Design

Each infant was exposed to each stimulus. Therefore infants are crossed with stimuli and Type of Stimulus is a within-subjects factor.

data;
input face 1-3 cc 5-7 news 9-11 sc 13-15;
datalines;
  3.1  3.5  2.0  2.1
  1.3  0.7  1.0  0.8
  2.1  1.8  1.5  1.0
  1.5  1.0  0.9  0.7
  0.9  0.7  1.2  1.1
  1.6  1.9  0.9  1.1
  1.8  1.5  1.1  0.9
  1.4  1.3  1.0  0.8
  2.7  2.4  1.5  1.4
  1.5  1.3  1.0  0.9
  1.4  1.0  1.3  0.8
  1.6  1.6  1.2  1.3
  1.3  1.6  1.7  1.9
  1.3  1.0  1.5  1.7
proc print double;
proc means maxdec = 3;
proc glm;
  model face cc news sc =/nouni;
  repeated stimulus 4/nom;
run;
quit;
Results of proc print were edited out.

The MEANS Procedure

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>face</td>
<td>14</td>
<td>1.679</td>
<td>0.590</td>
<td>0.900</td>
<td>3.100</td>
</tr>
<tr>
<td>cc</td>
<td>14</td>
<td>1.521</td>
<td>0.743</td>
<td>0.700</td>
<td>3.500</td>
</tr>
<tr>
<td>news</td>
<td>14</td>
<td>1.271</td>
<td>0.329</td>
<td>0.900</td>
<td>2.000</td>
</tr>
<tr>
<td>sc</td>
<td>14</td>
<td>1.179</td>
<td>0.444</td>
<td>0.700</td>
<td>2.100</td>
</tr>
</tbody>
</table>

The GLM Procedure

Number of Observations Read 14
Number of Observations Used 14

The GLM Procedure
Repeated Measures Analysis of Variance

Repeated Measures Level Information

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>face</th>
<th>cc</th>
<th>news</th>
<th>sc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of stimulus</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

The SAS System 29

The GLM Procedure
Repeated Measures Analysis of Variance
Univariate Tests of Hypotheses for Within Subject Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Type III SS</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>stimulus</td>
<td>3</td>
<td>2.20196429</td>
<td>0.73398810</td>
<td>6.43</td>
<td>0.0012</td>
</tr>
<tr>
<td>Error(stimulus)</td>
<td>39</td>
<td>4.45053571</td>
<td>0.11411630</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adj Pr > F

<table>
<thead>
<tr>
<th>Source</th>
<th>G - G</th>
<th>H - F</th>
</tr>
</thead>
<tbody>
<tr>
<td>stimulus</td>
<td>0.0113</td>
<td>0.0089</td>
</tr>
<tr>
<td>Error(stimulus)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Greenhouse-Geisser Epsilon 0.5040
Huynh-Feldt Epsilon 0.5561
*the following code calculates critical values for F;

data;
input alpha df1 df2 epsilon;
prob=1-alpha;
cdf1=df1*epsilon;
cdf2=df2*epsilon;
cvalF=finv(prob, cdf1, cdf2);
cards;
.05 3 39 .5561
proc print;
run;

Obs alpha df1 df2 epsilon prob cdf1 cdf2 cvalF
1 0.05 3 39 0.5561 0.95 1.6683 21.6879 3.65307
1. $H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4$

   $H_1: \mu_p \neq \mu_p$, for at least one pair of means

2. $F_{\alpha, e(p-1), e(n-1)(p-1)} = F_{0.05, .5561|4-1|, .5561|14-1|4-1} = 3.65$

3. $F(1.67, 21.69) = 6.43, p < .0089$
4. Reject $H_0$.

5. There is sufficient evidence to conclude that stimuli affect gaze time. The sample means indicate that mean gaze time is longer for more complex stimuli (faces and concentric circles) than for simpler stimuli (simple circles and newsprint).

Table 1

Descriptive Statistics

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td>1.68</td>
<td>.59</td>
</tr>
<tr>
<td>Concentric Circles</td>
<td>1.52</td>
<td>.74</td>
</tr>
<tr>
<td>News</td>
<td>1.27</td>
<td>.33</td>
</tr>
<tr>
<td>Simple Circles</td>
<td>1.18</td>
<td>.44</td>
</tr>
</tbody>
</table>