

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 level of motivation of participants in the third empirical study

data	df	chisq	AGFI	TLI	CFI	DETECT	ASSI	RATIO
Level of Motivation	9.196	20.051	0.980	0.844	0.749	6.634	0.242	0.279
Attention	4.337	3.955	0.997	1.006	1.000	7.166	0.333	0.621
Relevance	1.762	1.090	0.997	1.063	1.000	14.903	0.333	0.529
Satisfaction	0.000	0.000	1.000	1.000	1.000	18.022	0.333	0.939

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 third empirical study

data	max.chisq	maxaQ3	MADaQ3	SRMSR	p.value
Level of Motivation	138.794	0.601	0.201	0.213	0.002
Attention	282.594	0.335	0.139	0.086	0.284
Relevance	110.345	0.176	0.072	0.066	1.000
Satisfaction	62.109	0.282	0.188	0.073	0.144

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 third empirical study

data	ItemH	ac	vi	vi/ac	maxvi	sum	sum/ac	zmax	zsig	crit
Level of Motivation.Item12A	0.53	0	0		0	0		0	0	0
Level of Motivation.Item19A	0.47	0	0		0	0		0	0	0
Level of Motivation.Item04A	0.47	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	0.45	0	0		0	0		0	0	0
Level of Motivation.Item16A	0.51	5	0	0	0	0	0	0	0	0
Level of Motivation.Item01A	0.44	0	0		0	0		0	0	0
Level of Motivation.Item21R	0.24	0	0		0	0		0	0	0
Level of Motivation.Item10R	0.29	0	0		0	0		0	0	0
Level of Motivation.Item08R	0.12	0	0		0	0		0	0	0
Level of Motivation.Item13S	0.49	0	0		0	0		0	0	0
Level of Motivation.Item14S	0.52	3	0	0	0	0	0	0	0	0
Level of Motivation.Item17S	0.42	0	0		0	0		0	0	0
Attention.Item12A	0.68	5	0	0	0	0	0	0	0	0
Attention.Item19A	0.66	0	0		0	0		0	0	0
Attention.Item04A	0.66	0	0		0	0		0	0	0
Attention.Item20A	0.59	0	0		0	0		0	0	0
Attention.Item16A	0.66	4	0	0	0	0	0	0	0	0
Attention.Item01A	0.54	0	0		0	0		0	0	0
Relevance.Item15R	0.35	0	0		0	0		0	0	0
Relevance.Item21R	0.41	0	0		0	0		0	0	0
Relevance.Item10R	0.42	0	0		0	0		0	0	0
Relevance.Item08R	0.35	0	0		0	0		0	0	0
Satisfaction.Item13S	0.77	3	0	0	0	0	0	0	0	0
Satisfaction.Item14S	0.75	0	0		0	0		0	0	0
Satisfaction.Item17S	0.68	4	0	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	Item08R	Item10R	Item12A	Item13S	Item14S	Item16A	Item17S	Item19A	Item20A
xsi.item	0.241	0.253	-0.553	-0.383	0.229	-0.108	0.013	0.013	-0.170	0.181	0.181
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	0.672	0.660	1.466	1.296	0.684	1.021	0.899	0.899	1.082	0.731	0.731
AXsi.Cat2	0.840	0.816	2.427	2.088	0.863	1.538	1.295	1.295	1.661	0.959	0.959
AXsi.Cat3	1.716	1.680	4.097	3.588	1.751	2.763	2.399	2.399	2.948	1.895	1.895
AXsi.Cat4	0.823	0.776	3.999	3.320	0.871	2.220	1.734	1.734	2.466	1.062	1.062
AXsi.Cat5	-0.256	-0.315	3.713	2.865	-0.196	1.490	0.883	0.883	1.798	0.043	0.043
AXsi.Cat6	-1.446	-1.518	3.317	2.299	-1.375	0.649	-0.080	-0.080	1.018	-1.088	-1.088
Outfit	0.840	0.745	1.767	1.139	0.655	1.025	0.737	0.652	1.026	1.205	1.205
Infit	0.846	0.758	1.699	1.149	0.666	1.063	0.740	0.668	1.037	1.234	1.234

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

estimated	Item01A	Item04A	Item12A	Item16A	Item19A	Item20A
xsi.item	0.321	0.340	0.303	-0.029	0.229	0.376
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	1.292	1.274	1.311	1.643	1.384	1.237
AXsi.Cat2	1.608	1.571	1.645	2.309	1.792	1.497
AXsi.Cat3	2.891	2.836	2.946	3.943	3.167	2.725
AXsi.Cat4	1.786	1.712	1.859	3.188	2.154	1.565
AXsi.Cat5	-0.044	-0.136	0.048	1.709	0.416	-0.320
AXsi.Cat6	-1.928	-2.038	-1.817	0.176	-1.375	-2.259
Outfit	1.231	0.856	0.781	0.795	1.244	1.013
Infit	1.207	0.838	0.824	0.806	1.294	1.105

