On the Derivation of Relative Clauses in Teotitlán del Valle Zapotec[*]

Nick Kalivoda and Erik Zyman
UC Santa Cruz

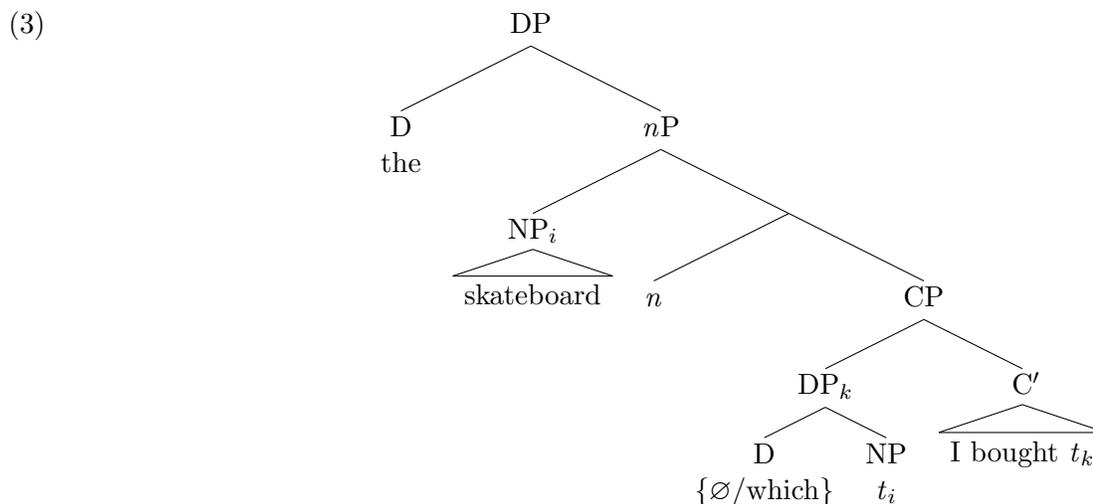WSCLA 20
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1   Introduction

- **Externally headed relative clauses** like that in (1)—i.e., those that do not seem to contain their head, the nominal phrase they modify—have received a number of analyses in the literature.

  (1)   the [$_{\text{head}}$ skateboard] [$_{\text{RC}}$ that I bought]

- On the traditional **head-external** analysis (e.g., Chomsky 1973, 1977), the formation of the relative clause involves the movement of an overt or null relative pronoun (e.g., *which*, *who*, ∅).

- The head is base-generated outside the relative clause, and the relative clause adjoins to it:

  (2)   the [$_{\text{NP}}$ [$_{\text{NP}}$ skateboard] [$_{\text{CP}}$ ∅$_i$ that I bought t_i]]

- On the **raising** or **head-raising** analysis (Åfarli 1994, Kayne 1994, Bianchi 1999, Bhatt 2002), the head originates inside the relative clause and raises out of it. One implementation of this analysis is shown below:

(3)

- Finally, the **matching** analysis holds that the visible head is generated outside the relative clause. . .

- . . .but what moves inside the relative clause is a nominal phrase containing an NP similar or identical to this visible "external" head, and this "internal head" is elided under (near-)identity with the external head.

- Much recent work (Åfarli 1994, Kayne 1994, Bianchi 1999, Bhatt 2002) argues that some or all externally headed relative clauses are derived by **raising**.

- Here, we present novel data that yield insights into the structure and derivation of relative clauses in Teotitlán del Valle Zapotec (TdVZ), an Oto-Manguean language spoken in the town of Teotitlán del Valle (30 km east of the city of Oaxaca in Oaxaca State, Mexico).

- These data show that relative clauses in this language lack the head-raising derivation entirely. . .

- . . .indicating that the derivation of externally headed relative clauses is subject to cross-linguistic variation which is not obvious on the surface.

1.1 Roadmap

- Basic properties of TdVZ relative clauses

- Evidence against head-raising

  - Reciprocal binding
  - Variable binding

- Apparent evidence for head-raising

  - Idiom interpretation
  - Low readings of RC-head modifiers

- Analysis

- Conclusion

2 Background: Basic properties of TdVZ relative clauses

- TdVZ relative clauses are postnominal and externally headed (on the surface).

- The language minimally allows relativization of subjects, direct objects, indirect objects, and locative and temporal adjuncts.[1]

  (4) *Subject relativization*

  benih **ni** ka-yul
  person REL PROG-read
  'the person who's reading'

  (5) *Direct object relativization*

  libr **ni** ba-to'o Mari
  book REL PERF-sell Mari
  'the book that Mari sold'

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[1] Abbreviations used: A = animal; ADJ = adjectivizer; COMPAR = comparative; COP = copula; EMPH = emphatic; H = human; HAB = habitual; INAN = inanimate; IRR = irrealis; LOC = locative; NEUT = neutral aspect; PERF = perfective; PL = plural; PROG = progressive; REL = relativizer.

(6) *Indirect object relativization*

    benih **ni** ba-ded   Roos te libr
    person REL PERF-give Roos a book
    'the person Roos gave a book to'

- (We return to relativization of adjuncts below.)

- As shown above, when a nominal phrase is relativized, the relative clause is introduced by a left-peripheral element *ni*.

