

Social Media Outputs v2

2025-12-16

Model Comparisons ANOVA Tables, Regression Outputs, and Post-Hoc Tests

Model Comparisons

Tests between demand models with and without social media measures (i.e., BSMAS, SMEQ, and SMDS).

smptSNDMLM = No social media covariates

smptSNDMLMSM = With covariates no interactions

smptSNDMLMInt = With covariates and interactions

##	Model	df	AIC	BIC	logLik	Test	L.Ratio	p-value
##	smptSNDMLM	1 20	187838.4	187996.1	-93899.19			
##	smptSNDMLMSM	2 26	187823.1	188028.2	-93885.57	1 vs 2	27.2347	1e-04
##	smptSNDMLMInt	3 44	187540.6	187887.6	-93726.30	2 vs 3	318.5451	<.0001

Tests between demand models without any social media measures and with social media measures and interactions .

##	Model	df	AIC	BIC	logLik	Test	L.Ratio	p-value
##	smptSNDMLM	1 20	187838.4	187996.1	-93899.19			
##	smptSNDMLMSM	2 26	187823.1	188028.2	-93885.57	1 vs 2	27.23471	1e-04

ANOVA tables for all three models

No Covariates

##		numDF	denDF	F-value	p-value
##	q0.(Intercept)	1	19327	667.297	<.0001
##	q0.condition	3	19327	74.421	<.0001
##	alpha.(Intercept)	1	19327	175.382	<.0001
##	alpha.condition	3	19327	14.413	<.0001

Social Media Covariates no Interactions

##		numDF	denDF	F-value	p-value
##	q0.(Intercept)	1	19321	116.354	<.0001
##	q0.condition	3	19321	78.035	<.0001
##	q0.BSMAS	1	19321	0.163	0.687
##	q0.SMEQ	1	19321	5.302	0.021

## q0.SMDS	1	19321	1.831	0.176
## alpha.(Intercept)	1	19321	7.781	0.005
## alpha.condition	3	19321	14.616	<.0001
## alpha.BSMAS	1	19321	1.590	0.207
## alpha.SMEQ	1	19321	0.001	0.971
## alpha.SMDS	1	19321	0.730	0.393

Social Media Covariates with Interactions with Condition

##	numDF	denDF	F-value	p-value
## q0.(Intercept)	1	19303	17.688	<.0001
## q0.condition	3	19303	11.198	<.0001
## q0.BSMAS	1	19303	0.281	0.596
## q0.SMEQ	1	19303	3.455	0.063
## q0.SMDS	1	19303	12.907	<.0001
## q0.condition:BSMAS	3	19303	1.149	0.328
## q0.condition:SMEQ	3	19303	1.022	0.382
## q0.condition:SMDS	3	19303	3.159	0.024
## alpha.(Intercept)	1	19303	3.793	0.051
## alpha.condition	3	19303	0.922	0.429
## alpha.BSMAS	1	19303	4.457	0.035
## alpha.SMEQ	1	19303	2.547	0.111
## alpha.SMDS	1	19303	0.557	0.456
## alpha.condition:BSMAS	3	19303	1.252	0.289
## alpha.condition:SMEQ	3	19303	2.428	0.063
## alpha.condition:SMDS	3	19303	1.379	0.247

Regression tables for all three models

No Covariates

##	Value	Std.Error	DF	t-value	p-value
## q0.(Intercept)	1.300	0.050	19327	25.832	0.000
## q0.conditionAutomatic	0.713	0.056	19327	12.813	0.000
## q0.conditionEscape	0.697	0.052	19327	13.382	0.000
## q0.conditionTangible	0.770	0.053	19327	14.658	0.000
## alpha.(Intercept)	-1.022	0.077	19327	-13.243	0.000
## alpha.conditionAutomatic	-0.347	0.058	19327	-5.979	0.000
## alpha.conditionEscape	-0.167	0.065	19327	-2.553	0.011
## alpha.conditionTangible	-0.286	0.063	19327	-4.559	0.000

