Comparing the effectiveness of Positive and Negative Feedback on Information-Integration Categorical Learning

Michael Freedberg\textsuperscript{1,2}, W. Todd Maddox\textsuperscript{3}, and Eliot Hazeltine\textsuperscript{1,2}

\textsuperscript{1}Interdisciplinary Neuroscience Program, \textsuperscript{2}Department of Psychology, University of Iowa, Iowa, \textsuperscript{3}Department of Psychology, University of Texas, Austin

**Introduction**

The ability to make accurate information-integration (II) categorizations is a critical tool that we use everyday. Ashby and O’Brien (2007) concluded that successful information-integration categorization learning relies on both the availability of positive and negative feedback. Here we use a modified version of the categorization task used by Ashby and O’Brien to examine the different roles that positive and negative feedback play in learning.

**Method**

The goal of the study was to compare the effects of positive and negative feedback while holding the amount of feedback constant.

Twenty-four participants were split into three groups and performed 2,400 categorizations over the course of 3 days.

**Results**

**Accuracy-Based Analysis**

<table>
<thead>
<tr>
<th>Source</th>
<th>F-value</th>
<th>P-value</th>
<th>( \eta^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>9.544</td>
<td>&lt; 0.001</td>
<td>0.312</td>
</tr>
<tr>
<td>Group</td>
<td>0.925</td>
<td>0.412</td>
<td>0.081</td>
</tr>
<tr>
<td>Interaction</td>
<td>2.796</td>
<td>&lt; 0.05</td>
<td>0.210</td>
</tr>
</tbody>
</table>

Table 1. Results of ANOVA using group (PFB, NFB, and BFB), and day as factors.

**Model-Based Analysis**

A significant association between group and strategy was identified:

\[ X^2 (4, N = 39) = 12.300, \ p < 0.05 \]

**Conclusions**

- Negative feedback appears to be more effective towards teaching complex category structures.
- Negative feedback appears to be necessary for information-integration (II) learning.
- Positive feedback may not be necessary for information-integration category learning.
- Differences in the information received do not seem to explain the differences in performance between groups.

**Proposed Mechanism**

- Negative feedback provides a robust signal to update the categorization strategy used.

**References**


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Michael Freedberg – Michael.Freedberg@uiowa.edu
Dr. Eliot Hazeltine – Eliot.Hazeltine@uiowa.edu
http://psychology.uiowa.edu/hazelab