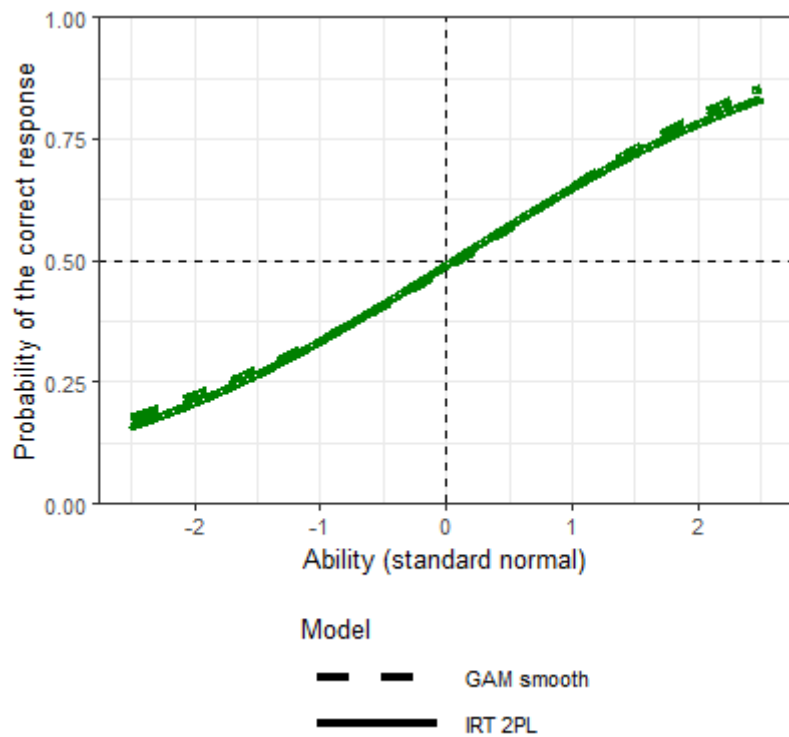


Table 3.19.1.1

Item S890026 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	thetaPVS All	thetaPVS TIMSS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	48.9%	281	MC	0.3041228	0.2283868	0.65	0.07	0.023	0.109

3.1.111. Gender DIF:

Table 3.19.2.1

Item S890026 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.39	0.824	1.000		0.001

3.1.112. Frequency of answers:

answer	Frequency	Percent
Gołąb	17	6.1%
Królik	34	12.1%
Róża	92	32.9%
Żaba (correct)	137	48.9%
Overall	280	100.0%

3.1.113. Distractors functioning:

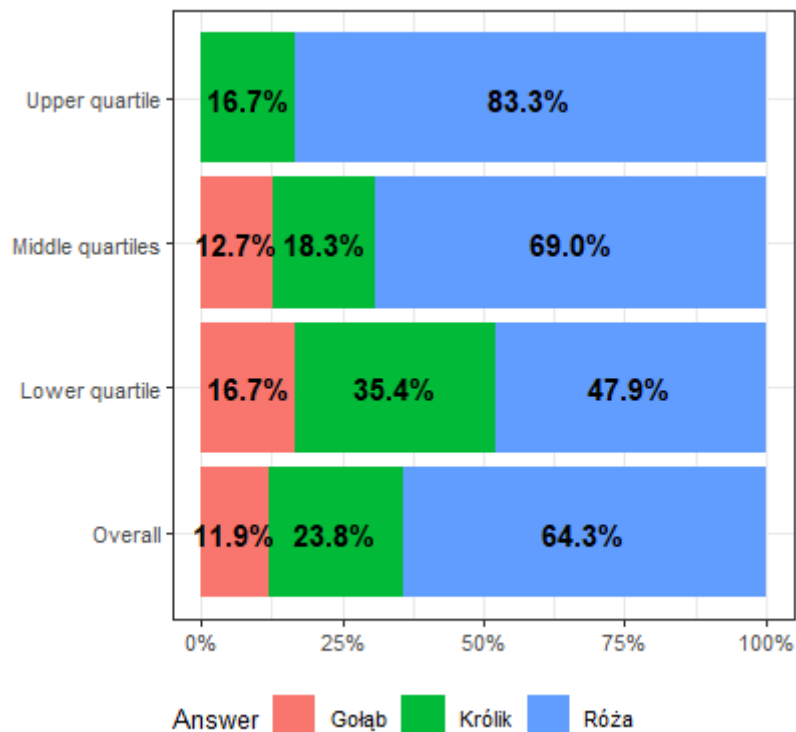
Table 3.19.4.1

Item S890026 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Gołąb	8	9	0	17	16.7%	12.7%	0.0%	11.9%
Królik	17	13	4	34	35.4%	18.3%	16.7%	23.8%
Róża	23	49	20	92	47.9%	69.0%	83.3%	64.3%
Overall	48	71	24	143	100.0%	100.0%	100.0%	100.0%

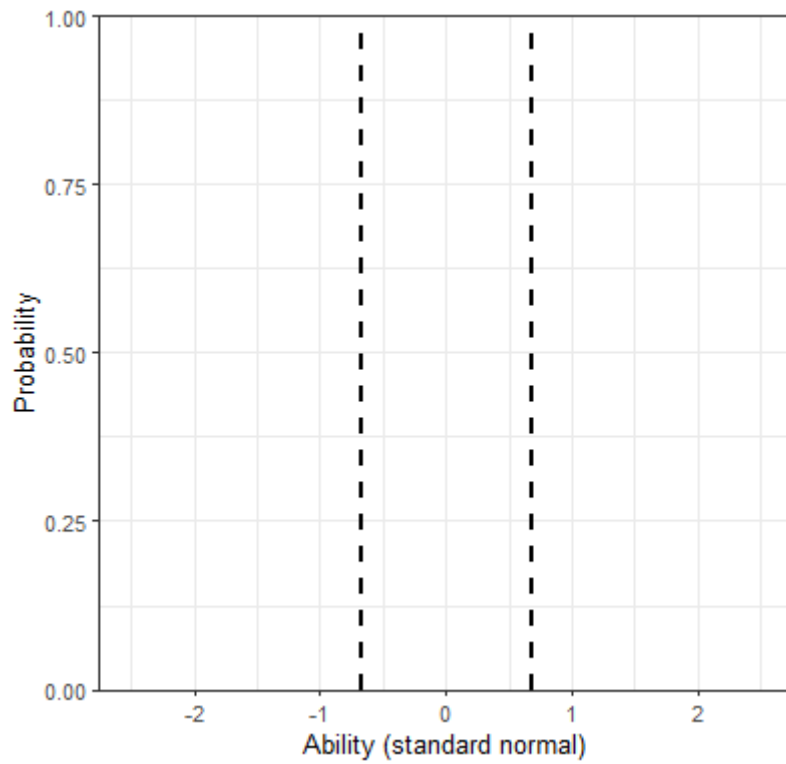
Graph 3.19.4.1

Item S890026 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.19.4.2

Item S890026 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.114. Answering time:

Graph 3.19.5.1

Item S890026 answering time distribution in groups of different ability level

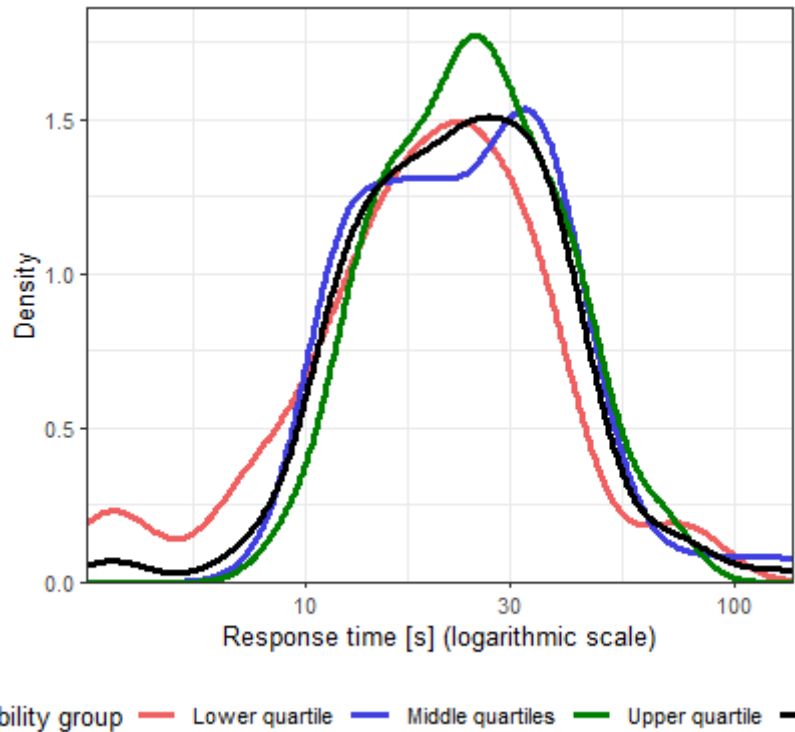


Table 3.19.5.1

Item S890026 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.11	13.74	20.00	27.50	87.34	2.93	0.68
Middle quartiles	7.99	15.41	23.12	34.50	136.47	3.16	0.54
Upper quartile	9.25	16.64	24.95	34.05	68.47	3.19	0.46
Overall	3.11	15.25	22.96	33.85	136.47	3.11	0.57

3.1.115. S100015 (LLM)

3.1.116. Item fit:

Graph 3.20.1.1

Item S100015 ICC and nonparametric trace line

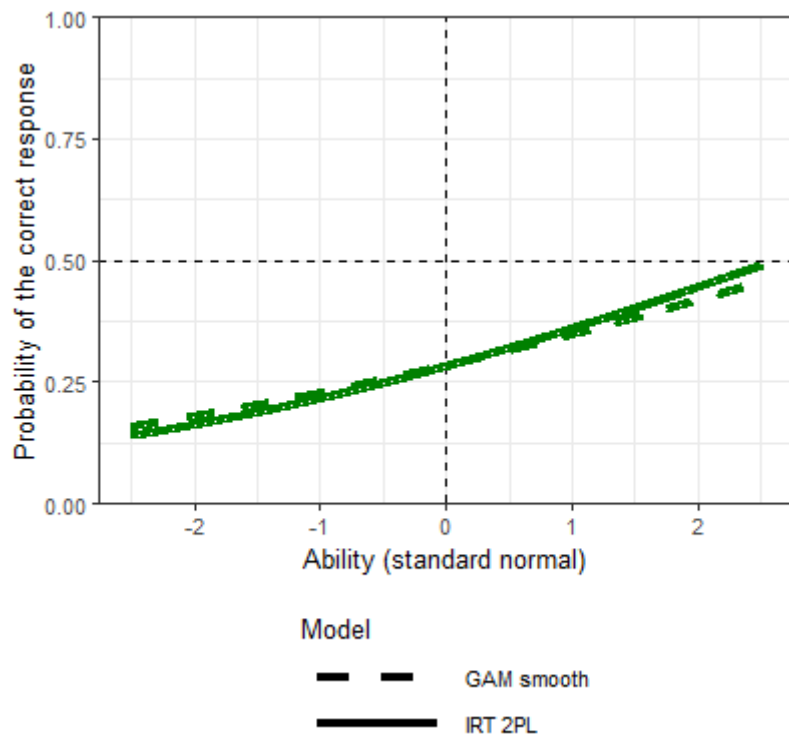


Table 3.20.1.1

Item S100015 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	28.6%	305	MC	0.135156 4	0.1503002	0.36	2.62	0.000	0.460

3.1.117. Gender DIF:

Table 3.20.2.1

Item S100015 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
4.37	0.112	1.000	0.014	

3.1.118. Frequency of answers:

answer	Frequency	Percent
Drewno ma większą gęstość niż woda.	68	22.4%
Guma ma mniejszą gęstość niż metal, ale większą niż woda. (correct)	87	28.6%
Guma ma większą gęstość niż drewno, ale mniejszą niż metal.	103	33.9%
Metal ma mniejszą gęstość niż woda.	46	15.1%
Overall	304	100.0%

3.1.119. Distractors functioning:

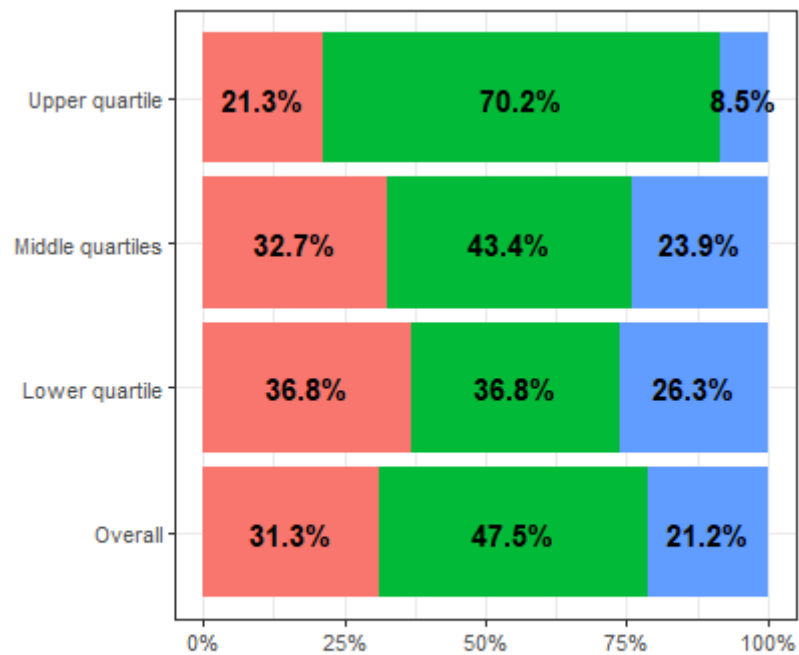
Table 3.20.4.1

Item S100015 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Drewno ma większą gęstość niż woda.	21	37	10	68	36.8%	32.7%	21.3%	31.3%
Guma ma większą gęstość niż drewno, ale mniejszą niż metal.	21	49	33	103	36.8%	43.4%	70.2%	47.5%
Metal ma mniejszą gęstość niż woda.	15	27	4	46	26.3%	23.9%	8.5%	21.2%
Overall	57	113	47	217	100.0%	100.0%	100.0%	100.0%

Graph 3.20.4.1

Item S100015 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

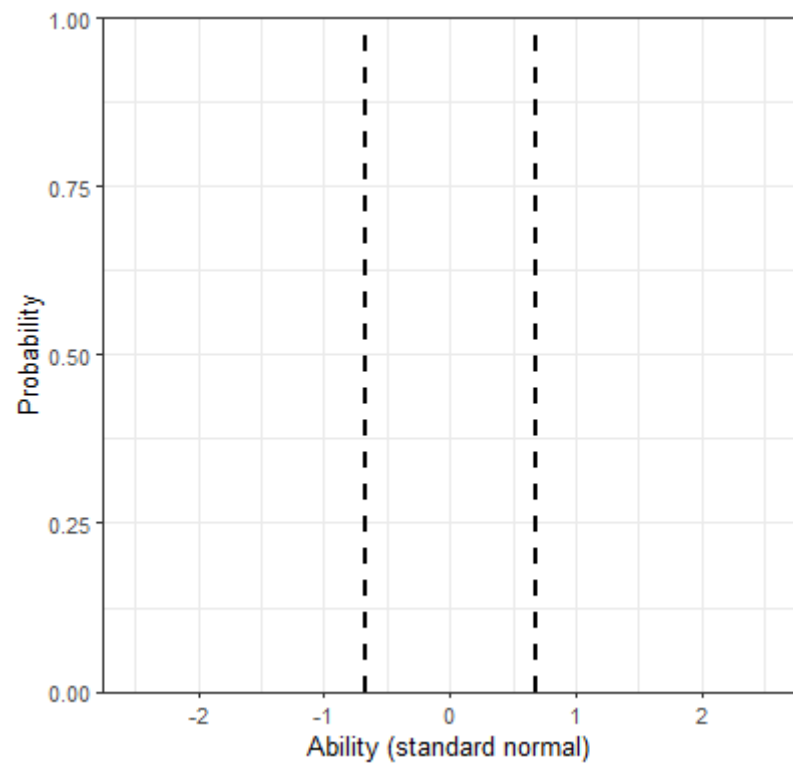


ść niż woda. ■ Guma ma większą gęstość niż drewno, ale mniejszą niż metal.

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Graph 3.20.4.2

Item S100015 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.120. Answering time:

Graph 3.20.5.1

Item S100015 answering time distribution in groups of different ability level

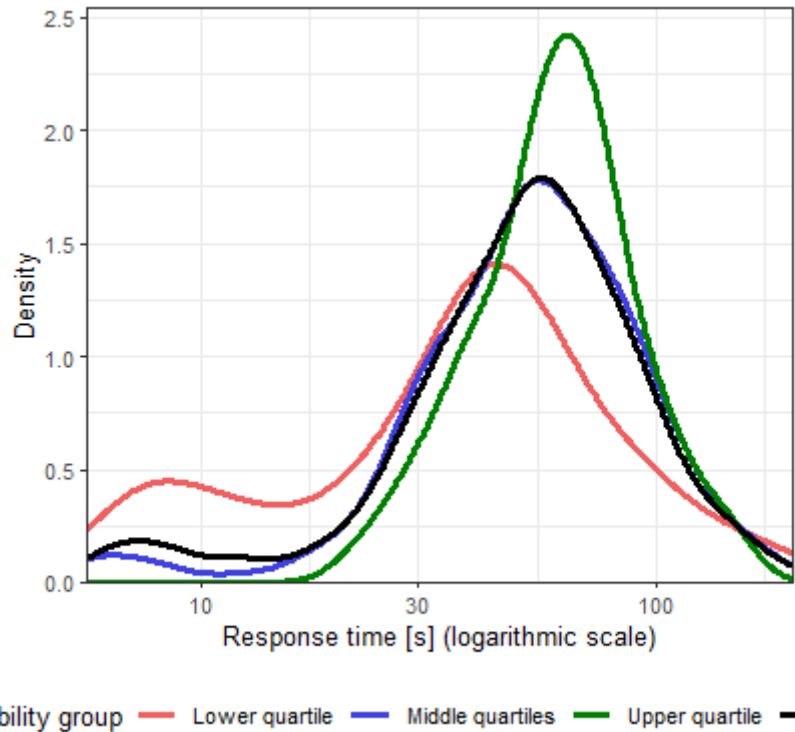


Table 3.20.5.1

Item S100015 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.90	24.03	40.26	58.53	199.04	3.57	0.83
Middle quartiles	5.62	37.70	53.89	76.44	186.95	3.94	0.61
Upper quartile	22.04	47.41	61.38	77.39	148.46	4.09	0.40
Overall	5.62	36.65	53.25	73.26	199.04	3.89	0.66

3.1.121. S041102 (TIMSS)

3.1.122. Item fit:

Graph 3.21.1.1

Item S041102 ICC and nonparametric trace line

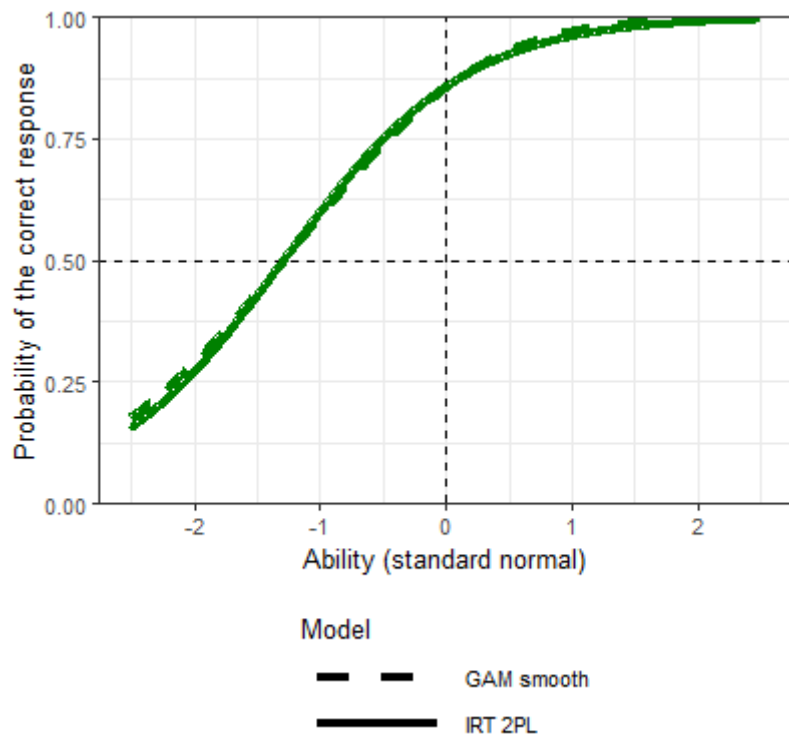


Table 3.21.1.1

Item S041102 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	78.6%	305	MC	0.448516 3	0.4437423	1.39	-1.29	0.000	0.631

3.1.123. Gender DIF:

Table 3.21.2.1

Item S041102 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.29	0.525	1.000	0.005	

3.1.124. Frequency of answers:

answer	Frequency	Percent
W miejscu A.	25	8.2%
W miejscu B.	36	11.8%
W miejscu C. (correct)	239	78.6%
W miejscu D.	4	1.3%
Overall	304	100.0%

3.1.125. Distractors functioning:

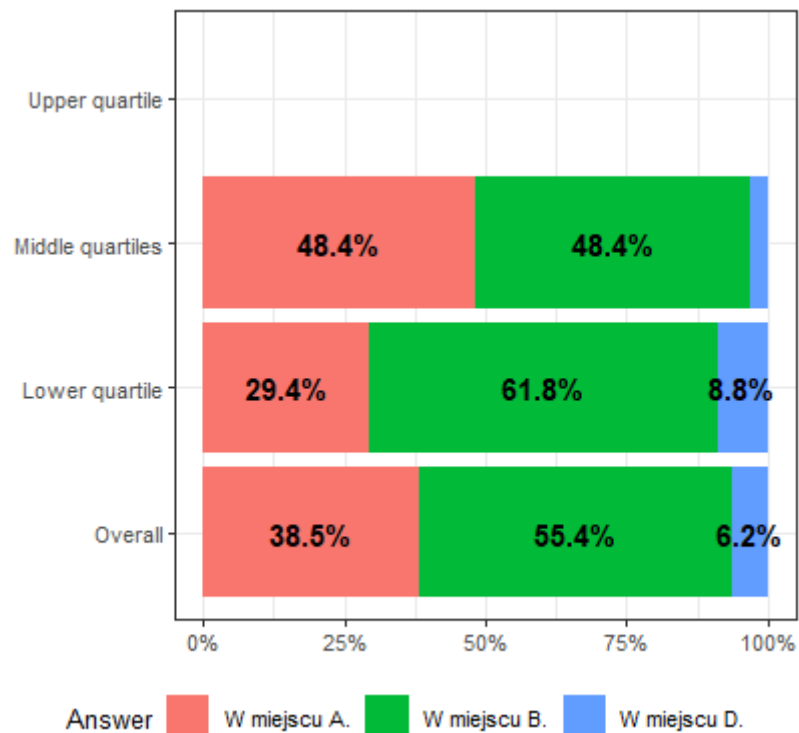
Table 3.21.4.1

Item S041102 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
W miejsca A.	10	15	0	25	29.4%	48.4%	0.0%	38.5%
W miejsca B.	21	15	0	36	61.8%	48.4%	0.0%	55.4%
W miejsca D.	3	1	0	4	8.8%	3.2%	0.0%	6.2%
Overall	34	31	0	65	100.0%	100.0%	0.0%	100.0%

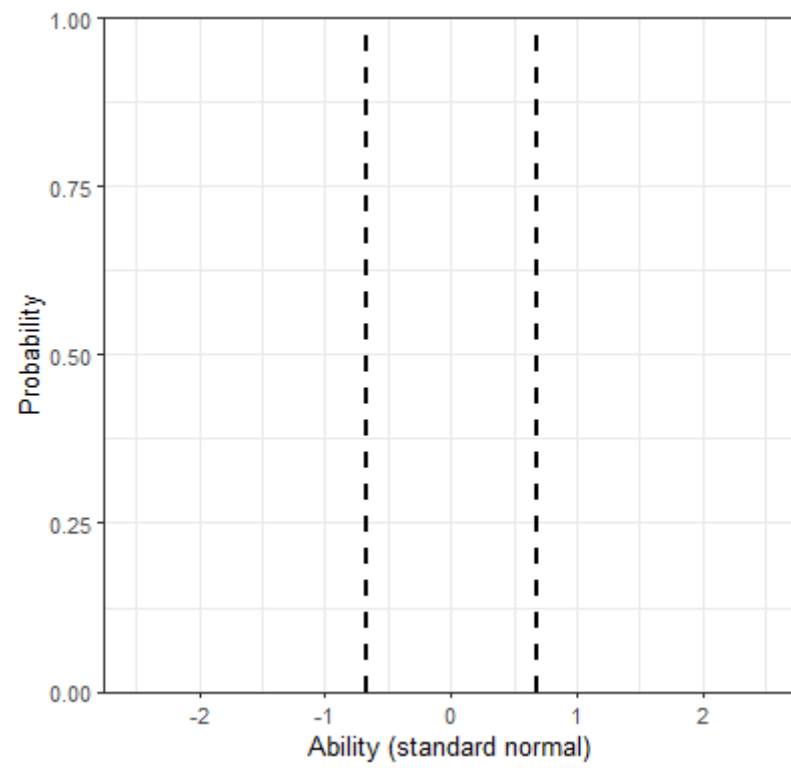
Graph 3.21.4.1

Item S041102 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.21.4.2

Item S041102 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.126. Answering time:

Graph 3.21.5.1

Item S041102 answering time distribution in groups of different ability level

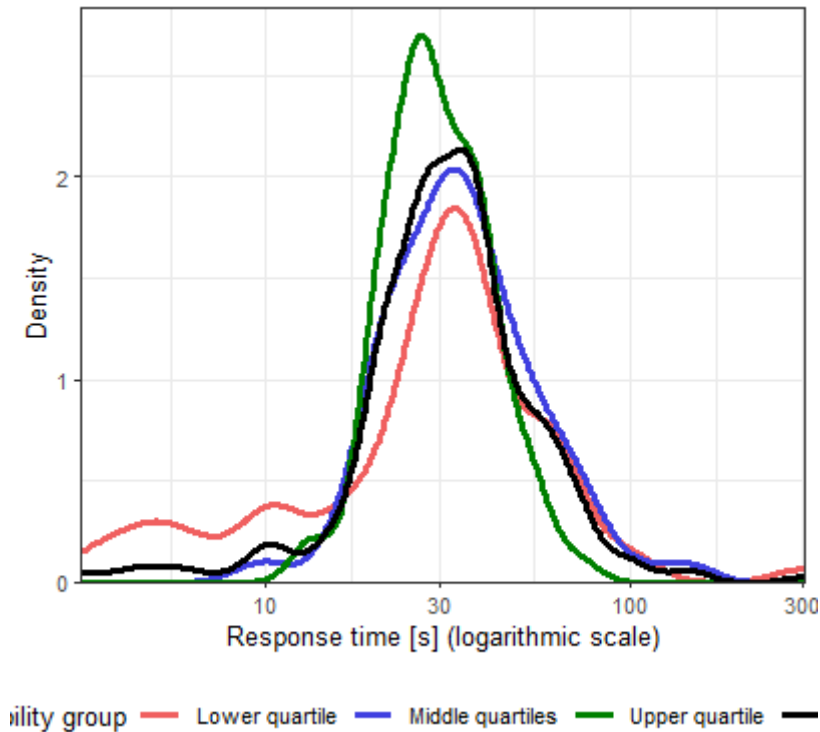


Table 3.21.5.1

Item S041102 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.13	20.38	31.07	38.66	301.79	3.28	0.83
Middle quartiles	8.77	24.91	33.80	45.34	153.71	3.54	0.48
Upper quartile	13.34	23.93	28.19	37.38	73.03	3.39	0.33
Overall	3.13	24.37	31.90	40.91	301.79	3.44	0.57

3.1.127. S061028 (TIMSS)

3.1.128. Item fit:

Graph 3.22.1.1

Item S061028 ICC and nonparametric trace line

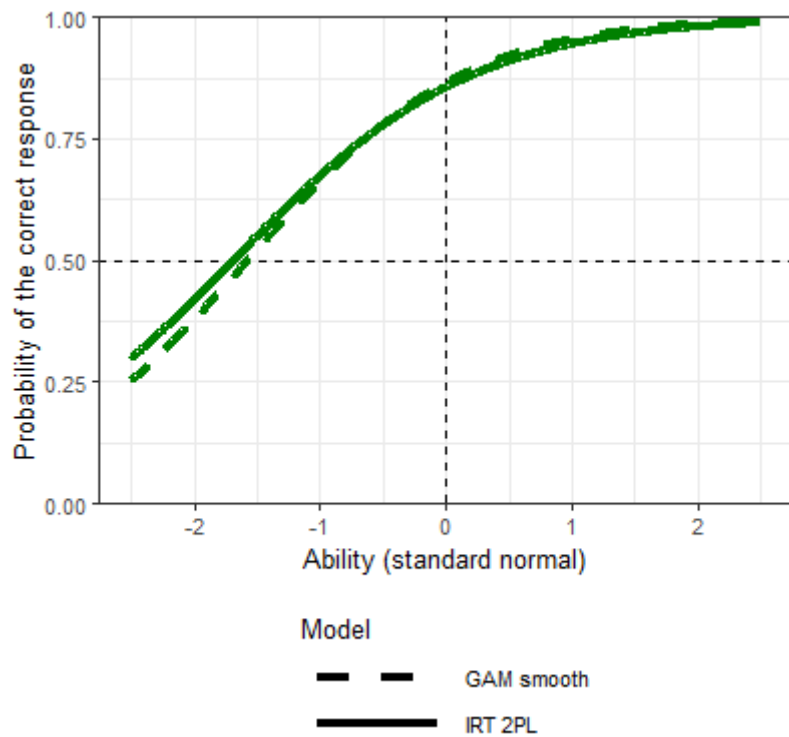


Table 3.22.1.1

Item S061028 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	80.9%	305	MC	0.387267 5	0.3715065	1.05	-1.69	0.020	0.154

3.1.129. Gender DIF:

Table 3.22.2.1

Item S061028 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.43	0.297	1.000		0.009

3.1.130. Frequency of answers:

answer	Frequency	Percent
Chleb.	35	11.5%
Ryba. (correct)	246	80.9%
Warzywa zielone	10	3.3%
Świeże owoce.	13	4.3%
Overall	304	100.0%

3.1.131. Distractors functioning:

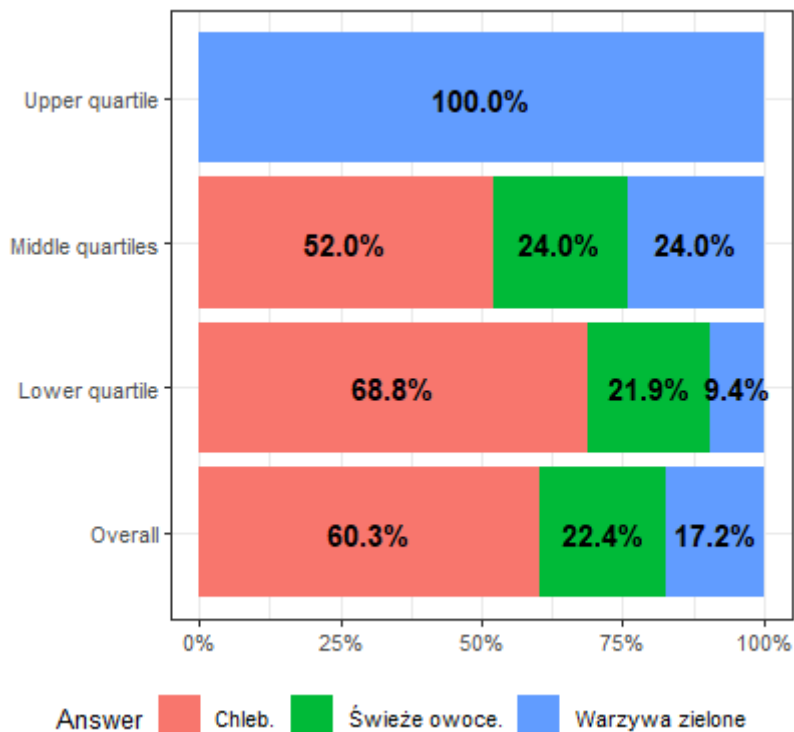
Table 3.22.4.1

Item S061028 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Chleb.	22	13	0	35	68.8%	52.0%	0.0%	60.3%
Warzywa zielone	3	6	1	10	9.4%	24.0%	100.0%	17.2%
Świeże owoce.	7	6	0	13	21.9%	24.0%	0.0%	22.4%
Overall	32	25	1	58	100.0%	100.0%	100.0%	100.0%

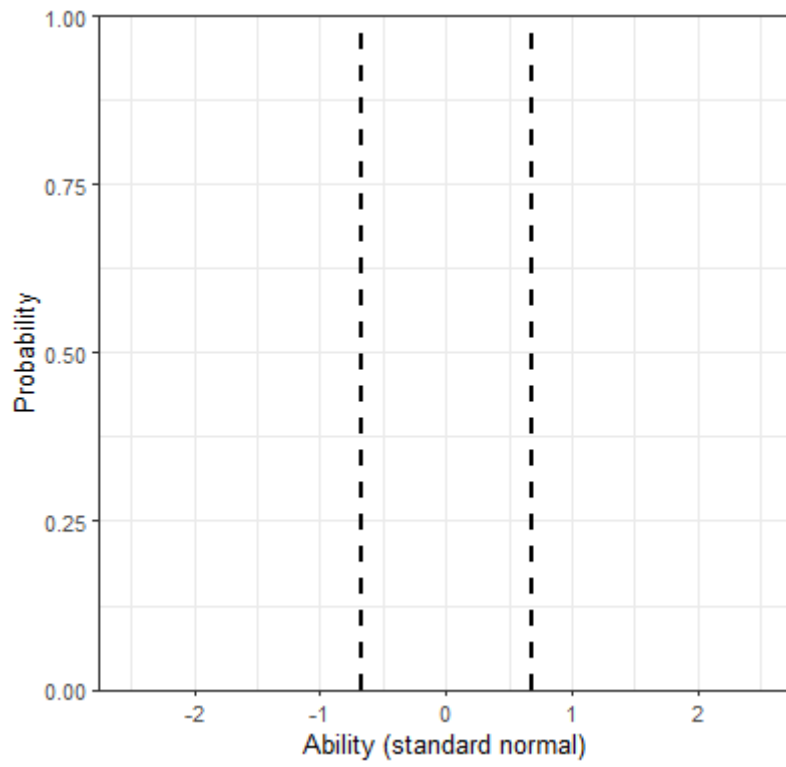
Graph 3.22.4.1

Item S061028 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.22.4.2

Item S061028 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.132. Answering time:

Graph 3.22.5.1

Item S061028 answering time distribution in groups of different ability level

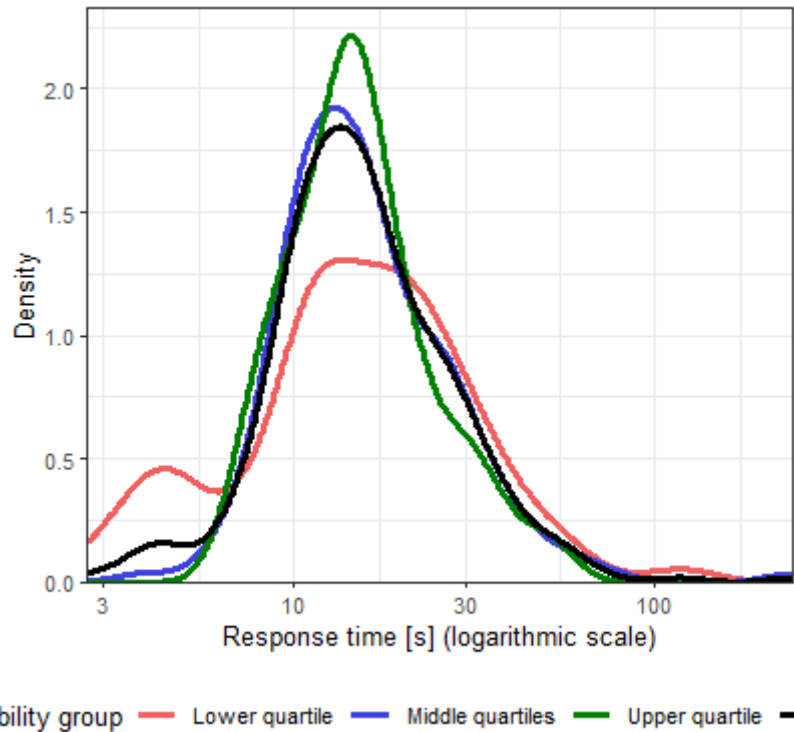


Table 3.22.5.1

Item S061028 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.71	10.30	16.14	23.03	118.60	2.69	0.74
Middle quartiles	3.80	11.03	14.90	22.03	241.05	2.77	0.54
Upper quartile	6.94	10.93	14.59	19.36	51.43	2.73	0.46
Overall	2.71	10.78	14.79	21.91	241.05	2.74	0.58

3.1.133. S090064 (TIMSS)

3.1.134. Item fit:

Graph 3.23.1.1

Item S090064 ICC and nonparametric trace line

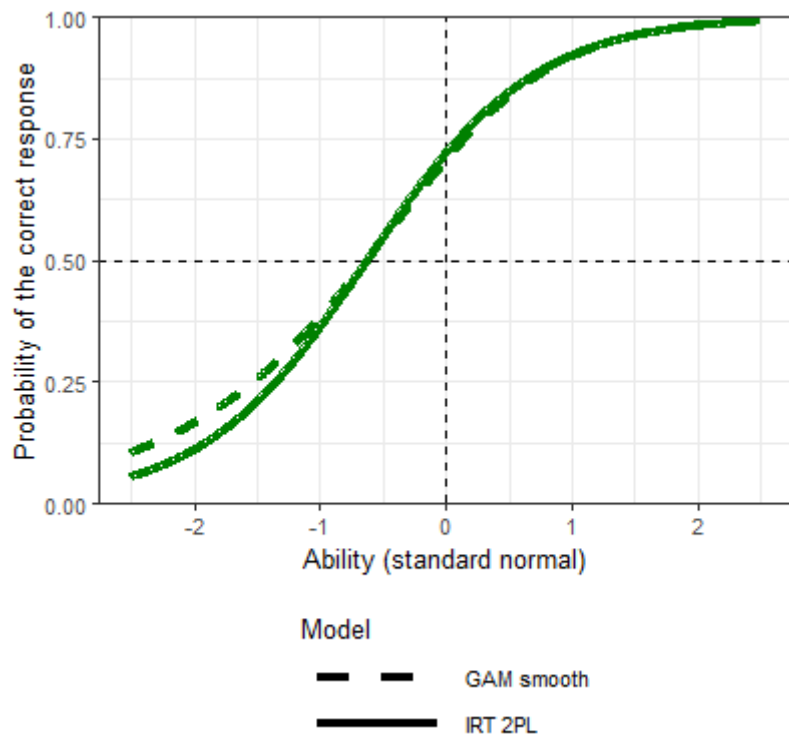


Table 3.23.1.1

Item S090064 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	66.1%	281	MC	0.506242 3	0.341758	1.51	-0.63	0.000	0.481

3.1.135. Gender DIF:

Table 3.23.2.1

Item S090064 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.47	0.480	1.000		0.005

3.1.136. Frequency of answers:

answer	Frequency	Percent
Woda zmienia się z ciała stałego w ciecz.	44	15.7%
Woda zmienia się z cieczy w ciało stałe. (correct)	185	66.1%
Woda zmienia się z cieczy w gaz.	27	9.6%
Woda zmienia się z gazu w ciecz.	24	8.6%
Overall	280	100.0%

3.1.137. Distractors functioning:

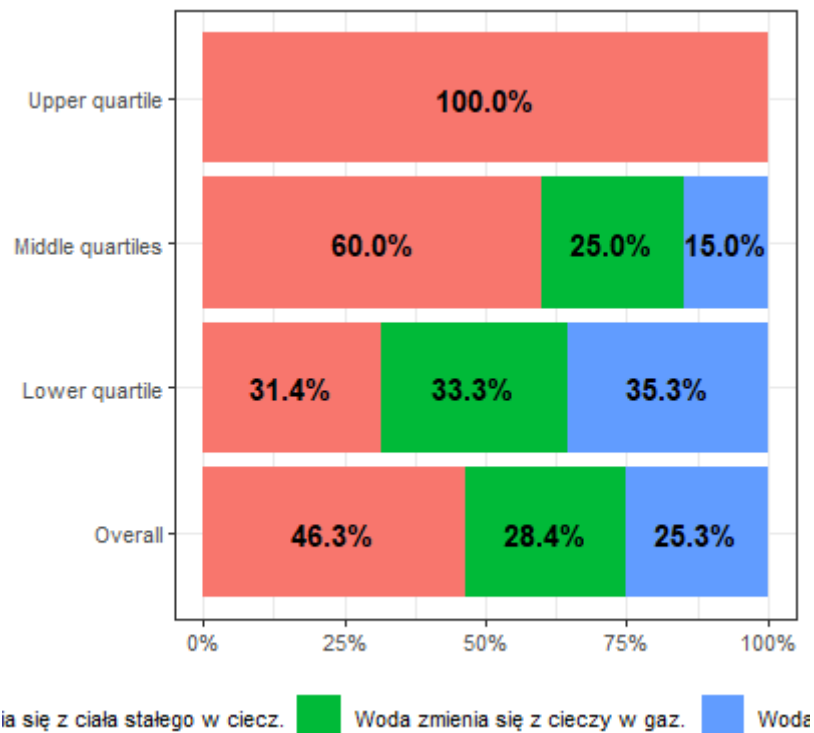
Table 3.23.4.1

Item S090064 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Woda zmienia się z ciała stałego w ciecz.	16	24	4	44	31.4%	60.0%	100.0%	46.3%
Woda zmienia się z cieczy w gaz.	17	10	0	27	33.3%	25.0%	0.0%	28.4%
Woda zmienia się z gazu w ciecz.	18	6	0	24	35.3%	15.0%	0.0%	25.3%
Overall	51	40	4	95	100.0%	100.0%	100.0%	100.0%

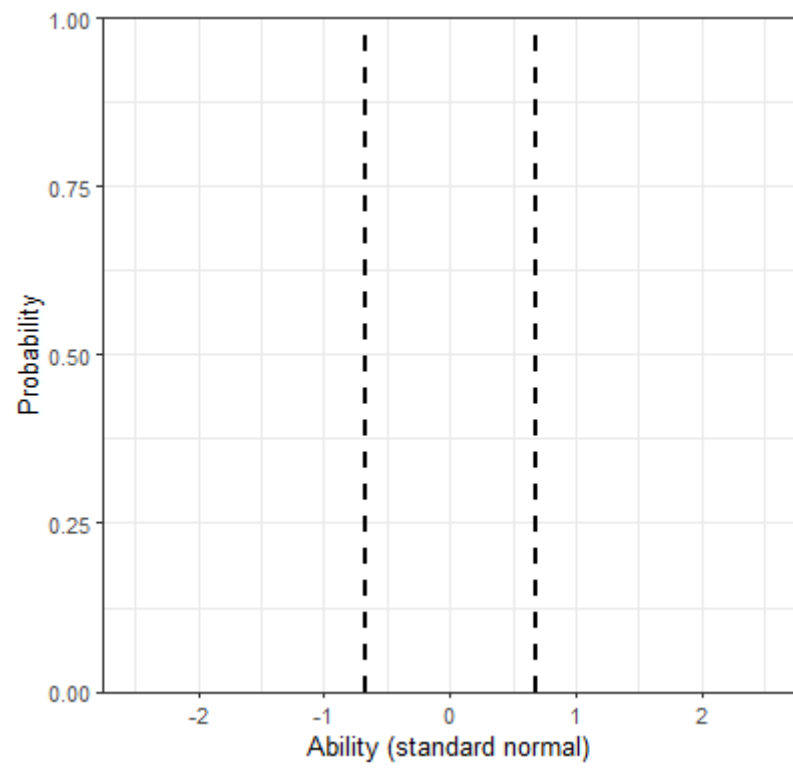
Graph 3.23.4.1

Item S090064 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.23.4.2

Item S090064 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.138. Answering time:

Graph 3.23.5.1

Item S090064 answering time distribution in groups of different ability level

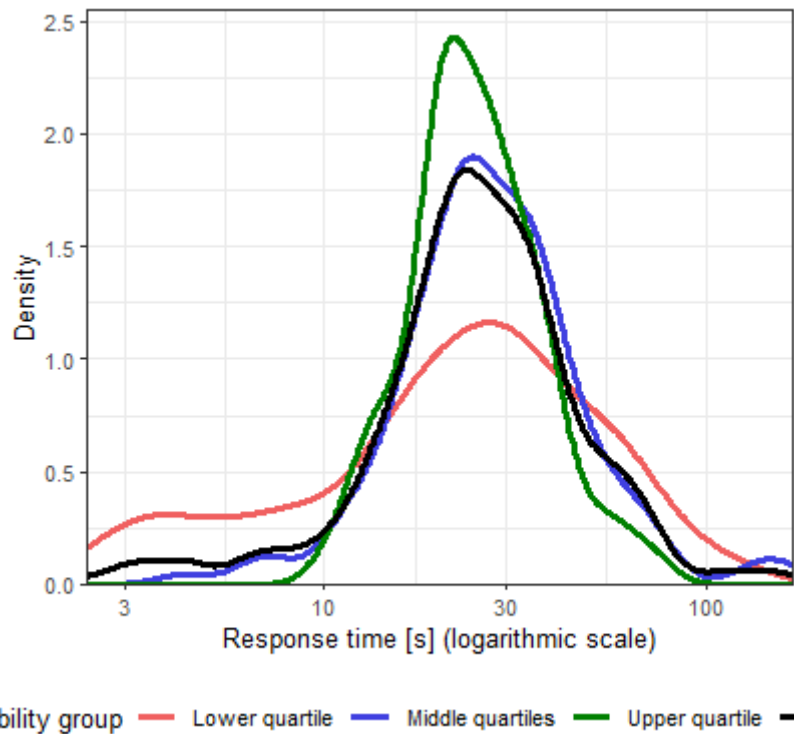


Table 3.23.5.1

Item S090064 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.41	14.16	23.44	37.69	111.28	3.04	0.90
Middle quartiles	4.31	19.83	26.25	36.57	167.09	3.30	0.56
Upper quartile	10.29	19.90	24.41	31.45	73.46	3.21	0.39
Overall	2.41	18.51	25.13	35.46	167.09	3.21	0.64

3.1.139. S090051 (TIMSS)

3.1.140. Item fit:

Graph 3.24.1.1

Item S090051 ICC and nonparametric trace line

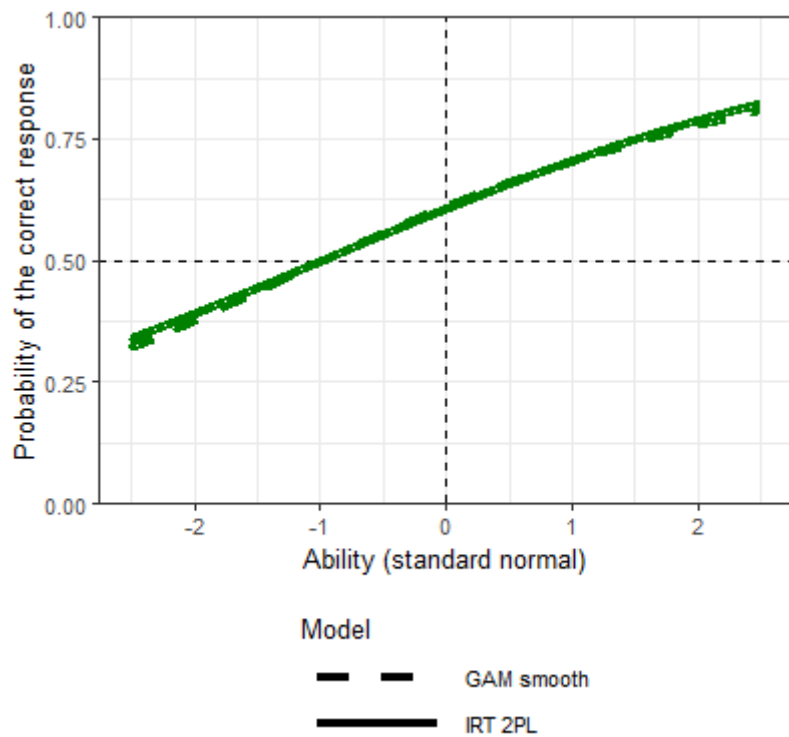


Table 3.24.1.1

Item S090051 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	59.9%	304	MC	0.2048187	0.167821	0.44	-0.97	0.020	0.154

3.1.141. Gender DIF:

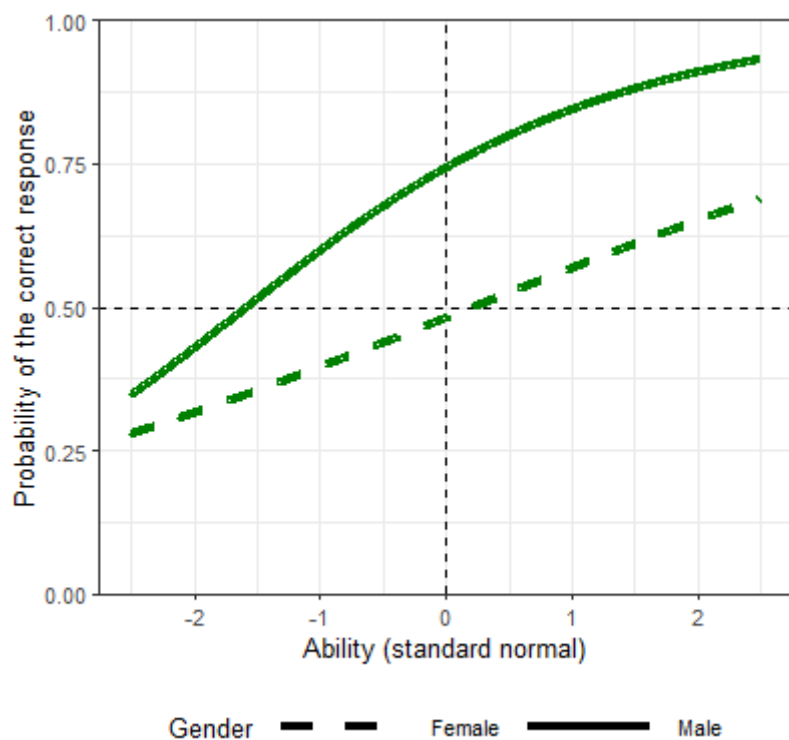
Table 3.24.2.1

Item S090051 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
17.99	0.000	0.012	0.051	moderate

Graph 3.24.2.1

Item S090051 gender-specific ICCs



3.1.142. Frequency of answers:

answer	Frequency	Percent
Drewno	44	14.5%
Guma	42	13.8%
Miedź (correct)	182	59.9%
Szkło	36	11.8%
Overall	304	100.0%

3.1.143. Distractors functioning:

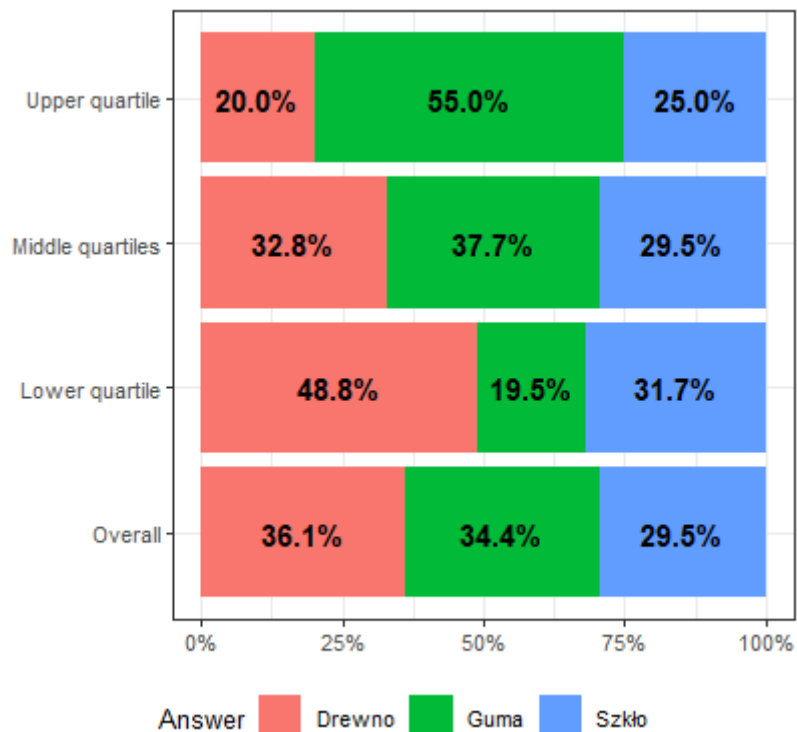
Table 3.24.4.1

Item S090051 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Drewno	20	20	4	44	48.8%	32.8%	20.0%	36.1%
Guma	8	23	11	42	19.5%	37.7%	55.0%	34.4%
Szkło	13	18	5	36	31.7%	29.5%	25.0%	29.5%
Overall	41	61	20	122	100.0%	100.0%	100.0%	100.0%

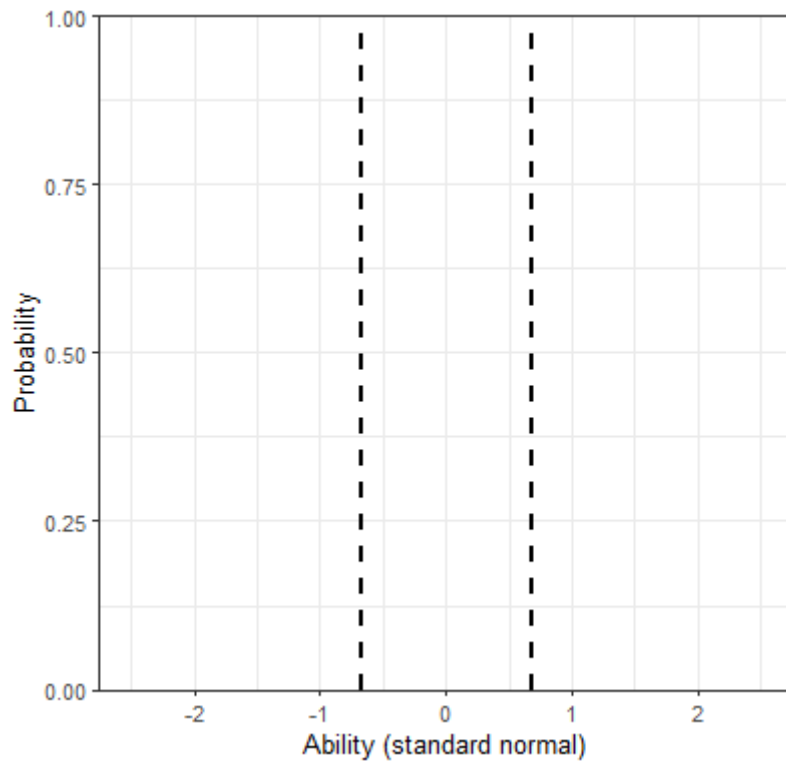
Graph 3.24.4.1

Item S090051 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.24.4.2

Item S090051 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.144. Answering time:

Graph 3.24.5.1

Item S090051 answering time distribution in groups of different ability level

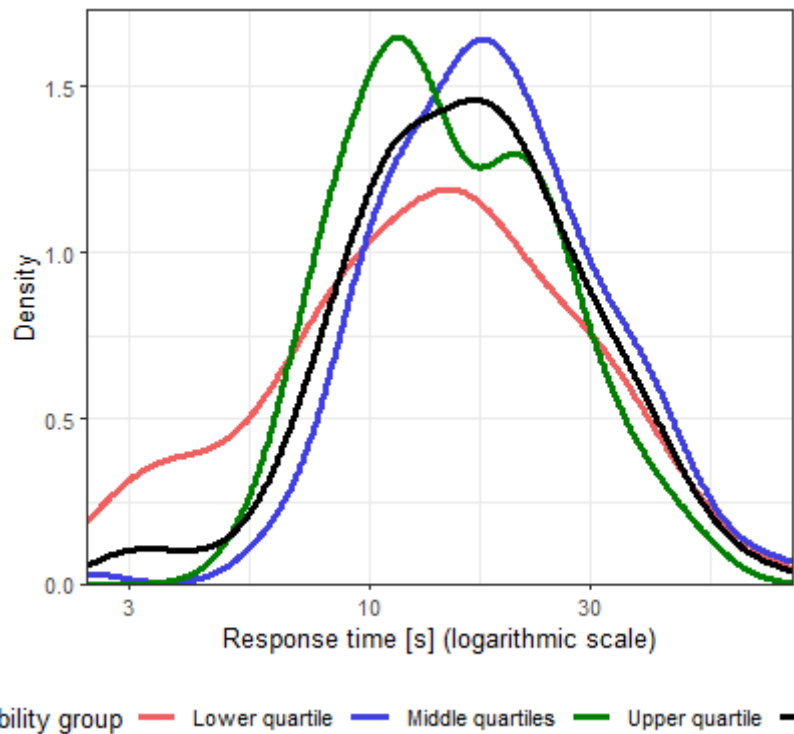


Table 3.24.5.1

Item S090051 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.80	7.95	14.37	21.15	61.30	2.58	0.74
Middle quartiles	2.45	12.14	17.89	25.55	82.40	2.90	0.55
Upper quartile	5.57	10.32	13.60	21.88	52.11	2.71	0.51
Overall	2.45	10.72	16.15	24.45	82.40	2.78	0.60

3.1.145. S890021 (TIMSS)

3.1.146. Item fit:

Graph 3.25.1.1

Item S890021 ICC and nonparametric trace line

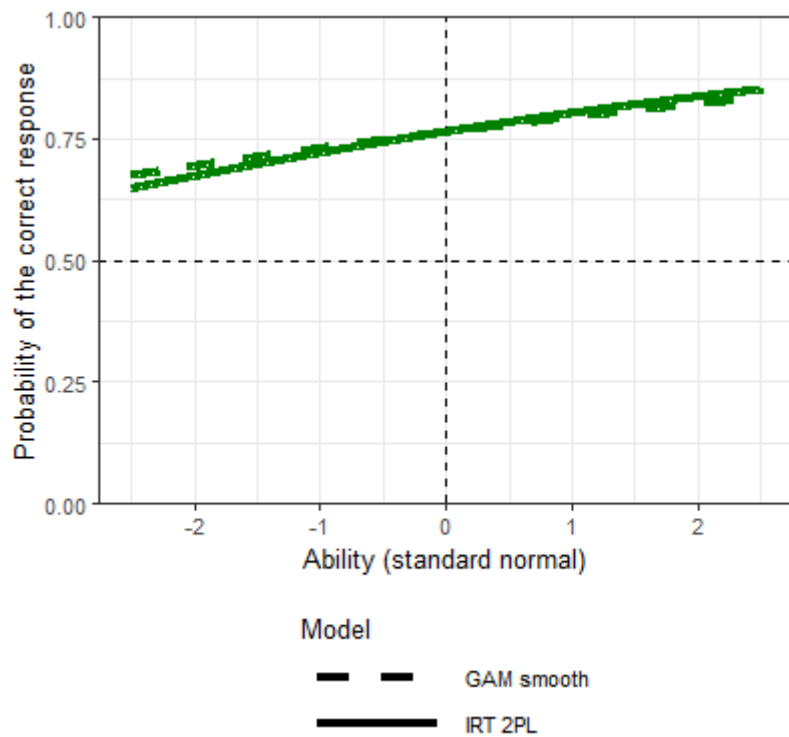


Table 3.25.1.1

Item S890021 parameters and fit statistics

Max. points	Ease	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	76.2%	319	MC	0.07379105	0.04274078	0.23	-5.18	0.012	0.316

3.1.147. Gender DIF:

Table 3.25.2.1

Item S890021 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.53	0.171	1.000	0.012	

3.1.148. Frequency of answers:

answer	Frequency	Percent
Czajnik wchłania wodę z otoczenia.	15	4.7%
Para wodna w czajniku zamienia się w płyn po schłodzeniu.	42	13.2%
Para wodna w czajniku zamieniła się w lód.	19	6.0%
Para wodna z czajnika skrapla się na jego powierzchni. (correct)	243	76.2%
Overall	319	100.0%

3.1.149. Distractors functioning:

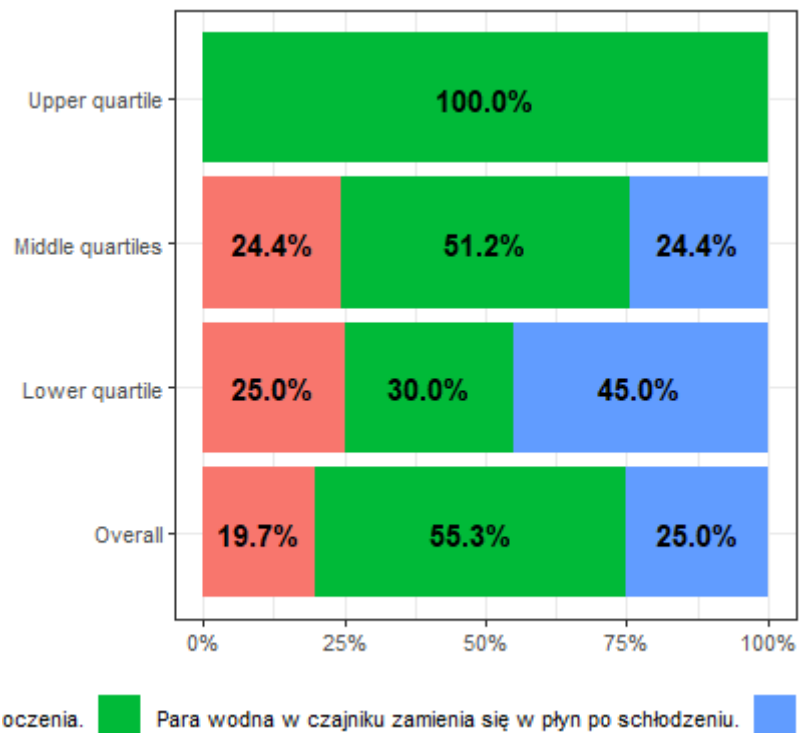
Table 3.25.4.1

Item S890021 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Czajnik wchłania wodę z otoczenia.	5	10	0	15	25.0%	24.4%	0.0%	19.7%
Para wodna w czajniku zamienia się w płyn po schłodzeniu.	6	21	15	42	30.0%	51.2%	100.0%	55.3%
Para wodna w czajniku zamieniła się w lód.	9	10	0	19	45.0%	24.4%	0.0%	25.0%
Overall	20	41	15	76	100.0%	100.0%	100.0%	100.0%

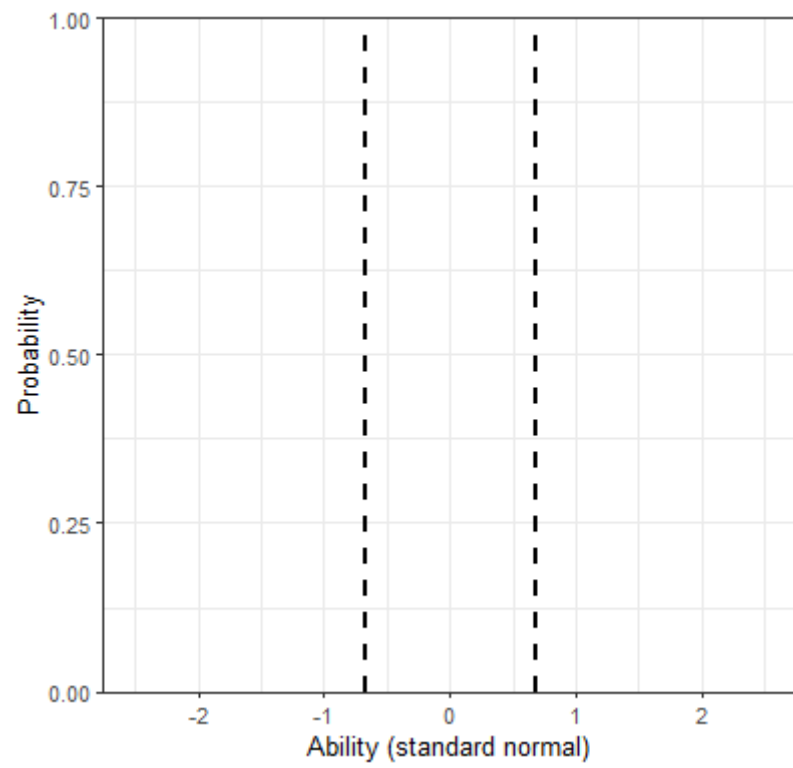
Graph 3.25.4.1

Item S890021 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.25.4.2

Item S890021 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.150. Answering time:

Graph 3.25.5.1

Item S890021 answering time distribution in groups of different ability level

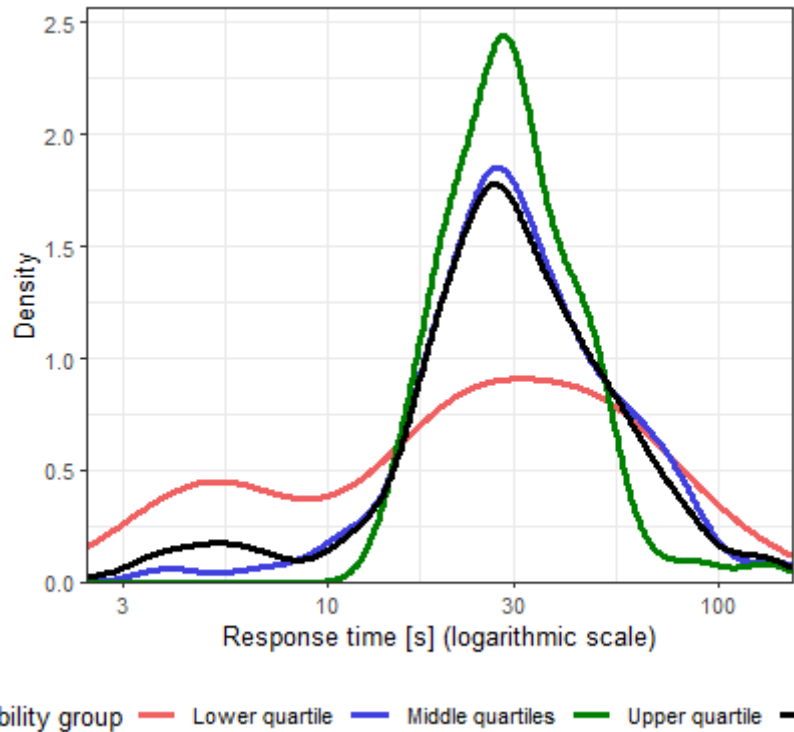


Table 3.25.5.1

Item S890021 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.44	12.54	24.42	47.87	121.69	3.09	1.00
Middle quartiles	3.64	21.81	29.64	43.13	154.96	3.42	0.59
Upper quartile	14.94	22.34	28.61	37.34	133.75	3.40	0.40
Overall	2.44	20.66	28.48	42.02	154.96	3.33	0.69

3.1.151. S090015 (LLM)

3.1.152. Item fit:

Graph 3.26.1.1

Item S090015 ICC and nonparametric trace line

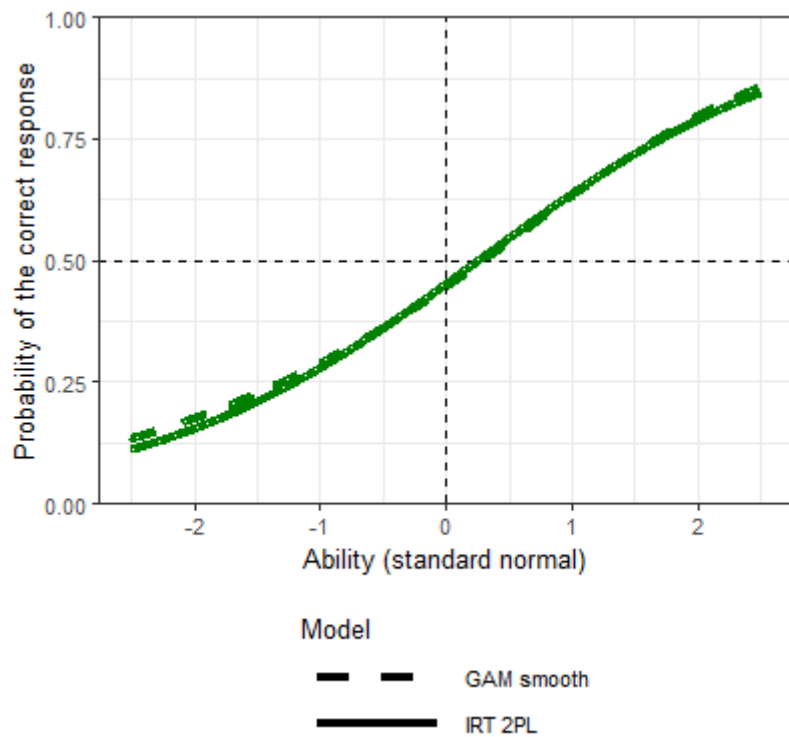


Table 3.26.1.1

Item S090015 parameters and fit statistics

Max. points	Ease	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic				
				thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	45.4%	304	MC	0.3246753	0.1488233	0.75	0.26	0.020	0.152	

