

Results

Descriptives

Descriptives

Recency	
N	2239
Missing	0
Mean	49.1
Median	49
Standard deviation	29.0
Minimum	0
Maximum	99

Reliability Analysis

Scale Reliability Statistics

Cronbach's α	
scale	0.642
[3]	

Item Reliability Statistics

If item dropped	
Cronbach's α	
NumDealsPurchases	0.725
NumWebPurchases	0.476
NumCatalogPurchases	0.542
NumStorePurchases	0.449

Reliability Analysis

Scale Reliability Statistics

Cronbach's α	
scale	0.588
[3]	

Item Reliability Statistics

If item dropped	
Cronbach's α	
AcceptedCmp1	0.503
AcceptedCmp2	0.572
AcceptedCmp3	0.614
AcceptedCmp4	0.563
AcceptedCmp5	0.481
Response	0.496

Reliability Analysis

Scale Reliability Statistics

Cronbach's α	
scale	0.627
[3]	

Item Reliability Statistics

	If item dropped
	Cronbach's α
MntWines	0.595
MntFruits	0.609
MntMeatProducts	0.421
MntFishProducts	0.592
MntSweetProducts	0.609
MntGoldProds	0.609

Reliability Analysis

Scale Reliability Statistics

	Cronbach's α
scale	0.0519

[3]

Item Reliability Statistics

	If item dropped
	Cronbach's α
YearsAsCustomer	-0.00197
Complain_rev ^a	0.07048
NumStorePurchases	0.02212

^a reverse scaled item

Structural Equation Modelling

Models Info

Estimation Method	ML
Optimization Method	NLMINB
Number of observations	2239
Free parameters	42
Standard errors	Robust Huber and White
Scaled test	Yuan-Bentler T2*
Converged	TRUE
Iterations	205
Model	Spending = ~MntFishProducts + MntSweetProducts + MntMeatProducts + MntGoldProds + MntFruits + MntWines Engagement = ~NumStorePurchases + NumWebPurchases PromotionSensitivity = ~AcceptedCmp5 + Response + AcceptedCmp4 + AcceptedCmp3 + AcceptedCmp1 Spending ~~ Engagement Spending ~~ PromotionSensitivity Engagement ~~ PromotionSensitivity

Note. lavaan->lav_data_full(): some observed variances are (at least) a factor 1000 times larger than others; use varTable(fit) to investigate

Note. lavaan->lav_model_vcov(): The variance-covariance matrix of the estimated parameters (vcov) does not appear to be positive definite! The smallest eigenvalue (= -3.817251e-11) is smaller than zero. This may be a symptom that the model is not identified.

Note. Factors scores (latent predicted values) saved in the dataset. Varnames: PRFS_Spending, PRFS_Engagement, PRFS_PromotionSensitivity, PRFS_MntFishProducts, PRFS_MntSweetProducts, PRFS_MntMeatProducts, PRFS_MntGoldProds, PRFS_MntFruits, PRFS_MntWines, PRFS_NumStorePurchases, PRFS_NumWebPurchases, PRFS_AcceptedCmp5, PRFS_Response, PRFS_AcceptedCmp4, PRFS_AcceptedCmp3, PRFS_AcceptedCmp1

[4] [5]

Overall Tests

Model tests

Label	X ²	df	p
User Model	2074	62	<.001
Baseline Model	10105	78	<.001
Scaled User	1113	62	<.001

Model tests

Scaled Baseline 4759 78 <.001

Fit indices

Type	95% Confidence Intervals				
	SRMR	RMSEA	Lower	Upper	RMSEA p
Classical	0.067	0.120	0.116	0.125	<.001
Robust	0.067	0.119	0.113	0.125	<.001
Scaled	0.067	0.087	0.084	0.090	<.001

