

# Summary of Rating Scale Model

July 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 level of motivation of participants in the second empirical study

data	df	chisq	AGFI	TLI	CFI	DETECT	ASSI	RATIO
Level of Motivation	6.883	11.704	0.990	0.951	0.912	2.305	0.212	0.152
Attention	4.632	4.865	0.998	0.998	0.993	5.641	0.067	0.506
Relevance	1.427	1.133	0.997	1.018	1.000	19.151	0.667	0.669
Satisfaction	0.000	0.000	1.000	1.000	1.000	10.099	0.333	0.495

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 level of motivation of participants in the second empirical study

data	max.chisq	maxaQ3	MADaQ3	SRMSR	p.value
Level of Motivation	288.358	0.485	0.163	0.124	0.022
Attention	286.339	0.237	0.134	0.061	1.000
Relevance	68.696	0.366	0.151	0.120	0.040
Satisfaction	54.715	0.237	0.158	0.074	0.237

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 level of motivation of participants in the second empirical study

data	ItemH	ac	vi	vi/ac	maxvi	sum	sum/ac	zmax	zsig	crit
Level of Motivation.Item12A	0.64	2	0	0	0	0	0	0	0	0
Level of Motivation.Item19A	0.52	0	0		0	0		0	0	0
Level of Motivation.Item04A	0.64	0	0		0	0		0	0	0

Table 3: (continued)

data	ItemH	ac	vi	vi/ac	maxvi	sum	sum/ac	zmax	zsig	crit
Level of Motivation.Item20A	0.59	0	0		0	0		0	0	0
Level of Motivation.Item16A	0.62	0	0		0	0		0	0	0
Level of Motivation.Item01A	0.63	0	0		0	0		0	0	0
Level of Motivation.Item15R	0.42	0	0		0	0		0	0	0
Level of Motivation.Item21R	0.59	0	0		0	0		0	0	0
Level of Motivation.Item10R	0.53	5	0	0	0	0	0	0	0	0
Level of Motivation.Item13S	0.58	4	0	0	0	0	0	0	0	0
Level of Motivation.Item14S	0.60	4	0	0	0	0	0	0	0	0
Level of Motivation.Item17S	0.51	0	0		0	0		0	0	0
Attention.Item12A	0.77	2	0	0	0	0	0	0	0	0
Attention.Item19A	0.66	0	0		0	0		0	0	0
Attention.Item04A	0.70	0	0		0	0		0	0	0
Attention.Item20A	0.72	0	0		0	0		0	0	0
Attention.Item16A	0.70	0	0		0	0		0	0	0
Attention.Item01A	0.71	0	0		0	0		0	0	0
Relevance.Item15R	0.43	0	0		0	0		0	0	0
Relevance.Item21R	0.53	0	0		0	0		0	0	0
Relevance.Item10R	0.49	0	0		0	0		0	0	0
Relevance.Item08R	0.35	0	0		0	0		0	0	0
Satisfaction.Item13S	0.70	0	0		0	0		0	0	0
Satisfaction.Item14S	0.66	0	0		0	0		0	0	0
Satisfaction.Item17S	0.61	0	0		0	0		0	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 instrument for measuring the Level of Motivation

estimated	Item01A	Item04A	Item10R	Item12A	Item13S	Item14S	Item15R	Item16A	Item17S	Item19A	Item20A
xsi.item	-0.004	0.036	-0.520	0.010	-0.326	-0.271	-0.577	-0.204	0.010	0.023	0.000
B.Cat0	0.000	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	1.000
B.Cat2	2.000	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	3.000
B.Cat4	4.000	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	5.000
B.Cat6	6.000	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	0.000
AXsi.Cat1	1.406	1.366	1.922	1.393	1.728	1.674	1.979	1.606	1.393	1.379	1.379
AXsi.Cat2	1.945	1.866	2.979	1.919	2.590	2.481	3.092	2.346	1.919	1.892	1.892
AXsi.Cat3	2.922	2.803	4.472	2.882	3.889	3.726	4.641	3.523	2.882	2.843	2.843
AXsi.Cat4	2.457	2.298	4.523	2.404	3.746	3.528	4.749	3.258	2.404	2.351	2.351
AXsi.Cat5	1.359	1.161	3.942	1.293	2.971	2.699	4.225	2.361	1.293	1.227	1.227
AXsi.Cat6	0.021	-0.217	3.121	-0.058	1.956	1.629	3.460	1.223	-0.058	-0.138	-0.138
Outfit	0.865	0.770	1.721	0.635	0.980	0.845	1.579	0.729	1.208	1.278	1.278
Infit	0.897	0.795	1.359	0.646	1.046	0.912	1.449	0.745	1.011	1.369	1.369