3.1.153. Gender DIF:

Table 3.26.2.1

Item S090015 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.12	0.941	1.000		0.000

3.1.154. Frequency of answers:

answer	Frequency	Percent
Delfin (correct)	138	45.4%
Krokodyl	58	19.1%
Rekin	36	11.8%
Żółw	72	23.7%
Overall	304	100.0%

3.1.155. Distractors functioning:

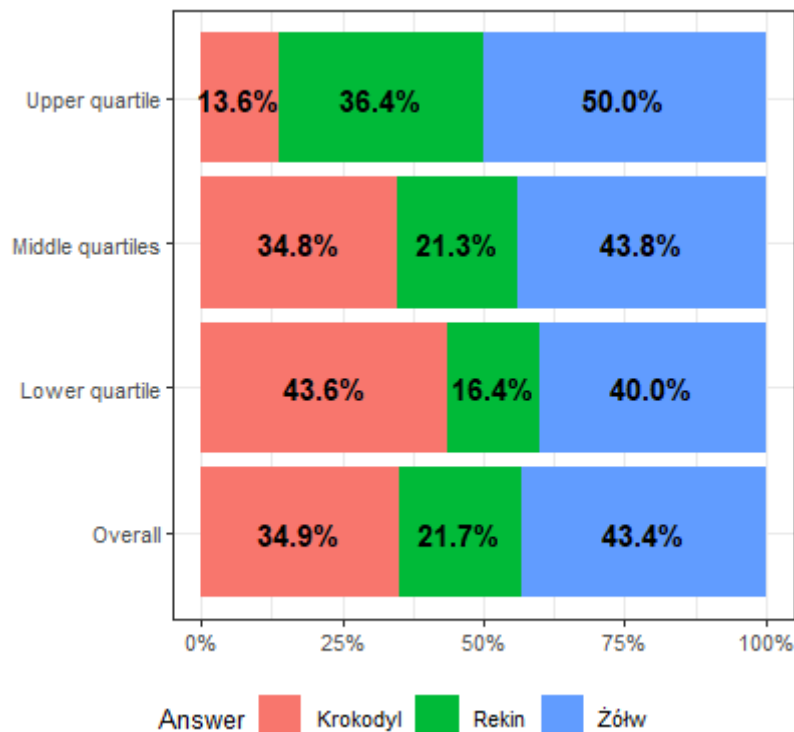
Table 3.26.4.1

Item S090015 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Krokodyl	24	31	3	58	43.6%	34.8%	13.6%	34.9%
Rekin	9	19	8	36	16.4%	21.3%	36.4%	21.7%
Żółw	22	39	11	72	40.0%	43.8%	50.0%	43.4%
Overall	55	89	22	166	100.0%	100.0%	100.0%	100.0%

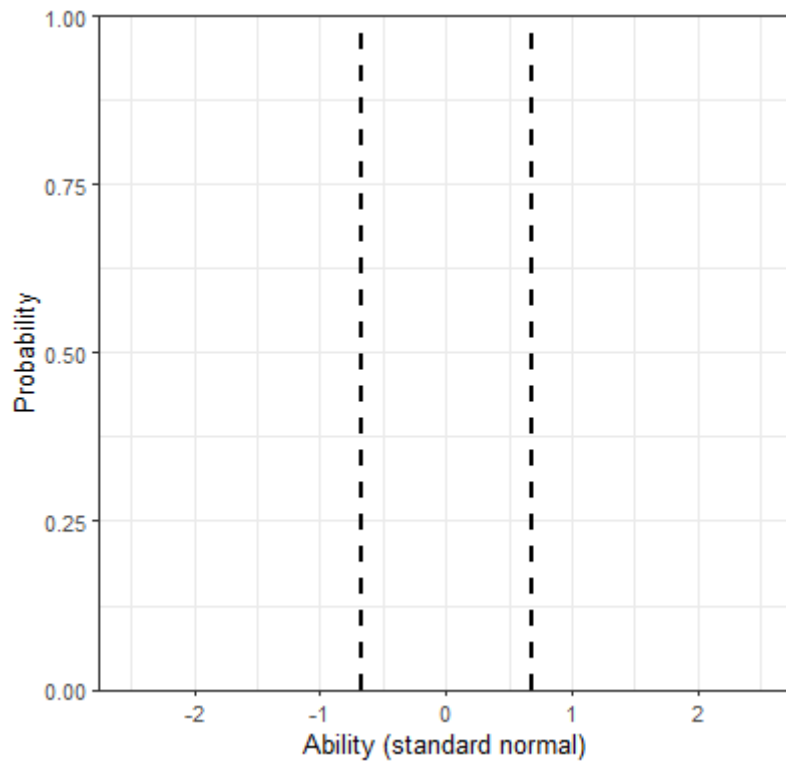
Graph 3.26.4.1

Item S090015 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.26.4.2

Item S090015 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.156. Answering time:

Graph 3.26.5.1

Item S090015 answering time distribution in groups of different ability level

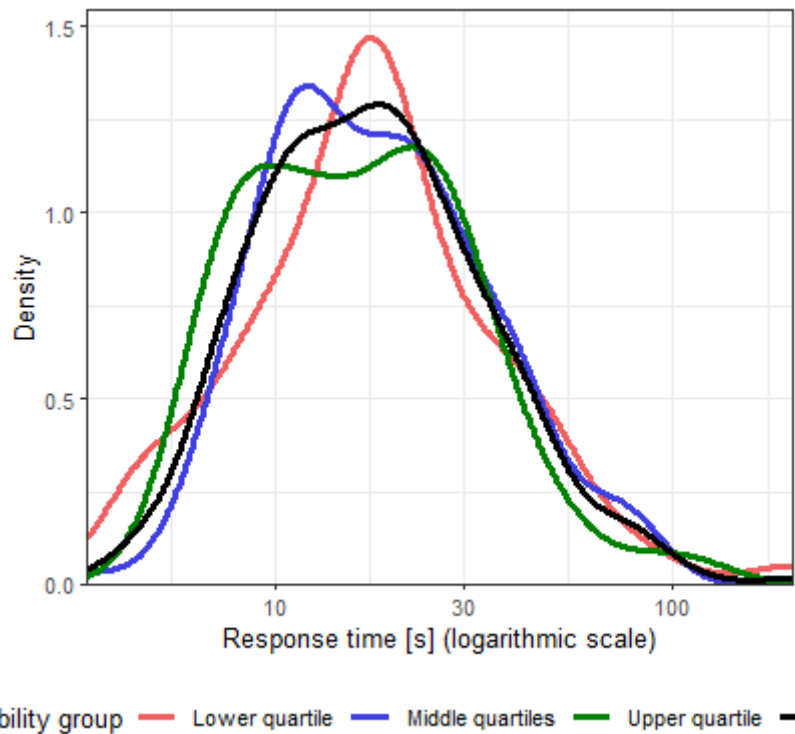


Table 3.26.5.1

Item S090015 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.39	10.95	17.33	26.26	199.76	2.87	0.73
Middle quartiles	3.39	10.97	17.56	27.15	87.62	2.90	0.64
Upper quartile	5.60	9.08	16.10	25.69	114.59	2.80	0.65
Overall	3.39	10.79	17.06	26.95	199.76	2.87	0.66

3.1.157. S090075 (TIMSS)

3.1.158. Item fit:

Graph 3.27.1.1

Item S090075 ICC and nonparametric trace line

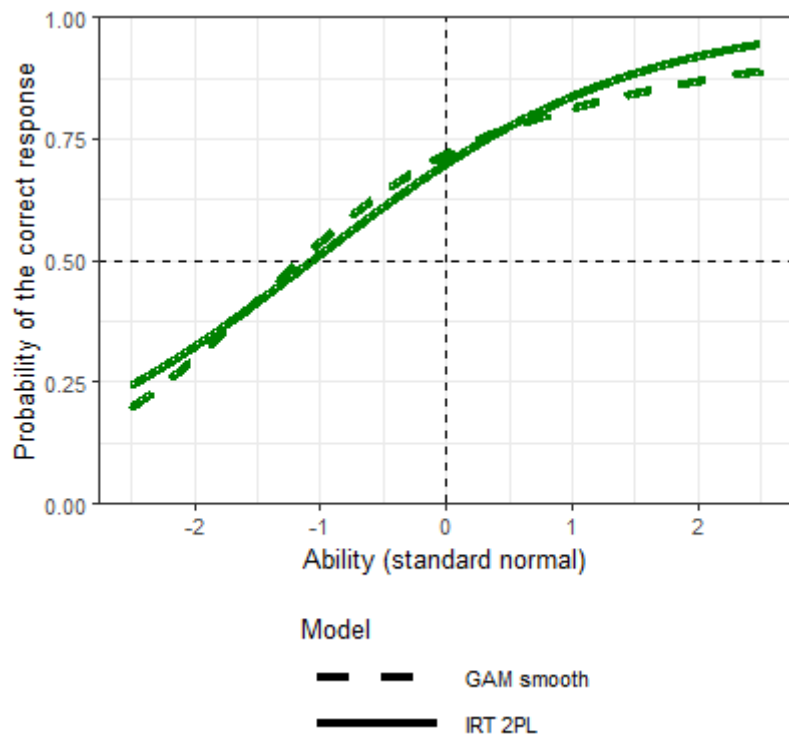


Table 3.27.1.1

Item S090075 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	67.5%	281	MC	0.314485 7	0.2258658	0.79	-1.06	0.000	0.565

3.1.159. Gender DIF:

Table 3.27.2.1

Item S090075 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.15	0.926	1.000		0.001

3.1.160. Frequency of answers:

answer	Frequency	Percent
Jowisz	16	5.7%
Mars	47	16.8%
Merkury (correct)	189	67.5%
Ziemia	28	10.0%
Overall	280	100.0%

3.1.161. Distractors functioning:

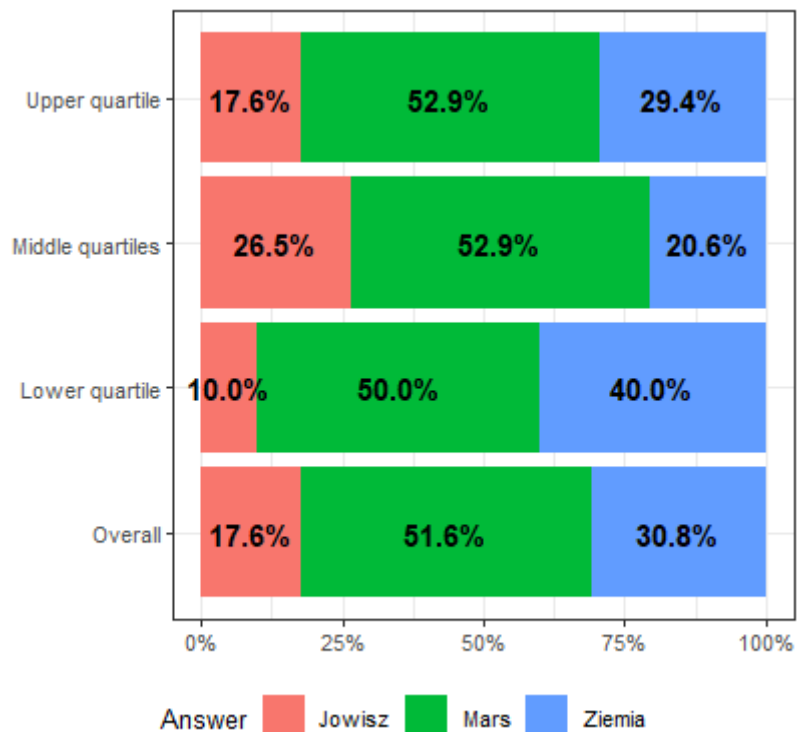
Table 3.27.4.1

Item S090075 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Jowisz	4	9	3	16	10.0%	26.5%	17.6%	17.6%
Mars	20	18	9	47	50.0%	52.9%	52.9%	51.6%
Ziemia	16	7	5	28	40.0%	20.6%	29.4%	30.8%
Overall	40	34	17	91	100.0%	100.0%	100.0%	100.0%

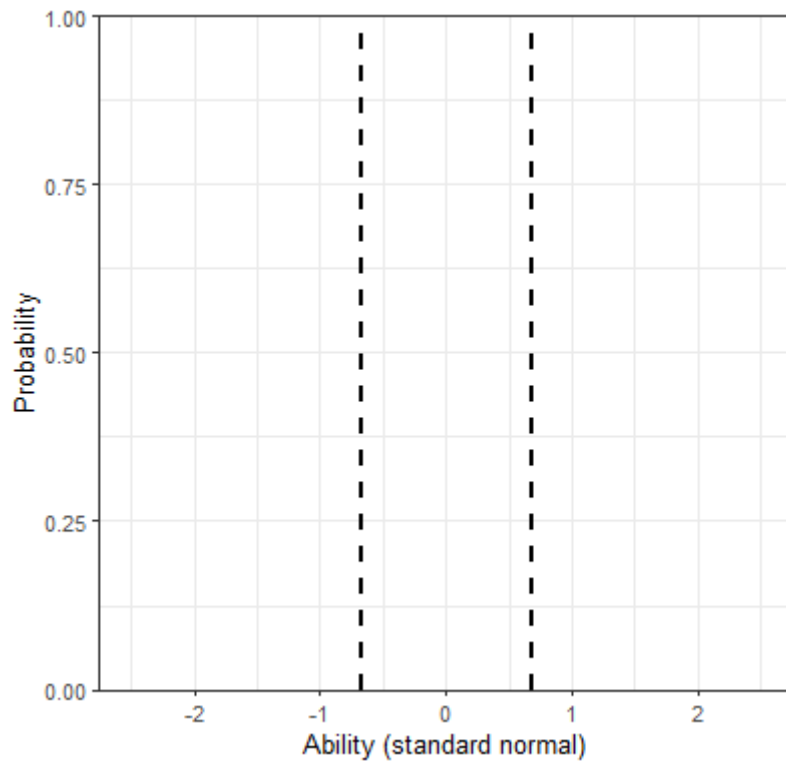
Graph 3.27.4.1

Item S090075 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.27.4.2

Item S090075 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.162. Answering time:

Graph 3.27.5.1

Item S090075 answering time distribution in groups of different ability level

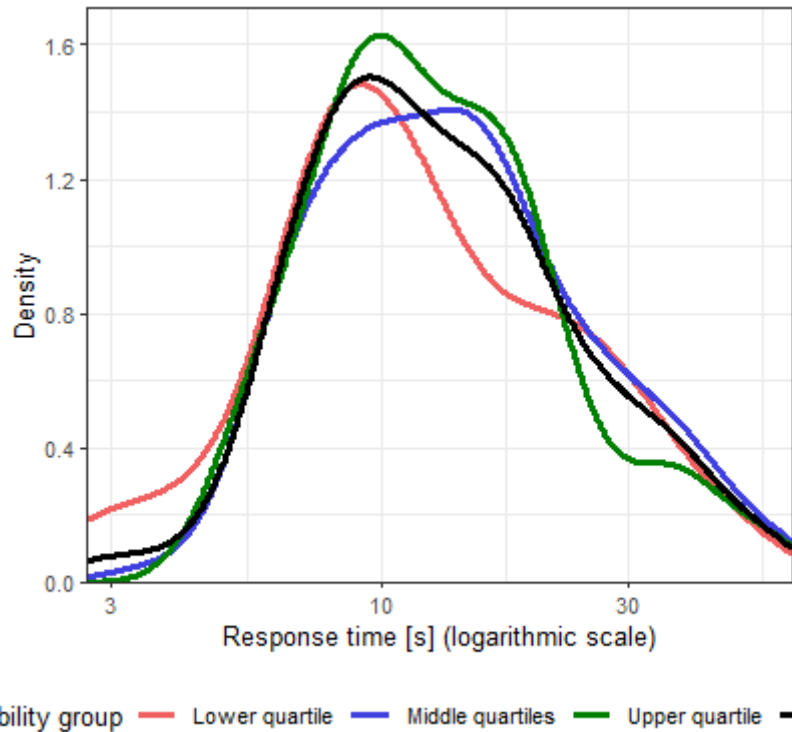


Table 3.27.5.1

Item S090075 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.70	7.74	11.02	19.60	49.60	2.47	0.66
Middle quartiles	3.46	9.02	12.98	20.30	62.31	2.62	0.59
Upper quartile	5.00	8.79	11.79	17.61	55.42	2.55	0.55
Overall	2.70	8.57	12.12	19.16	62.31	2.56	0.60

3.1.163. S090020 (TIMSS)

3.1.164. Item fit:

Graph 3.28.1.1

Item S090020 ICC and nonparametric trace line

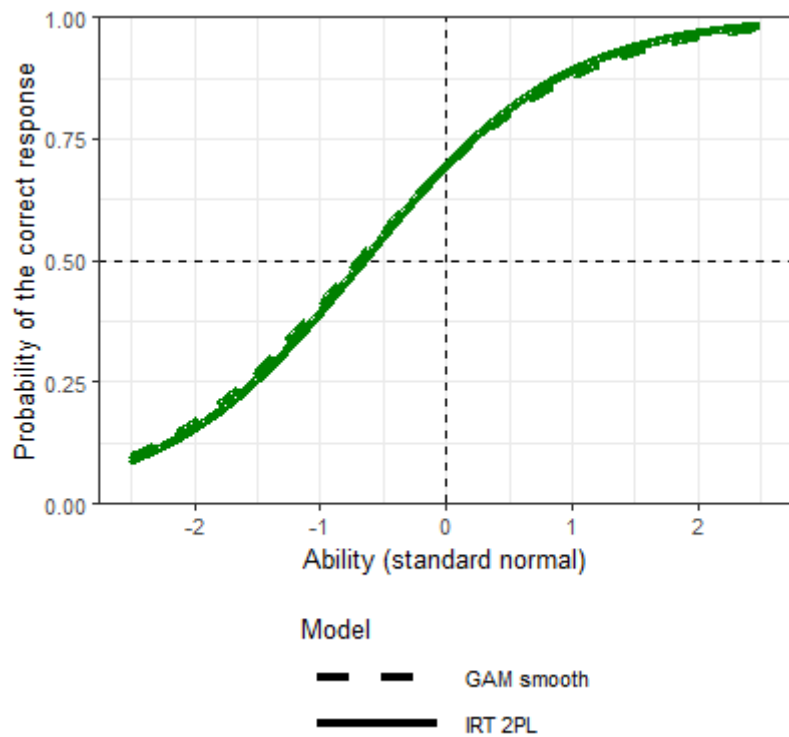


Table 3.28.1.1

Item S090020 parameters and fit statistics

				Corr. with latent ability estimates	IRT model parameters and fit statistic					
Max. points	Easiness	Number of obs.	Format	thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	64.8%	304	MC	0.4360293	0.3095508	1.26	-0.65	0.023	0.108	

3.1.165. Gender DIF:

Table 3.28.2.1

Item S090020 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.72	0.422	1.000	0.005	

3.1.166. Frequency of answers:

answer	Frequency	Percent
Światło słoneczne chroni rośliny przed szkodnikami.	7	2.3%
Światło słoneczne dostarcza roślinom ciepła.	42	13.8%
Światło słoneczne jest potrzebne do procesu oddychania roślin.	58	19.1%
Światło słoneczne umożliwia roślinom fotosyntezę. (correct)	197	64.8%
Overall	304	100.0%

3.1.167. Distractors functioning:

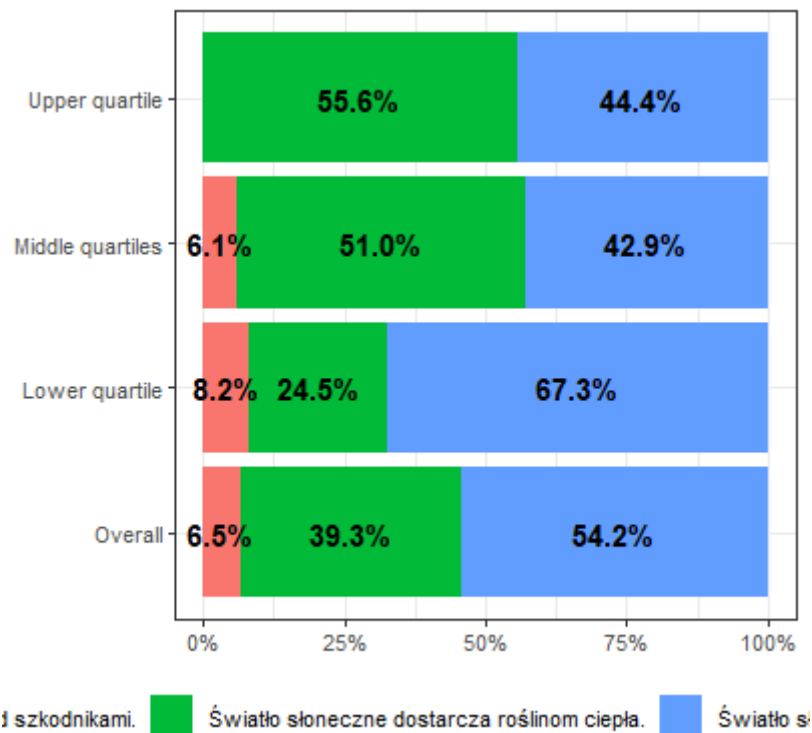
Table 3.28.4.1

Item S090020 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Światło słoneczne chroni rośliny przed szkodnikami.	4	3	0	7	8.2%	6.1%	0.0%	6.5%
Światło słoneczne dostarcza roślinom ciepła.	12	25	5	42	24.5%	51.0%	55.6%	39.3%
Światło słoneczne jest potrzebne do procesu oddychania roślin.	33	21	4	58	67.3%	42.9%	44.4%	54.2%
Overall	49	49	9	107	100.0%	100.0%	100.0%	100.0%

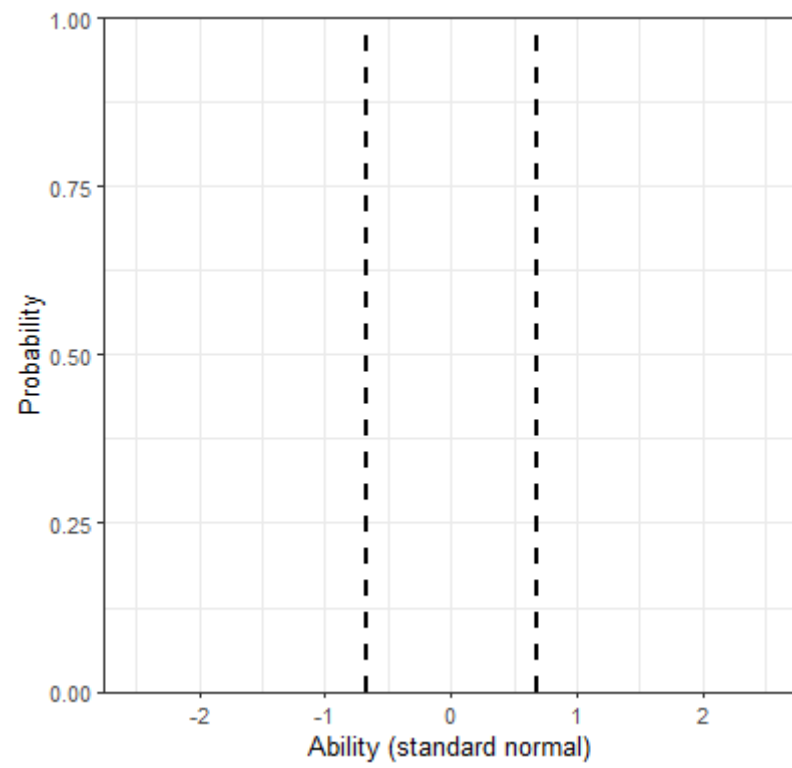
Graph 3.28.4.1

Item S090020 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.28.4.2

Item S090020 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.168. Answering time:

Graph 3.28.5.1

Item S090020 answering time distribution in groups of different ability level

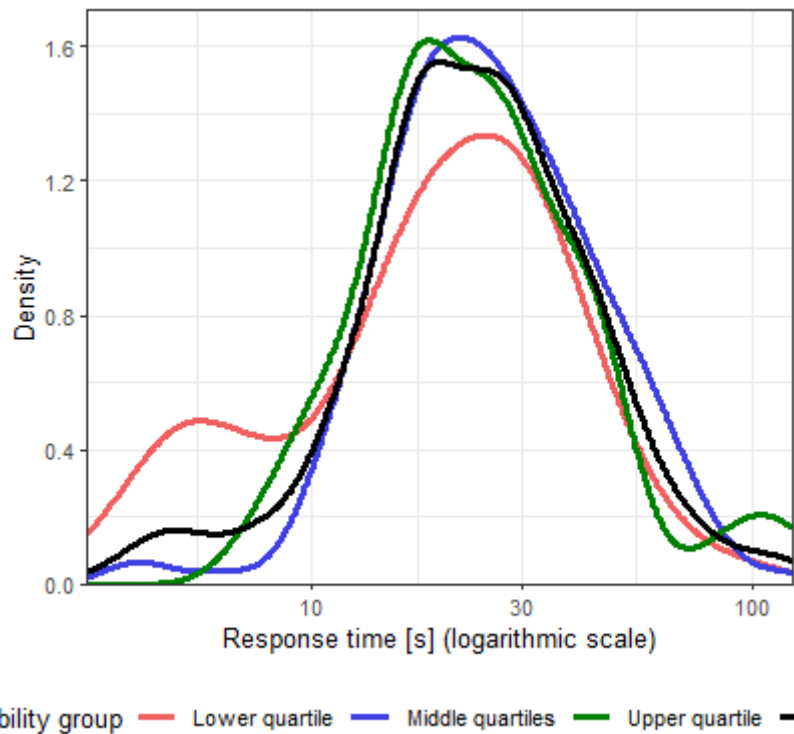


Table 3.28.5.1

Item S090020 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.10	12.70	20.72	30.63	97.90	2.91	0.75
Middle quartiles	4.03	17.36	24.12	36.00	119.72	3.23	0.55
Upper quartile	7.50	16.38	22.62	32.16	123.37	3.16	0.58
Overall	3.10	16.50	23.50	34.04	123.37	3.14	0.63

3.1.169. S100009 (LLM)

3.1.170. Item fit:

Graph 3.29.1.1

Item S100009 ICC and nonparametric trace line

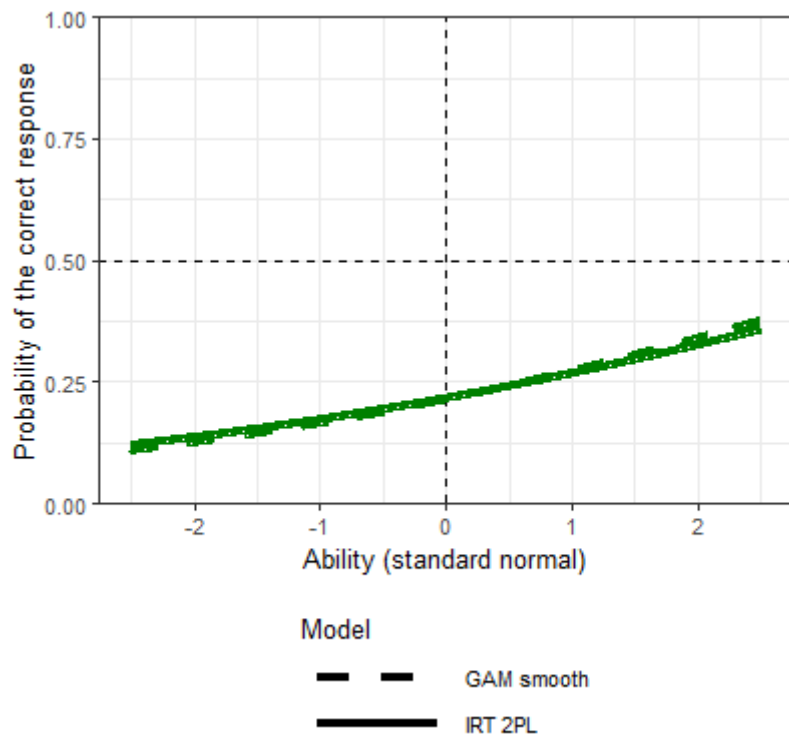


Table 3.29.1.1

Item S100009 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	22.1%	299	MC	0.126563 4	0.005664172	0.28	4.59	0.015	0.246

3.1.171. Gender DIF:

Table 3.29.2.1

Item S100009 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.63	0.730	1.000		0.002

3.1.172. Frequency of answers:

answer	Frequency	Percent
Guma (correct)	66	22.1%
Miedź	88	29.5%
Srebro	30	10.1%
Żelazo	114	38.3%
Overall	298	100.0%

3.1.173. Distractors functioning:

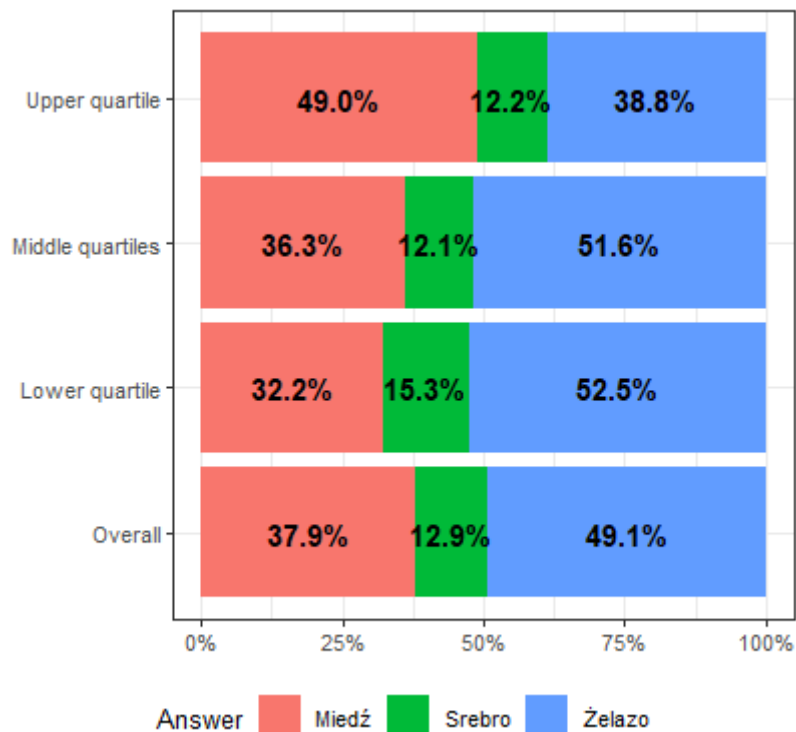
Table 3.29.4.1

Item S100009 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Miedź	19	45	24	88	32.2%	36.3%	49.0%	37.9%
Srebro	9	15	6	30	15.3%	12.1%	12.2%	12.9%
Żelazo	31	64	19	114	52.5%	51.6%	38.8%	49.1%
Overall	59	124	49	232	100.0%	100.0%	100.0%	100.0%

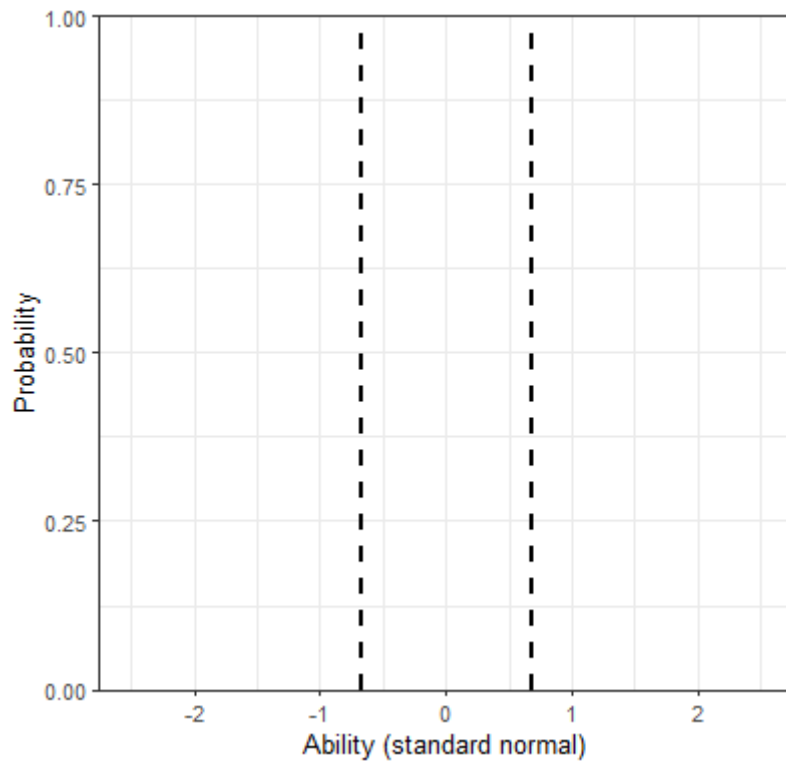
Graph 3.29.4.1

Item S100009 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.29.4.2

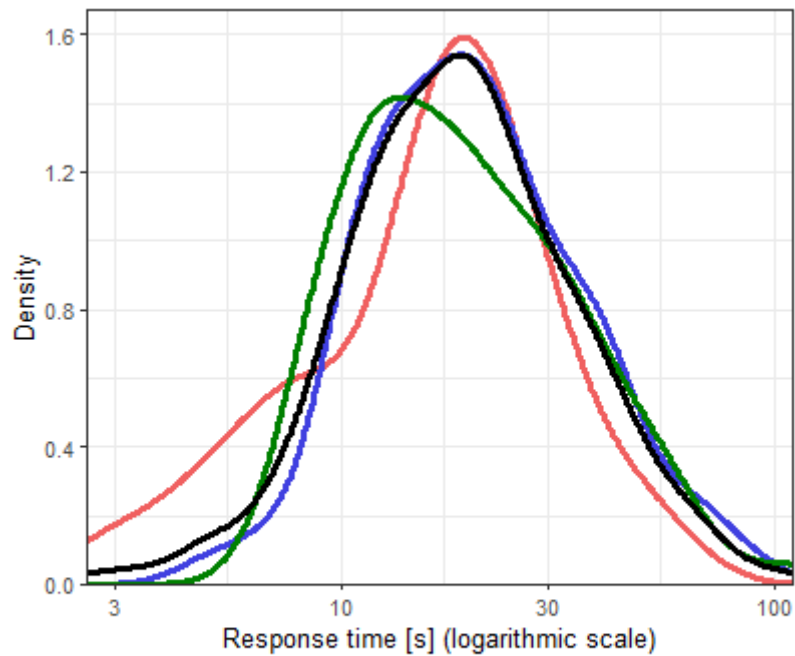
Item S100009 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.174. Answering time:

Graph 3.29.5.1

Item S100009 answering time distribution in groups of different ability level



ability group — Lower quartile — Middle quartiles — Upper quartile —

Table 3.29.5.1

Item S100009 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.60	10.66	17.53	23.57	63.20	2.75	0.68
Middle quartiles	4.82	13.42	19.68	29.58	95.05	3.01	0.57
Upper quartile	7.41	12.32	18.16	28.94	110.46	2.96	0.59
Overall	2.60	12.69	18.44	27.70	110.46	2.93	0.61

3.1.175. S051111 (TIMSS)

3.1.176. Item fit:

Graph 3.30.1.1

Item S051111 ICC and nonparametric trace line

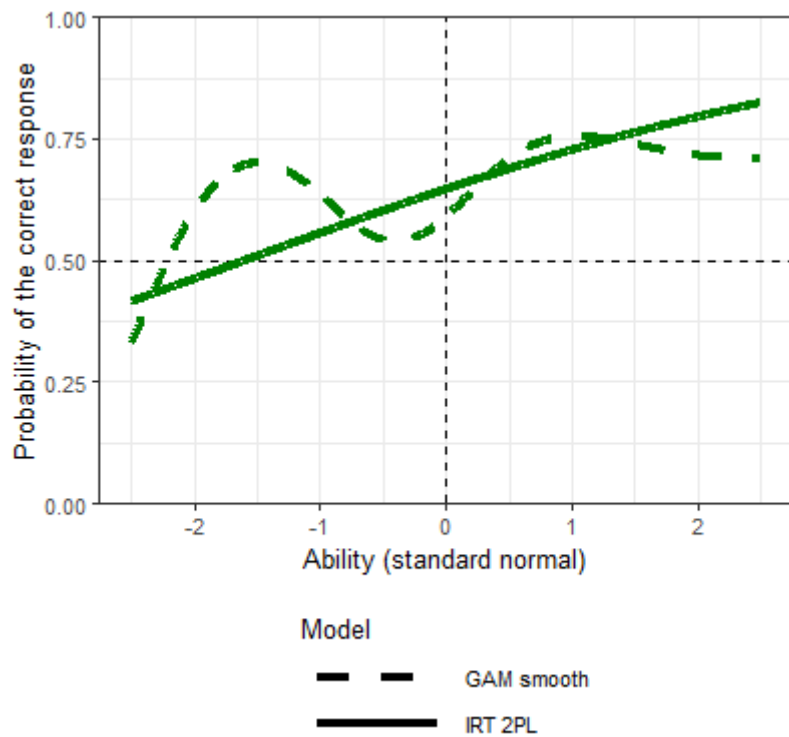


Table 3.30.1.1

Item S051111 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	64.6%	294	MC	0.127298 5	0.2242539	0.38	-1.60	0.000	0.817

3.1.177. Gender DIF:

Table 3.30.2.1

Item S051111 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.22	0.544	1.000		0.004

3.1.178. Frequency of answers:

answer	Frequency	Percent
A	31	10.5%
B (correct)	190	64.6%
C	48	16.3%
D	25	8.5%
Overall	294	100.0%

3.1.179. Distractors functioning:

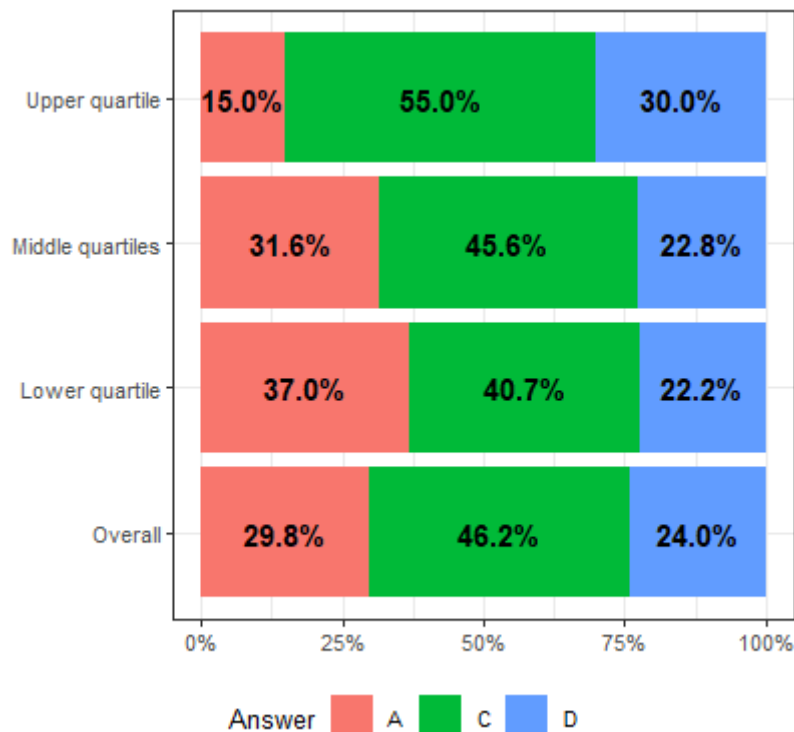
Table 3.30.4.1

Item S051111 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
A	10	18	3	31	37.0%	31.6%	15.0%	29.8%
C	11	26	11	48	40.7%	45.6%	55.0%	46.2%
D	6	13	6	25	22.2%	22.8%	30.0%	24.0%
Overall	27	57	20	104	100.0%	100.0%	100.0%	100.0%

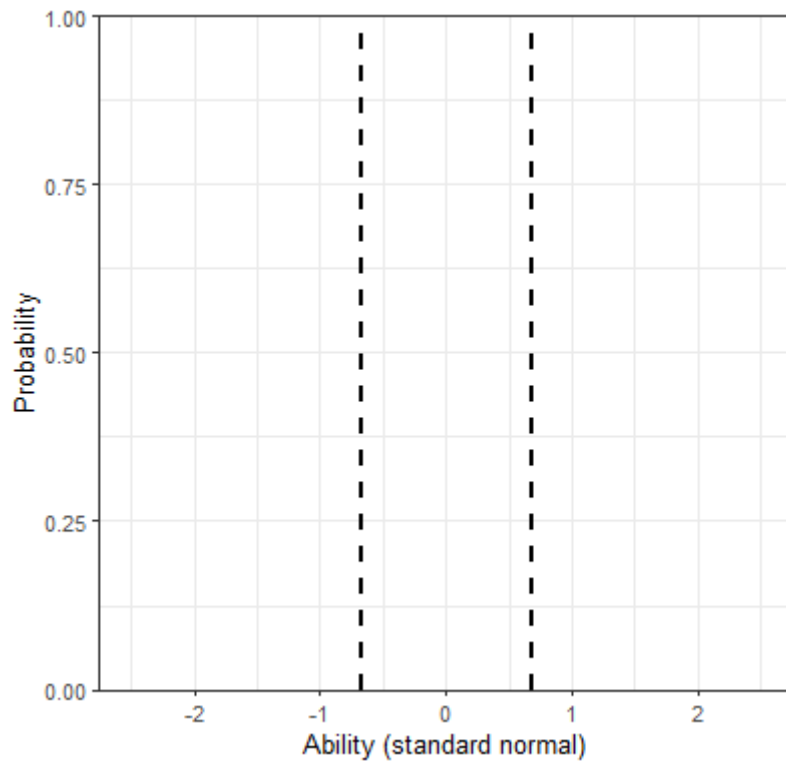
Graph 3.30.4.1

Item S051111 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.30.4.2

Item S051111 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.180. Answering time:

Graph 3.30.5.1

Item S051111 answering time distribution in groups of different ability level

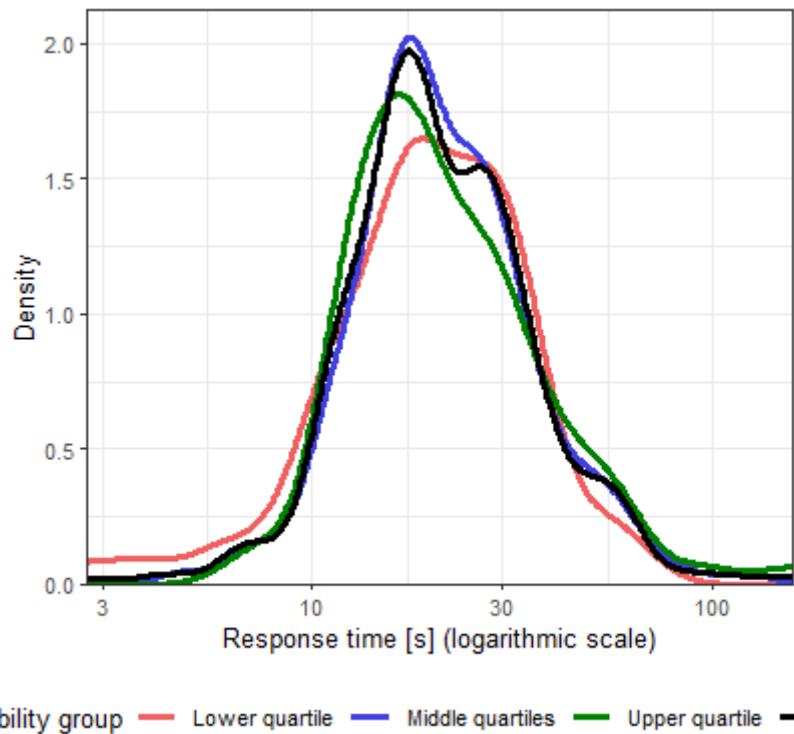


Table 3.30.5.1

Item S051111 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.76	15.11	19.38	29.72	63.17	2.96	0.58
Middle quartiles	4.76	15.85	20.25	28.31	119.84	3.06	0.51
Upper quartile	7.06	14.62	19.39	28.54	158.61	3.08	0.55
Overall	2.76	15.42	19.90	28.55	158.61	3.04	0.54

3.1.181. S090084 (TIMSS)

3.1.182. Item fit:

Graph 3.31.1.1

Item S090084 ICC and nonparametric trace line

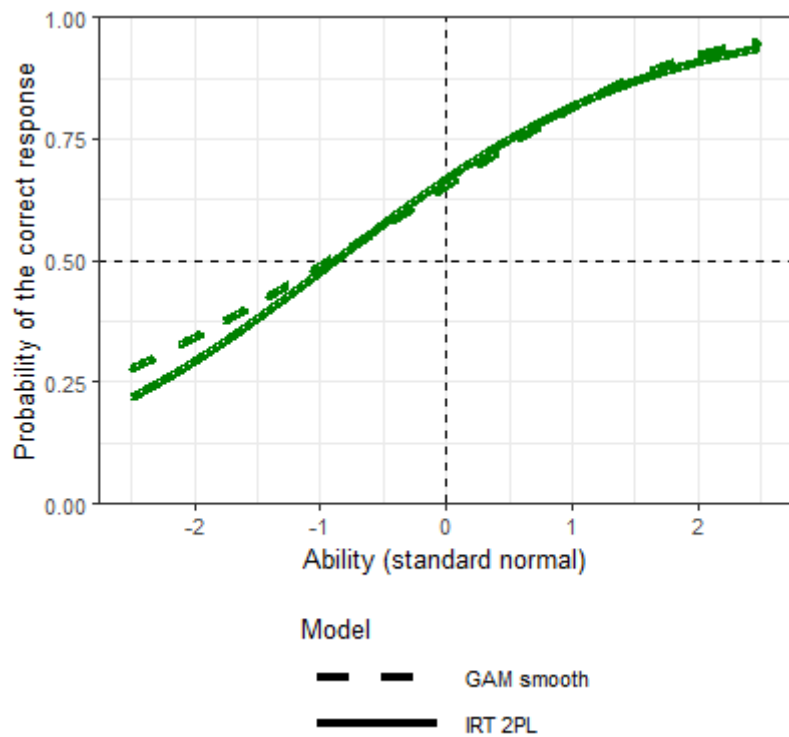


Table 3.31.1.1

Item S090084 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	64.5%	304	MC	0.313023 3	0.2328679	0.79	-0.88	0.015	0.246

3.1.183. Gender DIF:

Table 3.31.2.1

Item S090084 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.34	0.844	1.000		0.001

3.1.184. Frequency of answers:

answer	Frequency	Percent
Karmią młode mlekiem	33	10.9%
Mają sierść lub futro	44	14.5%
Oddychają przez płuca	31	10.2%
Składają jajka (correct)	196	64.5%
Overall	304	100.0%

3.1.185. Distractors functioning:

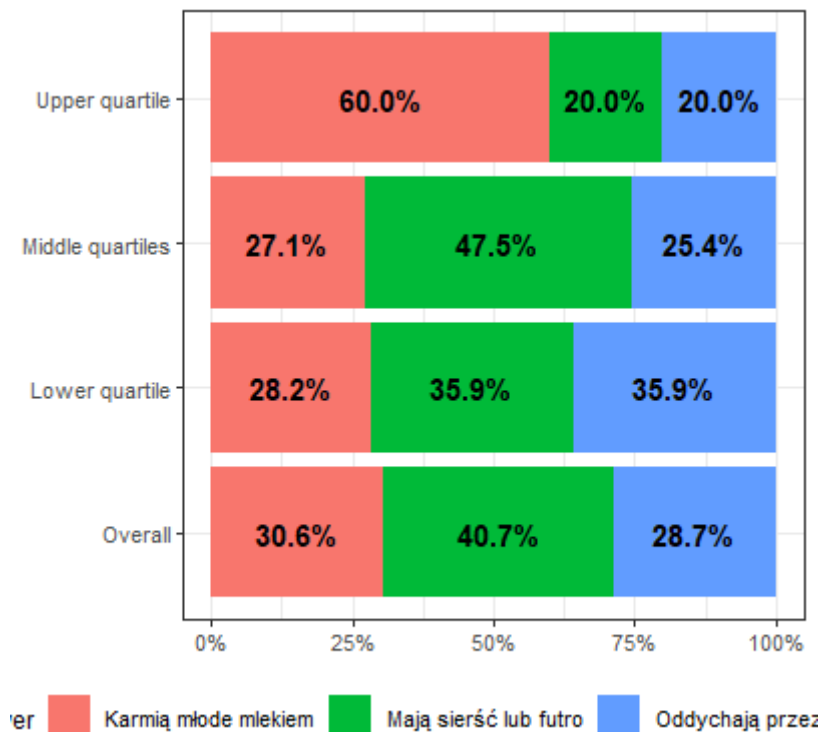
Table 3.31.4.1

Item S090084 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Karmią młode mlekiem	11	16	6	33	28.2%	27.1%	60.0%	30.6%
Mają sierść lub futro	14	28	2	44	35.9%	47.5%	20.0%	40.7%
Oddychają przez płuca	14	15	2	31	35.9%	25.4%	20.0%	28.7%
Overall	39	59	10	108	100.0%	100.0%	100.0%	100.0%

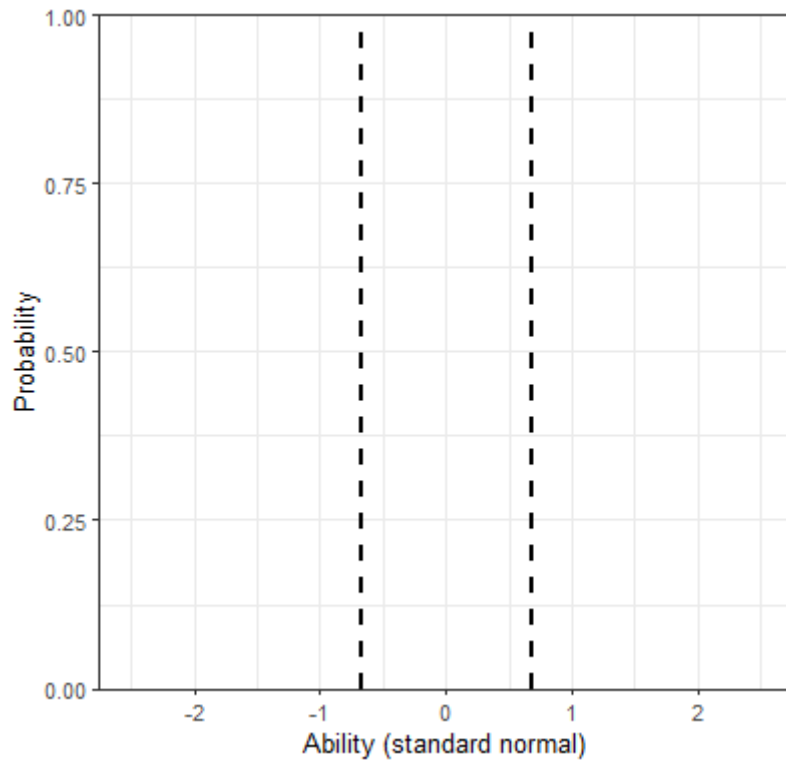
Graph 3.31.4.1

Item S090084 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.31.4.2

Item S090084 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.186. Answering time:

Graph 3.31.5.1

Item S090084 answering time distribution in groups of different ability level

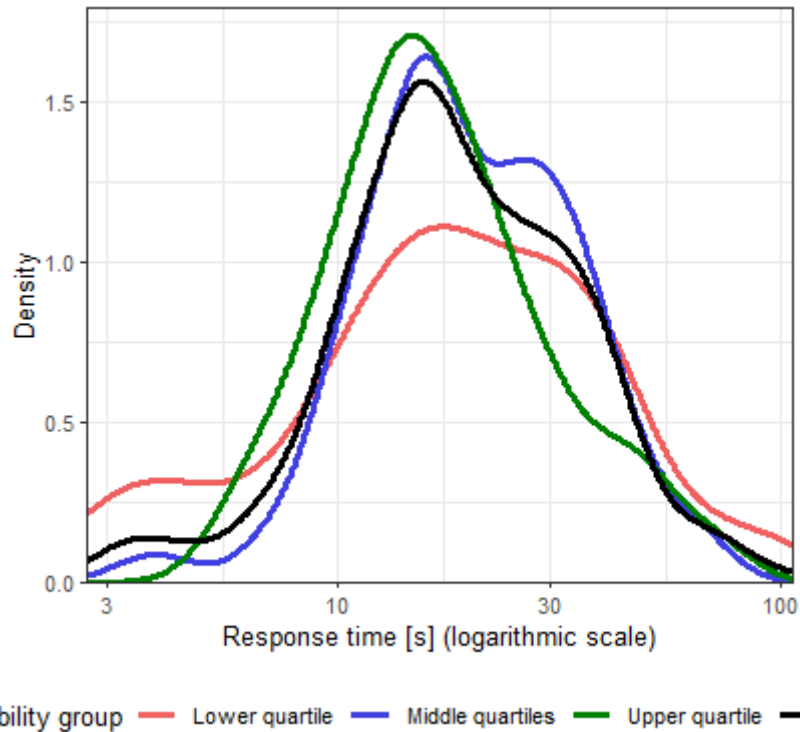


Table 3.31.5.1

Item S090084 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.72	11.31	18.16	32.95	106.01	2.86	0.82
Middle quartiles	3.39	13.85	18.49	29.28	69.57	2.98	0.55
Upper quartile	5.49	11.61	15.46	23.03	72.08	2.83	0.57
Overall	2.72	12.73	17.78	28.77	106.01	2.91	0.63

3.1.187. SP71128 (LLM)

3.1.188. Item fit:

Graph 3.32.1.1

Item SP71128 ICC and nonparametric trace line

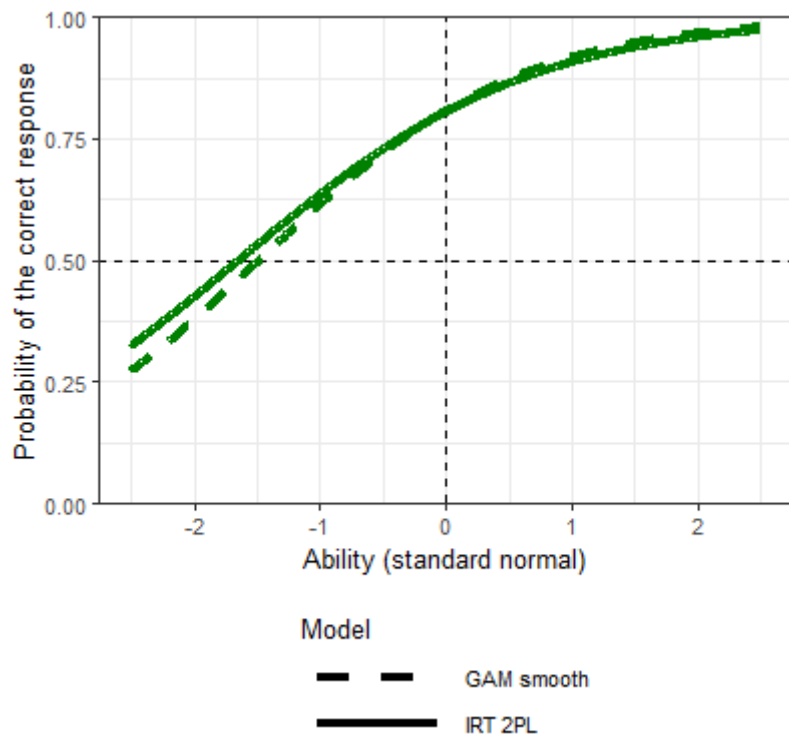


Table 3.32.1.1

Item SP71128 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	78.2%	294	MC	0.347392 9	0.3122047	0.86	-1.65	0.013	0.286

3.1.189. Gender DIF:

Table 3.32.2.1

Item SP71128 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.68	0.710	1.000	0.002	

3.1.190. Frequency of answers:

answer	Frequency	Percent
Energia elektryczna zamienia się w energię świetlną. (correct)	230	78.2%
Energia kinetyczna zamienia się w energię świetlną.	31	10.5%
Energia świetlna zamienia się w energię elektryczną.	31	10.5%
Energia świetlna zamienia się w energię kinetyczną.	2	0.7%
Overall	294	100.0%

3.1.191. Distractors functioning:

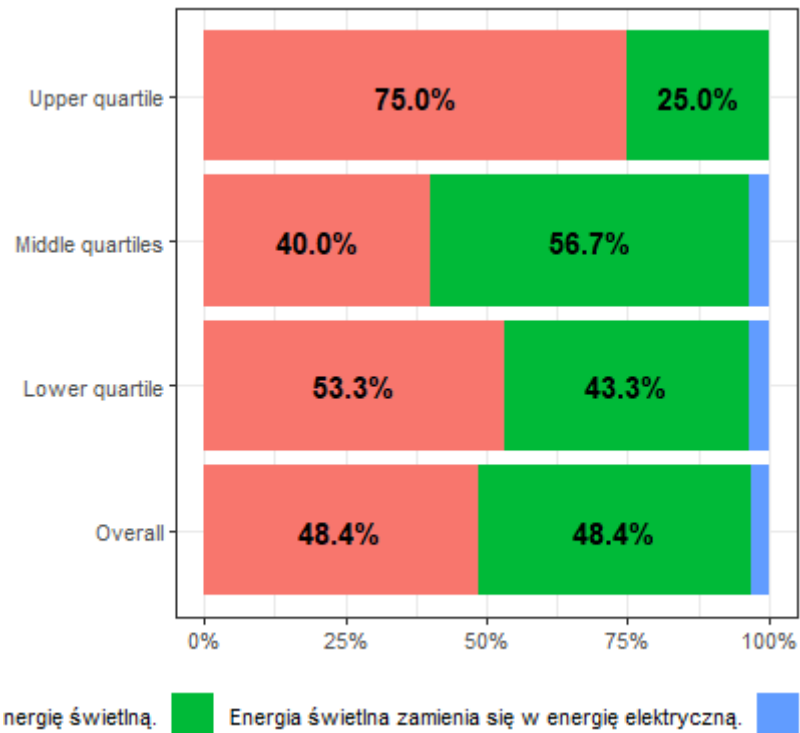
Table 3.32.4.1

Item SP71128 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Energia kinetyczna zamienia się w energię świetlną.	16	12	3	31	53.3%	40.0%	75.0%	48.4%
Energia świetlna zamienia się w energię elektryczną.	13	17	1	31	43.3%	56.7%	25.0%	48.4%
Energia świetlna zamienia się w energię kinetyczną.	1	1	0	2	3.3%	3.3%	0.0%	3.1%
Overall	30	30	4	64	100.0%	100.0%	100.0%	100.0%

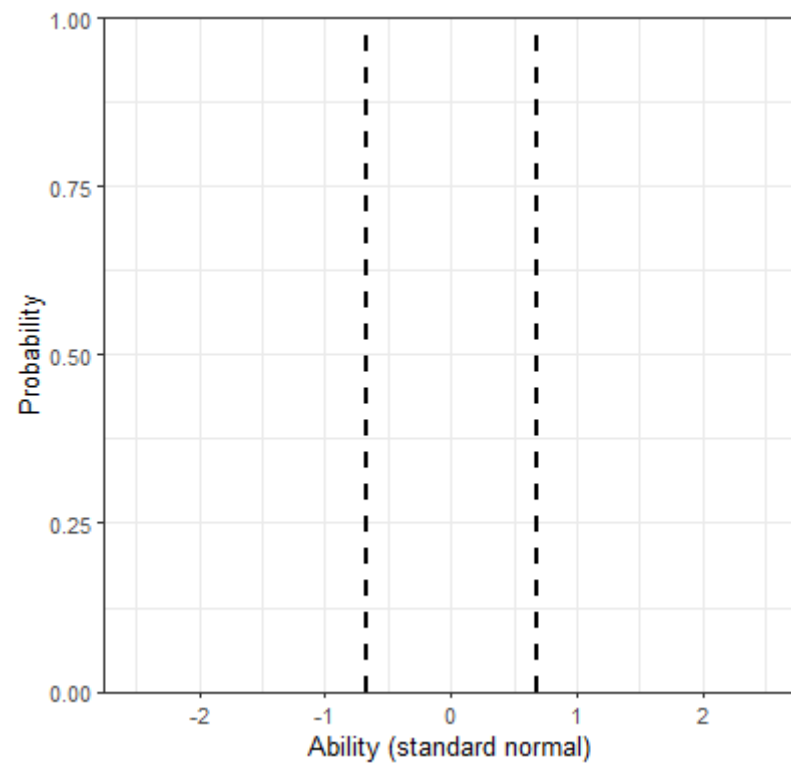
Graph 3.32.4.1

Item SP71128 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.32.4.2

Item SP71128 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.192. Answering time:

Graph 3.32.5.1

Item SP71128 answering time distribution in groups of different ability level

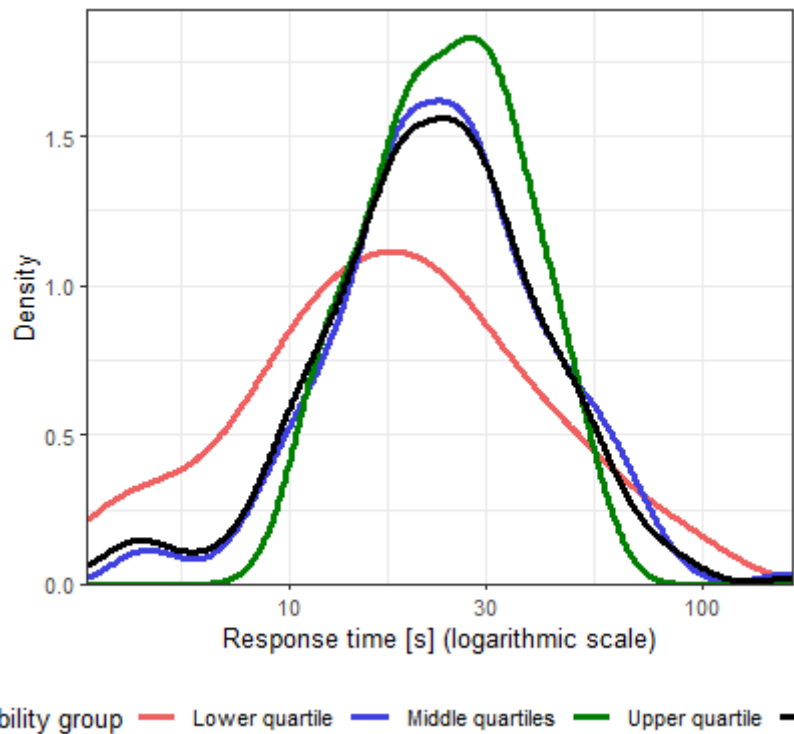


Table 3.32.5.1

Item SP71128 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.26	10.60	16.92	30.24	94.99	2.87	0.79
Middle quartiles	4.17	16.39	23.90	32.97	165.91	3.15	0.60
Upper quartile	9.83	18.36	24.84	32.44	56.17	3.18	0.43
Overall	3.26	15.47	22.69	32.27	165.91	3.10	0.62

3.1.193. S051087 (TIMSS)

3.1.194. Item fit:

Graph 3.33.1.1

Item S051087 ICC and nonparametric trace line

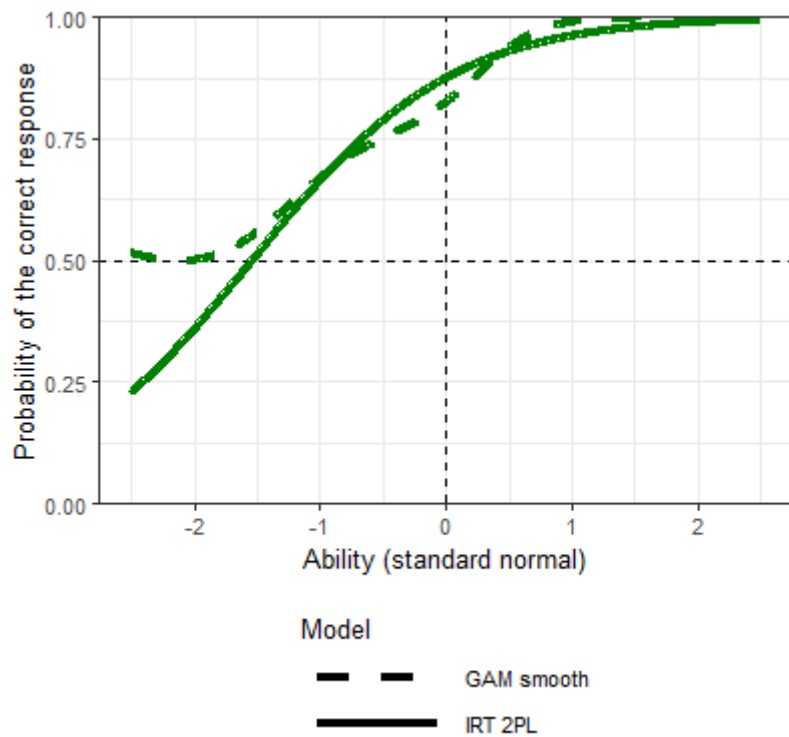


Table 3.33.1.1

Item S051087 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	81.3%	306	MC	0.376992 4	0.4197373	1.26	-1.54	0.000	0.528

3.1.195. Gender DIF:

Table 3.33.2.1

Item S051087 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.54	0.170	1.000	0.013	

3.1.196. Frequency of answers:

answer	Frequency	Percent
Stal jest cięższa niż drewno.	27	8.9%
Stal jest mocniejsza niż drewno. (correct)	248	81.3%
Stal nagrzewa się szybciej niż drewno.	17	5.6%
Stal przewodzi prąd lepiej niż drewno.	13	4.3%
Overall	305	100.0%

3.1.197. Distractors functioning:

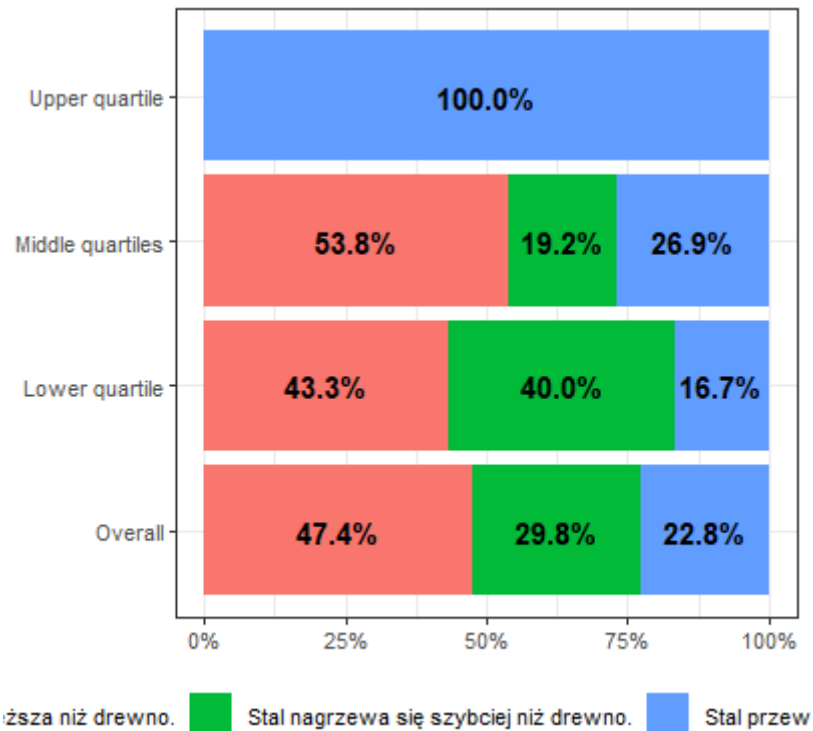
Table 3.33.4.1

Item S051087 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Stal jest cięższa niż drewno.	13	14	0	27	43.3%	53.8%	0.0%	47.4%
Stal nagrzewa się szybciej niż drewno.	12	5	0	17	40.0%	19.2%	0.0%	29.8%
Stal przewodzi prąd lepiej niż drewno.	5	7	1	13	16.7%	26.9%	100.0%	22.8%
Overall	30	26	1	57	100.0%	100.0%	100.0%	100.0%