Social Media Covariates no Interactions

##	Value	Std.Error	DF	t-value	p-value
## q0.(Intercept)	1.062	0.098	19321	10.787	0.000
## q0.conditionAutomatic	0.712	0.055	19321	12.945	0.000
## q0.conditionEscape	0.693	0.051	19321	13.461	0.000
## q0.conditionTangible	0.788	0.052	19321	15.120	0.000
## q0.BSMAS	0.002	0.006	19321	0.404	0.687
## q0.SMEQ	0.006	0.003	19321	2.303	0.021
## q0.SMDS	0.020	0.015	19321	1.353	0.176
## alpha.(Intercept)	-0.646	0.232	19321	-2.789	0.005

```
## alpha.conditionAutomatic -0.351    0.057 19321 -6.112    0.000
## alpha.conditionEscape    -0.175    0.065 19321 -2.699    0.007
## alpha.conditionTangible  -0.283    0.062 19321 -4.528    0.000
## alpha.BSMAS              -0.019    0.015 19321 -1.261    0.207
## alpha.SMEQ               0.000    0.007 19321  0.036    0.971
## alpha.SMDS               -0.032    0.037 19321 -0.854    0.393
```

Social Media Covariates with Interactions with Condition

```
##                               Value Std.Error    DF t-value p-value
## q0.(Intercept)              0.847     0.201 19303   4.206  0.000
## q0.conditionAutomatic        0.769     0.224 19303   3.425  0.001
## q0.conditionEscape           0.768     0.213 19303   3.608  0.000
## q0.conditionTangible         1.178     0.212 19303   5.557  0.000
## q0.BSMAS                    -0.007     0.013 19303  -0.530  0.596
## q0.SMEQ                     0.012     0.006 19303   1.859  0.063
## q0.SMDS                     0.113     0.032 19303   3.593  0.000
## q0.conditionAutomatic:BSMAS  0.019     0.015 19303   1.300  0.194
## q0.conditionEscape:BSMAS     0.012     0.014 19303   0.894  0.371
## q0.conditionTangible:BSMAS   0.003     0.014 19303   0.184  0.854
## q0.conditionAutomatic:SMEQ  -0.004     0.007 19303  -0.632  0.527
## q0.conditionEscape:SMEQ     -0.003     0.007 19303  -0.503  0.615
## q0.conditionTangible:SMEQ   -0.009     0.007 19303  -1.385  0.166
## q0.conditionAutomatic:SMDS  -0.101     0.035 19303  -2.860  0.004
## q0.conditionEscape:SMDS     -0.090     0.033 19303  -2.713  0.007
## q0.conditionTangible:SMDS   -0.095     0.034 19303  -2.832  0.005
## alpha.(Intercept)          -0.600     0.308 19303  -1.947  0.051
## alpha.conditionAutomatic    -0.326     0.237 19303  -1.376  0.169
## alpha.conditionEscape       -0.339     0.256 19303  -1.326  0.185
## alpha.conditionTangible     -0.409     0.247 19303  -1.657  0.097
## alpha.BSMAS                 -0.042     0.020 19303  -2.111  0.035
## alpha.SMEQ                  0.015     0.010 19303   1.596  0.111
## alpha.SMDS                  -0.035     0.047 19303  -0.746  0.456
## alpha.conditionAutomatic:BSMAS 0.019     0.015 19303   1.300  0.194
## alpha.conditionEscape:BSMAS   0.031     0.016 19303   1.925  0.054
## alpha.conditionTangible:BSMAS 0.021     0.016 19303   1.333  0.182
## alpha.conditionAutomatic:SMEQ -0.015     0.007 19303  -2.053  0.040
## alpha.conditionEscape:SMEQ   -0.022     0.008 19303  -2.695  0.007
## alpha.conditionTangible:SMEQ -0.016     0.008 19303  -2.105  0.035
## alpha.conditionAutomatic:SMDS 0.000     0.034 19303  -0.012  0.990
## alpha.conditionEscape:SMDS    0.039     0.037 19303   1.042  0.297
## alpha.conditionTangible:SMDS 0.044     0.036 19303   1.217  0.224
```

Post-hoc contrasts for Model with No Social Media Demographics

Q_0 by condition

```
## $emmeans
##   condition emmean      SE    df lower.CL upper.CL
## Attention   1.30 0.0503 19327    1.20    1.40
## Automatic   2.01 0.0338 19327    1.95    2.08
## Escape      2.00 0.0277 19327    1.94    2.05
```

```
## Tangible      2.07 0.0284 19327      2.01      2.13
##
## Confidence level used: 0.95
##
## $contrasts
## contrast      estimate      SE      df t.ratio p.value
## Attention - Automatic -0.7127 0.0556 19327 -12.816 <.0001
## Attention - Escape     -0.6969 0.0521 19327 -13.385 <.0001
## Attention - Tangible   -0.7696 0.0525 19327 -14.661 <.0001
## Automatic - Escape      0.0158 0.0364 19327  0.433 0.9728
## Automatic - Tangible   -0.0569 0.0369 19327 -1.541 0.4131
## Escape - Tangible      -0.0727 0.0315 19327 -2.309 0.0960
##
## P value adjustment: tukey method for comparing a family of 4 estimates
```

