**Abstract**

Problem: Previous work finds that pronoun interpretation in transfer-of-possession contexts is sensitive to coherence-driven biases, but that work does not address a mystery that has also been reported for such contexts: an asymmetry between pronoun production and interpretation.

Proposal: To explain the asymmetry, we introduce a Bayesian model of pronoun interpretation that distinguishes the primary factors (e.g., coherence relations) that generate expectations about who will be mentioned next (p(referent)) from those factors (e.g., subjecthood) that primarily determine whether a speaker will choose to use a pronoun instead of a name (p(pronoun | referent)). We predict more subject-biased coherence relations than non-subject-biased relations in a pronoun-pronoun story-continuation condition.

Results: We find that the rate at which a pronoun is interpreted to refer to the subject reflects the likelihood that the subject referent will be mentioned again (regardless of referring expression) and the likelihood that a speaker will use a pronoun. Crucially, we find that, in contexts with an ambiguous pronoun prompt, the mere presence of a pronoun, even if its referent is ambiguous, can change the distribution of coherence relations.

1. Goals

- Distinguish factors that influence comprehenders’ expectations for next mention from those that influence speakers’ choice of referring expression.
- Test whether ambiguous pronouns influence expectations about discourse direction given a production bias linking pronouns and subjects

2. Previous work: pronoun interpretation

Transfer of possession contexts

1. John _Source_ passed the comic to Bill _Goal_. He ___________________________.

Stevenson, Crawley, & Kleinman (1994): interpretation biases compete

- Thematic role bias (favoring Goal over Source)
- Subject assignment bias (favoring subject Source)

RESULT: participants interpret pronoun 50/50 to Source/Goal

Rohde, Kehler, & Elman (2006): interpretation reflects discourse biases

- Biases about where discourse is going (coherence relations)
- Biases about who is likely to be mentioned next (given discourse direction)

RESULT: interpretation depends on operative coherence relation

3. Interpretation/Production asymmetry

Prompt/no-prompt conditions reveal apparent asymmetry (Stevenson et al. 1994; Arnold 2001)

2a. John passed the comic to Bill. He ___________________________.

2b. John passed the comic to Bill.

Claim for 2 biases: an expectation for a subsequent mention of a referent, p(referent), and an expectation about the form of referring expression that the speaker would use to mention that referent, p(pronoun | referent).

4. Proposal: Bayesian model

\[
p(\text{Goal}) = p(\text{Goal} | \text{pronoun}) = \frac{p(\text{pronoun} | \text{Goal}) \cdot p(\text{Goal})}{p(\text{pronoun})}
\]

Claim: p(\text{Goal}) reflects coherence biases (e.g. Occasions biased to Goal)

5. Story continuation experiment

Task: participants instructed to imagine a natural continuation to a context sentence and prompt

Materials: pronoun prompt (2a) and bare prompt (2b)

Judge: annotation for next mention, intended pronoun interpretation, and coherence relation

6. Coreference results

Coherence and pronoun type

- Coherence influences pronoun interpretation: choice of next mention, p(\text{Goal}), reflects coherence-driven biases
- Pronoun interpretation influences coherence establishment: knowing that pronouns are more likely to be produced for a subject referent shifts coherence distribution, even when pronoun is ambiguous

References


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