

Inference, Coherence, and Pronoun Interpretation

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Overview

Although pronouns are often referentially ambiguous, hearers seem to have little trouble understanding them. The relative ease with which listeners identify an intended referent has led some researchers to posit special-purpose pronoun interpretation heuristics.

Antecedent Preferences

These heuristics are based on apparent preferences for antecedents in specific structural positions, for example, antecedents in subject position, as in (1a) and (1c), or antecedents in the same argument position as the pronoun, as in (1b) and (1c). Preferences, however, are often in conflict, (1b) and (1c), and appear to surface only under certain conditions. Note, for example, that neither preference predicts the pattern in (1d).

(1) Samuel threatened Justin with a knife, and

	subject	parallel
a) Erin stopped him.	yes	no
b) Erin blindfolded him.	no	yes
c) he blindfolded Erin.	yes	yes
d) he alerted security.	no	no

Subject Preference

Basic: Preferred antecedent is the subject of the preceding clause.

Qualified: Subject preference will not override semantic or pragmatic bias (Crowley & Stevenson 1990).

Parallel Structure Preference

Basic: Preferred antecedent occurs in the same structural position as the pronoun.

Qualified: Parallel preference observed only when clauses are structurally parallel; otherwise, the subject preference is observed (Smyth 1994).

Coherence Analysis

The coherence analysis predicts that apparent preferences can be disrupted through the **manipulation of coherence**. In particular, the parallel structure preference follows from **parallel coherence**, and causal inferencing drives interpretation in **result coherence** frames (Hobbs 1979, Kehler 2002).

Method

In order to test each of the various preference theories, as well as the coherence analysis, we varied sentences like those in (2) by **pronoun position** (subject/object), **sentence structure** (fully/partially parallel) and **coherence relation** (parallel/result). The modifier in the second clause was omitted in half of the stimuli, leading to non-parallel structure in those cases. Coherence relations were assessed by trained judges in a prior norming phase.

Materials

- (2) Samuel threatened Justin with a knife, and
- ... Erin stopped him (with pepper spray). **Result**
 - ... Erin blindfolded him (with a scarf). **Parallel**
 - ... he blindfolded Erin (with a scarf). **Parallel**
 - ... he alerted security (with a shout). **Result**

Design

- 32 monolingual native English speakers
- 2 x 2 x 2 repeated measure varying
 - pronoun position** (subject/object)
 - sentence structure** (fully/partially parallel)
 - coherence relation** (parallel/result)
- 16 stimulus sets x 8 stimuli per set = 128 total stimuli
- 16 stimuli per list + 24 fillers

Task

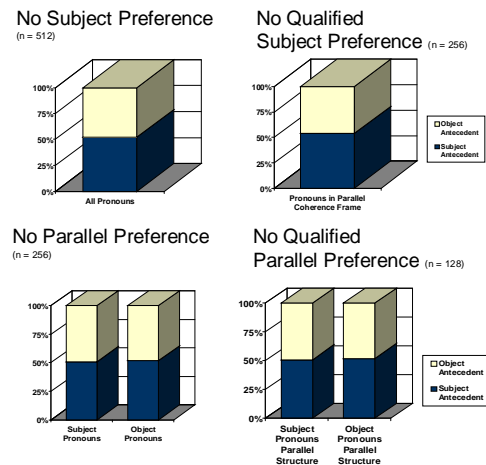
Offline pronoun interpretation:

Samuel threatened Justin with a knife, and he blindfolded Erin with a scarf.

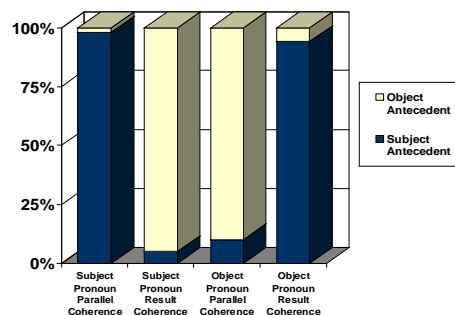
Who blindfolded Erin?

Results

With stimuli balanced across pronoun position, sentence structure, and, crucially, coherence frame, we found no evidence of structural preferences for antecedent selection. The results instead support the coherence analysis.



Coherence Analysis (n = 128)



Discussion

The coherence account makes the right predictions in (2b) and (2c), where **Parallel coherence** supports **parallel reference**. Similarly, the coherence model predicts non-parallel reference in the **Result coherence** frames (2a) and (2d) where causal bias supports **non-parallel reference**. Furthermore, we show that:

- 'Preferences' can be systematically disrupted through the manipulation of coherence relations.
- When the relevant factors are balanced, the preferences disappear.
- Morpho-syntactic cues cannot predictably identify a single preferred antecedent.
- Morpho-syntactic effects are mediated by coherence.

Two Models of Pronoun Interpretation

Preference Models

Morpho-Syntax ⇔ Pronoun Interpretation

Coherence Model

Morpho-Syntax ⇔ Coherence ⇔ Pronoun Interpretation

References

- Crowley, R. A., & Stevenson, R. J. (1990). Reference in Single Sentences and in Texts. *Journal of Psycholinguistic Research*, 19, 191-210.
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- Kehler, A. (2002). Coherence, Reference, and the Theory of Grammar. Stanford, CA: CSLI Publications.
- Smyth, R. (1994). Grammatical Determinants of Ambiguous Pronoun Resolution. *Journal of Psycholinguistic Research*, 23, 197-229.