Pain Relief Experiment

An experiment was done with males who had just had dental surgery. There are two factors of interest; drug (codeine or placebo) and acupuncture (needles at inactive sites, needles at active sites). Because different people have different pain tolerances and levels of pain after surgery, 32 subjects were grouped into blocks according to the level of pain they were experiencing (the first block consisted of 4 men with the least amounts of pain, the second block consisted of 4 men with the next lowest amounts of pain, ..., the eighth block consisted of 4 men with the highest amounts of pain). The experimenters randomly assigned the 4 treatment combinations to the four men within each block. After 2 hours the pain relief was assessed for each subject (higher scores indicate more effective pain relief).

Response: Pain relief (higher score indicates greater pain relief)

Conditions:
Factor 1: Drug – Codeine and Placebo
Factor 2: Acupuncture – Inactive and Active

Nuisance Factor: Pain level (Block)

Experimental material: 32 males after dental surgery.

Data:

<table>
<thead>
<tr>
<th>Block</th>
<th>Placebo/Inactive</th>
<th>Codeine/Inactive</th>
<th>Placebo/Active</th>
<th>Codeine/Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>0.5</td>
<td>0.6</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>0.3</td>
<td>0.6</td>
<td>0.7</td>
<td>1.3</td>
</tr>
<tr>
<td>3</td>
<td>0.4</td>
<td>0.8</td>
<td>0.8</td>
<td>1.6</td>
</tr>
<tr>
<td>4</td>
<td>0.4</td>
<td>0.7</td>
<td>0.9</td>
<td>1.5</td>
</tr>
<tr>
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<td>0.6</td>
<td>1.0</td>
<td>1.5</td>
<td>1.9</td>
</tr>
<tr>
<td>6</td>
<td>0.9</td>
<td>1.4</td>
<td>1.6</td>
<td>2.3</td>
</tr>
<tr>
<td>7</td>
<td>1.0</td>
<td>1.8</td>
<td>1.7</td>
<td>2.1</td>
</tr>
<tr>
<td>8</td>
<td>1.2</td>
<td>1.7</td>
<td>1.6</td>
<td>2.4</td>
</tr>
</tbody>
</table>
Treatment of Post-operative Dental Pain
Plots of Factor Means and Interaction Plots

<table>
<thead>
<tr>
<th>Drug</th>
<th>Level</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codeine</td>
<td>1.42500</td>
<td></td>
</tr>
<tr>
<td>Placebo</td>
<td>0.88750</td>
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</table>

<table>
<thead>
<tr>
<th>Acupuncture</th>
<th>Level</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
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</tr>
<tr>
<td>Inactive</td>
<td>0.83125</td>
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</tr>
</tbody>
</table>

**Drug**

![Relief LS Means for Drug](chart)

**Drug*Acupuncture**

<table>
<thead>
<tr>
<th>Level</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>1.7875</td>
</tr>
<tr>
<td>Codeine,Inactive</td>
<td>1.0625</td>
</tr>
<tr>
<td>Placebo,Active</td>
<td>1.1750</td>
</tr>
<tr>
<td>Placebo,Inactive</td>
<td>0.6000</td>
</tr>
</tbody>
</table>

![Relief LS Means for Drug*Acupuncture](chart)