Stay Inside: The Interpretation of Internally-Headed Relative Clauses in Navajo

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1 Introduction

- Relative clause constructions (e.g. (1)) are attested in many languages but are observed to vary crosslinguistically in their syntax.
  - A phrase — the head, bolded — plays a grammatical role in both a subordinate clause (the relative clause, RC) and the main clause.

(1) Tom branded all of the horses [that Sam roped].

- In English (1), quantifier all and noun horses pronounced RC-externally.
  - Such RCs are described as externally-headed relative clauses (EHRCs).

- In Navajo (2), quantifier t'áá 'ałtso 'all' and noun lį́į́' 'horse' pronounced RC-internally (Platero 1974, Willie 1989).
  - Such RCs are described as internally-headed relative clauses (IHRCs).

(2) [Sam lį́į́' t'áá 'ałtso yizlo]í=ígíí Tom yidiilid.

- Grosu (2012) argues that Navajo IHRCs with universal quantifier t'áá 'ałtso 'all' (2) have same truth conditions as English EHRC sentences like (1).

Today:

- Review characteristics of Navajo IHRCs and Grosu’s claims.

- Present fieldwork showing that some Navajo quantifiers must be interpreted RC-internally when pronounced RC-internally.

- Briefly reconsider Grosu’s conclusions about RCs with universal quantifiers (2).

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2 Background on Navajo IHRCs

- Verb words are morphologically complex with marking indicating person and number of event participants. Verb-external noun phrases are optional.\(^2\)

(3) a. Sam łį́į́’ yizloh. 
   Sam horse 3O.3S.rope.PERF
   ‘Sam roped the horse.’

b. Yizloh. 3O.3S.rope.PERF
   ‘S/he roped it/him/her.’

- First detailed discussion of Navajo IHRCs in Navajo from Platero (1974):

(4) ‘Ashkii ’ałhosh=ígíi ’ałháá’.
   boy 3S.sleep.IMPF=IGII 3S.snore.IMPF
   ‘The boy who is sleeping is snoring.’


- Platero (1974) also discusses EHRCs like (5).

(5) ’Ałhosh=ígíí ’ashkii ’ałháá’.
   3S.sleep.IMPF=IGII boy 3S.snore.IMPF
   ‘The boy who is sleeping is snoring.’

- However, only IHRCs are grammatical for some speakers (Willie 1989, Ellavina Perkins, p.c.). Platero (1974: 203) notes that even for speakers who accept EHRCs, IHRCs are preferred. **We focus on IHRCs today.**

- All Navajo RCs obligatorily bear a special morpheme at their right edge, variably realized as =ígíí ((2), (4), (5)), or as =ą́ą/=ę́ę.\(^2\)

– =ą́ą and =ę́ę occur when RC describes event/state prior to speech time (Platero 1974, Smith et al. 2007):

(6) [Tl’éédą́ą’ ’ashkii ’ałháá’]=ą́ą yádoołtih.
   last.night boy 3S.snore.IMPF=IGII 3S.speak.FUT
   ‘The boy who was snoring last night will speak.’ **IHRC** (Platero 1974: 12))

\(^2\)Navajo is a (typically) SOV language with OSV word order also allowed under certain grammatical, discourse, or prosodic conditions.
• We will not discuss differences (if any) among these morphemes. We use =ígíí and gloss igii) to stand for entire set.

• Only the presence of =ígíí indicates that the embedded clause is an RC. Removing =ígíí leaves behind a complete stand-alone clause.³

(7) Tl'éédą́ą́' 'ashkii 'ałhą́ą'.

last.night boy 3S.snore.IMPF

‘The boy was snoring last night.’

3 Analyses of IHRCs

3.1 Two accounts of IHRCs

Account 1: IHRCs have the same semantic analysis as EHRCs


• Nominal heads and associated material (quantifiers and modifiers) are interpreted in the main clause even when they are pronounced in the relative clause.

