

Results

Reliability Analysis

Affective Engagement_Dimensi

Scale Reliability Statistics

	Mean	SD	Cronbach's α
scale	2.83	0.319	0.602

[3]

Item Reliability Statistics

	Mean	SD	Item-rest correlation
SME26	2.20	0.766	0.2900
SME32	3.03	0.685	0.4267
SME40	3.12	0.764	0.1354
SME1	3.38	0.522	0.0757
SME20	3.21	0.573	0.3217
SME35	1.72	0.678	0.1684
SME7	2.82	0.717	0.4308
SME15	2.85	0.746	0.3177
SME23	2.85	0.768	0.3143
SME11	3.08	0.533	0.3000

Reliability Analysis

Behavior Engagement_Dimensi

Scale Reliability Statistics

	Mean	SD	Cronbach's α
scale	2.57	0.302	0.827

Note. items 'SME22r', 'SME9r', and 'SME19r' correlate negatively with the total scale and probably should be reversed

[3]

Item Reliability Statistics

	Mean	SD	Item-rest correlation
SME2	2.57	0.659	0.3141
SME12	2.68	0.656	0.4231
SME45	2.52	0.775	0.4971
SME8	3.03	0.627	0.5169
SME10	3.16	0.592	0.4177
SME16	2.97	0.652	0.4742
SME24r	2.18	0.652	0.2306
SME46	2.81	0.652	0.0342
SME36	2.39	0.687	0.5373
SME4	2.49	0.729	0.2415
SME42	2.48	0.832	0.4807
SME34	2.20	0.835	0.5610
SME3	2.51	0.818	0.5880
SME39	2.36	0.826	0.5382
SME18	2.72	0.776	0.5621
SME31	2.57	0.816	0.5854
SME47	2.85	0.738	0.1531
SME37	2.38	0.849	0.3569
SME27	2.17	0.802	0.2892
SME17	2.89	0.614	0.2441
SME29	2.84	0.651	0.3687
SME13	2.72	0.720	0.4286
SME22r	2.18	0.727	-0.0260
SME5	2.88	0.597	0.3205
SME14	2.67	0.744	0.3100
SME9r	1.81	0.547	-0.0679
SME25	2.76	0.744	0.2437
SME19r	2.22	0.711	-0.0198

Reliability Analysis

Cognitive Engagement_Dimensi

Scale Reliability Statistics

	Mean	SD	Cronbach's α
scale	2.55	0.385	0.737

Item Reliability Statistics

	SD	Item-rest correlation
SME30	0.704	0.606
SME48	0.816	0.479
SME44	0.728	0.137
SME41	0.686	0.466
SME28	0.670	0.533
SME38	0.753	0.506
SME21	0.766	0.447
SME33	0.840	0.377
SME6	0.683	0.156
SME43	0.713	0.328
SME49	0.679	0.212

Reliability Analysis

Total - Item Correlation Index Analysis (crlTT)

Scale Reliability Statistics

	Mean	SD	Cronbach's α
scale	2.62	0.287	0.892

Note. items 'SME22r', 'SME9r', and 'SME19r' correlate negatively with the total scale and probably should be reversed

