Ergativity and the complexity of extraction: A view from Mayan

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① The processing of relative clauses (RCs)
   ✷ A question for ergative languages
② Relative clauses in Ch’ol and Q’anjob’al
   ✷ Basic facts and RC ambiguities
③ Experiment 1: Ch’ol
④ Experiment 2: Q’anjob’al
⑤ Discussion and Conclusions
   ✷ Ch’ol and Q’anjob’al display a subject preference in the processing of relative clauses
The Processing of Relative Clauses
Resolving Ambiguities

- In languages with ambiguous RCs, ambiguity is more likely to be resolved in favor of subjects
  - Russian (Polinsky 2011; Levy et al. 2012)
  - German (Schwarz 2007)
- We assume this comprehension strategy results from a general RC processing asymmetry
Asymmetries in RC Processing

- Subject relative clauses are easier to process than object relative clauses
  - Different methodologies
  - Different languages
  - Results for head-final RCs are mixed
An Account of the Asymmetry

- **Phrase structural preference** Because subjects are structurally higher than other arguments, they are easier to extract
- But is the phrase structural preference based on grammatical function or structural case?
Grammatical Function or Case?

- In ACC languages, Function and Case align
- In ERG languages it is possible to separate grammatical function and case
A Question for ERG Languages

- ERG Languages allow us to tease apart the role of grammatical function and structural case in a way that ACC languages do not.
- Mostly European and East Asian languages have been investigated, i.e. ACC languages.
- See also Carreiras et al. 2010 for Basque, Polinsky et al. 2012 for Avar.
Current Study

- RC processing in Ch’ol and Q’anjob’al
- Disassociate grammatical function and case
- Eliminate a confound within the phrase structural preference hypothesis
Research Questions

✧ Are subjects privileged in the processing of RCs in Ch’ol and Q’anjob’al?
  ① Subject preference in resolving RC ambiguities?
  ② Subject preference in processing RCs?
✧ If so, we can confirm that the hypothesis in question is based on grammatical function.
The Structure of Relative Clauses in Ch’ol and Q’anjob’al
Mayan Language Family

- Verb-initial & pro-drop (England 1991)
- Different types of ergative patterns in the family: morphological, syntactic and splits
- Head-marking (ergative agreement not case)
- ERG DP structurally superior to ABS DP
- Word order, $\phi$-features, and absence of overt case on DPs can lead to ambiguous RCs
Relative Clauses: Word Order

- Verb-initial languages
  - Ch’ol has both VSO and VOS word orders
  - Q’anjob’al is pretty strictly VSO
- Subject relatives and object relatives have identical word order:

\[ \text{V Sub}_{RC} \text{ V Obj} \]
\[ \text{V Obj}_{RC} \text{ V Sub} \]
\[ \text{V DP}_{RC} \text{ V DP} \]
Both core arguments co-referenced on verb
When core arguments have the same $\phi$-features either could be interpreted as cross-referenced by the ERG or ABS marker
In practice this ambiguity only arises with 3rd person DPs
Disambiguating RCs

- Different $\phi$-features on arguments
- The subject or object may not be plausible agent or theme
- Syntactic ergativity and “agent focus” morphology (Q’anjob’al not Ch’ol)
Ambiguous Relative Clauses

5. **Ambiguous Relative Clause – Q’anjob’al**
Max w-il ix ix [lanan[y-ante-n naq winaq]]
PRF 1ERG-SEE the woman PROG 3ERG-cure-AF the man
‘I saw the woman [who was curing the man].’ or
‘I saw the woman [who the man was curing].’

