Pixel Stress Statistics Analysis

Alf

2025-06-05

Contents

1 Statistical Analysis Results

The following sections present the results for each dependent variable analyzed in the study.

1.1 Analysis for: effort

1.1.1 Descriptive Statistics

group	stage	feedback	mean	sd
ctrl	end	above	5.182	1.722
ctrl	end	below	6.303	2.038
ctrl	end	close	6.197	1.862
ctrl	start	above	4.909	1.665
ctrl	start	below	6.515	1.839
ctrl	start	close	6.379	1.484
exp	end	above	4.258	2.175
exp	end	below	5.387	2.539
exp	end	close	5.823	2.108
exp	start	above	4.355	2.106
exp	start	below	5.742	2.294
exp	start	close	5.984	2.115

1.1.2 Mixed ANOVA Results

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.000	2.545	0.116	0.039
stage	1.000	62.000	0.508	0.479	0.008
group:stage	1.000	62.000	0.228	0.635	0.004

feedback	1.447	89.743	45.572	0.000	0.424
group:feedback	1.447	89.743	1.059	0.332	0.017
stage:feedback	1.905	118.129	1.409	0.249	0.022
group:stage:feedback	1.905	118.129	0.372	0.680	0.006

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-1.311	0.206	62	-6.366	0
above - close	-1.420	0.163	62	-8.691	0
below - close	-0.109	0.114	62	-0.950	1

1.1.3 Follow-up Analysis: 2-way Interactions

1.2 Analysis for: arousal

1.2.1 Descriptive Statistics

group	stage	feedback	mean	sd
ctrl	end	above	4.576	2.586
ctrl	end	below	4.788	2.724
ctrl	end	close	5.606	2.458
ctrl	start	above	4.667	1.831
ctrl	start	below	5.485	2.224
ctrl	start	close	5.364	2.152
exp	end	above	3.774	2.171
exp	end	below	5.226	2.526
exp	end	close	5.468	2.210
exp	start	above	4.226	2.432
exp	start	below	5.871	2.473
exp	start	close	5.403	2.087

1.2.2 Mixed ANOVA Results

Effect	df1	df2	F	p (GG)	partial eta^2
group	1.000	62.000	0.030	0.862	0.000
stage	1.000	62.000	2.144	0.148	0.033
group:stage	1.000	62.000	0.204	0.653	0.003
feedback	1.633	101.276	25.100	0.000	0.288
group:feedback	1.633	101.276	4.203	0.024	0.063
stage:feedback	1.855	115.029	4.931	0.010	0.074
group:stage:feedback	1.855	115.029	0.310	0.718	0.005

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-1.032	0.215	62	-4.797	0
above - close	-1.150	0.169	62	-6.797	0
below - close	-0.118	0.144	62	-0.818	1

1.2.3 Follow-up Analysis: 2-way Interactions

Significant 2-way interaction: group:feedback

Subset: group = ctrl

Effect	df1	df2	F	p (GG)	partial eta²
stage	1.000	32.000	0.404	0.530	0.012
feedback	1.910	61.135	8.228	0.001	0.205
stage:feedback	1.978	63.298	4.380	0.017	0.120

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-0.515	0.232	32	-2.222	0.100
above - close	-0.864	0.217	32	-3.973	0.001
below - close	-0.348	0.192	32	-1.819	0.235

Subset: group = exp

Effect	df1	df2	F	p (GG)	partial eta²
stage	1.000	30.000	2.661	0.113	0.081
feedback	1.414	42.418	17.795	0.000	0.372
stage:feedback	1.566	46.993	1.526	0.229	0.048

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-1.548	0.369	30	-4.195	0.001
above - close	-1.435	0.261	30	-5.494	0.000
below - close	0.113	0.216	30	0.522	1.000

Significant 2-way interaction: stage:feedback

Subset: stage = end

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.000	0.086	0.771	0.001
feedback	1.742	108.011	24.645	0.000	0.284
group:feedback	1.742	108.011	5.029	0.011	0.075

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-0.832	0.228	62	-3.656	0.002
above - close	-1.362	0.191	62	-7.126	0.000
below - close	-0.530	0.163	62	-3.259	0.005

Subset: stage = start

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.000	0.000	0.992	0.000
feedback	1.728	107.114	13.795	0.000	0.182
group:feedback	1.728	107.114	1.438	0.242	0.023

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-1.232	0.289	62	-4.256	0.000
above - close	-0.937	0.217	62	-4.324	0.000
below - close	0.294	0.222	62	1.328	0.567