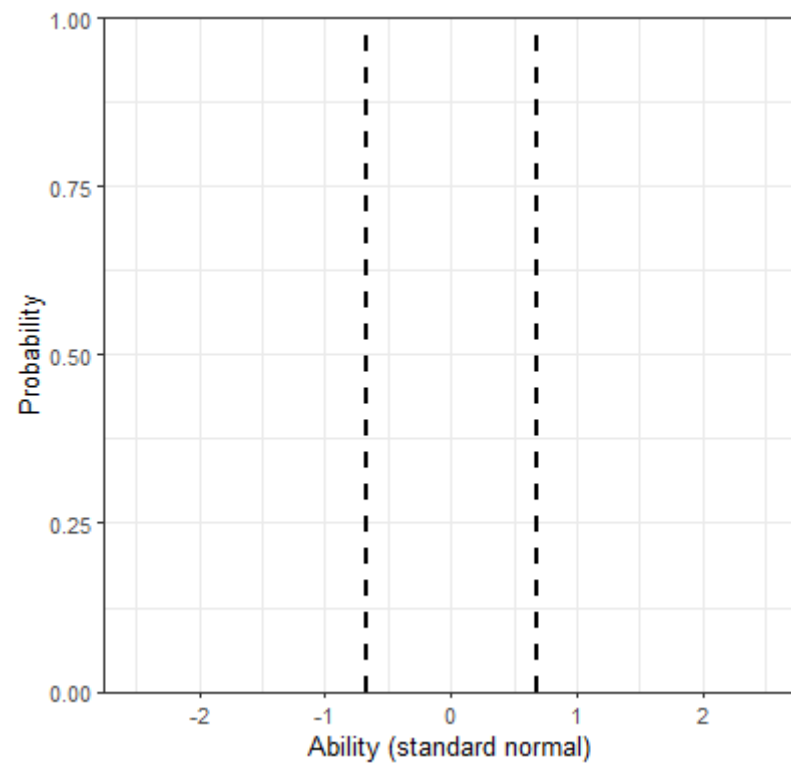
Graph 3.33.4.1

Item S051087 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.33.4.2

Item S051087 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.198. Answering time:

Graph 3.33.5.1

Item S051087 answering time distribution in groups of different ability level

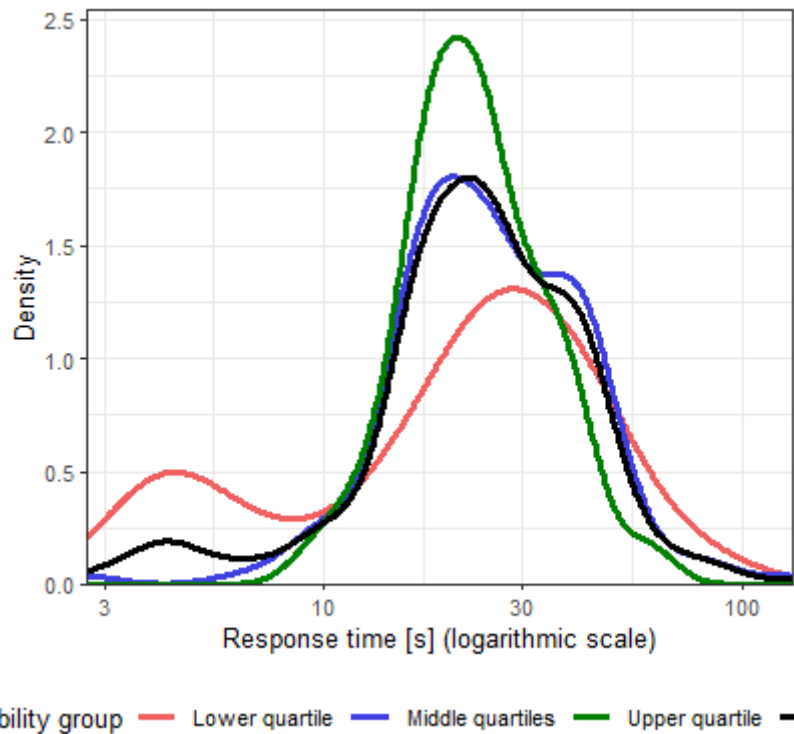


Table 3.33.5.1

Item S051087 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.05	12.63	24.07	35.87	95.15	2.97	0.87
Middle quartiles	2.74	17.93	24.25	37.01	132.16	3.21	0.52
Upper quartile	9.29	18.12	22.73	30.00	62.25	3.14	0.38
Overall	2.74	17.33	23.76	35.24	132.16	3.13	0.62

3.1.199. S890010 (LLM)

3.1.200. Item fit:

Graph 3.34.1.1

Item S890010 ICC and nonparametric trace line

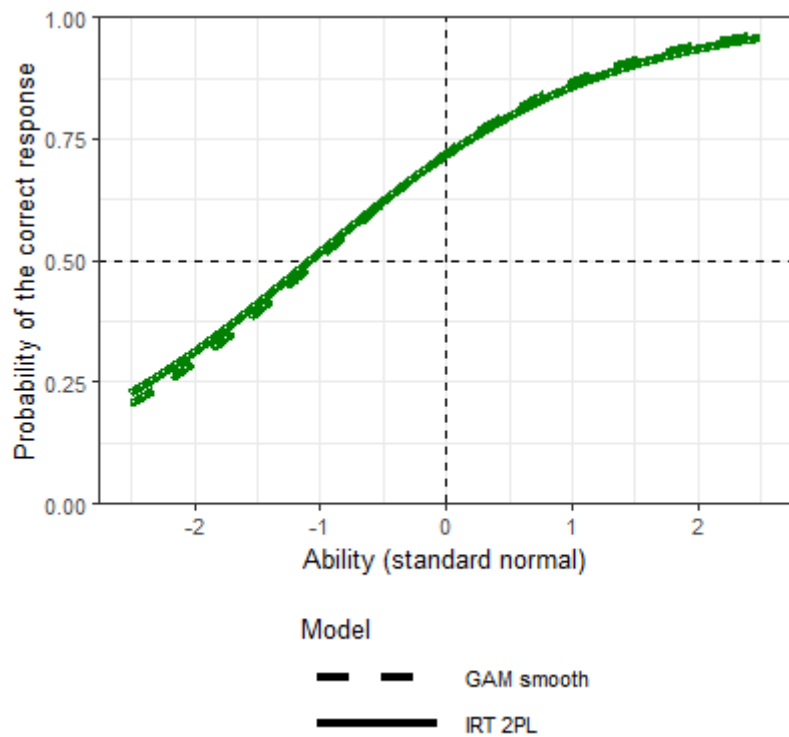


Table 3.34.1.1

Item S890010 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	69.3%	319	MC	0.362873 1	0.2069922	0.86	-1.08	0.009	0.363

3.1.201. Gender DIF:

Table 3.34.2.1

Item S890010 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.48	0.787	1.000		0.001

3.1.202. Frequency of answers:

answer	Frequency	Percent
Lód (correct)	221	69.3%
Metal	12	3.8%
Plastik	28	8.8%
Wosk	58	18.2%
Overall	319	100.0%

3.1.203. Distractors functioning:

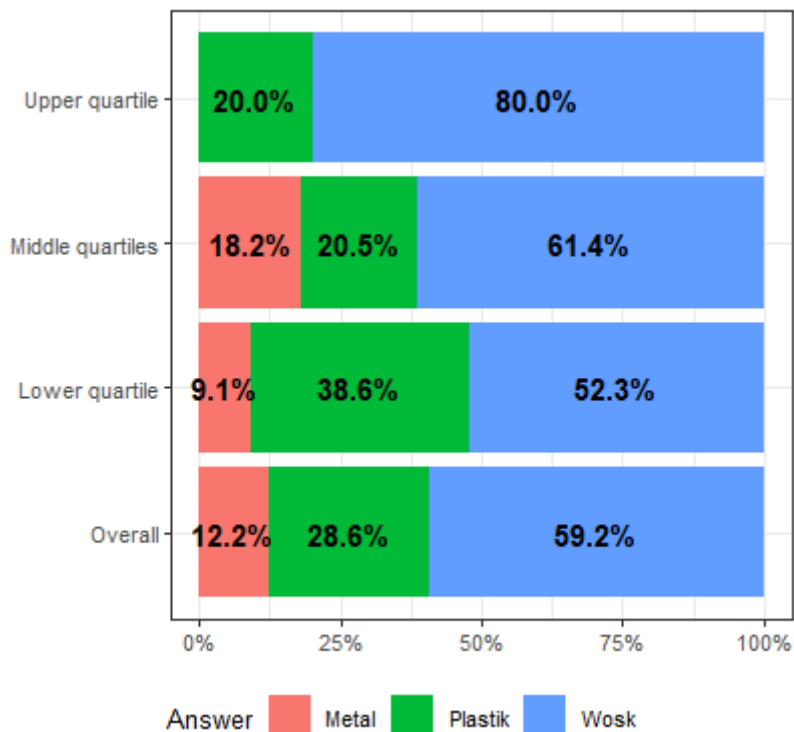
Table 3.34.4.1

Item S890010 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Metal	4	8	0	12	9.1%	18.2%	0.0%	12.2%
Plastik	17	9	2	28	38.6%	20.5%	20.0%	28.6%
Wosk	23	27	8	58	52.3%	61.4%	80.0%	59.2%
Overall	44	44	10	98	100.0%	100.0%	100.0%	100.0%

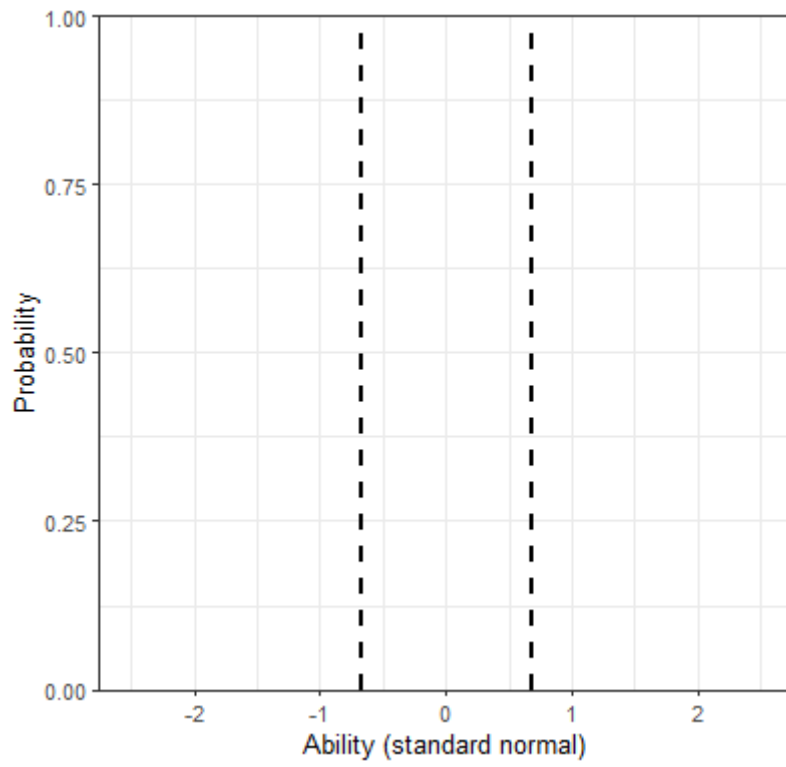
Graph 3.34.4.1

Item S890010 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.34.4.2

Item S890010 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.204. Answering time:

Graph 3.34.5.1

Item S890010 answering time distribution in groups of different ability level

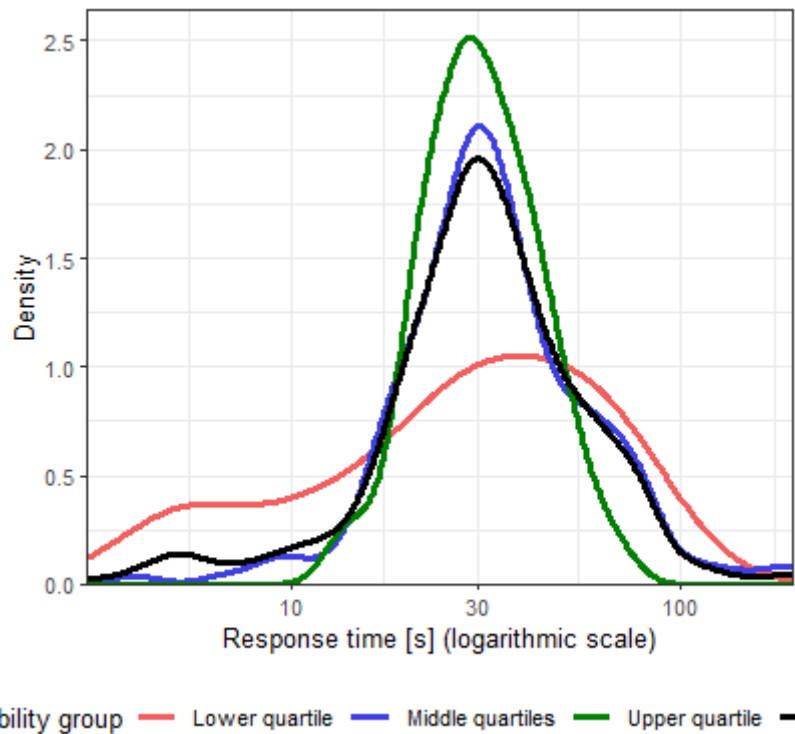


Table 3.34.5.1

Item S890010 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.02	16.43	30.09	51.52	112.65	3.26	0.88
Middle quartiles	3.98	24.62	31.78	44.49	192.71	3.50	0.56
Upper quartile	13.58	24.46	30.30	38.50	69.90	3.42	0.34
Overall	3.02	22.34	30.74	43.12	192.71	3.42	0.62

3.1.205. SP71072 (TIMSS)

3.1.206. Item fit:

Graph 3.35.1.1

Item SP71072 ICC and nonparametric trace line

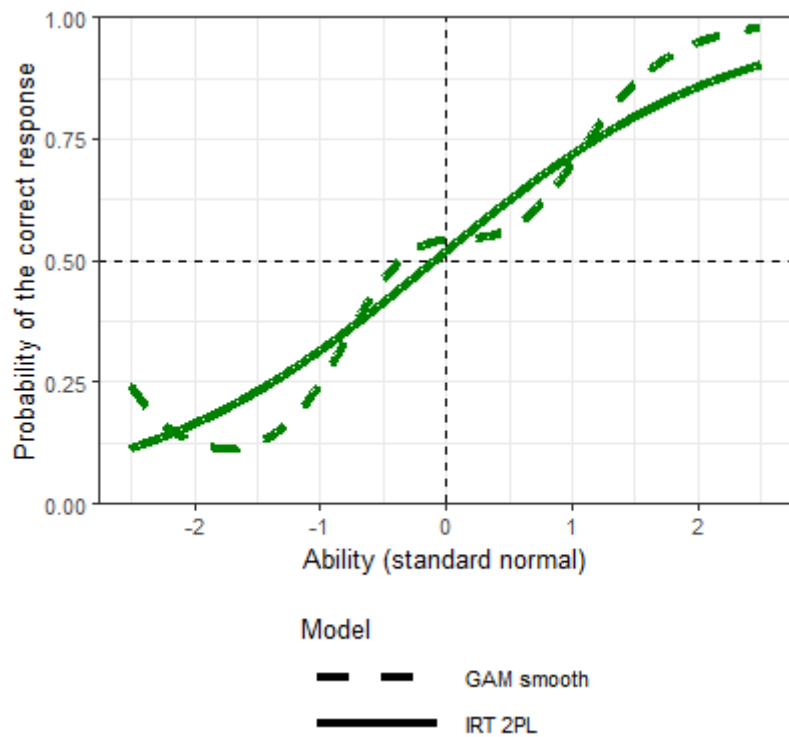


Table 3.35.1.1

Item SP71072 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	52.7%	294	MC	0.379750 5	0.357105	0.85	-0.09	0.017	0.222

3.1.207. Gender DIF:

Table 3.35.2.1

Item SP71072 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
5.03	0.081	1.000	0.014	

3.1.208. Frequency of answers:

answer	Frequency	Percent
Muchołówka pobiera składniki odżywcze od owadów, a inne rośliny tego nie robią. (correct)	155	52.7%
Muchołówka pobiera wodę z owadów, a inne rośliny tego nie robią.	22	7.5%
Muchołówka pomaga w rozmnażaniu się owadów, a inne rośliny tego nie robią.	10	3.4%
Muchołówka przyciąga owady, a inne rośliny tego nie robią.	107	36.4%
Overall	294	100.0%

3.1.209. Distractors functioning:

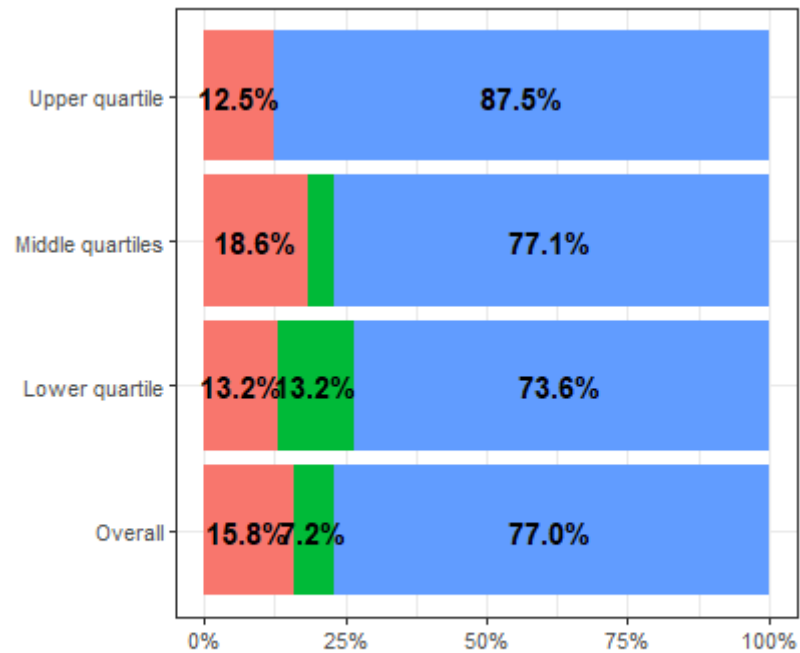
Table 3.35.4.1

Item SP71072 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Muchołówka pobiera wodę z owadów, a inne rośliny tego nie robią.	7	13	2	22	13.2%	18.6%	12.5%	15.8%
Muchołówka pomaga w rozmnażaniu się owadów, a inne rośliny tego nie robią.	7	3	0	10	13.2%	4.3%	0.0%	7.2%
Muchołówka przyciąga owady, a inne rośliny tego nie robią.	39	54	14	107	73.6%	77.1%	87.5%	77.0%
Overall	53	70	16	139	100.0%	100.0%	100.0%	100.0%

Graph 3.35.4.1

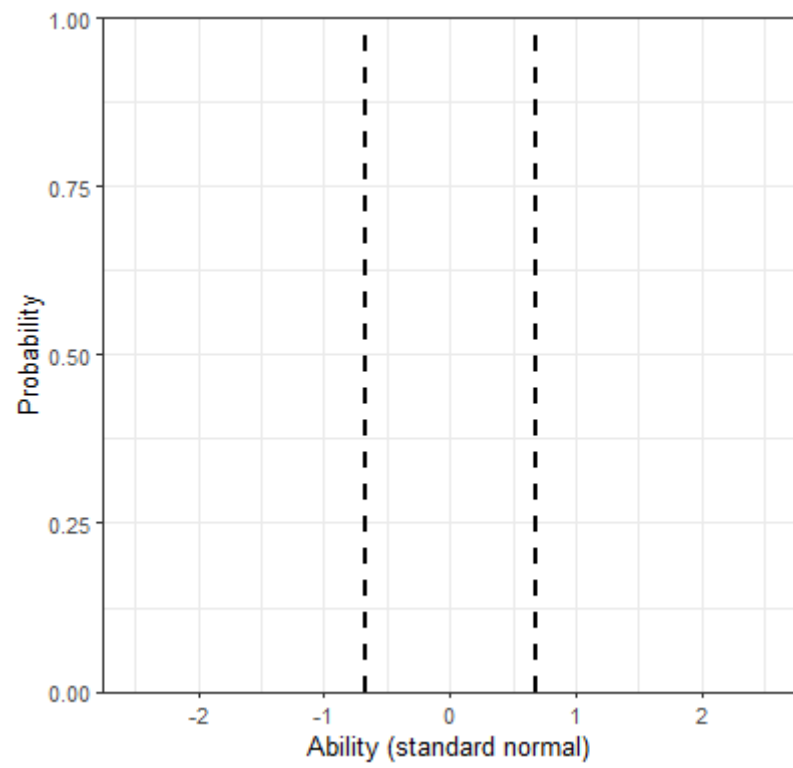
Item SP71072 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



robią. ■ Mucholówka pomaga w rozmnażaniu się owadów, a inne rośliny tego

Graph 3.35.4.2

Item SP71072 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.210. Answering time:

Graph 3.35.5.1

Item SP71072 answering time distribution in groups of different ability level

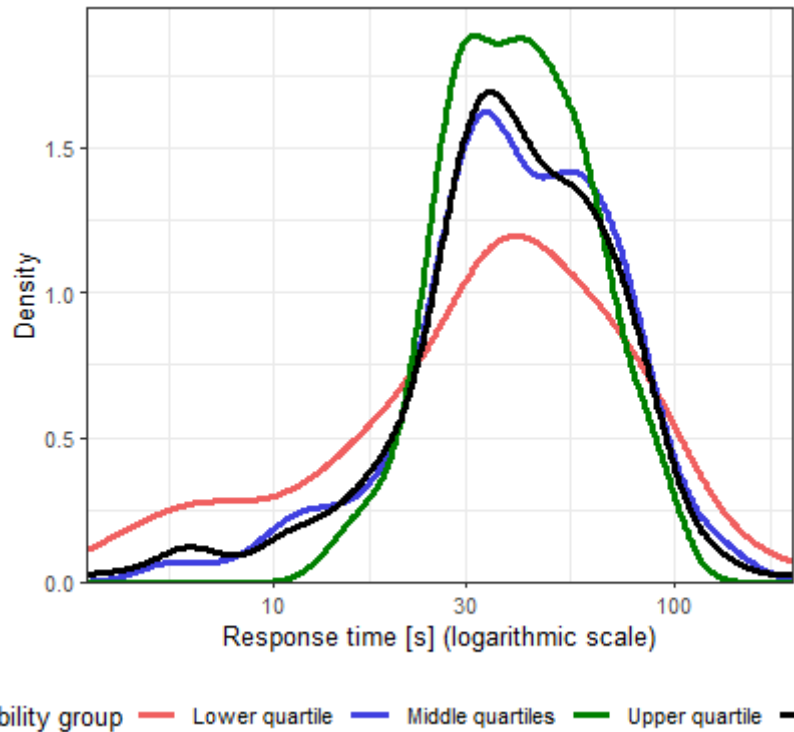


Table 3.35.5.1

Item SP71072 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.43	20.06	36.42	61.14	196.66	3.48	0.86
Middle quartiles	5.24	29.42	39.64	60.21	144.06	3.67	0.59
Upper quartile	14.76	29.21	41.03	54.21	92.31	3.70	0.41
Overall	3.43	28.59	39.91	58.88	196.66	3.64	0.63

3.1.211. S041052 (TIMSS)

3.1.212. Item fit:

Graph 3.36.1.1

Item S041052 ICC and nonparametric trace line

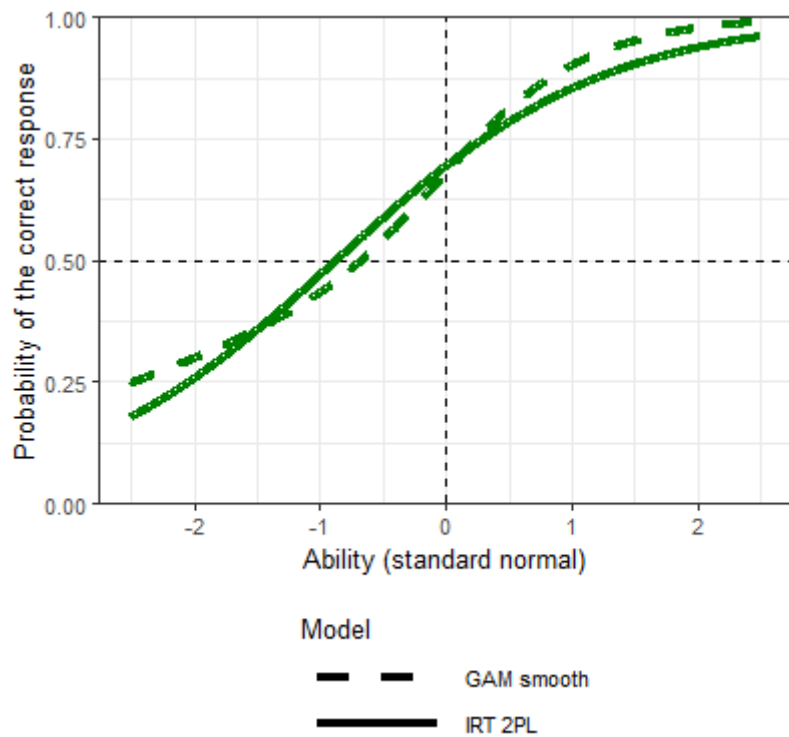


Table 3.36.1.1

Item S041052 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	66.1%	305	MC	0.413484 3	0.4088155	0.94	-0.88	0.037	0.007

3.1.213. Gender DIF:

Table 3.36.2.1

Item S041052 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
4.26	0.119	1.000		0.012

3.1.214. Frequency of answers:

answer	Frequency	Percent
Chmura.	43	14.1%
Kostka lodu. (correct)	201	66.1%
Kropla deszczu.	19	6.2%
Para wodna.	41	13.5%
Overall	304	100.0%

3.1.215. Distractors functioning:

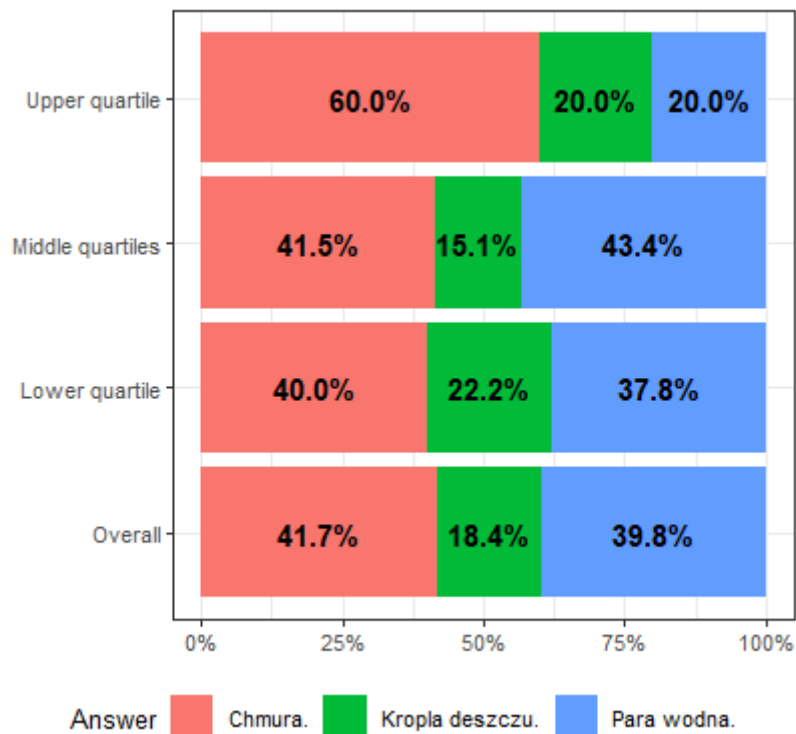
Table 3.36.4.1

Item S041052 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Chmura.	18	22	3	43	40.0%	41.5%	60.0%	41.7%
Kropla deszczu.	10	8	1	19	22.2%	15.1%	20.0%	18.4%
Para wodna.	17	23	1	41	37.8%	43.4%	20.0%	39.8%
Overall	45	53	5	103	100.0%	100.0%	100.0%	100.0%

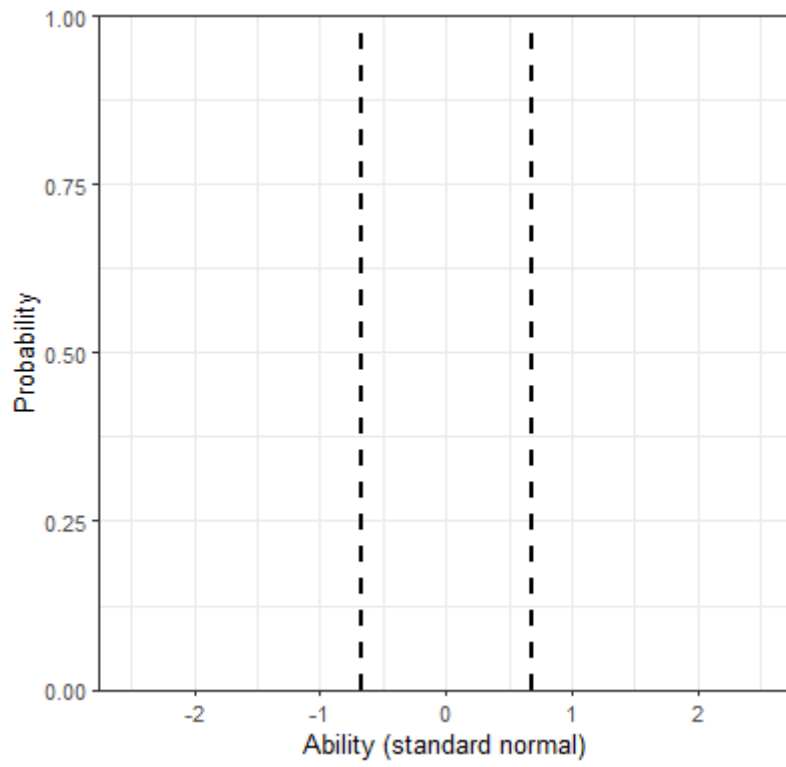
Graph 3.36.4.1

Item S041052 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.36.4.2

Item S041052 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.216. Answering time:

Graph 3.36.5.1

Item S041052 answering time distribution in groups of different ability level

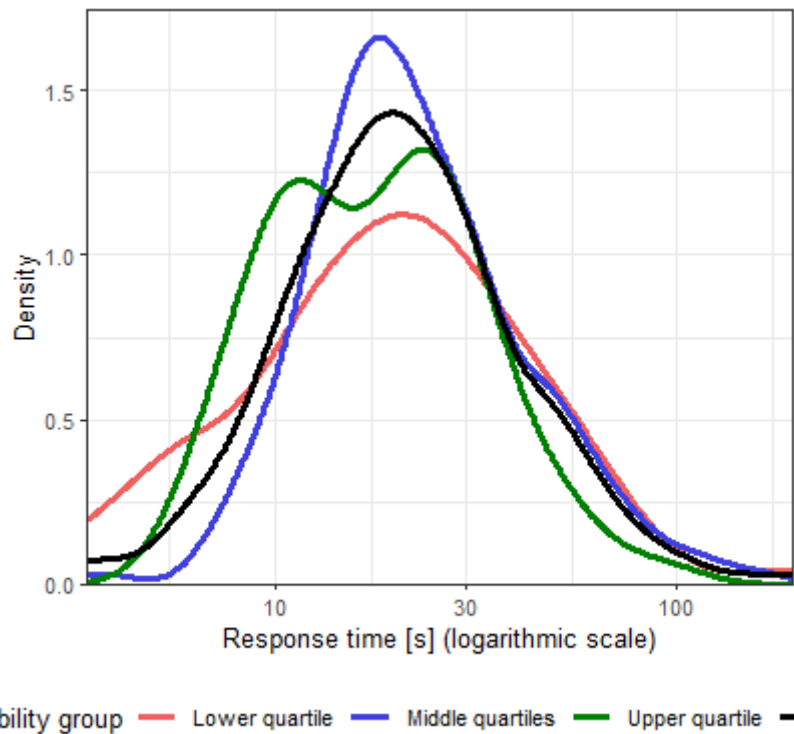


Table 3.36.5.1

Item S041052 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.42	11.88	19.73	31.41	194.57	2.95	0.81
Middle quartiles	3.71	15.08	20.57	31.64	160.87	3.12	0.61
Upper quartile	5.76	11.03	17.92	27.56	92.48	2.88	0.60
Overall	3.42	13.10	20.16	30.47	194.57	3.02	0.67

3.1.217. S041070 (TIMSS)

3.1.218. Item fit:

Graph 3.37.1.1

Item S041070 ICC and nonparametric trace line

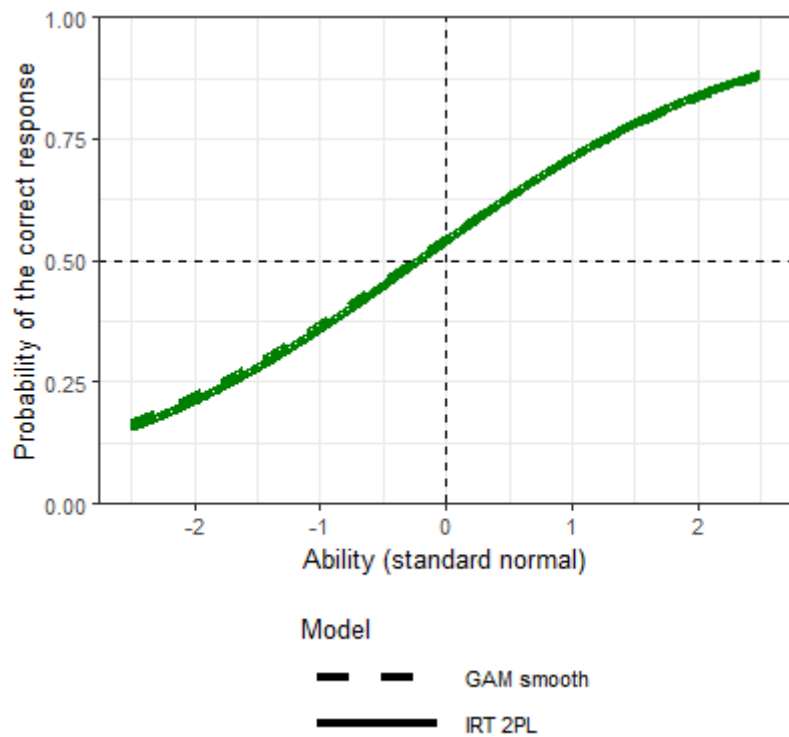


Table 3.37.1.1

Item S041070 parameters and fit statistics

Max. points	Ease	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	52.8%	306	MC	0.328875	0.3566456	0.74	-0.22	0.008	0.370

3.1.219. Gender DIF:

Table 3.37.2.1

Item S041070 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.42	0.181	1.000	0.009	

3.1.220. Frequency of answers:

answer	Frequency	Percent
Ten przedmiot odchyła na bok światło.	35	11.5%
Ten przedmiot zatrzymuje światło. (correct)	161	52.8%
Światło przechodzi przez ten przedmiot.	54	17.7%
Światło zakrzywia się wokół tego przedmiotu.	55	18.0%
Overall	305	100.0%

3.1.221. Distractors functioning:

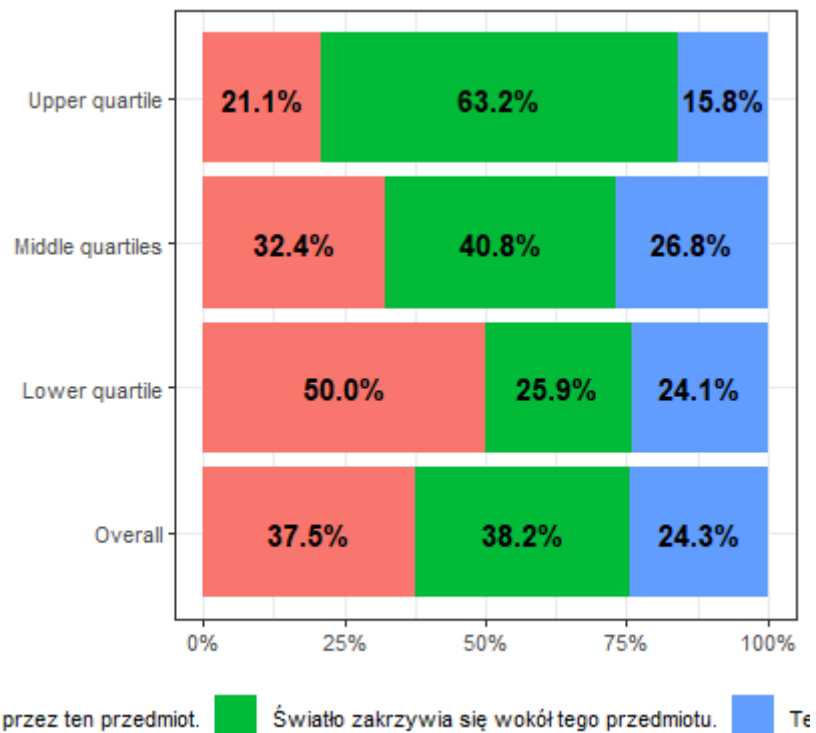
Table 3.37.4.1

Item S041070 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Ten przedmiot odchyła na bok światło.	13	19	3	35	24.1%	26.8%	15.8%	24.3%
Światło przechodzi przez ten przedmiot.	27	23	4	54	50.0%	32.4%	21.1%	37.5%
Światło zakrzywia się wokół tego przedmiotu.	14	29	12	55	25.9%	40.8%	63.2%	38.2%
Overall	54	71	19	144	100.0%	100.0%	100.0%	100.0%

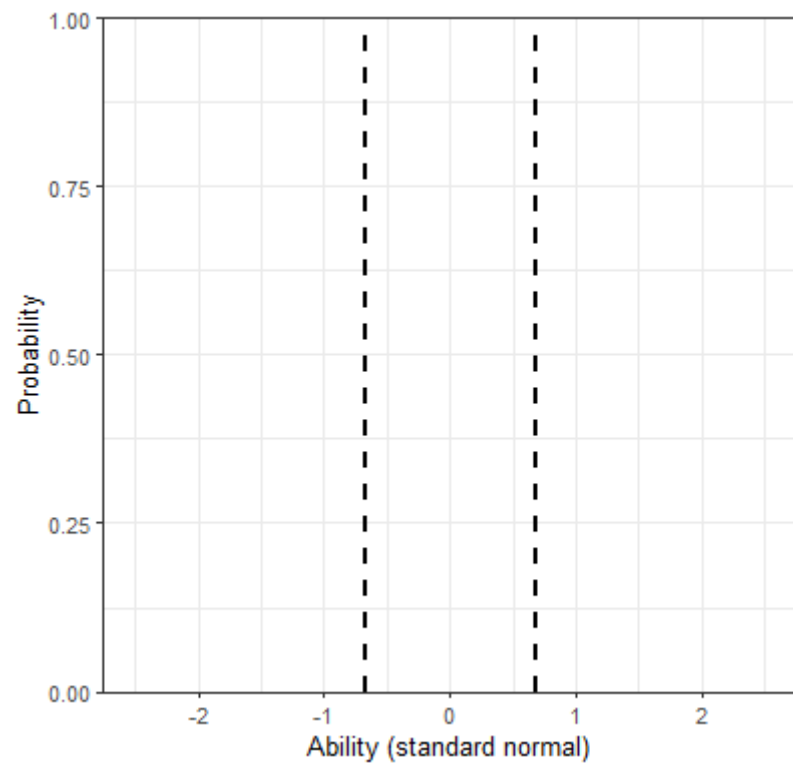
Graph 3.37.4.1

Item S041070 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.37.4.2

Item S041070 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.222. Answering time:

Graph 3.37.5.1

Item S041070 answering time distribution in groups of different ability level

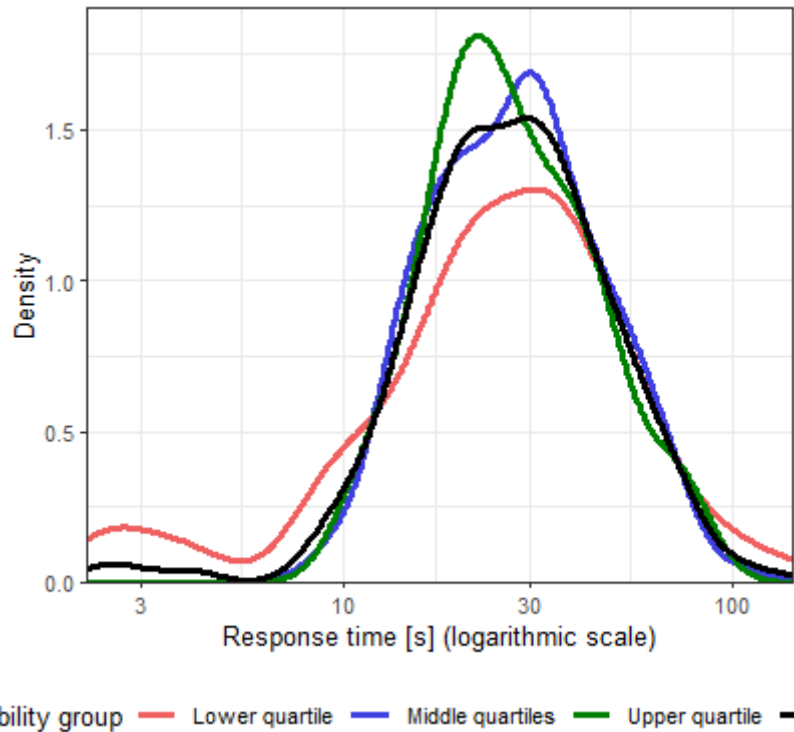


Table 3.37.5.1

Item S041070 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.20	17.11	26.84	39.31	142.63	3.18	0.82
Middle quartiles	9.15	19.36	28.93	39.32	108.10	3.32	0.50
Upper quartile	10.67	19.40	25.45	37.74	77.85	3.30	0.48
Overall	2.20	18.62	27.05	39.20	142.63	3.28	0.61

3.1.223. S100016 (TIMSS)

3.1.224. Item fit:

Graph 3.38.1.1

Item S100016 ICC and nonparametric trace line

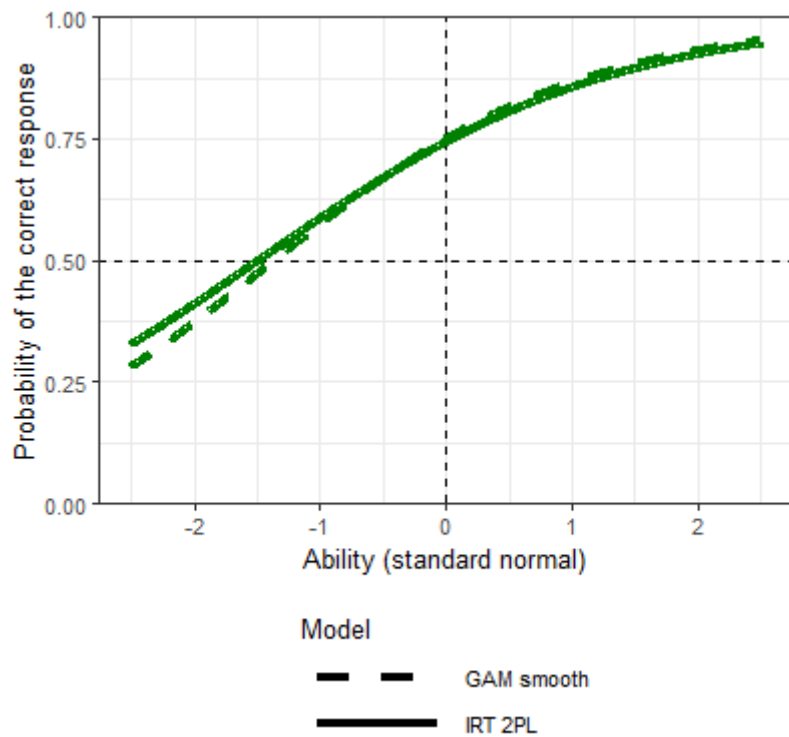


Table 3.38.1.1

Item S100016 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	72.0%	305	MC	0.308612 8	0.2028729	0.71	-1.49	0.015	0.251

3.1.225. Gender DIF:

Table 3.38.2.1

Item S100016 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.25	0.534	1.000		0.004

3.1.226. Frequency of answers:

answer	Frequency	Percent
Hel jest cięższy od powietrza.	25	8.2%
Hel jest lżejszy od powietrza. (correct)	219	72.0%
Hel nagrzewa się szybciej niż powietrze.	40	13.2%
Hel przewodzi prąd lepiej niż powietrze.	20	6.6%
Overall	304	100.0%

3.1.227. Distractors functioning:

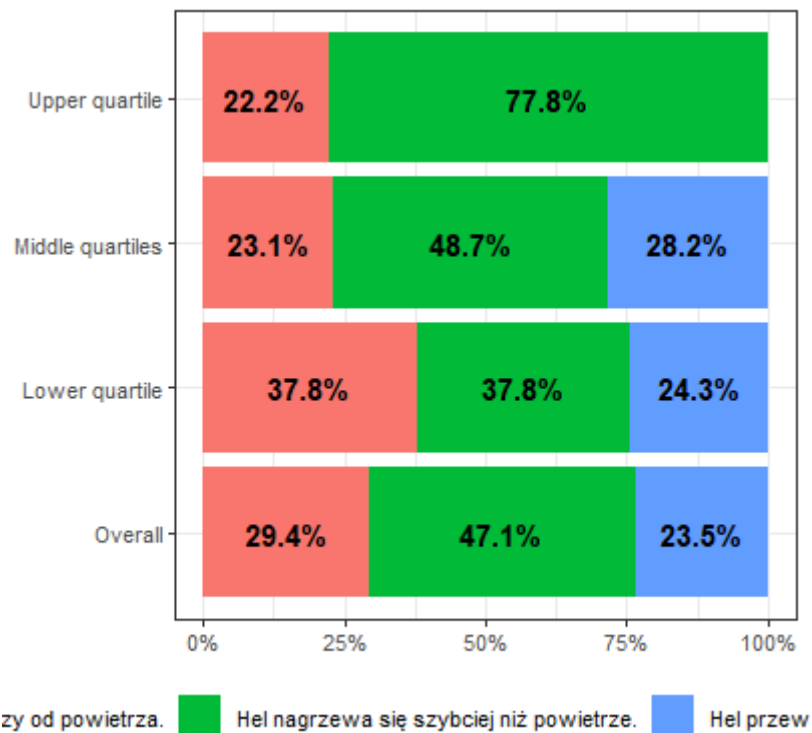
Table 3.38.4.1

Item S100016 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Hel jest cięższy od powietrza.	14	9	2	25	37.8%	23.1%	22.2%	29.4%
Hel nagrzewa się szybciej niż powietrze.	14	19	7	40	37.8%	48.7%	77.8%	47.1%
Hel przewodzi prąd lepiej niż powietrze.	9	11	0	20	24.3%	28.2%	0.0%	23.5%
Overall	37	39	9	85	100.0%	100.0%	100.0%	100.0%

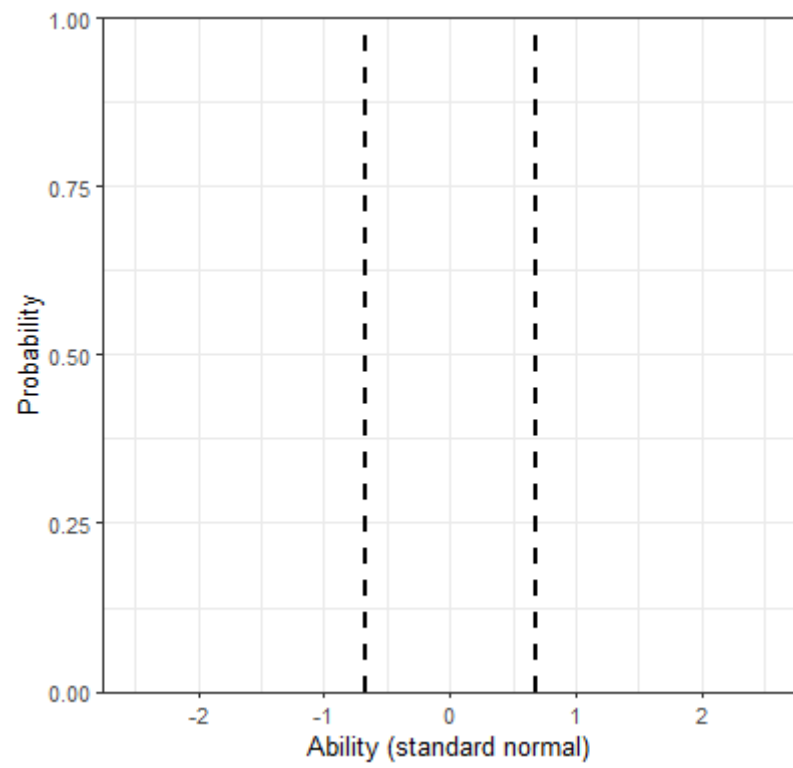
Graph 3.38.4.1

Item S100016 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.38.4.2

Item S100016 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.228. Answering time:

Graph 3.38.5.1

Item S100016 answering time distribution in groups of different ability level

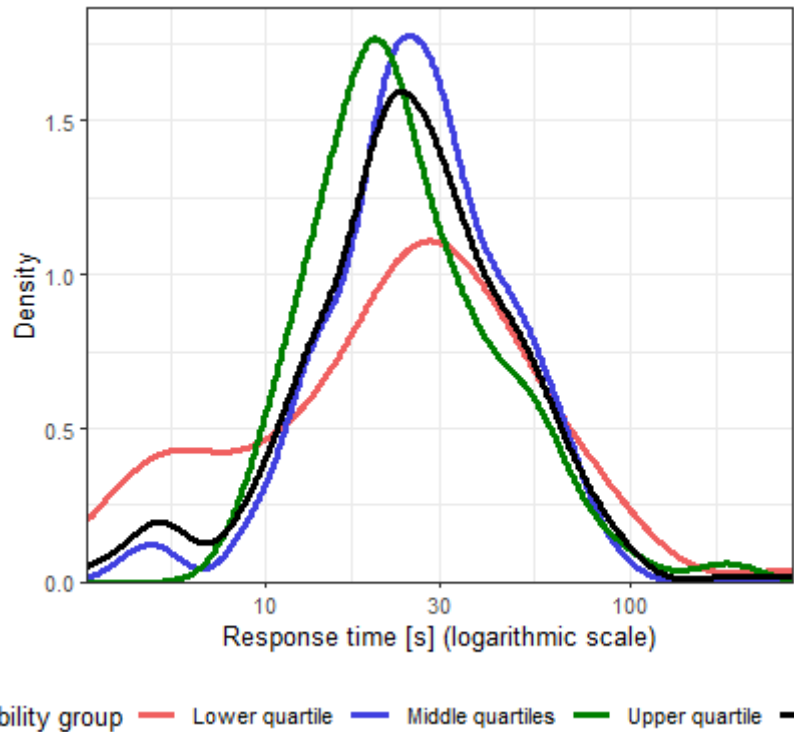


Table 3.38.5.1

Item S100016 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.24	12.46	25.63	39.66	280.71	3.10	0.90
Middle quartiles	4.15	19.87	26.26	38.08	93.16	3.26	0.57
Upper quartile	9.47	16.38	21.60	34.09	186.14	3.19	0.58
Overall	3.24	16.85	24.85	37.57	280.71	3.20	0.67

3.1.229. S061105 (LLM)

3.1.230. Item fit:

Graph 3.39.1.1

Item S061105 ICC and nonparametric trace line

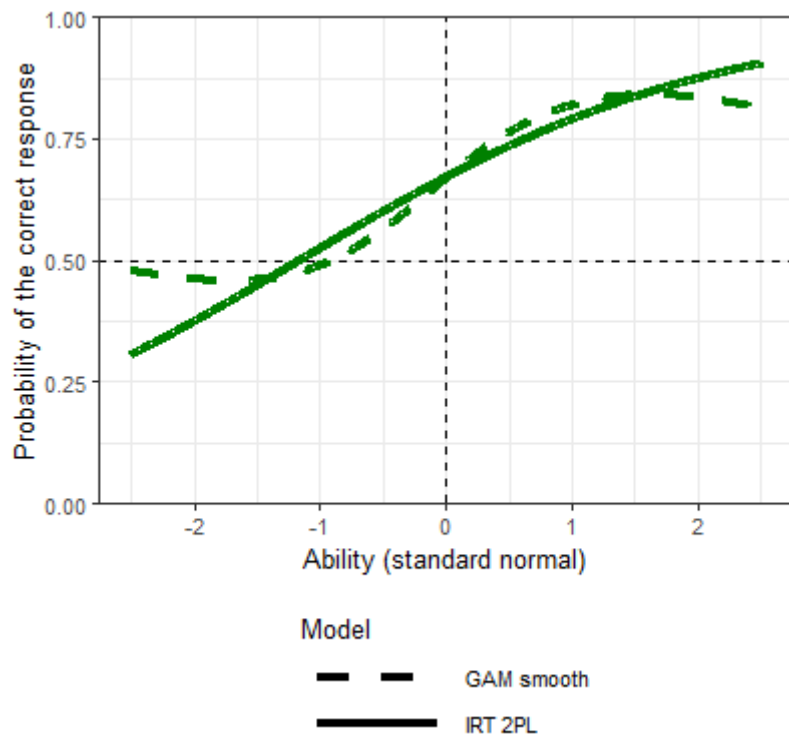


Table 3.39.1.1

Item S061105 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	65.5%	305	MC	0.248553 5	0.254016	0.61	-1.17	0.008	0.379

3.1.231. Gender DIF:

Table 3.39.2.1

Item S061105 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
8.85	0.012	0.996	0.026	

3.1.232. Frequency of answers:

answer	Frequency	Percent
W ramce A (correct)	199	65.5%
W ramce B	35	11.5%
W ramce C	20	6.6%
W ramce D	50	16.4%
Overall	304	100.0%

3.1.233. Distractors functioning:

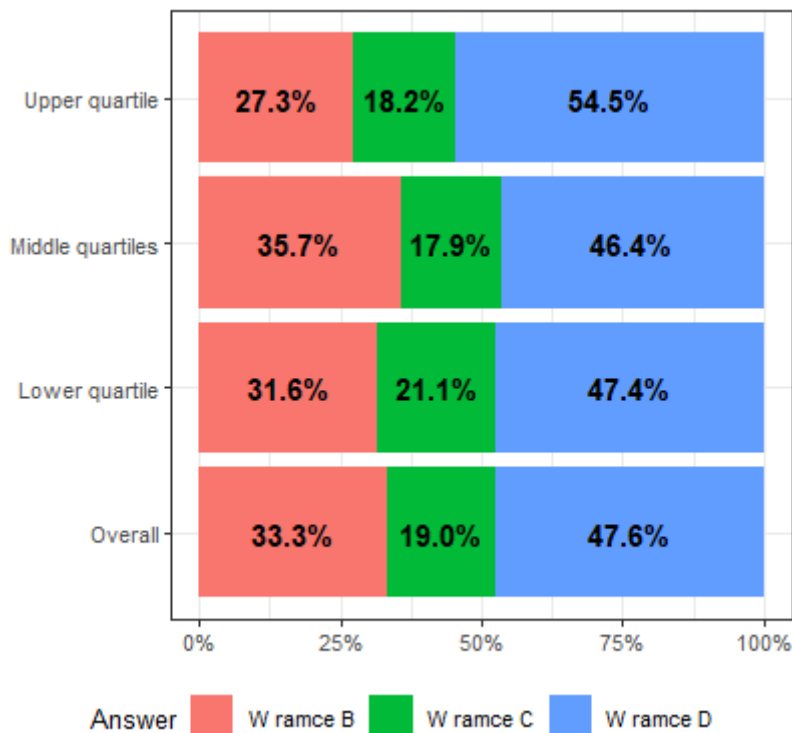
Table 3.39.4.1

Item S061105 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
W ramce B	12	20	3	35	31.6%	35.7%	27.3%	33.3%
W ramce C	8	10	2	20	21.1%	17.9%	18.2%	19.0%
W ramce D	18	26	6	50	47.4%	46.4%	54.5%	47.6%
Overall	38	56	11	105	100.0%	100.0%	100.0%	100.0%

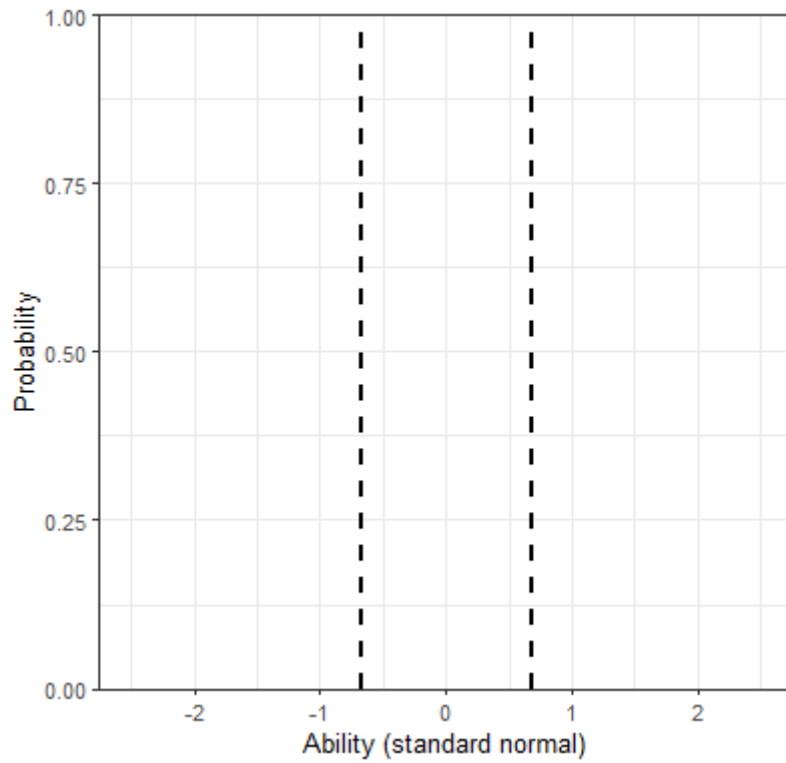
Graph 3.39.4.1

Item S061105 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.39.4.2

Item S061105 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.234. Answering time:

Graph 3.39.5.1

Item S061105 answering time distribution in groups of different ability level

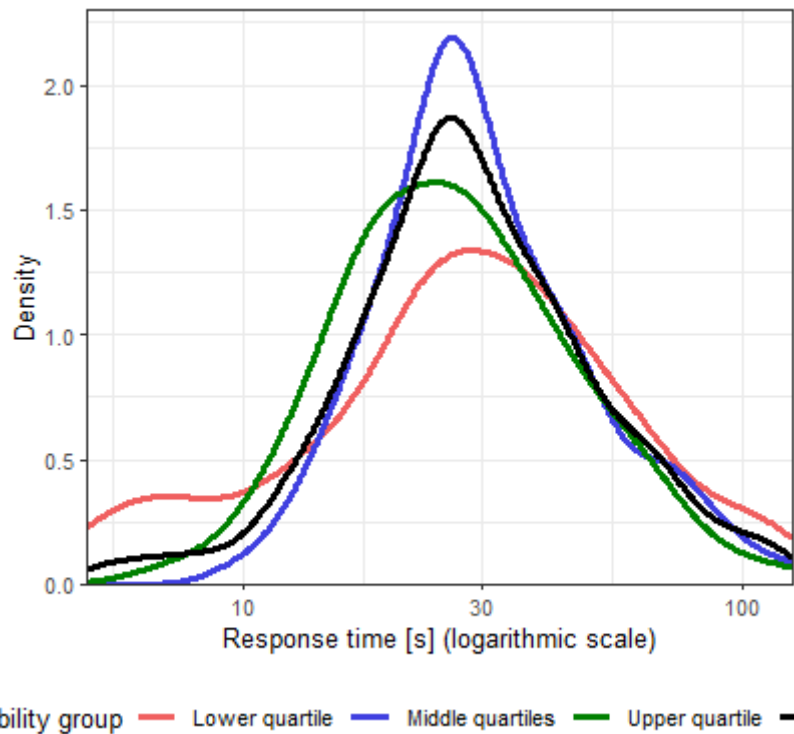


Table 3.39.5.1

Item S061105 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.87	18.99	27.34	43.42	111.25	3.29	0.75
Middle quartiles	9.53	22.31	28.02	40.25	125.60	3.40	0.49
Upper quartile	7.27	18.00	26.59	38.54	114.41	3.28	0.54
Overall	4.87	20.13	27.30	40.37	125.60	3.35	0.58

3.1.235. S051114 (TIMSS)

3.1.236. Item fit:

Graph 3.40.1.1

Item S051114 ICC and nonparametric trace line

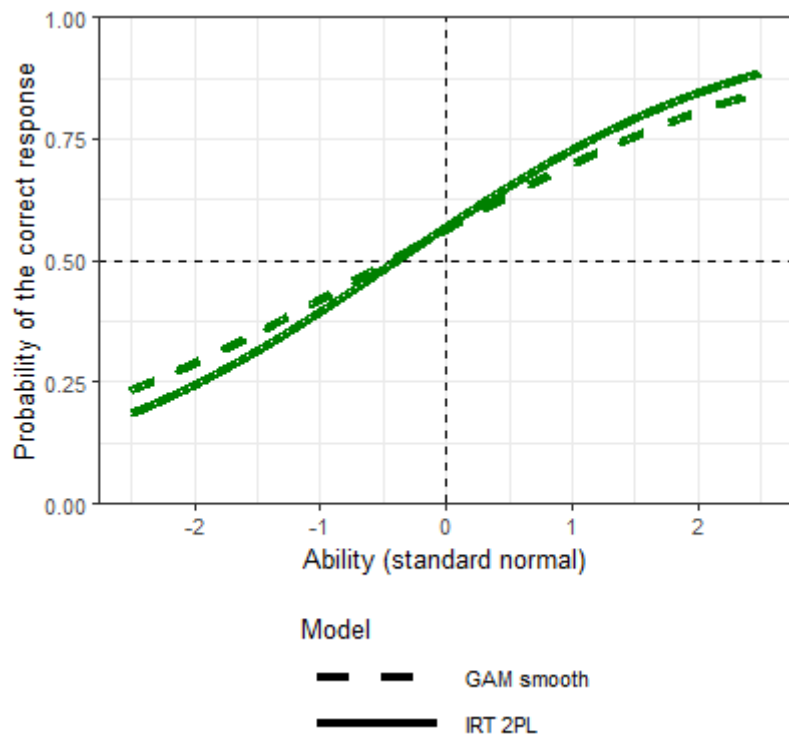


Table 3.40.1.1

Item S051114 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	56.7%	299	MC	0.256440 4	0.362227	0.70	-0.39	0.000	0.455

3.1.237. Gender DIF:

Table 3.40.2.1

Item S051114 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.40	0.820	1.000		0.001

3.1.238. Frequency of answers:

answer	Frequency	Percent
Przepuszczanie światła. (correct)	169	56.7%
Przyciąganie przez magnes.	39	13.1%
Uginanie się.	30	10.1%
Unoszenie się na wodzie.	60	20.1%
Overall	298	100.0%

3.1.239. Distractors functioning:

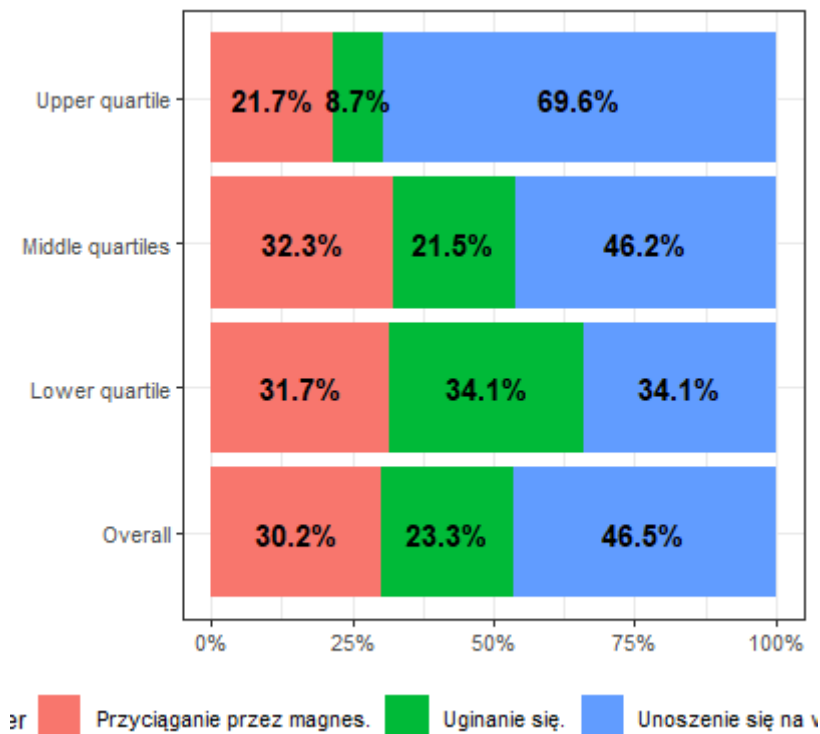
Table 3.40.4.1

Item S051114 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Przyciąganie przez magnes.	13	21	5	39	31.7%	32.3%	21.7%	30.2%
Uginanie się.	14	14	2	30	34.1%	21.5%	8.7%	23.3%
Unoszenie się na wodzie.	14	30	16	60	34.1%	46.2%	69.6%	46.5%
Overall	41	65	23	129	100.0%	100.0%	100.0%	100.0%

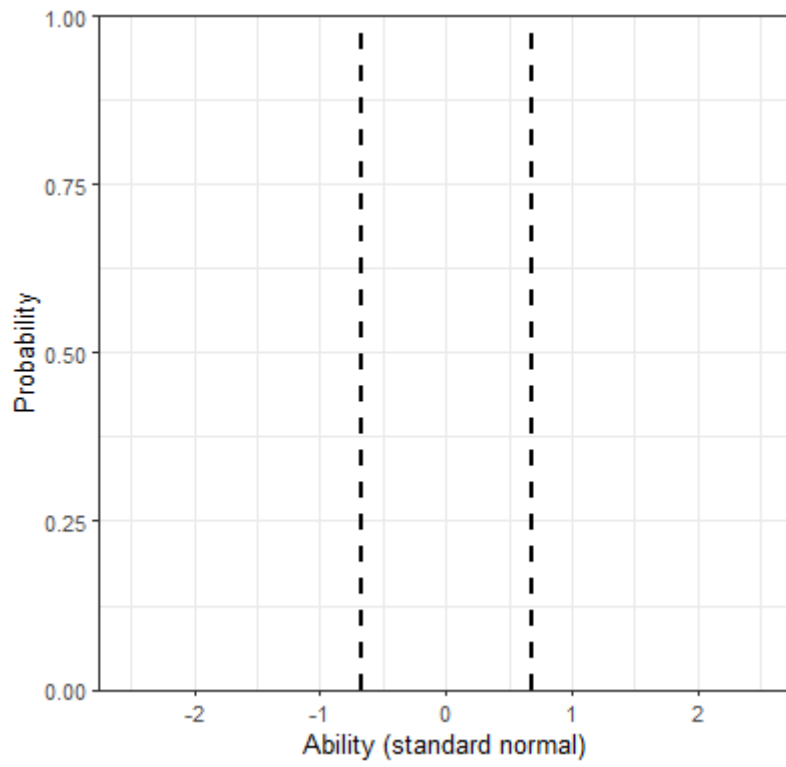
Graph 3.40.4.1

Item S051114 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.40.4.2

Item S051114 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.240. Answering time:

Graph 3.40.5.1

Item S051114 answering time distribution in groups of different ability level

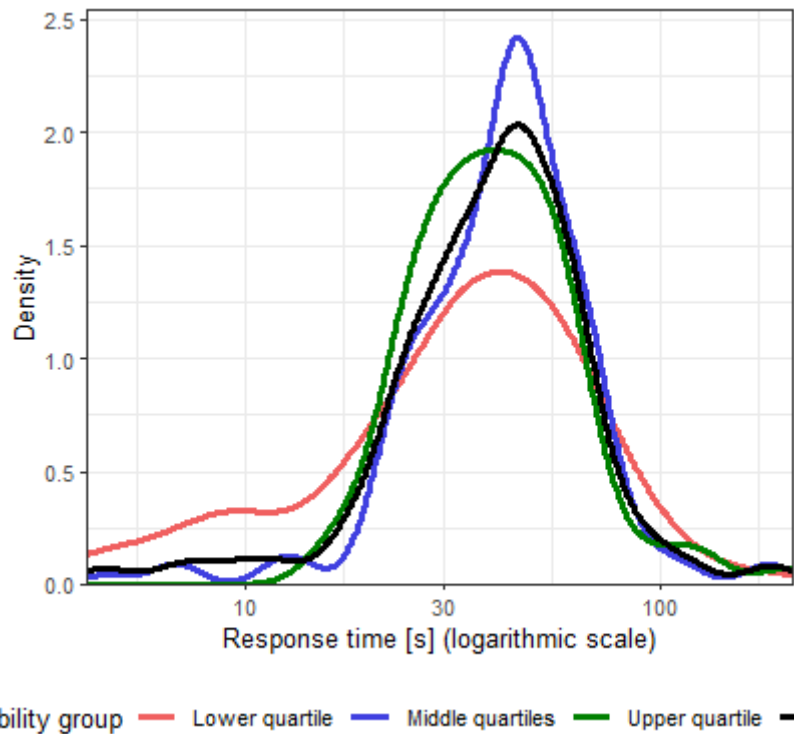


Table 3.40.5.1

Item S051114 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.16	21.66	36.64	56.00	174.53	3.46	0.76
Middle quartiles	4.71	31.92	43.38	54.24	190.92	3.71	0.51
Upper quartile	16.19	29.40	39.32	53.04	208.69	3.69	0.45
Overall	4.16	29.41	41.48	54.36	208.69	3.65	0.57

