On predicting temporal relations: assessing the role of verbal tenses and lexical aspect

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1. Mary looked for her keys. Ø/then/after she drank a glass of fresh water.
2. Mary was looking for her keys. Ø/while she drank a glass of fresh water.
3. Mary walked to downtown. She gave her mother a phone call.
4. Mary walked along the street. She discussed with her mother on the phone.

Some examples

Linguistic cues

1. Verbal tenses
   - Simple Past (perfective) vs. Past Progressive (imperfective)
2. Lexical aspect: events vs. activities
3. Linguistic marking: overt marking vs. implicit

State of the research and predictions for testing chronological vs. synchronous relations

1. Verbal tenses inform, via their semantics, the reader with respect to temporal relations (Kamp 1979; Kamp & Rohrer 1983; Hinrichs 1981)
   - Simple Past/perfective aspect – follow the iconicity principle (Chafe 1979) – mental representation of a completed situation (Madden & Swaan 2003) → chronological relations
   - Past Progressive/imperfective aspect – not follow the iconicity principle – mental representation of an incomplete situation → synchronous relations (Magliano & Schleich 2000)
2. Events → chronological relations, whereas activities → synchronous relations (Partee 1984; Dowty 1986; Hinrichs 1986; Kamp & Reyle 1993)
3. Chronological relations are highly expected relations (Murray 1997) – need not be overtly marked (in contrast to synchronous relations) (Asr & Demberg 2012)

Annotation experiment 1: story continuation data

- 2 English native speakers, worked independently
- 503 continuations of built items with transfer verbs (borrowed from Kehler & Rohde 2017) and ambiguous pronoun prompt vs. no pronoun prompt.
- Meg gave a book to Helen. She/Ø […]
- Meg was giving a book to Helen. She/Ø […]
- Predictions:
  - Perfective SP → more sequential relations
  - Imperfective PastProg → more synchronous
- Results: agreement on 369 items (73%)

Annotation experiment 2: corpus data

- 2 English native speakers, worked independently
- 130 corpus excerpts (literary text), a total of 502 pairs of verbal phrases
- The presence or absence of temporal connectives was coded
- Predictions:
  - Synchronous relations are most frequently overtly marked, whereas chronological relations are more frequently left implicit
- Results: agreement on 368 pairs (73%)

Crowdsourcing evaluation experiment 3

- 40 items, 48 fillers of which 36 were catch fillers: 18 ending with at the same time, 18 with afterwards; 172 participants from MTurk

Meg’s sister played a harmonica. Ronald planted new rose bushes.

2x2/2 within-subject Agent

<table>
<thead>
<tr>
<th>Lexical aspect of S1 - S2</th>
<th>same</th>
<th>different</th>
</tr>
</thead>
<tbody>
<tr>
<td>activity activity</td>
<td>S1</td>
<td>S2</td>
</tr>
<tr>
<td>activity event</td>
<td>activity</td>
<td>activity</td>
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<tr>
<td>event activity</td>
<td>event</td>
<td>activity</td>
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</tbody>
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Conclusion

Our study shows that, in corpora, chronological relations are not necessarily left implicit, and that a series of linguistic cues favour their inference: the SP (perfective), events in S1 and/or S2, same agent performing those actions and when there is no ambiguous pronoun prompt.