Offline effects but no online differences in phrasal meaning composition including intersective vs. subsective adjectives

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ELM poster presentation 2020

#68

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## ERP correlates of phrasal meaning composition

<table>
<thead>
<tr>
<th>Det.</th>
<th>Adj</th>
<th>4EEG</th>
<th>Composition</th>
<th>Denotation Question</th>
<th>Typicality Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>en</td>
<td>grønn</td>
<td>skilpadde</td>
<td>Syn+ Sem+ [Adj N]=[Adj]∩[N]</td>
<td>Is it a common turtle? Yes</td>
<td>Is it a green animal? Yes</td>
</tr>
<tr>
<td>a</td>
<td>green</td>
<td>turtle</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>en</td>
<td>rosa</td>
<td>skilpadde</td>
<td>Syn+ Sem+ [Adj N]=[Adj]∩[N]</td>
<td>Is it a common turtle? No</td>
<td>Is it a pink animal? Yes</td>
</tr>
<tr>
<td>an</td>
<td>pink</td>
<td>turtle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>en</td>
<td>langsom</td>
<td>skilpadde</td>
<td>Syn+ Sem+ [Adj N]⊆[N]</td>
<td>Is it a common turtle? Yes</td>
<td>Is it a slow animal? Yes</td>
</tr>
<tr>
<td>a</td>
<td>slow</td>
<td>turtle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>en</td>
<td>rask</td>
<td>skilpadde</td>
<td>Syn+ Sem+ [Adj N]⊆[N]</td>
<td>Is it a common turtle? No</td>
<td>Is it a fast animal? No</td>
</tr>
<tr>
<td>a</td>
<td>fast</td>
<td>turtle</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Typicality
- Typical
- Atypical

### Denotation
- Intersective
- Subsective

Expected answers based on linguistic theory
Experiment 1

No significant clusters: Cluster-based permutation tests across the whole epoch (0-800 ms)

Is it a XX animal?

- pink: YES
- slow: YES
- fast: NO

Experiment 1: Accuracies for Denotation Question
Difference: Participants were taught the intersective/subsective distinction plus given feedback after each trial.

Experiment 2

Is it a XY animal?

green YES pink YES slow YES fast NO
Experiment 2 (RTs)

Is it a XY animal?
- green: YES
- pink: YES
- slow: NO
- fast: NO

Is it a common turtle?
- green: YES
- pink: NO
- slow: YES
- fast: NO

Effect of Denotation: $p < .0001$
Denotation * Typicality: $p = .0001$

Effect of Typicality: $p < .0001$
Denotation * Typicality: $p < .0001$
Discussion

• Difference between online and offline processing
  Possibly speakers can assign “maximal meanings” to all or most phrases (offline results) as outlined in linguistic theory, but it is unclear whether such capacity actually plays out online during processing (ERP null results)

• Interpretation of the null results in light of the “good enough” approach to language comprehension (Ferreira et al. 2002)

• Null results of Typicality seemingly contradict a large body of ERP studies
  • But earlier work always used sentences or discourse contexts.
  • Federmeier et al. (2010) showed that low typicality items trigger N400 components whose amplitudes fall between high typicality and incongruous target words. Maybe manipulation not strong enough within a phrasal context?
  • Molinaro et al. (2012) found no N400 effects of typicality in phrases embedded in sentences.
ERP Effect of Composition

Experiments also included two baseline conditions

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<tbody>
<tr>
<td>en</td>
<td>xkqh</td>
<td>skilpadde</td>
<td>Syn− Sem−</td>
<td>Is it an animal?</td>
</tr>
<tr>
<td>a</td>
<td>[nonword]</td>
<td>turtle</td>
<td></td>
<td></td>
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<tr>
<td>en</td>
<td>tæff</td>
<td>skilpadde</td>
<td>Syn+ Sem−</td>
<td>Is it an animal?</td>
</tr>
<tr>
<td>a</td>
<td>[pseudoword]</td>
<td>turtle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Comparison: Non-semantic conditions vs. all four adjective conditions
- P600 composition effect
- Same effect was found in Ex1 & Ex2 plus in Fritz & Baggio (2020)