User model versus baseline model

	Model	Scaled	Robust
Comparative Fit Index (CFI)	0.799	0.775	0.804
Tucker-Lewis Index (TLI)	0.748	0.718	0.753
Bentler-Bonett Non-normed Fit Index (NNFI)	0.748	0.718	0.753
Relative Noncentrality Index (RNI)	0.799	0.775	0.804
Bentler-Bonett Normed Fit Index (NFI)	0.795	0.766	
Bollen's Relative Fit Index (RFI)	0.742	0.706	
Bollen's Incremental Fit Index (IFI)	0.800	0.776	
Parsimony Normed Fit Index (PNFI)	0.632	0.609	

Additional fit indices

	Model
Hoelter Critical N (CN), $\alpha=0.05$	88.853
Hoelter Critical N (CN), $\alpha=0.01$	99.022
Goodness of Fit Index (GFI)	0.910
Adjusted Goodness of Fit Index (AGFI)	0.849
Parsimony Goodness of Fit Index (PGFI)	0.542
McDonald Fit Index (MFI)	0.638
Expected Cross-Validation Index (ECVI)	0.964
Loglikelihood user model (H0)	-87275.273
Loglikelihood unrestricted model (H1)	-86238.241
Akaike (AIC)	174634.546
Bayesian (BIC)	174874.525
Sample-size adjusted Bayesian (SABIC)	174741.084

Estimates

Measurement model

Label	Latent	Observed	Estimate	SE	95% Confidence Intervals				
					Lower	Upper	β	z	p
p1	Spending	MntFishProducts	1.000	0.0000	1.000	1.000	0.711		
p2		MntSweetProducts	0.731	0.0288	0.674	0.787	0.688	25.40	<.001
p3		MntMeatProducts	4.367	0.1844	4.005	4.728	0.752	23.68	<.001
p4		MntGoldProds	0.729	0.0351	0.660	0.798	0.543	20.76	<.001
p5		MntFruits	0.710	0.0278	0.655	0.764	0.693	25.53	<.001
p6		MntWines	6.261	0.3547	5.566	6.957	0.723	17.65	<.001
p7	Engagement	NumStorePurchases	1.000	0.0000	1.000	1.000	0.827		
p8		NumWebPurchases	0.628	0.0260	0.577	0.679	0.608	24.16	<.001
p9	PromotionSensitivity	AcceptedCmp5	1.000	0.0000	1.000	1.000	0.704		
p10		Response	0.931	0.0792	0.776	1.086	0.478	11.76	<.001
p11		AcceptedCmp4	0.535	0.0658	0.406	0.664	0.373	8.13	<.001
p12		AcceptedCmp3	0.213	0.0551	0.105	0.321	0.150	3.88	<.001
p13		AcceptedCmp1	0.814	0.0738	0.669	0.959	0.607	11.03	<.001

Variances and Covariances

Label	Variable 1	Variable 2	Estimate	SE	95% Confidence Intervals			β	z	p
					Lower	Upper				
p14	Spending	Engagement	88.4244	3.46963	81.6240	95.2247	0.847	25.49	<.001	
p15	Spending	PromotionSensitivity	4.1019	0.34576	3.4242	4.7796	0.577	11.86	<.001	
p16	Engagement	PromotionSensitivity	0.1725	0.01688	0.1394	0.2056	0.351	10.22	<.001	
p17	MntFishProducts	MntFishProducts	1474.4780	93.67679	1290.8748	1658.0811	0.494	15.74	<.001	
p18	MntSweetProducts	MntSweetProducts	897.7889	64.74165	770.8976	1024.6802	0.527	13.87	<.001	
p19	MntMeatProducts	MntMeatProducts	22156.2059	3093.48092	16093.0948	28219.3171	0.435	7.16	<.001	
p20	MntGoldProds	MntGoldProds	1919.1814	112.85058	1697.9983	2140.3644	0.705	17.01	<.001	
p21	MntFruits	MntFruits	821.0424	53.10949	716.9498	925.1351	0.519	15.46	<.001	
p22	MntWines	MntWines	54090.4638	3865.18716	46514.8361	61666.0914	0.478	13.99	<.001	
p23	NumStorePurchases	NumStorePurchases	3.3380	0.36416	2.6242	4.0517	0.316	9.17	<.001	
p24	NumWebPurchases	NumWebPurchases	4.8689	0.48858	3.9113	5.8265	0.631	9.97	<.001	
p25	AcceptedCmp5	AcceptedCmp5	0.0340	0.00298	0.0282	0.0398	0.504	11.42	<.001	
p26	Response	Response	0.0979	0.00532	0.0875	0.1083	0.771	18.41	<.001	
p27	AcceptedCmp4	AcceptedCmp4	0.0594	0.00415	0.0513	0.0676	0.861	14.33	<.001	
p28	AcceptedCmp3	AcceptedCmp3	0.0660	0.00455	0.0571	0.0749	0.977	14.51	<.001	
p29	AcceptedCmp1	AcceptedCmp1	0.0380	0.00304	0.0320	0.0439	0.631	12.50	<.001	
p30	Spending	Spending	1509.2186	108.08198	1297.3818	1721.0554	1.000	13.96	<.001	
p31	Engagement	Engagement	7.2243	0.40199	6.4364	8.0122	1.000	17.97	<.001	
p32	PromotionSensitivity	PromotionSensitivity	0.0335	0.00429	0.0251	0.0419	1.000	7.81	<.001	

