

All pronouns are not created equal: The processing and interpretation of null and overt pronouns in Spanish

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BACKGROUND

Models of anaphoric processing

- Accessibility models (Ariel, 1990, 1991; Givón, 1983) propose that anaphors that are more specific (i.e. contain more phonological material, carry more information, and are less ambiguous) are used to refer to antecedents that are less accessible (i.e. are less prominent and have more competitors).
- Uniformity models (e.g. Gordon & Hendrick, 1998) distinguish the processing of reduced expressions (e.g. pronouns) from the processing of fuller expressions (e.g. names), but predict no differences within these categories.

Null and overt pronouns

- Pro-drop languages (e.g. Italian, Spanish, Chinese) allow phonetically null (\emptyset) subject pronouns as in the Spanish sentence (1) as well as phonetically overt subject pronouns as in the Spanish sentence (2).

(1) \emptyset Caminó al mercado. (2) Él caminó al mercado.
 "[He/she/it] walked to the store." "He walked to the store."

- Accessibility models predict a preference for null pronouns to refer to highly accessible antecedents and a preference for overt pronouns to refer to less accessible antecedents (because overt pronouns contain more phonological material and carry more information).

- Uniformity models predict no differences between null and overt pronouns.

Previous studies

- Previous studies in Italian (Carminati, 2002) and Castilian Spanish (Alonso-Ovalle et al., 2002) supported accessibility models and suggested that:
 - null pronouns are preferentially interpreted as referring to syntactically prominent referents
 - overt pronouns are preferentially interpreted as referring to a syntactically non-prominent referents
 - violating these preferences results in processing difficulty
 - effects may be weaker for overt pronouns overall and may also be weaker in Spanish and/or across sentences
- However, previous studies in Chinese (Yang et al., 1999, 2001) did not show any processing differences between null and overt pronouns in referentially ambiguous contexts.

CURRENT STUDY

Goal

- Extend previous studies by examining the effects of discourse prominence (i.e. topic-hood, defined here as the entity the discourse is about) on the processing and interpretation of null and overt pronouns

Methods

- **Participants:** 42 native speakers of Chilean Spanish
 - **Stimuli:** Two-sentence passages in which the number of mentioned referents (1 vs. 2) and the form of the subject of the embedded clause of the second sentence (Null pronoun, Overt pronoun, Name) varied.
 - **Procedure:**
 - Participants read two-sentence passages in a word-by-word self-paced reading task.
 - Following the self-paced reading task, participants completed a multiple-choice questionnaire in which they identified the subject of the embedded clause as in (3) below.
- (3) ¿Quién cree Juan que debería ir de vacaciones? A. Juan B. Sam C. Otra persona no mencionada
 Who does Juan think should go on vacation? A. Juan B. Sam C. Another unmentioned person

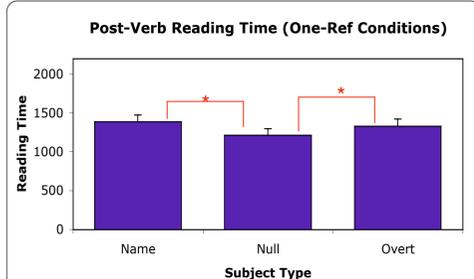
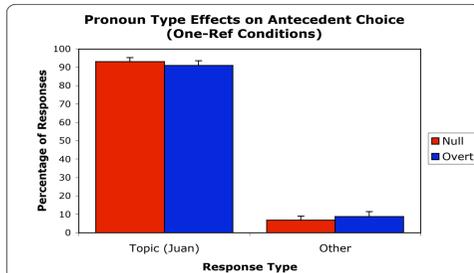
ONE-REFERENT CONDITIONS

Sample one-Referent Spanish item with English gloss

Juan trabaja cada día hasta las ocho. Juan cree que \emptyset /él/Sam debería ir de vacaciones.
 Juan works every day until eight o'clock. Juan thinks that [he/she/it]/he/Sam should go on vacation.

