

General Linear Model

Mauchly's Test of Sphericity^a

Measure: EffectiveWidth1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon ^b Greenhouse-Geisser
Cursor	.916	2.263	5	.812	.947
Amp	.957	1.142	2	.565	.959
Wdith	.874	3.504	2	.173	.888
Cursor * Amp	.294	30.322	20	.067	.722
Cursor * Wdith	.419	21.567	20	.368	.793
Amp * Wdith	.406	22.920	9	.006	.747
Cursor * Amp * Wdith	.004	123.557	77	<.001	.617

Mauchly's Test of Sphericity^a

Measure: EffectiveWidth1

Within Subjects Effect	Epsilon ^b	
	Huynh-Feldt	Lower-bound
Cursor	1.000	.333
Amp	1.000	.500
Wdith	.946	.500
Cursor * Amp	.878	.167
Cursor * Wdith	.984	.167
Amp * Wdith	.851	.250
Cursor * Amp * Wdith	.874	.083

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept

Within Subjects Design: Cursor + Amp + Wdith + Cursor * Amp + Cursor * Wdith + Amp * Wdith + Cursor * Amp * Wdith

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Tests of Within-Subjects Effects

Measure: EffectiveWidth1

Source		Type III Sum of Squares	df	Mean Square
Cursor	Sphericity Assumed	2112.137	3	704.046
	Greenhouse-Geisser	2112.137	2.841	743.381
	Huynh-Feldt	2112.137	3.000	704.046
	Lower-bound	2112.137	1.000	2112.137
Error(Cursor)	Sphericity Assumed	2258.130	81	27.878
	Greenhouse-Geisser	2258.130	76.714	29.436
	Huynh-Feldt	2258.130	81.000	27.878
	Lower-bound	2258.130	27.000	83.634
Amp	Sphericity Assumed	10485.980	2	5242.990
	Greenhouse-Geisser	10485.980	1.918	5468.310
	Huynh-Feldt	10485.980	2.000	5242.990
	Lower-bound	10485.980	1.000	10485.980
Error(Amp)	Sphericity Assumed	1522.758	54	28.199
	Greenhouse-Geisser	1522.758	51.775	29.411
	Huynh-Feldt	1522.758	54.000	28.199
	Lower-bound	1522.758	27.000	56.398
Wdith	Sphericity Assumed	147.625	2	73.813
	Greenhouse-Geisser	147.625	1.776	83.120
	Huynh-Feldt	147.625	1.892	78.017
	Lower-bound	147.625	1.000	147.625
Error(Wdith)	Sphericity Assumed	567.459	54	10.509
	Greenhouse-Geisser	567.459	47.953	11.834
	Huynh-Feldt	567.459	51.090	11.107
	Lower-bound	567.459	27.000	21.017
Cursor * Amp	Sphericity Assumed	210.655	6	35.109
	Greenhouse-Geisser	210.655	4.334	48.608
	Huynh-Feldt	210.655	5.265	40.008
	Lower-bound	210.655	1.000	210.655
Error(Cursor*Amp)	Sphericity Assumed	2113.022	162	13.043
	Greenhouse-Geisser	2113.022	117.011	18.058
	Huynh-Feldt	2113.022	142.163	14.863
	Lower-bound	2113.022	27.000	78.260
Cursor * Wdith	Sphericity Assumed	42.788	6	7.131
	Greenhouse-Geisser	42.788	4.760	8.988
	Huynh-Feldt	42.788	5.904	7.248
	Lower-bound	42.788	1.000	42.788
Error(Cursor*Wdith)	Sphericity Assumed	2012.972	162	12.426
	Greenhouse-Geisser	2012.972	128.532	15.661
	Huynh-Feldt	2012.972	159.396	12.629
	Lower-bound	2012.972	27.000	74.555

