Direct evidence for structural prediction from the processing of auxiliary dependencies: An ERP investigation in French

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Introduction

The question
- Are predictive mechanisms available at the structural level?

The idea
- The forms of certain words depend on upcoming linguistic content.
- Examining the processing of dependent words when the upcoming content is expected has provided convincing evidence for predictive mechanisms.

The study
- In French there is a dependency between auxiliary form and upcoming sentence structure.
- Examining processing of auxiliary forms to investigate whether processors formulate structural predictions given the animacy of subjects and the thematic constraints of structures.

Background

Previous evidence for predictive mechanisms at the lexical level.
- From electrophysiology:
  - N400: Elicited by mismatching English article form for expected nouns (DeLong et al., 2005).
  - Late positivities: Elicited by mismatching Spanish article agreement for expected nouns (Wicha et al., 2004) and mismatching Dutch adjectival agreement for expected nouns (Van Berkum et al., 2005).
- Late negativities: Elicited by mismatching Dutch adjectival agreement for expected nouns (Otten & Van Berkum 2006, 2009).

What about sentence structure?
- Need a probe word whose form is sensitive to upcoming sentence structure.
- In French, two types of auxiliaries, each selected by a different structure (Kayne, 2009):
  - Avoir/HAVE selected by undetermined structures (active, unergative).
  - Être/BE selected by derived structures (passive, unaccusative).
- Derived structures have non-agent/non-causer (theme) subjects.

Auxiliary in compound tense

<table>
<thead>
<tr>
<th>Avoir/HAVE</th>
<th>Être/BE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sentence structure</td>
<td>undetermined</td>
</tr>
<tr>
<td>Preferred subject</td>
<td>animate</td>
</tr>
</tbody>
</table>

Results: Waveforms

<table>
<thead>
<tr>
<th>Waveform</th>
<th>Avoir/HAVE</th>
<th>Être/BE</th>
</tr>
</thead>
<tbody>
<tr>
<td>High animacy</td>
<td>Avoir/HAVE 290 ms</td>
<td>Être/BE 350 ms</td>
</tr>
<tr>
<td>Low animacy</td>
<td>Avoir/HAVE 350 ms</td>
<td>Être/BE 290 ms</td>
</tr>
</tbody>
</table>

An ERP investigation in French

Direct evidence for structural prediction from the processing of auxiliary dependencies:

Increased ERP amplitude on Avoir/HAVE when preceded by inanimate subjects and on Être/BE when preceded by animate subjects.

- Inanimate subjects are compatible with agent interpretation and predict derived structures with Être/BE, not Avoir/HAVE.
- Animate subjects are compatible with agent interpretation and predict undetermined structures with Avoir/HAVE, not Être/BE.

Selected References


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