3.1.241. S890016 (LLM)

3.1.242. Item fit:

Graph 3.41.1.1

Item S890016 ICC and nonparametric trace line

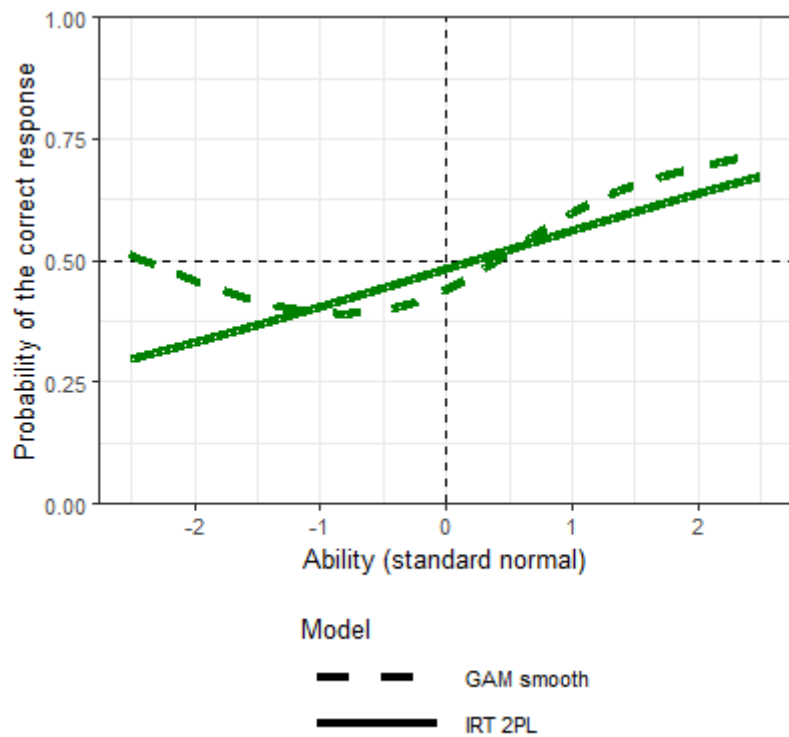


Table 3.41.1.1

Item S890016 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	48.3%	319	MC	0.149033 8	0.06506054	0.32	0.23	0.026	0.076

3.1.243. Gender DIF:

Table 3.41.2.1

Item S890016 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.61	0.164	1.000	0.010	

3.1.244. Frequency of answers:

answer	Frequency	Percent
Żeby lepiej oddychać.	69	21.6%
Żeby magazynować więcej wody. (correct)	154	48.3%
Żeby przyciągać owady do zapylania.	17	5.3%
Żeby przyspieszyć fotosyntezę.	79	24.8%
Overall	319	100.0%

3.1.245. Distractors functioning:

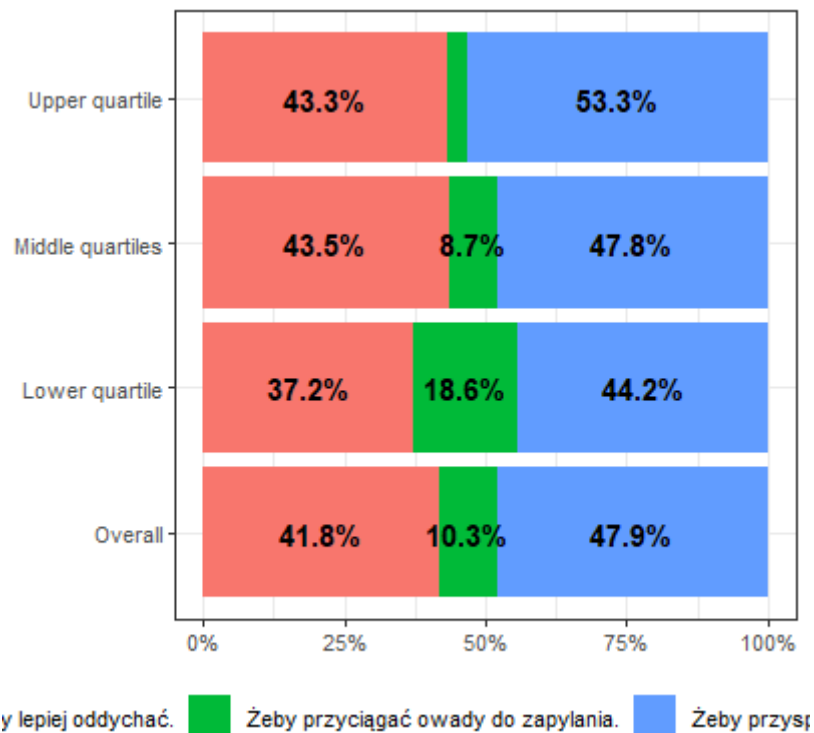
Table 3.41.4.1

Item S890016 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Żeby lepiej oddychać.	16	40	13	69	37.2%	43.5%	43.3%	41.8%
Żeby przyciągać owady do zapylania.	8	8	1	17	18.6%	8.7%	3.3%	10.3%
Żeby przyspieszyć fotosyntezę.	19	44	16	79	44.2%	47.8%	53.3%	47.9%
Overall	43	92	30	165	100.0%	100.0%	100.0%	100.0%

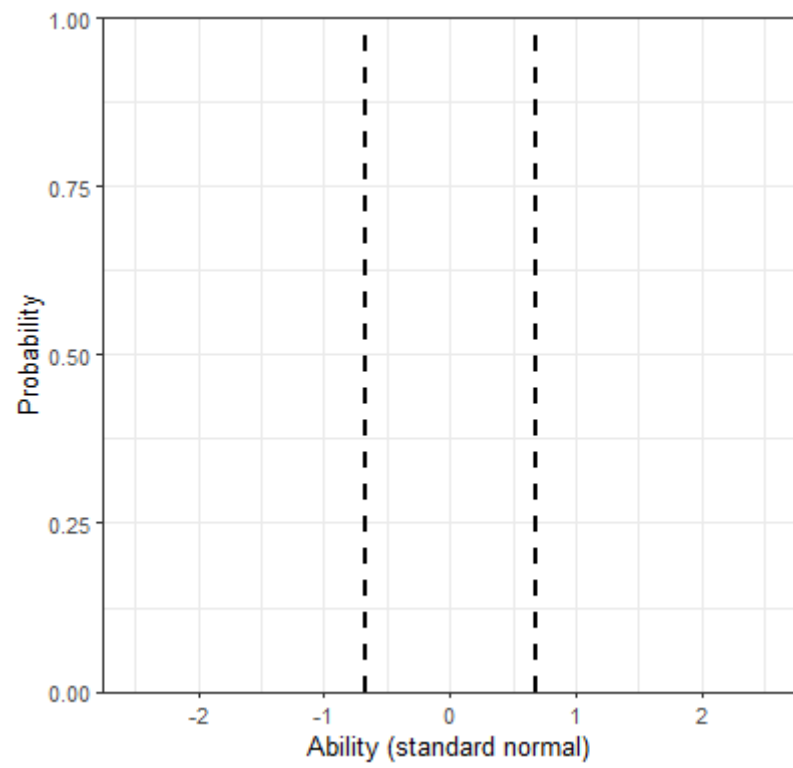
Graph 3.41.4.1

Item S890016 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.41.4.2

Item S890016 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.246. Answering time:

Graph 3.41.5.1

Item S890016 answering time distribution in groups of different ability level

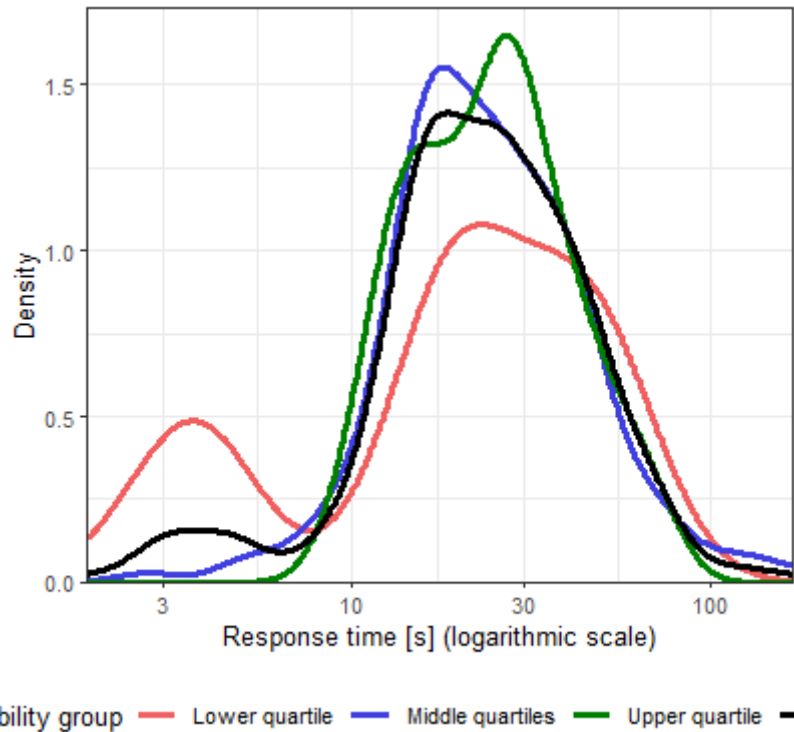


Table 3.41.5.1

Item S890016 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	1.84	13.25	21.70	38.33	84.48	2.91	0.99
Middle quartiles	2.70	15.94	23.22	36.19	168.17	3.17	0.62
Upper quartile	9.12	15.78	25.21	34.46	72.65	3.18	0.51
Overall	1.84	15.72	23.60	36.09	168.17	3.11	0.71

3.1.247. SP71402 (TIMSS)

3.1.248. Item fit:

Graph 3.42.1.1

Item SP71402 ICC and nonparametric trace line

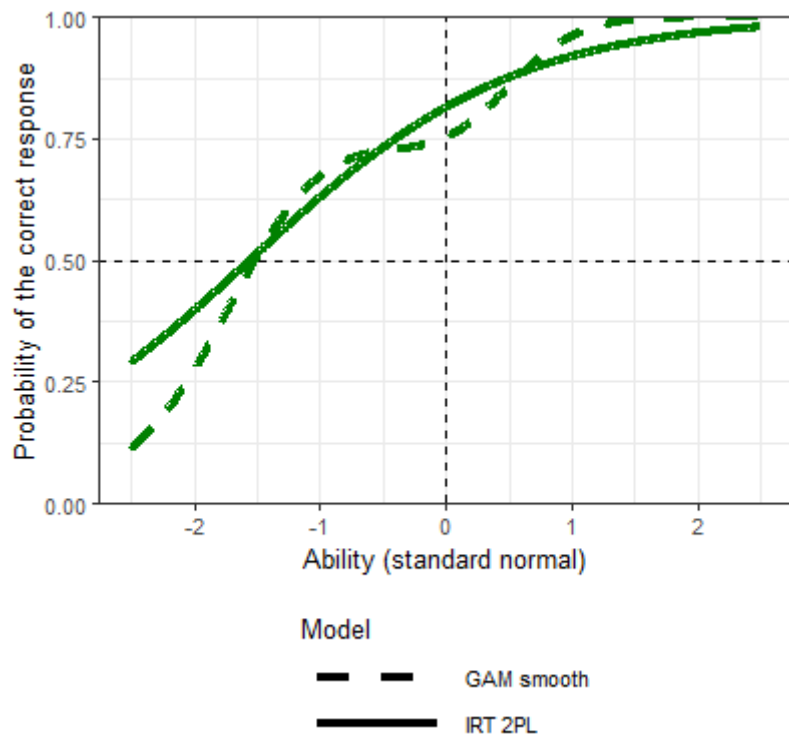


Table 3.42.1.1

Item SP71402 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	78.5%	299	MC	0.352944 3	0.325555	0.95	-1.56	0.005	0.414

3.1.249. Gender DIF:

Table 3.42.2.1

Item SP71402 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.37	0.504	1.000		0.005

3.1.250. Frequency of answers:

answer	Frequency	Percent
Mózg.	22	7.4%
Płuca. (correct)	234	78.5%
Serce.	28	9.4%
Żołądek.	14	4.7%
Overall	298	100.0%

3.1.251. Distractors functioning:

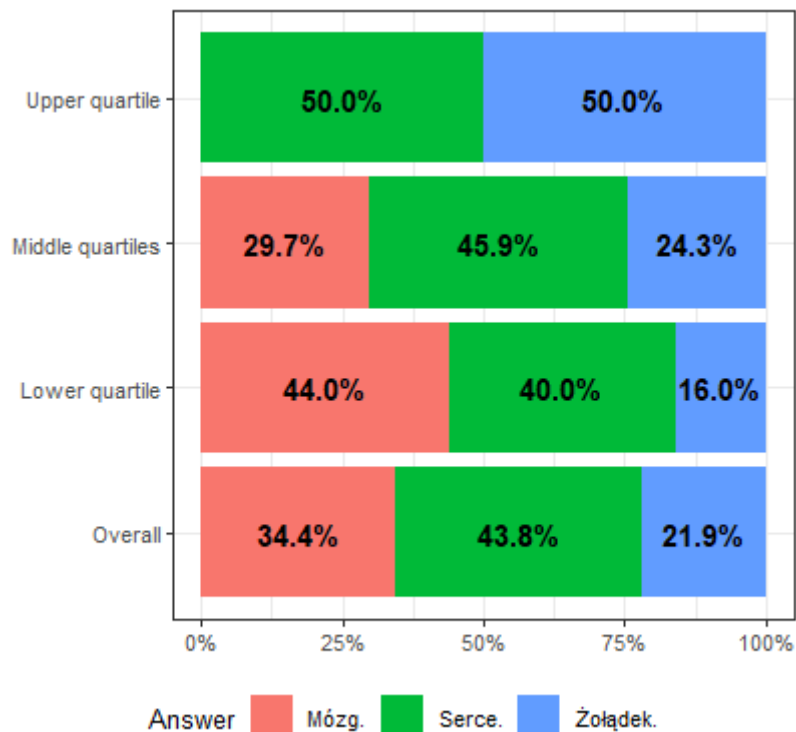
Table 3.42.4.1

Item SP71402 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Mózg.	11	11	0	22	44.0%	29.7%	0.0%	34.4%
Serce.	10	17	1	28	40.0%	45.9%	50.0%	43.8%
Żołądek.	4	9	1	14	16.0%	24.3%	50.0%	21.9%
Overall	25	37	2	64	100.0%	100.0%	100.0%	100.0%

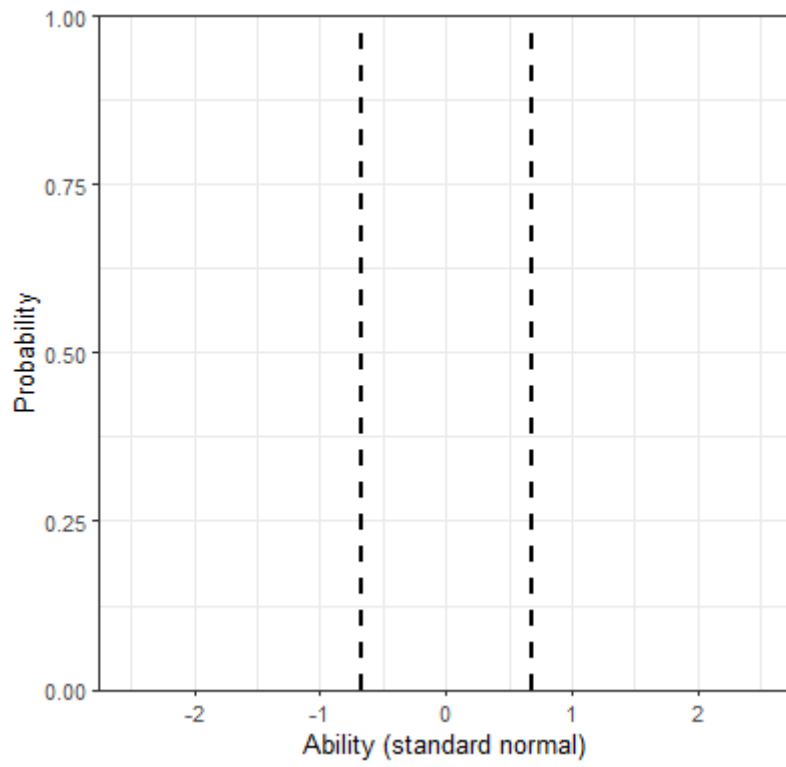
Graph 3.42.4.1

Item SP71402 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.42.4.2

Item SP71402 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.252. Answering time:

Graph 3.42.5.1

Item SP71402 answering time distribution in groups of different ability level

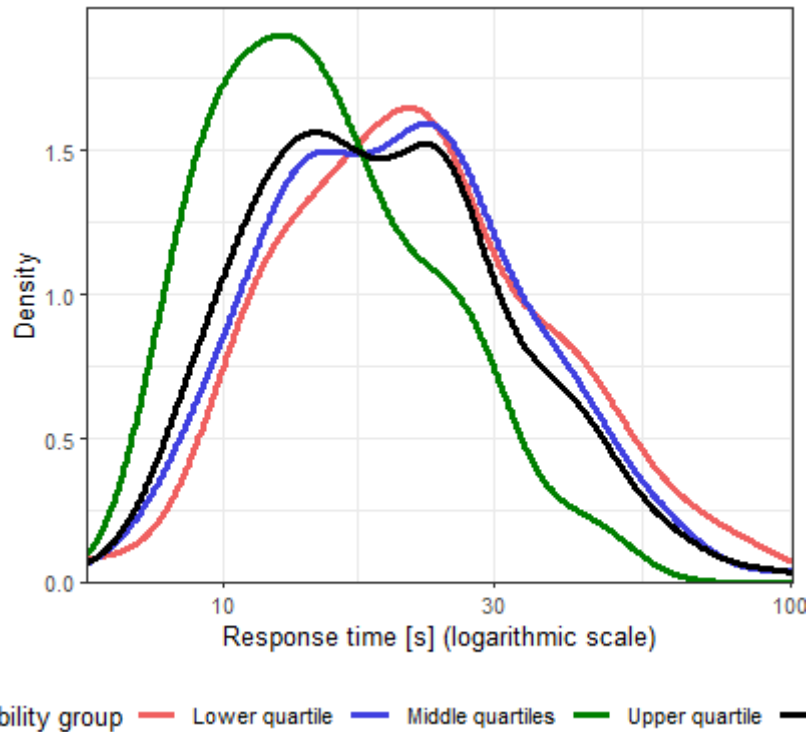


Table 3.42.5.1

Item SP71402 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.79	15.52	21.03	30.59	87.09	3.08	0.54
Middle quartiles	6.06	13.86	20.36	28.26	101.08	3.01	0.52
Upper quartile	7.47	10.45	14.35	20.32	47.10	2.71	0.45
Overall	5.79	12.93	18.36	26.55	101.08	2.95	0.53

3.1.253. S100029 (LLM)

3.1.254. Item fit:

Graph 3.43.1.1

Item S100029 ICC and nonparametric trace line

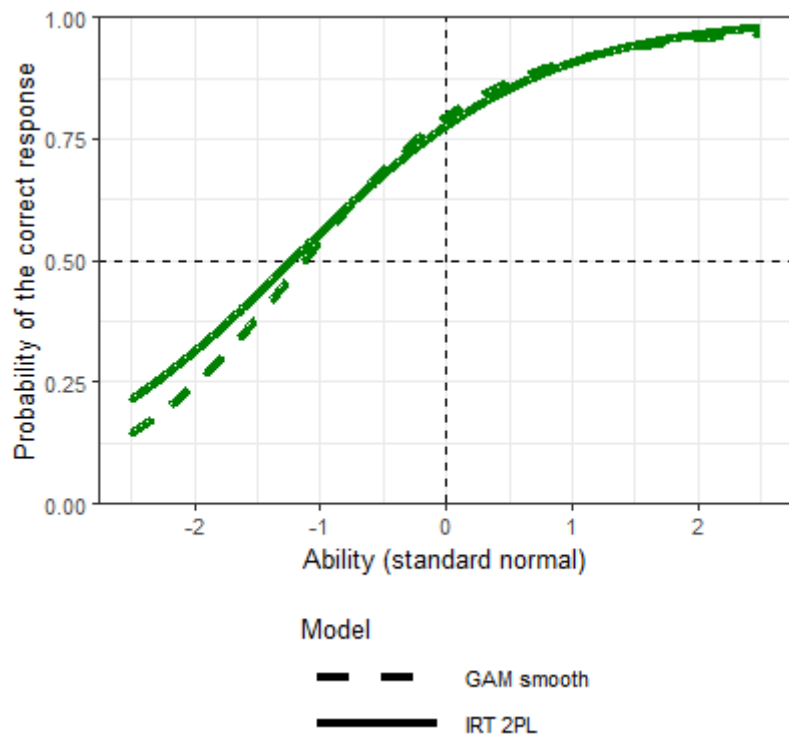


Table 3.43.1.1

Item S100029 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	73.4%	305	MC	0.395368 8	0.3284106	1.01	-1.22	0.018	0.198

3.1.255. Gender DIF:

Table 3.43.2.1

Item S100029 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.34	0.512	1.000	0.004	

3.1.256. Frequency of answers:

answer	Frequency	Percent
Wulkany wybuchają, ponieważ Słońce nagrzewa Ziemię.	51	16.8%
Wulkany wybuchają, ponieważ gorąca magma podnosi się na powierzchnię Ziemi. (correct)	223	73.4%
Wulkany wybuchają, ponieważ księżyc przyciąga magmę.	25	8.2%
Wulkany wybuchają, ponieważ wiatr wieje mocno na Ziemi.	5	1.6%
Overall	304	100.0%

3.1.257. Distractors functioning:

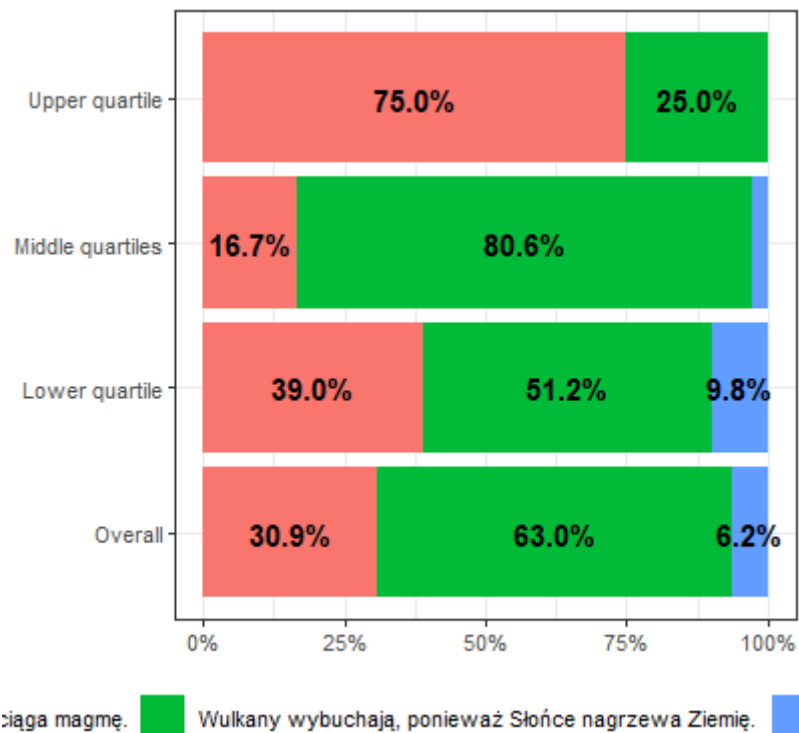
Table 3.43.4.1

Item S100029 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Wulkany wybuchają, ponieważ Słońce nagrzewa Ziemię.	21	29	1	51	51.2%	80.6%	25.0%	63.0%
Wulkany wybuchają, ponieważ księżyc przyciąga magmę.	16	6	3	25	39.0%	16.7%	75.0%	30.9%
Wulkany wybuchają, ponieważ wiatr wieje mocno na Ziemi.	4	1	0	5	9.8%	2.8%	0.0%	6.2%
Overall	41	36	4	81	100.0%	100.0%	100.0%	100.0%

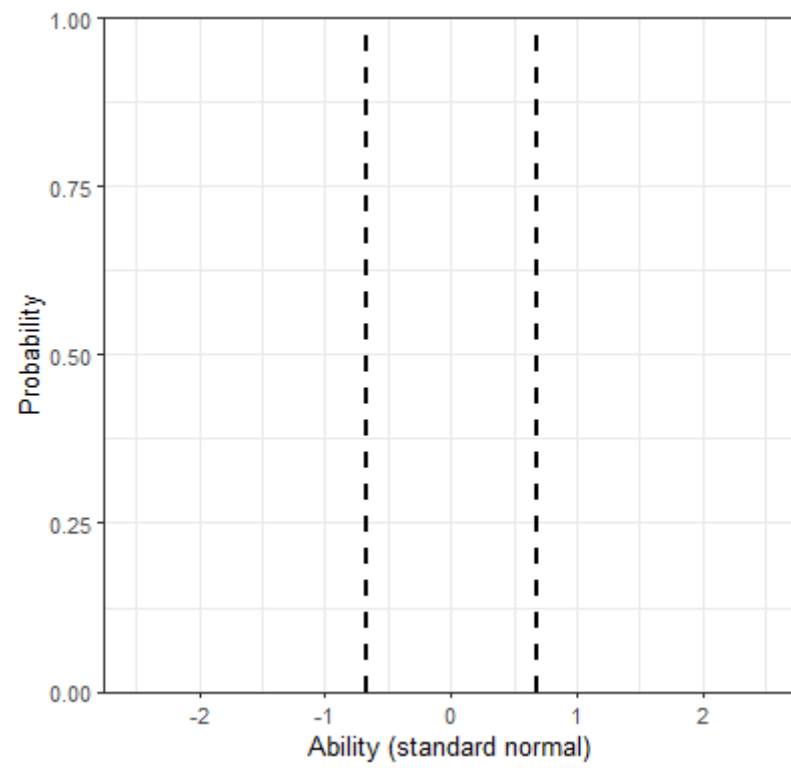
Graph 3.43.4.1

Item S100029 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.43.4.2

Item S100029 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.258. Answering time:

Graph 3.43.5.1

Item S100029 answering time distribution in groups of different ability level

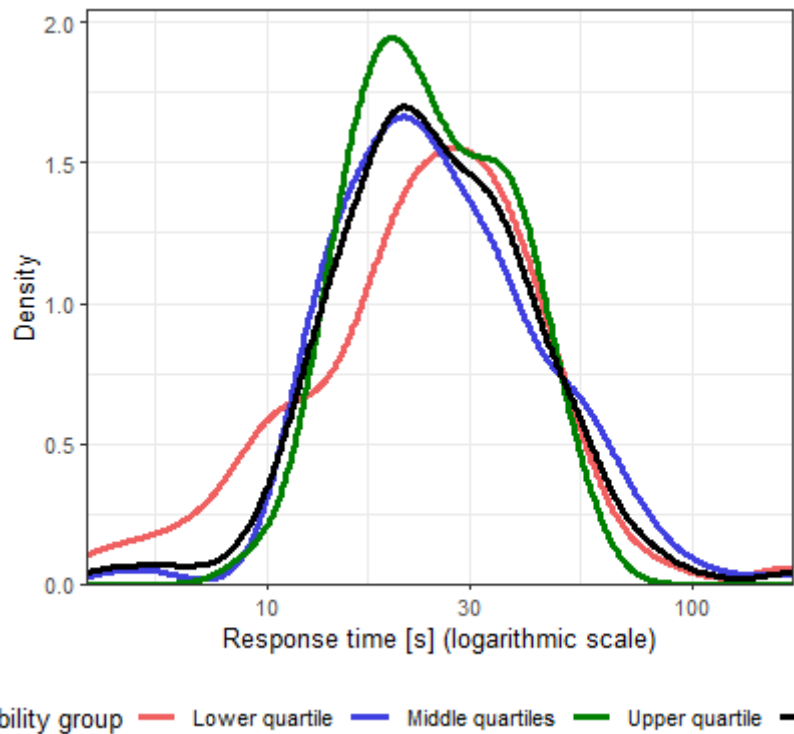


Table 3.43.5.1

Item S100029 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.80	16.72	24.13	34.66	172.04	3.13	0.66
Middle quartiles	4.37	17.19	24.16	34.97	166.34	3.23	0.56
Upper quartile	9.27	18.12	23.85	34.07	59.01	3.19	0.41
Overall	3.80	17.18	24.09	34.46	172.04	3.20	0.55

3.1.259. S100020 (LLM)

3.1.260. Item fit:

Graph 3.44.1.1

Item S100020 ICC and nonparametric trace line

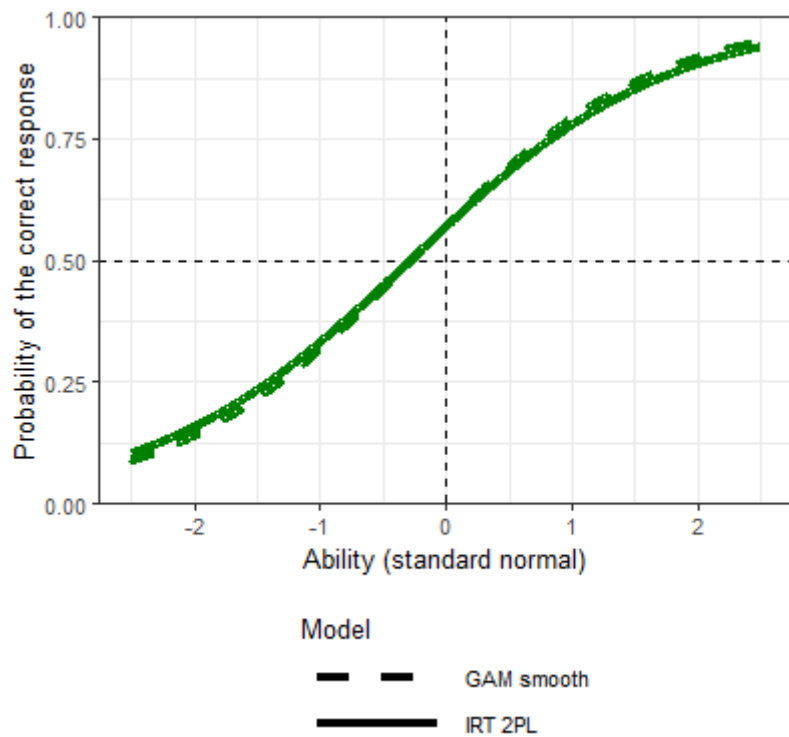


Table 3.44.1.1

Item S100020 parameters and fit statistics

Max. points	Ease	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	56.1%	319	MC	0.4204751	0.3576457	0.98	-0.29	0.009	0.362

3.1.261. Gender DIF:

Table 3.44.2.1

Item S100020 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.02	0.992	1.000		0.000

3.1.262. Frequency of answers:

answer	Frequency	Perc
Drzewa te będą miały trudności z przetrwaniem i mogą zacząć wymierać. (correct)	179	5
Drzewa te będą przenosić się do chłodniejszych obszarów, gdzie będą mogły przetrwać.	18	
Drzewa te będą przystosowywać się do nowych warunków, zmieniając swoje cechy genetyczne.	73	2
Drzewa te będą rosły szybciej i stawały się silniejsze.	49	1
Overall	319	10

3.1.263. Distractors functioning:

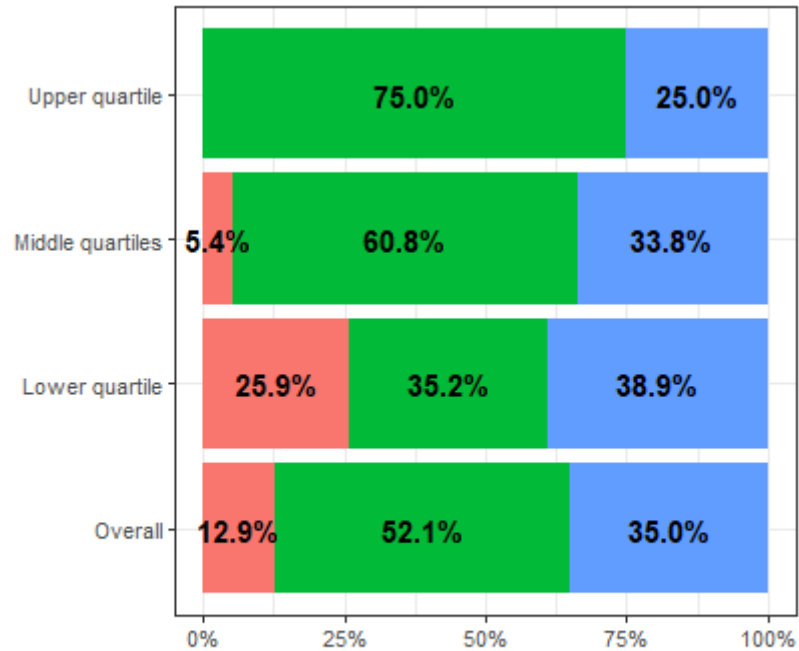
Table 3.44.4.1

Item S100020 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Drzewa te będą przenosić się do chłodniejszych obszarów, gdzie będą mogły przetrwać.	14	4	0	18	25.9%	5.4%	0.0%	12.9%
Drzewa te będą przystosowywać się do nowych warunków, zmieniając swoje cechy genetyczne.	19	45	9	73	35.2%	60.8%	75.0%	52.1%
Drzewa te będą rosły szybciej i stawały się silniejsze.	21	25	3	49	38.9%	33.8%	25.0%	35.0%
Overall	54	74	12	140	100.0%	100.0%	100.0%	100.0%

Graph 3.44.4.1

Item S100020 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

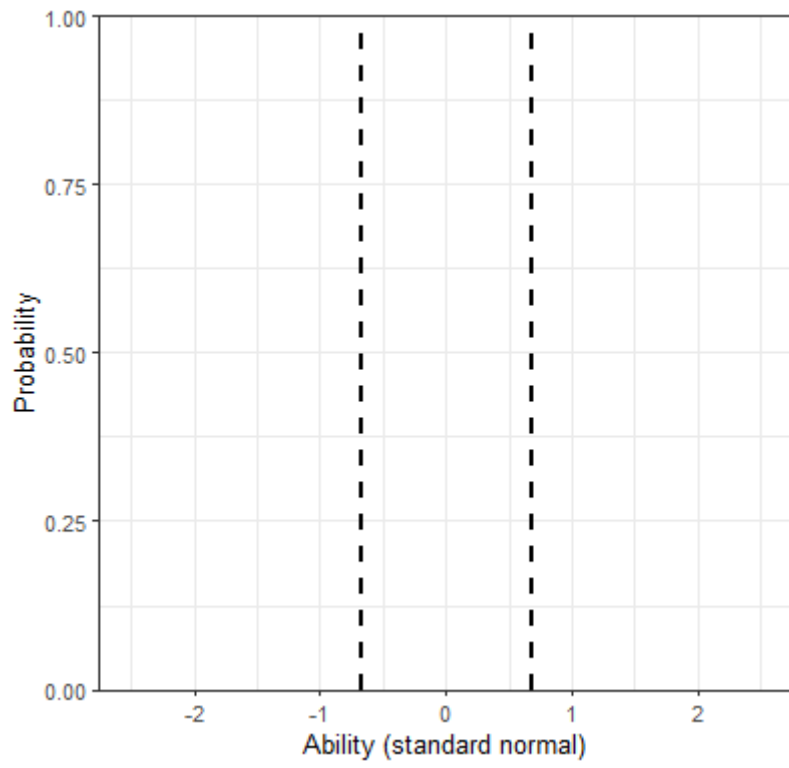


irzetrwać. ■ Drzewa te będą przystosowywać się do nowych warunków, zn

.

Graph 3.44.4.2

Item S100020 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.264. Answering time:

Graph 3.44.5.1

Item S100020 answering time distribution in groups of different ability level

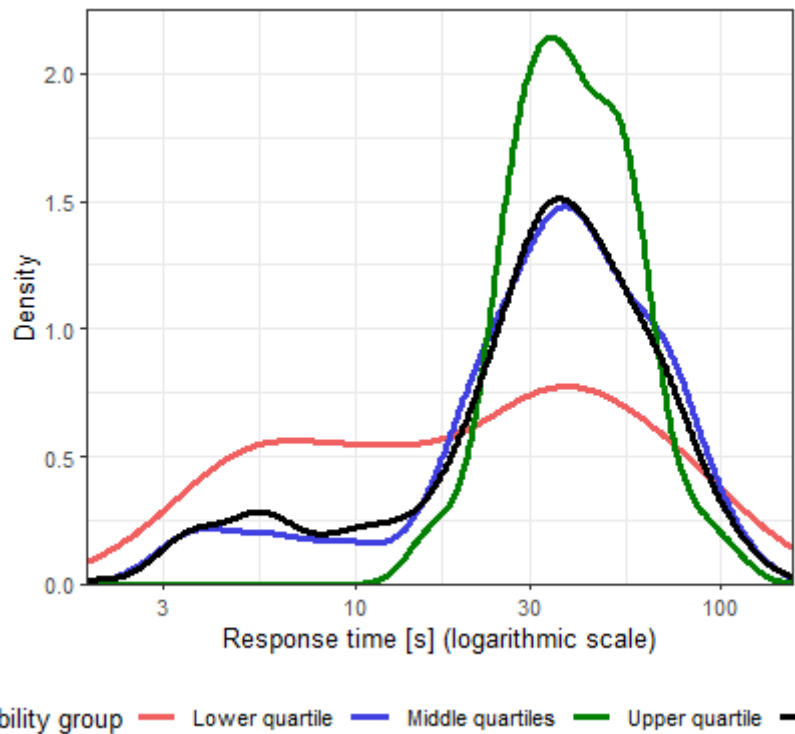


Table 3.44.5.1

Item S100020 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	1.87	7.98	23.38	46.33	156.41	2.98	1.07
Middle quartiles	2.84	22.97	35.78	53.24	112.36	3.44	0.81
Upper quartile	15.60	29.84	38.40	52.26	108.09	3.67	0.39
Overall	1.87	21.82	34.80	50.44	156.41	3.38	0.84

3.1.265. S890023 (TIMSS)

3.1.266. Item fit:

Graph 3.45.1.1

Item S890023 ICC and nonparametric trace line

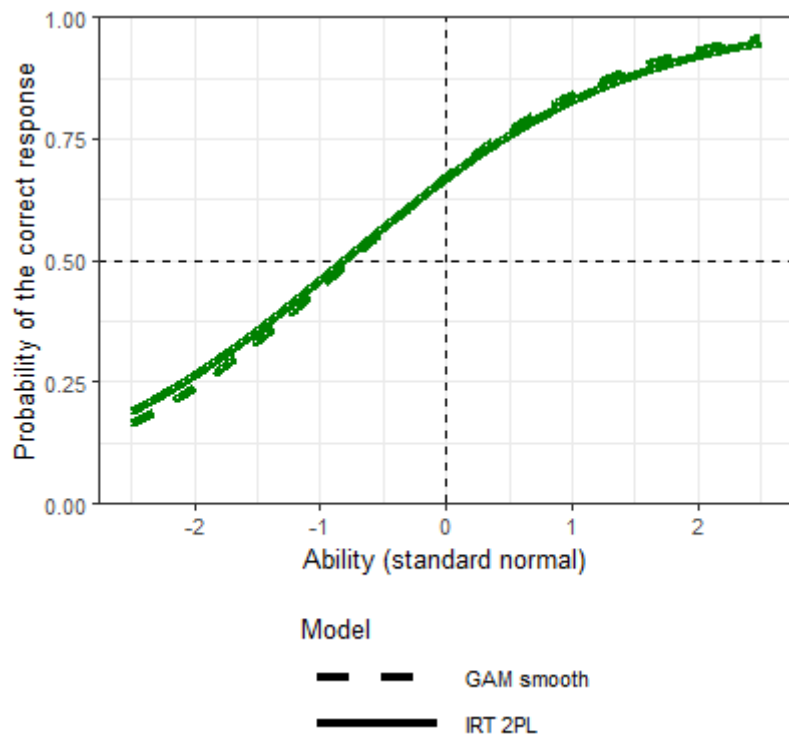


Table 3.45.1.1

Item S890023 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	64.9%	319	MC	0.378378 7	0.2365151	0.86	-0.81	0.012	0.315

3.1.267. Gender DIF:

Table 3.45.2.1

Item S890023 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.37	0.306	1.000	0.007	

3.1.268. Frequency of answers:

answer	Frequency	Percent
Chroni Ziemię przed szkodliwym promieniowaniem słonecznym (correct)	207	64.9%
Ogranicza dostęp do wody na powierzchni Ziemi	44	13.8%
Powoduje przemieszczanie się płyt tektonicznych	46	14.4%
Sprawia, że Słońce zawsze świeci w jednym miejscu	22	6.9%
Overall	319	100.0%

3.1.269. Distractors functioning:

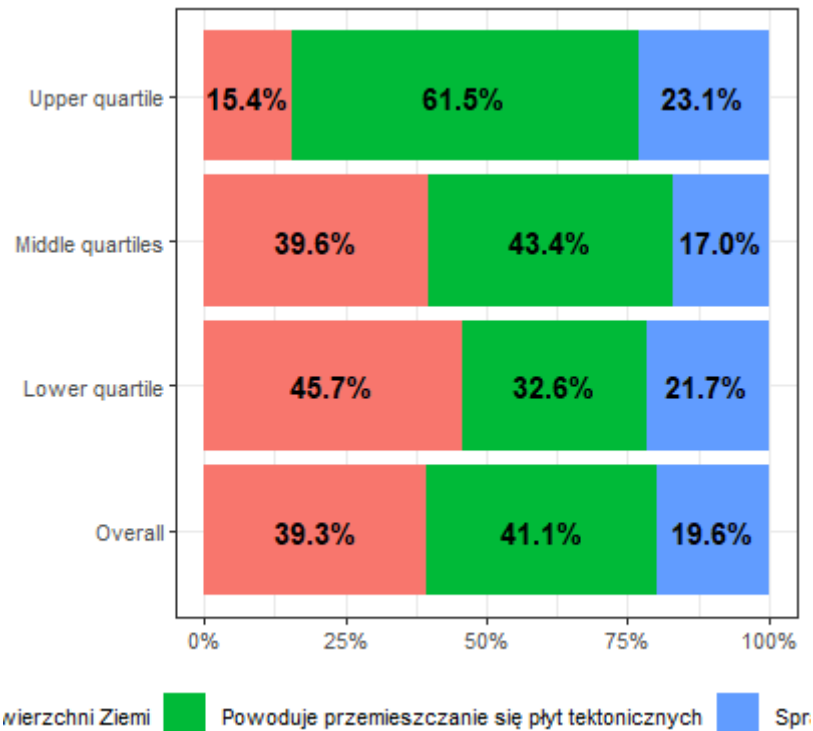
Table 3.45.4.1

Item S890023 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Ogranicza dostęp do wody na powierzchni Ziemi	21	21	2	44	45.7%	39.6%	15.4%	39.3%
Powoduje przemieszczanie się płyt tektonicznych	15	23	8	46	32.6%	43.4%	61.5%	41.1%
Sprawia, że Słońce zawsze świeci w jednym miejscu	10	9	3	22	21.7%	17.0%	23.1%	19.6%
Overall	46	53	13	112	100.0%	100.0%	100.0%	100.0%

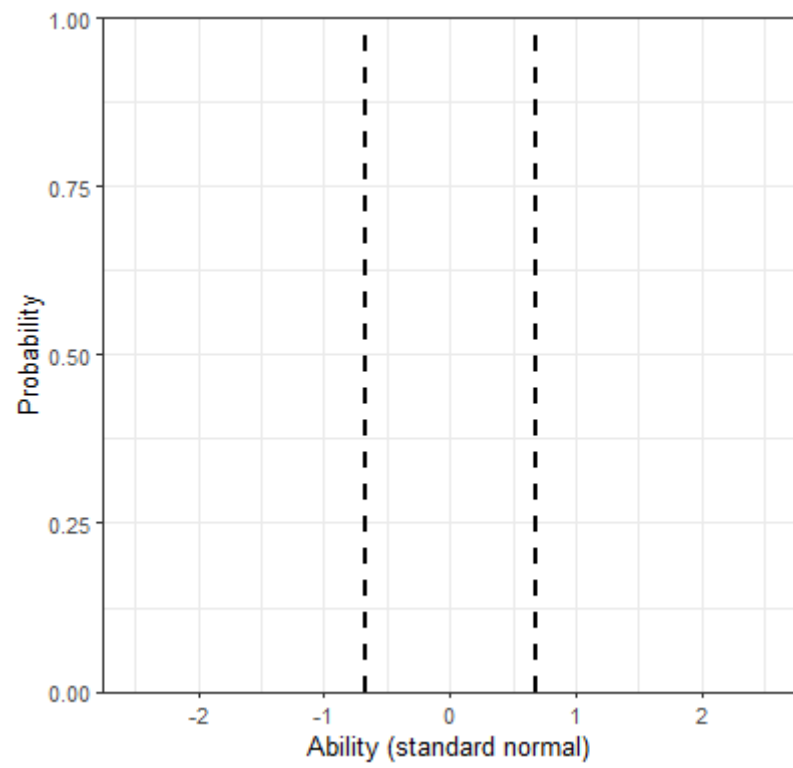
Graph 3.45.4.1

Item S890023 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.45.4.2

Item S890023 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.270. Answering time:

Graph 3.45.5.1

Item S890023 answering time distribution in groups of different ability level

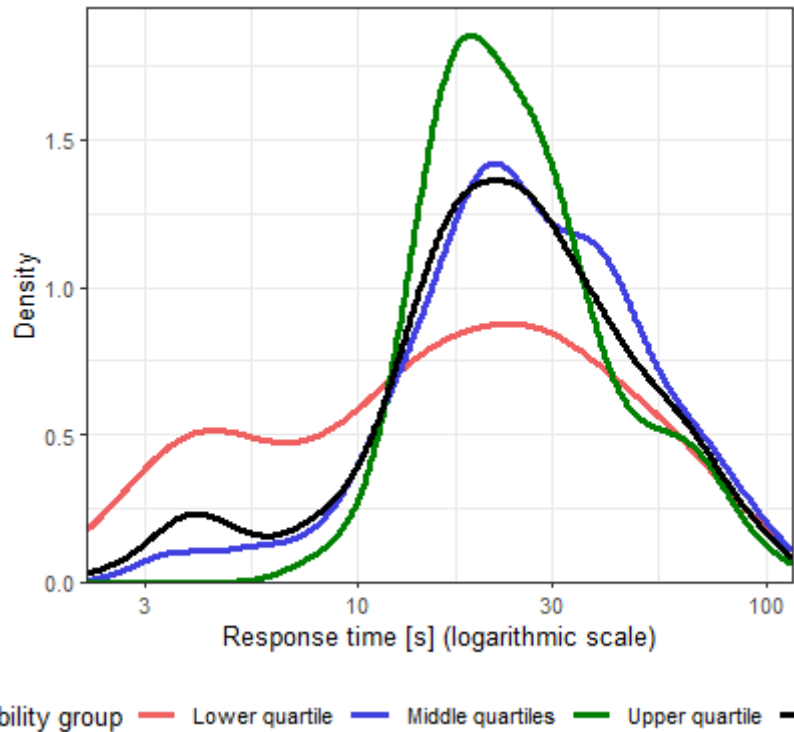


Table 3.45.5.1

Item S890023 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.18	8.19	16.90	31.04	92.07	2.79	0.96
Middle quartiles	3.13	17.95	24.99	39.96	116.21	3.23	0.68
Upper quartile	8.03	17.06	23.28	32.80	101.82	3.22	0.52
Overall	2.18	15.34	23.53	37.40	116.21	3.12	0.75

3.1.271. S890011 (LLM)

3.1.272. Item fit:

Graph 3.46.1.1

Item S890011 ICC and nonparametric trace line

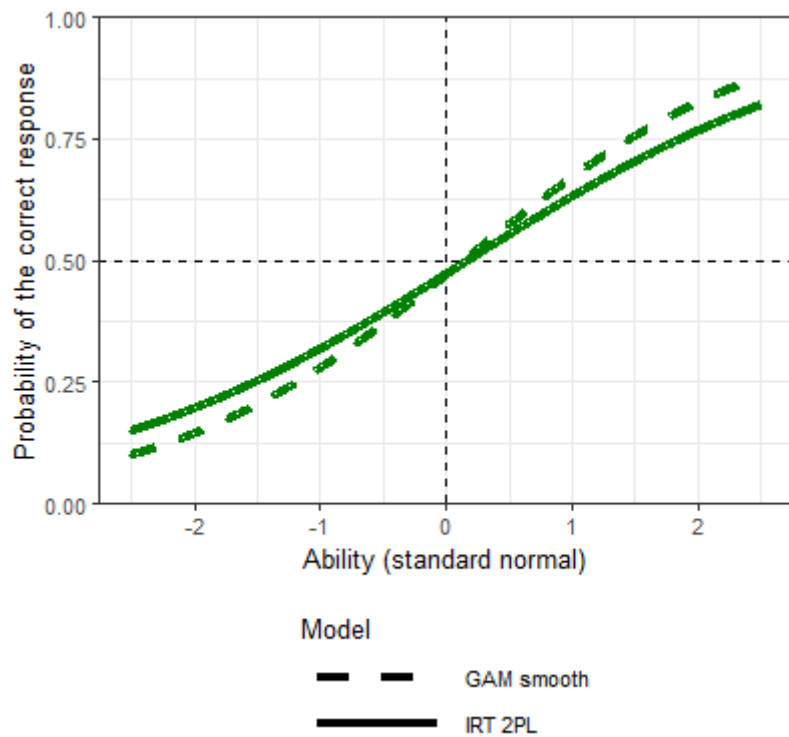


Table 3.46.1.1

Item S890011 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	47.6%	319	MC	0.354474 3	0.1634413	0.65	0.17	0.000	0.900

3.1.273. Gender DIF:

Table 3.46.2.1

Item S890011 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.25	0.536	1.000	0.003	

3.1.274. Frequency of answers:

answer	Frequency	Percent
Gorący kawałek stanie się jeszcze gorętszy, a zimny jeszcze zimniejszy.	29	9.1%
Gorący kawałek stanie się zimniejszy, a zimny kawałek stanie się cieplejszy. (correct)	152	47.6%
Oba kawałki metalu staną się gorące.	54	16.9%
Temperatura obu kawałków metalu pozostanie bez zmian.	84	26.3%
Overall	319	100.0%

3.1.275. Distractors functioning:

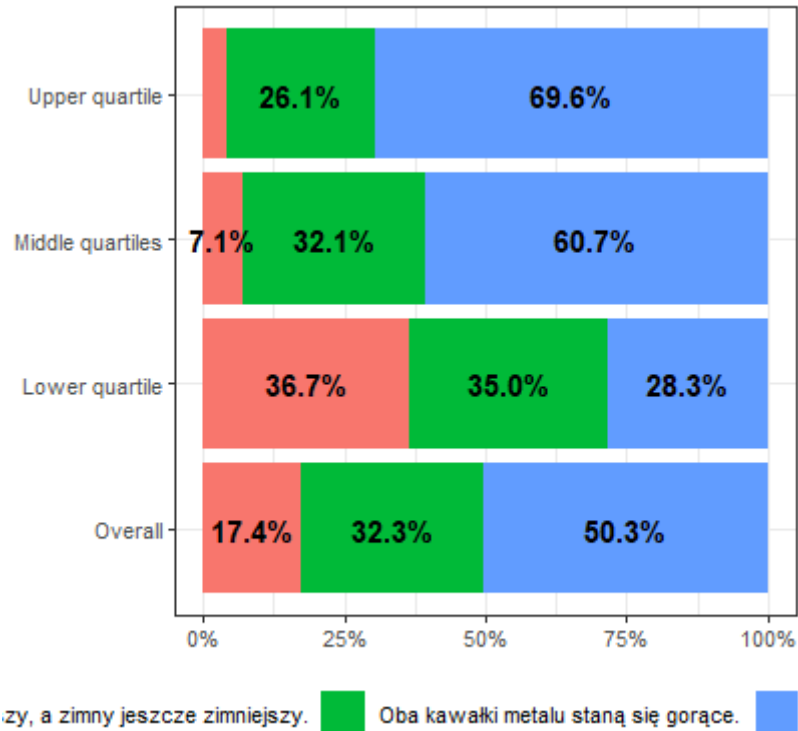
Table 3.46.4.1

Item S890011 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Gorący kawałek stanie się jeszcze gorętszy, a zimny jeszcze zimniejszy.	22	6	1	29	36.7%	7.1%	4.3%	17.4%
Oba kawałki metalu staną się gorące.	21	27	6	54	35.0%	32.1%	26.1%	32.3%
Temperatura obu kawałków metalu pozostanie bez zmian.	17	51	16	84	28.3%	60.7%	69.6%	50.3%
Overall	60	84	23	167	100.0%	100.0%	100.0%	100.0%

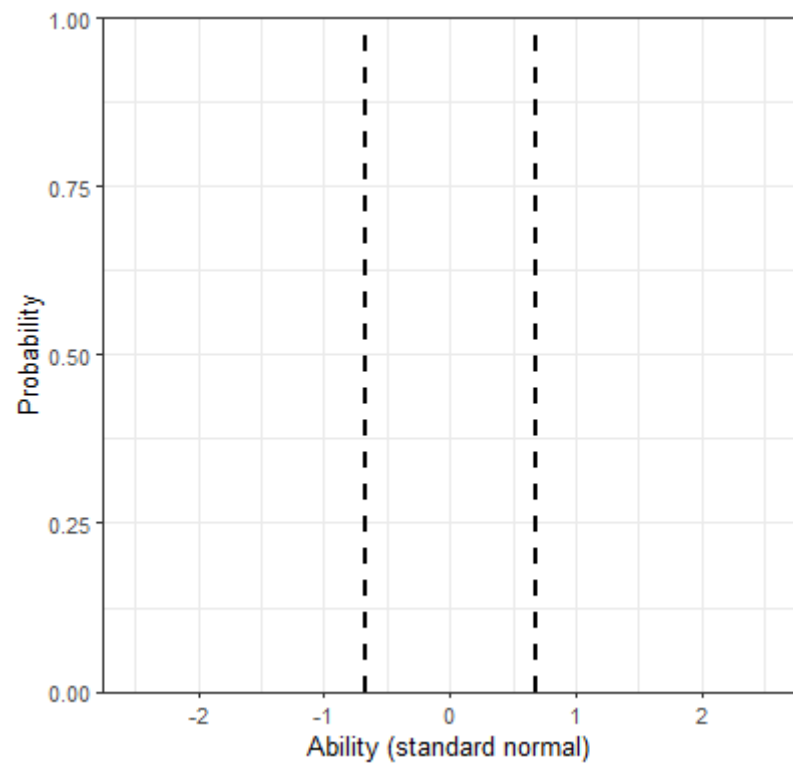
Graph 3.46.4.1

Item S890011 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.46.4.2

Item S890011 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.276. Answering time:

Graph 3.46.5.1

Item S890011 answering time distribution in groups of different ability level

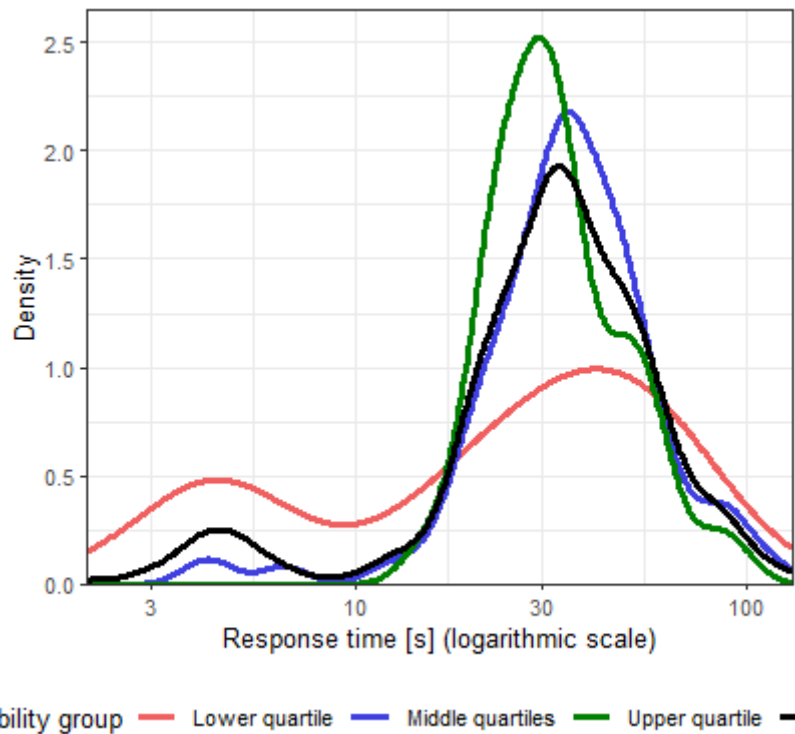


Table 3.46.5.1

Item S890011 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.08	10.13	31.71	49.90	130.36	3.07	1.06
Middle quartiles	4.02	26.70	34.89	46.81	121.81	3.54	0.55
Upper quartile	14.55	25.20	31.23	41.08	95.81	3.49	0.39
Overall	2.08	23.90	33.38	46.81	130.36	3.41	0.71

3.1.277. S890024 (TIMSS)

3.1.278. Item fit:

Graph 3.47.1.1

Item S890024 ICC and nonparametric trace line

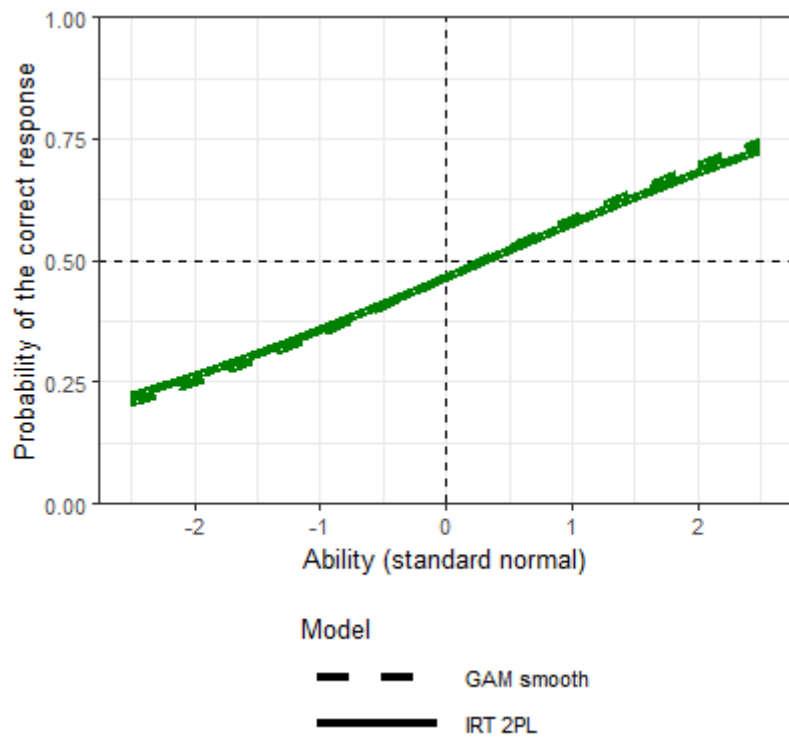


Table 3.47.1.1

Item S890024 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	46.7%	319	MC	0.2228088	0.1114402	0.45	0.32	0.013	0.292

3.1.279. Gender DIF:

Table 3.47.2.1

Item S890024 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.04	0.981	1.000		0.000

3.1.280. Frequency of answers:

answer	Frequency	Percent
Delfin	110	34.5%
Karp (correct)	149	46.7%
Krab	31	9.7%
Mewa	29	9.1%
Overall	319	100.0%

3.1.281. Distractors functioning:

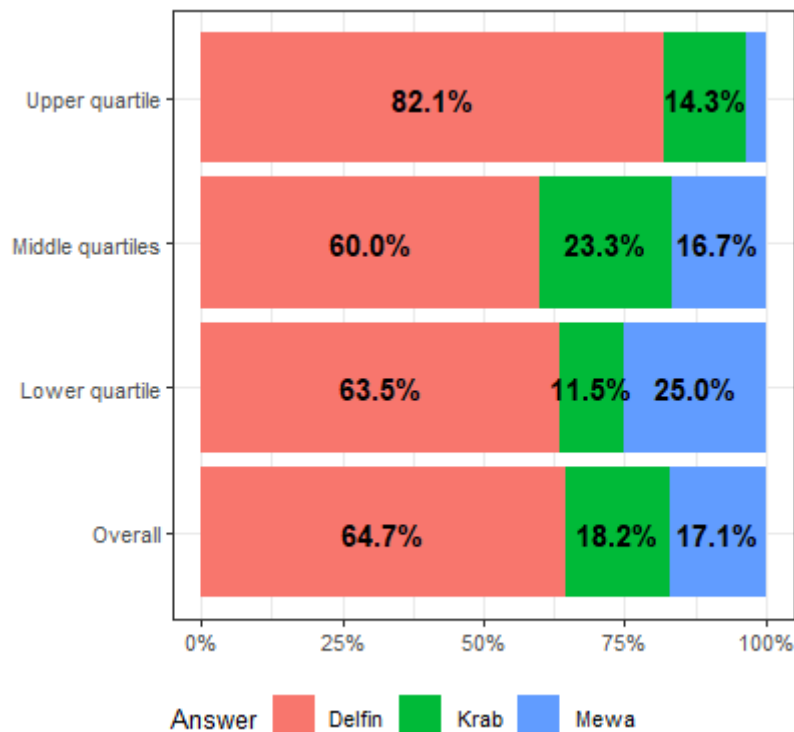
Table 3.47.4.1

Item S890024 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Delfin	33	54	23	110	63.5%	60.0%	82.1%	64.7%
Krab	6	21	4	31	11.5%	23.3%	14.3%	18.2%
Mewa	13	15	1	29	25.0%	16.7%	3.6%	17.1%
Overall	52	90	28	170	100.0%	100.0%	100.0%	100.0%

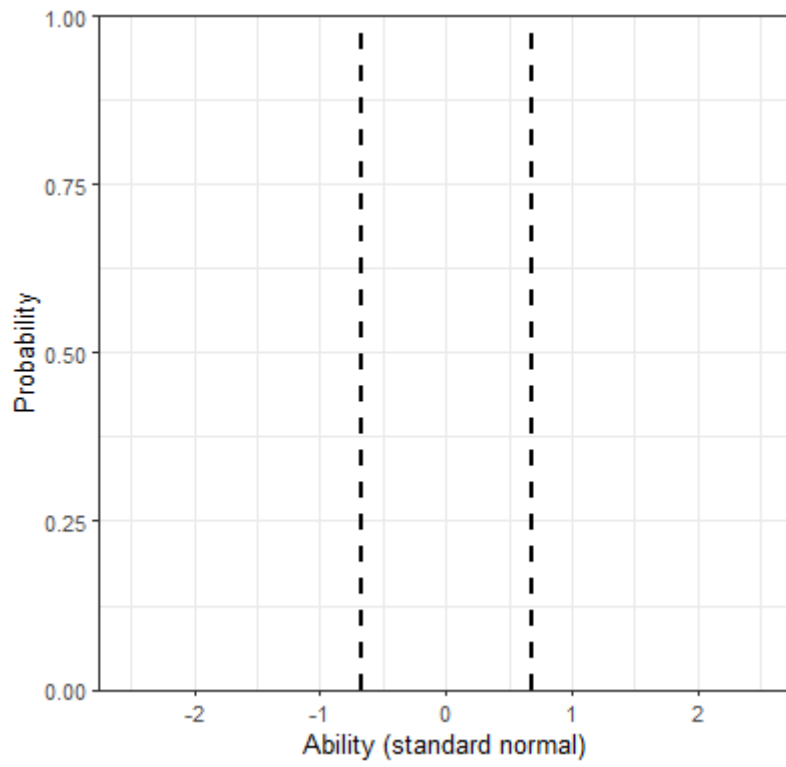
Graph 3.47.4.1

Item S890024 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.47.4.2

Item S890024 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.282. Answering time:

Graph 3.47.5.1

Item S890024 answering time distribution in groups of different ability level

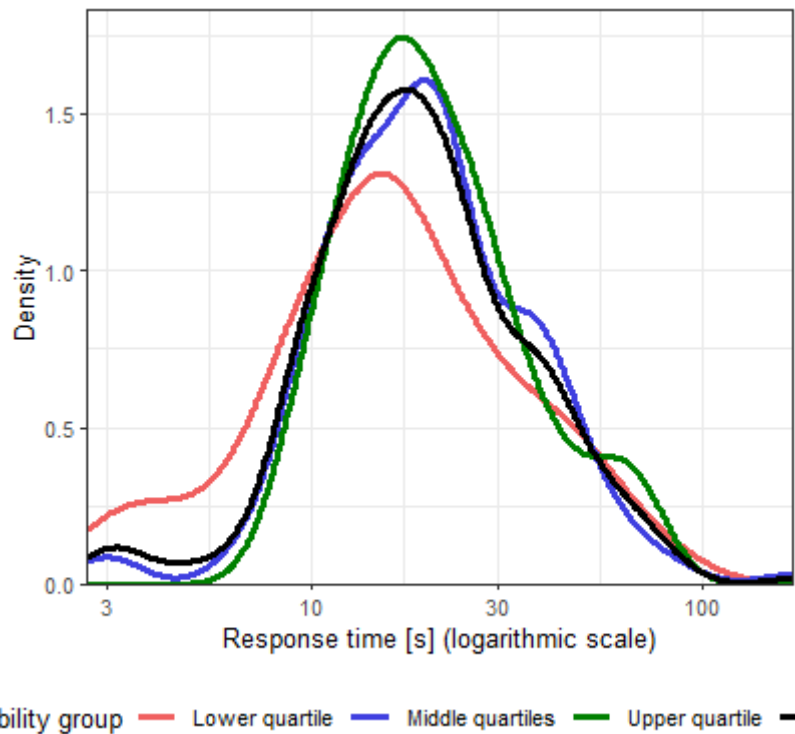


Table 3.47.5.1

Item S890024 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.69	9.89	15.86	25.44	85.86	2.77	0.76
Middle quartiles	2.88	13.20	19.12	27.98	169.43	2.97	0.61
Upper quartile	8.39	14.13	19.12	27.68	74.37	3.03	0.53
Overall	2.69	12.83	18.18	27.66	169.43	2.94	0.64

3.1.283. S890022 (TIMSS)

3.1.284. Item fit:

Graph 3.48.1.1

Item S890022 ICC and nonparametric trace line

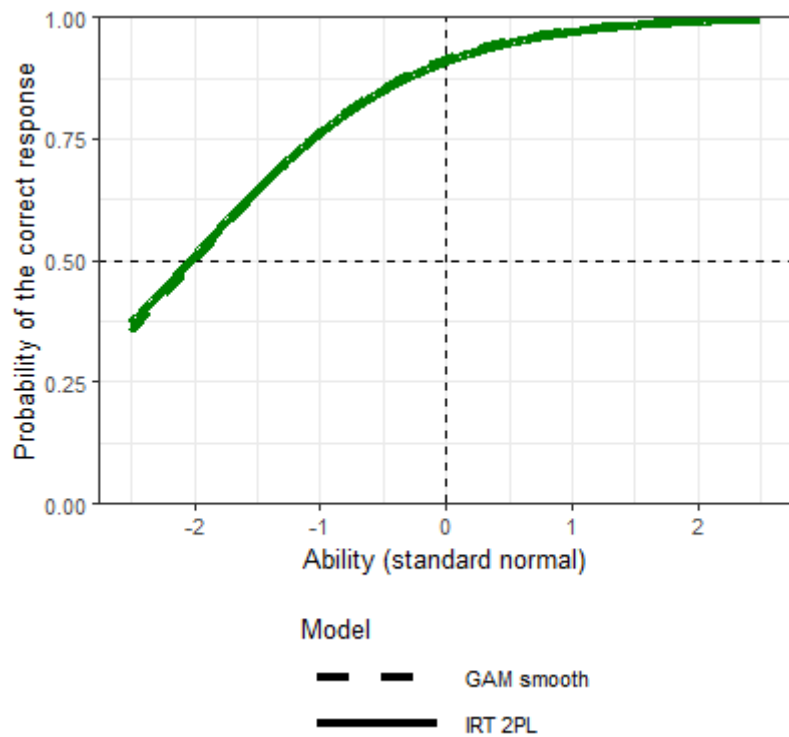


Table 3.48.1.1

Item S890022 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	86.4%	281	MC	0.361190 7	0.2020634	1.12	-2.03	0.000	0.528

3.1.285. Gender DIF:

Table 3.48.2.1

Item S890022 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
4.27	0.118	1.000		0.021

3.1.286. Frequency of answers:

answer	Frequency	Percent
Drewno	10	3.6%
Metal (correct)	242	86.4%
Plastik	21	7.5%
Szkło	7	2.5%
Overall	280	100.0%