Intercepts

Label	Variable	Intercept	SE	95% Confidence Intervals			z	p
				Lower	Upper			
p33	MntFishProducts	37.542	1.154	35.280	39.805	32.521	<.001	
p34	MntSweetProducts	27.074	0.872	25.364	28.784	31.036	<.001	
p35	MntMeatProducts	167.022	4.770	157.674	176.370	35.018	<.001	
p36	MntGoldProds	44.041	1.102	41.881	46.202	39.953	<.001	
p37	MntFruits	26.312	0.841	24.664	27.959	31.305	<.001	
p38	MntWines	304.069	7.112	290.129	318.009	42.753	<.001	
p39	NumStorePurchases	5.792	0.069	5.657	5.926	84.327	<.001	
p40	NumWebPurchases	4.086	0.059	3.971	4.201	69.602	<.001	
p41	AcceptedCmp5	0.073	0.005	0.062	0.084	13.259	<.001	
p42	Response	0.149	0.008	0.134	0.164	19.813	<.001	
p43	AcceptedCmp4	0.075	0.006	0.064	0.085	13.434	<.001	
p44	AcceptedCmp3	0.073	0.005	0.062	0.084	13.259	<.001	
p45	AcceptedCmp1	0.064	0.005	0.054	0.074	12.406	<.001	
p46	Spending	0.000	0.000	0.000	0.000			
p47	Engagement	0.000	0.000	0.000	0.000			
p48	PromotionSensitivity	0.000	0.000	0.000	0.000			

Covariances and correlations

Fitted covariances (lower triangle) and correlations (upper triangle)

	MntFishProducts	MntSweetProducts	MntMeatProducts	MntGoldProds	MntFruits	MntWines	NumStorePurchases	NumWebPurchases	AcceptedCmp5
MntFishProducts	2983.697	0.489	0.535	0.386	0.493	0.514	0.4981	0.3659	0.28904
MntSweetProducts	1102.926	1703.799	0.517	0.373	0.477	0.497	0.4817	0.3538	0.27952
MntMeatProducts	6590.507	4816.294	50935.853	0.408	0.521	0.543	0.5264	0.3867	0.30548
MntGoldProds	1099.790	803.718	4802.600	2720.615	0.376	0.392	0.3801	0.2792	0.22057
MntFruits	1071.464	783.018	4678.904	780.791	1581.724	0.501	0.4857	0.3568	0.28183
MntWines	9449.683	6905.760	41265.196	6886.124	6708.765	113257.846	0.5062	0.3718	0.29374
NumStorePurchases	88.424	64.620	386.134	64.436	62.777	553.652	10.5623	0.5024	0.20427
NumWebPurchases	55.520	40.574	242.447	40.458	39.416	347.629	4.5360	7.7170	0.15005
AcceptedCmp5	4.102	2.998	17.912	2.989	2.912	25.683	0.1725	0.1083	0.06750
Response	3.818	2.790	16.671	2.782	2.710	23.904	0.1605	0.1008	0.03117
AcceptedCmp4	2.195	1.604	9.585	1.599	1.558	13.743	0.0923	0.0580	0.01792
AcceptedCmp3	0.875	0.640	3.823	0.638	0.622	5.481	0.0368	0.0231	0.00715
AcceptedCmp1	3.339	2.440	14.581	2.433	2.371	20.907	0.1404	0.0882	0.02727

