Meaning can be Accessed for the Groundside of a Figure
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Introduction
• Figure-ground perception entails inhibitory competition between possible objects across a border
• Response to the shape of the loser is suppressed \(^1\)
  • Evident at 83ms SOA, not > 100ms

Are semantics of the losing competitor accessed as well?
Different predictions on feedforward vs. recurrent architectures

Methods
• Task: categorize words as naming natural/artificial objects
  • Words followed silhouettes with familiar shapes suggested but not perceived on the groundside
• Conditions: same object (SO), different object, same category (DO-SC), different object, different category (DO-DC)

<table>
<thead>
<tr>
<th>Natural Words</th>
<th>SO</th>
<th>DO-SC</th>
<th>DO-DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>hand</td>
<td>🖱️</td>
<td>🖱️</td>
<td>🖱️</td>
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<tr>
<td>deer</td>
<td>🦌</td>
<td>🦌</td>
<td>🦌</td>
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<tr>
<td>ant</td>
<td>🦀</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Artificial (Man-made) Words</th>
<th>SO</th>
<th>DO-SC</th>
<th>DO-DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>anchor</td>
<td>🚀</td>
<td>🚀</td>
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<tr>
<td>scissors</td>
<td>🔨</td>
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<td>saucepan</td>
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• Predictions: if meaning is accessed for groundside and:
  • suppressed: slower RTs for SO & DO-SC than DO-DC
  • not suppressed: faster RTs for SO & DO-SC than DO-DC

Results
Word Only
• Goal: equate RTs for words across conditions

Words + silhouettes: 83ms SOA
• At SOA when shape is suppressed, is meaning suppressed or facilitated for groundside?
• Meaning is accessed for groundside of silhouettes \(^2\)
  • DO-SC & SO faster than DO-DC
  • SO longer RTs than DO-SC
  • Due to suppression of shape?

Words + silhouettes: 166ms SOA
• At longer SOA when shape is no longer suppressed, does difference between DO-SC and SO disappear?
  • Is meaning still facilitated?
  • Meaning is accessed at longer SOA
    • DO-SC & SO faster than DO-DC
    • Equal facilitation of SO & DO-SC
    • Shape no longer suppressed

Conclusions
• The semantics of familiar objects that are suggested but not perceived in the ground are accessed
• Unlike shape, semantics facilitated, & effects are long-lasting (for consistent ERP evidence, see \(^3\))
• Familiar object on groundside loses competition for shape perception, but results are not relayed to the semantic level
• Results support recurrent architecture
  • Meaning accessed prior to figure assignment

References:

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Support: MAP NSF BCS 0960695