Item Reliability Statistics

	Mean	SD	Item-rest correlation
SME26	2.20	0.766	0.45637
SME32	3.03	0.685	0.36293
SME40	3.12	0.764	0.11418
SME1	3.38	0.522	0.14388
SME20	3.21	0.573	0.25516
SME35	1.72	0.678	0.35377
SME7	2.82	0.717	0.32339
SME15	2.85	0.746	0.26348
SME23	2.85	0.768	0.34468
SME11	3.08	0.533	0.26105
SME2	2.57	0.659	0.31500
SME12	2.68	0.656	0.44450
SME45	2.52	0.775	0.51329
SME8	3.03	0.627	0.47857
SME10	3.16	0.592	0.39905
SME16	2.97	0.652	0.46340
SME24r	2.18	0.652	0.15100
SME46	2.81	0.652	0.06709
SME36	2.39	0.687	0.52199
SME4	2.49	0.729	0.29399
SME42	2.48	0.832	0.49326
SME34	2.20	0.835	0.59579
SME3	2.51	0.818	0.53036
SME39	2.36	0.826	0.52735
SME18	2.72	0.776	0.52620
SME31	2.57	0.816	0.56637
SME47	2.85	0.738	0.22970
SME37	2.38	0.849	0.40743
SME27	2.17	0.802	0.37452
SME17	2.89	0.614	0.29614
SME29	2.84	0.651	0.41018
SME13	2.72	0.720	0.45120
SME22r	2.18	0.727	-0.06325
SME5	2.88	0.597	0.34440
SME14	2.67	0.744	0.34819
SME9r	1.81	0.547	-0.10014
SME25	2.76	0.744	0.28995
SME19r	2.22	0.711	-0.00882
SME30	2.44	0.704	0.61626
SME48	2.51	0.816	0.49943
SME44	2.73	0.728	0.10530
SME41	2.76	0.686	0.48669
SME28	2.81	0.670	0.55696
SME38	2.04	0.753	0.49559
SME21	2.64	0.766	0.48294

Item Reliability Statistics

	Mean	SD	Item-rest correlation
SME33	2.27	0.840	0.41561
SME6	2.51	0.683	0.29958
SME43	2.67	0.713	0.40833
SME49	2.64	0.679	0.20934

Reliability Analysis

Affective Engagement

Scale Reliability Statistics

	Mean	SD	Cronbach's α
scale	2.72	0.364	0.632

[3]

Reliability Analysis

Behavior Engagement

Scale Reliability Statistics

	Mean	SD	Cronbach's α
scale	2.62	0.462	0.775

[3]

Reliability Analysis

Cognitive Engagement

Scale Reliability Statistics

	Mean	SD	Cronbach's α
scale	2.52	0.466	0.777

[3]

Correlation Matrix

Correlation Matrix

Correlation Matrix

Correlation Matrix

Correlation Matrix

Correlation Matrix

		Affective	Behavior	Cognitive	SME Score Total	Impulsive Feelings	Time Displacement	Social Consequences	SA Score Total
Affective	Pearson's r	—							
	df	—							
	p-value	—							
Behavior	Pearson's r	0.521	—						
	df	433	—						
	p-value	< .001	—						
Cognitive	Pearson's r	0.470	0.694	—					
	df	433	433	—					
	p-value	< .001	< .001	—					
SME Score Total	Pearson's r	0.753	0.891	0.875	—				
	df	433	433	433	—				
	p-value	< .001	< .001	< .001	—				
Impulsive Feelings	Pearson's r	0.380	0.547	0.498	0.570	—			
	df	433	433	433	433	—			
	p-value	< .001	< .001	< .001	< .001	—			
Time Displacement	Pearson's r	0.368	0.615	0.620	0.646	0.528	—		
	df	433	433	433	433	433	—		
	p-value	< .001	< .001	< .001	< .001	< .001	—		
Social Consequences	Pearson's r	0.371	0.412	0.516	0.517	0.511	0.455	—	
	df	433	433	433	433	433	433	—	
	p-value	< .001	< .001	< .001	< .001	< .001	< .001	—	
SA Score Total	Pearson's r	0.456	0.648	0.663	0.708	0.864	0.808	0.769	—
	df	433	433	433	433	433	433	433	—
	p-value	< .001	< .001	< .001	< .001	< .001	< .001	< .001	—

References

- [1] The jamovi project (2024). *jamovi*. (Version 2.5) [Computer Software]. Retrieved from <https://www.jamovi.org>.
- [2] R Core Team (2023). *R: A Language and environment for statistical computing*. (Version 4.3) [Computer software]. Retrieved from <https://cran.r-project.org>. (R packages retrieved from CRAN snapshot 2024-01-09).
- [3] Revelle, W. (2023). *psych: Procedures for Psychological, Psychometric, and Personality Research*. [R package]. Retrieved from <https://cran.r-project.org/package=psych>.