- We take this element to be a relative complementizer, primarily because it cannot cooccur with a pied-piped preposition:

(7)   a. Sofie zub-an   **lo** te bangu.
          Sofie is.sitting-3H on a chair
          'Sofie is sitting on a chair.'

       b. bangu ⟨***lo**⟩ ni   ⟨***lo**⟩ zub   Sofie
          chair ⟨*on⟩ REL ⟨*on⟩ is.sitting Sofie
          'the chair that Sofie is sitting on'

- It is also worth noting that the relativizer *ni* does not resemble the language's demonstratives (*kin* 'that (distal)', *kan* 'that (distal)', *re* 'that (medial)', *rè'* 'this', *nde* 'this') or its interrogative *wh*-words (e.g., *tu* 'who, which', *xi* 'what, which').

- TdVZ relative clauses are formed by movement—specifically, Ā-movement—as can be ascertained from the island-sensitivity of relativization.

- To see this, first consider the fact that relative clauses are themselves islands:

(8) *TdVZ relative clauses are islands*

    a. Markuh ru-mbee   gunaa ni gu-zi   d-guzhar.
       Markuh HAB-know woman REL PERF-buy PL-spoon
       'Markuh knows the woman who bought the spoons.'

    b. *Xi   ru-mbee   Markuh gunaa ni gu-zi?
       what HAB-know Markuh woman REL PERF-buy
       lit. '*What$_i$ does Markuh know the woman who bought ___$_i$?'
       int. 'What is such that Markuh knows the woman who bought it?'

- Since relative clauses are islands, we can determine whether relativization is island-sensitive by attempting to relativize out of a relative.

- This produces unacceptable results:

(9) *No relativization out of subject relatives*

    a. *Na ba-yee   dibuj ni Els ru-mbee   benih ni ba-in.
       I   PERF-see.1.SG drawing REL Els HAB-know person REL PERF-make
       lit. '*I saw the drawing$_i$ that Els knows the person who made ___$_i$.'
       int. 'I saw the drawing such that Els knows the person who made it.'

    b. *Markuh ra-p   juget ni ba-yee   gule'en ni ba-zhiel.
       Markuh HAB-have toy   REL PERF-see.1.SG boy   REL PERF-find
       lit. '*Markuh has the toy$_i$ that I saw the boy who found ___$_i$.'
       int. 'Markuh has the toy such that I saw the boy who found it.'

(10) *No relativization out of object relatives*

    a. *Na ru-mbee gunaa ni ri-zhulaaz-a kamion ni ba-in pintar.
       I   HAB-know woman REL HAB-like-1.SG car   REL PERF-do paint
       lit. '*I know the woman who$_i$ I like the car that ___$_i$ painted.'
       int. 'I know the woman such that I like the car she painted.'

    b. *Na ba-yee ngiu ni ku-a'a zhape'en kafee ni gu-niab.
       I   PERF-see.1.SG man REL PERF-take girl   coffee REL PERF-order
       lit. '*I saw the man who$_i$ the girl took the coffee that ___$_i$ ordered.'
       int. 'I saw the man such that the girl took the coffee he ordered.'

- We conclude, then, that relative clauses are formed by movement in TdVZ.

3   Evidence against head-raising

- With these preliminary facts established, we can now proceed to the evidence that TdVZ relatives are never derived by head-raising.

3.1   Reciprocal binding

- In English, the head of a relative clause can contain an anaphor such as the reciprocal *each other*:

(11) **Elsa and Benito**$_i$ saw the [cars of **each other**$_i$'s] that are blue.

- In (11), *each other* is bound by a DP that c-commands it in surface syntax.

- But an instance of *each other* in an RC-head can also take as its antecedent a DP <u>inside the relative clause</u>:

(12) The [cars of **each other**$_i$'s] [that **Elsa and Benito**$_i$ saw yesterday] are blue.

- On the standard assumption that *each other* is subject to (some version of) Condition A, sentences like (12) strongly suggest that English relativization structures can be formed by head-raising...

- ...allowing *each other* to be bound by its RC-internal antecedent in its base position:

(13) ... [$_{RC}$ that **Elsa and Benito**$_i$ saw [$_{DP}$ [$_D$ ∅] cars of **each other**$_i$'s] yesterday] ...

- TdVZ also allows a reciprocal (*sa'adan* 'each other') to appear in an RC-head:

(14)   a. **Sofie kun Markuh**$_i$ ri-zhulaaz d-maset xten **sa'a-d-an**$_i$ ni ba-in Oliib.
       Sofie with Markuh HAB-like PL-pot of SA'A-PL-3H REL PERF-make Oliib
       'Sofie and Markuh like the pots of each other's that Oliib made.'

    b. **Marie kun Luk**$_i$ gu-la'a d-komputador xten **sa'a-d-an**$_i$ ni ba-in sru Mart.
       Marie and Luk PERF-break PL-computer of SA'A-PL-3H REL PERF-make good Mart
       'Marie and Luk broke the computers of each other's that Mart fixed.'

    c. **D-bekuh**$_i$ gu-do d-juget xten **sa'a-d-um**$_i$ ni gu-zi Serjih.
       PL-dog PERF-eat PL-toy of SA'A-PL-3A REL PERF-buy Serjih
       'The dogs ate the toys of each other's that Serjih bought.'