Residual covariances (lower triangle) and correlations (upper triangle)

	MntFishProducts	MntSweetProducts	MntMeatProducts	MntGoldProds	MntFruits	MntWines	NumStorePurchases	NumWebPurchases	AcceptedCmp5
MntFishProducts	-3.48e-4	0.09062	0.03371	0.03672	0.1015	-0.11446	-0.03841	-0.07244	-0.08952
MntSweetProducts	204.326	-2.45e-4	0.00675	-0.00372	0.0901	-0.11069	-0.03309	-0.00548	-0.01998
MntMeatProducts	415.534	62.91547	0.00132	-0.05753	0.0218	0.01925	-0.04695	-0.09318	0.06825
MntGoldProds	104.620	-7.99978	-677.28112	8.22e-6	0.0165	-0.00497	0.00131	0.14238	-0.03962
MntFruits	220.558	147.95146	195.27210	34.21581	-5.01e-4	-0.11172	-0.02403	-0.06020	-0.06605
MntWines	-2104.055	-1537.59760	1462.00997	-87.31881	-1495.2967	0.02909	0.13574	0.17023	0.17886
NumStorePurchases	-6.819	-4.43874	-34.43762	0.22136	-3.1064	148.46900	-4.46e-6	-2.16e-7	0.01044
NumWebPurchases	-10.992	-0.62791	-58.42244	20.63099	-6.6509	159.14359	-3.02e-6	-3.97e-7	-0.01147
AcceptedCmp5	-1.270	-0.21428	4.00177	-0.53698	-0.6825	15.63831	0.00881	-0.00828	-1.18e-8
Response	-1.653	-1.06541	2.32324	-0.18564	-0.9364	5.72723	-0.11519	0.04624	-9.44e-4
AcceptedCmp4	-1.954	-1.29422	-3.48722	-1.29568	-1.4529	19.25817	0.06079	0.05576	0.00300
AcceptedCmp3	-0.872	-0.62418	-2.75665	1.02900	-0.4700	-0.05149	-0.09401	0.00723	-0.00173
AcceptedCmp1	0.154	0.00793	2.56604	-0.30503	-0.4710	8.32605	0.00563	0.01751	-0.00158