Confirmatory Factor Analysis SMEAS (49-items)

Model fit

Chi-square test

Model	X ²	df	p
Baseline model	14382.814	1176	
Factor model	3197.358	1124	< .001

Additional fit measures

Fit indices

Index	Value
Comparative Fit Index (CFI)	0.843
Tucker-Lewis Index (TLI)	0.836
Bentler-Bonett Non-normed Fit Index (NNFI)	0.836
Bentler-Bonett Normed Fit Index (NFI)	0.778
Parsimony Normed Fit Index (PNFI)	0.743
Bollen's Relative Fit Index (RFI)	0.767
Bollen's Incremental Fit Index (IFI)	0.844
Relative Noncentrality Index (RNI)	0.843

Other fit measures

Metric	Value
Root mean square error of approximation (RMSEA)	0.065
RMSEA 90% CI lower bound	0.063
RMSEA 90% CI upper bound	0.068
RMSEA p-value	9.217×10 ⁻¹³
Standardized root mean square residual (SRMR)	0.089
Hoelter's critical N ($\alpha = .05$)	164.306
Hoelter's critical N ($\alpha = .01$)	168.938
Goodness of fit index (GFI)	0.873
McDonald fit index (MFI)	0.092
Expected cross validation index (ECVI)	7.833

Parameter estimates

Factor loadings

Factor	Indicator	Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Affective	SME26	0.430	0.021	20.400	< .001	0.389	0.471
	SME32	0.289	0.017	16.840	< .001	0.256	0.323
	SME40	0.111	0.017	6.515	< .001	0.078	0.144

Factor loadings

Factor	Indicator	Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Behavior	SME1	0.104	0.011	9.285	< .001	0.082	0.125
	SME20	0.183	0.014	13.117	< .001	0.156	0.210
	SME35	0.278	0.016	17.576	< .001	0.247	0.309
	SME7	0.265	0.018	15.111	< .001	0.231	0.300
	SME15	0.218	0.018	12.100	< .001	0.182	0.253
	SME23	0.329	0.020	16.593	< .001	0.290	0.367
	SME11	0.172	0.013	13.309	< .001	0.147	0.197
	SME2	0.227	0.013	17.955	< .001	0.202	0.252
	SME12	0.316	0.013	23.784	< .001	0.290	0.342
	SME45	0.432	0.015	28.585	< .001	0.402	0.461
	SME8	0.313	0.013	23.870	< .001	0.288	0.339
	SME10	0.260	0.012	22.252	< .001	0.237	0.283
	SME16	0.326	0.013	24.522	< .001	0.300	0.352
	SME24r	0.129	0.012	10.292	< .001	0.104	0.153
	SME46	0.041	0.012	3.262	0.001	0.016	0.065
	SME36	0.400	0.014	28.549	< .001	0.372	0.427
	SME4	0.216	0.014	15.195	< .001	0.188	0.244
	SME42	0.458	0.016	27.837	< .001	0.426	0.490
	SME34	0.539	0.017	32.551	< .001	0.506	0.571
	SME3	0.485	0.016	31.313	< .001	0.455	0.516
	SME39	0.489	0.016	29.918	< .001	0.457	0.521
	SME18	0.467	0.015	31.218	< .001	0.438	0.497
	SME31	0.519	0.016	32.207	< .001	0.487	0.550
	SME47	0.174	0.015	11.970	< .001	0.146	0.203
	SME37	0.363	0.017	21.809	< .001	0.331	0.396
	SME27	0.286	0.015	18.500	< .001	0.256	0.316
	SME17	0.178	0.012	14.371	< .001	0.153	0.202
	SME29	0.260	0.013	19.844	< .001	0.234	0.286
	SME13	0.323	0.014	23.099	< .001	0.296	0.351
	SME22r	-0.015	0.014	-1.068	0.286	-0.042	0.012
	SME5	0.198	0.012	16.534	< .001	0.174	0.221
	SME14	0.264	0.015	17.962	< .001	0.235	0.293
	SME9r	-0.040	0.011	-3.719	< .001	-0.060	-0.019
	SME25	0.220	0.015	14.948	< .001	0.192	0.249
Cognitive	SME19r	-0.027	0.013	-1.987	0.047	-0.053	-3.656×10 ⁻⁴
	SME30	0.495	0.016	31.041	< .001	0.464	0.526
	SME48	0.458	0.017	26.612	< .001	0.424	0.491
	SME44	0.097	0.015	6.600	< .001	0.069	0.126
	SME41	0.380	0.015	24.782	< .001	0.350	0.410
	SME28	0.418	0.015	27.130	< .001	0.388	0.449
	SME38	0.404	0.016	25.504	< .001	0.373	0.435
	SME21	0.421	0.016	25.810	< .001	0.389	0.453
	SME33	0.378	0.017	21.944	< .001	0.344	0.411
	SME6	0.200	0.014	14.387	< .001	0.172	0.227
	SME43	0.301	0.015	19.725	< .001	0.271	0.331
	SME49	0.141	0.014	10.154	< .001	0.114	0.168