α by condition

```
## $emmeans
## condition emmean      SE      df lower.CL upper.CL
## Attention -1.02 0.0771 19327   -1.17   -0.87
## Automatic -1.37 0.0620 19327   -1.49   -1.25
## Escape     -1.19 0.0679 19327   -1.32   -1.06
## Tangible   -1.31 0.0654 19327   -1.44   -1.18
##
## Confidence level used: 0.95
##
## $contrasts
## contrast      estimate      SE      df t.ratio p.value
## Attention - Automatic  0.3473 0.0581 19327  5.980 <.0001
## Attention - Escape     0.1666 0.0653 19327  2.553 0.0521
## Attention - Tangible   0.2858 0.0627 19327  4.560 <.0001
## Automatic - Escape     -0.1807 0.0463 19327 -3.905 0.0005
## Automatic - Tangible   -0.0615 0.0427 19327 -1.439 0.4747
## Escape - Tangible      0.1192 0.0510 19327  2.338 0.0896
##
## P value adjustment: tukey method for comparing a family of 4 estimates
```

Post-hoc contrasts for Model with Social Media Demographic Interactions

Q_0 by Condition

NOTE: Results may be misleading due to involvement in interactions

```
## $emmeans
## condition emmean      SE      df lower.CL upper.CL
## Attention  1.34 0.0501 19303    1.24    1.44
## Automatic  2.01 0.0338 19303    1.95    2.08
## Escape     1.97 0.0283 19303    1.91    2.02
## Tangible   2.07 0.0285 19303    2.01    2.13
##
```

```
## Confidence level used: 0.95
##
## $contrasts
## contrast estimate SE df t.ratio p.value
## Attention - Automatic -0.6739 0.0557 19303 -12.094 <.0001
## Attention - Escape -0.6271 0.0526 19303 -11.927 <.0001
## Attention - Tangible -0.7289 0.0527 19303 -13.825 <.0001
## Automatic - Escape 0.0467 0.0374 19303 1.247 0.5966
## Automatic - Tangible -0.0550 0.0376 19303 -1.464 0.4593
## Escape - Tangible -0.1018 0.0328 19303 -3.102 0.0104
##
## P value adjustment: tukey method for comparing a family of 4 estimates
```

Q_0 by Social Media by Condition

```
## $semtrends
## condition BSMAS.trend SE df lower.CL upper.CL
## Attention -0.00698 0.01320 19303 -0.03279 0.0188
## Automatic 0.01222 0.00919 19303 -0.00579 0.0302
## Escape 0.00548 0.00778 19303 -0.00977 0.0207
## Tangible -0.00440 0.00786 19303 -0.01982 0.0110
##
## Confidence level used: 0.95
##
## $contrasts
## contrast estimate SE df t.ratio p.value
## Attention - Automatic -0.01920 0.01480 19303 -1.301 0.5624
## Attention - Escape -0.01246 0.01390 19303 -0.895 0.8074
## Attention - Tangible -0.00258 0.01400 19303 -0.184 0.9978
## Automatic - Escape 0.00675 0.01020 19303 0.662 0.9112
## Automatic - Tangible 0.01663 0.01020 19303 1.626 0.3641
## Escape - Tangible 0.00988 0.00902 19303 1.095 0.6925
##
## P value adjustment: tukey method for comparing a family of 4 estimates
```

```
## $semtrends
## condition SMDS.trend SE df lower.CL upper.CL
## Attention 0.1133 0.0315 19303 0.0515 0.1750
## Automatic 0.0119 0.0225 19303 -0.0322 0.0560
## Escape 0.0230 0.0189 19303 -0.0140 0.0600
## Tangible 0.0184 0.0193 19303 -0.0194 0.0562
##
## Confidence level used: 0.95
##
## $contrasts
## contrast estimate SE df t.ratio p.value
## Attention - Automatic 0.10137 0.0354 19303 2.863 0.0219
## Attention - Escape 0.09029 0.0333 19303 2.715 0.0335
## Attention - Tangible 0.09491 0.0335 19303 2.834 0.0238
## Automatic - Escape -0.01108 0.0248 19303 -0.446 0.9703
## Automatic - Tangible -0.00646 0.0251 19303 -0.258 0.9940
## Escape - Tangible 0.00462 0.0220 19303 0.210 0.9967
##
## P value adjustment: tukey method for comparing a family of 4 estimates
```

```
## $emtrends
##   condition SMEQ.trend      SE    df lower.CL upper.CL
## Attention    0.01161 0.00624 19303 -0.000624  0.02385
## Automatic    0.00722 0.00417 19303 -0.000951  0.01539
## Escape       0.00828 0.00358 19303  0.001268  0.01530
## Tangible     0.00250 0.00351 19303 -0.004379  0.00938
##
## Confidence level used: 0.95
##
## $contrasts
##   contrast      estimate      SE    df t.ratio p.value
## Attention - Automatic  0.00439 0.00694 19303   0.633  0.9214
## Attention - Escape    0.00333 0.00660 19303   0.504  0.9582
## Attention - Tangible  0.00911 0.00657 19303   1.386  0.5078
## Automatic - Escape   -0.00107 0.00469 19303  -0.227  0.9959
## Automatic - Tangible  0.00472 0.00464 19303   1.018  0.7390
## Escape - Tangible     0.00578 0.00412 19303   1.404  0.4967
##
## P value adjustment: tukey method for comparing a family of 4 estimates
```