Tests of Within-Subjects Effects

Measure: EffectiveWidth1

Source		F	Sig.	Partial Eta Squared
Cursor	Sphericity Assumed	25.254	<.001	.483
	Greenhouse-Geisser	25.254	<.001	.483
	Huynh-Feldt	25.254	<.001	.483
	Lower-bound	25.254	<.001	.483
Error(Cursor)	Sphericity Assumed			
	Greenhouse-Geisser			
	Huynh-Feldt			
	Lower-bound			
Amp	Sphericity Assumed	185.927	<.001	.873
	Greenhouse-Geisser	185.927	<.001	.873
	Huynh-Feldt	185.927	<.001	.873
	Lower-bound	185.927	<.001	.873
Error(Amp)	Sphericity Assumed			
	Greenhouse-Geisser			
	Huynh-Feldt			
	Lower-bound			
Wdith	Sphericity Assumed	7.024	.002	.206
	Greenhouse-Geisser	7.024	.003	.206
	Huynh-Feldt	7.024	.002	.206
	Lower-bound	7.024	.013	.206
Error(Wdith)	Sphericity Assumed			
	Greenhouse-Geisser			
	Huynh-Feldt			
	Lower-bound			
Cursor * Amp	Sphericity Assumed	2.692	.016	.091
	Greenhouse-Geisser	2.692	.031	.091
	Huynh-Feldt	2.692	.021	.091
	Lower-bound	2.692	.112	.091
Error(Cursor*Amp)	Sphericity Assumed			
	Greenhouse-Geisser			
	Huynh-Feldt			
	Lower-bound			
Cursor * Wdith	Sphericity Assumed	.574	.751	.021
	Greenhouse-Geisser	.574	.712	.021
	Huynh-Feldt	.574	.748	.021
	Lower-bound	.574	.455	.021
Error(Cursor*Wdith)	Sphericity Assumed			
	Greenhouse-Geisser			
	Huynh-Feldt			
	Lower-bound			

Tests of Within-Subjects Effects

Measure: EffectiveWidth1

Source		Type III Sum of Squares	df	Mean Square
Amp * Wdith	Sphericity Assumed	32.244	4	8.061
	Greenhouse-Geisser	32.244	2.989	10.788
	Huynh-Feldt	32.244	3.402	9.477
	Lower-bound	32.244	1.000	32.244
Error(Amp*Wdith)	Sphericity Assumed	1247.518	108	11.551
	Greenhouse-Geisser	1247.518	80.702	15.458
	Huynh-Feldt	1247.518	91.860	13.581
	Lower-bound	1247.518	27.000	46.204
Cursor * Amp * Wdith	Sphericity Assumed	139.780	12	11.648
	Greenhouse-Geisser	139.780	7.409	18.865
	Huynh-Feldt	139.780	10.488	13.328
	Lower-bound	139.780	1.000	139.780
Error(Cursor*Amp*Wdith)	Sphericity Assumed	3738.388	324	11.538
	Greenhouse-Geisser	3738.388	200.051	18.687
	Huynh-Feldt	3738.388	283.167	13.202
	Lower-bound	3738.388	27.000	138.459

Tests of Within-Subjects Effects

Measure: EffectiveWidth1

Source		F	Sig.	Partial Eta Squared
Amp * Wdith	Sphericity Assumed	.698	.595	.025
	Greenhouse-Geisser	.698	.556	.025
	Huynh-Feldt	.698	.573	.025
	Lower-bound	.698	.411	.025
Error(Amp*Wdith)	Sphericity Assumed			
	Greenhouse-Geisser			
	Huynh-Feldt			
	Lower-bound			
Cursor * Amp * Wdith	Sphericity Assumed	1.010	.440	.036
	Greenhouse-Geisser	1.010	.428	.036
	Huynh-Feldt	1.010	.437	.036
	Lower-bound	1.010	.324	.036
Error(Cursor*Amp*Wdith)	Sphericity Assumed			
	Greenhouse-Geisser			
	Huynh-Feldt			
	Lower-bound			

Estimated Marginal Means

1. Grand Mean

Measure: EffectiveWidth1

Mean	Std. Error	95% Confidence Interval	
		Lower Bound	Upper Bound
9.695	.362	8.951	10.438

