**Pronoun interpretation in Brazilian Portuguese: event structure can override subject preference**

**Background and Motivation**

- Kehler and Rohde (2013) on the interpretation of ambiguous pronouns can be explained by a Bayesian model that relies on:
  \[ P(\text{pronoun} | \text{referent}) \] a production bias based on the likelihood of using a pronoun to refer to a given referent (mainly influenced by grammatical factors such as subjectivity);
  \[ P(\text{referent}) \] a non-mention bias based on semantic factors, e.g., coherence relations expected to occur in the ensuing context.

An example in transfer-of-possession context:

- \( P(\text{pronoun} | \text{source}) > P(\text{pronoun} | \text{goal}) \) in (1) and (2) due to the subject preference associated with the use of overt pronouns in English.
  - Perfective aspect favors coherence relations that focus on the event’s end state; therefore \( P(\text{goal}) > P(\text{source}) \) in (1).
  - Imperfective aspect favors coherence relations that focus on the ongoing event; therefore \( P(\text{source}) > P(\text{goal}) \) in (2).

Results also hold true for Korean (Kim et al., 2009) and Japanese (Uno and Kehler, 2010): overt pronoun interpretation is influenced by event structure, but not enough to show a preference for goals over sources in perfective contexts, possibly due to a subject preference associated with this referential expression.

**Our goals**

- To investigate whether overt pronoun interpretation in Brazilian Portuguese is more sensitive to event structure than in English, Japanese, and Korean, as this language shows no subject preference associated with the use of overt pronouns (Fonseca and Guerreiro, 2012; Štefaši et al., 2014). [Experiment 1]
- To test whether differences in \( P(\text{pronoun} | \text{referent}) \), a production bias, result in different goal/source distribution, while \( P(\text{referent}) \), determined by coherence-driven information, remains constant despite of changes in production bias. [Experiment 1]
- To assess whether the production of overt pronouns in Brazilian Portuguese shows a bias towards source or goal. [Experiment 2]

**Methods and Design**

**Experiment 1: Event Structure**

- Participants (n = 64) wrote story continuations to Brazilian Portuguese versions of stories like (3-5) below. Two trained judges categorized the responses by coherence relation and annotated whether pronouns were interpreted as referring to goals or sources.
- 2x3: Verb Aspect x Verb Class, following Rohde et al.’s (2006) 18 experimental sentences, 6 for each Verb Class, 30 files
- Verb Class 1: [participants co-located; guaranteed transfer]
- Verb Class 2: [participants co-located; no guaranteed transfer]
- Verb Class 3: [participants not co-located; no guaranteed transfer]

**Methods and Design**

**Experiment 2: Prompt type**

- Participants (n = 130) wrote story continuations to Brazilian Portuguese versions of stories like (1) and (2). Two trained judges assessed whether the subject of the continuation (the referent) referred to the source or goal and annotated whether this reference was made using a proper name, an overt pronoun or a null pronoun.
- 2x2: Verb Aspect x Prompt-type (pronoun-prompt, as in Exp. 1, and free-prompt)
  - Same 18 experimental sentences and 30 files from Experiment 1

**Results for pronoun interpretation**

- > Pronoun-prompt data replicate the findings of Experiment 1 for goal distribution across verbal aspect (β = 1.7960, p < 0.0005).
  - There are more goal interpretations in the free-prompt condition (β = 0.7364, p < 0.001).
  - No interaction across verbal aspect and prompt-type (β = 0.6440, p > 0.05).

**Results for rates of pronominalization**

- More null pronouns when referring to the source (β = -8.3007, p < 0.0001).
- Similar to findings in Korean and Japanese
  - More proper names when referring to the goal (β = 5.6001, p < 0.001).

**Findings unique to Brazilian Portuguese**

- Overt pronouns are equally used to refer to source or goal (β = 0.2103, p < 0.05).

**Conclusions**

- Both \( \text{P(\text{pronoun}|\text{referent})} \) and \( \text{P(\text{referent})} \) influence overt pronoun interpretation in Brazilian Portuguese, as they do in English, Korean, and Japanese.
- \( \text{P(\text{referent})} \) is determined by coherence relations and it is not affected by cross-linguistic differences, playing a homogenous role in pronoun interpretation across languages.
- Cross-linguistic differences in pronoun interpretation are due to differences in \( \text{P(\text{pronoun}|\text{referent})} \).
- Overt pronouns in Brazilian Portuguese are more prone than proper names to refer to the subject of a previous clause; yet, overt pronouns are used indiscriminately by reference to sources or goals.

**References**


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