• Languages differ only in whether this material is pronounced in the main clause (in EHRCs) or in the relative clause (in IHRCs).

Account 2: IHRCs & EHRCs motivate different semantic analyses


• In EHRCs, nominal heads and associated material (quantifiers, modifiers) are semantically interpreted in the main clause, where they are pronounced.

• In IHRCs, nominal heads and associated material (quantifiers, modifiers) are semantically interpreted in the relative clause, where they are pronounced.

³=ígíí is also found on some clausal complements (Schauber 1979) (i). It is crosslinguistically common to find the same marker on both IHRCs and clausal complements (Culy 1990, Kim 2009, Grosu 2012).

(i) [Ch'éétingóó naanée]=ígí shil bééhózin.
entrance.toward 3S.play.IMPF=igii 1O.with 3S.be.known
‘I know that he is playing in the yard.’ (Schauber 1979: 230-231)
Key predictions:

- **Account 1 predicts:** IHRCs and minimally different EHRCs have identical truth conditions.

- **Account 2 predicts:** IHRCs and minimally different EHRCs have different truth conditions.
  
  - Hoshi (1995) and Shimoyama (1999) present data from Japanese that demonstrates that IHRCs (8) and EHRCs (9) have different truth conditions.

  (8) Taro-wa [[Yoko-ga reezooko-ni kukkii-o hotondo
  Taro-TOP Yoko-NOM refrigerator-LOC cookie-ACC most
  irete-oita[-no]-o paatii-ni motte itta.
  put-AUX-NO-ACC party-to brought
  ‘Yoko put {most of the cookies}1 in the refrigerator and Taro brought them1 to the party.’] IHRC (Shimoyama 1999: (4))

  (9) Taro-wa [[Yoko-ga reezooko-ni irete-oita] kukkii-o hotondo]
  Taro-TOP Yoko-NOM refrigerator-LOC put-AUX cookie-ACC most
  paatii-ni motte itta.
  party-to brought
  ‘Taro brought to the party most cookies that Yoko had put in the refrigerator.’] EHRC (Shimoyama 1999: (5))

- To capture truth conditional differences, Hoshi (1995) and Shimoyama (1999) give new analysis for IHRCs in which:
  
  - Head does not raise out of RC. The IHRC is a closed sentence.
  - The head’s role in the main clause is mediated via a null proform taken as argument by main clause verb. Role fixed by grammar and/or context.

3.2 Faltz (1995) and Grosu (2012) on Navajo

- **Research question:** Do all languages with IHRCs support Account 2, where IHRCs are not semantically equivalent to EHRCs?
  
  - Very little detailed study of RC truth conditions in other languages.
Grosu and Faltz on Navajo:

  - In both examples, the quantifier t’áá ’altso ‘all’ is pronounced RC-internally.
  - Faltz and Grosu claim that t’áá ’altso is interpreted in the main clause in both (10a) and (10b).
    * Grosu on (10b): “The sentence is true in a situation where...John owns eight cars, and exactly three of John’s cars were bought from Bill. In this context, the claim of good functioning is limited to those three cars, and nothing is said about the others.”

- If this is true, Navajo supports Account 1 rather than Account 2.

(10) a. [Łééchąą’í t’áá ’altso ’ashkii deishxash] =ígíí nidahał’in.
    dog all boy 3O.3plS.bite.PERF=IGII 3plS.bark.IMPF 
    Translation from Faltz: ‘All the dogs that bit the boy are barking.’

b. [John Bill t’áá ’altso chidi yaa nayiisni] =éé t’éiya
    John Bill all car 3O.from 3O.3S.buy.PERF=IGII only
    nizhónigo nidaajeeh.
    well 3S.run.plural.actors.IMPF
    Translation from Faltz and Grosu: ‘All the cars that John bought from Bill (and only those) run well.’
    (Faltz 1995: 106, 107)

But what can we conclude about Navajo from such examples?
Less than we’d like.