Factor variances

Factor	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
Affective	1.000	0.000			1.000	1.000
Behavior	1.000	0.000			1.000	1.000
Cognitive	1.000	0.000			1.000	1.000

Factor Covariances

							95% Confidence Interval	
			Estimate	Std. Error	z-value	p	Lower	Upper
Affective	↔	Behavior	0.783	0.032	24.139	< .001	0.720	0.847
Affective	↔	Cognitive	0.739	0.039	18.932	< .001	0.663	0.816
Behavior	↔	Cognitive	0.920	0.022	40.920	< .001	0.876	0.964

Residual variances

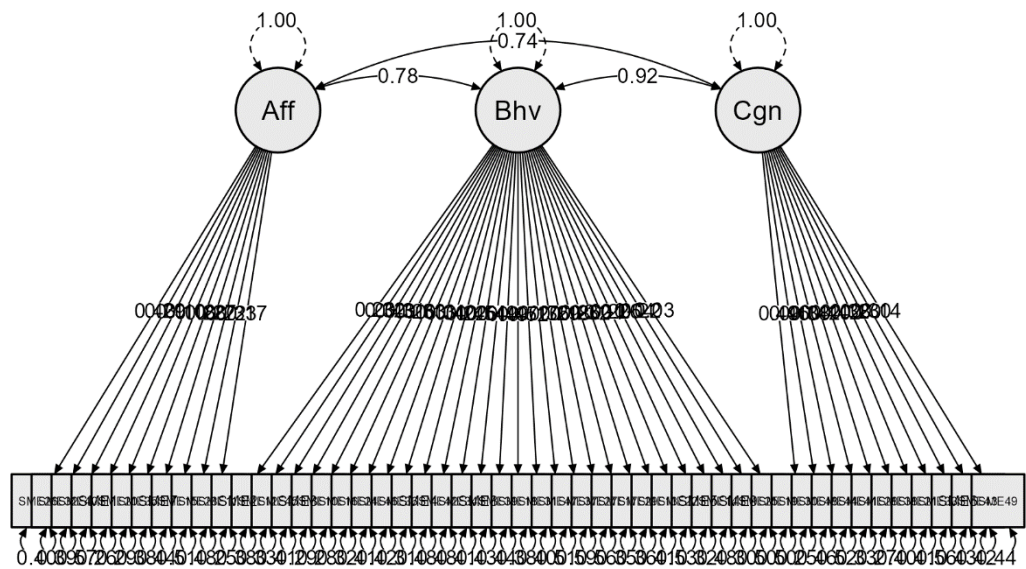
Indicator	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
SME26	0.401	0.041	9.678	< .001	0.320	0.482
SME32	0.386	0.040	9.605	< .001	0.307	0.464
SME40	0.571	0.049	11.658	< .001	0.475	0.667
SME1	0.262	0.019	13.528	< .001	0.224	0.300
SME20	0.295	0.027	11.051	< .001	0.243	0.347
SME35	0.383	0.032	11.858	< .001	0.320	0.447
SME7	0.444	0.036	12.172	< .001	0.373	0.516
SME15	0.509	0.041	12.424	< .001	0.428	0.589
SME23	0.482	0.042	11.429	< .001	0.399	0.564
SME11	0.255	0.028	9.214	< .001	0.200	0.309
SME2	0.383	0.030	12.664	< .001	0.324	0.442
SME12	0.330	0.031	10.708	< .001	0.270	0.391
SME45	0.414	0.039	10.625	< .001	0.338	0.490
SME8	0.295	0.037	7.983	< .001	0.222	0.367
SME10	0.283	0.029	9.714	< .001	0.226	0.340
SME16	0.319	0.033	9.560	< .001	0.253	0.384
SME24r	0.409	0.029	14.198	< .001	0.352	0.465
SME46	0.424	0.029	14.510	< .001	0.366	0.481
SME36	0.313	0.030	10.281	< .001	0.253	0.372
SME4	0.485	0.034	14.302	< .001	0.418	0.551
SME42	0.483	0.042	11.396	< .001	0.400	0.566
SME34	0.406	0.046	8.907	< .001	0.317	0.496
SME3	0.434	0.042	10.372	< .001	0.352	0.516
SME39	0.443	0.041	10.824	< .001	0.363	0.523
SME18	0.384	0.039	9.846	< .001	0.307	0.460
SME31	0.396	0.043	9.247	< .001	0.312	0.480
SME47	0.515	0.036	14.350	< .001	0.444	0.585
SME37	0.588	0.041	14.290	< .001	0.508	0.669
SME27	0.562	0.038	14.889	< .001	0.488	0.636

