Expectations for Novelty: Does Information Structure affect Syntactic Processing?
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What are we testing?
The observed complexity of different types of relative structures is often attributed to their syntactic structure (Gibson et al., 2013). However, it has been shown that syntactic explanations alone fail to make the right predictions (Gibson et al., 2005; Gordon et al., 2001). In the current study we investigate the influence of information structure on comprehender’s relative clause processing.

What has previous research found?
Gibson et al. (2005):
- Foregrounded information is more easily processed later in a sentence.
- Assumption:
  - non-restrictive relative clauses assign their content foregrounded status.
  - restrictive relative clauses assign their content backgrounded status.
  - Restrictive relative clauses were parsed slower sentence final than non-restrictive relative clauses.
  - object-modifying
  - Sentence initial relative clauses were parsed faster overall
  - subject-modifying

Item design:
- short narratives relating to the first person and their family/friends (cohesion)
- no implicitly causal verbs (Ferstl et al., 2011)
- givens:
  - subjects and objects always given by context for all conditions, and equally given across conditions
  - actions/events (verbs) marked for givens, achieved by making these habitual in the present context
  - always only one clause containing a given event/action.

Hypotheses and research questions
We test four hypotheses, two of which make predictions based on syntactic explanations (i-ii, Gibson et al., 2013), and two which incorporate information structural constraints (iii, Gibson et al., 2005; iv, Diesel, 2001):

(i) Perspective shifts are harder to process
(ii) Longer distance dependencies require more storage, causing processing difficulty
(iii) Information Flow Hypothesis: new information is processed more easily later in a sentence
(iv) Clause type mapping: new information is processed more easily in a matrix clause

This leads to the following research questions:
- Is new information better understood early or late in a sentence?
- Is new information better understood in a matrix clause or a relative clause?
- Are syntactic theories of relative clause processing better at predicting relative clause complexity than those that incorporate information structural constraints?

How are we testing this?
- Self-paced reading task in Ibex farm
- 32 items in four conditions (+short narratives)
- each of which is predicted to be more/less difficult to process based on the abovementioned hypotheses
- 63 monolingual speakers of American English
- Crowdsourced via Amazon Mechanical Turk.
- Analysis of residual reading times
- Mixed effects model (Mplus package, Bates et al., 2014)

What is our design?
- Non-restrictive relative clause structures
  - 2 x 2 design
  - object-modifying & subject-modifying
  - New information in the matrix clause & given information in the relative clause, or vice versa
  - Information status manipulated by a short narrative preceding the relative clause
  - (a) object-modifying - matrix given, RC new
  - (b) subject-modifying - matrix given, RC new
  - (c) object-modifying - matrix new, RC given
  - (d) subject-modifying - matrix new, RC given

References

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# Full sentence analysis

- Reading times for the matrix and the relative clauses added up
- Considered as a single target region

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- Mixed effects model
- Residual reading time depended on:
  - position of the relative clause (object-modifying / subject-modifying)
  - status of information in the relative clause (given/new)
- No significant effect for either however...

- Reading times of matrix or relative clause in isolation compared between all conditions:
  - significant effect for relative clause position & information status in both cases

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- Replication of Gibson et al. (2005)’s results
- Potential issue in relative clause processing research?
- significant differences found in processing of matrix and relative clauses, depending on their position and the status of the information they convey cancelled out once these clauses are considered together.
- Total processing demand of relative clause structures – while distributed differently across sentences – is not found to be different between conditions