- But TdVZ, unlike English, does not allow a reciprocal in an RC-head to take an antecedent inside the relative clause:

(15) a. *Nga'a naa d-kamion xten **sa'a-d-an** ni ba-yee **Els kun Beniit** nai.
          blue COP PL-car   of   SA'A-PL-3H REL PERF-see Els and Beniit yesterday
          int. 'The cars of each other's that Els and Beniit saw yesterday are blue.'

      b. *Gura'au naa d-kubet   xten **sa'a-d-an** ni gu-dee   **Sofie kun Luk**.
          big   COP PL-bucket of SA'A-PL-3H REL PERF-carry Sofie and Luk
          int. 'The buckets of each other's that Sofie and Luk carried are big.'

      c. *D-fot   xten **sa'a-d-an** ni ri-zhulaaz-te-ru   **Marie kun Juan** naa ni naa
          PL-picture of   SA'A-PL-3H REL HAB-like-EMPH-COMPAR Marie and Juan   COP REL COP
          gura'au-te-ru.
          big-EMPH-COMPAR
          int. 'The pictures of each other that Marie and Juan like best are the ones that are biggest.'

- A sentence like those in (15) can be made acceptable by placing the PP *xten sa'adan* 'of each other's' <u>inside</u> the relative clause:

(16) a. Nga'a naa d-kamion ni   ba-yee   Els kun Beniit **xten sa'a-d-an** nai.
          blue COP PL-car   REL PERF-see Els with Beniit of   SA'A-PL-3H yesterday
          'The cars of each other's that Els and Beniit saw yesterday are blue.'

      b. Gura'au naa d-kubet ni gu-dee   Sofie kun Luk **xten sa'a-d-an**.
          big   COP PL-bucket REL PERF-carry Sofie and Luk of   SA'A-PL-3H
          'The buckets of each other's that Sofie and Luk carried are big.'

- The relative positions of *xten sa'adan* 'of each other's' and *nai* 'yesterday' in (16a) show us that the PP *xten sa'adan* is truly RC-internal in these examples, and not RC-external but extraposed.

- In (16a), *nai* 'yesterday' is interpreted as modifying the relative clause predicate *bayee* 'saw', not the matrix predicate *nga'a* 'blue'.

- So *nai* 'yesterday' must be inside the relative clause, and hence so must *xten sa'adan* 'of each other's', which precedes it.

- Inverting *xten sa'adan* 'of each other's' and *nai* 'yesterday' in (16a) produces unacceptability:

(17) *Nga'a naa d-kamion ni   ba-yee   Els kun Beniit <u>nai</u>   **xten sa'a-d-an**.
        blue COP PL-car   REL PERF-see Els with Beniit yesterday of   SA'A-PL-3H
        int. 'The cars of each other's that Els and Beniit saw yesterday are blue.'

- This shows that an instance of *sa'adan* 'each other' is illicit outside a relative clause—whether it precedes or follows the relative clause—when its would-be antecedent is <u>inside</u> the relative clause.

- As we have seen, *sa'adan* 'each other' does not display binding connectivity in relativization structures: an instance of *sa'adan* in an RC-head cannot take as its antecedent a nominal phrase inside the relative clause.

- If one wanted to square this fact with a head-raising analysis of TdVZ relatives, one might suggest that perhaps *sa'adan* 'each other' <u>never</u> reconstructs for binding.

- But this is not the case: *sa'adan* regularly reconstructs for binding under other types of Ā-movement, such as *wh*-question formation and topicalization ((18-19)).[2]

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[2] These examples also show that *sa'adan* 'each other' can precede its antecedent, and hence the unacceptable relativization structures we have seen cannot be unacceptable because they feature the linear configuration $\boxed{sa'adan_i \ldots \text{ANTECEDENT}_i}$.

(18) <u>*Sa'adan* 'each other' reconstructs for binding under <u>*wh*</u>-question formation</u>

    Xi   d-maset xten **sa'a-d-an**$_i$ gu-dee   **Juan kun Marie**$_i$?
    what PL-pot of   SA'A-PL-3H PERF-carry Juan with Marie
    'Which pots of each other's did Juan and Marie carry?'

(19) <u>*Sa'adan* 'each other' reconstructs for binding under topicalization</u>

    D-maset xten **sa'a-d-an**$_i$ gu-dee   **Juan kun Marie**$_i$.
    PL-pot   of   SA'A-PL-3H PERF-carry Juan kun Marie.
    'Each other's pots, Juan and Marie carried.'

- This shows that the binding nonconnectivity displayed by *sa'adan* 'each other' in relativization structures is an effect specific to relativization.

- If TdVZ relativization structures could be formed by **head-raising**, the *sa'adan* 'each other' in the head of an object relative like those in (15) would have a copy c-commanded by its RC-internal potential antecedent.

- Therefore, we would expect that its binding needs would be met in its base position and the sentences would be acceptable.

- We argue that TdVZ relativization structures are **head-external**: the head of a relative clause in this language is never inside the relative clause at any stage of the derivation.

- Therefore, an instance of *sa'adan* 'each other' in an RC-head should never be able to take as its antecedent a nominal phrase inside the relative clause. This is what we find.