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

estimated	Item08R	Item10R	Item15R	Item21R
xsi.item	-0.953	-0.773	-0.539	-0.677
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	3.925	3.745	3.511	3.649
AXsi.Cat2	4.994	4.634	4.166	4.441
AXsi.Cat3	6.466	5.925	5.223	5.636
AXsi.Cat4	6.291	5.570	4.634	5.185
AXsi.Cat5	6.096	5.195	4.024	4.713
AXsi.Cat6	5.718	4.637	3.232	4.059
Outfit	1.124	0.896	1.014	0.945
Infit	1.142	0.898	0.986	0.960

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

estimated	Item13S	Item14S	Item17S
xsi.item	-0.267	-0.047	-0.378
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	2.315	2.095	2.426
AXsi.Cat2	4.032	3.592	4.253
AXsi.Cat3	5.337	4.677	5.669
AXsi.Cat4	4.692	3.813	5.135
AXsi.Cat5	3.596	2.496	4.149
AXsi.Cat6	1.602	0.282	2.266
Outfit	0.944	0.921	1.176
Infit	0.938	0.889	1.163

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	2.348	0.490	2.109	1.238	4.278	1.300	0.087	0
10170	0.329	0.228	0.723	0.690	0.844	0.411	0.646	0
10171	0.820	0.243	0.388	0.375	1.167	0.395	0.342	0
10172	0.226	0.226	1.159	1.121	1.167	0.285	0.285	0
10174	0.381	0.230	1.352	1.334	1.314	0.389	1.038	1
10175	1.000	0.253	0.322	0.305	1.314	0.389	0.321	0
10176	0.025	0.222	0.287	0.288	0.470	0.421	0.296	0
10178	-0.168	0.219	0.329	0.327	0.095	0.402	0.019	0
10179	-0.073	0.220	0.504	0.507	-0.344	0.361	0.909	0
10181	-0.263	0.218	1.243	1.244	0.276	0.415	0.362	0
10183	-0.876	0.228	0.138	0.148	-1.247	0.368	0.036	0
10184	-0.024	0.221	0.501	0.502	-0.068	0.387	0.788	0
10185	-0.168	0.219	1.030	1.007	-0.068	0.387	1.322	1
10186	0.277	0.227	2.241	2.257	-0.344	0.361	2.834	2
10188	-0.073	0.220	0.845	0.818	-0.465	0.351	0.395	0
10189	-0.927	0.231	1.131	1.219	-2.220	0.603	0.452	0
10190	0.025	0.222	0.989	0.992	1.011	0.402	0.801	0
10191	-0.216	0.218	0.673	0.648	-0.465	0.351	0.534	0
10192	0.879	0.246	1.605	1.489	1.314	0.389	1.664	1
10193	-0.876	0.228	2.397	2.606	-2.710	0.795	0.624	0
10197	0.277	0.227	1.831	1.831	1.314	0.389	1.805	1
10198	1.270	0.276	0.907	0.934	1.881	0.399	1.273	1
10199	-0.024	0.221	0.694	0.706	-0.344	0.361	1.124	1
10200	0.762	0.241	0.348	0.343	1.167	0.395	0.295	0
10201	0.434	0.231	1.043	0.999	1.011	0.402	1.198	1
10202	-0.121	0.220	0.530	0.531	-0.579	0.345	0.545	0
10203	0.487	0.232	0.873	0.864	0.662	0.419	0.626	0
10204	-1.149	0.249	1.634	1.851	-3.843	1.425	0.084	0
10206	0.434	0.231	0.250	0.253	0.662	0.419	0.572	0
10208	-0.541	0.218	0.598	0.605	-1.012	0.347	0.144	0
10209	-0.728	0.222	0.750	0.775	-1.126	0.356	0.141	0
10210	-2.299	0.486	0.310	0.352	-3.843	1.425	0.084	0
10213	1.198	0.269	1.590	1.767	1.596	0.387	2.625	2
10214	-0.681	0.220	0.506	0.500	-1.247	0.368	0.722	0
10215	-0.168	0.219	2.231	2.186	-0.689	0.341	1.659	1
10216	0.434	0.231	0.834	0.844	-0.068	0.387	1.367	1
10217	0.025	0.222	0.121	0.123	-0.068	0.387	0.319	0
10218	-0.121	0.220	0.456	0.461	0.095	0.402	0.774	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.
10219	-1.211	0.255	0.704	0.677	-1.378	0.386	0.608	0
10220	-0.073	0.220	3.289	3.273	-1.919	0.507	2.147	2

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:
10221	-0.587	0.218	0.671	0.671	-0.796	0.340	0.442	0
10223	0.075	0.223	0.247	0.239	-0.068	0.387	0.114	0
10224	0.277	0.227	0.211	0.208	0.470	0.421	0.180	0
10226	-0.448	0.217	0.734	0.742	-0.344	0.361	1.402	1
10227	0.939	0.250	0.382	0.354	1.596	0.387	0.179	0
10228	-0.448	0.217	1.367	1.339	-1.247	0.368	1.180	1
10230	0.226	0.226	0.999	0.997	0.844	0.411	1.057	1
10231	0.226	0.226	0.479	0.468	0.095	0.402	0.019	0
10232	0.820	0.243	0.334	0.338	1.011	0.402	0.632	0
10234	-0.402	0.217	2.340	2.335	-0.579	0.345	3.201	3
10237	-0.024	0.221	0.495	0.488	-0.213	0.373	0.549	0
10238	0.025	0.222	0.547	0.546	0.470	0.421	0.260	0