α by Condition

NOTE: Results may be misleading due to involvement in interactions

```
## $emmeans
##   condition emmean      SE    df lower.CL upper.CL
## Attention  -0.96 0.0789 19303   -1.11  -0.806
## Automatic  -1.37 0.0613 19303   -1.49  -1.250
## Escape     -1.25 0.0645 19303   -1.38  -1.124
## Tangible   -1.33 0.0630 19303   -1.45  -1.205
##
## Confidence level used: 0.95
##
## $contrasts
##   contrast      estimate      SE    df t.ratio p.value
## Attention - Automatic  0.4097 0.0607 19303   6.746 <.0001
## Attention - Escape    0.2903 0.0645 19303   4.498 <.0001
## Attention - Tangible  0.3682 0.0631 19303   5.833 <.0001
## Automatic - Escape   -0.1194 0.0414 19303  -2.884  0.0205
## Automatic - Tangible -0.0415 0.0392 19303  -1.058  0.7154
## Escape - Tangible     0.0779 0.0441 19303   1.767  0.2894
##
## P value adjustment: tukey method for comparing a family of 4 estimates
```

α by Social Media by Condition

```
## $emtrends
##   condition BSMAS.trend      SE    df lower.CL upper.CL
## Attention   -0.0421 0.0199 19303  -0.0811 -0.00304
## Automatic   -0.0226 0.0159 19303  -0.0539  0.00860
## Escape      -0.0110 0.0169 19303  -0.0442  0.02215
## Tangible    -0.0211 0.0165 19303  -0.0535  0.01134
##
```

```
## Confidence level used: 0.95
##
## $contrasts
## contrast estimate SE df t.ratio p.value
## Attention - Automatic -0.01942 0.0149 19303 -1.301 0.5622
## Attention - Escape -0.03104 0.0161 19303 -1.926 0.2170
## Attention - Tangible -0.02096 0.0157 19303 -1.335 0.5408
## Automatic - Escape -0.01161 0.0110 19303 -1.057 0.7158
## Automatic - Tangible -0.00154 0.0104 19303 -0.148 0.9989
## Escape - Tangible 0.01007 0.0119 19303 0.845 0.8329
##
## P value adjustment: tukey method for comparing a family of 4 estimates
```

```
## $emtrends
## condition SMDS.trend SE df lower.CL upper.CL
## Attention -0.03504 0.0469 19303 -0.1270 0.0569
## Automatic -0.03547 0.0393 19303 -0.1124 0.0415
## Escape 0.00393 0.0416 19303 -0.0776 0.0855
## Tangible 0.00897 0.0408 19303 -0.0710 0.0890
##
```

```
## Confidence level used: 0.95
```

```
##
## $contrasts
## contrast estimate SE df t.ratio p.value
## Attention - Automatic 0.000426 0.0344 19303 0.012 1.0000
## Attention - Escape -0.038966 0.0374 19303 -1.043 0.7240
## Attention - Tangible -0.044010 0.0361 19303 -1.218 0.6152
## Automatic - Escape -0.039393 0.0273 19303 -1.444 0.4715
## Automatic - Tangible -0.044436 0.0261 19303 -1.703 0.3219
## Escape - Tangible -0.005044 0.0296 19303 -0.170 0.9982
##
```

```
## P value adjustment: tukey method for comparing a family of 4 estimates
```

```
## $emtrends
## condition SMEQ.trend SE df lower.CL upper.CL
## Attention 1.54e-02 0.00966 19303 -0.00351 0.03438
## Automatic 7.53e-05 0.00750 19303 -0.01462 0.01477
## Escape -6.17e-03 0.00795 19303 -0.02175 0.00942
## Tangible -8.40e-04 0.00766 19303 -0.01585 0.01417
##
```

```
## Confidence level used: 0.95
```

```
##
## $contrasts
## contrast estimate SE df t.ratio p.value
## Attention - Automatic 0.015360 0.00748 19303 2.055 0.1683
## Attention - Escape 0.021603 0.00801 19303 2.697 0.0353
## Attention - Tangible 0.016275 0.00773 19303 2.107 0.1510
## Automatic - Escape 0.006243 0.00523 19303 1.195 0.6301
## Automatic - Tangible 0.000915 0.00477 19303 0.192 0.9975
## Escape - Tangible -0.005328 0.00548 19303 -0.972 0.7652
##
```

```
## P value adjustment: tukey method for comparing a family of 4 estimates
```