3.2   Bound variable anaphora

- A second strand of evidence that TdVZ relatives are not formed by head-raising comes from bound variable anaphora. Consider the following:

(20)   Idee de ke   sru'in-te   naa-**m**$_i$ ba-in   **kadga bekuh**$_i$ feliis.
        idea of that pretty-EMPH COP-3A PERF-make each   dog   happy
        'The idea that it$_i$ was really pretty made each dog$_i$ happy.'

- In (20), the third-person singular animal clitic *-m* 'it', which is the subject of the clausal complement to the noun *idee* 'idea', is interpreted as a variable bound by the quantified nominal *kadga bekuh* 'each dog'.

- We take this to be the result of Quantifier Raising: *kadga bekuh* raises covertly to the root of the tree and from that position binds the variable *-m* 'it', as in (21).

(21)   [**kadga bekuh**]$_1$ [idee de ke   sru'in-te   naa-**m**$_1$ ba-in t_1 feliis]
    [each   dog]$_1$ idea of that pretty-EMPH COP-3A$_1$ PERF-make t_1 happy

- This Quantifier Raising operation apparently does not induce a weak crossover violation in TdVZ or in English, plausibly because the pronominal being crossed over is so deeply embedded, and/or because of the causative nature of the main-clause predicate.

- In English, the complex DP containing the bound pronoun in a sentence like (20) can be "relativized out" and the bound variable reading preserved:

(22)   We talked about the idea that it$_i$ was really pretty that made each dog$_i$ happy.

- This constitutes more evidence that English relativization structures can be formed by head-raising. If (22) is formed by head-raising, then the bound variable reading can come about as follows:

(23) the [idea that it was really pretty]$_k$ ...
      that [**each dog**]$_1$ [$_{DP}$ [$_D$ ∅] [idea that it$_1$ was really pretty]$_k$] made t_1 happy

- Because there is a copy of [*idea that it was really pretty*] inside the relative clause, *each dog* can covertly QR past it and reach a position near the left edge of the relative clause, from which it can bind *it*.

- If, as we contend, TdVZ relativization structures cannot be formed by head-raising, then the TdVZ counterpart of (22) should not have the bound variable reading. This prediction is correct:

(24) *Ba-yuy-un   xten idee de ke   sru'in-te   naa-**m**$_i$ ni ba-in   **kadga bekuh**$_i$ feliis.
      PERF-talk-1.PL of   idea of that pretty-EMPH COP-3A REL PERF-make each   dog   happy
      int. 'We talked about the idea that it$_i$ was really pretty that made each dog$_i$ happy.'

- This follows from our head-external analysis of TdVZ relatives:

  – The variable inside the RC-head cannot be bound inside the relative clause, because there is no copy of the RC-head inside the relative clause.

  – The variable inside the RC-head cannot be bound in its surface position, because this would require *kadga bekuh* 'each dog' to QR out of the relative clause—which is an island.

- The claim that a variable in an RC-head cannot be bound by a quantifier inside the relative clause is further supported by the following contrasts, which are precisely analogous to the one we have just seen:

(25) [Context: There are a bunch of boys, and each one has been claimed by someone or other to be really smart. Each boy is happy about the claim that he's really smart.]
      a. Dizh de ke   nasin-te   naa-**n**$_i$ ba-in   **kadga gule'en**$_i$ feliis.
          word of that smart-EMPH COP-3H PERF-make each   boy   happy
          'The claim that he$_i$ was really smart made each boy$_i$ happy.'
      b. *Ba-yuy-un   dizh de ke   nasin-te   naa-**n**$_i$ ni ba-in   **kadga gule'en**$_i$ feliis.
          PERF-talk-1.PL word of that smart-EMPH COP-3H REL PERF-make each   boy   happy
          int. 'We made the claim that he$_i$ was really smart that made each boy$_i$ happy.'

(26) a. Dizh-gizhih de ke   debil-te   naa-**n**$_i$ ba-in   **kadga ngiu**$_i$ na-zhichih.
          word-trash of that weak-EMPH COP-3H PERF-make each   man   ADJ-angry
          'The rumor that he$_i$ was really weak made each man$_i$ angry.'
      b. *Ba-yuy-un   dizh-gizhih de ke   debil-te   naa-**n**$_i$ ni ba-in   **kadga ngiu**$_i$ na-zhichih.
          PERF-talk-1.PL word-trash of that weak-EMPH COP-3H REL PERF-make each   man   ADJ-angry.
          int. 'We spread the rumor that he$_i$ was really weak that made each man$_i$ angry.'

4 Apparent evidence for head-raising

- We have just seen that, in TdVZ, a reciprocal or would-be bound variable in an RC-head cannot take an antecedent inside the relative clause, suggesting that TdVZ relative clauses are not derived by head-raising.

- However, there are two strands of evidence that initially appear to suggest that TdVZ does have head-raising after all.

4.1 Relativization of a VP-idiom chunk

- TdVZ has at least one VP-idiom, which is illustrated below:

(27) Nai   gu-**daw**-an   **ru'u**   Marie.
yesterday PERF-**eat**-3H **mouth** Marie
lit. 'Yesterday he ate Marie's mouth.'
id. 'Yesterday he kissed Marie.'
[Felicitous if the referent of the subject kissed Marie on the mouth or anywhere on her face.]