2. Cursor

Estimates

Measure: EffectiveWidth1

Cursor	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	7.947	.455	7.013	8.881
2	8.800	.460	7.855	9.745
3	10.299	.436	9.403	11.194
4	11.734	.497	10.714	12.755

Pairwise Comparisons

Measure: EffectiveWidth1

(I) Cursor	(J) Cursor	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
1	2	-.853	.482	.528	-2.225	.519
	3	-2.352 [*]	.420	<.001	-3.548	-1.156
	4	-3.788 [*]	.525	<.001	-5.282	-2.293
2	1	.853	.482	.528	-.519	2.225
	3	-1.499 [*]	.418	.008	-2.690	-.308
	4	-2.935 [*]	.488	<.001	-4.323	-1.547
3	1	2.352 [*]	.420	<.001	1.156	3.548
	2	1.499 [*]	.418	.008	.308	2.690
	4	-1.436 [*]	.480	.035	-2.803	-.069
4	1	3.788 [*]	.525	<.001	2.293	5.282
	2	2.935 [*]	.488	<.001	1.547	4.323
	3	1.436 [*]	.480	.035	.069	2.803

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

3. Amp

Estimates

Measure: EffectiveWidth1

Amp	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	5.471	.220	5.019	5.923
2	10.316	.474	9.343	11.289
3	13.298	.537	12.196	14.400

Pairwise Comparisons

Measure: EffectiveWidth1

(I) Amp	(J) Amp	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
1	2	-4.845 [*]	.399	<.001	-5.863	-3.827
	3	-7.827 [*]	.449	<.001	-8.972	-6.681
2	1	4.845 [*]	.399	<.001	3.827	5.863
	3	-2.982 [*]	.378	<.001	-3.948	-2.016
3	1	7.827 [*]	.449	<.001	6.681	8.972
	2	2.982 [*]	.378	<.001	2.016	3.948

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

4. Width

Estimates

Measure: EffectiveWidth1

Width	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	9.384	.366	8.634	10.135
2	9.466	.404	8.636	10.296
3	10.234	.399	9.415	11.053

Pairwise Comparisons

Measure: EffectiveWidth1

(I) Wdith	(J) Wdith	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
1	2	-.082	.263	1.000	-.753	.590
	3	-.850 [*]	.279	.015	-1.561	-.139
2	1	.082	.263	1.000	-.590	.753
	3	-.768 [*]	.202	.002	-1.284	-.252
3	1	.850 [*]	.279	.015	.139	1.561
	2	.768 [*]	.202	.002	.252	1.284

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

5. Cursor * Amp

Estimates

Measure: EffectiveWidth1

Cursor	Amp	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
1	1	4.166	.234	3.686	4.645
	2	8.115	.569	6.947	9.283
	3	11.559	.852	9.810	13.308
2	1	4.945	.286	4.358	5.531
	2	8.764	.633	7.466	10.063
	3	12.691	.769	11.112	14.269
3	1	6.064	.340	5.366	6.762
	2	11.274	.599	10.046	12.502
	3	13.558	.628	12.269	14.846
4	1	6.709	.361	5.968	7.451
	2	13.110	.688	11.698	14.522
	3	15.384	.723	13.900	16.867