Comparisons between Rzeszutek et al. (2025) and Koffarnus et al. (2015) models

SND = Rzeszutek et al. (2025), Simplified Exponential with Normalized Decay

EXPD = Koffarnus et al. (2015), Exponentiated Model of Demand

R2 and MAE values for Rzeszutek et al.

```
## [1] "Overall R2"
```

```
## [1] 0.9130959
```

```
## [1] "Individual Median R2"
```

```
## [1] 0.943
```

```
## [1] "Individual Median R2 by condition"
```

```
##      condition      V1
##      <fctr>      <num>
## 1:   Escape 0.9452266
## 2:  Tangible 0.9353272
## 3: Attention 0.9028877
## 4: Automatic 0.9566318
```

```
## [1] "Individual R2 range by condition"
```

```
##      condition      V1
##      <fctr>      <num>
## 1:   Escape      -Inf
## 2:   Escape 0.9996959
## 3:  Tangible      -Inf
## 4:  Tangible 0.9995630
## 5: Attention      -Inf
## 6: Attention 0.9989111
## 7: Automatic      -Inf
## 8: Automatic 0.9993066
```

```
## [1] "Overall MAE"
```

```
## [1] 6.253
```

```
## [1] "Individual Median MAE"
```

```
## [1] 2.972
```

```
## [1] "Individual MAE by condition"
```

```
##      condition      V1
##      <fctr>      <num>
## 1:      Escape 3.029597
## 2:      Tangible 3.393859
## 3: Attention 2.300450
## 4: Automatic 3.754569
```

```
## [1] "Individual MAE range by condition"
```

```
##      condition      V1
##      <fctr>      <num>
## 1:      Escape 0.01711367
## 2:      Escape 186.95009430
## 3:      Tangible 0.21872097
## 4:      Tangible 153.12608445
## 5: Attention 0.41489691
## 6: Attention 53.83616887
## 7: Automatic 0.38810693
## 8: Automatic 164.05816178
```