3.1.287. Distractors functioning:

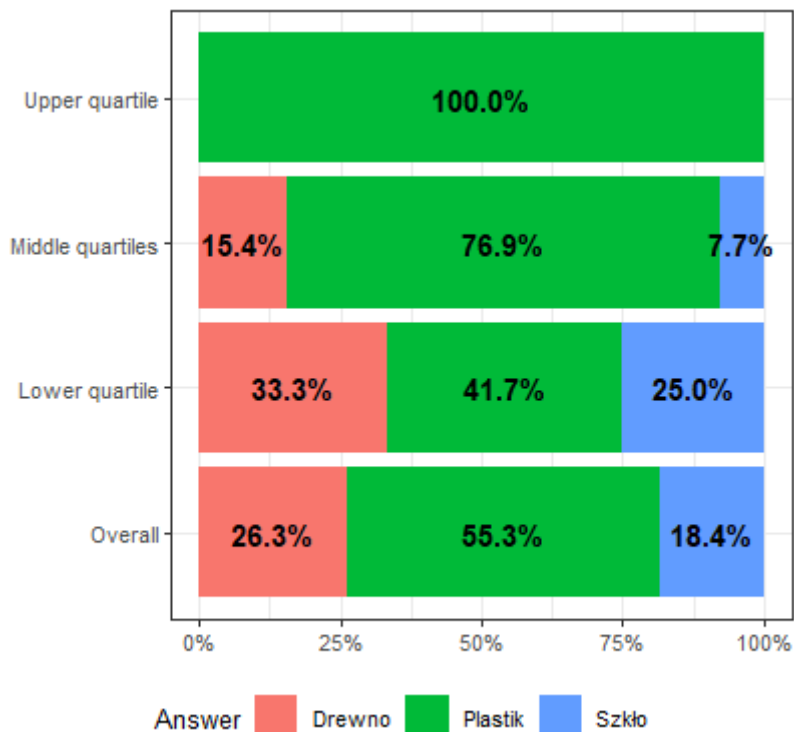
Table 3.48.4.1

Item S890022 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Drewno	8	2	0	10	33.3%	15.4%	0.0%	26.3%
Plastik	10	10	1	21	41.7%	76.9%	100.0%	55.3%
Szkło	6	1	0	7	25.0%	7.7%	0.0%	18.4%
Overall	24	13	1	38	100.0%	100.0%	100.0%	100.0%

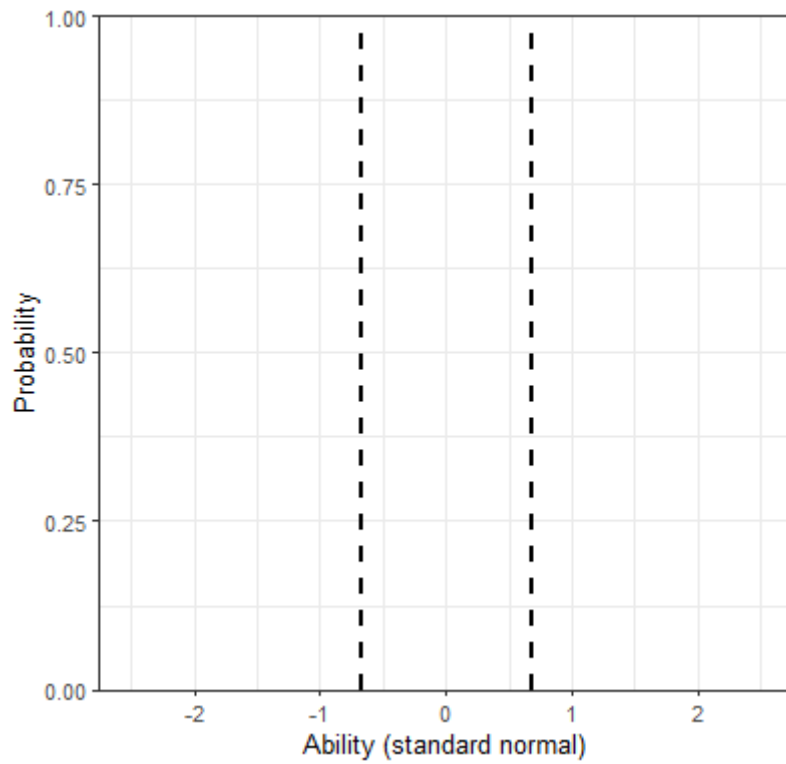
Graph 3.48.4.1

Item S890022 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.48.4.2

Item S890022 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.288. Answering time:

Graph 3.48.5.1

Item S890022 answering time distribution in groups of different ability level

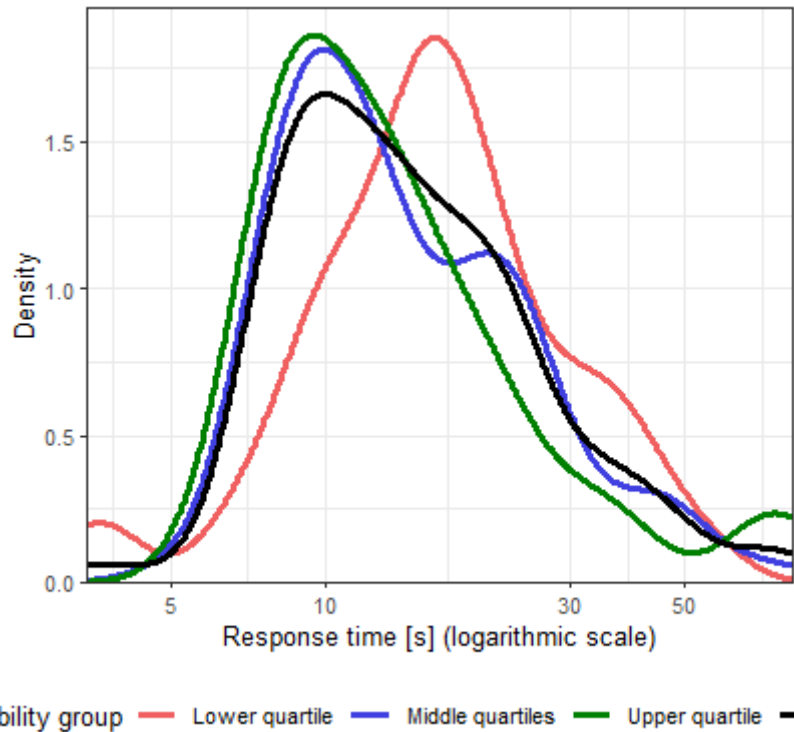


Table 3.48.5.1

Item S890022 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.45	11.79	16.35	22.24	54.11	2.79	0.57
Middle quartiles	4.87	9.25	12.73	21.24	79.12	2.66	0.55
Upper quartile	5.95	8.67	11.88	17.78	81.01	2.61	0.60
Overall	3.45	9.45	13.38	20.81	81.01	2.68	0.57

3.1.289. S051121 (TIMSS)

3.1.290. Item fit:

Graph 3.49.1.1

Item S051121 ICC and nonparametric trace line

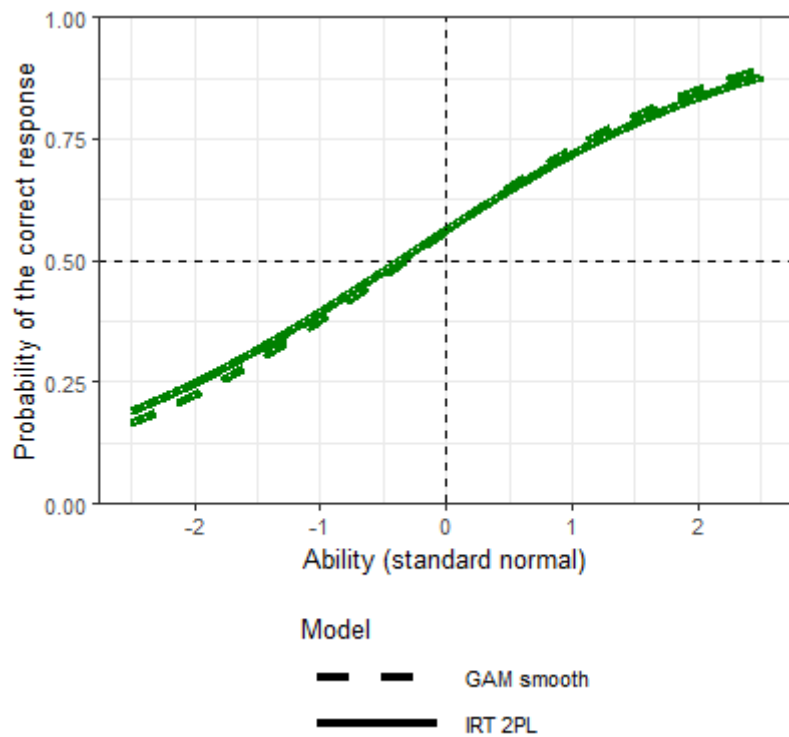


Table 3.49.1.1

Item S051121 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	56.5%	294	MC	0.324675	0.2789367	0.68	-0.37	0.003	0.422

3.1.291. Gender DIF:

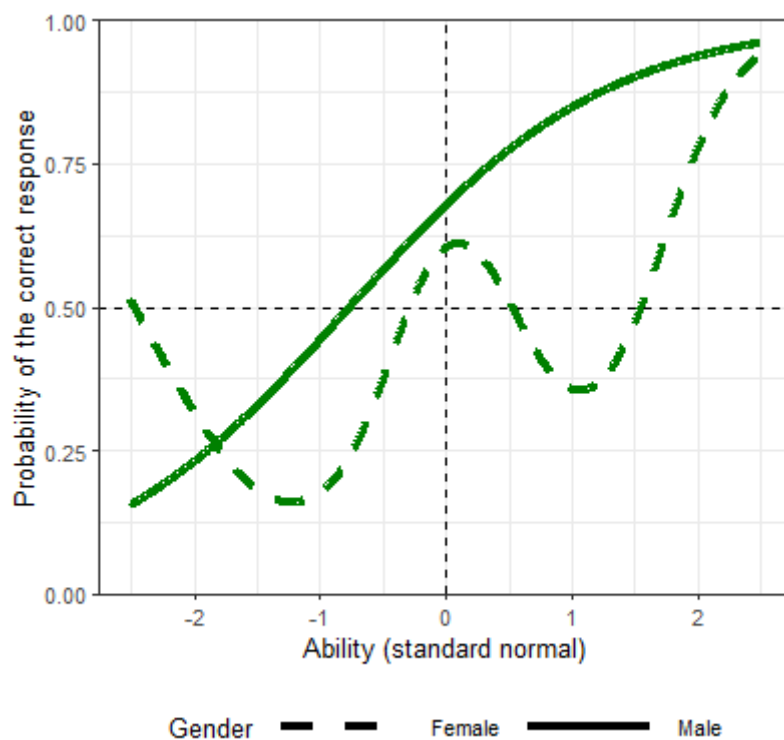
Table 3.49.2.1

Item S051121 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
17.64	0.000	0.014	0.051	moderate

Graph 3.49.2.1

Item S051121 gender-specific ICCs



3.1.292. Frequency of answers:

answer	Frequency	Percent
Nie, Nie, Nie, Nie, Nie	13	4.4%
Nie, Nie, Nie, Nie, Tak	11	3.7%
Nie, Nie, Nie, Tak, Tak	1	0.3%
Nie, Nie, Tak, Nie, Nie	8	2.7%
Nie, Nie, Tak, Nie, Tak (correct)	166	56.5%

answer	Frequency	Percent
Nie, Nie, Tak, Tak, Nie	1	0.3%
Nie, Nie, Tak, Tak, Tak	16	5.4%
Nie, Tak, Nie, Nie, Tak	2	0.7%
Nie, Tak, Nie, Tak, Nie	12	4.1%
Nie, Tak, Tak, Nie, Nie	2	0.7%
Nie, Tak, Tak, Nie, Tak	23	7.8%
Nie, Tak, Tak, Tak, Nie	2	0.7%
Nie, Tak, Tak, Tak, Tak	4	1.4%
Tak, Nie, Nie, Nie, Nie	1	0.3%
Tak, Nie, Nie, Nie, Tak	1	0.3%
Tak, Nie, Nie, Tak, Nie	4	1.4%
Tak, Nie, Tak, Nie, Nie	1	0.3%
Tak, Nie, Tak, Nie, Tak	7	2.4%
Tak, Nie, Tak, Tak, Nie	3	1.0%
Tak, Nie, Tak, Tak, Tak	1	0.3%
Tak, Tak, Nie, Nie, Tak	4	1.4%
Tak, Tak, Tak, Nie, Nie	1	0.3%
Tak, Tak, Tak, Nie, Tak	4	1.4%
Tak, Tak, Tak, Tak, Tak	6	2.0%
Overall	294	100.0%

3.1.293. Distractors functioning:

Table 3.49.4.1

Item S051121 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Nie, Nie, Nie, Nie, Nie	5	7	1	13	11.6%	11.1%	4.5%	10.2%
Nie, Nie, Nie, Nie, Tak	4	4	3	11	9.3%	6.3%	13.6%	8.6%
Nie, Nie, Tak, Nie, Nie	2	5	1	8	4.7%	7.9%	4.5%	6.2%
Nie, Nie, Tak, Tak, Tak	1	11	4	16	2.3%	17.5%	18.2%	12.5%
Nie, Tak, Nie, Nie, Tak	1	1	0	2	2.3%	1.6%	0.0%	1.6%
Nie, Tak, Nie, Tak, Nie	3	7	2	12	7.0%	11.1%	9.1%	9.4%
Nie, Tak, Tak, Nie, Tak	5	13	5	23	11.6%	20.6%	22.7%	18.0%
Nie, Tak, Tak, Tak, Nie	1	0	1	2	2.3%	0.0%	4.5%	1.6%
Nie, Tak, Tak, Tak, Tak	2	1	1	4	4.7%	1.6%	4.5%	3.1%
Tak, Nie, Nie, Tak, Nie	2	1	1	4	4.7%	1.6%	4.5%	3.1%

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Tak, Nie, Tak, Nie, Tak	1	6	0	7	2.3%	9.5%	0.0%	5.5%
Tak, Nie, Tak, Tak, Nie	2	1	0	3	4.7%	1.6%	0.0%	2.3%
Tak, Nie, Tak, Tak, Tak	1	0	0	1	2.3%	0.0%	0.0%	0.8%
Tak, Tak, Nie, Nie, Tak	3	1	0	4	7.0%	1.6%	0.0%	3.1%
Tak, Tak, Tak, Nie, Tak	4	0	0	4	9.3%	0.0%	0.0%	3.1%
Tak, Tak, Tak, Tak, Tak	6	0	0	6	14.0%	0.0%	0.0%	4.7%
Overall	43	63	22	128	100.0%	100.0%	100.0%	100.0%
Nie, Nie, Nie, Tak, Tak	0	1	0	1	0.0%	1.6%	0.0%	0.8%
Nie, Nie, Tak, Tak, Nie	0	1	0	1	0.0%	1.6%	0.0%	0.8%
Nie, Tak, Tak, Nie, Nie	0	1	1	2	0.0%	1.6%	4.5%	1.6%
Tak, Nie, Nie, Nie, Tak	0	1	0	1	0.0%	1.6%	0.0%	0.8%
Tak, Tak, Tak, Nie, Nie	0	1	0	1	0.0%	1.6%	0.0%	0.8%
Tak, Nie, Nie, Nie, Nie	0	0	1	1	0.0%	0.0%	4.5%	0.8%

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Tak, Nie, Tak, Nie, Nie	0	0	1	1	0.0%	0.0%	4.5%	0.8%

Graph 3.49.4.1

Item S051121 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

3.1.294. Answering time:

Graph 3.49.5.1

Item S051121 answering time distribution in groups of different ability level

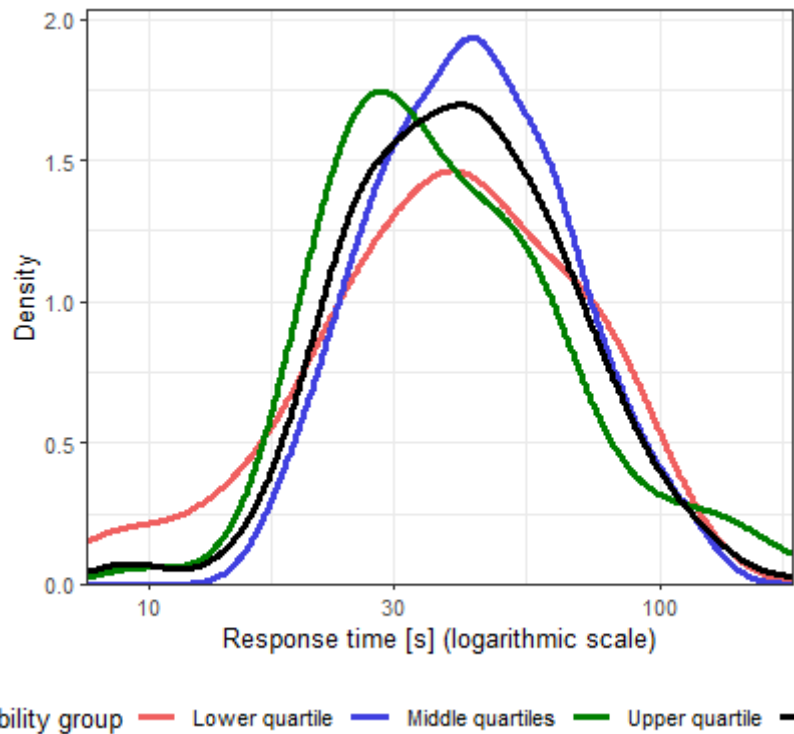


Table 3.49.5.1

Item S051121 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	7.60	25.37	38.83	57.92	107.78	3.63	0.60
Middle quartiles	17.70	30.78	43.13	57.90	120.97	3.76	0.43
Upper quartile	9.78	25.66	34.92	52.94	180.79	3.64	0.54
Overall	7.60	28.20	41.13	57.15	180.79	3.70	0.50

3.1.295. S100014 (TIMSS)

3.1.296. Item fit:

Graph 3.50.1.1

Item S100014 ICC and nonparametric trace line

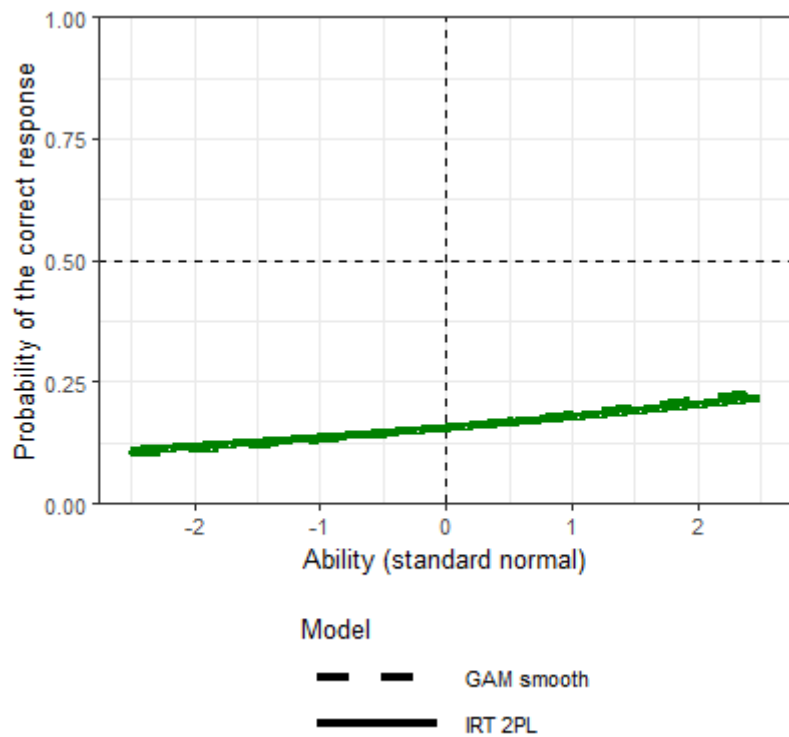


Table 3.50.1.1

Item S100014 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	15.7%	319	MC	0.067749 95	-0.0285209	0.16	10.35	0.015	0.254

3.1.297. Gender DIF:

Table 3.50.2.1

Item S100014 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
6.18	0.045	1.000	0.025	

3.1.298. Frequency of answers:

answer	Frequency	Percent
Grzyb i bakteria	194	60.8%
Lis i zając	50	15.7%
Rekin i remora (ryba podczepka) (correct)	50	15.7%
Słoń i lew	25	7.8%
Overall	319	100.0%

3.1.299. Distractors functioning:

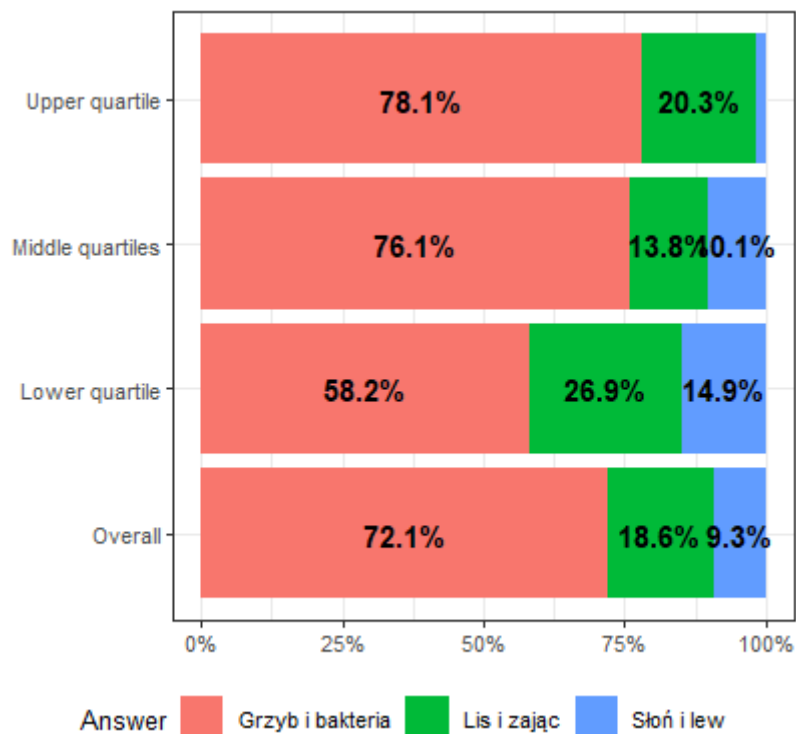
Table 3.50.4.1

Item S100014 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Grzyb i bakteria	39	105	50	194	58.2%	76.1%	78.1%	72.1%
Lis i zając	18	19	13	50	26.9%	13.8%	20.3%	18.6%
Słoń i lew	10	14	1	25	14.9%	10.1%	1.6%	9.3%
Overall	67	138	64	269	100.0%	100.0%	100.0%	100.0%

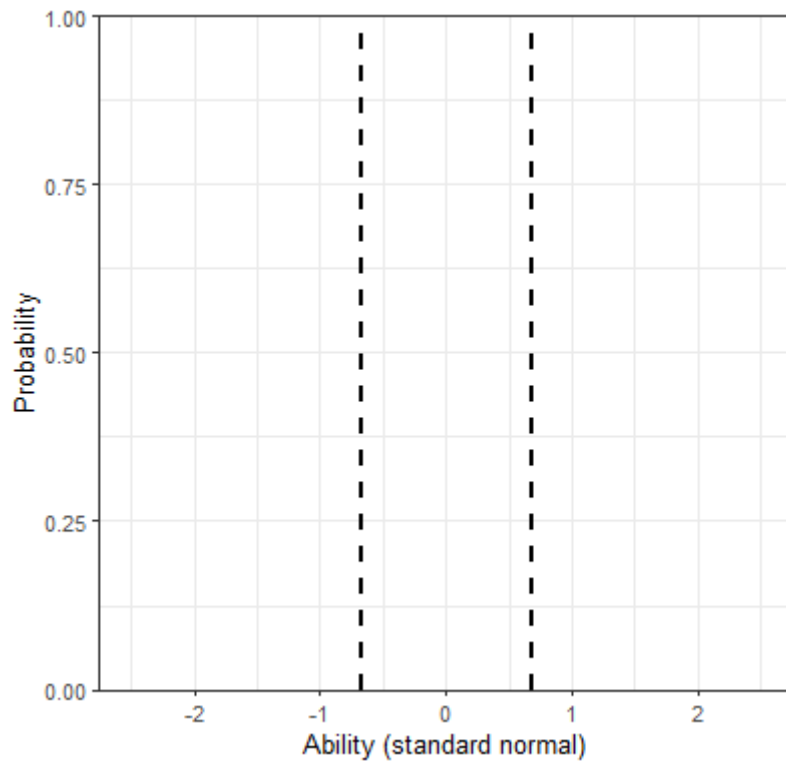
Graph 3.50.4.1

Item S100014 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.50.4.2

Item S100014 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.300. Answering time:

Graph 3.50.5.1

Item S100014 answering time distribution in groups of different ability level

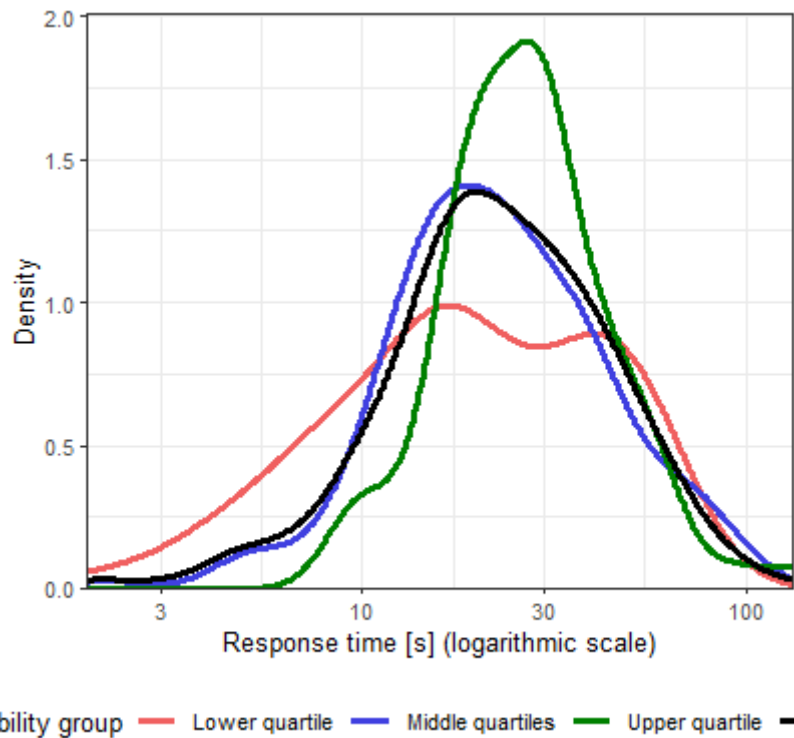


Table 3.50.5.1

Item S100014 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	1.94	10.56	18.75	38.40	67.46	2.93	0.82
Middle quartiles	2.18	14.78	22.37	34.57	107.04	3.12	0.65
Upper quartile	8.62	19.45	27.30	35.63	132.29	3.29	0.50
Overall	1.94	15.25	22.76	35.64	132.29	3.11	0.68

3.1.301. S100010 (TIMSS)

3.1.302. Item fit:

Graph 3.51.1.1

Item S100010 ICC and nonparametric trace line

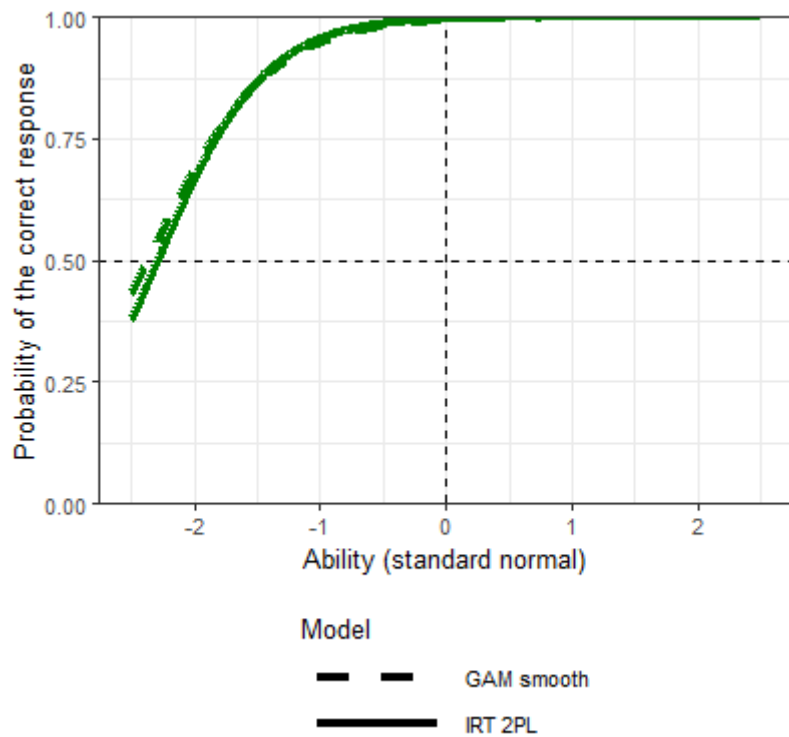


Table 3.51.1.1

Item S100010 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	96.6%	299	MC	0.314697 6	0.2392016	2.38	-2.29	0.038	0.005

3.1.303. Gender DIF:

Table 3.51.2.1

Item S100010 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.11	0.211	1.000		0.036

3.1.304. Frequency of answers:

answer	Frequency	Percent
Sosna (correct)	288	96.6%
Wilk	2	0.7%
Łosoś	1	0.3%
Ślimak	7	2.3%
Overall	298	100.0%

3.1.305. Distractors functioning:

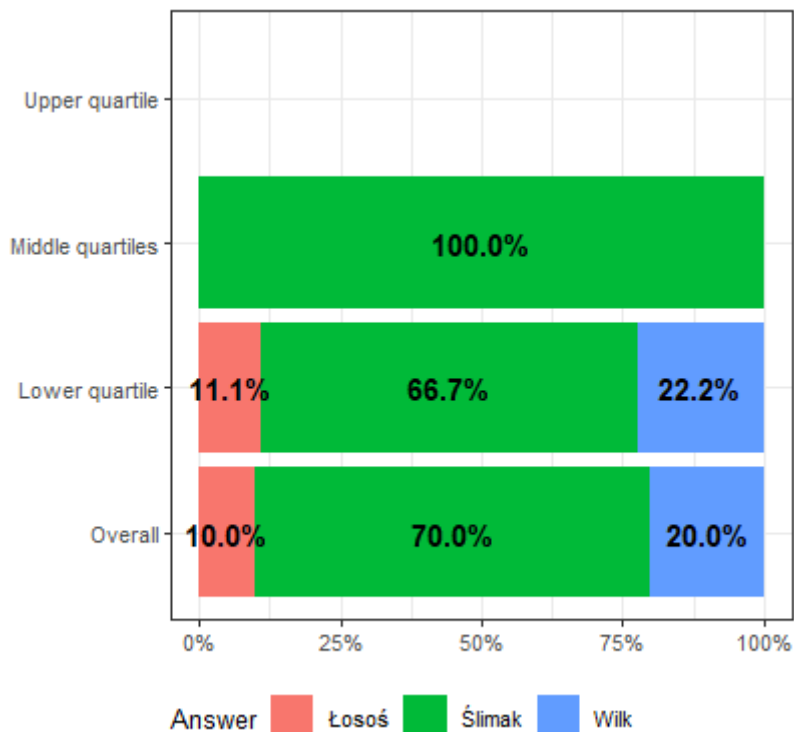
Table 3.51.4.1

Item S100010 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Wilk	2	0	0	2	22.2%	0.0%	0.0%	20.0%
Łosoś	1	0	0	1	11.1%	0.0%	0.0%	10.0%
Ślimak	6	1	0	7	66.7%	100.0%	0.0%	70.0%
Overall	9	1	0	10	100.0%	100.0%	0.0%	100.0%

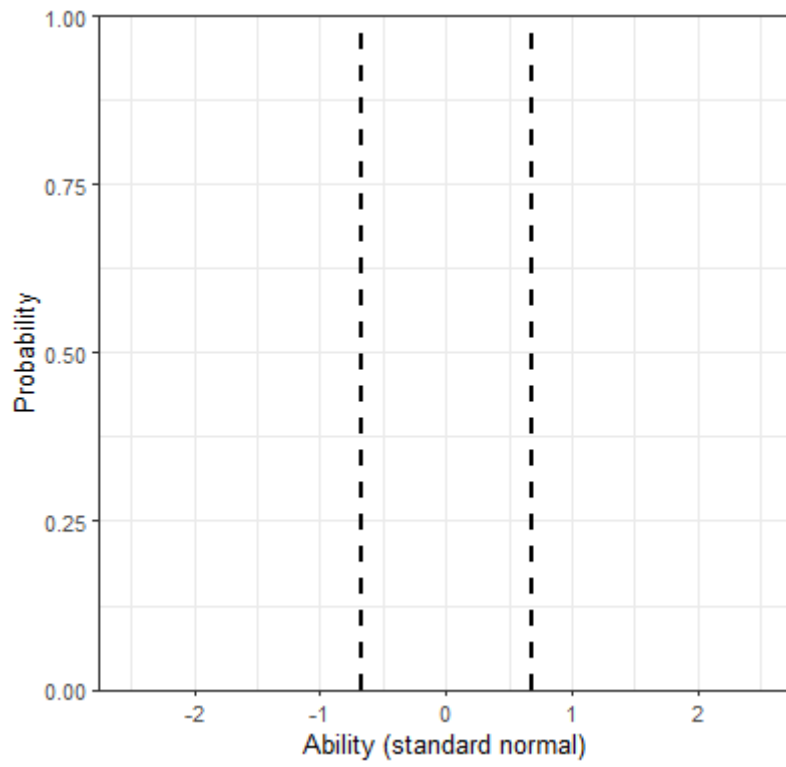
Graph 3.51.4.1

Item S100010 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.51.4.2

Item S100010 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.306. Answering time:

Graph 3.51.5.1

Item S100010 answering time distribution in groups of different ability level

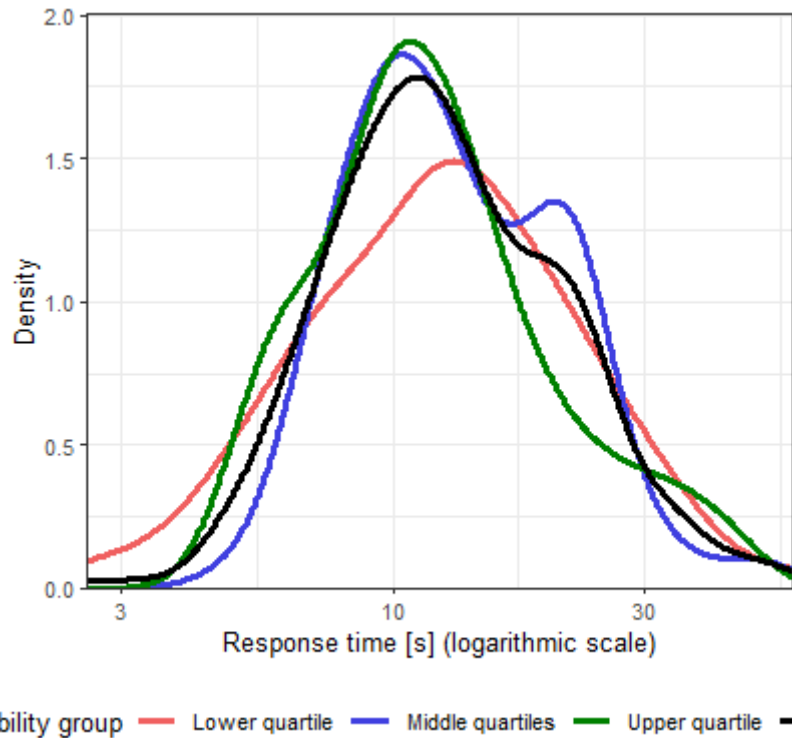


Table 3.51.5.1

Item S100010 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.59	8.18	12.12	18.41	57.80	2.51	0.60
Middle quartiles	4.66	9.34	12.29	19.46	53.09	2.58	0.47
Upper quartile	4.89	8.66	11.20	15.59	45.63	2.48	0.52
Overall	2.59	8.79	12.01	18.47	57.80	2.53	0.52

3.1.307. S041010 (TIMSS)

3.1.308. Item fit:

Graph 3.52.1.1

Item S041010 ICC and nonparametric trace line

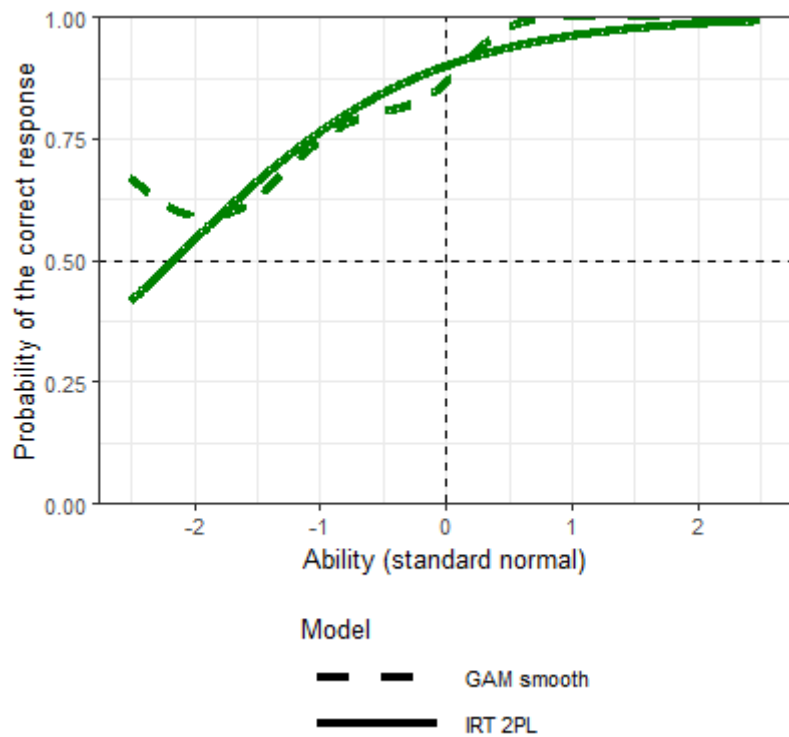


Table 3.52.1.1

Item S041010 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	85.9%	306	MC	0.344302 9	0.3191225	1.01	-2.17	0.012	0.312

3.1.309. Gender DIF:

Table 3.52.2.1

Item S041010 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
10.43	0.005	0.477	0.045	

3.1.310. Frequency of answers:

answer	Frequency	Percent
Pomagają zapylać roślinę.	19	6.2%
Przechowują wodę w roślinie.	9	3.0%
Wytwarzają nowe rośliny. (correct)	262	85.9%
Wytwarzają pożywienie dla rośliny.	15	4.9%
Overall	305	100.0%

3.1.311. Distractors functioning:

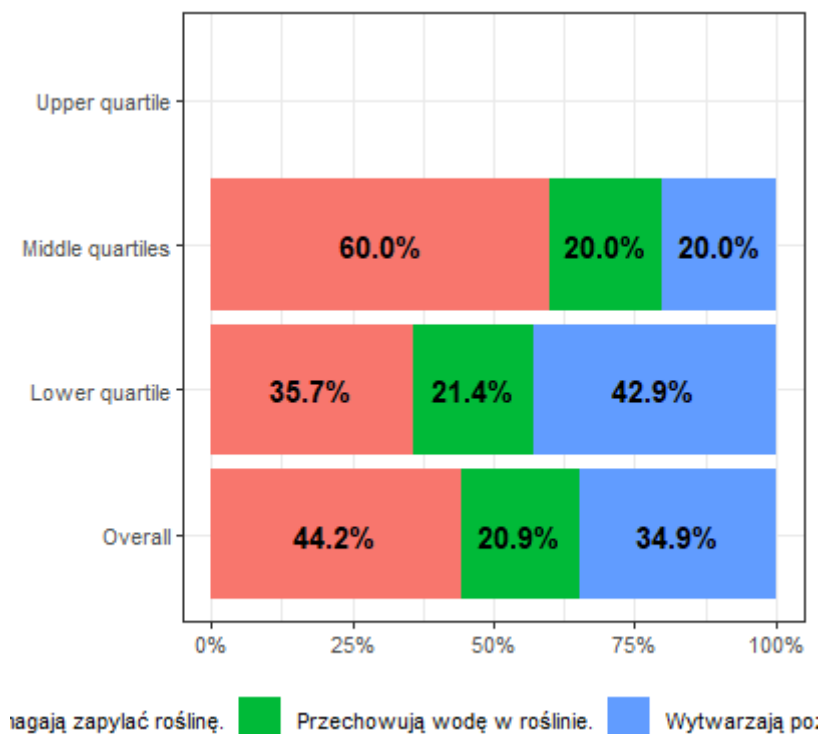
Table 3.52.4.1

Item S041010 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Pomagają zapylać roślinę.	10	9	0	19	35.7%	60.0%	0.0%	44.2%
Przechowują wodę w roślinie.	6	3	0	9	21.4%	20.0%	0.0%	20.9%
Wytwarzają pożywienie dla rośliny.	12	3	0	15	42.9%	20.0%	0.0%	34.9%
Overall	28	15	0	43	100.0%	100.0%	0.0%	100.0%

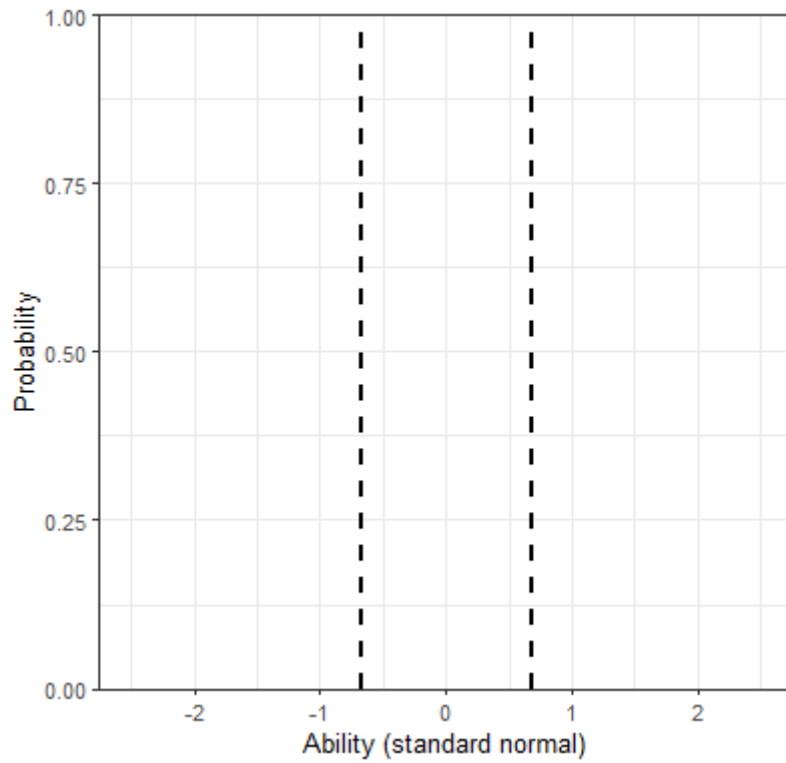
Graph 3.52.4.1

Item S041010 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.52.4.2

Item S041010 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.312. Answering time:

Graph 3.52.5.1

Item S041010 answering time distribution in groups of different ability level

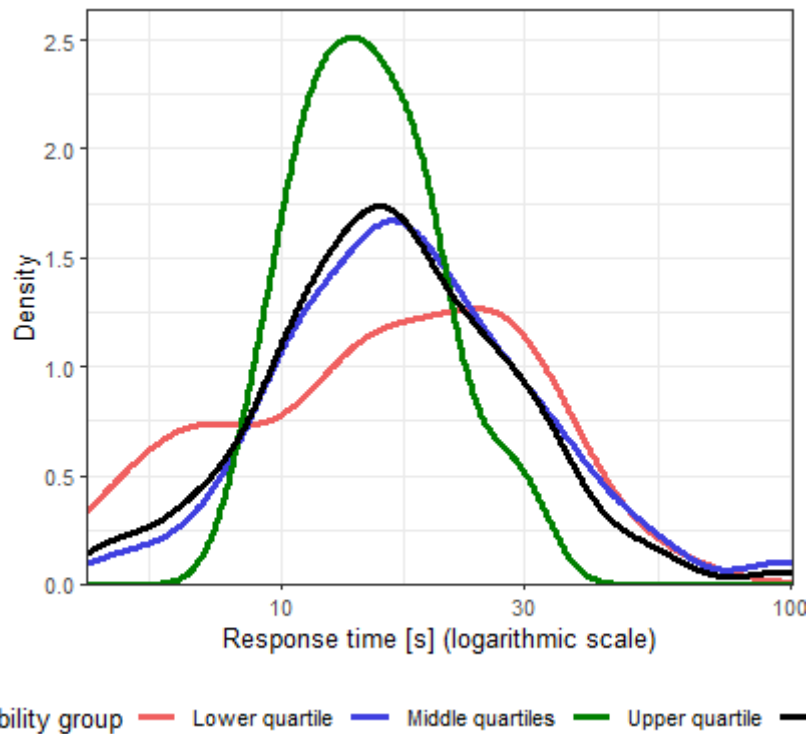


Table 3.52.5.1

Item S041010 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.16	9.48	16.02	26.87	63.35	2.75	0.66
Middle quartiles	4.46	11.91	17.00	24.72	100.52	2.88	0.58
Upper quartile	8.22	11.48	14.54	18.54	31.75	2.70	0.32
Overall	4.16	11.52	16.14	23.68	100.52	2.80	0.56

3.1.313. S041209 (LLM)

3.1.314. Item fit:

Graph 3.53.1.1

Item S041209 ICC and nonparametric trace line

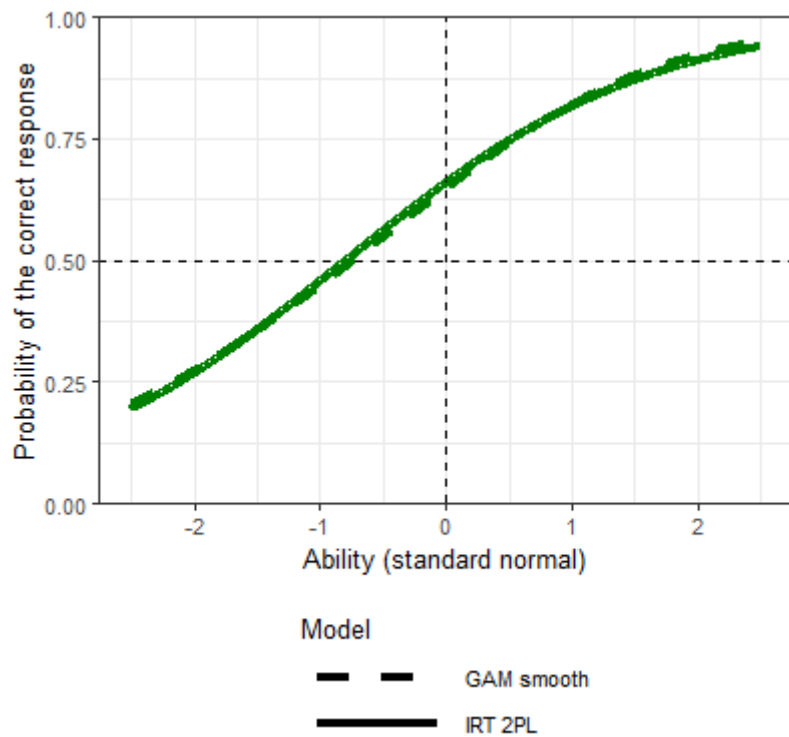


Table 3.53.1.1

Item S041209 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	64.8%	299	MC	0.342637 6	0.3347011	0.83	-0.80	0.012	0.314

3.1.315. Gender DIF:

Table 3.53.2.1

Item S041209 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.21	0.898	1.000		0.001

3.1.316. Frequency of answers:

answer	Frequency	Percent
12 lat	15	5.0%
24 godziny	85	28.5%
Miesiąc	5	1.7%
Rok (correct)	193	64.8%
Overall	298	100.0%

3.1.317. Distractors functioning:

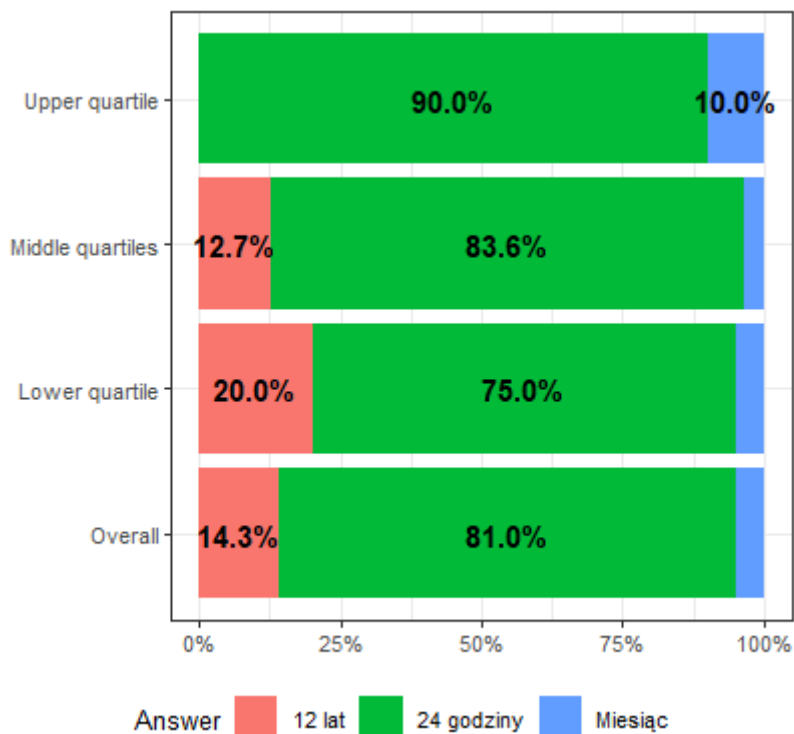
Table 3.53.4.1

Item S041209 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
12 lat	8	7	0	15	20.0%	12.7%	0.0%	14.3%
24 godziny	30	46	9	85	75.0%	83.6%	90.0%	81.0%
Miesiąc	2	2	1	5	5.0%	3.6%	10.0%	4.8%
Overall	40	55	10	105	100.0%	100.0%	100.0%	100.0%

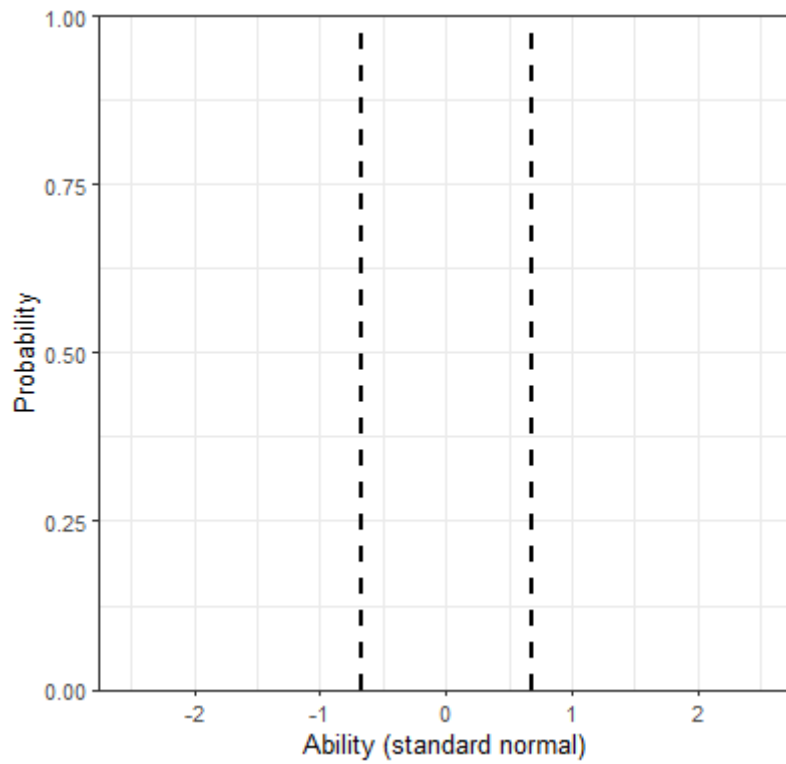
Graph 3.53.4.1

Item S041209 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.53.4.2

Item S041209 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.318. Answering time:

Graph 3.53.5.1

Item S041209 answering time distribution in groups of different ability level

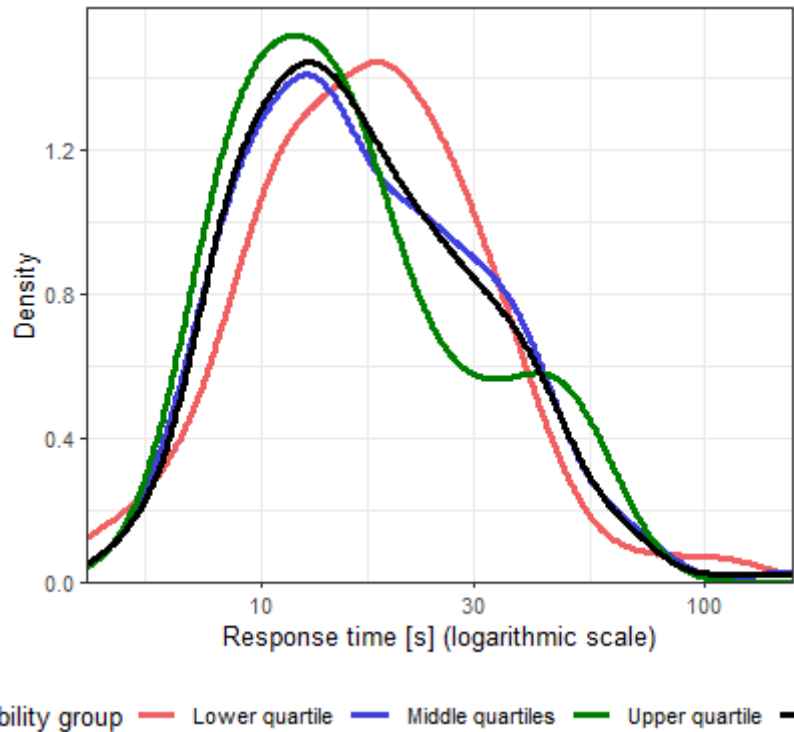


Table 3.53.5.1

Item S041209 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.05	11.14	17.67	25.76	111.39	2.85	0.60
Middle quartiles	5.09	10.70	15.36	25.57	157.18	2.84	0.62
Upper quartile	5.33	9.91	14.50	24.02	62.06	2.77	0.61
Overall	4.05	10.71	15.83	25.34	157.18	2.82	0.62

3.1.319. S090048 (TIMSS)

3.1.320. Item fit:

Graph 3.54.1.1

Item S090048 ICC and nonparametric trace line

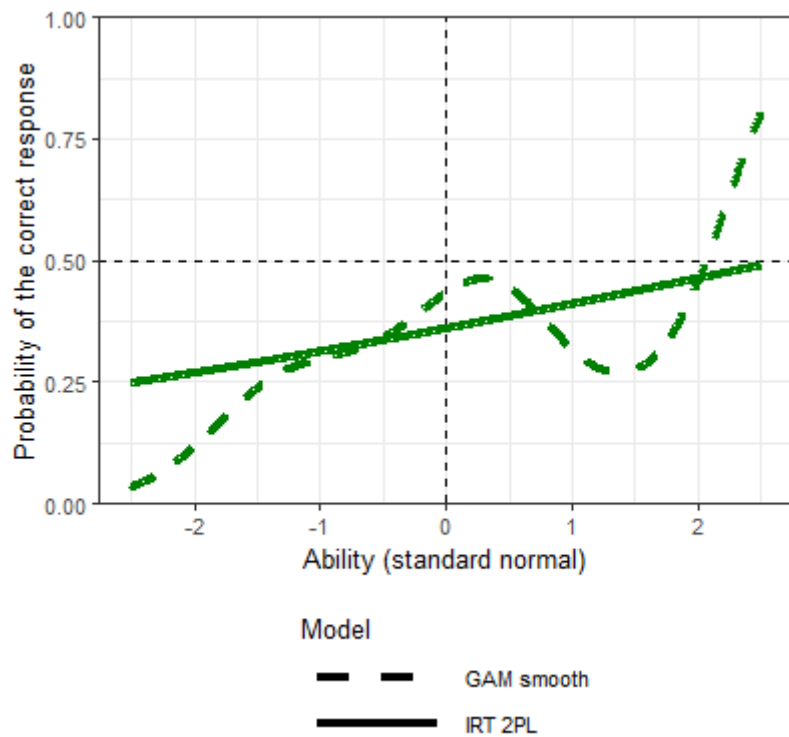


Table 3.54.1.1

Item S090048 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	36.2%	299	MC	0.118202 5	0.1284321	0.21	2.70	0.000	0.832

3.1.321. Gender DIF:

Table 3.54.2.1

Item S090048 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.96	0.376	1.000		0.006

3.1.322. Frequency of answers:

answer	Frequency	Percent
A	44	14.8%
B	135	45.3%
C (correct)	108	36.2%
D	11	3.7%
Overall	298	100.0%

3.1.323. Distractors functioning:

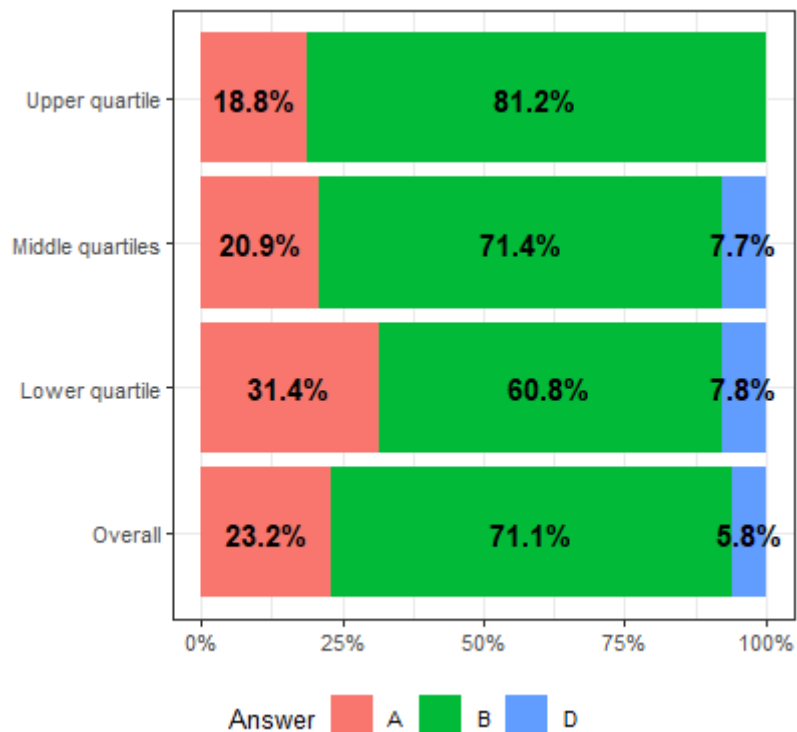
Table 3.54.4.1

Item S090048 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
A	16	19	9	44	31.4%	20.9%	18.8%	23.2%
B	31	65	39	135	60.8%	71.4%	81.2%	71.1%
D	4	7	0	11	7.8%	7.7%	0.0%	5.8%
Overall	51	91	48	190	100.0%	100.0%	100.0%	100.0%

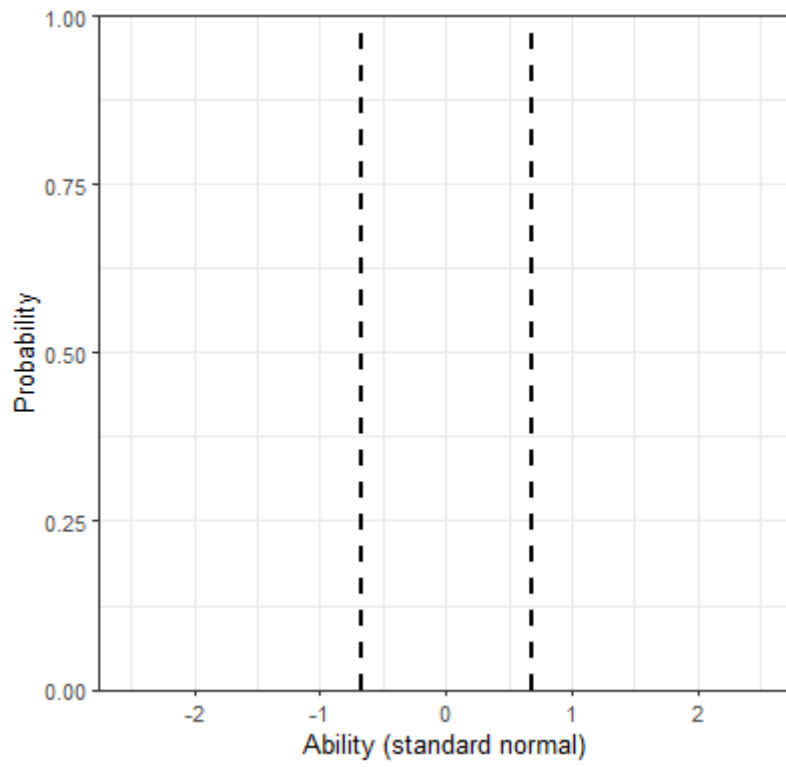
Graph 3.54.4.1

Item S090048 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.54.4.2

Item S090048 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.324. Answering time:

Graph 3.54.5.1

Item S090048 answering time distribution in groups of different ability level

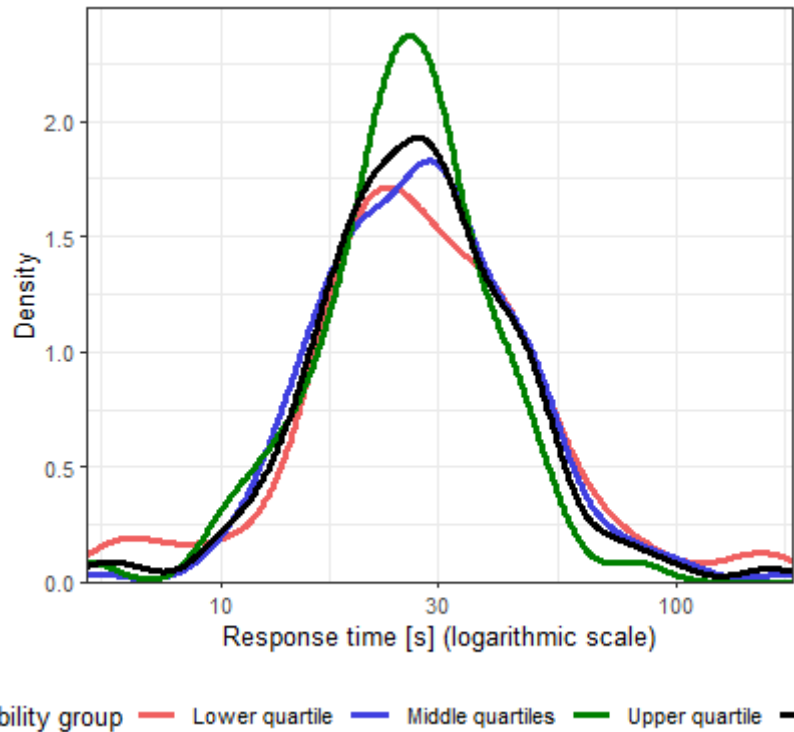


Table 3.54.5.1

Item S090048 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.95	19.40	26.04	39.82	155.19	3.32	0.61
Middle quartiles	5.33	19.52	28.14	37.63	179.36	3.32	0.50
Upper quartile	5.11	19.48	25.66	32.13	81.73	3.22	0.45
Overall	5.11	19.48	26.58	36.97	179.36	3.29	0.52

3.1.325. S090053 (TIMSS)

3.1.326. Item fit:

Graph 3.55.1.1

Item S090053 ICC and nonparametric trace line

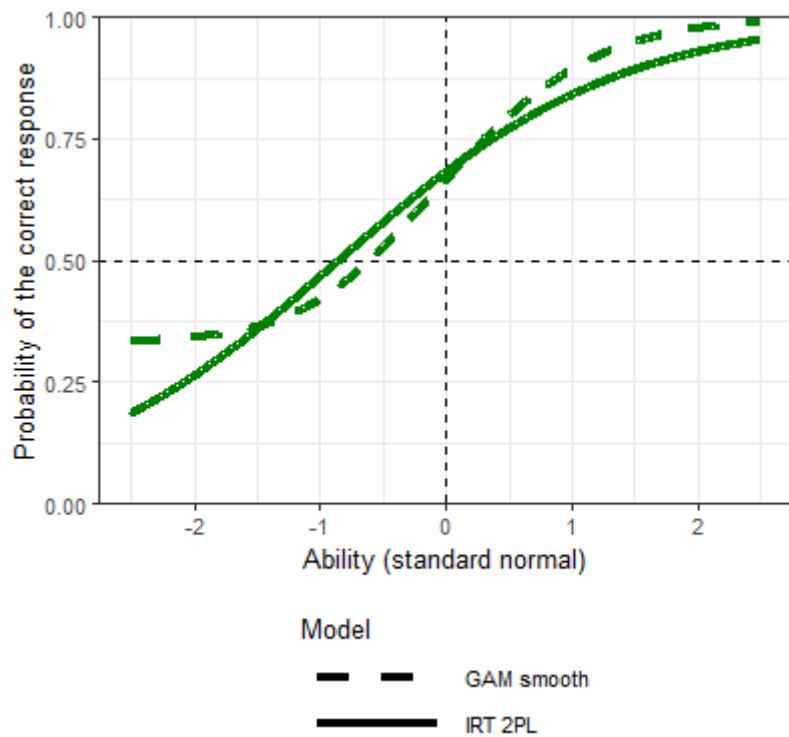


Table 3.55.1.1

Item S090053 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic				
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value	
1	65.5%	304	MC	0.396325 1	0.2252826	0.90	-0.85	0.035	0.010	

3.1.327. Gender DIF:

Table 3.55.2.1

Item S090053 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.07	0.966	1.000	0.000	

3.1.328. Frequency of answers:

answer	Frequency	Percent
Ochrona rośliny przed owadami	17	5.6%
Produkowanie nasion	34	11.2%
Przeprowadzanie fotosyntezy	54	17.8%
Wchłanianie wody i składników mineralnych z gleby (correct)	199	65.5%
Overall	304	100.0%

3.1.329. Distractors functioning:

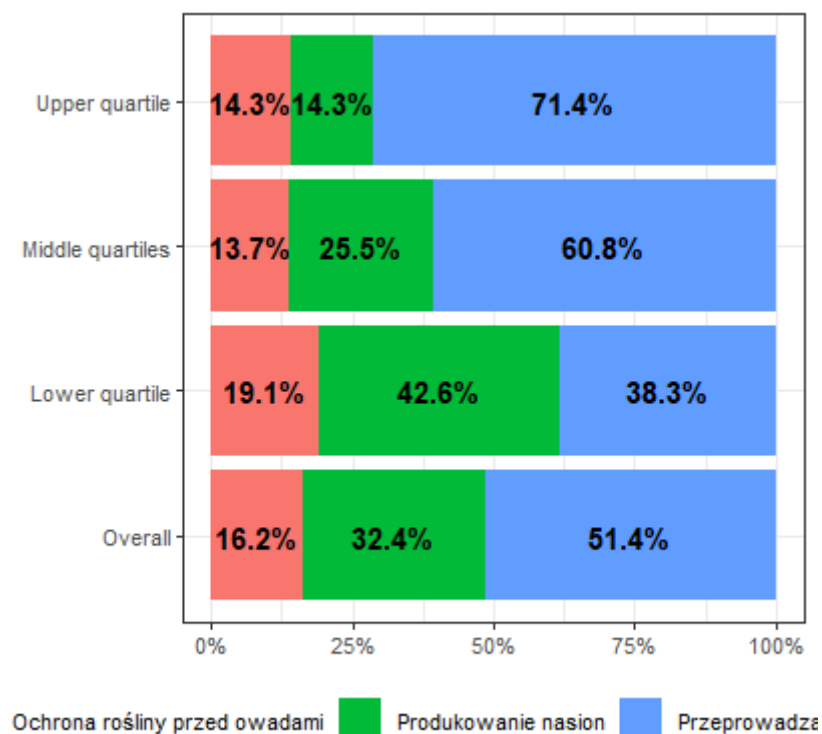
Table 3.55.4.1

Item S090053 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Ochrona rośliny przed owadami	9	7	1	17	19.1%	13.7%	14.3%	16.2%
Produkowanie nasion	20	13	1	34	42.6%	25.5%	14.3%	32.4%
Przeprowadzanie fotosyntezy	18	31	5	54	38.3%	60.8%	71.4%	51.4%
Overall	47	51	7	105	100.0%	100.0%	100.0%	100.0%

