

Summary of Rating Scale Model

May 29, 2018

1 Checking Assumptions

Table 1: Goodness of fit statistics related to the test of unidimensionality in the RSM-based instrument for measuring the intrinsic motivation of participants in the third empirical study

data	df	chisq	AGFI	TLI	CFI	DETECT	ASSI	RATIO
Intrinsic Motivation	9.598	54.026	0.899	0.156	0.226	6.096	0.242	0.128
Interest/Enjoyment	5.419	8.602	0.996	0.963	0.887	6.028	0.200	0.507
Perceived Choice	4.040	3.576	0.998	1.006	1.000	12.178	0.600	0.803
Pressure/Tension	1.765	1.113	0.999	1.014	1.000	17.469	0.000	0.644
Effort/Importance	0.000	0.000	1.000	1.000	1.000	17.820	0.333	0.776

df: degree of freedom; AGFI: Adjusted Goodness of Fit Index; CFI: Comparative Fit Index; TLI: Tucker-Lewis Index;

Table 2: Item residual correlation statistics related to the test of local independence in the RSM-based instrument for measuring the intrinsic motivation of participants in the third empirical study

data	max.chisq	maxaQ3	MADaQ3	SRMSR	p.value
Intrinsic Motivation	169.797	0.738	0.276	0.274	0.000
Interest/Enjoyment	1034.187	0.329	0.147	0.096	0.339
Perceived Choice	180.200	0.316	0.113	0.054	0.284
Pressure/Tension	64.855	0.500	0.338	0.189	0.003
Effort/Importance	52.489	0.211	0.141	0.081	0.430

aQ3: adjusted correlation of item residuals; maxaQ3: maximum aQ3; MADaQ3: Median Absolute Deviation of aQ3;

Table 3: Test of monotonicity in the RSM-based instrument for measuring the intrinsic motivation of participants in the third empirical study

data	ItemH	ac	vi	vi/ac	maxvi	sum	sum/ac	zmax	zsig	crit
Intrinsic Motivation.Item22IE	0.33	0	0		0.00	0.00		0.00	0	0

Table 3: (continued)

data	ItemH	ac	vi	vi/ac	maxvi	sum	sum/ac	zmax	zsig	crit
Intrinsic Motivation.Item09IE	0.33	0	0		0.00	0.00		0.00	0	0
Intrinsic Motivation.Item12IE	0.28	5	1	0.2	0.08	0.08	0.02	0.53	0	51
Intrinsic Motivation.Item24IE	0.18	0	0		0.00	0.00		0.00	0	0
Intrinsic Motivation.Item21IE	0.25	6	0	0.0	0.00	0.00	0.00	0.00	0	0
Intrinsic Motivation.Item01IE	0.29	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Intrinsic Motivation.Item17PC	0.33	0	0		0.00	0.00		0.00	0	0
Intrinsic Motivation.Item15PC	0.32	6	0	0.0	0.00	0.00	0.00	0.00	0	0
Intrinsic Motivation.Item06PC	0.38	0	0		0.00	0.00		0.00	0	0
Intrinsic Motivation.Item02PC	0.33	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Intrinsic Motivation.Item08PC	0.39	0	0		0.00	0.00		0.00	0	0
Intrinsic Motivation.Item16PT	0.16	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Intrinsic Motivation.Item14PT	0.27	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Intrinsic Motivation.Item18PT	0.28	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Intrinsic Motivation.Item11PT	0.11	0	0		0.00	0.00		0.00	0	0
Intrinsic Motivation.Item13EI	0.19	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Intrinsic Motivation.Item03EI	0.06	5	0	0.0	0.00	0.00	0.00	0.00	0	0
Intrinsic Motivation.Item07EI	0.14	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Interest/Enjoyment.Item22IE	0.76	0	0		0.00	0.00		0.00	0	0
Interest/Enjoyment.Item09IE	0.73	0	0		0.00	0.00		0.00	0	0
Interest/Enjoyment.Item12IE	0.66	0	0		0.00	0.00		0.00	0	0
Interest/Enjoyment.Item24IE	0.61	0	0		0.00	0.00		0.00	0	0
Interest/Enjoyment.Item21IE	0.69	0	0		0.00	0.00		0.00	0	0
Interest/Enjoyment.Item01IE	0.60	0	0		0.00	0.00		0.00	0	0
Perceived Choice.Item17PC	0.69	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Perceived Choice.Item15PC	0.63	0	0		0.00	0.00		0.00	0	0
Perceived Choice.Item06PC	0.71	0	0		0.00	0.00		0.00	0	0
Perceived Choice.Item02PC	0.69	0	0		0.00	0.00		0.00	0	0
Perceived Choice.Item08PC	0.69	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Pressure/Tension.Item16PT	0.64	0	0		0.00	0.00		0.00	0	0
Pressure/Tension.Item14PT	0.65	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Pressure/Tension.Item18PT	0.65	4	0	0.0	0.00	0.00	0.00	0.00	0	0
Pressure/Tension.Item11PT	0.44	0	0		0.00	0.00		0.00	0	0
Effort/Importance.Item13EI	0.63	0	0		0.00	0.00		0.00	0	0
Effort/Importance.Item03EI	0.53	5	0	0.0	0.00	0.00	0.00	0.00	0	0
Effort/Importance.Item07EI	0.60	0	0		0.00	0.00		0.00	0	0