Residual variances

Indicator	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
SME17	0.345	0.034	10.268	< .001	0.279	0.411
SME29	0.357	0.033	10.715	< .001	0.291	0.422
SME13	0.414	0.035	11.674	< .001	0.344	0.483
SME22r	0.528	0.037	14.120	< .001	0.455	0.601
SME5	0.317	0.032	10.013	< .001	0.255	0.379
SME14	0.483	0.036	13.348	< .001	0.412	0.554
SME9r	0.298	0.026	11.619	< .001	0.248	0.348
SME25	0.505	0.037	13.510	< .001	0.432	0.578
SME19r	0.505	0.031	16.387	< .001	0.444	0.565
SME30	0.251	0.036	7.062	< .001	0.182	0.321
SME48	0.456	0.042	10.865	< .001	0.373	0.538
SME44	0.520	0.035	14.835	< .001	0.452	0.589
SME41	0.326	0.039	8.353	< .001	0.250	0.403
SME28	0.273	0.038	7.222	< .001	0.199	0.347
SME38	0.404	0.039	10.494	< .001	0.329	0.480
SME21	0.409	0.038	10.837	< .001	0.335	0.483
SME33	0.563	0.044	12.675	< .001	0.476	0.650
SME6	0.427	0.030	14.087	< .001	0.368	0.487
SME43	0.417	0.036	11.603	< .001	0.346	0.487
SME49	0.442	0.032	13.929	< .001	0.380	0.504

Plots

Model plot



Confirmatory Factor Analysis SMEAS (24-Items)

Model fit

Chi-square test

Model	X ²	df	p
Baseline model	5378.271	276	
Factor model	544.568	249	< .001

Additional fit measures

Fit indices

Index	Value
Comparative Fit Index (CFI)	0.942
Tucker-Lewis Index (TLI)	0.936
Bentler-Bonett Non-normed Fit Index (NNFI)	0.936
Bentler-Bonett Normed Fit Index (NFI)	0.899
Parsimony Normed Fit Index (PNFI)	0.811
Bollen's Relative Fit Index (RFI)	0.888
Bollen's Incremental Fit Index (IFI)	0.942
Relative Noncentrality Index (RNI)	0.942

Other fit measures

Metric	Value
Root mean square error of approximation (RMSEA)	0.052
RMSEA 90% CI lower bound	0.046
RMSEA 90% CI upper bound	0.058
RMSEA p-value	0.257
Standardized root mean square residual (SRMR)	0.075
Hoelter's critical N ($\alpha = .05$)	229.575
Hoelter's critical N ($\alpha = .01$)	243.145
Goodness of fit index (GFI)	0.949
McDonald fit index (MFI)	0.711
Expected cross validation index (ECVI)	1.490

Parameter estimates

Factor loadings

Factor	Indicator	Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Affective	SME32	0.286	0.021	13.964	< .001	0.246	0.327
	SME7	0.264	0.021	12.560	< .001	0.223	0.305