- The idiom is *-daw- ru'u* (X)—literally 'eat (X's) mouth', but interpreted as meaning 'kiss (X) (on the mouth or anywhere on the face)'.

- When *ru'u* 'mouth' is used as the head of an object relative and the relative clause predicate is a form of *-daw-* 'eat', the relativization structure can be interpreted idiomatically:

(28) **Ru'u** ni   gu-**do**   Marie naa Beed.
mouth REL PERF-eat Marie COP Beed
lit. 'The mouth that Marie ate is Beed.'
id. 'The person that Marie kissed was Beed.'

(29) **Ru'u** ni   gu-**do**   Markuh na-zhaab-te   gua-lu'uzhi-an.
mouth REL PERF-eat Markuh ADJ-bad-EMPH PERF-end.up-3H
lit. 'The mouth that Markuh ate ended up really badly.'
id. 'The person that Markuh kissed ended up really badly.'

- These particular examples have an extra layer of semantic complexity to them: in each one, the subject refers not to a mouth but to the person whose mouth it is. We tentatively take this to be a synecdoche phenomenon that arises outside the semantic composition proper, but more work is needed here.

- On the standard assumption that two constituents that could serve as the chunks of an idiom must be highly local to one another at LF for the idiomatic interpretation to be available. . .

- . . .(28-29) would seem to suggest that TdVZ relatives can be derived by head-raising after all.

- On this analysis, (28-29) have idiomatic readings because their RC-heads (*ru'u* 'mouth') have raised from the object position of *-daw-* 'eat', and hence form an underlying constituent with it.

- We argue, though, that these facts can be given an alternative analysis which is compatible with our head-external analysis of TdVZ relatives.

- The relativization structures we have just seen involving the idiom *-daw- ru'u* (X) are different in an important respect from English relativization structures such as the following:

(30)   a. the headway we made
       b. the umbrage she took at those remarks
       c. the advantage he took of them

- The head nouns in (30) are truly unusable without their licensing verbs:

(31)   We discussed the {*headway / *umbrage / #advantage}.[3]

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[3]The version of this sentence with *advantage* is well formed, but does not have anything like the idiomatic reading available in (30c).

- The noun *ru'u* 'mouth', on the other hand, is meaningful independently of the idiom *-daw- ru'u (X)*.

- We can capture the interpretation of sentences like (28-29) by positing that they involve a special meaning of the verb *-daw-* 'eat' (cf. Kratzer 1996:114-115):

(32) a. $[\![\textbf{-daw-}_1]\!] = \lambda\text{x} . \lambda\text{y} . \text{y ate x}$
      b. $[\![\textbf{-daw-}_2]\!] = \lambda\text{x} : \text{x is a mouth} . \lambda\text{y} . \text{y kissed x}$

- On this analysis, a relativization structure like *ru'u ni gudo Marie* (lit. 'the mouth that Marie ate')—*even* on a head-external analysis of TdVZ relatives—will have the following interpretation available to it (by Predicate Modification):

(33) ιx [x is a mouth and Marie kissed x]

4.2   Low readings of RC-head modifiers

- Another phenomenon that initially appears to provide evidence for head-raising in TdVZ has to do with low (relative-clause-internal) readings of RC-head modifiers (Bhatt 2002).

- The phenomenon can be illustrated using English examples:

(34) the first book that John said Tolstoy had written
      a. **High reading:**
         'the book that John said Tolstoy had written before he said Tolstoy had written any other book'
         (Order of saying matters; order of writing is irrelevant.) $\boxed{first \gg said}$
      b. **Low reading:**
         'the book that John said Tolstoy wrote before he wrote any other book'
         (Order of writing matters; order of saying is irrelevant.) $\boxed{said \gg first}$

      [adapted from Bhatt 2002:57, (20)]

- It appears that, on the "low" reading of *first* in (34), *first* is interpreted within the scope of the relative-clause-internal verb *said*. An analogous ambiguity shows up when *first* is replaced with *only* ((35)) or with an ordinary superlative such as *longest*.

(35) the only book that John said Tolstoy had written
      a. **High reading:**
         'the only book about which John said that Tolstoy had written it' $\boxed{only \gg said}$
      b. **Low reading:**
         'the book about which John said that Tolstoy had written it and no other book' $\boxed{said \gg only}$

      [adapted from Bhatt 2002:57, (21a)]

- Bhatt (2002) argues that the low readings of these English RC-head modifiers come about through head-raising.

- When head-raising occurs, there is a copy of the RC-head modifier in the (relative-clause-internal) base position of the head, below the relative-clause-internal verb (e.g., *said*).

- The interpretation at LF of this low copy of the modifier rather than its highest copy produces the low reading of the modifier.

- Low readings of RC-head modifiers are robustly available in TdVZ, which may initially seem to indicate that this language allows head-raising. We begin with the ordinal *primer* 'first'.