Table 5: Estimated parameters in the RSM-based instrument for measuring the Attention

estimated	Item01A	Item04A	Item12A	Item16A	Item19A	Item20A
xsi.item	-0.004	0.053	0.015	-0.290	0.034	0.090
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

Table 5: (continued)

estimated	Item01A	Item04A	Item12A	Item16A	Item19A	Item20A
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	1.688	1.632	1.670	1.974	1.651	1.594
AXsi.Cat2	2.833	2.720	2.795	3.405	2.757	2.644
AXsi.Cat3	4.141	3.971	4.084	4.999	4.028	3.858
AXsi.Cat4	3.591	3.365	3.516	4.735	3.440	3.214
AXsi.Cat5	1.928	1.645	1.833	3.357	1.739	1.456
AXsi.Cat6	0.023	-0.317	-0.090	1.739	-0.203	-0.543
Outfit	1.048	1.029	0.606	0.961	1.313	1.046
Infit	1.119	1.075	0.630	0.995	1.425	0.863

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

estimated	Item08R	Item10R	Item15R	Item21R
xsi.item	-1.152	-0.777	-0.821	-0.766
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	5.000	5.000	5.000
B.Cat6	6.000	6.000	6.000	6.000
AXsi.Cat0	0.000	0.000	0.000	0.000
AXsi.Cat1	4.435	4.060	4.104	4.049
AXsi.Cat2	5.226	4.475	4.563	4.453
AXsi.Cat3	6.531	5.405	5.537	5.372
AXsi.Cat4	6.807	5.305	5.481	5.262
AXsi.Cat5	6.965	5.089	5.309	5.034
AXsi.Cat6	6.913	4.662	4.925	4.596
Outfit	1.231	0.989	0.948	0.832
Infit	1.209	1.020	0.902	0.849

Table 7: Estimated parameters in the RSM-based instrument for measuring the Satisfaction

estimated	Item13S	Item14S	Item17S
xsi.item	-0.415	-0.344	0.025
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	2.615	2.544	2.175
AXsi.Cat2	3.805	3.662	2.924
AXsi.Cat3	5.326	5.112	4.004
AXsi.Cat4	5.125	4.839	3.363
AXsi.Cat5	4.154	3.797	1.952
AXsi.Cat6	2.492	2.064	-0.151
Outfit	0.939	1.000	1.064
Infit	0.957	1.039	1.025

### 3 Latent Trait Estimates

Table 8: Latent trait estimates and person model fit of  
for measuring the level of motivation of participants in

