

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

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Some examples

1. Mary looked for her keys. \emptyset /then/after she drank a glass of fresh water.
2. Mary was looking for her keys. \emptyset /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.

Linguistic cues

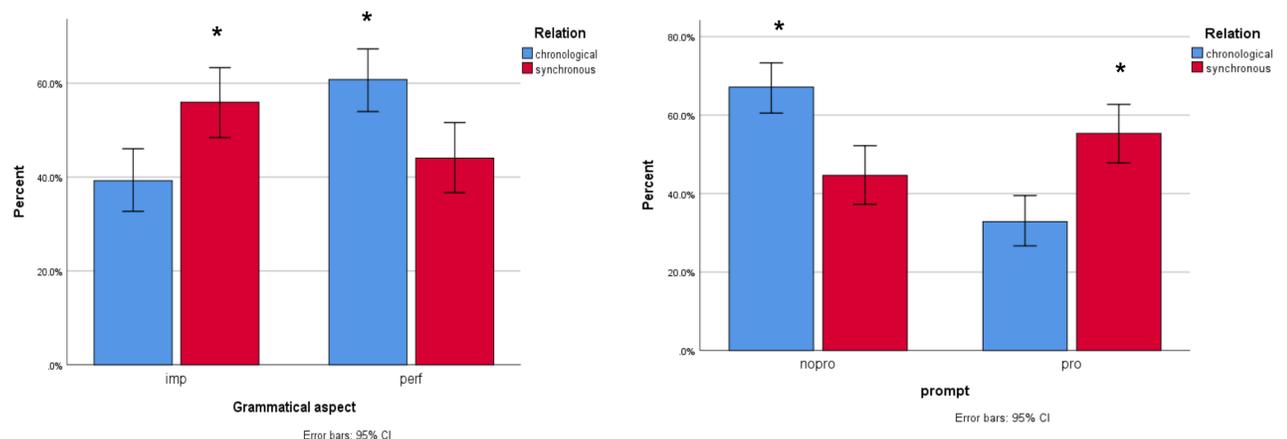
1. **Verbal tenses**
 - Simple Past (perfective) vs. Past Progressive (imperfective)
2. **Lexical aspect**: events vs. activities
3. **Linguistic marking**: overt marking vs. implicit

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 a **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)

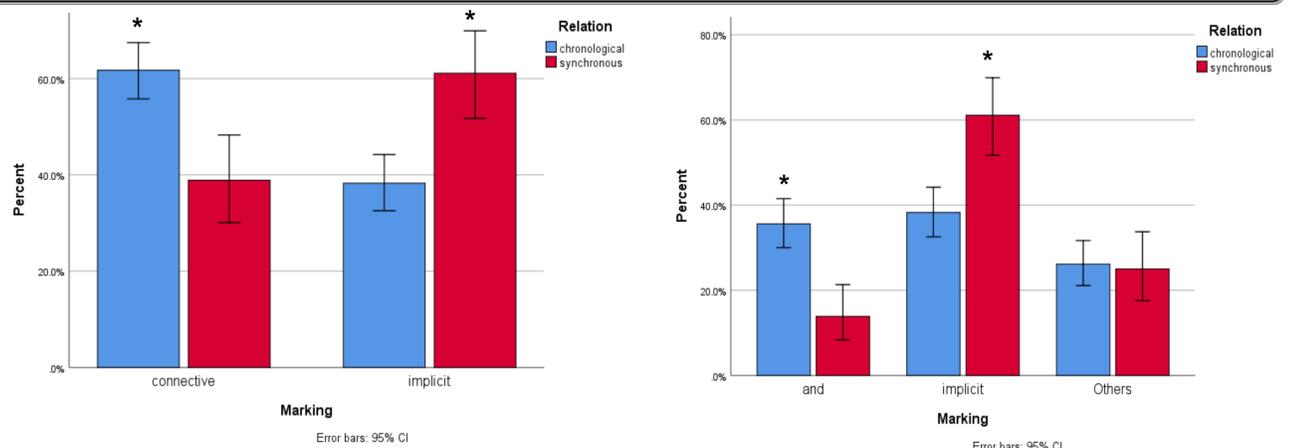
Annotation experiment 1: story continuation data

- 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/ \emptyset [...]*
 - *Meg was giving a book to Helen. She/ \emptyset [...]*
- **Predictions**:
 - Perfective SP → more sequential relations
 - Imperfective PastProg → more synchronous
- **Results**: agreement on 369 items (73%)



Annotation experiment 2: corpus data

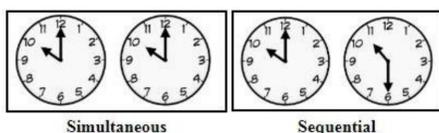
- 2 English native speakers, worked independently
- 130 corpus excerpts (literary text), a total of 502 pairs of verbal phrases
- The presence or absence of temporal connectives was coded
- **Predictions**:
 - Synchronous relations are most frequently overtly marked, whereas chronological relations are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



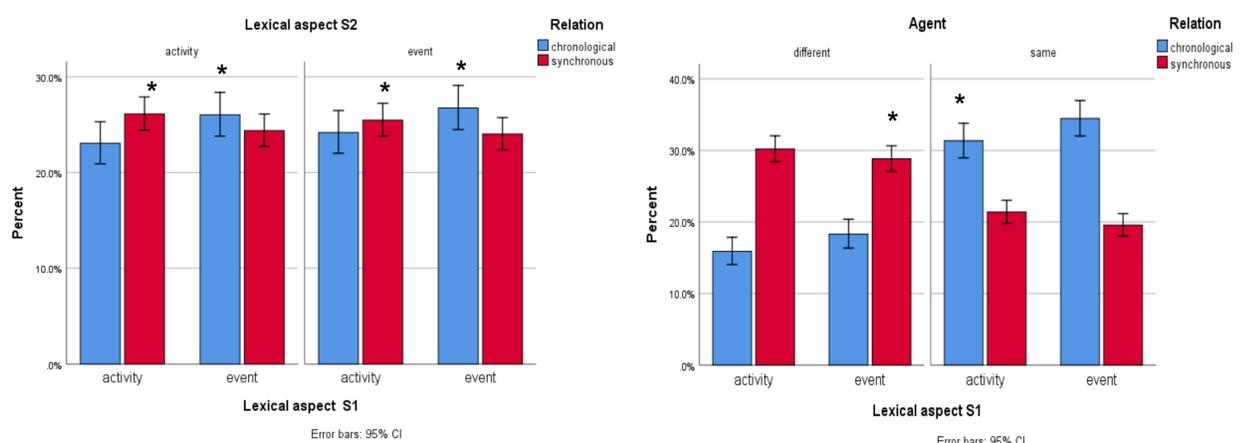
Crowdsourcing evaluation experiment 3

- 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.



2x2x2 within-subject	Agent			
	same		different	
Lexical aspect of S1 - S2	S1	S2	S1	S2
activity	activity	activity	activity	activity
activity	event	activity	activity	event
event	activity	event	event	activity
event	event	event	event	event



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.