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4.2.1 Low readings of *primer* 'first'

(36) [Context: Juan said that Marie wrote the book *Dbaalih* [*The Stars*]. Then he said, "She also wrote the book *Dmàín* [*Animals*], and that's the first book she wrote."]

    a. #*D-baalih* naa **primer** libr ni gu-**ni** Juan ba-kaa Marie.
         PL-star COP first book REL PERF-say Juan PERF-write Marie

        '*The Stars* is the first book Juan said Marie wrote.' $\boxed{first \gg said}$

    b. *D-màín* naa **primer** libr ni gu-**ni** Juan ba-kaa Marie.
         PL-animal COP first book REL PERF-say Juan PERF-write Marie

        '*The Animals* is the first book Juan said Marie wrote.' $\boxed{said \gg first}$

- The felicity of (36b) in this context indicates that *primer* 'first' can be interpreted low in (36b), within the scope of the relative-clause-internal verb *guni* 'said'.[4]

- Two more examples of low readings of *primer* 'first' follow. (37) and (38) show that a *primer* in an RC-head can be interpreted within the scope of a relative-clause-internal (*bain*) *desidir* 'decided' or *baziru'an* 'admitted'. (Interestingly, the English counterparts of both these verbs block the low reading for *first* (Heycock 2005).)

(37) [Context: Sofie decided to drink some coffee. Then she decided to drink some hibiscus tea first.]

    Jamaik naa **primer** bebiid ni ba-in **desidir** Sofie g-e'e-n.
    hibiscus.tea COP first drink REL PERF-do decide Sofie IRR-drink-3H

    semilit. '#Hibiscus tea is the first drink that Sofie decided to drink.'

    id.   'Hibiscus tea is the drink that Sofie decided to [drink first].' $\boxed{decide \gg first}$

(38) [Context: Juayn admitted that he had made a mistake when painting the house. Then he admitted that he had made another mistake when fixing the car, and he said that he had done that first.]

    Erroor ni ba-in Juayn kamion naa **primer** erroor ni **ba-ziru'-an** ba-ni-an.
    mistake REL PERF-make Juayn car COP first mistake REL PERF-admit-3H PERF-make-3H

    semilit. 'The mistake that Juayn made to the car is the first mistake that he admitted that he made.'

    id.   'The mistake that Juayn made when fixing the car is the mistake that he admitted [he had made first].' $\boxed{admit \gg first}$

- The robust availability of low readings of *primer* 'first' initially appears to pose a considerable challenge to our head-external analysis of TdVZ relatives.

- But appearances can be deceiving. Consider the following relativization structure in English:

(39) the second mammal that we know emerged from the water   (Heycock 2005:379, (77))

- This phrase does not have a classical Bhatt-style low reading, with *second* interpreted within the scope of *know*. That is, it cannot be paraphrased as follows:

(40) the x (*or:* the mammal) such that we **know** that it was the **second** mammal to emerge from the water

- This is because factive predicates like *know* block low readings of Bhatt modifiers generally (Heycock 2005).

---

[4]The judgments of infelicity we have received in response to sentences like (36a) in relevant contexts would appear on the face of it to suggest that RC-head modifiers cannot be interpreted high in TdVZ. We have no explanation for these surprising data, but we wonder whether the empirical picture would change if more speakers were consulted.

- But although straightforward reconstruction of the RC-head into its base position does not give the right reading for (39)...

- ...its most salient reading is nonetheless one on which the scale associated with the ordinal *second* is a timeline of *emergences*, not states of *knowing*:

- "[I]n a scenario where there are 3 mammals, A, B, and C, about which we are sure that A and B emerged from the water, and in that order, while we do not know whether or not C emerged from the water at all, B can accurately be described by [(39)]" (Heycock 2005:380).

- This shows that, in English, the scale associated with an ordinal in an RC-head can be constructed with the help of RC-internal material without reconstruction of the head into the relative clause.

- Therefore, low readings of ordinals in English RC-heads do not necessarily tell us anything about whether those RC-heads got to their surface position by head-raising.

- Heycock's "mammal" observation can be replicated in TdVZ:

(41) [Context: We're talking about the development of three species of animals: A, B, and C. We know that at some point a long time ago, A emerged from the water, and we know that B emerged from the water at some point after that. As for C, we have no idea if it emerged from the water, let alone when, if it did. For all we know, it could have emerged from the water before A, or between A and B, or after B, or not at all.]

B naa **rarup** màín ni **na-n-oon** zaa lo nis.
B COP second animal REL NEUT-know-1.PL NEUT.come P_{LOC} water

'B is the second animal we know came from the water.'[5]

- (41) shows that, in TdVZ too, the scale associated with an ordinal in an RC-head can be constructed with the help of relative-clause-internal material without reconstruction of the head into the relative clause.

- This suggests that the scales associated with ordinals in TdVZ may be constructed largely on the basis of what properties are most contextually salient. If this is so, *rarup* 'second' in (41) may have the following (type $\langle e,t \rangle$) denotation:

(42) $[\![\mathbf{rarup}]\!] = \lambda x . \exists! y [y <_s x]$
    where $<_s$ = 'precedes (on some contextually salient scale s)'

- ...and be interpreted in situ.

- At any rate, it appears that TdVZ is like English here: low readings of ordinals modifying RC-heads do not necessarily indicate that head-raising has occurred.

4.2.2 Low readings of *-zi* 'only'

- Low readings are also robustly available for another modifier of RC-heads: the clitic *-zi* 'only' ((43)).