vi: number of violations; vi/ac: proportion of active pairs; maxvi: maximum violations; sum: sum of all violations;

zmax: maximum z-value; zsig: number of significant z-values; crit: Critical value

2 Estimating Item Parameters

Table 4: Estimated parameters in the RSM-based in Intrinsic Motivation

estimated	Item01IE	Item02PC	Item03EI	Item06PC	Item07EI	Item08PC	Item09IE	Item11PT	Item12IE	Item13EI
xsi.item	0.451	-0.019	-0.075	0.027	-0.437	-0.112	0.322	0.008	0.302	-0.008
B.Cat0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
B.Cat1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
B.Cat2	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
B.Cat3	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
B.Cat4	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
B.Cat5	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
B.Cat6	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
AXsi.Cat0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AXsi.Cat1	-0.081	0.390	0.445	0.343	0.807	0.483	0.049	0.362	0.068	0.008
AXsi.Cat2	0.371	1.312	1.424	1.219	2.146	1.498	0.630	1.257	0.669	0.008
AXsi.Cat3	0.250	1.662	1.829	1.523	2.913	1.941	0.639	1.579	0.698	0.008
AXsi.Cat4	-0.975	0.908	1.131	0.722	2.576	1.280	-0.456	0.797	-0.378	0.008
AXsi.Cat5	-2.018	0.336	0.615	0.104	2.421	0.801	-1.369	0.197	-1.271	0.008
AXsi.Cat6	-2.708	0.117	0.451	-0.162	2.619	0.674	-1.929	-0.050	-1.812	0.008

Table 4: (continued)

estimated	Item01IE	Item02PC	Item03EI	Item06PC	Item07EI	Item08PC	Item09IE	Item11PT	Item12IE	Item13EI
Outfit	1.104	1.006	1.342	0.940	1.269	0.747	0.669	1.920	0.812	0.812
Infit	1.132	1.014	1.304	0.951	1.236	0.767	0.660	1.905	0.807	0.807

Table 5: Estimated parameters in the RSM-based instrument for measuring the Interest/Enjoyment

estimated	Item01IE	Item09IE	Item12IE	Item21IE	Item22IE	Item24IE
xsi.item	0.912	0.615	0.570	0.080	0.615	0.797
B.Cat0	0.000	0.000	0.000	0.000	0.000	0.000
B.Cat1	1.000	1.000	1.000	1.000	1.000	1.000
B.Cat2	2.000	2.000	2.000	2.000	2.000	2.000
B.Cat3	3.000	3.000	3.000	3.000	3.000	3.000
B.Cat4	4.000	4.000	4.000	4.000	4.000	4.000
B.Cat5	5.000	5.000	5.000	5.000	5.000	5.000
B.Cat6	6.000	6.000	6.000	6.000	6.000	6.000
AXsi.Cat0	0.000	0.000	0.000	0.000	0.000	0.000
AXsi.Cat1	0.877	1.174	1.219	1.709	1.174	0.992
AXsi.Cat2	1.646	2.241	2.331	3.311	2.241	1.876
AXsi.Cat3	1.780	2.672	2.808	4.278	2.672	2.125
AXsi.Cat4	-0.028	1.161	1.342	3.302	1.161	0.431
AXsi.Cat5	-2.330	-0.844	-0.617	1.833	-0.844	-1.755
AXsi.Cat6	-5.473	-3.690	-3.418	-0.478	-3.690	-4.784
Outfit	1.503	0.664	1.009	0.937	0.521	1.309
Infit	1.537	0.694	0.996	0.926	0.516	1.425