Pairwise Comparisons

Measure: EffectiveWidth1

Amp	(I) Cursor	(J) Cursor	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for ^b ...
						Lower Bound
1	1	2	-.779	.364	.251	-1.816
		3	-1.898 [*]	.407	<.001	-3.057
		4	-2.544 [*]	.358	<.001	-3.563
	2	1	.779	.364	.251	-.259
		3	-1.120 [*]	.295	.004	-1.959
		4	-1.765 [*]	.372	<.001	-2.823
	3	1	1.898 [*]	.407	<.001	.740
		2	1.120 [*]	.295	.004	.281
		4	-.645	.317	.311	-1.548
	4	1	2.544 [*]	.358	<.001	1.524
		2	1.765 [*]	.372	<.001	.707
		3	.645	.317	.311	-.258
2	1	2	-.649	.626	1.000	-2.432
		3	-3.158 [*]	.645	<.001	-4.994
		4	-4.995 [*]	.630	<.001	-6.787
	2	1	.649	.626	1.000	-1.134
		3	-2.510 [*]	.595	.001	-4.202
		4	-4.346 [*]	.703	<.001	-6.348
	3	1	3.158 [*]	.645	<.001	1.323
		2	2.510 [*]	.595	.001	.817
		4	-1.836	.759	.136	-3.998
	4	1	4.995 [*]	.630	<.001	3.202
		2	4.346 [*]	.703	<.001	2.343
		3	1.836	.759	.136	-.325
3	1	2	-1.132	.868	1.000	-3.602
		3	-1.999	.770	.090	-4.191
		4	-3.825 [*]	1.040	.006	-6.784
	2	1	1.132	.868	1.000	-1.339
		3	-.867	.781	1.000	-3.090
		4	-2.693 [*]	.854	.024	-5.126
	3	1	1.999	.770	.090	-.193
		2	.867	.781	1.000	-1.355
		4	-1.826	.749	.130	-3.959
	4	1	3.825 [*]	1.040	.006	.865
		2	2.693 [*]	.854	.024	.261
		3	1.826	.749	.130	-.307

Pairwise Comparisons

Measure: EffectiveWidth1

			95% Confidence Interval for ^b ...
Amp	(I) Cursor	(J) Cursor	Upper Bound
1	1	2	.259
		3	-.740
		4	-1.524
	2	1	1.816
		3	-.281
		4	-.707
	3	1	3.057
		2	1.959
		4	.258
	4	1	3.563
		2	2.823
		3	1.548
2	1	2	1.134
		3	-1.323
		4	-3.202
	2	1	2.432
		3	-.817
		4	-2.343
	3	1	4.994
		2	4.202
		4	.325
	4	1	6.787
		2	6.348
		3	3.998
3	1	2	1.339
		3	.193
		4	-.865
	2	1	3.602
		3	1.355
		4	-.261
	3	1	4.191
		2	3.090
		4	.307
	4	1	6.784
		2	5.126
		3	3.959

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

6. Cursor * Amp

Pairwise Comparisons

Measure: EffectiveWidth1

Cursor	(I) Amp	(J) Amp	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
						Lower Bound	Upper Bound
1	1	2	-3.950 [*]	.566	<.001	-5.394	-2.505
		3	-7.393 [*]	.832	<.001	-9.517	-5.269
	2	1	3.950 [*]	.566	<.001	2.505	5.394
		3	-3.444 [*]	.661	<.001	-5.131	-1.757
	3	1	7.393 [*]	.832	<.001	5.269	9.517
		2	3.444 [*]	.661	<.001	1.757	5.131
2	1	2	-3.820 [*]	.556	<.001	-5.240	-2.400
		3	-7.746 [*]	.701	<.001	-9.535	-5.957
	2	1	3.820 [*]	.556	<.001	2.400	5.240
		3	-3.926 [*]	.716	<.001	-5.754	-2.099
	3	1	7.746 [*]	.701	<.001	5.957	9.535
		2	3.926 [*]	.716	<.001	2.099	5.754
3	1	2	-5.210 [*]	.479	<.001	-6.431	-3.988
		3	-7.494 [*]	.590	<.001	-9.001	-5.986
	2	1	5.210 [*]	.479	<.001	3.988	6.431
		3	-2.284 [*]	.560	.001	-3.714	-.854
	3	1	7.494 [*]	.590	<.001	5.986	9.001
		2	2.284 [*]	.560	.001	.854	3.714
4	1	2	-6.401 [*]	.569	<.001	-7.852	-4.949
		3	-8.674 [*]	.553	<.001	-10.087	-7.262
	2	1	6.401 [*]	.569	<.001	4.949	7.852
		3	-2.274 [*]	.725	.012	-4.124	-.424
	3	1	8.674 [*]	.553	<.001	7.262	10.087
		2	2.274 [*]	.725	.012	.424	4.124

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Profile Plots