Modification indices

Modification indices

		Modif. index	EPC	sEPC (LV)	sEPC (all)	sEPC (nox)
MntWines	~~ AcceptedCmp4	253.37269	21.061	21.061	0.371	0.371
Engagement	=~ MntWines	217.77572	90.881	244.271	0.726	0.726
MntWines	~~ AcceptedCmp5	124.57312	13.136	13.136	0.306	0.306
Response	~~ AcceptedCmp3	113.99204	0.019	0.019	0.242	0.242
MntGoldProds	~~ NumWebPurchases	94.94853	21.977	21.977	0.227	0.227
Engagement	=~ MntMeatProducts	84.13940	-37.194	-99.971	-0.443	-0.443
MntMeatProducts	~~ NumWebPurchases	66.13146	-68.473	-68.473	-0.208	-0.208
MntFishProducts	~~ AcceptedCmp4	57.12738	-1.643	-1.643	-0.175	-0.175
PromotionSensitivity	=~ MntFruits	56.03663	-43.980	-8.049	-0.202	-0.202
MntFruits	~~ AcceptedCmp4	55.33794	-1.198	-1.198	-0.171	-0.171
AcceptedCmp4	~~ AcceptedCmp3	52.99631	-0.010	-0.010	-0.160	-0.160
PromotionSensitivity	=~ MntFishProducts	51.27039	-56.989	-10.430	-0.191	-0.191
MntFishProducts	~~ AcceptedCmp5	50.29571	-1.369	-1.369	-0.193	-0.193
NumStorePurchases	~~ Response	47.93073	-0.116	-0.116	-0.203	-0.203
MntSweetProducts	~~ AcceptedCmp4	45.49959	-1.134	-1.134	-0.155	-0.155
NumStorePurchases	~~ AcceptedCmp4	44.48602	0.084	0.084	0.190	0.190
MntFishProducts	~~ NumWebPurchases	41.43177	-13.552	-13.552	-0.160	-0.160
MntGoldProds	~~ AcceptedCmp3	39.45719	1.539	1.539	0.137	0.137
NumStorePurchases	~~ AcceptedCmp3	34.75409	-0.076	-0.076	-0.162	-0.162
MntFruits	~~ NumWebPurchases	30.21097	-8.544	-8.544	-0.135	-0.135
NumWebPurchases	~~ Response	26.75359	0.084	0.084	0.122	0.122
MntMeatProducts	~~ AcceptedCmp4	21.95058	-4.029	-4.029	-0.111	-0.111
AcceptedCmp5	~~ AcceptedCmp1	21.91857	-0.008	-0.008	-0.223	-0.223
AcceptedCmp5	~~ AcceptedCmp4	21.58311	0.006	0.006	0.145	0.145
Engagement	=~ MntGoldProds	19.60044	4.712	12.664	0.243	0.243
MntGoldProds	~~ AcceptedCmp4	18.00202	-1.008	-1.008	-0.094	-0.094
Engagement	=~ AcceptedCmp3	17.65923	-0.011	-0.029	-0.112	-0.112
Engagement	=~ MntFishProducts	16.84308	-4.133	-11.110	-0.203	-0.203
MntSweetProducts	~~ NumStorePurchases	16.43905	-6.854	-6.854	-0.125	-0.125
Engagement	=~ Response	15.90163	-0.014	-0.037	-0.104	-0.104
MntFishProducts	~~ NumStorePurchases	15.46154	-8.665	-8.665	-0.124	-0.124
PromotionSensitivity	=~ MntSweetProducts	15.01958	-23.735	-4.344	-0.105	-0.105
NumWebPurchases	~~ AcceptedCmp4	14.28242	0.047	0.047	0.087	0.087
MntMeatProducts	~~ AcceptedCmp5	14.08840	2.882	2.882	0.105	0.105
MntFruits	~~ AcceptedCmp5	13.25858	-0.520	-0.520	-0.098	-0.098
NumWebPurchases	~~ AcceptedCmp5	12.50896	-0.039	-0.039	-0.095	-0.095
PromotionSensitivity	=~ MntGoldProds	11.76916	-29.215	-5.347	-0.103	-0.103
MntMeatProducts	~~ Response	11.46446	3.829	3.829	0.082	0.082
Spending	=~ AcceptedCmp3	10.96918	-0.001	-0.026	-0.101	-0.101
Spending	=~ Response	10.23282	-0.001	-0.035	-0.098	-0.098
MntFishProducts	~~ AcceptedCmp1	10.20968	0.600	0.600	0.080	0.080
NumWebPurchases	~~ AcceptedCmp3	9.74941	0.040	0.040	0.070	0.070
MntFishProducts	~~ Response	7.11129	-0.762	-0.762	-0.063	-0.063
MntSweetProducts	~~ Response	6.80442	-0.576	-0.576	-0.061	-0.061
MntGoldProds	~~ NumStorePurchases	6.70669	-6.018	-6.018	-0.075	-0.075
Spending	=~ AcceptedCmp1	6.56774	0.001	0.020	0.084	0.084
MntFruits	~~ NumStorePurchases	6.05277	-3.992	-3.992	-0.076	-0.076
MntFruits	~~ AcceptedCmp1	5.76907	-0.334	-0.334	-0.060	-0.060
Spending	=~ AcceptedCmp5	5.27907	0.001	0.022	0.083	0.083
AcceptedCmp5	~~ AcceptedCmp3	5.15774	-0.003	-0.003	-0.063	-0.063
Engagement	=~ MntFruits	4.94454	-1.650	-4.434	-0.111	-0.111
Spending	=~ AcceptedCmp4	4.56100	-0.000	-0.017	-0.065	-0.065
MntGoldProds	~~ AcceptedCmp5	4.53814	-0.445	-0.445	-0.055	-0.055
Spending	=~ NumStorePurchases	4.35239	-0.030	-1.180	-0.363	-0.363
Spending	=~ NumWebPurchases	4.35118	0.019	0.741	0.267	0.267
PromotionSensitivity	=~ NumStorePurchases	4.35072	-1.380	-0.253	-0.078	-0.078
PromotionSensitivity	=~ NumWebPurchases	4.35062	0.866	0.159	0.057	0.057
Engagement	=~ MntSweetProducts	4.27100	-1.597	-4.293	-0.104	-0.104
AcceptedCmp4	~~ AcceptedCmp1	4.00788	0.003	0.003	0.053	0.053