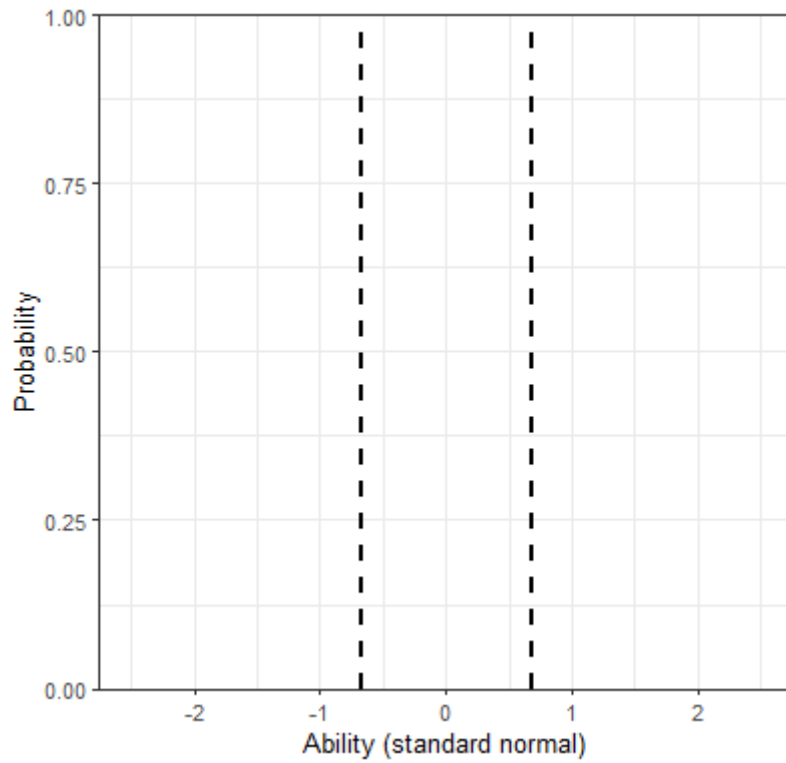
Graph 3.55.4.1

Item S090053 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.55.4.2

Item S090053 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.330. Answering time:

Graph 3.55.5.1

Item S090053 answering time distribution in groups of different ability level

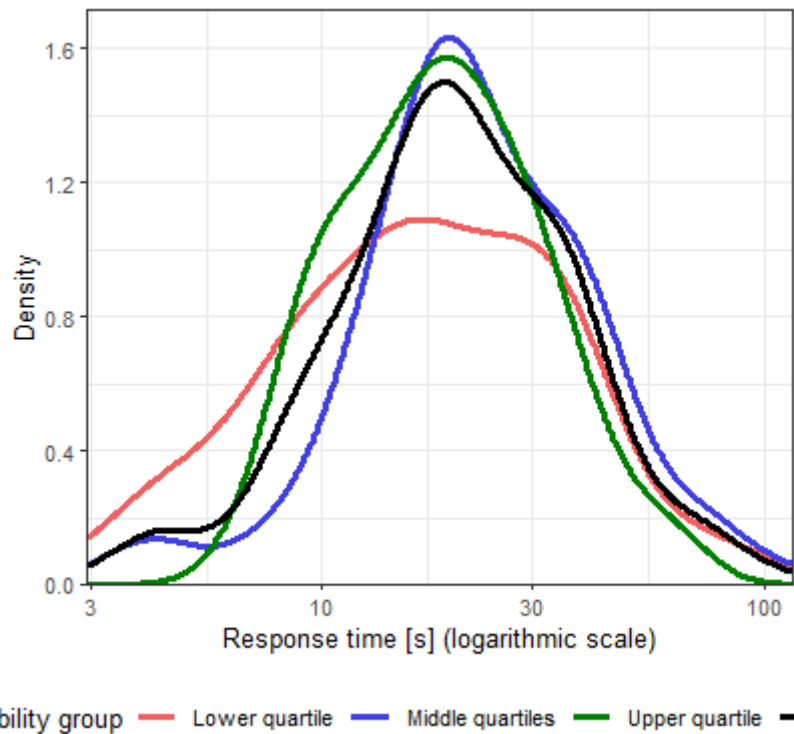


Table 3.55.5.1

Item S090053 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.95	9.57	16.66	30.74	88.19	2.81	0.74
Middle quartiles	3.25	15.73	21.18	33.76	116.00	3.09	0.63
Upper quartile	6.55	12.57	19.02	26.78	63.51	2.92	0.52
Overall	2.95	13.40	19.66	31.09	116.00	2.98	0.64

3.1.331. S090018 (LLM)

3.1.332. Item fit:

Graph 3.56.1.1

Item S090018 ICC and nonparametric trace line

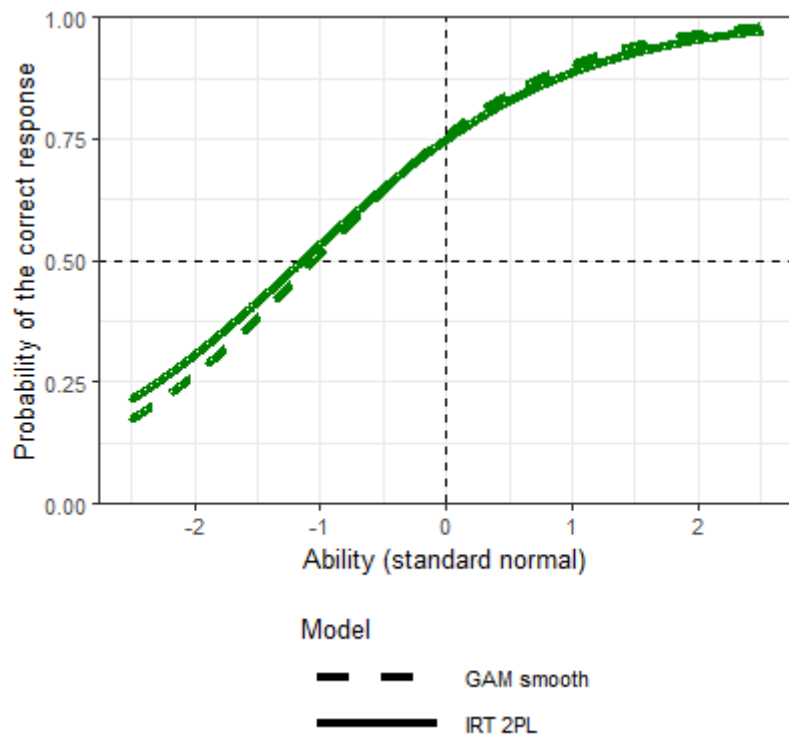


Table 3.56.1.1

Item S090018 parameters and fit statistics

Max. points	Ease	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	71.1%	304	MC	0.3921459	0.2721648	0.95	-1.14	0.021	0.135

3.1.333. Gender DIF:

Table 3.56.2.1

Item S090018 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
9.45	0.009	0.754	0.029	

3.1.334. Frequency of answers:

answer	Frequency	Percent
Bakteria	4	1.3%
Grzyb	74	24.3%
Owca	10	3.3%
Sosna (correct)	216	71.1%
Overall	304	100.0%

3.1.335. Distractors functioning:

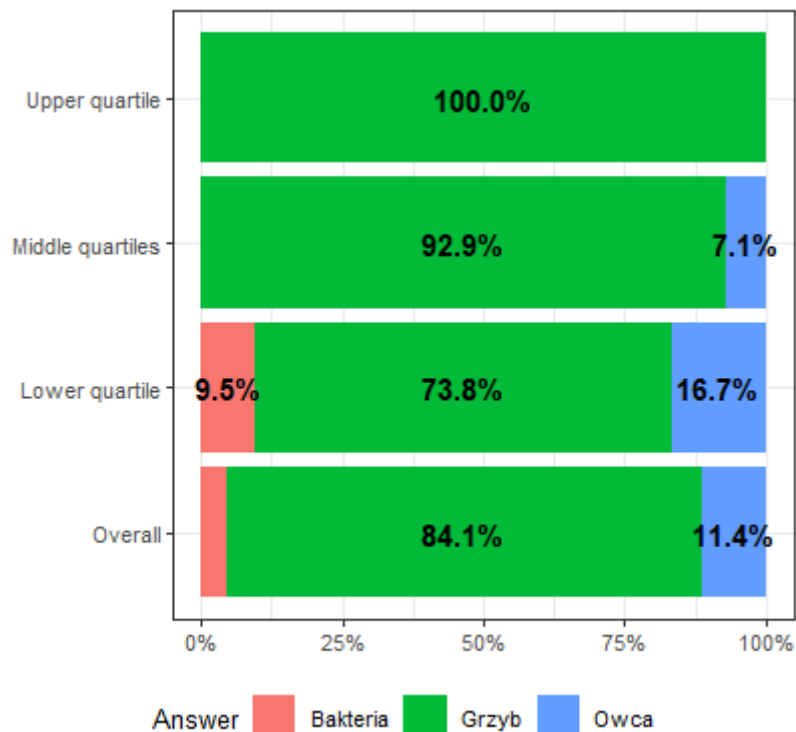
Table 3.56.4.1

Item S090018 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Bakteria	4	0	0	4	9.5%	0.0%	0.0%	4.5%
Grzyb	31	39	4	74	73.8%	92.9%	100.0%	84.1%
Owca	7	3	0	10	16.7%	7.1%	0.0%	11.4%
Overall	42	42	4	88	100.0%	100.0%	100.0%	100.0%

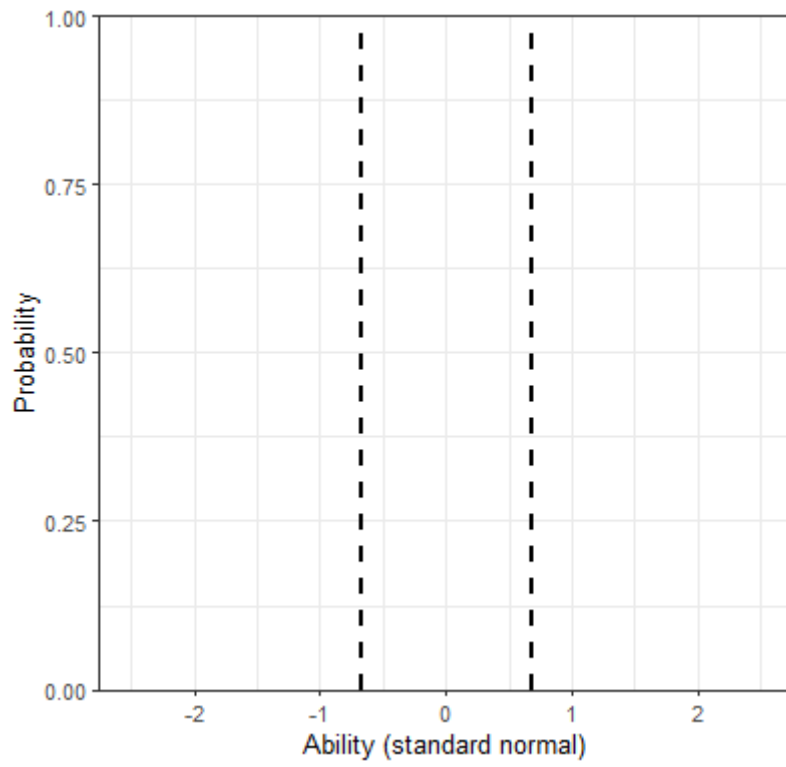
Graph 3.56.4.1

Item S090018 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.56.4.2

Item S090018 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.336. Answering time:

Graph 3.56.5.1

Item S090018 answering time distribution in groups of different ability level

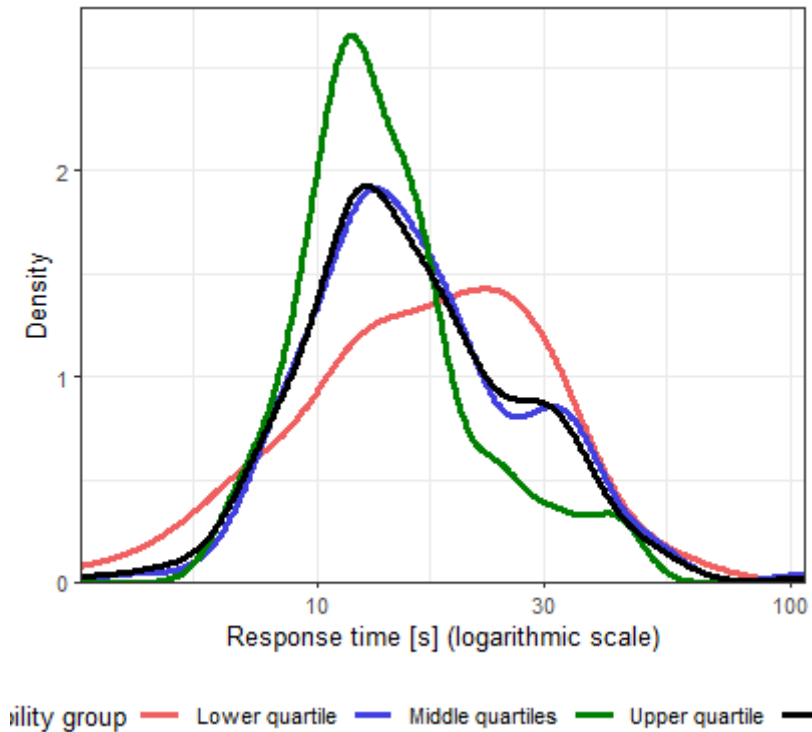


Table 3.56.5.1

Item S090018 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.17	11.78	18.23	26.09	61.12	2.81	0.59
Middle quartiles	3.94	11.50	15.20	21.61	107.05	2.79	0.52
Upper quartile	6.28	10.84	12.66	16.69	44.79	2.64	0.43
Overall	3.17	11.30	14.88	22.12	107.05	2.76	0.52

3.1.337. S100008 (LLM)

3.1.338. Item fit:

Graph 3.57.1.1

Item S100008 ICC and nonparametric trace line

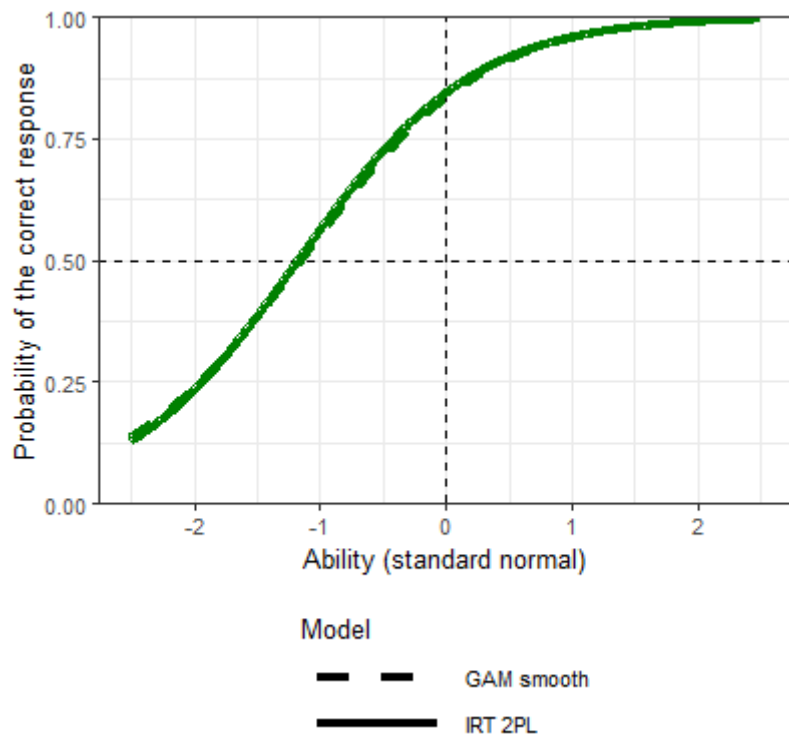


Table 3.57.1.1

Item S100008 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	78.2%	299	MC	0.4520898	0.2793056	1.44	-1.18	0.000	0.533

3.1.339. Gender DIF:

Table 3.57.2.1

Item S100008 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.00	0.369	1.000		0.007

3.1.340. Frequency of answers:

answer	Frequency	Percent
Powstawanie fal na morzu. (correct)	233	78.2%
Powstawanie rzeki.	14	4.7%
Trzęsienie ziemi.	28	9.4%
Wybuch wulkanu.	23	7.7%
Overall	298	100.0%

3.1.341. Distractors functioning:

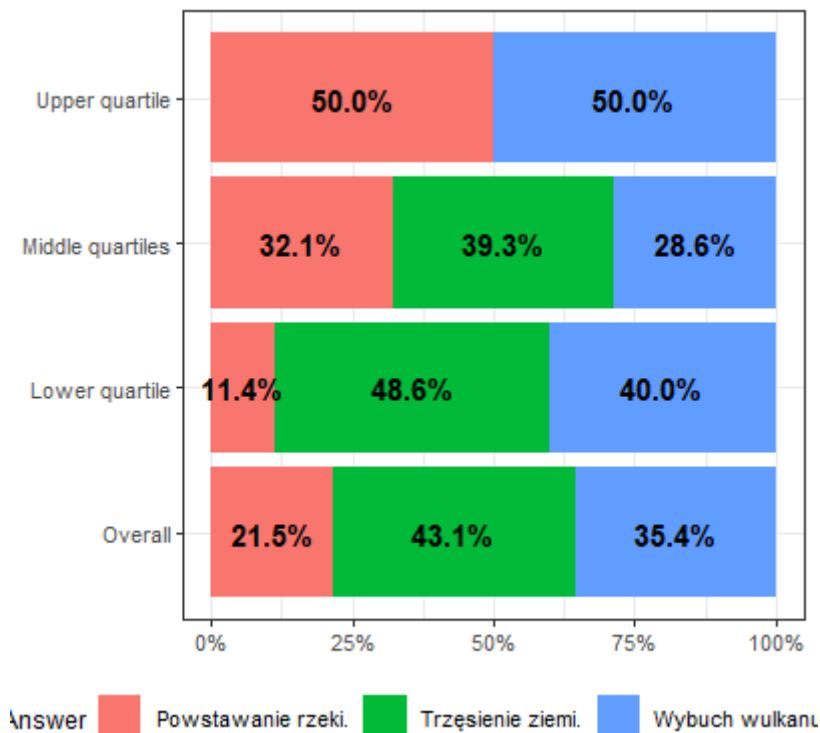
Table 3.57.4.1

Item S100008 distractor frequency (among those who did not choose the correct answer) in groups of different ability level

Answer	Frequency				Percent			
	Lower quartile	Middle quartiles	Upper quartile	Overall	Lower quartile	Middle quartiles	Upper quartile	Overall
Powstawanie rzeki.	4	9	1	14	11.4%	32.1%	50.0%	21.5%
Trzęsienie ziemi.	17	11	0	28	48.6%	39.3%	0.0%	43.1%
Wybuch wulkanu.	14	8	1	23	40.0%	28.6%	50.0%	35.4%
Overall	35	28	2	65	100.0%	100.0%	100.0%	100.0%

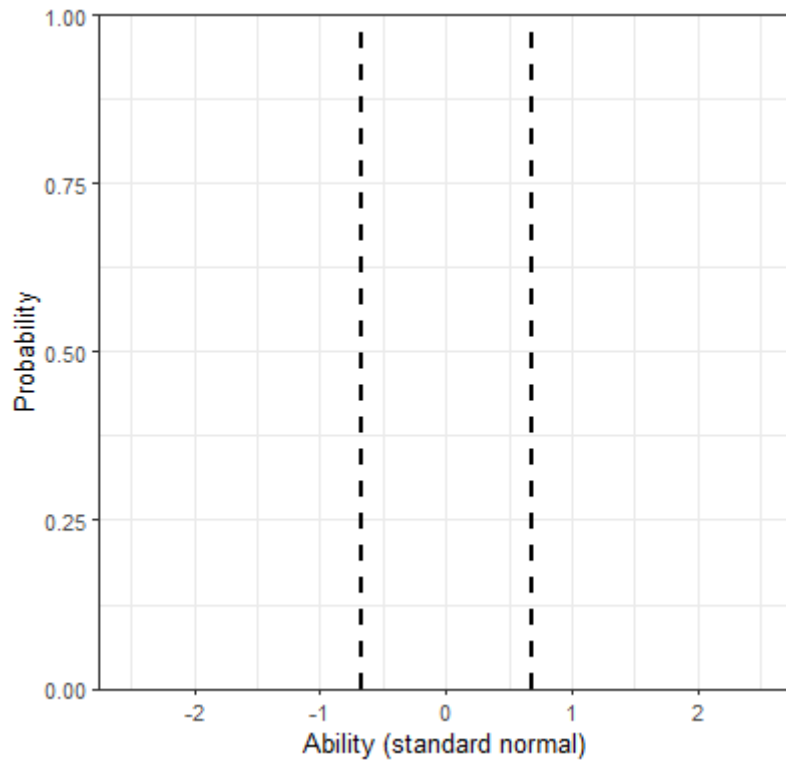
Graph 3.57.4.1

Item S100008 distractor frequency (among those who did not choose the correct answer) in groups of different ability level



Graph 3.57.4.2

Item S100008 predicted distractor frequency (among those who did not choose the correct answer) for different values of the ability



3.1.342. Answering time:

Graph 3.57.5.1

Item S100008 answering time distribution in groups of different ability level

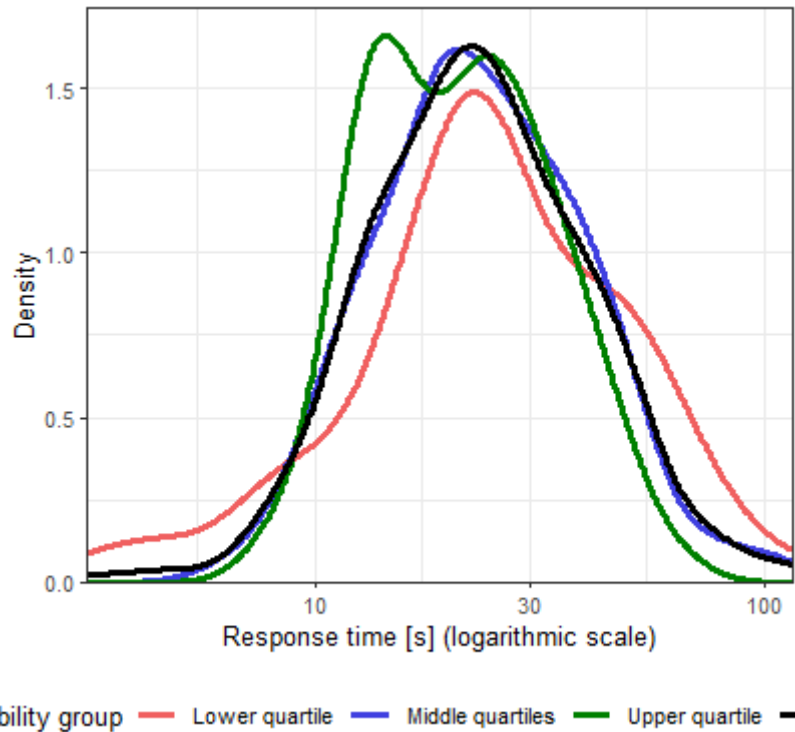


Table 3.57.5.1

Item S100008 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.11	17.06	24.76	39.61	115.91	3.18	0.70
Middle quartiles	6.19	16.55	22.90	34.69	108.17	3.15	0.54
Upper quartile	7.89	14.10	21.90	29.17	63.19	3.04	0.46
Overall	3.11	15.62	22.86	33.50	115.91	3.13	0.56

3.1.343. S061034 (TIMSS)

3.1.344. Item fit:

Graph 3.58.1.1

Item S061034 ICC and nonparametric trace line

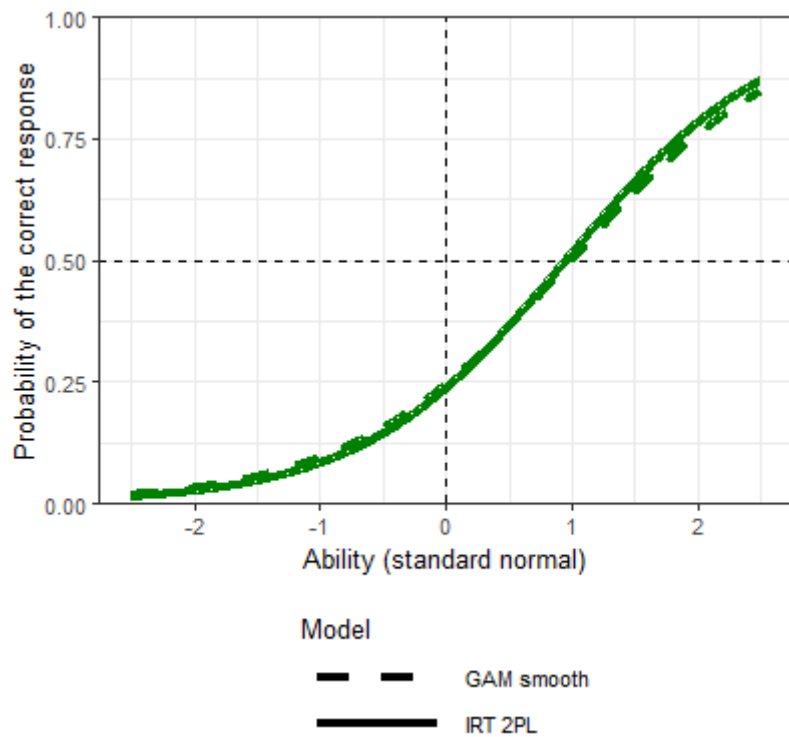


Table 3.58.1.1

Item S061034 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	27.9%	306	CR	0.412877	0.4528902	1.23	0.95	0.000	0.489

3.1.345. Gender DIF:

Table 3.58.2.1

Item S061034 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
4.87	0.088	1.000		0.015

3.1.346. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.347. Answering time:

Graph 3.58.4.1

Item S061034 answering time distribution in groups of different ability level

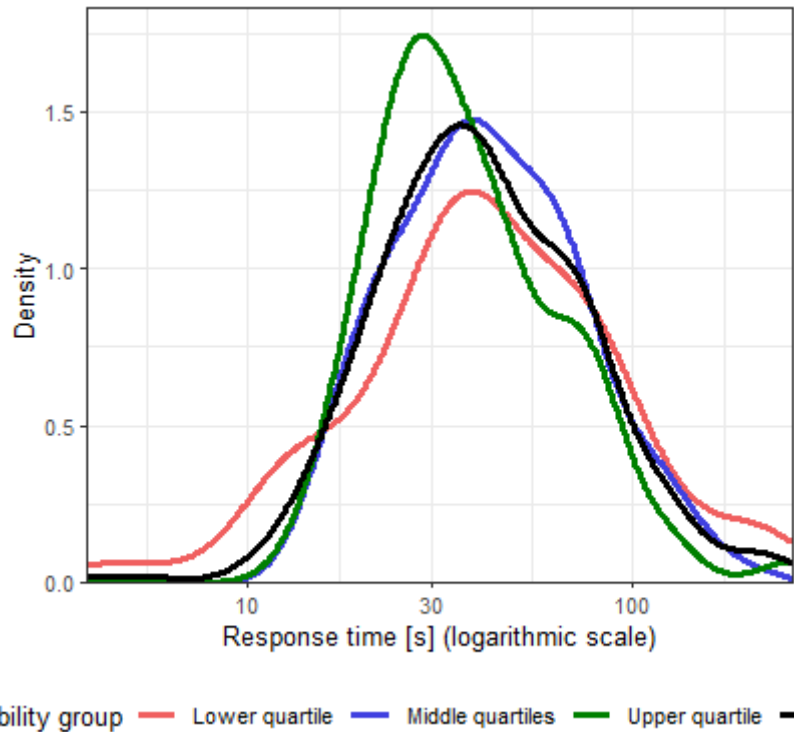


Table 3.58.4.1

Item S061034 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.84	27.00	40.60	71.20	229.99	3.71	0.79
Middle quartiles	14.61	28.36	40.69	63.43	200.87	3.74	0.56
Upper quartile	14.21	25.62	33.75	50.55	259.99	3.63	0.56
Overall	3.84	26.53	38.94	64.12	259.99	3.71	0.63

3.1.348. S041068 (TIMSS)

3.1.349. Item fit:

Graph 3.59.1.1

Item S041068 ICC and nonparametric trace line

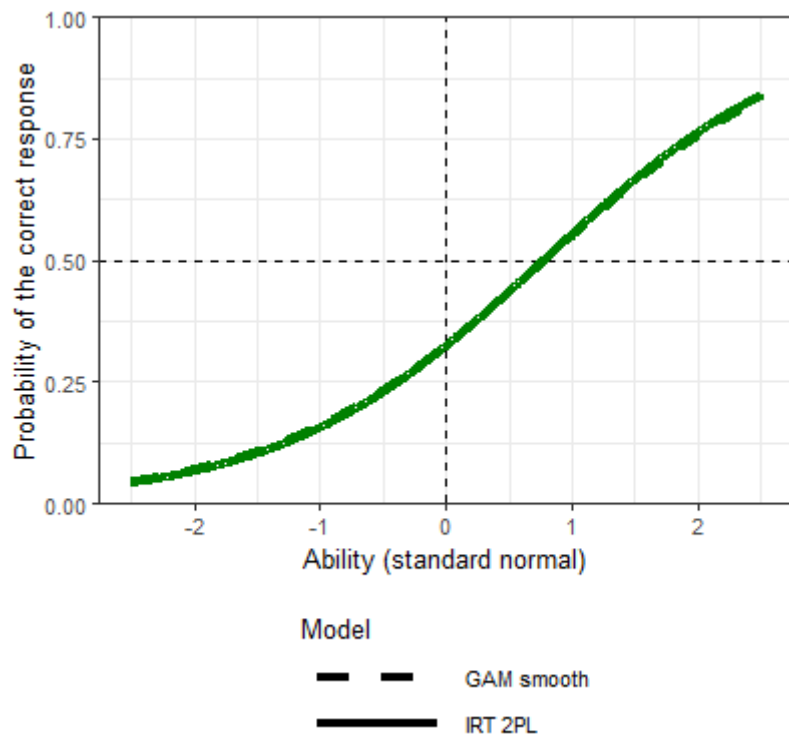


Table 3.59.1.1

Item S041068 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	34.5%	305	CR	0.381098 8	0.4521458	0.95	0.77	0.016	0.227

3.1.350. Gender DIF:

Table 3.59.2.1

Item S041068 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
3.49	0.174	1.000	0.010	

3.1.351. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.352. Answering time:

Graph 3.59.4.1

Item S041068 answering time distribution in groups of different ability level

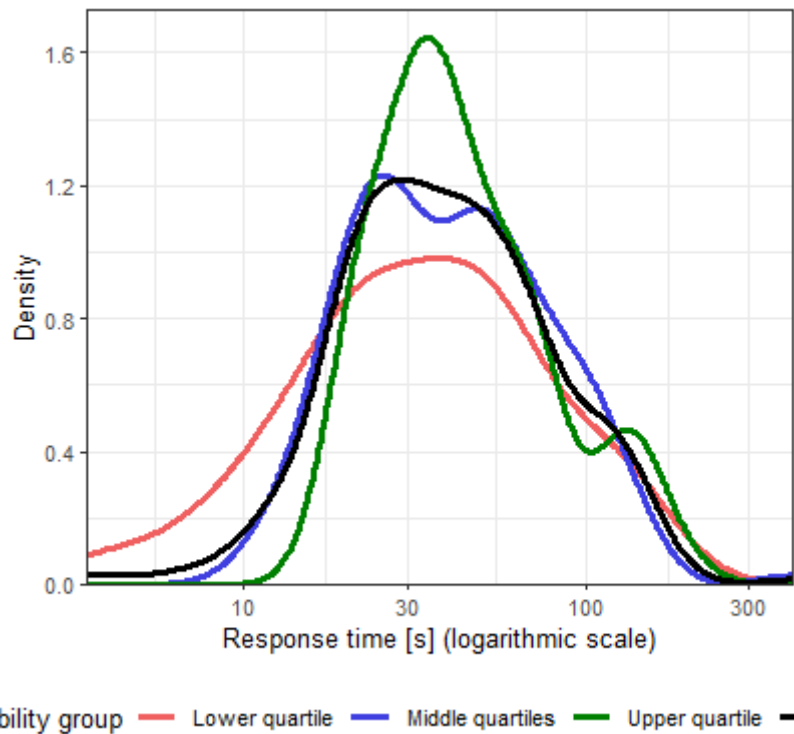


Table 3.59.4.1

Item S041068 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.49	18.77	33.81	57.81	170.51	3.48	0.86
Middle quartiles	9.95	24.14	40.13	64.67	400.99	3.69	0.66
Upper quartile	18.76	29.35	38.33	62.42	189.06	3.78	0.58
Overall	3.49	23.86	38.96	62.15	400.99	3.66	0.70

3.1.353. S100004 (LLM)

3.1.354. Item fit:

Graph 3.60.1.1

Item S100004 ICC and nonparametric trace line

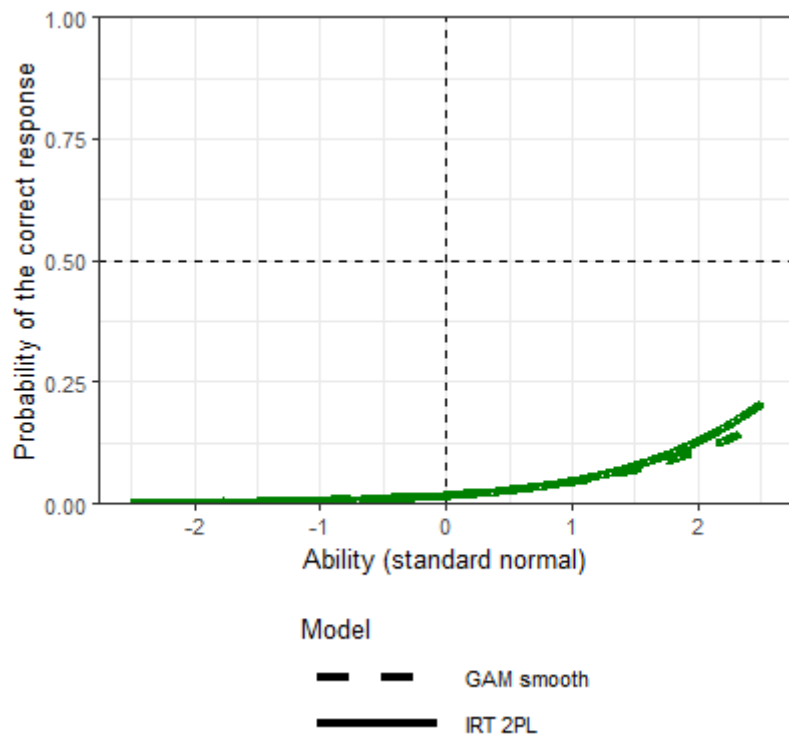


Table 3.60.1.1

Item S100004 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	2.7%	299	CR	0.144615 5	0.1311568	1.12	3.71	0.019	0.171

3.1.355. Gender DIF:

Table 3.60.2.1

Item S100004 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.14	0.566	1.000	0.016	

3.1.356. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.357. Answering time:

Graph 3.60.4.1

Item S100004 answering time distribution in groups of different ability level

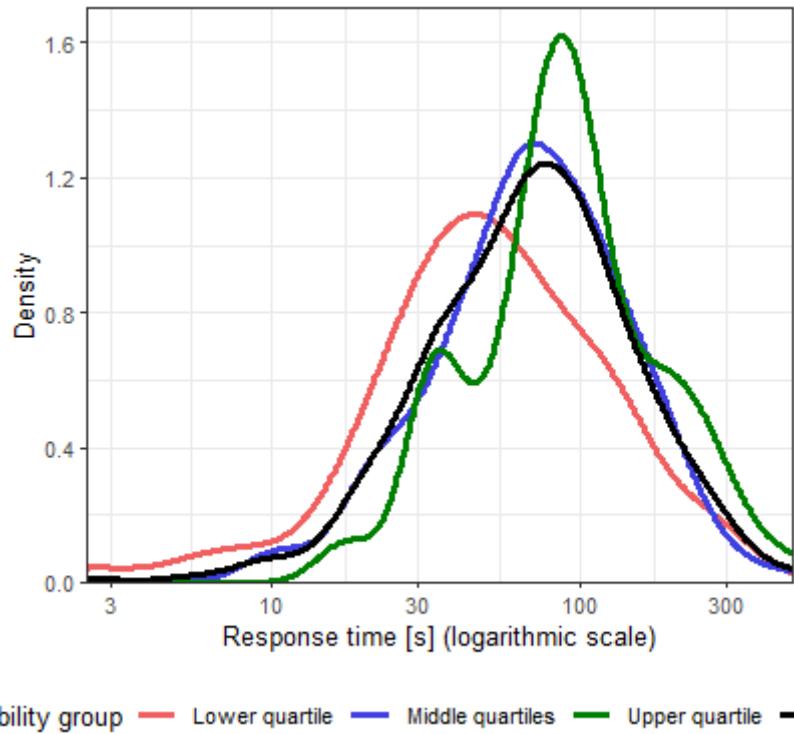


Table 3.60.4.1

Item S100004 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.53	30.78	51.62	92.30	293.92	3.92	0.89
Middle quartiles	9.20	43.96	70.99	112.00	460.03	4.23	0.72
Upper quartile	16.49	60.20	87.41	123.00	489.58	4.48	0.70
Overall	2.53	40.27	71.86	111.78	489.58	4.22	0.78

3.1.358. S041033 (LLM)

3.1.359. Item fit:

Graph 3.61.1.1

Item S041033 ICC and nonparametric trace line

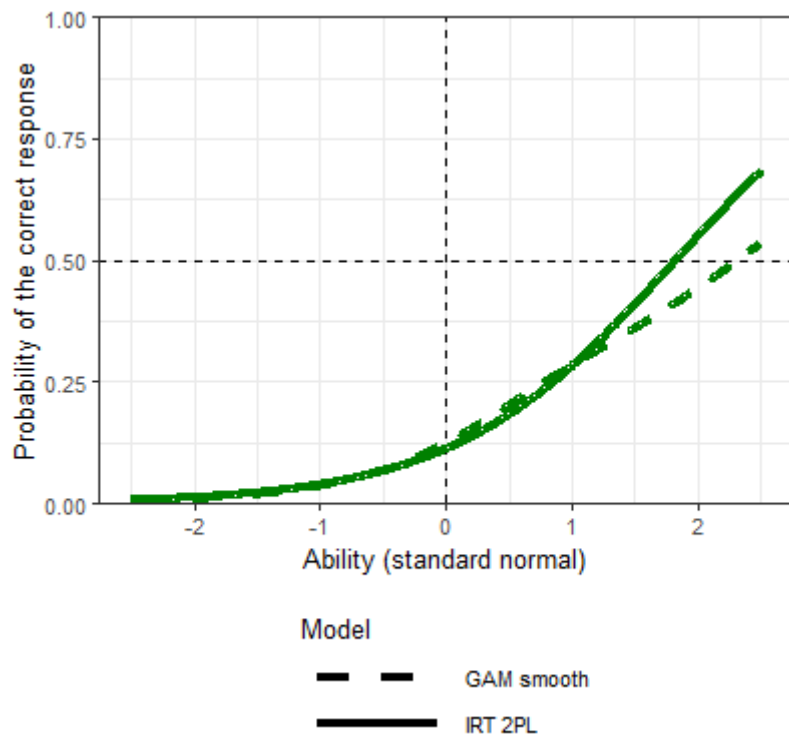


Table 3.61.1.1

Item S041033 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic				
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value	
1	16.1%	299	CR	0.314860 3	0.3460764	1.13	1.82	0.015	0.262	

3.1.360. Gender DIF:

Table 3.61.2.1

Item S041033 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
11.88	0.003	0.237	0.049	

3.1.361. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.362. Answering time:

Graph 3.61.4.1

Item S041033 answering time distribution in groups of different ability level

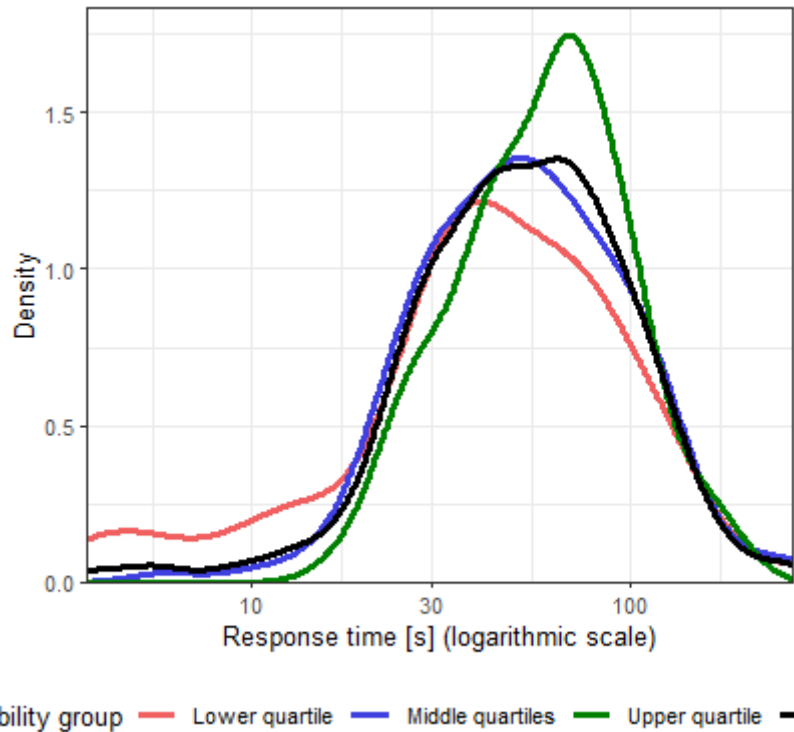


Table 3.61.4.1

Item S041033 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.70	29.19	41.70	74.34	256.26	3.71	0.87
Middle quartiles	5.91	33.84	51.20	79.98	267.35	3.95	0.63
Upper quartile	17.49	42.88	62.80	85.20	184.81	4.07	0.51
Overall	3.70	33.81	52.97	79.47	267.35	3.92	0.67

3.1.363. S061010 (TIMSS)

3.1.364. Item fit:

Graph 3.62.1.1

Item S061010 ICC and nonparametric trace line

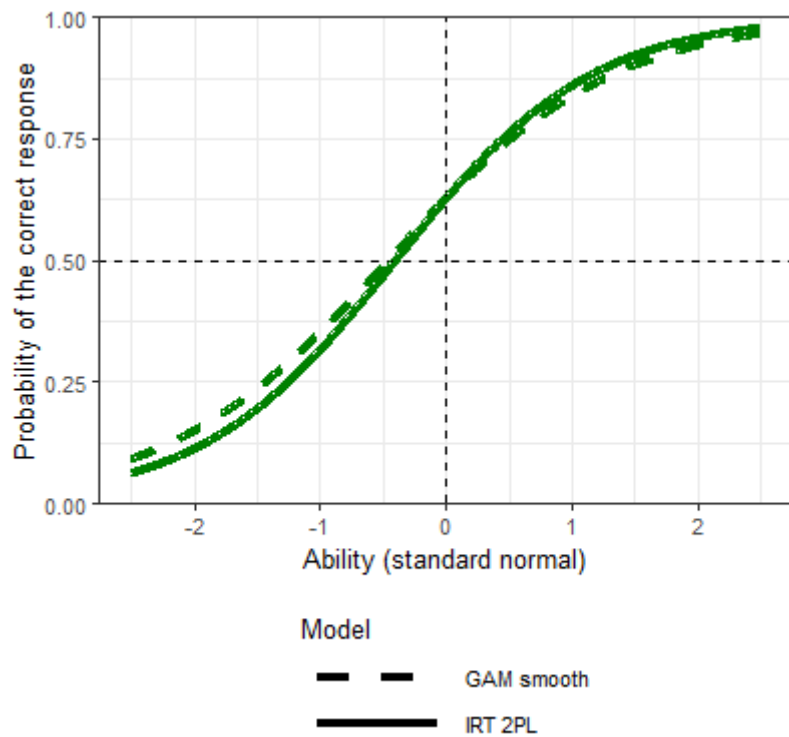


Table 3.62.1.1

Item S061010 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	58.7%	306	CR	0.455844 7	0.513763	1.29	-0.40	0.018	0.203

3.1.365. Gender DIF:

Table 3.62.2.1

Item S061010 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.80	0.669	1.000	0.002	

3.1.366. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.367. Answering time:

Graph 3.62.4.1

Item S061010 answering time distribution in groups of different ability level

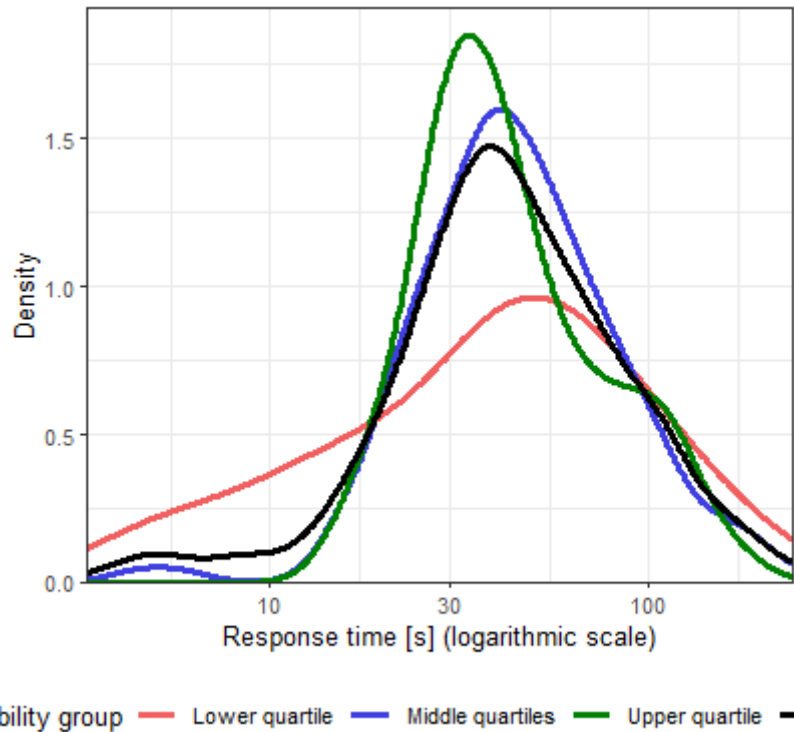


Table 3.62.4.1

Item S061010 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.32	18.72	40.28	70.83	239.96	3.59	0.98
Middle quartiles	4.46	30.82	43.92	64.97	222.82	3.80	0.61
Upper quartile	16.81	28.89	38.94	58.78	171.13	3.77	0.55
Overall	3.32	28.12	40.83	66.26	239.96	3.73	0.73

3.1.368. S090077 (LLM)

3.1.369. Item fit:

Graph 3.63.1.1

Item S090077 ICC and nonparametric trace line

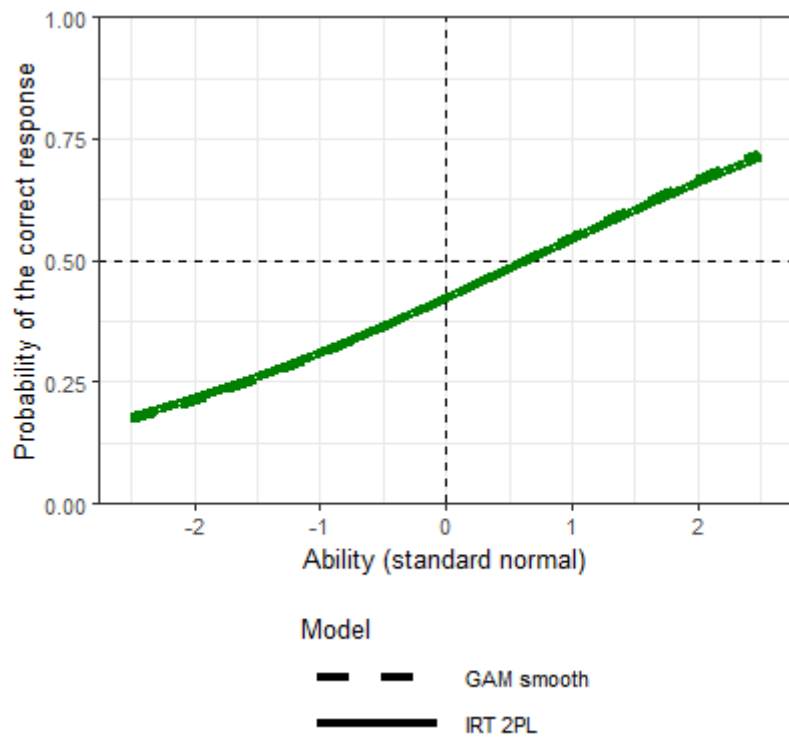


Table 3.63.1.1

Item S090077 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	42.4%	304	CR	0.236500 8	0.1720675	0.49	0.64	0.000	0.480

3.1.370. Gender DIF:

Table 3.63.2.1

Item S090077 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
8.48	0.014	1.000	0.024	

3.1.371. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.372. Answering time:

Graph 3.63.4.1

Item S090077 answering time distribution in groups of different ability level

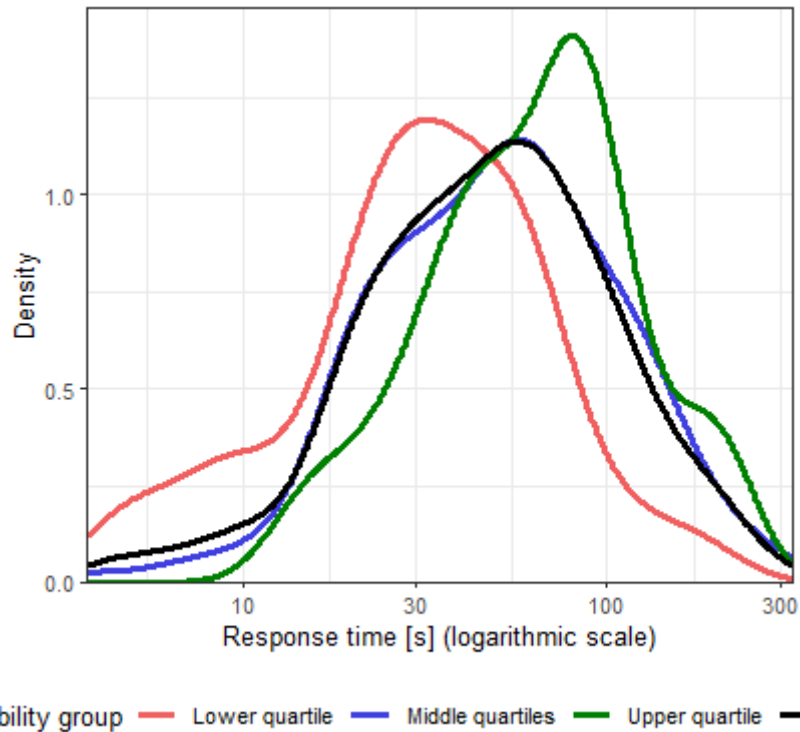


Table 3.63.4.1

Item S090077 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.62	20.97	32.50	56.37	183.14	3.42	0.81
Middle quartiles	3.77	29.11	50.88	85.11	321.92	3.90	0.77
Upper quartile	13.21	41.11	69.29	93.45	214.49	4.12	0.67
Overall	3.77	27.97	49.92	79.71	321.92	3.84	0.80

3.1.373. S100039 (LLM)

3.1.374. Item fit:

Graph 3.64.1.1

Item S100039 ICC and nonparametric trace lines

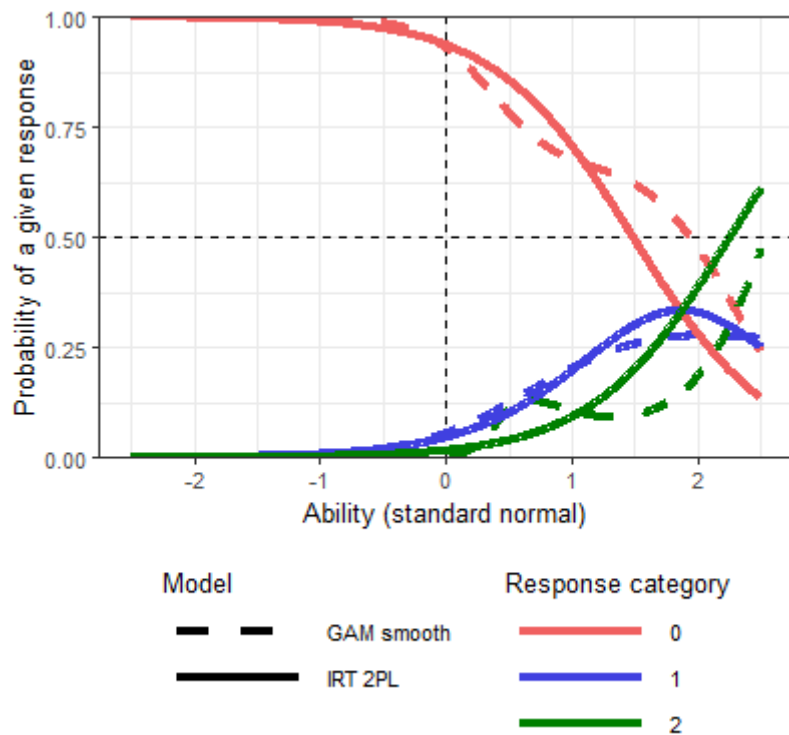


Table 3.64.1.1

Item S100039 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic					
Max. points	Easiness	Number of obs.	Format	thetaPV SAll	thetaPVSTI MSS	Discrimination	Difficulty	Category 1 difficulty	Category 2 difficulty	RMS EA	RMS EA p-value
2	9.6%	304	CR	0.4535147	0.2753219	1.82	1.87	1.49	2.25	0.000	0.595

3.1.375. Gender DIF:

Table 3.64.2.1

Item S100039 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.30	0.859	1.000	0.001	

3.1.376. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.377. Answering time:

Graph 3.64.4.1

Item S100039 answering time distribution in groups of different ability level

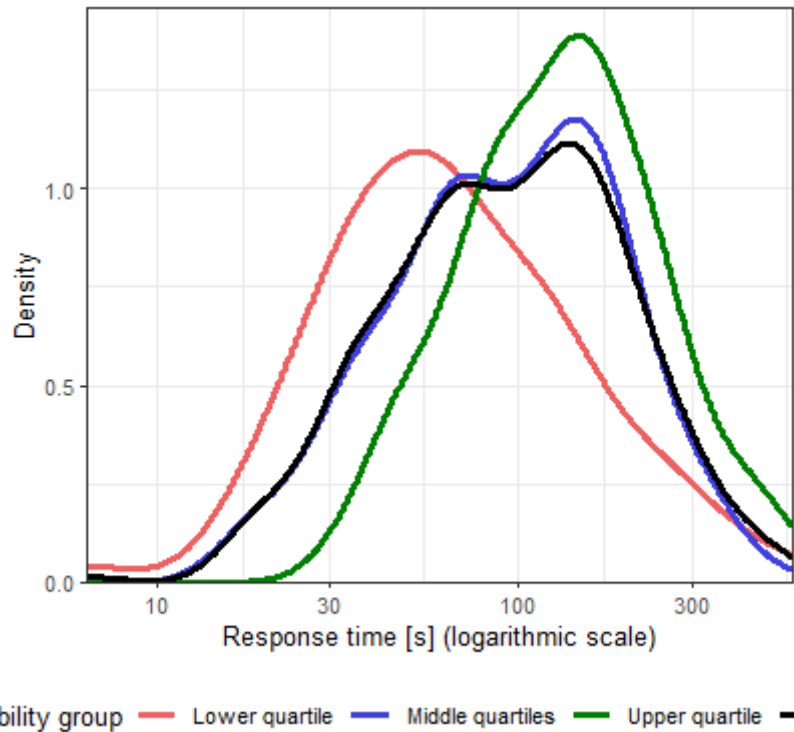


Table 3.64.4.1

Item S100039 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	6.45	36.45	61.84	117.13	542.68	4.18	0.82
Middle quartiles	16.78	58.51	98.20	156.00	483.75	4.52	0.72
Upper quartile	32.73	86.39	136.74	194.48	570.13	4.87	0.62
Overall	6.45	53.41	95.28	156.82	570.13	4.52	0.76

3.1.378. SP71054 (TIMSS)

3.1.379. Item fit:

Graph 3.65.1.1

Item SP71054 ICC and nonparametric trace line

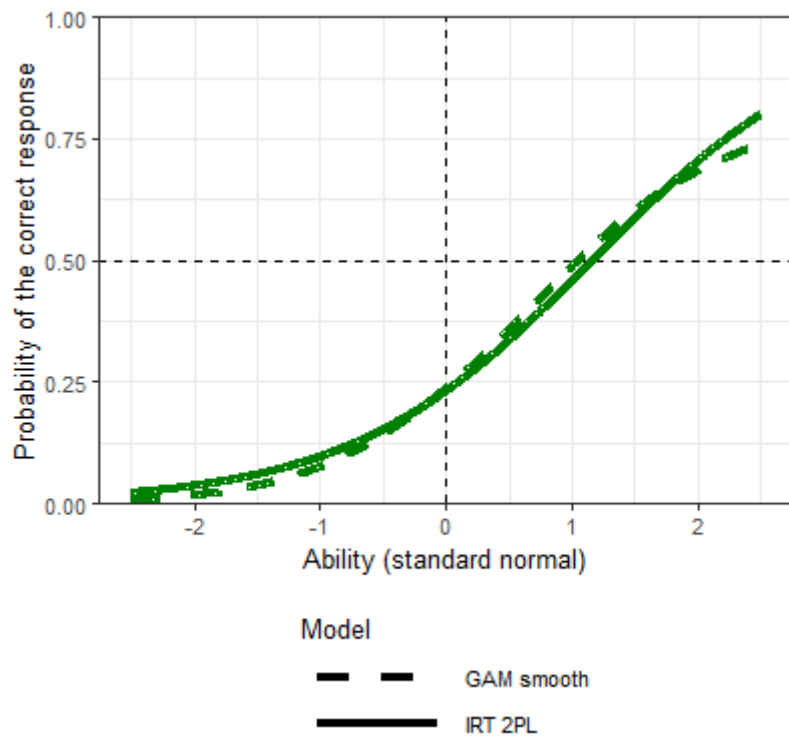


Table 3.65.1.1

Item SP71054 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	26.6%	305	CR	0.409414 3	0.4416781	1.03	1.16	0.007	0.390

3.1.380. Gender DIF:

Table 3.65.2.1

Item SP71054 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.93	0.382	1.000	0.006	

3.1.381. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.382. Answering time:

Graph 3.65.4.1

Item SP71054 answering time distribution in groups of different ability level

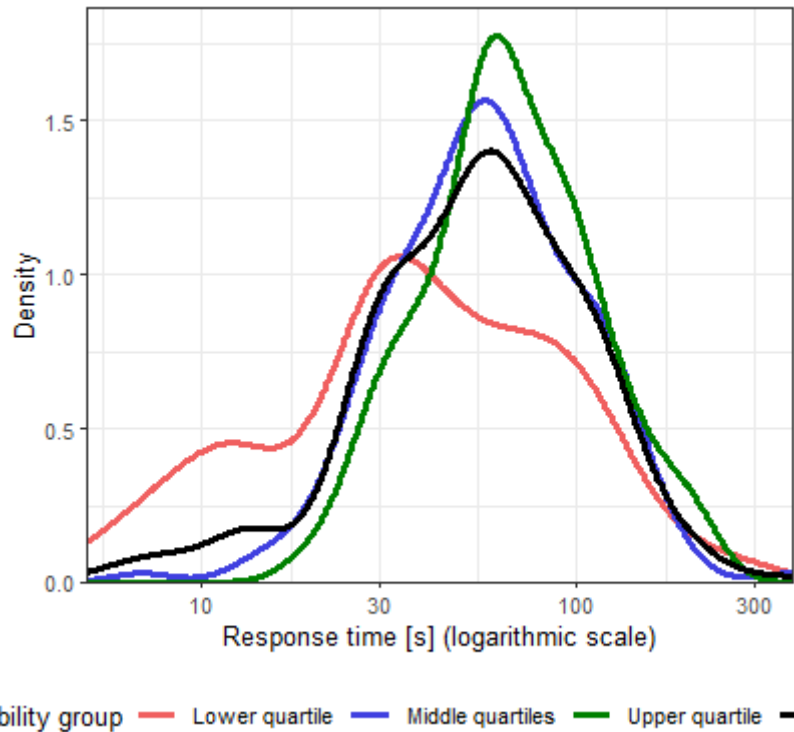


Table 3.65.4.1

Item SP71054 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.96	25.37	36.05	74.42	273.87	3.63	0.89
Middle quartiles	6.95	38.75	58.07	84.98	377.03	4.04	0.59
Upper quartile	19.41	49.03	64.14	92.14	209.06	4.19	0.53
Overall	4.96	34.29	56.19	86.33	377.03	3.98	0.69

3.1.383. S061138 (LLM)

3.1.384. Item fit:

Graph 3.66.1.1

Item S061138 ICC and nonparametric trace line

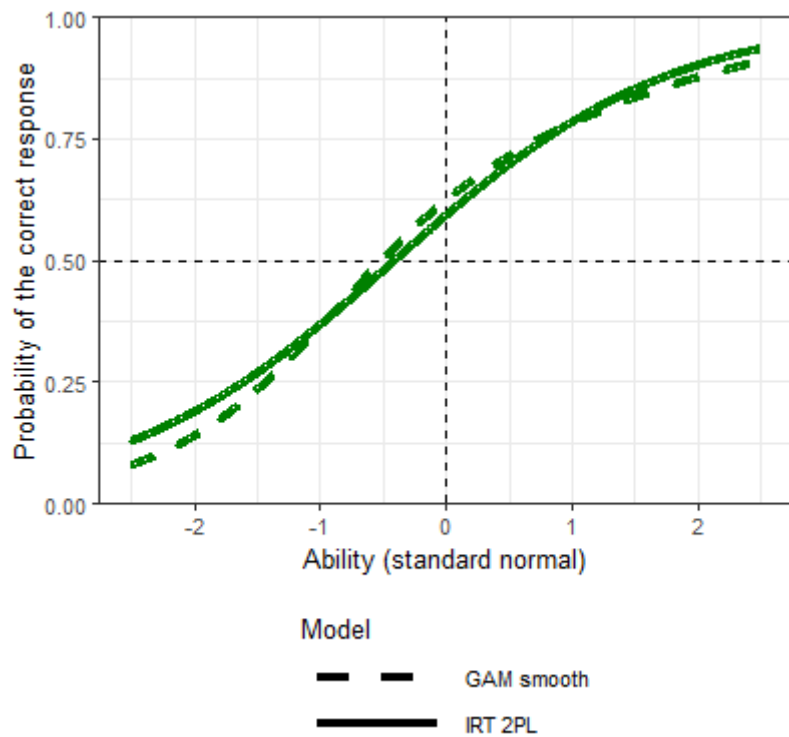


Table 3.66.1.1

Item S061138 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	57.1%	306	CR	0.410096 3	0.4080923	0.92	-0.41	0.004	0.419

3.1.385. Gender DIF:

Table 3.66.2.1

Item S061138 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
10.12	0.006	0.552	0.028	

3.1.386. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.387. Answering time:

Graph 3.66.4.1

Item S061138 answering time distribution in groups of different ability level

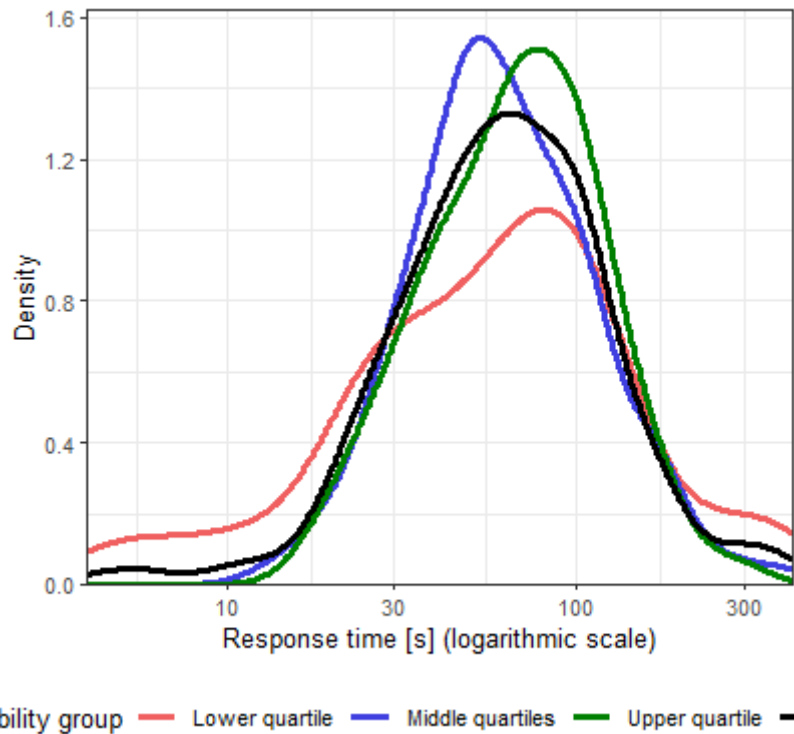


Table 3.66.4.1

Item S061138 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.98	30.35	60.70	99.69	400.40	4.00	0.96
Middle quartiles	13.09	42.58	58.73	91.94	412.98	4.12	0.60
Upper quartile	18.31	44.13	67.62	99.24	282.32	4.19	0.57
Overall	3.98	38.92	61.88	97.03	412.98	4.10	0.72

3.1.388. S100032 (LLM)

3.1.389. Item fit:

Graph 3.67.1.1

Item S100032 ICC and nonparametric trace line

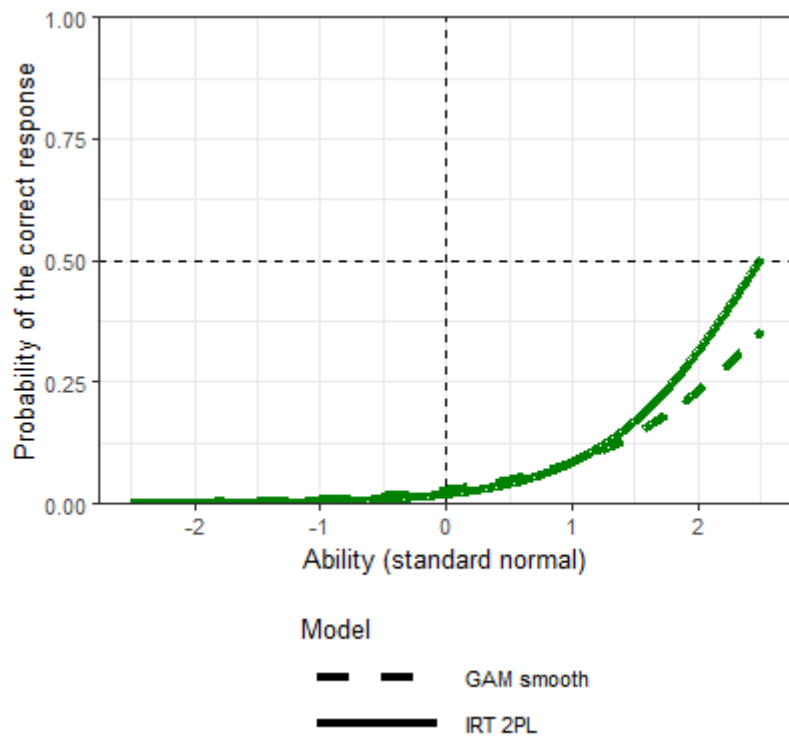


Table 3.67.1.1

Item S100032 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	4.7%	319	CR	0.215708 1	0.1766881	1.59	2.49	0.000	0.626

3.1.390. Gender DIF:

Table 3.67.2.1

Item S100032 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
12.31	0.002	0.193	0.105	

3.1.391. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.392. Answering time:

Graph 3.67.4.1

Item S100032 answering time distribution in groups of different ability level

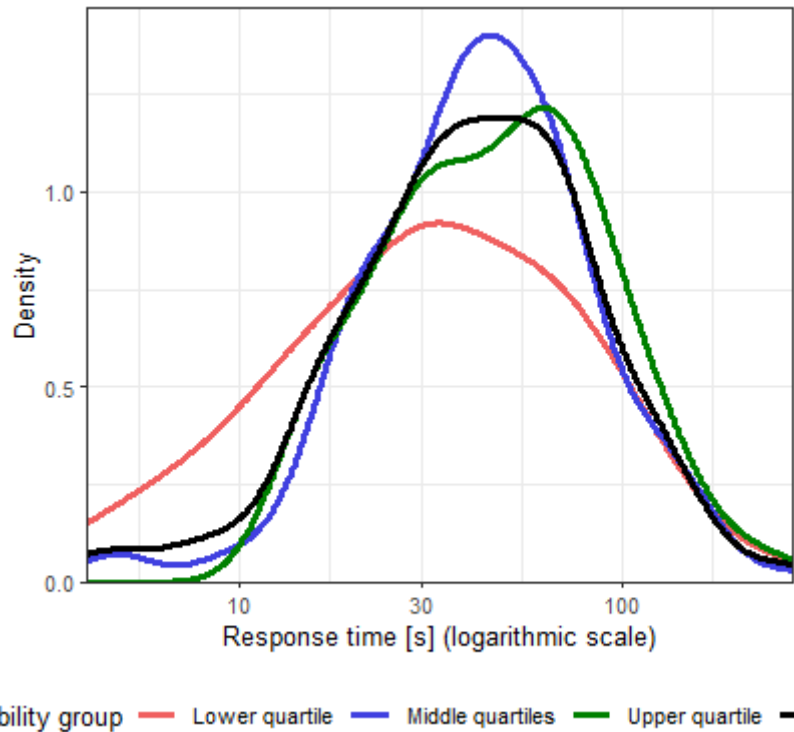


Table 3.67.4.1

Item S100032 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.04	16.16	32.12	64.90	278.35	3.44	0.92
Middle quartiles	4.18	27.69	42.73	65.11	273.33	3.74	0.69
Upper quartile	13.73	27.72	48.56	73.88	253.52	3.84	0.66
Overall	4.04	25.69	42.55	66.80	278.35	3.69	0.76