Table 6: Estimated parameters in the RSM-based instrument for measuring the Perceived Choice

estimated	Item02PC	Item06PC	Item08PC	Item15PC	Item17PC
xsi.item	-0.210	-0.119	-0.393	0.192	-0.356
B.Cat0	0.000	0.000	0.000	0.000	0.000
B.Cat1	1.000	1.000	1.000	1.000	1.000
B.Cat2	2.000	2.000	2.000	2.000	2.000
B.Cat3	3.000	3.000	3.000	3.000	3.000
B.Cat4	4.000	4.000	4.000	4.000	4.000
B.Cat5	5.000	5.000	5.000	5.000	5.000
B.Cat6	6.000	6.000	6.000	6.000	6.000
AXsi.Cat0	0.000	0.000	0.000	0.000	0.000
AXsi.Cat1	2.122	2.031	2.305	1.720	2.268
AXsi.Cat2	3.359	3.177	3.725	2.555	3.652
AXsi.Cat3	4.097	3.824	4.645	2.890	4.535
AXsi.Cat4	3.435	3.071	4.166	1.826	4.020
AXsi.Cat5	2.634	2.178	3.548	0.622	3.365
AXsi.Cat6	1.261	0.714	2.357	-1.153	2.138
Outfit	1.005	0.955	0.873	1.267	0.937
Infit	1.028	0.917	0.911	1.240	0.991

Table 7: Estimated parameters in the RSM-based instrument for measuring the Pressure/Tension

estimated	Item11PT	Item14PT	Item16PT	Item18PT
xsi.item	0.123	-0.009	0.113	-0.081
B.Cat0	0.000	0.000	0.000	0.000
B.Cat1	1.000	1.000	1.000	1.000
B.Cat2	2.000	2.000	2.000	2.000
B.Cat3	3.000	3.000	3.000	3.000
B.Cat4	4.000	4.000	4.000	4.000
B.Cat5	5.000	0.000	0.000	0.000
B.Cat6	6.000	0.000	0.000	0.000

Table 7: *(continued)*

estimated	Item11PT	Item14PT	Item16PT	Item18PT
AXsi.Cat0	0.000	0.000	0.000	0.000
AXsi.Cat1	0.222	-0.022	-0.145	0.049
AXsi.Cat2	0.418	-0.072	-0.316	0.071
AXsi.Cat3	1.149	0.415	0.048	0.628
AXsi.Cat4	1.017	0.038	-0.451	0.322
AXsi.Cat5	-1.232			
AXsi.Cat6	-0.736			
Outfit	1.530	0.747	0.778	0.744
Infit	1.583	0.819	0.910	0.866

Table 8: Estimated parameters in the RSM-based instrument for measuring the Effort/Importance

estimated	Item03EI	Item07EI	Item13EI
xsi.item	-1.278	-2.012	-2.309
B.Cat0	0.000	0.000	0.000
B.Cat1	1.000	1.000	1.000
B.Cat2	2.000	2.000	2.000
B.Cat3	3.000	3.000	3.000
B.Cat4	4.000	4.000	4.000
B.Cat5	5.000	5.000	5.000
B.Cat6	6.000	6.000	6.000
AXsi.Cat0	0.000	0.000	0.000
AXsi.Cat1	8.240	8.975	9.272
AXsi.Cat2	9.465	10.933	11.527
AXsi.Cat3	10.365	12.567	13.458
AXsi.Cat4	9.821	12.758	13.946
AXsi.Cat5	8.680	12.351	13.837
AXsi.Cat6	7.667	12.072	13.855
Outfit	1.148	0.923	0.818
Infit	1.160	0.973	0.903