6. **Ambiguous Relative Clause – Ch’ol**
Ta’ juli jiñi x’ixik [ta’-bä i-tsäk’-a]
PRF arrive the woman PRF-REL 3ERG-cure-TV
‘The woman [who cured him/her] arrived.’ or
‘The woman [who he/she cured] arrived.’
Experiment 1: Ch’ol
Ch’ Research Questions

① How do Ch’ol speakers resolve ambiguities in relative clauses?
② Do Ch’ol speakers demonstrate asymmetrical processing of subject and object relative clauses?
Four gap types under investigation

1. ABS subject gaps
2. Semantically biased ERG subject
3. Semantically biased ABS object
4. Ambiguous ERG subject / ABS object
Ch’ Methodology

- Conducted in Tabasco and Chiapas, Mexico
- Presented in Linger (Rohde 2007)
- Sentence-Picture Matching with audio stimuli
- Participants received instructions in Ch’ol
- Instructed to 1) listen to each item to completion and 2) select the picture that best represented the item
- Binary button box used to indicate choice
“Where is the girl who is swimming near the boy?”
“Find the priest that dragged the nun”
Ch’ Participants

- 63 participants completed the study
- Data from 56 participants were analyzed
- 40 Ch’ol-Spanish bilingual and 16 Ch’ol monolingual
- Age range 15-54, with a mean of 29
Ch’ Results: Resolving Ambiguity

- Participants gave 68% (2% s.e.) of ambiguous relative clauses a subject interpretation.
Higher accuracy with ERG extractions than ABS extractions (p < .05)
Subject responses quicker than object responses ($p < .05$).
Ch’ Results: Bilingualism

✧ Bilinguals are more accurate (p < .05)
✧ Bilinguals gave more subject responses in the ambiguous condition (p < .005)
✧ The preference for interpreting ambiguous RCs as subject relatives is still significant for monolinguals (p < .05)
Summary of Ch’ol Results

① Responses from bilinguals and monolinguals pattern in the same way, but effects are stronger for bilinguals

② Faster and more accurate with subject-biased transitives than with object-biased transitives

③ Prefer subject interpretation for ambiguous RCs and chose subject interpretations faster
Experiment 2: Q’anjob’al
① How do Q’anjob’al speakers resolve ambiguities in relative clauses?
② Do Q’anjob’al speakers demonstrate asymmetrical processing of subject and object relative clauses?
Q’ Materials

✧ Six gap types under investigation
  ① ABS subject gaps
  ② Unambiguous subject extraction(AF)
  ③ Unambiguous object extraction
  ④ Semantically biased ERG subject
  ⑤ Semantically biased ABS object
  ⑥ Ambiguous ERG subject/ABS object
Q’ Participants

- Experiment run Huehuetenango, Guatemala
- 100 participants completed the study
- Data from 94 participants were analyzed
- 47 Q’anjob’al-Spanish bilingual and 47 Q’anjob’al monolingual
- Age range 16-65, with a mean of 30
Q’ Results: Resolving Ambiguity

- Participants gave 74% (2% s.e.) of ambiguous relative clauses a subject interpretation.
Q’ Results: Accuracy

✧ Higher accuracy with (AF) and biased ERG than ABS extractions (p < .001)
Q’ Results: Response Time

- Subject-compatible responses given quicker, but this trend did not reach significance
Bilinguals gave more accurate responses (p < .001)

Bilinguals gave more subject responses in the ambiguous condition (p < .001)

The preference for interpreting ambiguous RCs as subject relatives is still significant for monolinguals (p < .05)
Summary of Q’anjob’al Results

1. Bilinguals and monolinguals pattern in the same way, but effects stronger for bilinguals
2. More bias congruent responses in the case of object as compared to subject extractions
3. Still, more accurate with subject relatives than object relatives overall
4. Prefer subject interpretation for ambiguous items with no bias
Conclusions
Research Questions Revisited

① How do Ch’ol and Q’anjob’al speakers resolve ambiguities in relative clauses?
   ✔️ In favor of subject interpretations

② Do they display asymmetrical processing of subject and object relative clauses?
   ✔️ Yes, in favor of subject relatives

Subjects are privileged in the processing of RCs in Ch’ol and Q’anjob’al
In Sum

- Asymmetries in RC processing may be the result of structural superiority
- Processing literature has mostly considered ACC languages, where case and grammatical function overlap
- A preference for NOM over ACC would look exactly like a phrase-structural preference
Conclusions

- These ergative languages show a subject preference in relative clause processing
- Our results support basing the phrase-structural account as stated
Wokox awälä’ & Yuj wal tyoxh
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