Factor loadings

Factor	Indicator	Estimate	Std. Error	z-value	p	95% Confidence Interval	
						Lower	Upper
Behavior	SME23	0.360	0.024	14.889	< .001	0.313	0.408
	SME26	0.474	0.026	18.435	< .001	0.423	0.524
	SME20	0.175	0.017	10.466	< .001	0.142	0.208
	SME35	0.291	0.019	15.362	< .001	0.254	0.328
	SME15	0.194	0.022	8.940	< .001	0.152	0.237
	SME11	0.145	0.016	9.337	< .001	0.115	0.176
	SME45	0.457	0.020	23.118	< .001	0.418	0.496
	SME16	0.322	0.017	19.089	< .001	0.289	0.355
	SME36	0.391	0.018	21.499	< .001	0.356	0.427
	SME34	0.559	0.022	25.604	< .001	0.516	0.602
	SME18	0.464	0.020	23.714	< .001	0.426	0.503
	SME31	0.543	0.021	25.484	< .001	0.501	0.584
Cognitive	SME13	0.294	0.018	16.662	< .001	0.259	0.328
	SME29	0.249	0.017	14.959	< .001	0.216	0.282
	SME30	0.516	0.019	26.465	< .001	0.477	0.554
	SME48	0.470	0.021	22.541	< .001	0.429	0.511
	SME41	0.393	0.019	21.066	< .001	0.356	0.429
	SME28	0.427	0.019	22.833	< .001	0.391	0.464
	SME38	0.409	0.019	21.204	< .001	0.371	0.447
	SME21	0.427	0.020	21.555	< .001	0.388	0.465
	SME33	0.370	0.021	17.570	< .001	0.329	0.411
	SME43	0.296	0.019	15.896	< .001	0.259	0.332

Factor variances

Factor	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
Affective	1.000	0.000			1.000	1.000
Behavior	1.000	0.000			1.000	1.000
Cognitive	1.000	0.000			1.000	1.000

Factor Covariances

							95% Confidence Interval	
			Estimate	Std. Error	z-value	p	Lower	Upper
Affective	↔	Behavior	0.739	0.040	18.556	< .001	0.661	0.817
Affective	↔	Cognitive	0.689	0.039	17.865	< .001	0.613	0.764
Behavior	↔	Cognitive	0.884	0.030	29.159	< .001	0.825	0.943

Residual variances

Indicator	Estimate	Std. Error	z-value	p	95% Confidence Interval	
					Lower	Upper
SME32	0.387	0.041	9.533	< .001	0.308	0.467
SME7	0.445	0.037	12.025	< .001	0.372	0.517
SME23	0.460	0.044	10.515	< .001	0.374	0.546
SME26	0.362	0.045	8.130	< .001	0.275	0.449
SME20	0.298	0.027	11.090	< .001	0.245	0.350
SME35	0.376	0.033	11.378	< .001	0.311	0.440
SME15	0.518	0.041	12.622	< .001	0.438	0.599
SME11	0.263	0.028	9.515	< .001	0.209	0.317
SME45	0.392	0.041	9.569	< .001	0.311	0.472
SME16	0.321	0.034	9.469	< .001	0.255	0.388
SME36	0.319	0.032	10.089	< .001	0.257	0.382
SME34	0.384	0.049	7.904	< .001	0.289	0.479
SME18	0.387	0.041	9.511	< .001	0.307	0.466
SME31	0.371	0.046	8.110	< .001	0.281	0.461
SME13	0.432	0.036	12.068	< .001	0.362	0.502
SME29	0.362	0.034	10.772	< .001	0.296	0.428
SME30	0.230	0.038	6.112	< .001	0.156	0.304
SME48	0.445	0.044	10.214	< .001	0.359	0.530
SME41	0.316	0.040	7.899	< .001	0.238	0.395
SME28	0.266	0.039	6.809	< .001	0.189	0.342
SME38	0.400	0.040	10.082	< .001	0.322	0.477
SME21	0.404	0.039	10.357	< .001	0.328	0.480
SME33	0.568	0.045	12.571	< .001	0.480	0.657
SME43	0.420	0.036	11.536	< .001	0.349	0.492

Plots

Model plot