3.1.393. S041027 (LLM)

3.1.394. Item fit:

Graph 3.68.1.1

Item S041027 ICC and nonparametric trace line

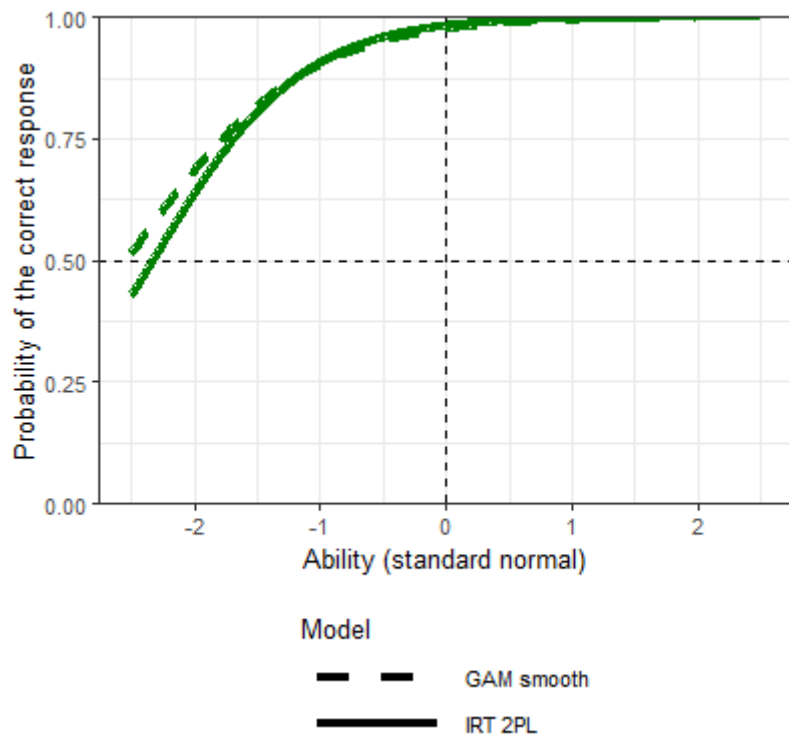


Table 3.68.1.1

Item S041027 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	94.9%	294	CR	0.294823 6	0.2473787	1.71	-2.33	0.019	0.177

3.1.395. Gender DIF:

Table 3.68.2.1

Item S041027 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.67	0.263	1.000	0.023	

3.1.396. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.397. Answering time:

Graph 3.68.4.1

Item S041027 answering time distribution in groups of different ability level

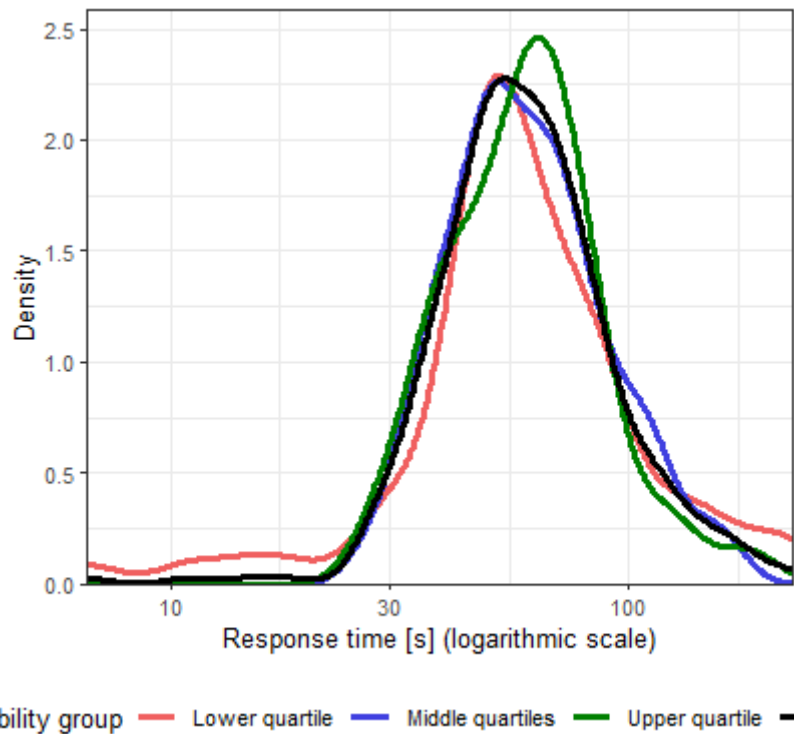


Table 3.68.4.1

Item S041027 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	6.57	45.79	55.45	79.64	228.07	4.05	0.61
Middle quartiles	26.96	46.90	57.51	76.92	167.00	4.10	0.40
Upper quartile	27.88	44.82	60.42	74.75	191.68	4.08	0.39
Overall	6.57	45.34	58.37	77.31	228.07	4.08	0.45

3.1.398. S061130 (LLM)

3.1.399. Item fit:

Graph 3.69.1.1

Item S061130 ICC and nonparametric trace line

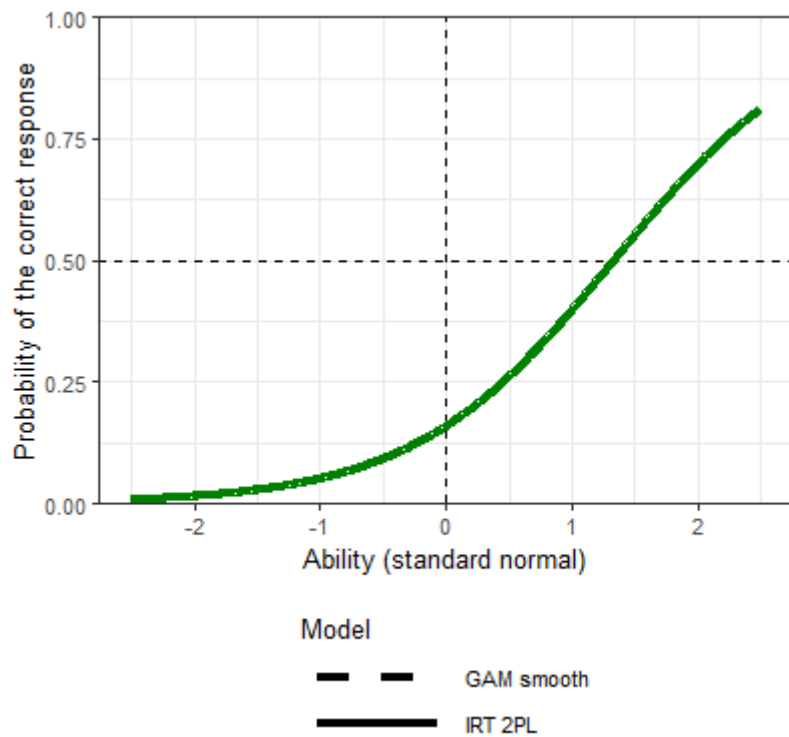


Table 3.69.1.1

Item S061130 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	21.1%	305	CR	0.420521 6	0.3886985	1.25	1.33	0.024	0.089

3.1.400. Gender DIF:

Table 3.69.2.1

Item S061130 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.64	0.726	1.000	0.002	

3.1.401. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.402. Answering time:

Graph 3.69.4.1

Item S061130 answering time distribution in groups of different ability level

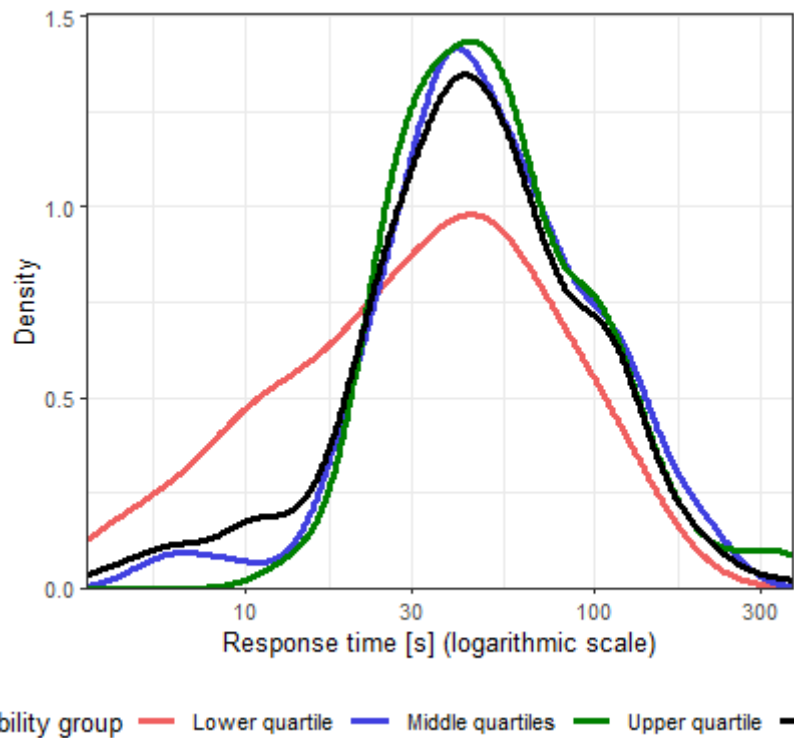


Table 3.69.4.1

Item S061130 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.54	15.91	35.46	56.99	155.51	3.42	0.90
Middle quartiles	5.25	32.03	46.26	76.75	229.47	3.88	0.70
Upper quartile	13.79	33.44	50.51	73.11	367.75	3.96	0.64
Overall	3.54	28.87	44.07	72.29	367.75	3.78	0.77

3.1.403. S890002 (LLM)

3.1.404. Item fit:

Graph 3.70.1.1

Item S890002 ICC and nonparametric trace line

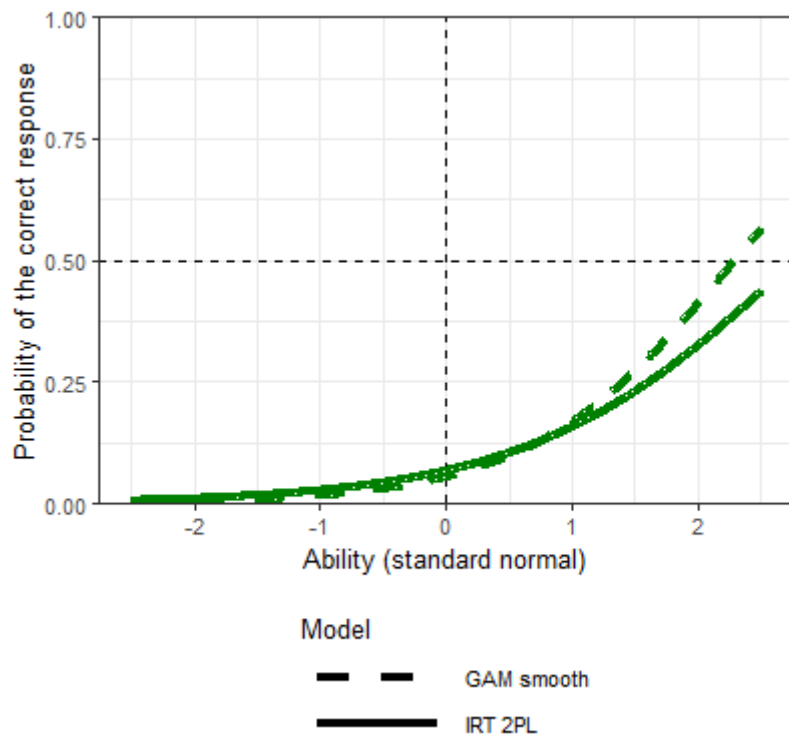


Table 3.70.1.1

Item S890002 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	9.3%	281	CR	0.307533 5	0.1240382	0.95	2.77	0.000	0.474

3.1.405. Gender DIF:

Table 3.70.2.1

Item S890002 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.68	0.712	1.000	0.004	

3.1.406. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.407. Answering time:

Graph 3.70.4.1

Item S890002 answering time distribution in groups of different ability level

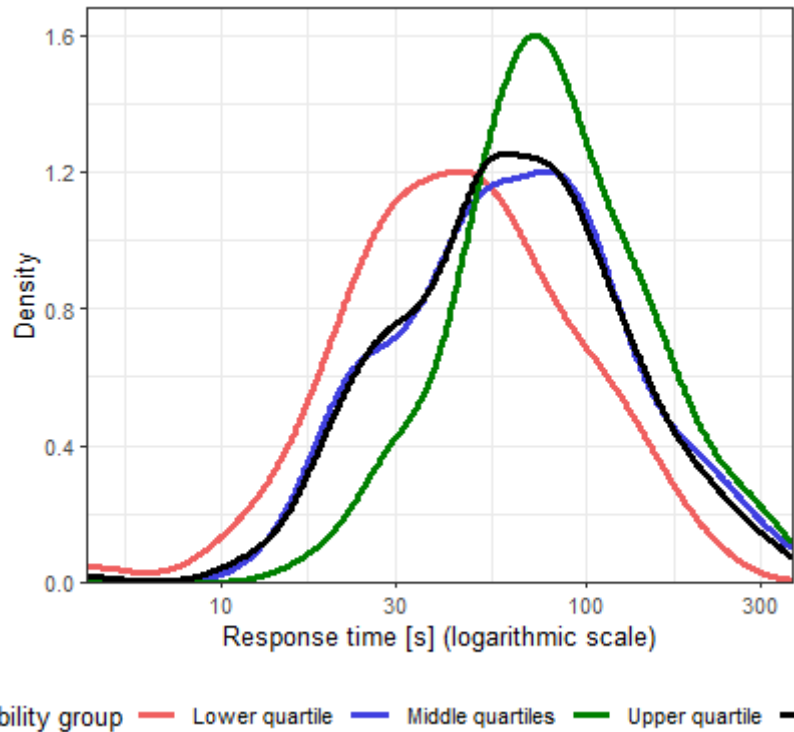


Table 3.70.4.1

Item S890002 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.31	27.95	46.64	73.44	202.49	3.80	0.72
Middle quartiles	13.12	39.25	63.51	97.05	366.19	4.15	0.71
Upper quartile	18.27	56.36	75.19	125.07	315.67	4.38	0.59
Overall	4.31	38.72	60.61	96.49	366.19	4.12	0.72

3.1.408. S051037 (TIMSS)

3.1.409. Item fit:

Graph 3.71.1.1

Item S051037 ICC and nonparametric trace line

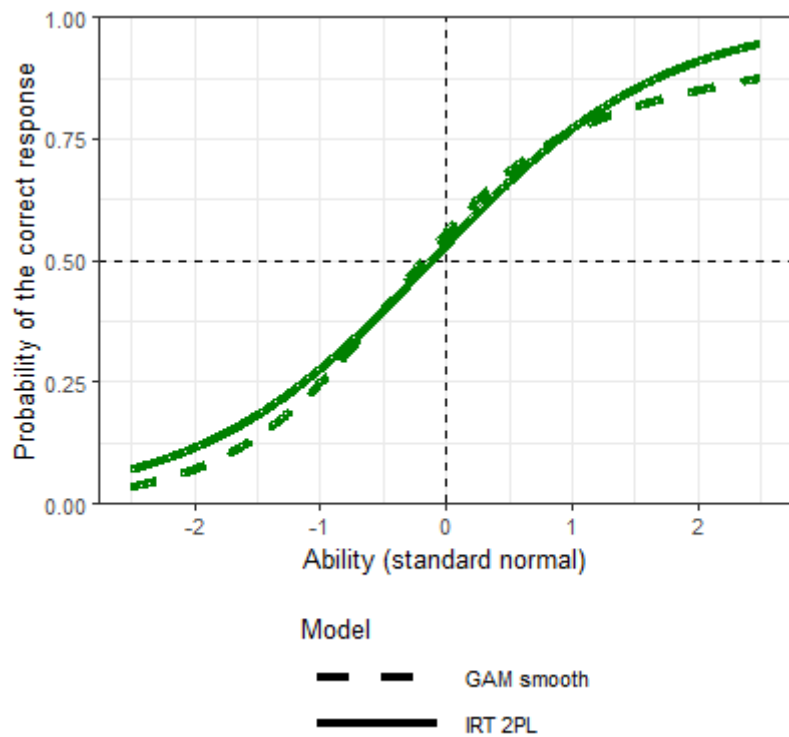


Table 3.71.1.1

Item S051037 parameters and fit statistics

Max. points	Ease	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	53.7%	294	CR	0.4307989	0.4469637	1.08	-0.11	0.025	0.081

3.1.410. Gender DIF:

Table 3.71.2.1

Item S051037 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.54	0.281	1.000	0.007	

3.1.411. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.412. Answering time:

Graph 3.71.4.1

Item S051037 answering time distribution in groups of different ability level

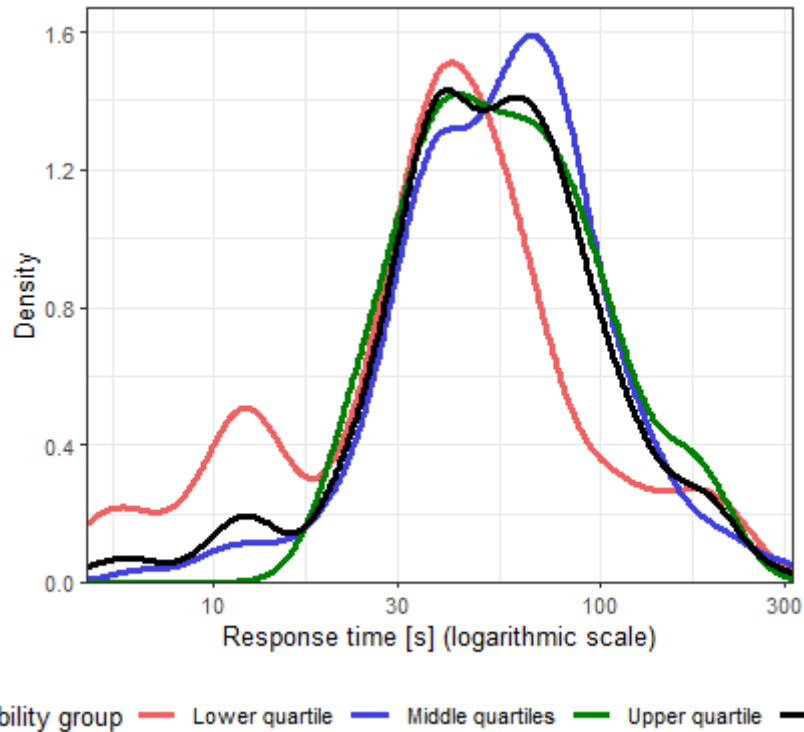


Table 3.71.4.1

Item S051037 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.72	27.29	40.05	58.68	216.97	3.61	0.86
Middle quartiles	6.47	38.44	57.91	80.53	314.66	4.01	0.62
Upper quartile	21.19	37.50	54.88	80.12	194.08	4.04	0.56
Overall	4.72	35.08	52.30	77.79	314.66	3.93	0.69

3.1.413. S041032 (LLM)

3.1.414. Item fit:

Graph 3.72.1.1

Item S041032 ICC and nonparametric trace line

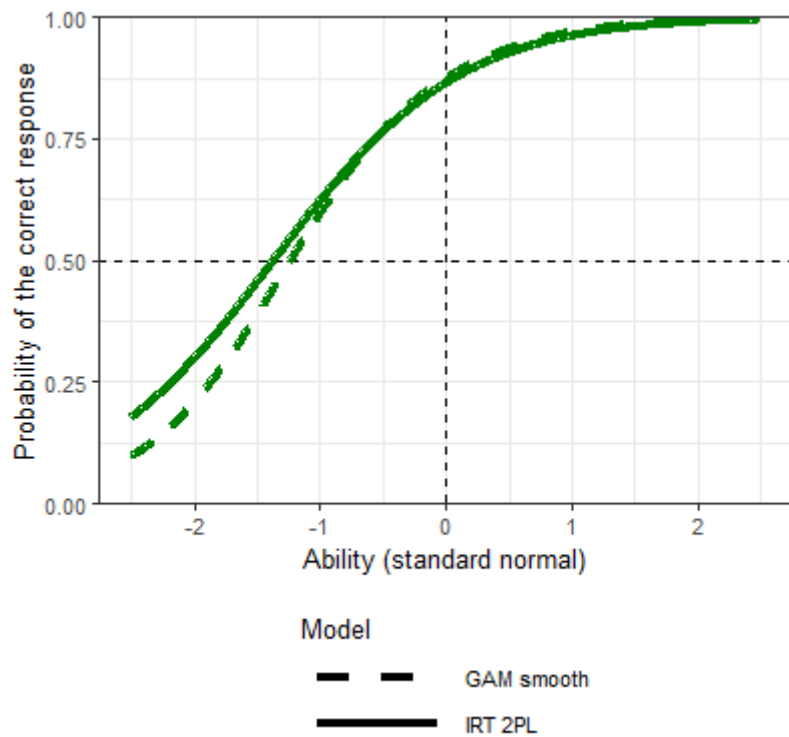


Table 3.72.1.1

Item S041032 parameters and fit statistics

Max. points	Ease	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	81.3%	294	CR	0.4589139	0.4267778	1.36	-1.37	0.000	0.557

3.1.415. Gender DIF:

Table 3.72.2.1

Item S041032 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.94	0.380	1.000	0.008	

3.1.416. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.417. Answering time:

Graph 3.72.4.1

Item S041032 answering time distribution in groups of different ability level

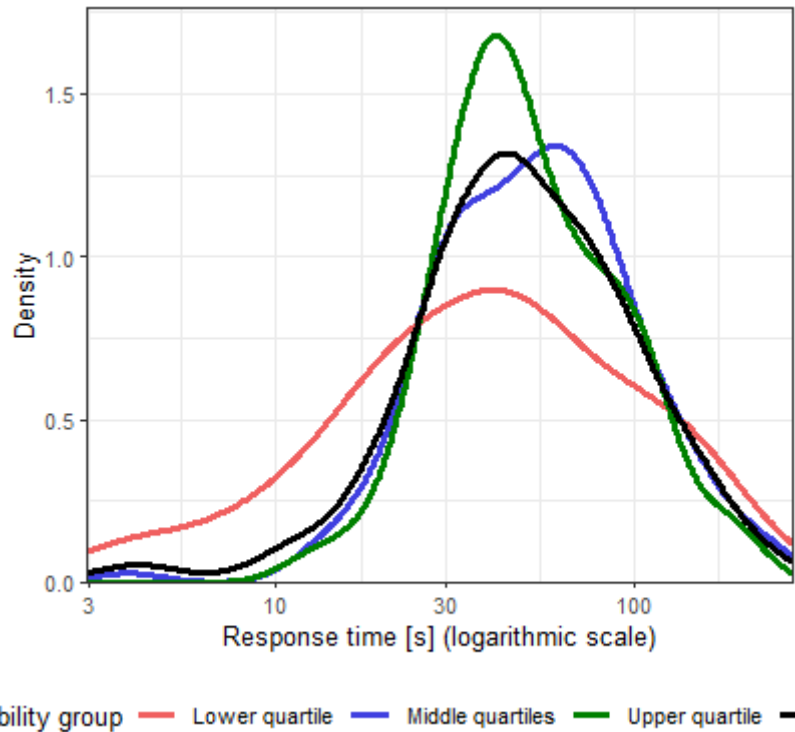


Table 3.72.4.1

Item S041032 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.99	19.85	41.51	76.83	248.97	3.62	0.98
Middle quartiles	3.88	33.03	53.53	80.72	278.28	3.97	0.66
Upper quartile	12.51	35.12	47.25	76.43	197.83	3.93	0.57
Overall	2.99	31.64	48.03	79.26	278.28	3.88	0.73

3.1.418. SP71077 (LLM)

3.1.419. Item fit:

Graph 3.73.1.1

Item SP71077 ICC and nonparametric trace line

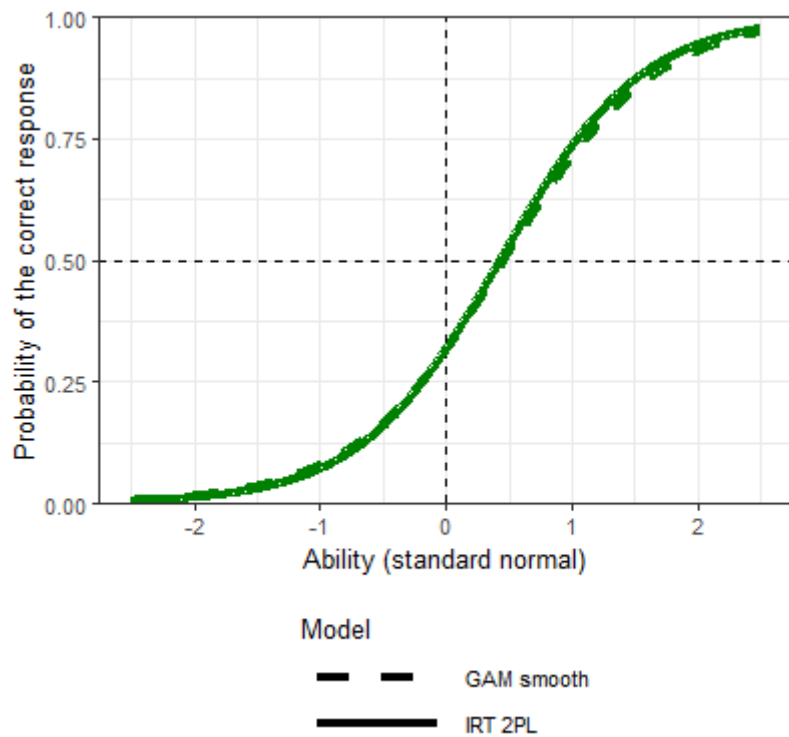


Table 3.73.1.1

Item SP71077 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	38.9%	299	CR	0.545395 2	0.6469888	1.79	0.43	0.027	0.063

3.1.420. Gender DIF:

Table 3.73.2.1

Item SP71077 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.08	0.962	1.000	0.000	

3.1.421. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.422. Answering time:

Graph 3.73.4.1

Item SP71077 answering time distribution in groups of different ability level

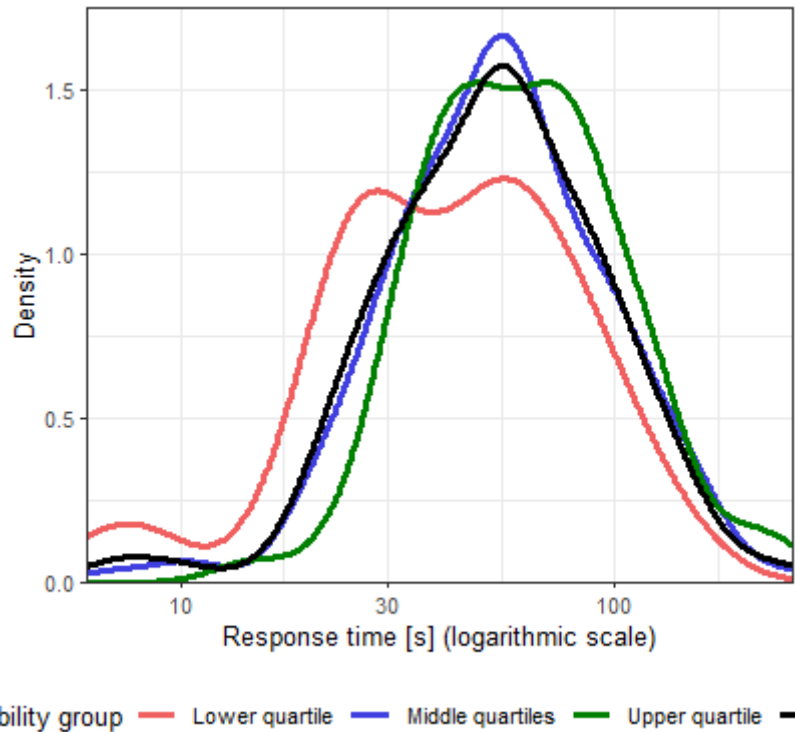


Table 3.73.4.1

Item SP71077 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	6.13	25.71	45.10	65.85	152.89	3.71	0.68
Middle quartiles	6.96	36.02	54.30	77.09	255.52	3.98	0.58
Upper quartile	14.53	41.07	61.47	84.80	248.03	4.11	0.53
Overall	6.13	35.16	53.52	77.89	255.52	3.95	0.61

3.1.423. S041006 (LLM)

3.1.424. Item fit:

Graph 3.74.1.1

Item S041006 ICC and nonparametric trace lines

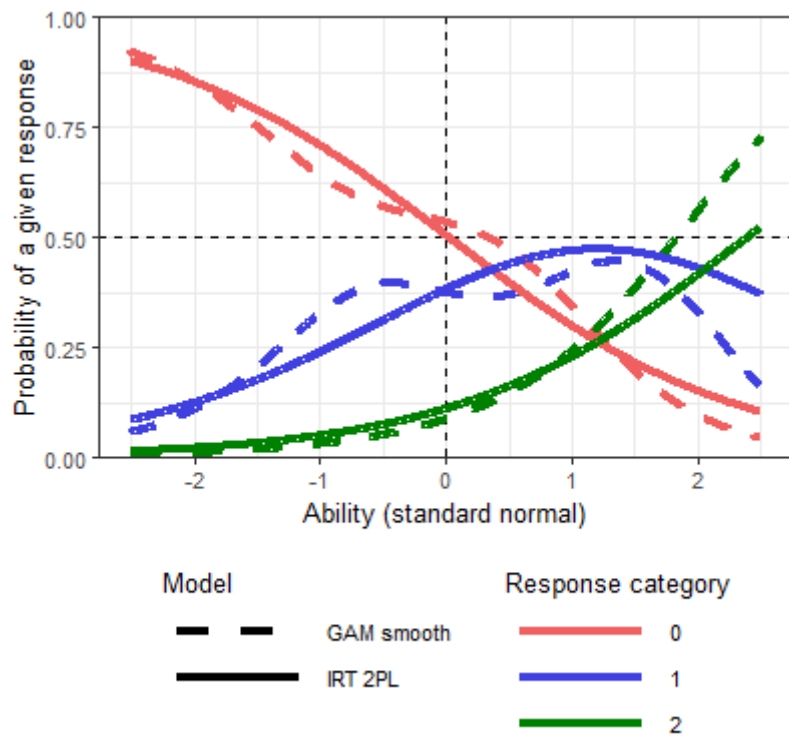


Table 3.74.1.1

Item S041006 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic					
Max. points	Easiness	Number of obs.	Format	thetaPV SAll	thetaPVSTI MSS	Discrimination	Difficulty	Category 1 difficulty	Category 2 difficulty	RMS EA	RMS EA p-value
2	30.9 %	305	CR	0.4211956	0.3953533	0.87	1.21	0.03	2.39	0.012	0.275

3.1.425. Gender DIF:

Table 3.74.2.1

Item S041006 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.49	0.288	1.000	0.007	

3.1.426. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.427. Answering time:

Graph 3.74.4.1

Item S041006 answering time distribution in groups of different ability level

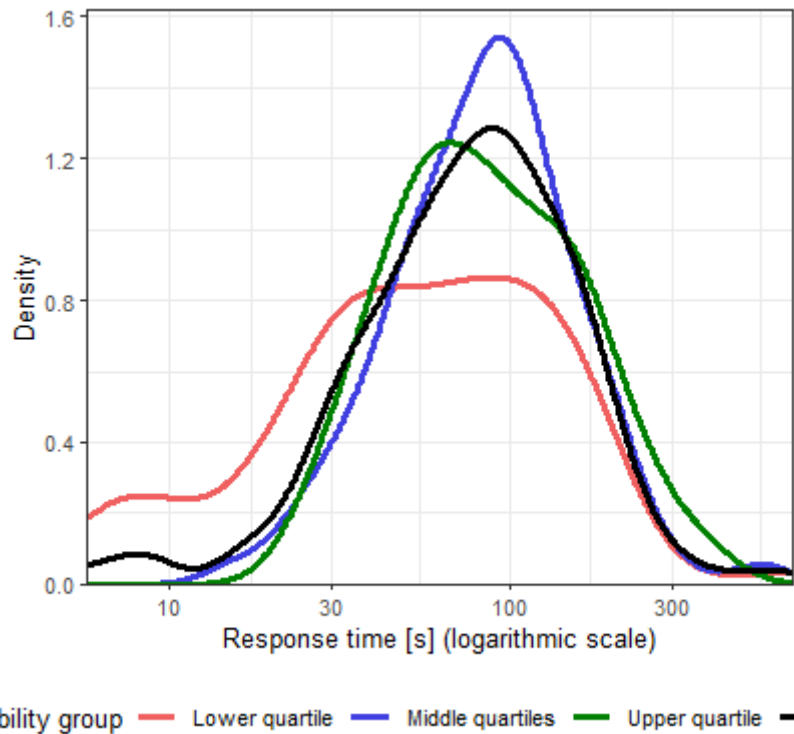


Table 3.74.4.1

Item S041006 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.74	29.77	55.98	108.88	680.80	3.94	0.97
Middle quartiles	15.01	54.62	88.07	122.50	591.01	4.42	0.62
Upper quartile	25.20	53.70	86.04	138.77	387.49	4.45	0.64
Overall	5.74	48.95	78.67	123.46	680.80	4.31	0.76

3.1.428. S041043 (TIMSS)

3.1.429. Item fit:

Graph 3.75.1.1

Item S041043 ICC and nonparametric trace line

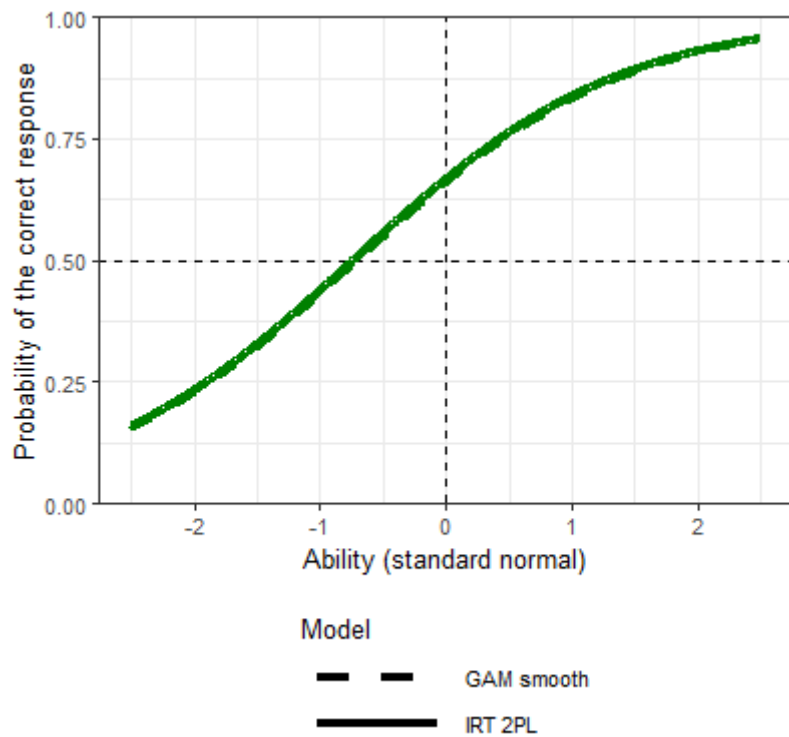


Table 3.75.1.1

Item S041043 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	65.1%	299	CR	0.368509 8	0.340371	0.94	-0.74	0.006	0.398

3.1.430. Gender DIF:

Table 3.75.2.1

Item S041043 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
2.17	0.337	1.000	0.006	

3.1.431. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.432. Answering time:

Graph 3.75.4.1

Item S041043 answering time distribution in groups of different ability level

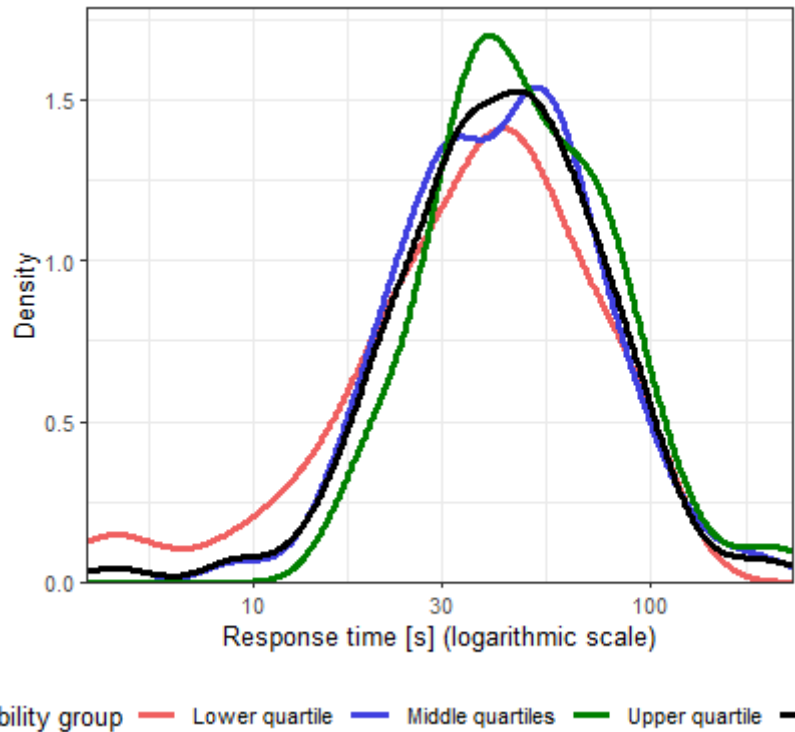


Table 3.75.4.1

Item S041043 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.86	23.55	38.06	55.30	104.12	3.54	0.72
Middle quartiles	8.77	28.65	43.97	60.64	210.62	3.74	0.56
Upper quartile	17.18	33.97	45.76	69.41	226.63	3.87	0.52
Overall	3.86	28.66	42.94	63.28	226.63	3.73	0.60

3.1.433. S090001 (TIMSS)

3.1.434. Item fit:

Graph 3.76.1.1

Item S090001 ICC and nonparametric trace line

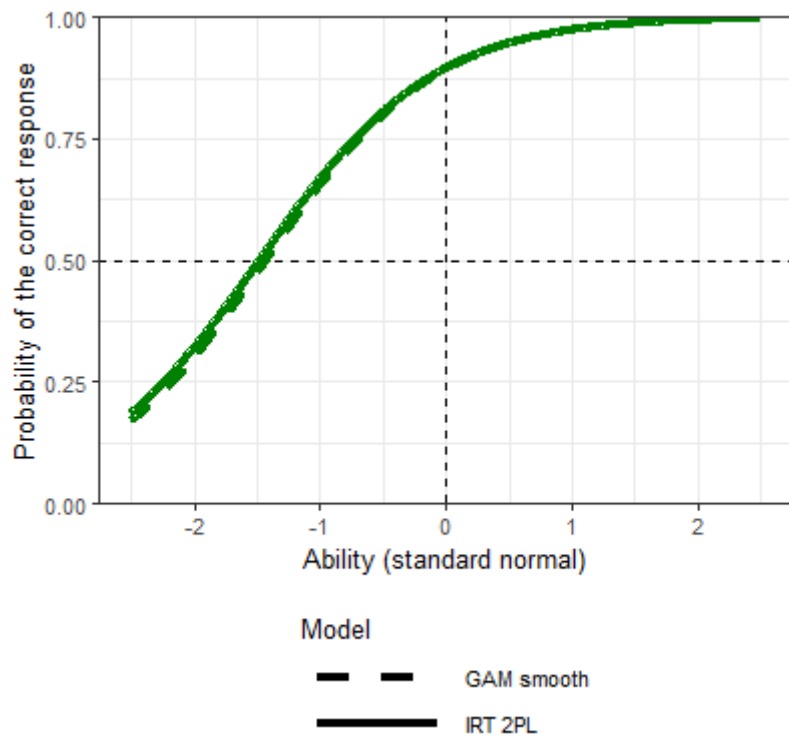


Table 3.76.1.1

Item S090001 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	83.6%	299	CR	0.429841 4	0.2814579	1.45	-1.49	0.000	0.588

3.1.435. Gender DIF:

Table 3.76.2.1

Item S090001 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.04	0.978	1.000	0.000	

3.1.436. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.437. Answering time:

Graph 3.76.4.1

Item S090001 answering time distribution in groups of different ability level

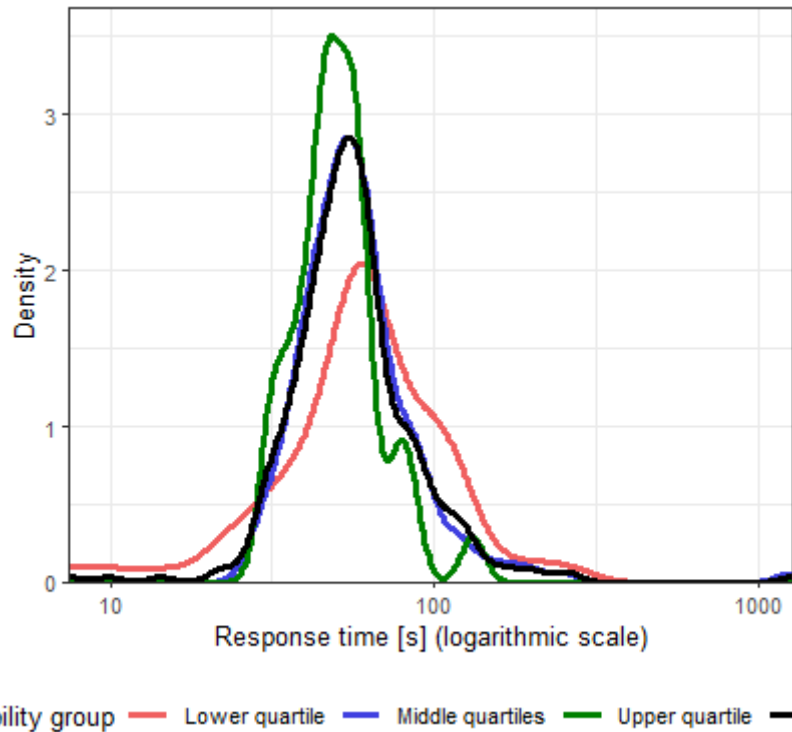


Table 3.76.4.1

Item S090001 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	7.49	45.47	61.23	84.75	265.93	4.07	0.61
Middle quartiles	27.98	44.27	54.34	67.54	1279.18	4.06	0.45
Upper quartile	29.93	42.51	48.77	57.27	133.10	3.92	0.30
Overall	7.49	43.69	54.10	66.59	1279.18	4.03	0.47

3.1.438. S100024 (TIMSS)

3.1.439. Item fit:

Graph 3.77.1.1

Item S100024 ICC and nonparametric trace line

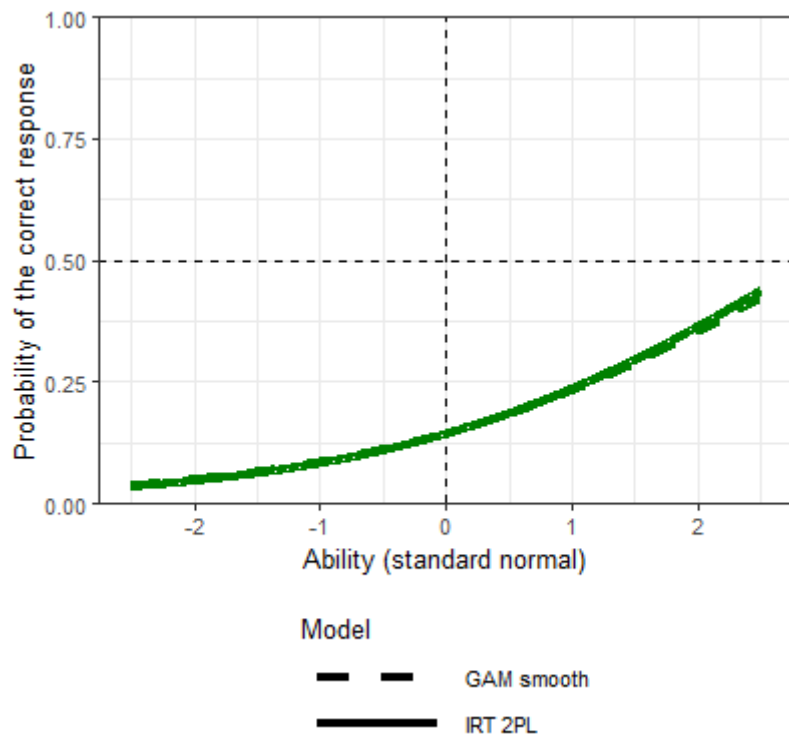


Table 3.77.1.1

Item S100024 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	15.8%	305	CR	0.214900 6	0.1702422	0.61	2.91	0.000	0.547

3.1.440. Gender DIF:

Table 3.77.2.1

Item S100024 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
5.70	0.058	1.000	0.023	

3.1.441. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.442. Answering time:

Graph 3.77.4.1

Item S100024 answering time distribution in groups of different ability level

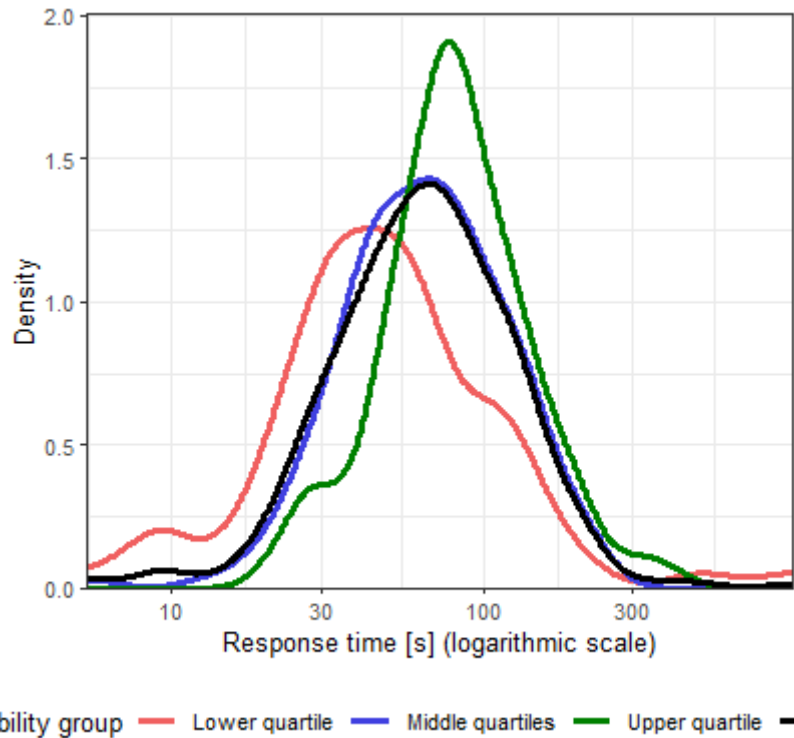


Table 3.77.4.1

Item S100024 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.40	29.54	46.64	68.68	968.70	3.87	0.86
Middle quartiles	5.59	43.36	64.77	98.25	235.49	4.16	0.60
Upper quartile	21.68	58.97	79.28	112.72	375.13	4.39	0.54
Overall	5.40	42.33	64.77	99.13	968.70	4.14	0.68

3.1.443. S061060 (LLM)

3.1.444. Item fit:

Graph 3.78.1.1

Item S061060 ICC and nonparametric trace line

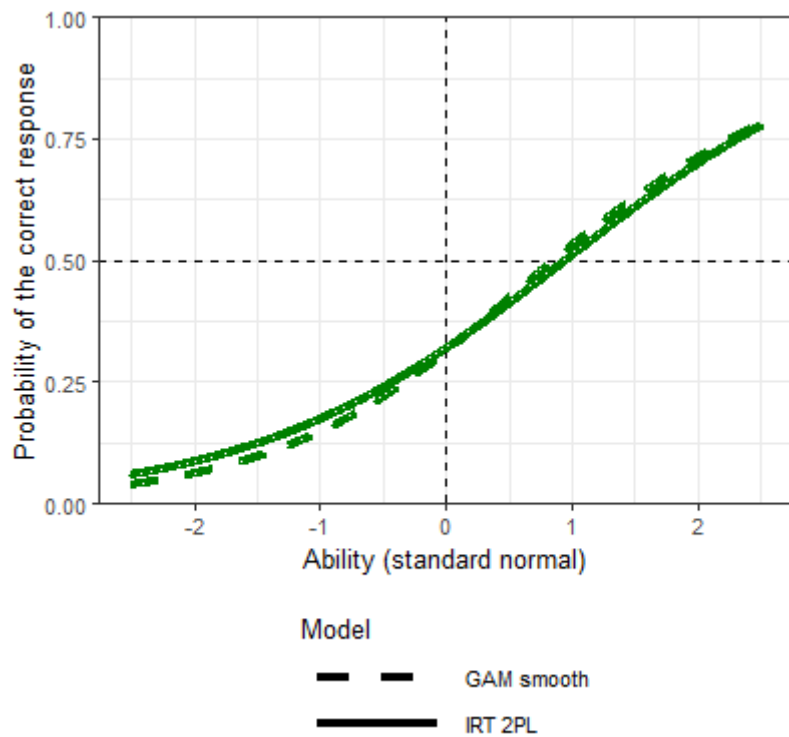


Table 3.78.1.1

Item S061060 parameters and fit statistics

Max. points	Ease	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	34.6%	299	CR	0.3617748	0.3491972	0.80	0.94	0.014	0.280

3.1.445. Gender DIF:

Table 3.78.2.1

Item S061060 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.42	0.492	1.000	0.004	

3.1.446. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.447. Answering time:

Graph 3.78.4.1

Item S061060 answering time distribution in groups of different ability level

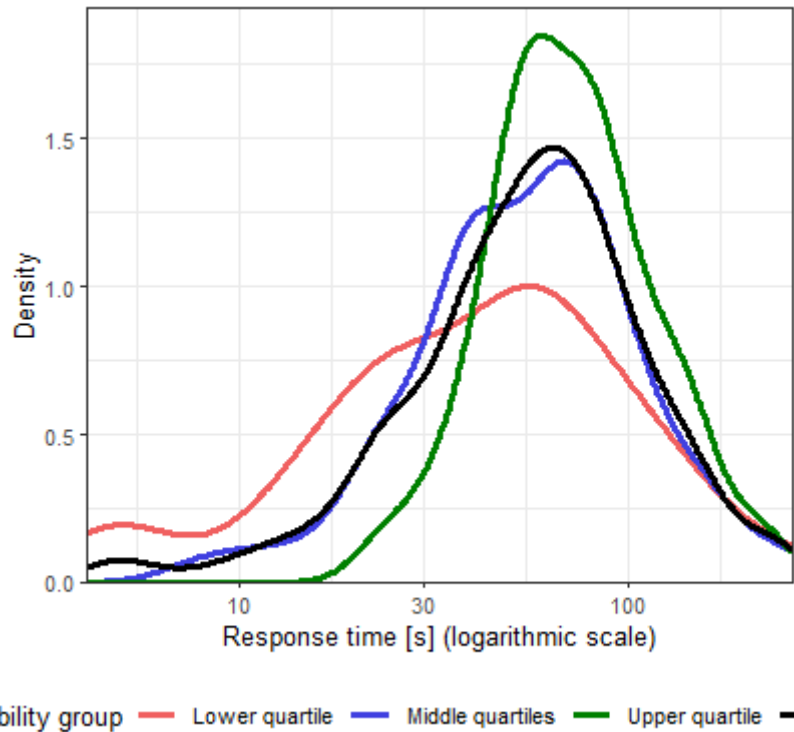


Table 3.78.4.1

Item S061060 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.08	22.42	45.24	71.84	259.51	3.68	0.93
Middle quartiles	6.97	36.92	57.84	82.94	265.55	3.99	0.67
Upper quartile	23.41	52.05	71.26	97.72	231.55	4.26	0.48
Overall	4.08	37.26	58.09	85.06	265.55	3.99	0.73

3.1.448. S051147 (LLM)

3.1.449. Item fit:

Graph 3.79.1.1

Item S051147 ICC and nonparametric trace line

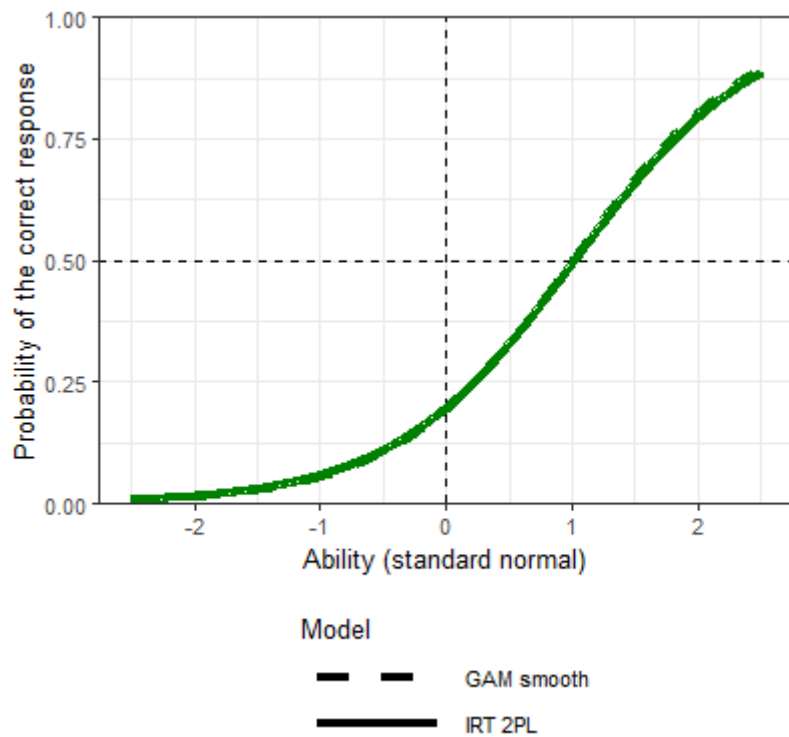


Table 3.79.1.1

Item S051147 parameters and fit statistics

Max. points	Ease	Number of obs.	Format	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	27.2%	294	CR	0.4628659	0.4938495	1.37	1.02	0.026	0.066

3.1.450. Gender DIF:

Table 3.79.2.1

Item S051147 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
4.29	0.117	1.000		0.014

3.1.451. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.452. Answering time:

Graph 3.79.4.1

Item S051147 answering time distribution in groups of different ability level

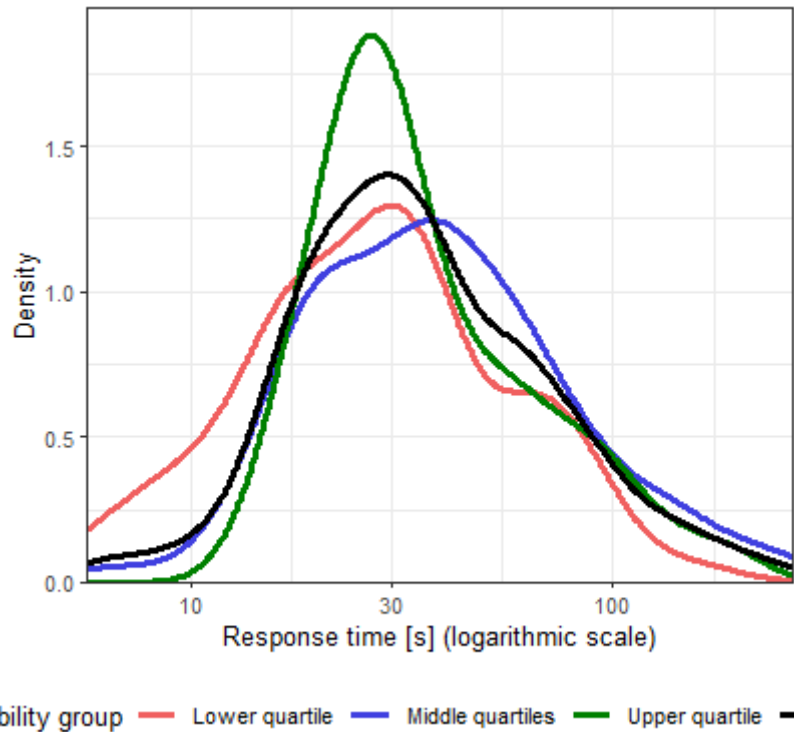


Table 3.79.4.1

Item S051147 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.68	16.56	29.00	38.95	157.05	3.31	0.72
Middle quartiles	5.92	21.72	37.91	58.29	266.41	3.65	0.71
Upper quartile	14.68	23.76	29.67	51.61	186.54	3.58	0.59
Overall	5.68	21.49	32.34	56.85	266.41	3.56	0.69

3.1.453. S061031 (LLM)

3.1.454. Item fit:

Graph 3.80.1.1

Item S061031 ICC and nonparametric trace line

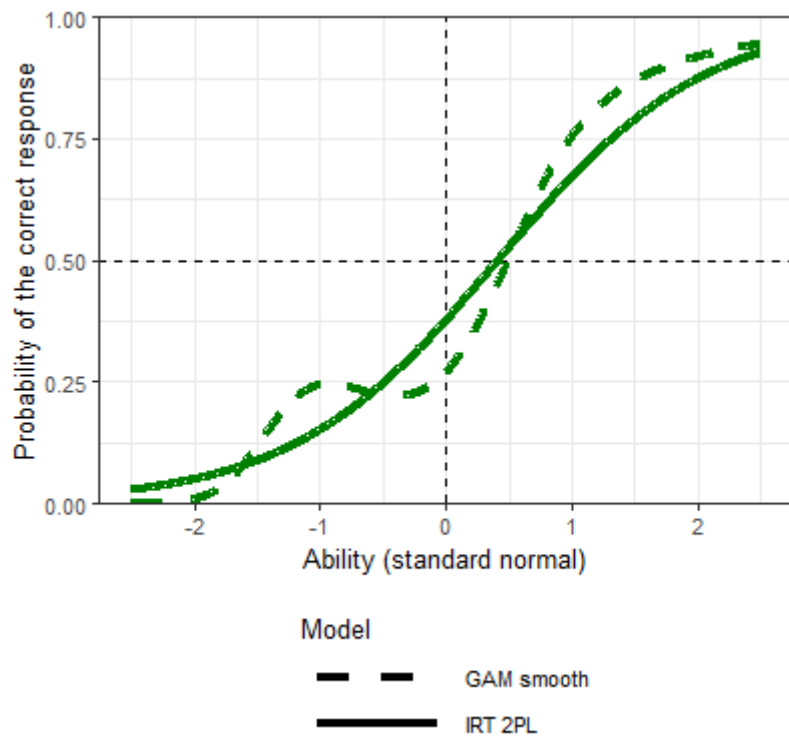


Table 3.80.1.1

Item S061031 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic				
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value	
1	41.8%	294	CR	0.483132 1	0.500173	1.22	0.41	0.028	0.050	

3.1.455. Gender DIF:

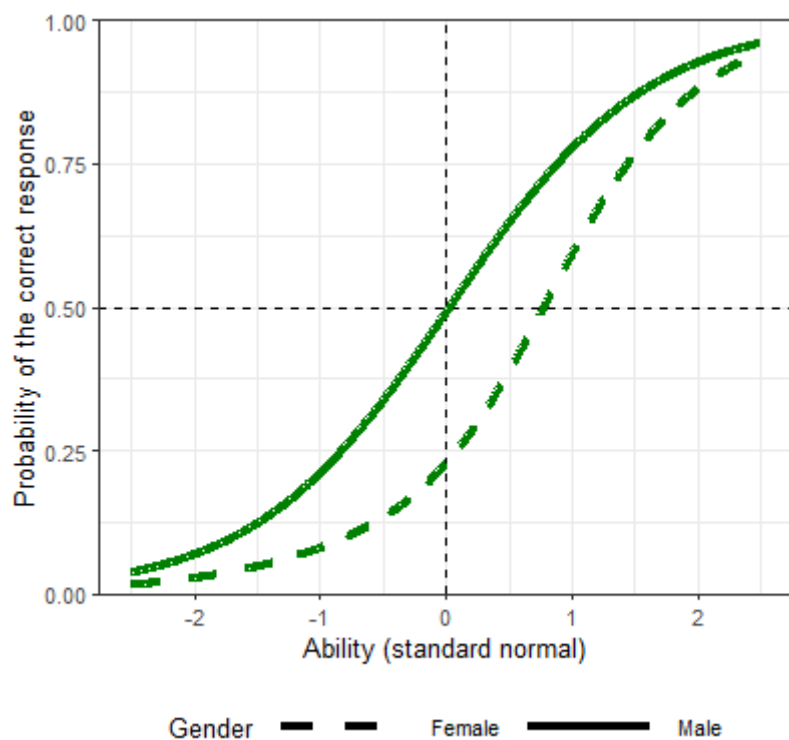
Table 3.80.2.1

Item S061031 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
17.06	0.000	0.018	0.049	moderate

Graph 3.80.2.1

Item S061031 gender-specific ICCs



3.1.456. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.457. Answering time:

Graph 3.80.4.1

Item S061031 answering time distribution in groups of different ability level

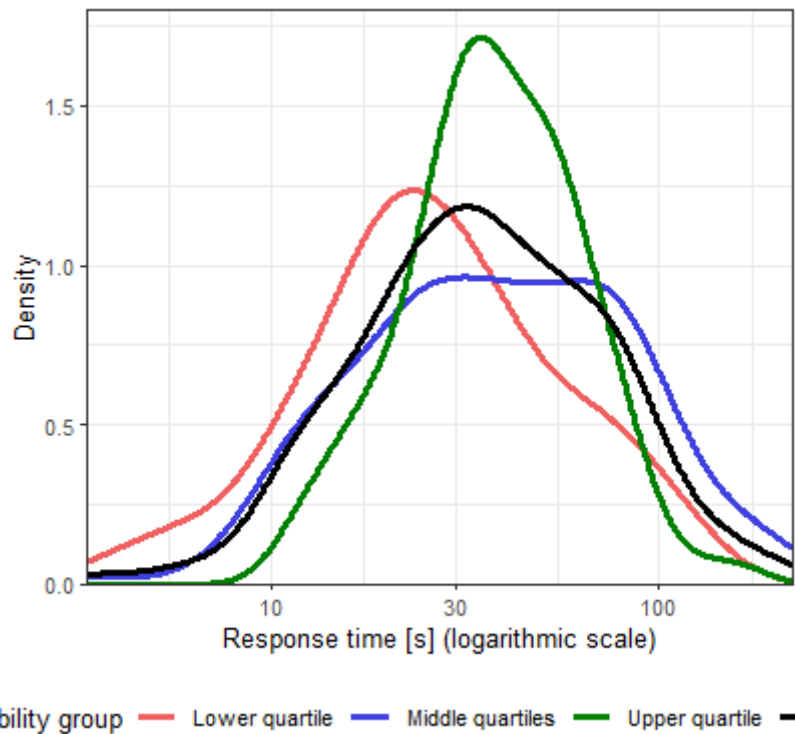


Table 3.80.4.1

Item S061031 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.80	16.80	24.98	44.18	126.80	3.26	0.76
Middle quartiles	3.37	21.54	37.92	71.81	220.64	3.63	0.79
Upper quartile	11.68	27.48	37.08	53.97	155.55	3.62	0.52
Overall	3.37	21.51	33.92	59.28	220.64	3.55	0.73

3.1.458. S890004 (LLM)

3.1.459. Item fit:

Graph 3.81.1.1

Item S890004 ICC and nonparametric trace line

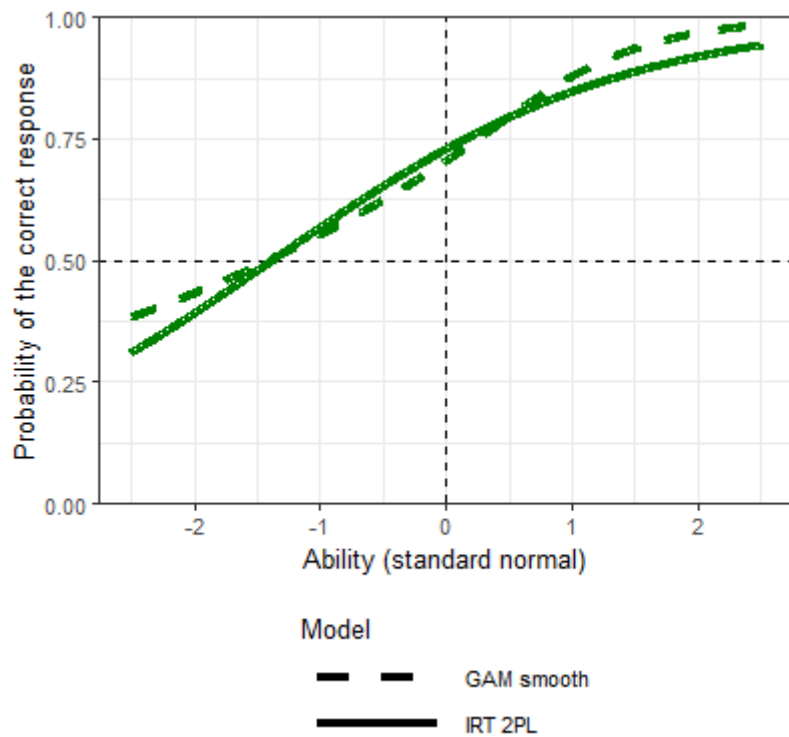


Table 3.81.1.1

Item S890004 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	70.7%	281	CR	0.328129 9	0.1702016	0.71	-1.38	0.010	0.339

3.1.460. Gender DIF:

Table 3.81.2.1

Item S890004 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.31	0.858	1.000	0.001	

3.1.461. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.462. Answering time:

Graph 3.81.4.1

Item S890004 answering time distribution in groups of different ability level

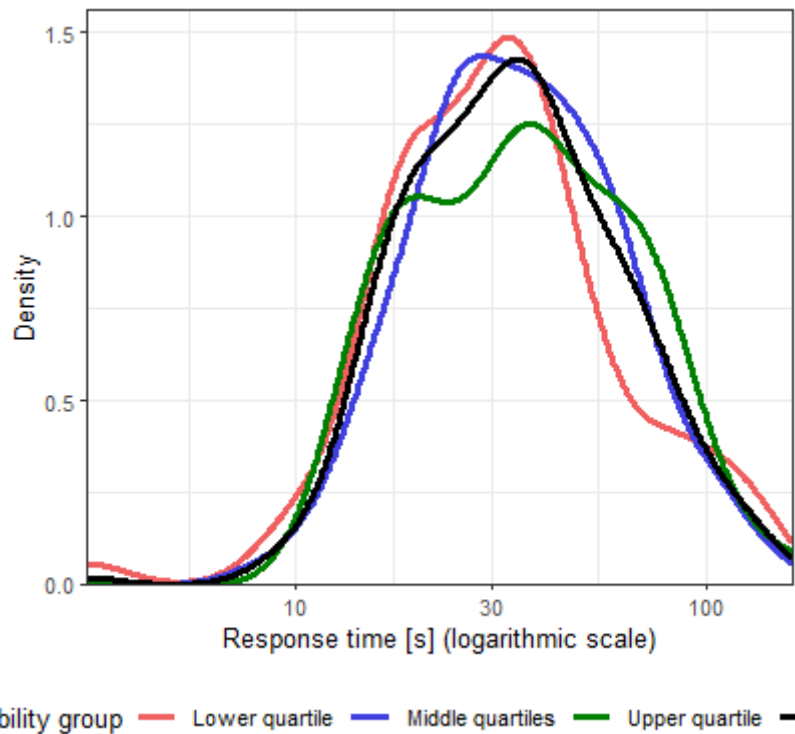


Table 3.81.4.1

Item S890004 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.10	19.61	30.28	42.90	133.61	3.44	0.67
Middle quartiles	8.16	23.51	33.40	53.47	147.38	3.55	0.57
Upper quartile	12.57	20.59	36.11	59.20	162.66	3.57	0.61
Overall	3.10	21.34	33.50	51.38	162.66	3.53	0.61