R2 and MAE values for Koffarnus et al.

```
## [1] "Overall R2"
```

```
## [1] 0.9171949
```

```
## [1] "Individual Median R2"
```

```
## [1] 0.948
```

```
## [1] "Individual Median R2 by condition"
```

```
##      condition      V1
##      <fctr>      <num>
## 1:      Escape 0.9520847
## 2:      Tangible 0.9401253
## 3: Attention 0.9045035
## 4: Automatic 0.9624383
```

```
## [1] "Individual R2 range by condition"
```

```
##      condition      V1
##      <fctr>      <num>
## 1:      Escape      -Inf
## 2:      Escape 0.9994125
## 3:      Tangible      -Inf
## 4:      Tangible 0.9986973
## 5: Attention      -Inf
## 6: Attention 0.9988551
## 7: Automatic      -Inf
## 8: Automatic 0.9987989
```

```

## [1] "Overall MAE"

## [1] 6.423

## [1] "Individual Median MAE"

## [1] 3.019

## [1] "Individual MAE by condition"

##      condition      V1
##      <fctr>      <num>
## 1:   Escape 3.172013
## 2: Tangible 3.429531
## 3: Attention 2.393225
## 4: Automatic 3.781220

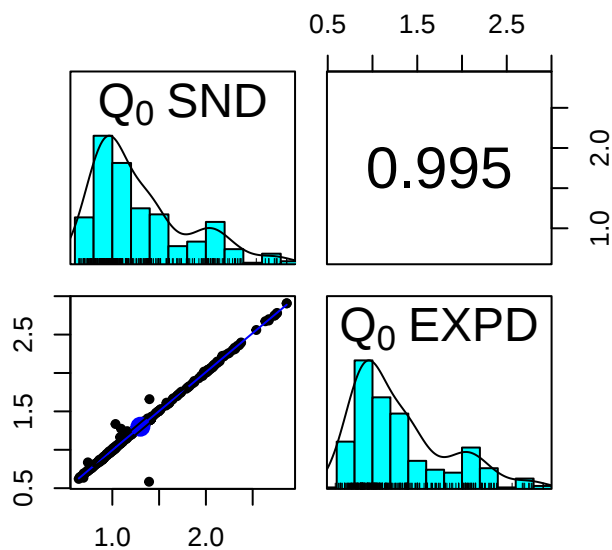
## [1] "Invdividual MAE range by condition"

##      condition      V1
##      <fctr>      <num>
## 1:   Escape 0.6140842
## 2:   Escape 186.9330772
## 3: Tangible 0.4223503
## 4: Tangible 146.4691288
## 5: Attention 0.4069614
## 6: Attention 53.4873943
## 7: Automatic 0.6436076
## 8: Automatic 164.8374134

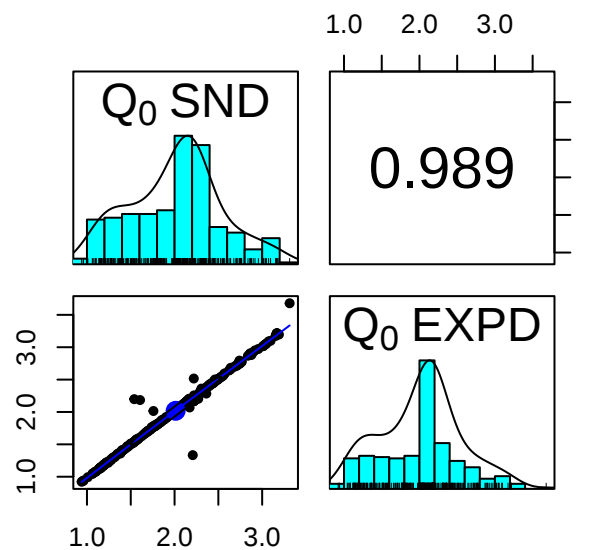
```