	Level of Motivation.theta	Level of Motivation.error	Level of Motivation.Outfit	Level of Motivation.Infit	Attention.theta	Attention.error	Attention.Outfit	Attention.
10169	-1.408	0.260	0.453	0.528	-1.957	0.419	0.224	0
10170	0.226	0.248	0.641	0.640	0.568	0.435	0.852	0
10171	0.802	0.262	0.363	0.344	0.758	0.428	0.134	0
10172	0.288	0.249	1.043	1.056	0.758	0.428	1.437	1
10174	-0.628	0.231	1.109	1.119	-0.952	0.357	0.786	0
10175	1.319	0.294	1.086	1.139	1.764	0.425	1.141	1
10176	-0.838	0.232	0.838	0.269	-1.070	0.353	0.022	0
10178	0.413	0.252	0.227	0.226	0.758	0.428	0.164	0
10179	0.103	0.246	0.289	0.284	-0.041	0.428	0.082	0
10181	-0.248	0.238	1.060	1.074	-0.041	0.428	2.256	2
10183	-0.628	0.231	0.627	0.626	-0.952	0.357	0.855	0
10184	0.870	0.265	0.437	0.449	1.436	0.413	0.571	0
10185	-0.134	0.240	0.261	0.265	-0.041	0.428	0.531	0
10186	0.043	0.244	2.338	2.347	-0.829	0.364	3.208	3
10187	-0.191	0.239	1.134	1.102	0.367	0.439	0.732	0
10188	0.043	0.244	0.427	0.424	-0.041	0.428	0.548	0
10189	-1.985	0.335	1.655	2.149	-3.114	0.777	0.617	0
10190	-0.522	0.233	2.803	2.767	-1.665	0.377	1.204	1
10191	1.237	0.287	0.858	0.730	1.937	0.438	0.537	0
10192	1.702	0.340	4.317	3.505	4.367	1.348	0.085	0
10193	-0.628	0.231	0.731	0.720	-0.557	0.386	0.386	0
10196	-0.469	0.233	0.919	0.912	-0.557	0.386	1.244	1
10197	0.164	0.247	1.334	1.338	0.161	0.437	2.566	2
10198	2.516	0.511	1.764	2.085	4.367	1.348	0.085	0
10200	0.226	0.248	0.470	0.460	0.367	0.439	0.240	0
10201	0.670	0.257	0.289	0.293	0.568	0.435	0.240	0
10202	-0.248	0.238	0.185	0.187	-0.230	0.415	0.346	0
10203	4.338	1.368	0.043	0.045	4.367	1.348	0.085	0
10204	1.953	0.381	1.280	1.112	3.360	0.789	0.508	0
10206	0.043	0.244	0.499	0.496	-0.402	0.400	0.435	0
10208	-0.469	0.233	0.553	0.543	-0.402	0.400	0.445	0
10209	-1.545	0.273	1.163	1.163	-2.357	0.510	1.388	1
10210	-0.522	0.233	1.262	1.233	-0.952	0.357	0.765	0
10211	-1.700	0.292	0.547	0.564	-2.652	0.599	0.425	0
10212	-0.522	0.233	0.419	0.417	-0.829	0.364	0.405	0
10213	0.350	0.250	0.675	0.682	0.367	0.439	1.132	1
10214	0.164	0.247	0.440	0.433	0.367	0.439	0.252	0
10215	0.540	0.254	1.450	1.450	0.367	0.439	1.269	1

Table 8: (continued)

	Level of Motivation.theta	Level of Motivation.error	Level of Motivation.Outfit	Level of Motivation.Infit	Attention.theta	Attention.error	Attention.Outfit	Attention.
10216	-0.134	0.240	1.427	1.454	-0.402	0.400	2.949	3
10217	0.540	0.254	0.328	0.332	0.758	0.428	0.535	0

Table 8: (continued)

	Level of Motivation:theta	Level of Motivation:error	Level of Motivation:Outfit	Level of Motivation:Infit	Attention:theta	Attention:error	Attention:Outfit	Attention:
10218	-0.134	0.240	0.852	0.870	-0.952	0.357	0.926	0
10219	-1.052	0.238	1.485	1.466	-1.301	0.353	1.751	1
10220	-0.248	0.238	4.191	4.152	-2.357	0.510	2.272	2
10221	-0.838	0.232	0.611	0.610	-0.698	0.373	0.440	0
10223	-1.475	0.266	0.513	0.456	-1.803	0.395	0.694	0
10224	0.870	0.265	0.829	0.794	1.274	0.413	0.875	0
10226	0.939	0.268	0.617	0.610	0.938	0.421	0.802	0
10227	1.159	0.281	0.246	0.270	1.764	0.425	0.483	0
10228	-0.076	0.242	0.136	0.134	-0.041	0.428	0.178	0
10230	1.159	0.281	1.190	1.158	2.124	0.459	0.627	0
10231	-0.575	0.232	0.964	0.953	-1.417	0.357	0.522	0
10232	1.010	0.271	0.297	0.276	1.109	0.416	0.067	0
10233	-0.785	0.232	2.458	2.444	0.161	0.437	3.419	3
10234	0.103	0.246	1.444	1.421	0.568	0.435	1.133	1
10237	-0.076	0.242	0.527	0.517	-0.402	0.400	0.337	0
10238	0.103	0.246	0.222	0.219	0.367	0.439	0.240	0
10240	-1.475	0.266	0.147	0.166	-1.803	0.395	0.019	0
10242	-2.395	0.417	0.964	1.247	-4.171	1.373	0.085	0