Results of paired two-tailed t-tests:

- No difference between Null and Overt for Topic ($p=.31$) or Other ($p=.37$) responses
- Reading times for verb (e.g. *debería*) slower for Name than Null ($p=.007$) or Overt ($p=.0004$), no difference between Null and Overt ($p=.43$)
- Reading times for post-verb region (e.g. *ir de vacaciones*) faster for Null than for Name ($p=.0002$) or Overt ($p=.02$), no difference between Overt and Name ($p=.09$)



Conclusions for One-Referent Conditions:

- Overwhelming interpretative preference for discourse topic (e.g. Juan) as antecedent for both null and overt pronouns is consistent with previous evidence from Italian speakers in one-referent contexts (Carminati, 2002, Exp. 3).
- Slower reading times for the clause containing an overt pronoun is also consistent with previous evidence from Italian speakers in one-referent contexts (Carminati, 2002, Exp. 8).
- In this study the effect was not detectable at the verb immediately following the pronoun. Reading times were only slower for the verb when the preceding subject directly contradicted the interpretative preference by introducing a new referent (i.e. when Name is Sam).

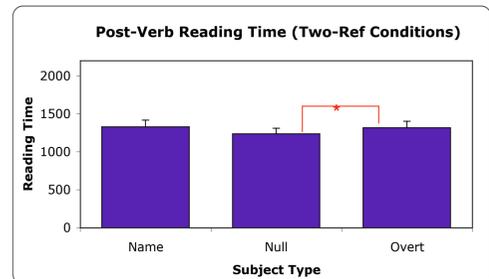
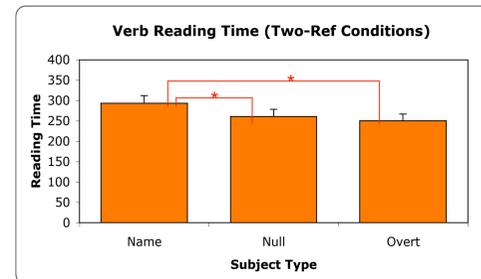
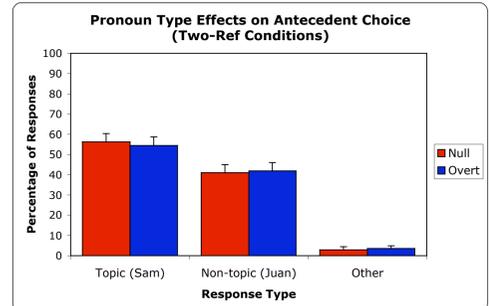
TWO-REFERENT CONDITIONS

Sample two-referent Spanish item with English gloss

Sam trabaja cada día hasta las ocho. Juan cree que \emptyset /él/Sam debería ir de vacaciones.
 Sam works every day until eight o'clock. Juan thinks that [he/she/it]/he/Sam should go on vacation.

Results of paired two-tailed t-tests:

- No difference between Null and Overt for Topic ($p=.59$), Non-topic ($p=.77$), or Other ($p=.32$) responses
- Reading times for verb (e.g. *debería*) slower for Name than Null ($p=.02$) or Overt ($p<.0001$), no difference between Null and Overt ($p=.37$)
- Reading times for post-verb region (e.g. *ir de vacaciones*) slower for Overt than Null ($p=.05$), a trend for Name slower than Null ($p=.06$) and no difference between Name and Overt ($p=.84$)



Conclusions for Two-Referent Conditions:

- More topic interpretations than non-topic interpretations were observed for both types of pronouns (Null: 15% difference; Overt: 13% difference).
- Preference of null pronoun for discourse prominent referent is weaker than in previous studies of syntactic prominence and two-referent contexts in Italian (Carminati, 2002, Exp 2) and Spanish (Alonso-Ovalle et al., 2002). Also, in this study overt and null pronouns showed similar preference for discourse prominent referent.
- Slower reading times for the clause containing an overt pronoun is consistent with previous evidence from Italian speakers in two-referent contexts (Carminati, 2002, Exp. 8). As in one-referent contexts, this effect is not detectable at the verb.