Correlations between Model Parameters

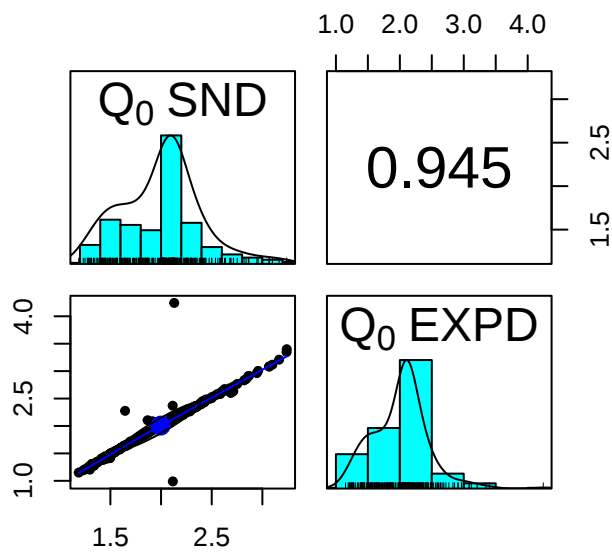
SND vs EXPD Q_0 Attention



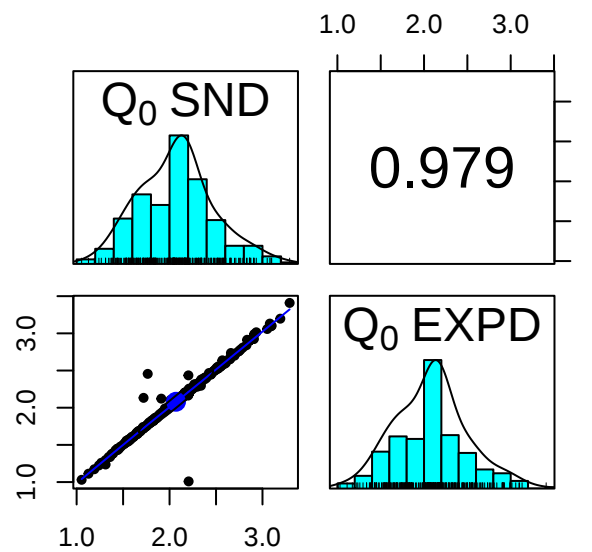
SND vs EXPD Q_0 Automatic



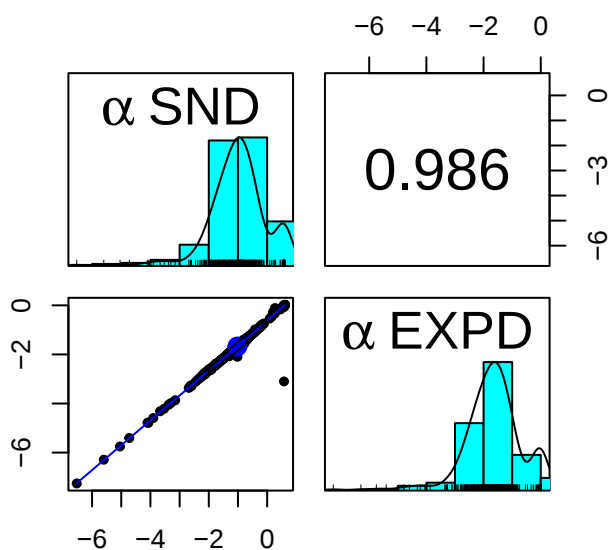
SND vs EXPD Q_0 Escape



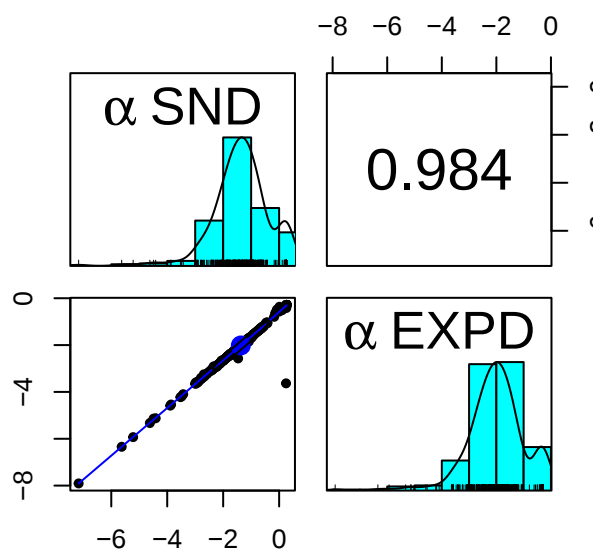
SND vs EXPD Q_0 Tangible



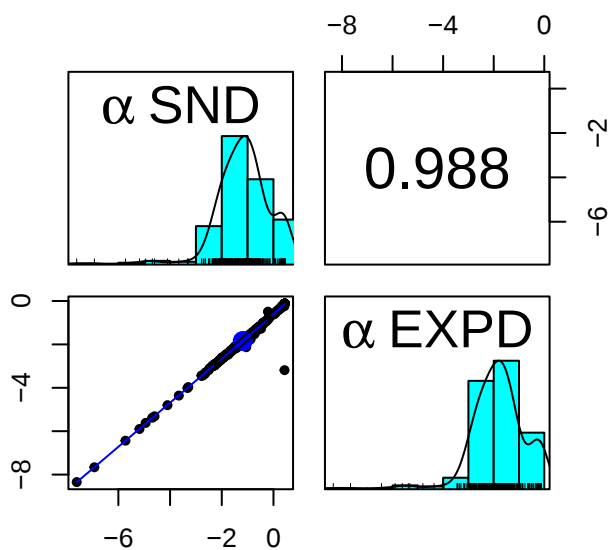
SND vs EXPD α Attention



SND vs EXPD α Automatic



SND vs EXPD α Escape



SND vs EXPD α Tangible

