Compression vs. Partition: Memory domains and the processing of appositives

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Memory Domains & Linguistic Structure

Previous research suggests that some units of linguistic structure correspond to memory domains, units that influence storage and access during on-line processing [3, 6, 11].

How (if at all) is retrieval of linguistic content affected by segmentation of that content into memory domains?

A test case: Appositive relative clauses (ARCs).
- Sub-sentential units that are semantically, pragmatically, and prosodically demarcated from their host clauses [10].
- Argued to be less impactful on later processing than restrictive relative clauses (RRCs) [2, 3, 7, 9].

ARC: The cat, who loves to eat tuna in the morning, came running into the kitchen.
RRC: The cat that loves to eat tuna in the morning came running into the kitchen.

Two explanations: Appositives are stored in separate domains that are...
- less accessible in memory due to loss/compression of structure [3, 11], or
- easier to target directly and/or bypass during memory retrieval [8].

Two views of segmentation effects
- Prosodic and semantic/pragmatic segmentation sometimes reduces the accessibility of previous content, because crossing domain boundaries induces memory decay [3, 11].
- Prosodic segmentation enhances memory for utterances and their segments [6], because domains lessen the burden on working memory and reduce potential of interference [8].

Hypotheses & Predictions

Compress: Following processing of the RC, appositives are compressed in memory due to their semantic/pragmatic status [3].
- Predicts worse memory for ARCs compared to RRCs.
- Predicts difficulty accessing ARC-internal content, post-RC.

Partition: Appositives create a structural division in the memory representation of a sentence that makes all the sentence’s content more easily accessible.
- Predicts better memory for ARCs compared to RRCs.
- Predicts easier access to all content in a sentence with an ARC.

Experiment 1: Recognition Memory (n = 48)

Q: Are ARCs remembered worse or better than RRCs?
A: Numerically better, but not significantly. Crucially, not worse.

Quality of evidence: An ellipsis site in an RRC targets an ARC-internal antecedent. ARC-2, who published the successful hack, is faster than in ARC-1 but also slower than in Control.

ARC-2
ARC-1
Control

\( C, \text{ARC-1 vs. ARC-2} \)
-0.03 (-0.08, 0.02)

\( C, \text{ARC-1 vs. Control} \)
-0.01 (-0.05, 0.02)

\( C, \text{ARC-2 vs. Control} \)
-0.02 (-0.05, -0.0008)

Q: Are ARCs remembered worse or better than RRCs?
A: Tentatively, more accessible - ellipsis resolution is faster in sentences with ARCs.

Table 1: Experiment 1 Results

<table>
<thead>
<tr>
<th>Condition</th>
<th>RT (ms)</th>
<th>95% CrI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>747</td>
<td>(705, 790)</td>
</tr>
<tr>
<td>ARC-1</td>
<td>749</td>
<td>(716, 781)</td>
</tr>
<tr>
<td>ARC-2</td>
<td>775</td>
<td>(738, 812)</td>
</tr>
</tbody>
</table>

Discussion

We find evidence that segmentation facilitates memory retrieval: support for Partition.

• Are domains also compressed?
  - The two hypotheses aren’t mutually exclusive.
  - Alternatively: an avoidance of ellipsis antecedents in ARCs?

• Some large linguistic constituents constitute domains in memory.
  - These domains serve to restrict the search space for retrieval, and so can reduce potential sources of similarity-based interference.
  - But what large linguistic constituents? Syntactic? Pragmatic? Prosodic? All of the above? (see [4])

Conclusions

• We do not find evidence in support of Compression: ARCs are not less accessible in memory than RRCs.

• We find tentative evidence in favor of Partition: ARCs (through segmentation) make utterance content more accessible in memory than RRCs.

References


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