1.3 Analysis for: frustration

1.3.1 Descriptive Statistics

group	stage	feedback	mean	sd
ctrl	end	above	4.212	2.434
ctrl	end	below	6.576	2.475
ctrl	end	close	6.470	2.311
ctrl	start	above	4.788	2.088
ctrl	start	below	6.697	2.568
ctrl	start	close	6.303	2.186
exp	end	above	4.032	2.345
exp	end	below	6.839	2.672
exp	end	close	6.548	2.154
exp	start	above	4.161	2.311
exp	start	below	6.806	2.626
exp	start	close	6.484	2.023

1.3.2 Mixed ANOVA Results

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.000	0.004	0.949	0.000
stage	1.000	62.000	0.202	0.655	0.003
group:stage	1.000	62.000	0.158	0.692	0.003
feedback	1.478	91.633	72.937	0.000	0.541
group:feedback	1.478	91.633	1.090	0.325	0.017

stage:feedback	1.822	112.942	1.113	0.328	0.018
group:stage:feedback	1.822	112.942	0.371	0.671	0.006

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-2.431	0.271	62	-8.957	0.000
above - close	-2.153	0.220	62	-9.800	0.000
below - close	0.278	0.154	62	1.807	0.227

1.3.3 Follow-up Analysis: 2-way Interactions

1.4 Analysis for: mental.demand

1.4.1 Descriptive Statistics

group	stage	feedback	mean	sd
ctrl	end	above	4.970	1.723
ctrl	end	below	5.818	1.685
ctrl	end	close	5.758	1.664
ctrl	start	above	4.667	1.472
ctrl	start	below	5.970	1.862
ctrl	start	close	6.015	1.608
exp	end	above	4.194	1.905
exp	end	below	4.935	2.828
exp	end	close	5.145	2.266
exp	start	above	3.677	2.242
exp	start	below	5.645	2.416
exp	start	close	5.081	2.157

1.4.2 Mixed ANOVA Results

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.000	3.088	0.084	0.047
stage	1.000	62.000	0.076	0.784	0.001
group:stage	1.000	62.000	0.001	0.979	0.000
feedback	1.462	90.643	40.746	0.000	0.397
group:feedback	1.462	90.643	0.440	0.583	0.007
stage:feedback	1.849	114.617	6.182	0.004	0.091
group:stage:feedback	1.849	114.617	1.989	0.145	0.031

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-1.215	0.185	62	-6.570	0

| above - close | -1.123 | 0.150 | 62 | -7.475 | 0 |
| below - close | 0.092 | 0.103 | 62 | 0.898 | 1 |

1.4.3   Follow-up Analysis: 2-way Interactions

Significant 2-way interaction: stage:feedback

Subset: stage = end

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.00	2.573	0.114	0.040
feedback	1.691	104.83	16.039	0.000	0.206
group:feedback	1.691	104.83	0.320	0.690	0.005

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-0.795	0.201	62	-3.956	0.001
above - close	-0.870	0.166	62	-5.253	0.000
below - close	-0.075	0.138	62	-0.539	1.000

Subset: stage = start

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.000	3.033	0.087	0.047
feedback	1.656	102.668	34.410	0.000	0.357
group:feedback	1.656	102.668	1.516	0.226	0.024

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-1.635	0.254	62	-6.436	0.00
above - close	-1.376	0.200	62	-6.882	0.00
below - close	0.260	0.174	62	1.494	0.42

1.5   Analysis for: performance

1.5.1   Descriptive Statistics

group	stage	feedback	mean	sd
ctrl	end	above	6.788	1.341
ctrl	end	below	4.333	1.814
ctrl	end	close	4.939	1.685
ctrl	start	above	6.030	1.649
ctrl	start	below	4.152	2.917
ctrl	start	close	4.136	1.974

exp	end	above	6.484	1.913
exp	end	below	4.000	2.620
exp	end	close	4.887	1.892
exp	start	above	6.452	1.981
exp	start	below	3.645	2.653
exp	start	close	3.855	2.110

1.5.2 Mixed ANOVA Results

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.00	0.193	0.662	0.003
stage	1.000	62.00	15.405	0.000	0.199
group:stage	1.000	62.00	0.161	0.690	0.003
feedback	1.334	82.71	70.761	0.000	0.533
group:feedback	1.334	82.71	0.614	0.480	0.010
stage:feedback	1.683	104.35	2.484	0.097	0.039
group:stage:feedback	1.683	104.35	1.504	0.228	0.024

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	2.406	0.281	62	8.570	0.000
above - close	1.984	0.192	62	10.343	0.000
below - close	-0.422	0.156	62	-2.704	0.026