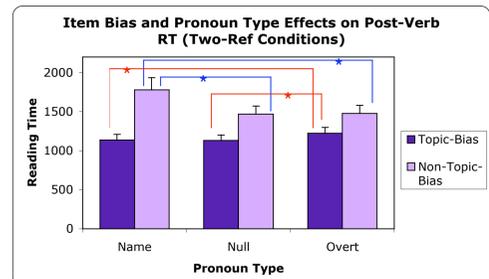
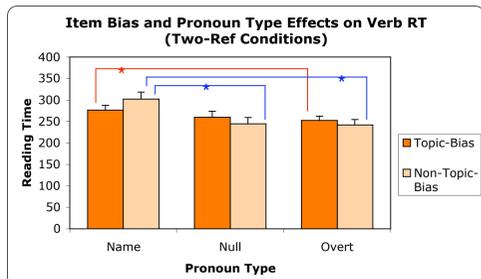
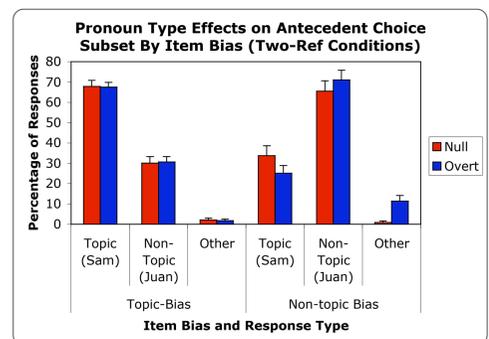
ITEM BIAS SUBSET ANALYSES

Does Interpretative Bias Vary Across Items?:

- Given that the overall interpretative preference for the topic is weaker in two-referent contexts, items may vary with regard to whether the topic or non-topic is the more plausible interpretation. This factor may be obscuring effects related to pronoun type in the reading time data.
- To test this hypothesis, item subsets were created based on a measure of average antecedent bias for each item in the two-referent conditions collapsing across pronoun type:
 - items with >50% topic interpretations were classified as TOPIC-BIAS (n=37)
 - items with >50% non-topic interpretations were classified as NON-TOPIC-BIAS (n=18)
 - items not meeting either criterion were classified as NO BIAS (n=5) and excluded from further analysis

Results of paired one-tailed t-tests:

- Despite opposite patterns of interpretative bias, within each subset, responses still did not vary by pronoun type (all $p>.05$)
- **Topic-Bias:** For verb, Name slower than Overt ($p=.04$), no difference between Name and Null ($p=.16$) or Null and Overt ($p=.32$). For post-verb, Overt slower than Null ($p=.05$) or Name ($p=.05$), Null and Name do not differ ($p=.57$)
- **Non-Topic-Bias:** For verb, Name slower than Null ($p=.01$) or Overt ($p=.0004$), no difference between Null and Overt ($p=.44$). For post-verb, Name slower than Null ($p=.02$) and Overt ($p=.02$), no difference between Null and Overt ($p=.55$)



GENERAL DISCUSSION

- In one-referent contexts, both null and overt pronouns were interpreted as referring to the only mentioned referent, consistent with previous evidence. In two-referent contexts, the overall pattern suggested that both null and overt pronouns were more often interpreted as referring to the discourse prominent referent.
- When the interpretative bias of the items was taken into account, however, it was revealed that both null and overt pronouns were interpreted as referring to the more plausible referent, whether this referent was discourse prominent or not. This finding highlights the interaction of pronoun biases with plausibility biases in determining final conscious interpretation.
- Although interpretation did not vary based on pronoun type in any analysis, clauses with overt pronouns were read more slowly than those with null pronouns in both one- and two-referent contexts. This effect was not observed at the verb immediately following the pronoun, but rather was observed in the post-verb region.
- Interestingly, when items were subset by interpretative bias, it was revealed that this effect was restricted to Topic-Bias items. For Non-Topic-Bias items, reading times did not differ for null and overt pronouns.
- The reading time data is consistent with previous findings of processing difficulty when overt pronouns refer to prominent referents. This study extends this notion of prominence to include discourse prominence and also represents the first observation of on-line processing difficulty in Spanish.
- The data also contribute to evidence suggesting that the non-prominent bias of the overt pronoun is weaker than the prominent bias of the null pronoun but that violating the preference of the overt pronoun causes more processing difficulty than violating the bias of the null pronoun.
- In general, the findings in this study are consistent with accessibility models that posit differences based on pronoun type and inconsistent with uniformity models that posit no such differences.

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