- The key evidence about (10a)/(10b) is their translation as English EHRCs.
  - Matthewson (2004): Translations are only partial clues. They may not accurately represent a sentence’s truth conditions, particularly if the language of translation lacks the construction of interest.
  - English lacks IHRCs, so of course (10a)/(10b) were translated as EHRCs.
  - Shortcomings of translations can be circumvented by using contexts (written, oral, or pictorial) to question a sentence’s acceptability (Matthewson 2004).
• We don’t know if (10a)/(10b) only permit the interpretations described.
  – E.g. could (10b) be used in a context where all of John’s cars were bought from Bill?

• No systematic comparison between (10a)/(10b) and sentences where the quantifier is pronounced in the main clause.

• We have only considered t’áá ’ałtso. What about other quantifiers?

Our response:

• In the next section, we consider sentences with RCs and the quantifier ‘ałníí’dóó ‘half.’
• By testing these sentences in clear contexts, we show that this quantifier must be interpreted where it is pronounced.

4 A quantifier that is pronounced and interpreted RC-internally

• We elicited judgements using storyboards, sequences of pictures designed to elicit or test particular constructions of interest. Allow complex contexts to be set up clearly.

• We focused on sentences with the proportional quantifier ‘ałníí’dóó:

(11) [Mary ‘agha’ ’ałníí’dóó yidiz]=éç Alice yiyíí tłchíí’.  
Mary wool half 3O.3S.spin.PERF=IGII Alice 3O.3S.dye.red.PERF

• We first used a storyboard that targeted an RC-internal interpretation of ‘ałníí’dóó ‘half.’
• When presented with (11) in this storyboard, the consultant (i) accepted (11) as felicitous, (ii) translated it as ‘Half of the wool that Mary spun, Alice dyed it red,’ and (iii) commented that “half goes with the spinning.”

• We then used a storyboard that targeted an RC-external interpretation of ‘alñú’t’dóó ‘half.’
When presented with (11) in this context, the consultant (i) rejected (11) and (ii) volunteered sentence (12) instead.

(12) [Mary 'agha' yidiz]̣=e³ [Mary woöl 3O.3S.spin.PERF=I.GII half]̣=e³ Alice yi=yi=le=chii. Alice 3O.3S.dye.red.PERF

Comment: “Alice only dyed half of the wool.”

- In (12), 'alníí’dóó is pronounced in RC-external position.
  - NB: The noun 'agha' ‘wool’ is still pronounced in the RC. The consultant rejected the 'full EHRC’ version of (12) where 'agha' ‘wool’ was pronounced RC-externally.
    * We leave to future work why quantifiers and nouns have different positional restrictions.
Summary of results:

- We compared (11) (RC-internal quantifier) with (12) (RC-external quantifier):
  - Story 1 (internal interpretation targeted): ✓ (11), #(12)
  - Story 2 (external interpretation targeted): #(11), ✓ (12)

5 Conclusions and puzzles

We have argued that:

- Grosu's (2012) claim about the height of interpretation of the Navajo quantifier t’áá ’ältso does not extend to all quantifiers in Navajo.
  - While Grosu (2012) may still be correct that t’áá ’ältso ‘all’ always takes RC-external scope, at least one quantifier — ’ałníídóó ‘half’ — must be interpreted RC-internally when it is pronounced RC-internally.
  - The truth conditional differences we observed based on quantifier position in Navajo recall Hoshi (1995) and Shimoyama’s (1999) results for Japanese.

- Storyboard contexts can be used to show the truth-conditional differences that result from the position of ’ałníídóó.

What can we conclude about Navajo?

- We might conclude that Navajo quantifiers behave differently when pronounced in RC-internal position.
  - Quantifiers like ’ałníídóó can, and must, be interpreted RC-internally if they are pronounced RC-internally, e.g. (13).
  - IHRCs like (13) could be amenable to the analyses that Hoshi (1995) and Shimoyama (1999) give for Japanese IHRCs: the bracketed RC is a closed sentence.