1.5.3 Follow-up Analysis: 2-way Interactions

1.6 Analysis for: stress

1.6.1 Descriptive Statistics

group	stage	feedback	mean	sd
ctrl	end	above	4.758	2.574
ctrl	end	below	5.000	2.727
ctrl	end	close	5.818	2.128
ctrl	start	above	4.848	1.938
ctrl	start	below	5.697	2.284
ctrl	start	close	5.288	2.027
exp	end	above	3.452	2.095
exp	end	below	5.097	2.468
exp	end	close	5.403	2.208
exp	start	above	3.710	2.369
exp	start	below	5.871	2.705
exp	start	close	5.387	2.379

1.6.2 Mixed ANOVA Results

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.000	0.740	0.393	0.012
stage	1.000	62.000	1.245	0.269	0.020
group:stage	1.000	62.000	0.441	0.509	0.007
feedback	1.531	94.927	30.450	0.000	0.329
group:feedback	1.531	94.927	7.410	0.003	0.107
stage:feedback	1.542	95.621	6.347	0.005	0.093
group:stage:feedback	1.542	95.621	0.331	0.663	0.005

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-1.224	0.231	62	-5.296	0
above - close	-1.282	0.162	62	-7.921	0
below - close	-0.058	0.154	62	-0.376	1

1.6.3 Follow-up Analysis: 2-way Interactions

Significant 2-way interaction: group:feedback

Subset: group = ctrl

Effect	df1	df2	F	p (GG)	partial eta²
stage	1.000	32.000	0.104	0.749	0.003
feedback	1.693	54.177	5.215	0.012	0.140
stage:feedback	1.646	52.684	6.263	0.006	0.164

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-0.545	0.284	32	-1.921	0.191
above - close	-0.750	0.231	32	-3.242	0.008
below - close	-0.205	0.197	32	-1.039	0.920

Subset: group = exp

Effect	df1	df2	F	p (GG)	partial eta²
stage	1.000	30.000	1.547	0.223	0.049
feedback	1.373	41.191	28.358	0.000	0.486
stage:feedback	1.467	44.007	1.558	0.223	0.049

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-1.903	0.369	30	-5.156	0

8

above - close	-1.815	0.226	30	-8.040	0
below - close	0.089	0.239	30	0.372	1

Significant 2-way interaction: stage:feedback

Subset: stage = end

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.00	0.971	0.328	0.015
feedback	1.754	108.77	28.975	0.000	0.318
group:feedback	1.754	108.77	6.302	0.004	0.092

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-0.944	0.232	62	-4.070	0.000
above - close	-1.506	0.195	62	-7.715	0.000
below - close	-0.562	0.168	62	-3.357	0.004

Subset: stage = start

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.000	0.352	0.555	0.006
feedback	1.389	86.108	17.273	0.000	0.218
group:feedback	1.389	86.108	3.930	0.037	0.060

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-1.505	0.337	62	-4.464	0.000
above - close	-1.058	0.193	62	-5.493	0.000
below - close	0.446	0.238	62	1.874	0.197

1.7 Analysis for: temporal.demand

1.7.1 Descriptive Statistics

group	stage	feedback	mean	sd
ctrl	end	above	5.121	1.900
ctrl	end	below	5.970	2.229
ctrl	end	close	6.091	1.938
ctrl	start	above	5.394	1.731
ctrl	start	below	6.485	2.078
ctrl	start	close	6.318	1.849
exp	end	above	3.968	2.198

exp	end	below	4.871	2.778
exp	end	close	5.355	2.381
exp	start	above	4.161	2.647
exp	start	below	5.387	2.604
exp	start	close	5.306	2.562

1.7.2 Mixed ANOVA Results

Effect	df1	df2	F	p (GG)	partial eta²
group	1.000	62.000	4.551	0.037	0.068
stage	1.000	62.000	3.289	0.075	0.050
group:stage	1.000	62.000	0.147	0.703	0.002
feedback	1.372	85.043	29.779	0.000	0.324
group:feedback	1.372	85.043	0.529	0.524	0.008
stage:feedback	1.829	113.399	1.894	0.159	0.030
group:stage:feedback	1.829	113.399	0.204	0.796	0.003

Post hoc comparisons for feedback (significant main effect):

contrast	estimate	SE	df	t.ratio	p.value
above - below	-1.017	0.202	62	-5.042	0
above - close	-1.107	0.156	62	-7.080	0
below - close	-0.089	0.105	62	-0.853	1

1.7.3 Follow-up Analysis: 2-way Interactions