3.1.463. S890009 (LLM)

3.1.464. Item fit:

Graph 3.82.1.1

Item S890009 ICC and nonparametric trace line

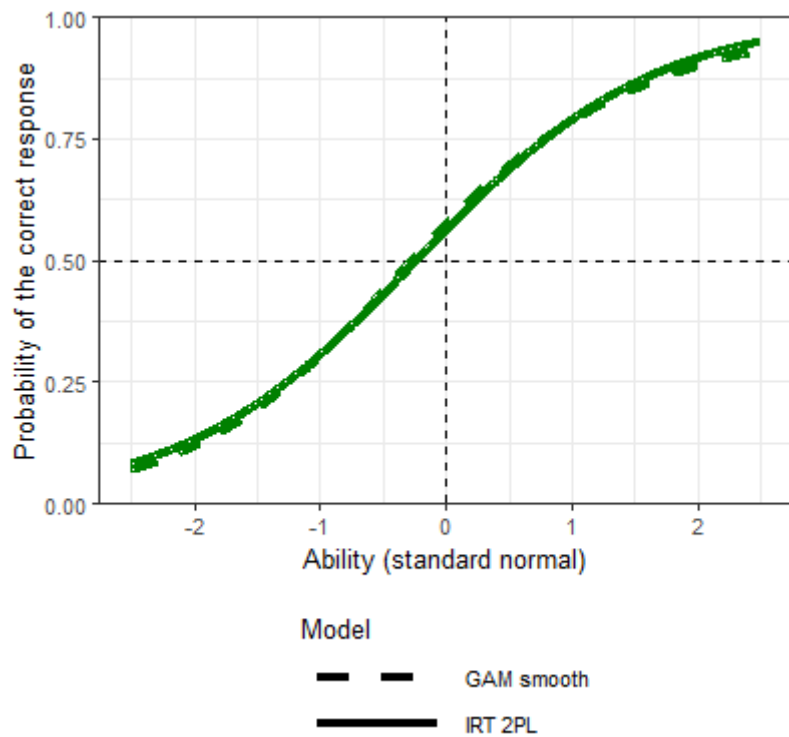


Table 3.82.1.1

Item S890009 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	55.0%	281	CR	0.443271 5	0.3492879	1.07	-0.24	0.000	0.495

3.1.465. Gender DIF:

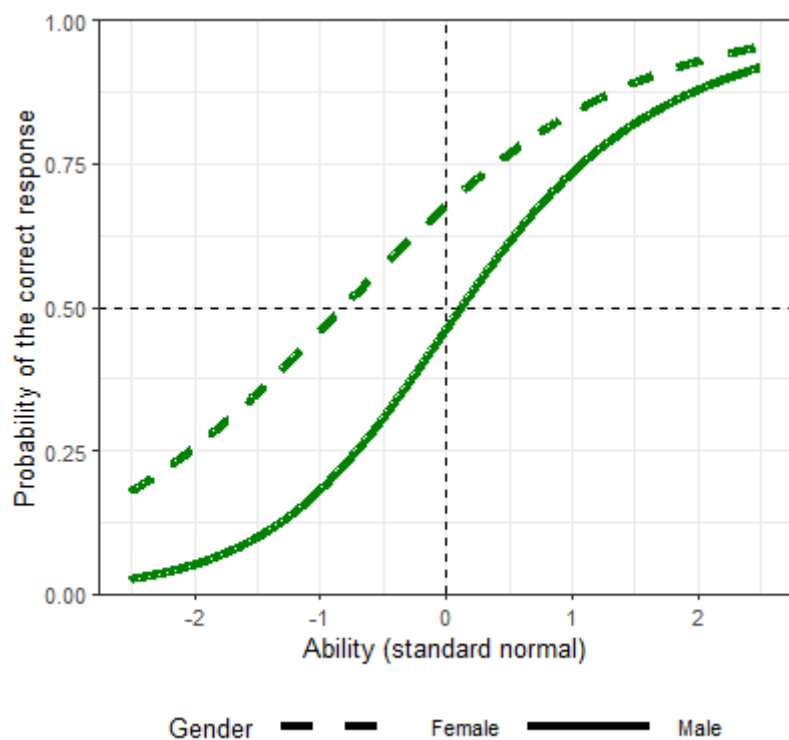
Table 3.82.2.1

Item S890009 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
19.69	0.000	0.005	0.058	moderate

Graph 3.82.2.1

Item S890009 gender-specific ICCs



3.1.466. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.467. Answering time:

Graph 3.82.4.1

Item S890009 answering time distribution in groups of different ability level

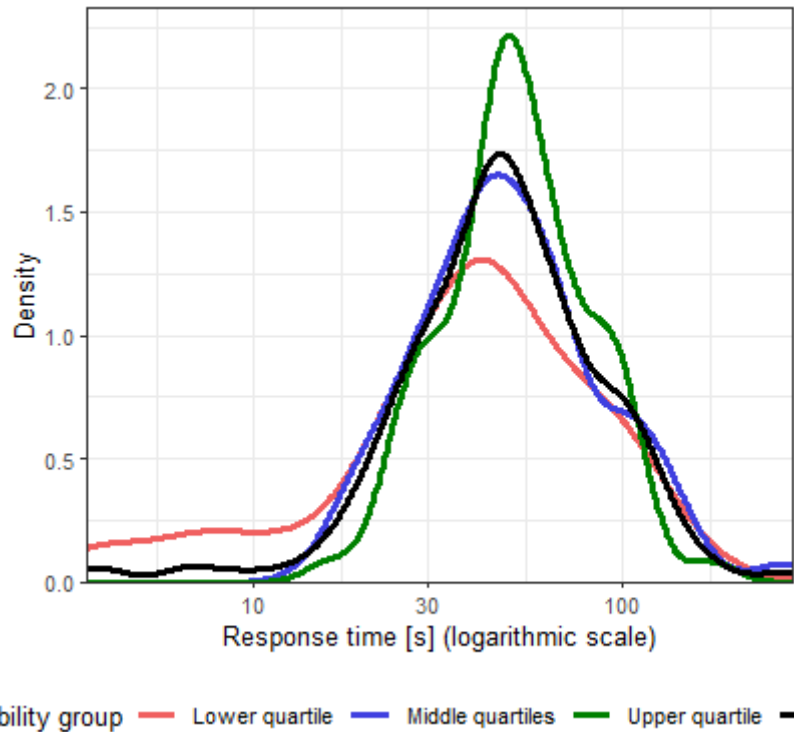


Table 3.82.4.1

Item S890009 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.57	25.74	41.39	68.56	178.74	3.62	0.85
Middle quartiles	14.70	33.90	48.83	68.70	290.57	3.91	0.57
Upper quartile	16.24	39.68	49.62	67.91	175.64	3.95	0.45
Overall	3.57	32.62	47.68	68.61	290.57	3.84	0.64

3.1.468. S100023 (LLM)

3.1.469. Item fit:

Graph 3.83.1.1

Item S100023 ICC and nonparametric trace line

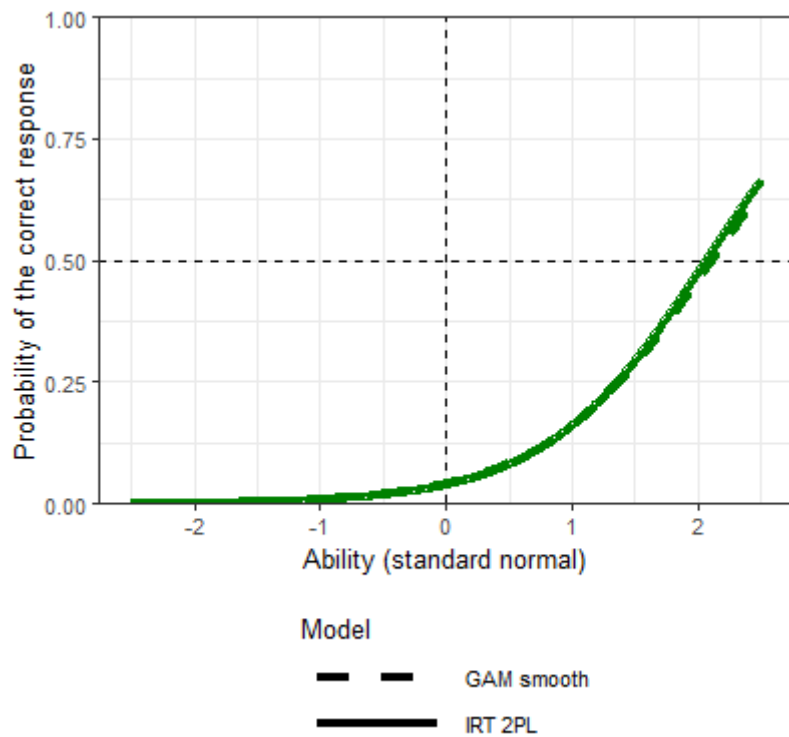


Table 3.83.1.1

Item S100023 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	8.5%	319	CR	0.325578 2	0.2216659	1.55	2.06	0.000	0.495

3.1.470. Gender DIF:

Table 3.83.2.1

Item S100023 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.11	0.949	1.000	0.001	

3.1.471. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.472. Answering time:

Graph 3.83.4.1

Item S100023 answering time distribution in groups of different ability level

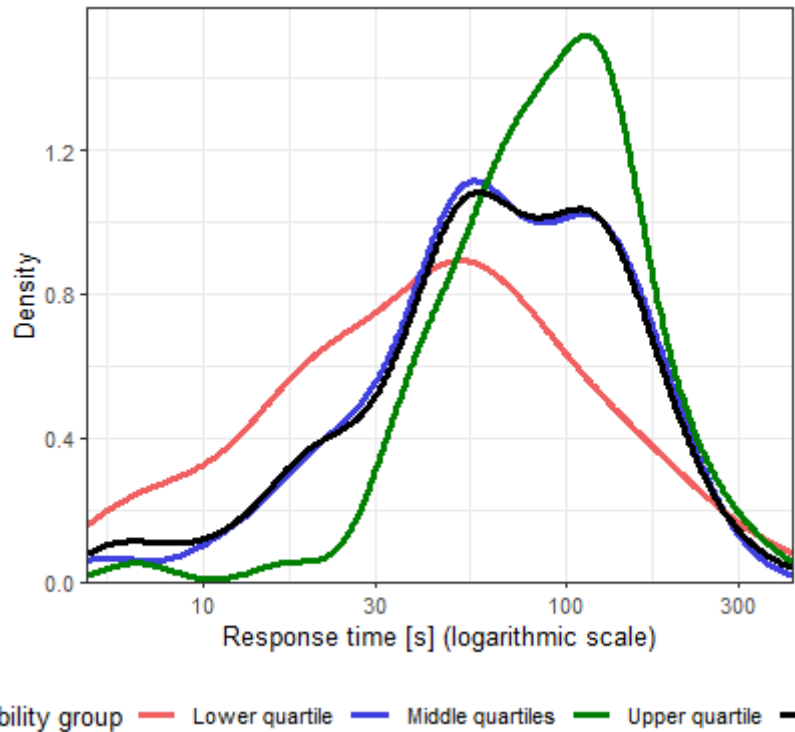


Table 3.83.4.1

Item S100023 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	4.84	22.05	46.86	84.29	421.83	3.75	1.00
Middle quartiles	5.08	41.75	66.77	121.09	297.67	4.15	0.81
Upper quartile	6.61	59.43	90.78	129.95	357.44	4.47	0.64
Overall	4.84	40.45	66.77	120.31	421.83	4.13	0.86

3.1.473. S051201 (TIMSS)

3.1.474. Item fit:

Graph 3.84.1.1

Item S051201 ICC and nonparametric trace line

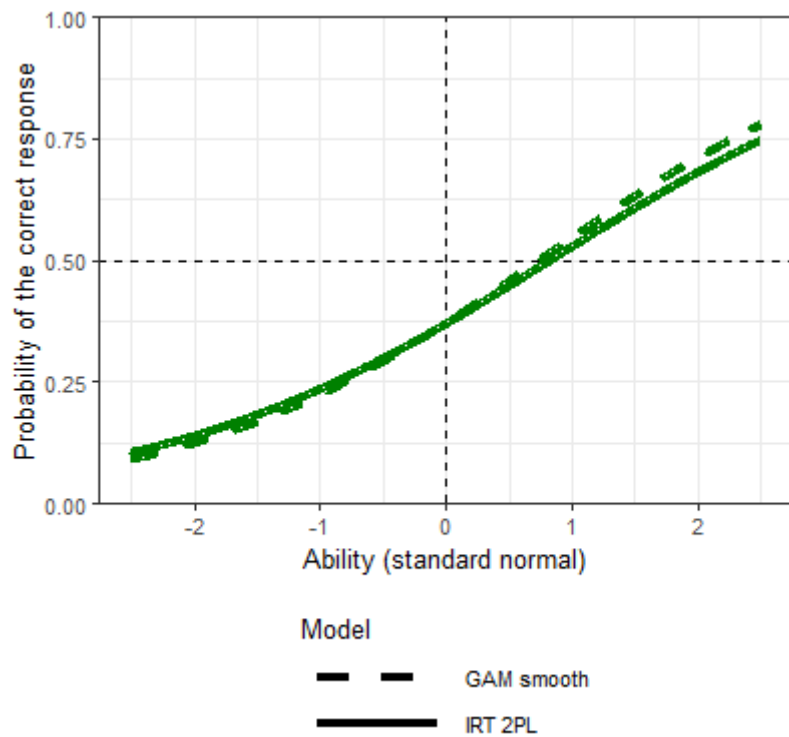


Table 3.84.1.1

Item S051201 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVS TIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	37.4%	306	CR	0.313522 2	0.323168	0.65	0.82	0.036	0.010

3.1.475. Gender DIF:

Table 3.84.2.1

Item S051201 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.04	0.981	1.000	0.000	

3.1.476. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.477. Answering time:

Graph 3.84.4.1

Item S051201 answering time distribution in groups of different ability level

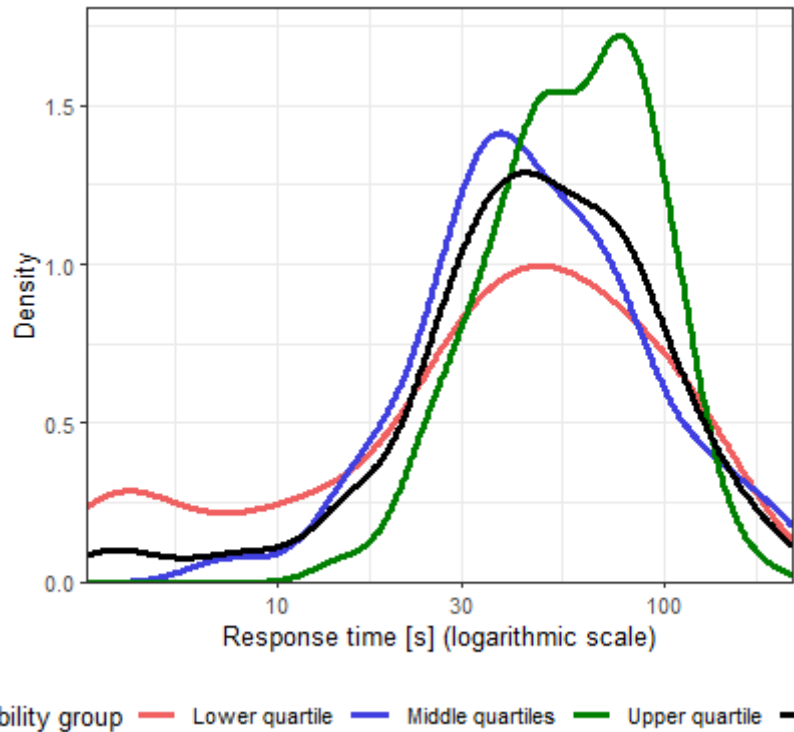


Table 3.84.4.1

Item S051201 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.24	22.90	42.26	71.94	177.24	3.54	1.04
Middle quartiles	6.77	30.45	44.15	70.80	214.61	3.83	0.68
Upper quartile	15.09	42.56	58.22	82.44	161.86	4.05	0.48
Overall	3.24	31.02	46.61	76.08	214.61	3.80	0.78

3.1.478. SP61011 (LLM)

3.1.479. Item fit:

Graph 3.85.1.1

Item SP61011 ICC and nonparametric trace line

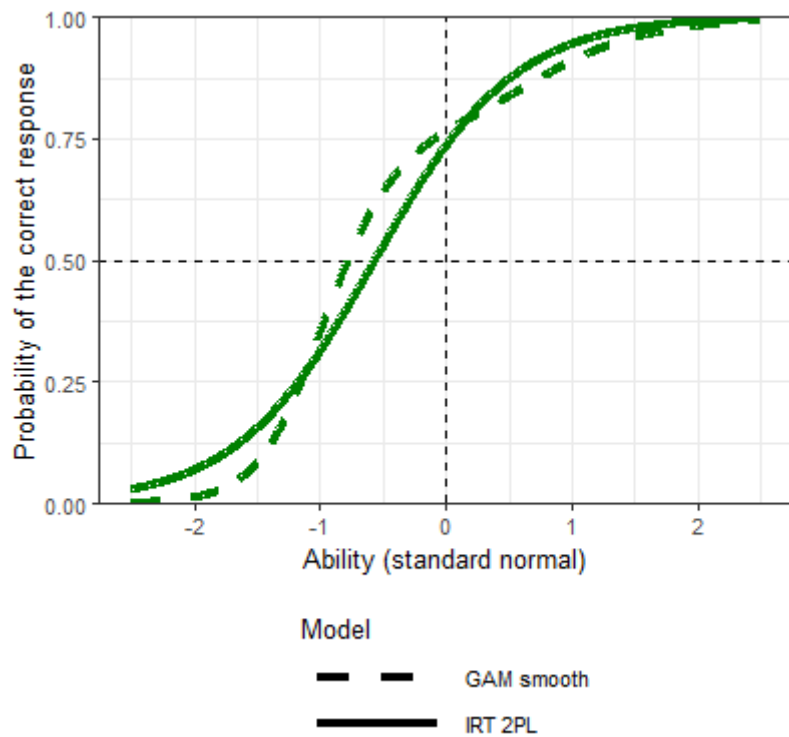


Table 3.85.1.1

Item SP61011 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	64.9%	306	CR	0.568325 3	0.6350046	1.81	-0.57	0.028	0.054

3.1.480. Gender DIF:

Table 3.85.2.1

Item SP61011 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
7.47	0.024	1.000	0.021	

3.1.481. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.482. Answering time:

Graph 3.85.4.1

Item SP61011 answering time distribution in groups of different ability level

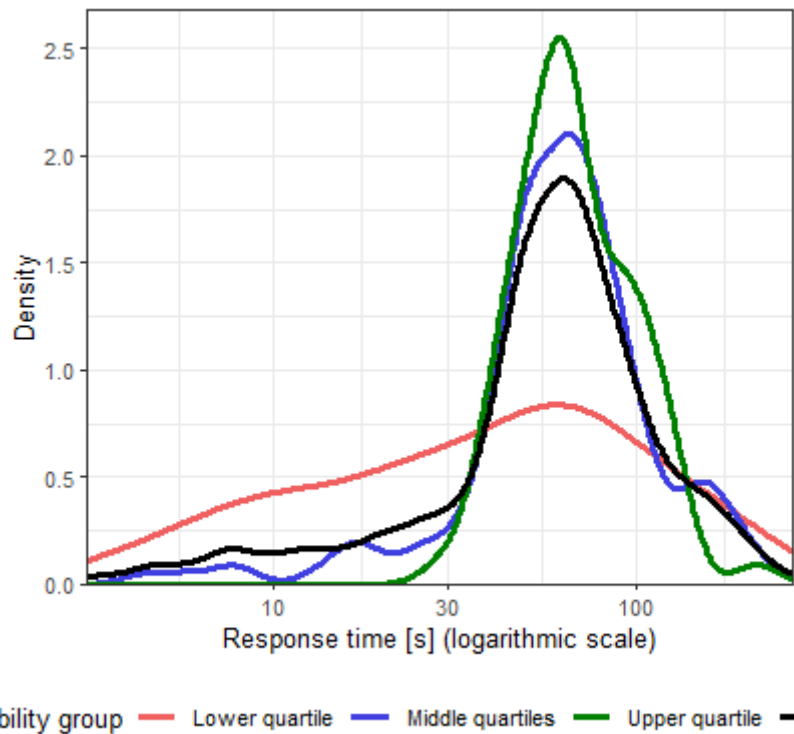


Table 3.85.4.1

Item SP61011 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.06	17.57	44.92	74.51	267.83	3.58	1.07
Middle quartiles	4.36	47.95	65.16	82.71	233.47	4.10	0.63
Upper quartile	29.14	51.59	63.82	88.59	214.71	4.21	0.37
Overall	3.06	43.67	61.07	83.75	267.83	3.98	0.78

3.1.483. S051164 (TIMSS)

3.1.484. Item fit:

Graph 3.86.1.1

Item S051164 ICC and nonparametric trace line

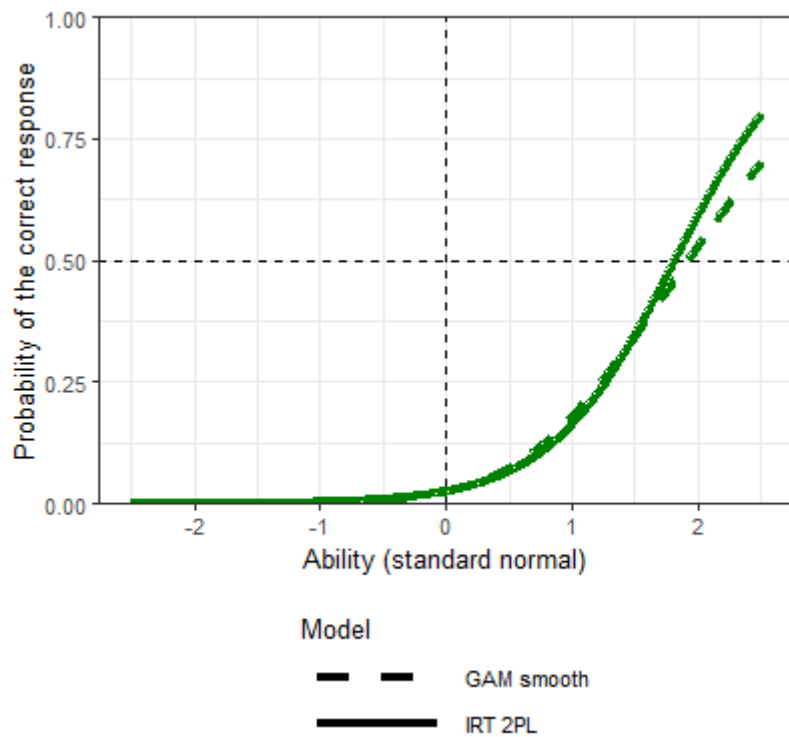


Table 3.86.1.1

Item S051164 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic				
Max. points	Easiness	Number of obs.	Format	thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value	
1	7.9%	306	CR	0.3646573	0.3148433	2.00	1.81	0.019	0.182	

3.1.485. Gender DIF:

Table 3.86.2.1

Item S051164 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.24	0.887	1.000		0.002

3.1.486. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.487. Answering time:

Graph 3.86.4.1

Item S051164 answering time distribution in groups of different ability level

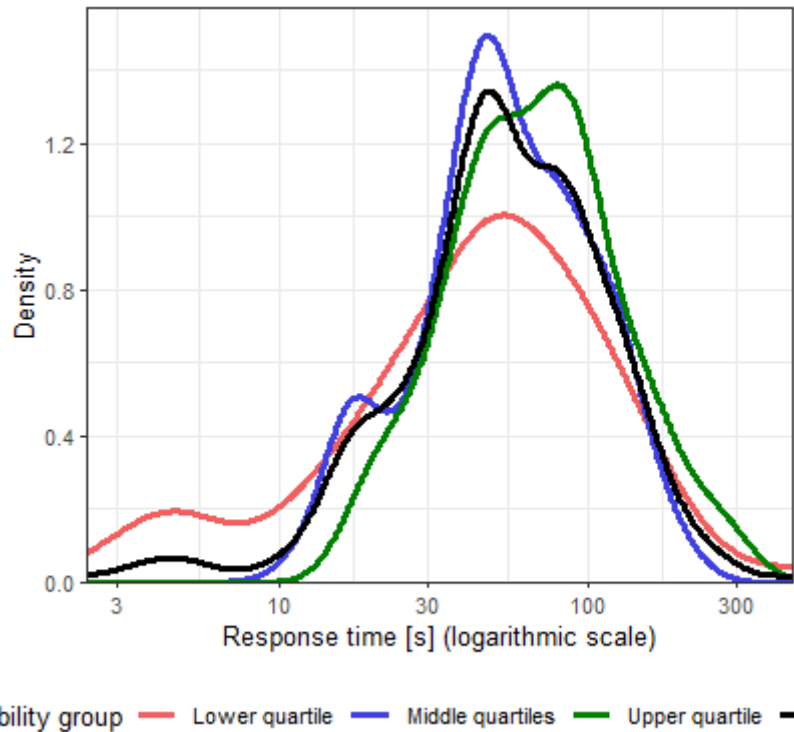


Table 3.86.4.1

Item S051164 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.40	25.25	47.38	80.66	456.25	3.71	1.04
Middle quartiles	10.98	36.97	50.87	82.60	209.79	3.97	0.64
Upper quartile	18.80	43.99	68.66	96.83	297.03	4.20	0.63
Overall	2.40	35.56	52.61	87.38	456.25	3.95	0.79

3.1.488. S890005 (TIMSS)

3.1.489. Item fit:

Graph 3.87.1.1

Item S890005 ICC and nonparametric trace line

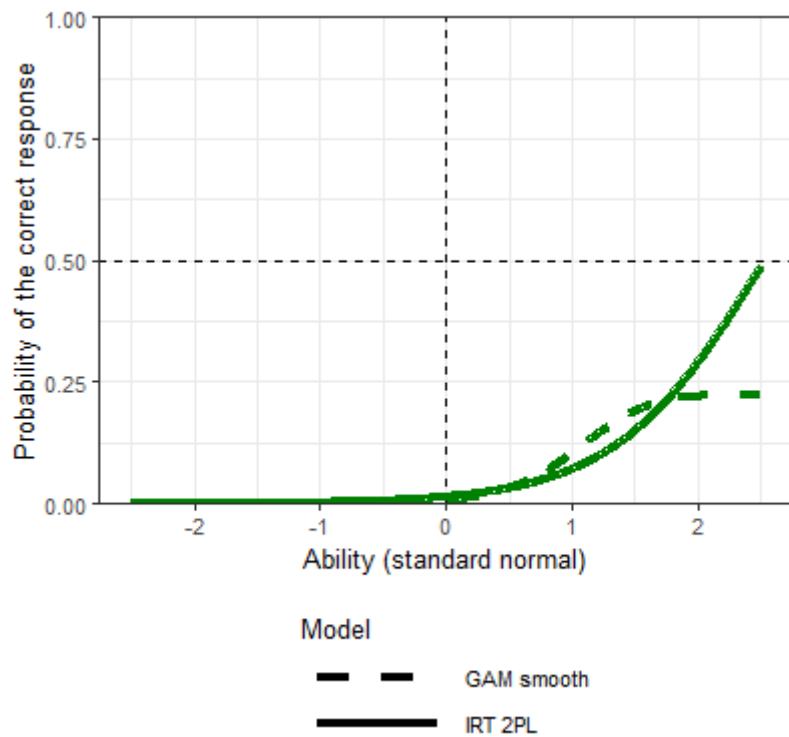


Table 3.87.1.1

Item S890005 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic			
Max. points	Easiness	Number of obs.	Format	thetaPVS All	thetaPVSTIM SS	Discrimination	Difficulty	RMSEA	RMSEA p-value
1	4.1%	319	CR	0.2597447	0.156234	1.67	2.53	0.017	0.223

3.1.490. Gender DIF:

Table 3.87.2.1

Item S890005 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.42	0.810	1.000	0.004	

3.1.491. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.492. Answering time:

Graph 3.87.4.1

Item S890005 answering time distribution in groups of different ability level

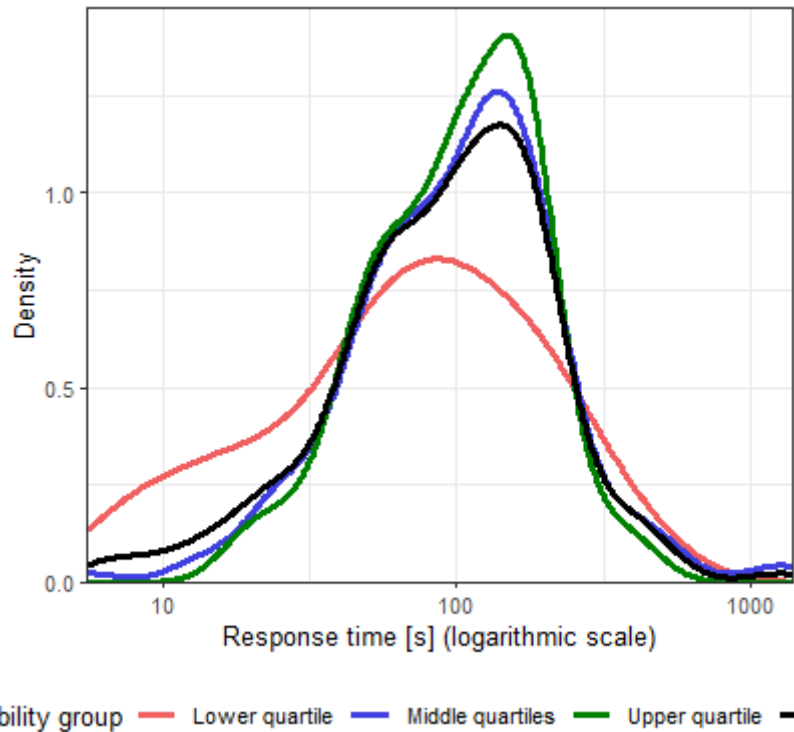


Table 3.87.4.1

Item S890005 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	6.20	34.92	77.18	142.11	503.45	4.19	1.07
Middle quartiles	5.58	60.76	109.34	163.37	1381.22	4.60	0.81
Upper quartile	18.69	63.07	105.25	160.80	407.01	4.59	0.65
Overall	5.58	54.16	100.34	161.49	1381.22	4.50	0.86

3.1.493. S890006 (TIMSS)

3.1.494. Item fit:

Graph 3.88.1.1

Item S890006 ICC and nonparametric trace lines

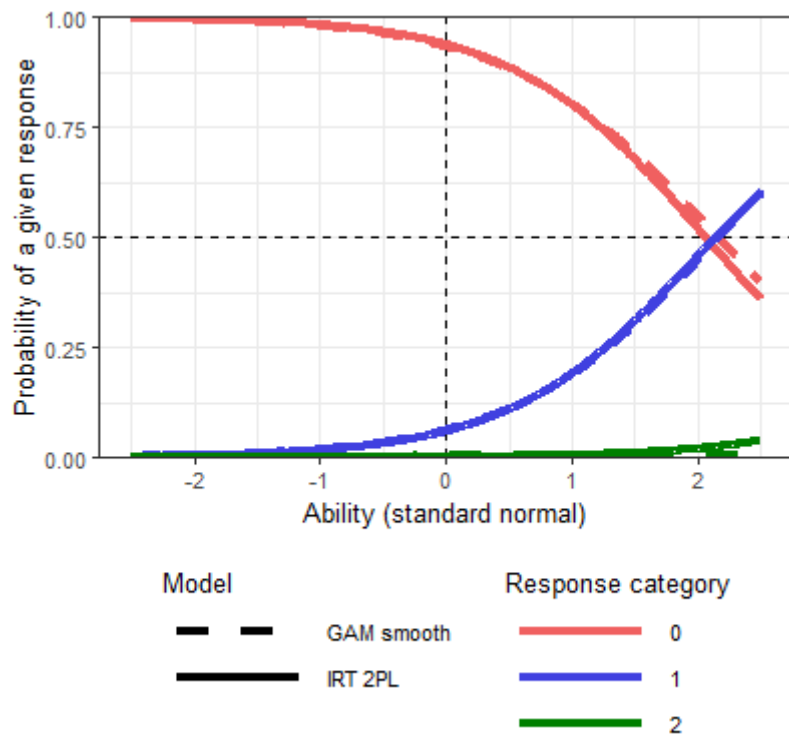


Table 3.88.1.1

Item S890006 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic					
Max. points	Easiness	Number of obs.	Format	thetaPV SAll	thetaPVSTI MSS	Discrimination	Difficulty	Category 1 difficulty	Category 2 difficulty	RMS EA	RMS EA p-value
2	5.5%	281	CR	0.3073011	0.2407057	1.32	3.50	2.06	4.93	0.021	0.069

3.1.495. Gender DIF:

Table 3.88.2.1

Item S890006 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
1.75	0.417	1.000	0.010	

3.1.496. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.497. Answering time:

Graph 3.88.4.1

Item S890006 answering time distribution in groups of different ability level

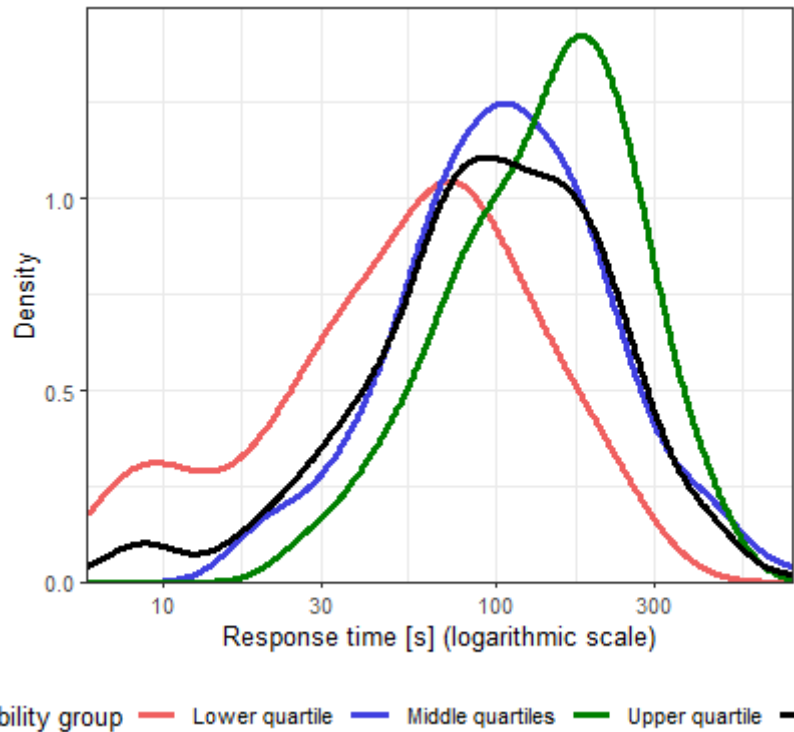


Table 3.88.4.1

Item S890006 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.98	30.65	64.39	100.57	247.79	3.95	0.93
Middle quartiles	18.38	66.91	108.02	169.23	774.97	4.66	0.73
Upper quartile	27.11	91.60	153.73	213.53	456.02	4.92	0.63
Overall	5.98	60.54	102.73	169.72	774.97	4.54	0.85

3.1.498. S041183 (TIMSS)

3.1.499. Item fit:

Graph 3.89.1.1

Item S041183 ICC and nonparametric trace lines

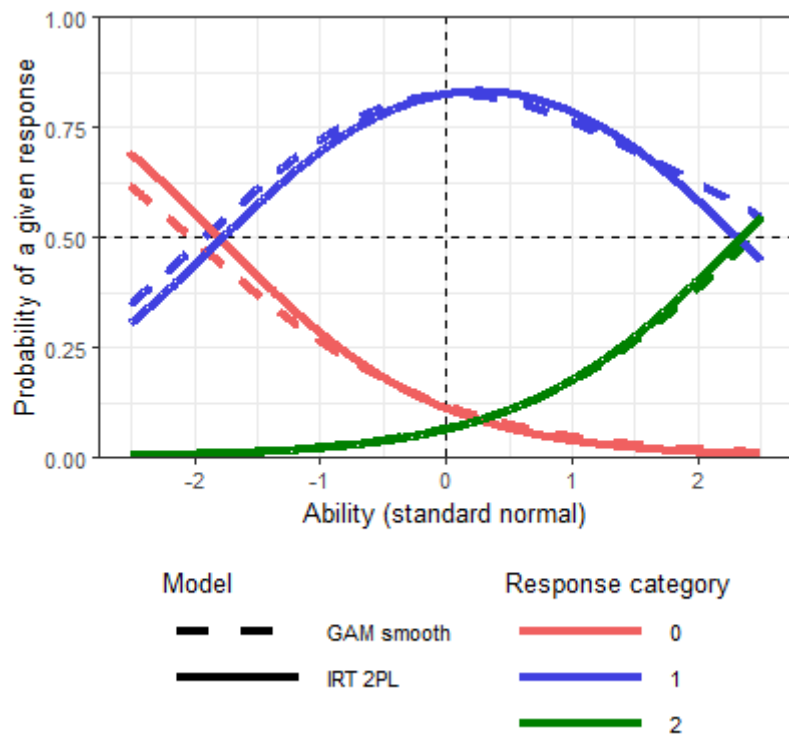


Table 3.89.1.1

Item S041183 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic					
Max. points	Easiness	Number of obs.	Format	thetaPV SAll	thetaPVSTI MSS	Discrimination	Difficulty	Category 1 difficulty	Category 2 difficulty	RMS EA	RMS EA p-value
2	46.4 %	306	CR	0.4046495	0.4385982	1.15	0.27	-1.80	2.34	0.016	0.186

3.1.500. Gender DIF:

Table 3.89.2.1

Item S041183 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
7.93	0.019	1.000	0.032	

3.1.501. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.502. Answering time:

Graph 3.89.4.1

Item S041183 answering time distribution in groups of different ability level

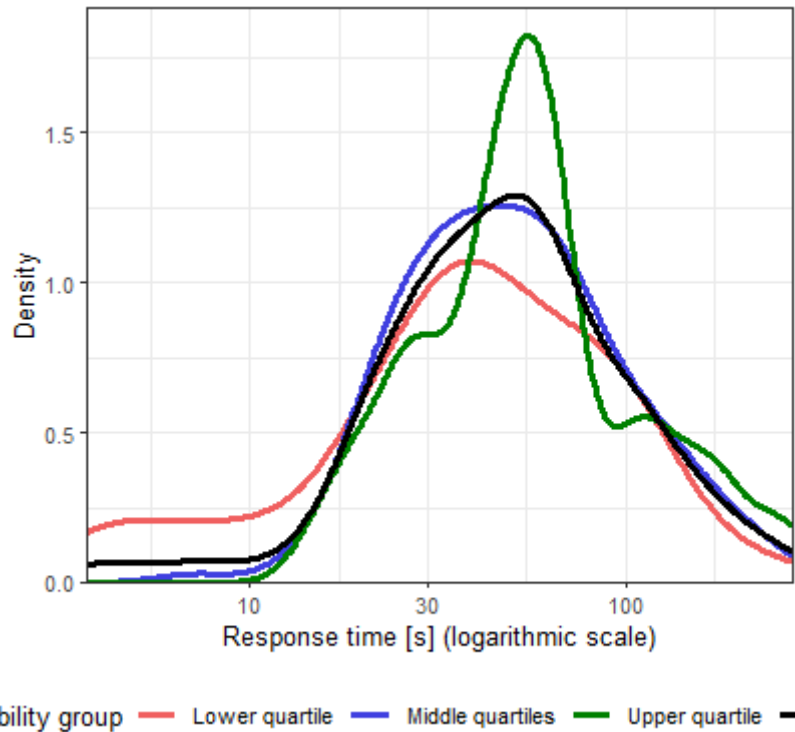


Table 3.89.4.1

Item S041183 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.72	23.27	38.95	73.44	278.21	3.62	0.93
Middle quartiles	7.17	31.11	48.25	77.22	266.46	3.91	0.66
Upper quartile	14.77	38.31	54.75	70.12	277.83	4.01	0.67
Overall	3.72	29.53	48.28	75.74	278.21	3.85	0.76

3.1.503. SP61044 (LLM)

3.1.504. Item fit:

Graph 3.90.1.1

Item SP61044 ICC and nonparametric trace line

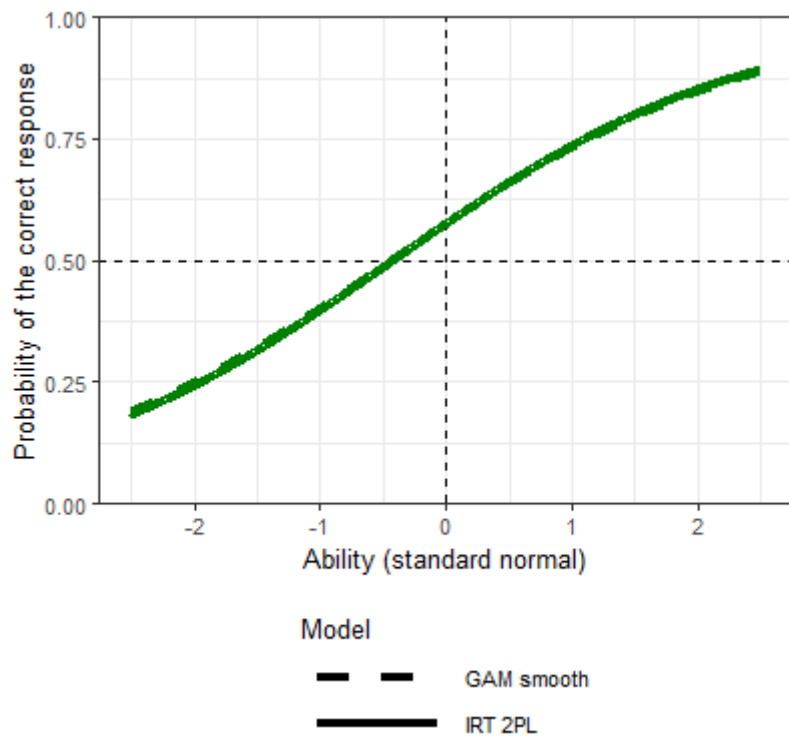


Table 3.90.1.1

Item SP61044 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	56.2%	305	CR	0.317281 3	0.3400766	0.72	-0.42	0.026	0.074

3.1.505. Gender DIF:

Table 3.90.2.1

Item SP61044 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.97	0.614	1.000		0.003

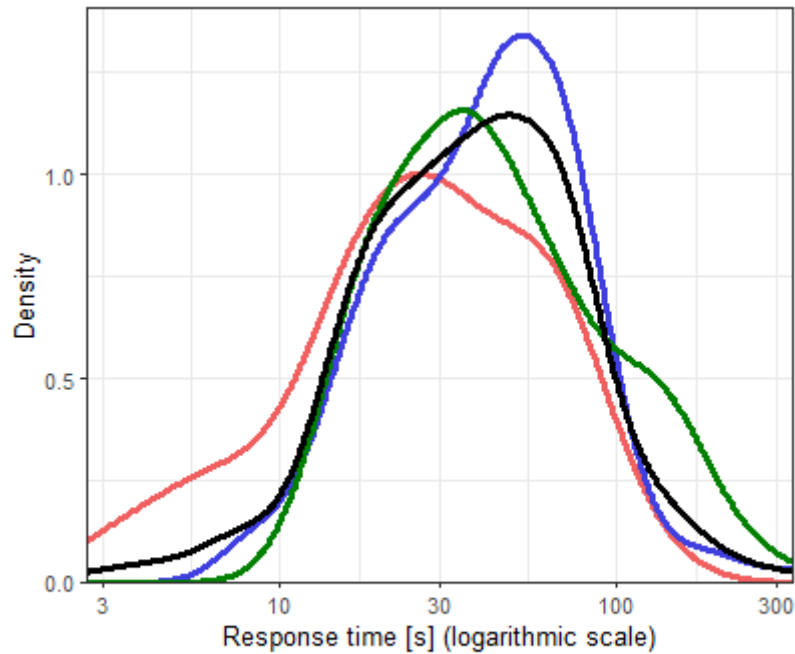
3.1.506. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.507. Answering time:

Graph 3.90.4.1

Item SP61044 answering time distribution in groups of different ability level



ability group — Lower quartile — Middle quartiles — Upper quartile —

Table 3.90.4.1

Item SP61044 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	2.71	15.90	28.96	49.87	133.53	3.25	0.87
Middle quartiles	7.46	24.80	43.64	64.34	333.93	3.69	0.67
Upper quartile	12.82	23.98	39.37	72.46	273.50	3.78	0.74
Overall	2.71	21.55	37.34	63.48	333.93	3.60	0.76

3.1.508. S100012 (TIMSS)

3.1.509. Item fit:

Graph 3.91.1.1

Item S100012 ICC and nonparametric trace line

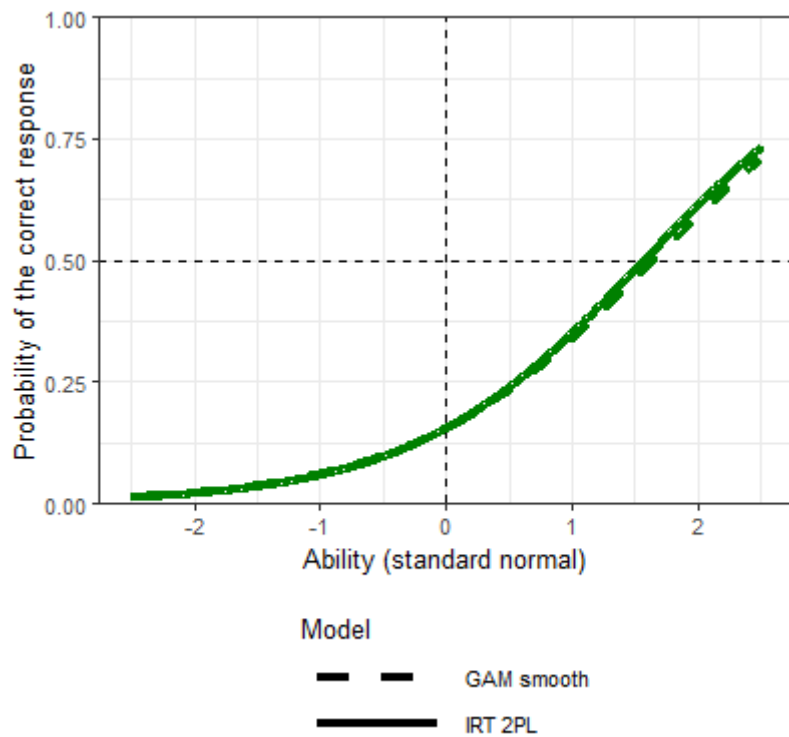


Table 3.91.1.1

Item S100012 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	20.1%	299	CR	0.344956 8	0.2299741	1.08	1.57	0.029	0.043

3.1.510. Gender DIF:

Table 3.91.2.1

Item S100012 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.52	0.770	1.000	0.002	

3.1.511. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.512. Answering time:

Graph 3.91.4.1

Item S100012 answering time distribution in groups of different ability level

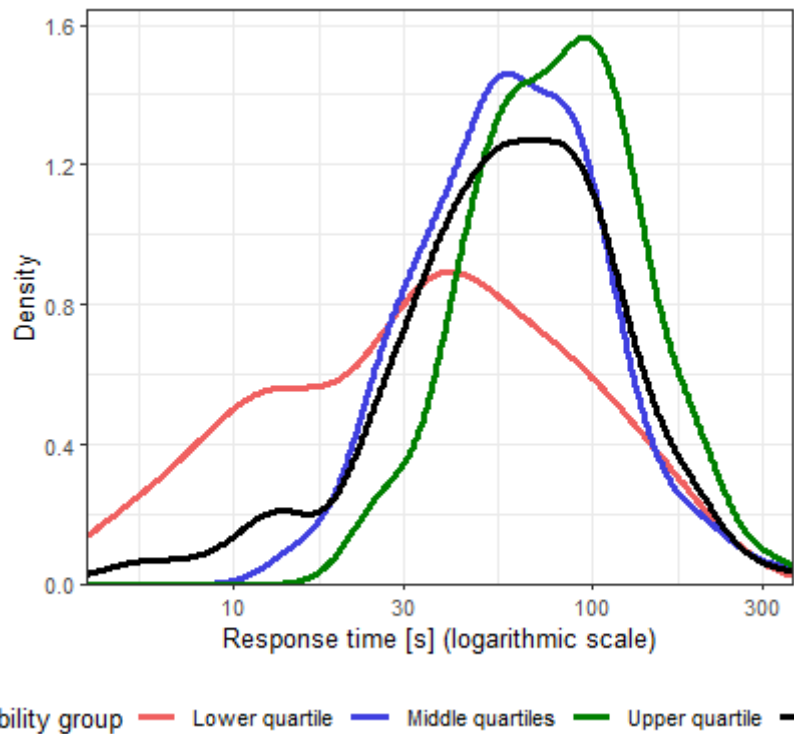


Table 3.91.4.1

Item S100012 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.93	14.33	36.81	71.16	190.37	3.51	0.97
Middle quartiles	14.42	39.14	58.69	89.48	361.52	4.09	0.59
Upper quartile	23.72	56.04	82.31	113.53	318.42	4.38	0.53
Overall	3.93	37.14	59.58	93.96	361.52	4.03	0.75

3.1.513. S041081 (TIMSS)

3.1.514. Item fit:

Graph 3.92.1.1

Item S041081 ICC and nonparametric trace lines

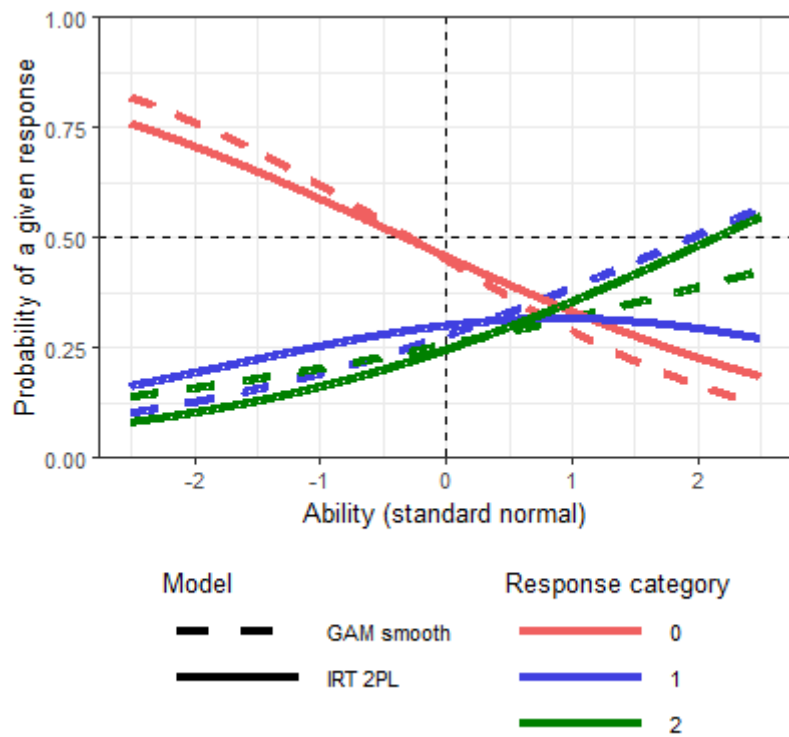


Table 3.92.1.1

Item S041081 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic					
Max. points	Easiness	Number of obs.	Format	thetaPV SAll	thetaPVSTI MSS	Discrimination	Difficulty	Category 1 difficulty	Category 2 difficulty	RMS EA	RMS EA p-value
2	39.9 %	305	CR	0.2635352	0.2924581	0.53	0.91	-0.33	2.15	0.027	0.017

3.1.515. Gender DIF:

Table 3.92.2.1

Item S041081 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
8.94	0.011	0.964	0.025	

3.1.516. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.517. Answering time:

Graph 3.92.4.1

Item S041081 answering time distribution in groups of different ability level

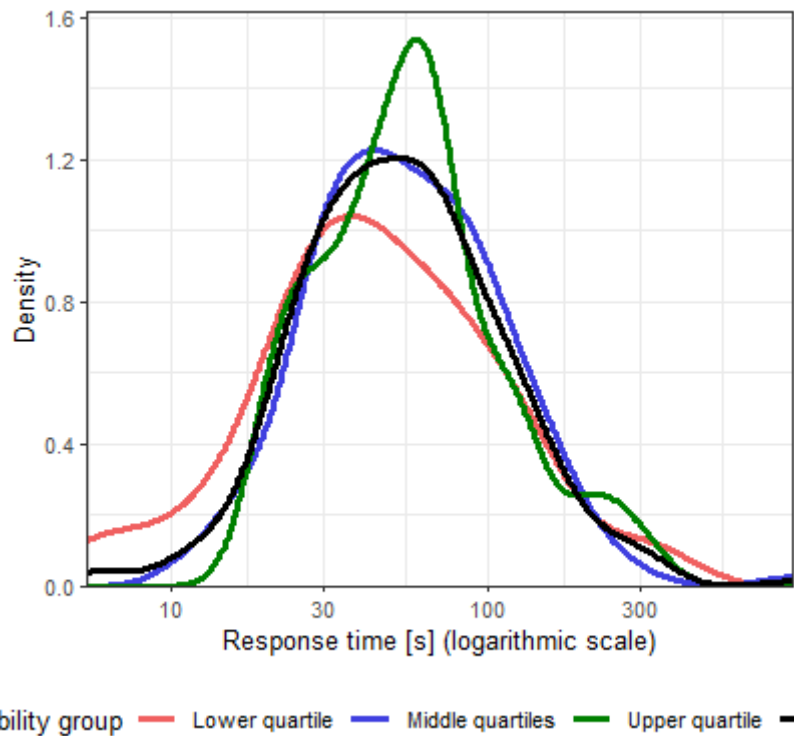


Table 3.92.4.1

Item S041081 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	5.46	26.46	42.60	81.73	362.20	3.80	0.88
Middle quartiles	10.73	33.43	54.04	88.52	903.01	4.01	0.69
Upper quartile	19.46	36.16	56.07	75.59	311.13	4.04	0.66
Overall	5.46	31.92	52.31	84.32	903.01	3.96	0.74

3.1.518. S890017 (LLM)

3.1.519. Item fit:

Graph 3.93.1.1

Item S890017 ICC and nonparametric trace lines

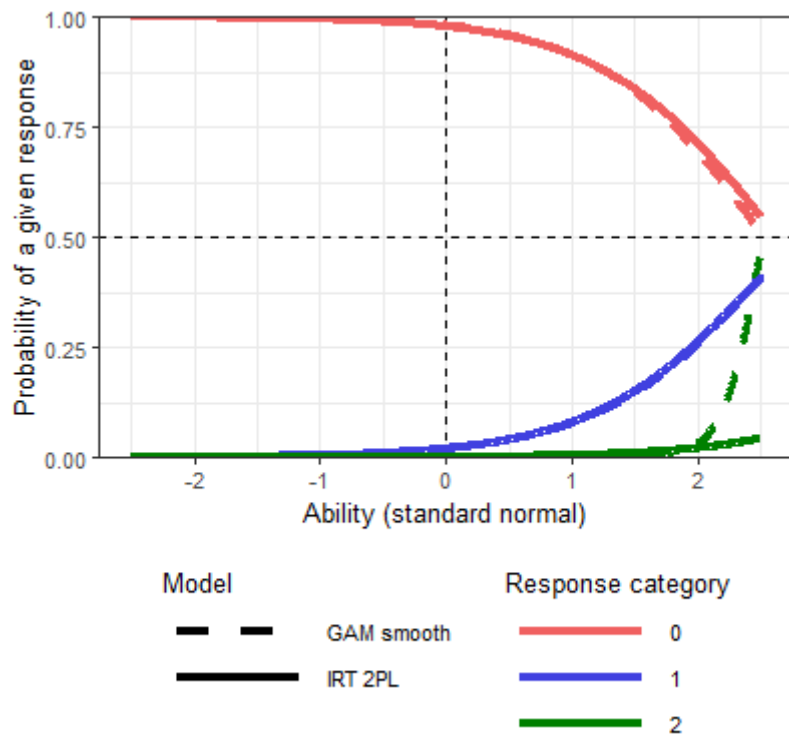


Table 3.93.1.1

Item S890017 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic					
Max. points	Easiness	Number of obs.	Format	thetaPV SAll	thetaPVSTI MSS	Discrimination	Difficulty	Category 1 difficulty	Category 2 difficulty	RMS EA	RMS EA p-value
2	2.5%	319	CR	0.2699056	0.1864684	1.45	3.63	2.63	4.62	0.000	0.505

3.1.520. Gender DIF:

Table 3.93.2.1

Item S890017 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
9.81	0.007	0.637	0.084	

3.1.521. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.522. Answering time:

Graph 3.93.4.1

Item S890017 answering time distribution in groups of different ability level

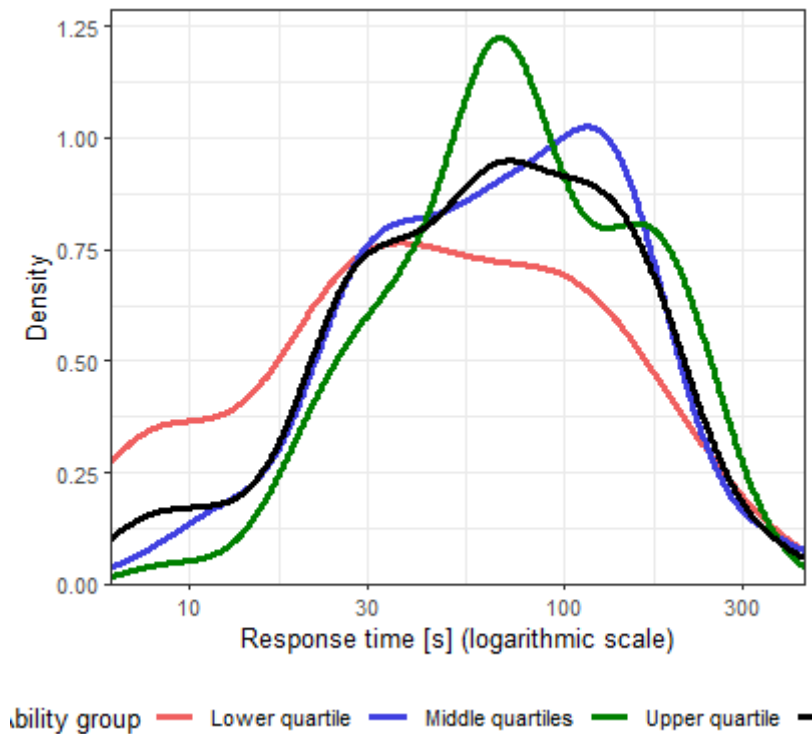


Table 3.93.4.1

Item S890017 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	6.21	23.89	44.79	103.28	383.98	3.79	1.03
Middle quartiles	7.30	33.56	70.83	126.91	438.06	4.18	0.82
Upper quartile	8.94	44.36	71.10	137.63	305.49	4.29	0.75
Overall	6.21	33.06	65.46	122.00	438.06	4.11	0.88

3.1.523. S041107 (LLM)

3.1.524. Item fit:

Graph 3.94.1.1

Item S041107 ICC and nonparametric trace lines

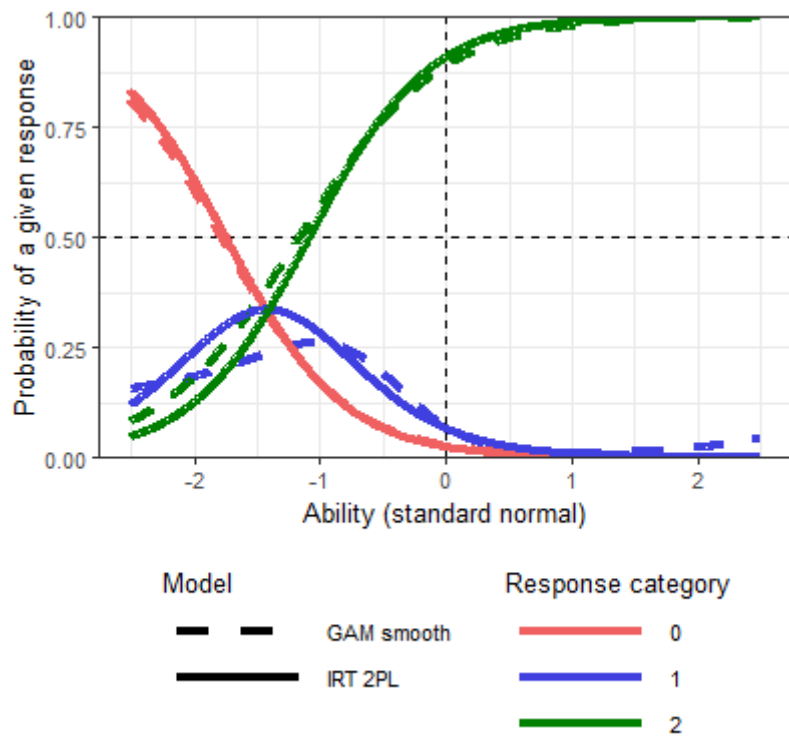


Table 3.94.1.1

Item S041107 parameters and fit statistics

				Corr. with latent ability estimates		IRT model parameters and fit statistic					
Max. points	Easiness	Number of obs.	Format	thetaPV SAll	thetaPVSTI MSS	Discrimination	Difficulty	Category 1 difficulty	Category 2 difficulty	RMS EA	RMS EA p-value
2	86.7 %	294	CR	0.5074901	0.5018653	2.12	-1.42	-1.75	-1.09	0.016	0.187

3.1.525. Gender DIF:

Table 3.94.2.1

Item S041107 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.77	0.680	1.000	0.003	

3.1.526. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.527. Answering time:

Graph 3.94.4.1

Item S041107 answering time distribution in groups of different ability level

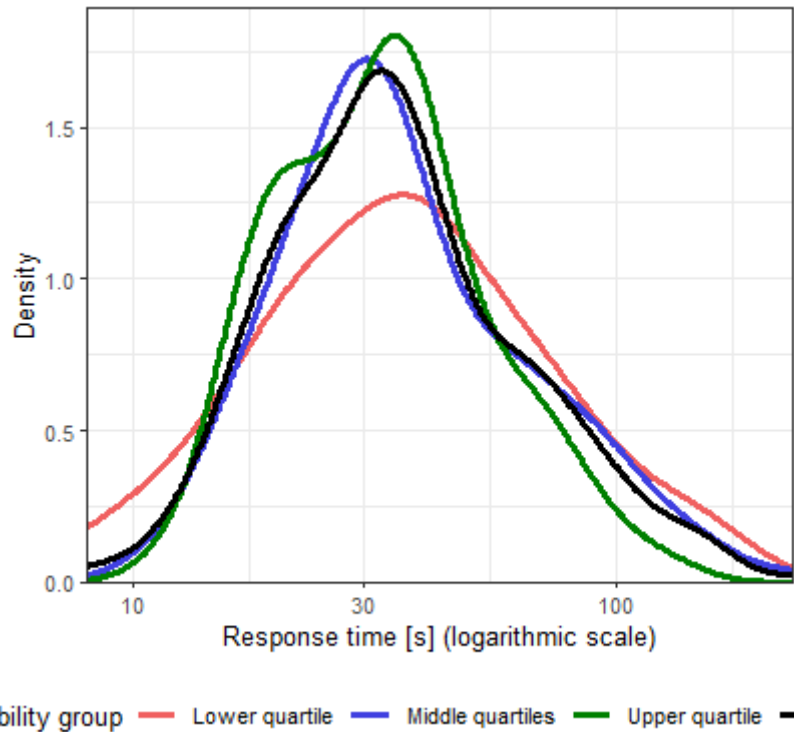


Table 3.94.4.1

Item S041107 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	8.04	21.68	34.12	57.01	152.77	3.58	0.69
Middle quartiles	9.91	24.11	32.29	54.75	230.50	3.59	0.60
Upper quartile	11.83	21.35	32.52	42.94	126.14	3.48	0.50
Overall	8.04	23.10	33.05	49.83	230.50	3.56	0.59

3.1.528. S890007 (NA)

3.1.529. Item fit:

Graph 3.95.1.1

Item S890007 ICC and nonparametric trace line

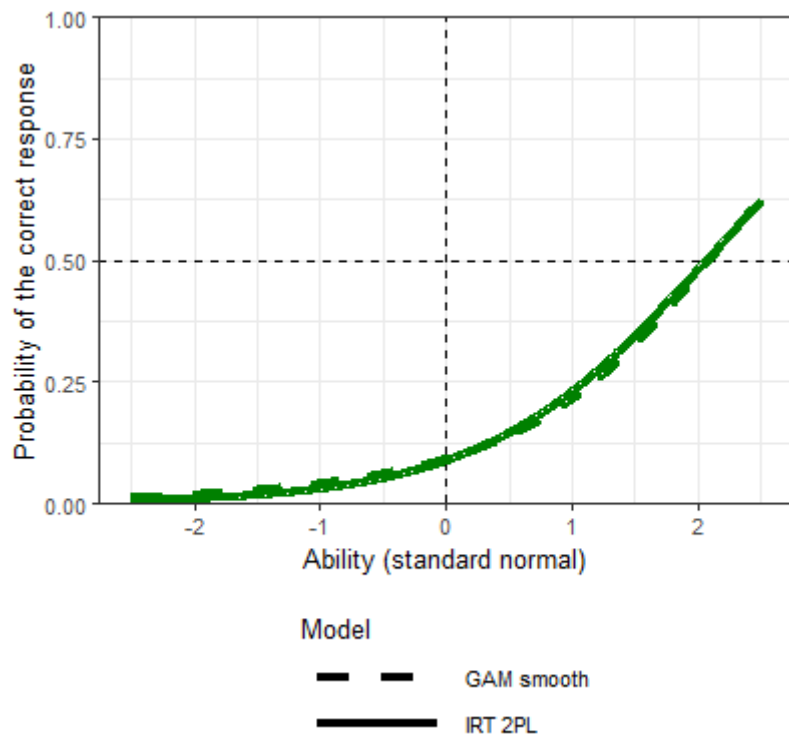


Table 3.95.1.1

Item S890007 parameters and fit statistics

Max. point s	Easine ss	Numb er of obs.	Form at	Corr. with latent ability estimates		IRT model parameters and fit statistic			
				thetaPVS All	thetaPVSTIM SS	Discriminati on	Difficul ty	RMSE A	RMSE A p- value
1	12.9%	281	CR	0.301154 7	0.2325526	1.13	2.07	0.016	0.232

3.1.530. Gender DIF:

Table 3.95.2.1

Item S890007 gender DIF statistics

Statistic	P-value	Holm's corrected p-value	Delta Nagelkerke's R-sq.	Effect size (Jodoin & Gierl)
0.30	0.863	1.000	0.001	

3.1.531. Frequency of answers:

The item is open-ended. The distribution of answers cannot be shown.

3.1.532. Answering time:

Graph 3.95.4.1

Item S890007 answering time distribution in groups of different ability level

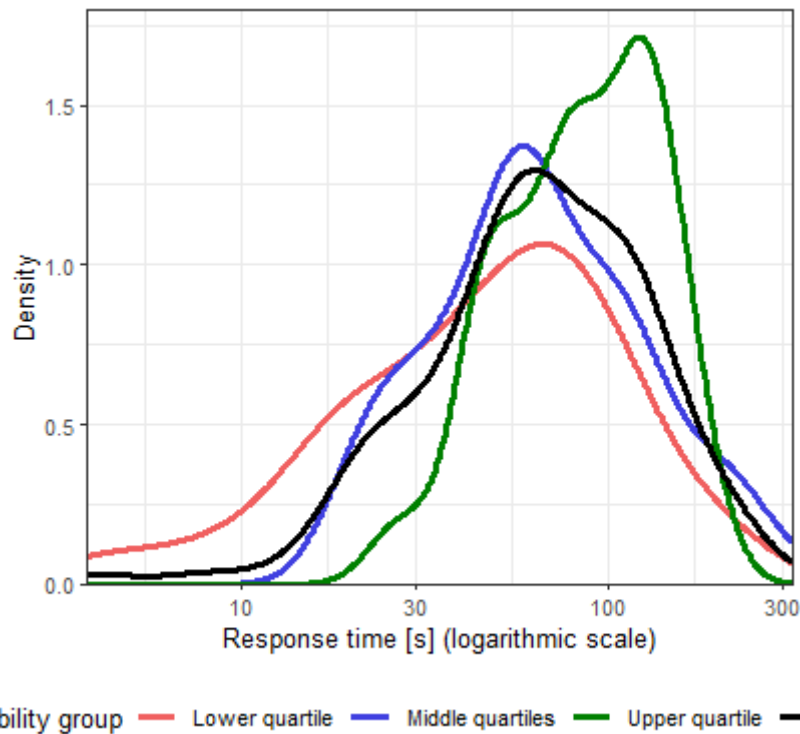


Table 3.95.4.1

Item S890007 parameters of answering time distribution in groups of different ability level

Ability group	Time [s]					log(time)	
	Min	Q1	Median	Q3	Max	Mean	SD
Lower quartile	3.84	24.40	52.20	85.39	243.34	3.81	0.89
Middle quartiles	17.84	42.50	61.11	107.42	319.38	4.18	0.67
Upper quartile	25.17	58.81	88.65	125.96	198.59	4.43	0.48
Overall	3.84	42.63	64.96	108.32	319.38	4.15	0.73