3 Latent Trait Estimates

	Intrinsic Motivation.theta	Intrinsic Motivation.error	Intrinsic Motivation.Outfit	Intrinsic Motivation.Infit	Interest/Enjoyment.theta	Interest/Enjoyment.error	Interest
10169	0.455	0.163	2.935	2.794	5.357	1.439	
10170	0.481	0.164	0.870	0.875	0.721	0.443	
10171	1.203	0.219	0.256	0.237	2.448	0.432	
10172	-0.028	0.161	1.282	1.267	1.795	0.408	
10174	0.124	0.160	0.770	0.753	1.116	0.430	
10175	0.857	0.183	0.700	0.702	0.512	0.443	
10176	-0.157	0.163	0.439	0.440	0.305	0.437	
10179	0.250	0.160	1.264	1.264	0.109	0.427	
10181	-0.264	0.166	0.870	0.907	-1.250	0.401	
10183	-0.210	0.164	0.492	0.501	-0.685	0.385	
10184	-0.002	0.160	0.269	0.265	0.305	0.437	
10185	0.074	0.160	0.992	0.981	1.469	0.415	
10186	0.200	0.160	1.326	1.329	0.305	0.437	
10188	0.535	0.165	0.967	1.006	-0.543	0.389	
10189	-0.028	0.161	0.808	0.797	-1.405	0.416	
10190	-0.291	0.166	0.595	0.593	-0.396	0.395	
10191	0.023	0.160	0.952	0.964	-1.104	0.391	
10192	0.225	0.160	1.019	1.005	0.512	0.443	
10193	0.200	0.160	2.406	2.445	-2.287	0.601	
10197	0.175	0.160	0.583	0.584	-0.072	0.416	
10198	0.074	0.160	1.088	1.079	0.512	0.443	
10199	-0.079	0.161	0.411	0.400	-0.543	0.389	
10200	0.326	0.161	0.902	0.869	1.116	0.430	
10201	0.403	0.162	0.561	0.568	1.795	0.408	
10202	0.200	0.160	0.369	0.382	-0.543	0.389	
10203	0.673	0.171	1.183	1.072	0.721	0.443	
10204	-1.007	0.205	1.102	1.272	-3.681	1.306	
10206	0.403	0.162	0.267	0.279	0.109	0.427	
10208	0.403	0.162	0.126	0.130	0.305	0.437	
10209	-0.237	0.165	1.597	1.644	-1.104	0.391	
10210	-0.780	0.188	1.937	2.140	-3.681	1.306	
10213	-0.079	0.161	2.095	2.075	0.305	0.437	
10214	-0.375	0.169	1.851	1.920	-2.722	0.762	
10215	0.377	0.161	1.305	1.319	0.512	0.443	
10216	0.824	0.180	0.669	0.717	1.297	0.422	
10217	0.403	0.162	0.749	0.729	0.924	0.438	
10218	-0.028	0.161	0.361	0.358	0.512	0.443	
10219	-0.237	0.165	2.223	2.282	-1.574	0.438	

	Intrinsic	Motivation.theta	Intrinsic	Motivation.error	Intrinsic	Motivation.Outfit	Intrinsic	Motivation.Infit	Interest/Enjoyment.theta	Interest/Enjoyment.error	Interest/
10220		0.562		0.166		1.539		1.641	-0.963	0.386	
10221		-0.131		0.162		0.539		0.554	-0.824	0.383	

	Intrinsic	Motivation.theta	Intrinsic	Motivation.error	Intrinsic	Motivation.Outfit	Intrinsic	Motivation.Infit	Interest/Enjoyment.theta	Interest/Enjoyment.error	Interest
10223		0.275		0.160		0.574		0.546	1.634		0.410
10224		-0.105		0.162		0.456		0.456	0.512		0.443
10226		-1.237		0.228		0.625		0.561	-1.994		0.519
10227		0.175		0.160		0.643		0.614	0.924		0.438
10228		0.049		0.160		1.940		1.938	-2.287		0.601
10230		0.149		0.160		0.660		0.668	1.116		0.430
10231		0.703		0.173		1.179		1.084	1.116		0.430
10232		0.481		0.164		0.289		0.281	1.116		0.430
10234		-0.613		0.179		1.334		1.408	-1.766		0.470
10237		0.023		0.160		0.698		0.689	0.512		0.443
10238		-0.105		0.162		0.666		0.673	0.305		0.437