Modification indices

MntGoldProds	~~	Response	3.45033	0.579	0.579	0.042	0.042
Engagement	=~	AcceptedCmp1	3.31067	0.004	0.012	0.049	0.049
MntWines	~~	Response	3.10526	3.064	3.064	0.042	0.042
MntWines	~~	AcceptedCmp1	2.84861	1.931	1.931	0.043	0.043
Engagement	=~	AcceptedCmp4	2.55561	0.004	0.011	0.042	0.042
NumStorePurchases	~~	AcceptedCmp5	2.12518	0.018	0.018	0.052	0.052
MntSweetProducts	~~	AcceptedCmp3	2.10863	-0.251	-0.251	-0.033	-0.033
MntMeatProducts	~~	AcceptedCmp3	2.00554	-1.253	-1.253	-0.033	-0.033
MntFishProducts	~~	AcceptedCmp3	1.91748	-0.310	-0.310	-0.031	-0.031
Engagement	=~	AcceptedCmp5	1.86412	0.004	0.010	0.040	0.040
AcceptedCmp5	~~	Response	1.68133	-0.003	-0.003	-0.046	-0.046
MntWines	~~	AcceptedCmp3	1.53446	1.687	1.687	0.028	0.028
MntGoldProds	~~	AcceptedCmp1	1.24434	-0.228	-0.228	-0.027	-0.027
MntFruits	~~	Response	0.74675	-0.183	-0.183	-0.020	-0.020
MntSweetProducts	~~	AcceptedCmp5	0.52384	-0.108	-0.108	-0.020	-0.020
NumStorePurchases	~~	AcceptedCmp1	0.38371	-0.007	-0.007	-0.020	-0.020
MntSweetProducts	~~	AcceptedCmp1	0.32834	0.083	0.083	0.014	0.014
MntMeatProducts	~~	AcceptedCmp1	0.22600	0.354	0.354	0.012	0.012
Response	~~	AcceptedCmp1	0.11115	0.001	0.001	0.010	0.010
MntSweetProducts	~~	NumWebPurchases	0.06933	-0.427	-0.427	-0.006	-0.006
AcceptedCmp3	~~	AcceptedCmp1	0.05694	0.000	0.000	0.006	0.006
MntFruits	~~	AcceptedCmp3	0.04861	-0.037	-0.037	-0.005	-0.005
NumWebPurchases	~~	AcceptedCmp1	0.00874	0.001	0.001	0.002	0.002
Response	~~	AcceptedCmp4	0.00661	-0.000	-0.000	-0.002	-0.002

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