(13) [Mary ’agha’ ’ałníídóó yidiz]=éę Alice yiyífíchíí.
Mary wool half 3O.3S.spin.PERF=IGII Alice 3O.3S.dye.red.PERF
• If Grosu and Faltz are right, t’áá ‘altso would be interpreted RC-externally even where it is pronounced RC-internally, e.g. (14).

(14) [Sam ħíj’ t’áá ‘altso yizlohol=íjí Tom yidiild.]
Sam horse all 3O.3S.rope.PERF=IGH Tom 3O.3S.brand.PERF

• Precedent for heterogeneous behavior of quantifiers pronounced RC-internally comes from Imbabura Quechua.
  – Hastings (2004) argues that:
    * Strong quantifiers in Quechua (e.g. ‘all’) always interpreted RC-externally.
    * Weak quantifiers (e.g. ‘a little’) always interpreted RC-internally.

Open question: were Grosu and Faltz correct about t’áá ‘altso ‘all’?
• We elicited data that seem to agree with Grosu’s claims, e.g. (15).
  – In (15a), it is not the case that Sam roped all of the horses on our ranch.
  – The consultant accepted the sentence in (15b) and translated the sentence using the English EHRC shown.
  – The consultant also accepted the version in (15) with t’áá ‘áltso pronounced RC-externally ((15c)).

(15) a. Context: There are 10 horses on our ranch. Sam roped 4 of the horses. Tom branded those 4 horses.

b. [Sam ħíj’ t’áá ‘altso deizlohol=áq Tom
Sam horse all DIST.3O.3S.rope.PERF=IGH Tom
yída’idiild.
DIST.3O.3S.brand.PERF
Comment: ‘That’s how you’d say it. Tom branded all of the horses that Sam roped.’

c. [Sam ħíj’ deizlohol=áq Tom t’áá ‘áltso
Sam horse DIST.3O.3S.rope.PERF=IGH Tom all
yída’idiild.
DIST.3O.3S.brand.PERF
‘Tom branded all of the horses that Sam roped.’
• However: We also elicited data suggesting that sentences with RC-internal *t’áá ‘ałtso* have different truth conditions than sentences with RC-external quantifiers.
  
  – In the context in (16a), sentence (16b) with RC-internal *t’áá ‘ałtso* was rejected.
  
  – In this context, English EHRC was accepted as was the Navajo sentence (16c) with RC-external *t’áá ‘ałtso*.

(16)  
  a. **Context**: Sam roped 4 horses. Tom branded those 4 horses plus 6 others.
  
  b. #\[Sam \déé́́’ t’áá ‘ałtso deizloh]=áąq  
     Tom
     Sam horse all  \text{dist.3O.3S.rope.PERF=Igii} Tom
     yída’diiłid.
     \text{dist.3O.3S.brand.PERF}
     \text{Comment}: “It sounds like you’re saying Sam roped all of the horses and Tom branded them...It’s okay if you don’t worry about the plus six others.”
  
  c. [Sam \déé́́’ deizloh]=áąq  
     Tom t’áá ‘ałtso
     Sam horse \text{dist.3O.3S.rope.PERF=Igii} Tom all
     yída’diiłid.
     \text{dist.3O.3S.brand.PERF}
     ‘Tom branded all of the horses that Sam roped.’

• **Question**: If *t’áá ‘ałtso* is interpreted RC-externally regardless of where it is pronounced, what explains (15b) vs. (16b)?

• **Ongoing**: Is *t’áá ‘ałtso* always interpreted RC-internally but with a restricted and maximalized domain?
  
  – E.g. ‘Tom branded the maximal plurality such that they were horses that Sam branded all of.’
    
    * True in (15a), False in (15b).

• Does the mode of context presentation (oral vs. storyboard) affect the results?
References