(43) [Context: Mart said, "Felip saw the movie *Dbel* [*The Snakes*]. Oh wait, no—the only movie he saw was *Dbedund* [*The Hummingbirds*]."]

D-bedund naa tee-**zi** pelikuh ni **gu-ni** Mart ba-yee Felip.
PL-hummingbird COP one-only movie REL PERF-say Mart PERF-see Felip

'*The Hummingbirds* is the only movie Mart said Felip saw.' $\boxed{said \gg only}$

---

[5]The name of the letter B is pronounced *be* in TdVZ.

- Sentence (43) would be false on a high reading of *-zi* ($\boxed{only \gg said}$), because *The Hummingbirds* is not the <u>only</u> movie about which Mart <u>said</u> that Felip had seen it.

- But it is true on a low reading of *-zi*, since Mart did <u>say</u> at one point that Felip had seen <u>only</u> *The Hummingbirds*.

- The felicity of (43) in the context given shows that *-zi* can be interpreted low (i.e., within the scope of a relative-clause-internal predicate, here *guni* 'said').

- Like *primer* 'first', *-zi* 'only' can be interpreted below a relative-clause-internal *bain desidir* 'decided' (English is different in this respect):

(44) [Context: Marie decided to eat a banana. Then she changed her mind and decided to eat only an apple.]

Mansan naa tee-**zi** frut ni ba-in **desidir** Marie g-agu-an.
apple COP one-only fruit REL PERF-do decide Marie IRR-eat-3H

semilit. '#The apple is the only fruit that Marie decided to eat.' $\boxed{decided \gg only}$

id. 'The apple is the fruit such that Marie decided to eat only it.'

(45) [Context: Beniit decided to buy a coat. Then he changed his mind and decided to buy only a shirt.]

Kamset naa tee-**zi** laadih ni ba-in **desidir** Beniit ∅-si-en.
shirt COP one-only cloth.garment REL PERF-do decide Beniit IRR-buy-3H

semilit. '#The shirt is the only article of clothing that Beniit decided to buy.' $\boxed{decided \gg only}$

id. 'The shirt is the article of clothing such that Beniit decided to buy only it.'

- The ability of an instance of *-zi* 'only' in an RC-head to be interpreted below a relative-clause-internal predicate seems to pose another challenge for our head-external analysis of TdVZ relatives, on which the head never raises from within the relative clause.

- However, this fact about *-zi* does not <u>force</u> the conclusion that TdVZ relatives can be derived by head-raising after all.

- Whenever an instance of inverse scope is discovered (i.e., a situation in which A asymmetrically c-commands B in surface syntax, but is interpreted semantically as falling within the scope of B), there are in principle two broad kinds of analyses one can give for it (see Fox 1999, Fox & Nissenbaum 2004 for discussion):

(46) a. **Syntactic reconstruction:** Inverse scope is available because A, which c-commands B in surface syntax, has moved from a position below B, and it can be interpreted at LF in this lower position.

b. **Semantic reconstruction:** Inverse scope is available not because A has moved from below B, but because some element has a denotation whose effect is to place the denotation of A within the scope of B in the process of semantic composition.

- A priori, these two approaches seem equally reasonable.

- But adopting a syntactic reconstruction analysis of low readings of *-zi* 'only'—which would require positing head-raising in TdVZ—would make it very difficult to understand the reciprocal binding and bound variable anaphora facts in §3, which suggest that TdVZ relatives lack the head-raising derivation.

- Therefore, we will pursue a semantic reconstruction analysis of low readings of *-zi*.

- The basic proposal can be illustrated using the relativization structure in (43), repeated here:

(47) [Context: Mart said, "Felip saw the movie *Dbel* [*The Snakes*]. Oh wait, no—the only movie he saw was *Dbedund* [*The Hummingbirds*]."]

D-bedund	naa	**tee-<u>zi</u>**	**pelikuh ni**	**gu-<u>ni</u>**	**Mart ba-yee**	**Felip**.
PL-hummingbird	COP	one-only	movie	REL PERF-say	Mart	PERF-see Felip

'*The Hummingbirds* is the only movie Mart said Felip saw.' $\boxed{said \gg only}$

- On our analysis, the phrase boldfaced in (47) has the following syntactic structure:

(48)
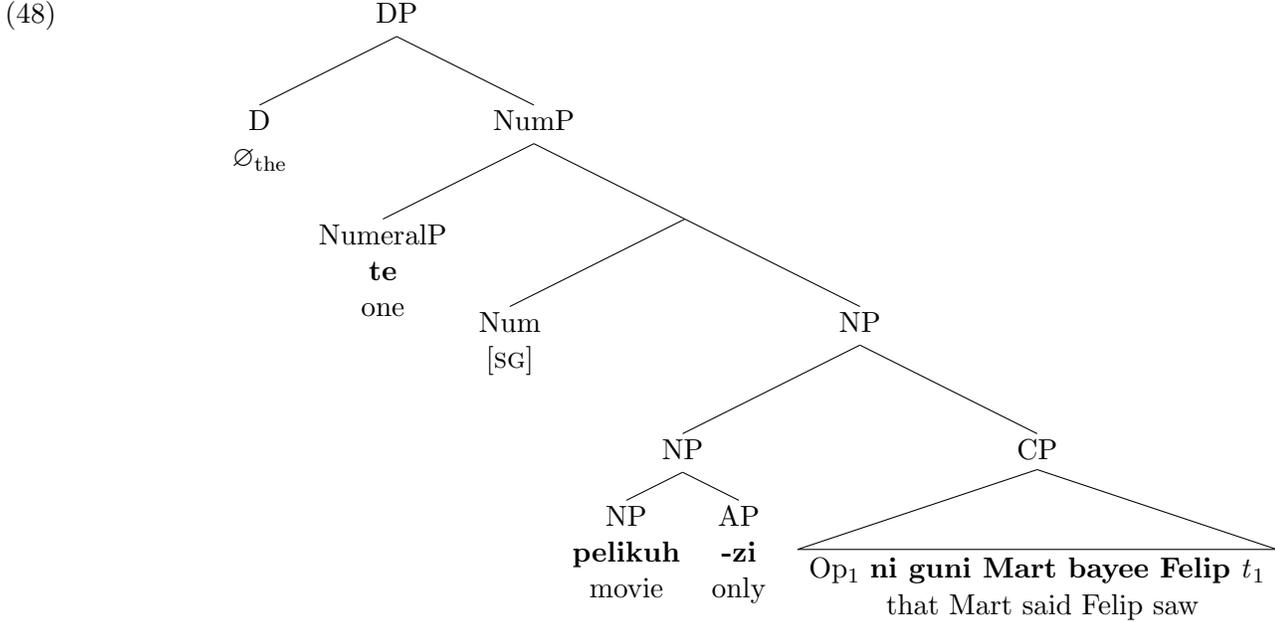
- And *-zi* 'only' has the following denotation:

(49) $[\![[_{AP} \textbf{-zi}]]\!] = \lambda f_{e,st} \; . \; \lambda Q_{\langle\langle\langle e,st\rangle,st\rangle,st\rangle} \; . \; \lambda z \; . \; \lambda w \; . \; f(z)(w) = 1 = Q(\lambda g_{e,st} \; . \; \lambda w'' \; . \; g(z)(w'') \text{ and } \neg\exists v \; [v \neq z$ and $f(v)(w'') = g(v)(w'') = 1])(w)$

- ...yielding the following denotation for the underlying NP <u>pelikuh -zi **Op**$_1$ ni Mart guni t_1 C</u> <u>Felip bayee t_1</u> 'only movie that Mart said Felip saw':

(50) $[\![[_{NP} \textbf{pelikuh -zi Op}_1 \textbf{ ni Mart guni } t_1 \textbf{ C Felip bayee } t_1]]\!] =$
$\lambda z \; . \; \lambda w \; . \; z$ is a movie in w and Mart said something in w and $\forall w' : w'$ is compatible with what Mart said in w [Felip saw z in w' and $\neg\exists v \; [v \neq z$ and v is a movie in w' and Felip saw v in $w']]$

- Adopting this semantic reconstruction analysis, then, allows us to understand low readings of *-zi* 'only' without becoming unable to account for the reciprocal binding and bound variable anaphora facts in §3.

5   A head-external analysis of TdVZ relatives

- Having surveyed the empirical landscape, we can now proceed to our analysis of the structure and derivation of relative clauses in TdVZ.

- We do not yet have evidence bearing on whether TdVZ has only head-external relatives, only matching relatives, or both...

- ...but we contend that TdVZ relatives are never derived by head-raising.

- Here, we will implement our analysis in terms of a traditional head-external derivation, with operator movement inside the relative clause.
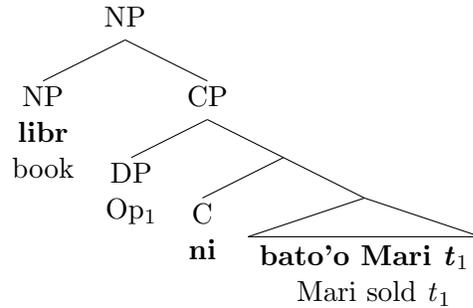
5.1 The basics

- A relativization structure like (51) will have the derivation shown in (52):

(51) *Direct object relativization* (= (5))

    libr **ni** ba-to'o Mari
    book REL PERF-sell Mari
    'the book that Mari sold'

(52)

```
                              NP
                          ┌────┴────┐
                        NP          CP
                      libr      ┌────┴────┐
                      book     DP         C
                               Op₁   ┌────┴────┐
                                     C    bato'o Mari t₁
                                     ni   Mari sold t₁
```

- A null relative operator—a silent counterpart of relative pronouns such as English *which*—is base-generated in the "core" of the clause. . .

- . . .and then internally merges with the C-projection *ni bato'o Mari t_1* 'that Mary sold t_1' (in more traditional terms, moves to [Spec,CP]).

- The resulting CP adjoins to the head NP, which is never inside the CP at any point in the derivation.

- This structure can be semantically interpreted by the composition principles familiar from Heim and Kratzer (1998)—most importantly Predicate Abstraction (for the CP) and Predicate Modification (for the higher NP).

5.2 A puzzle: apparent RC-internal "stranding" of *xten sa'adan* 'of each other's'

- With this much established, we can now proceed to consider a TdVZ-internal puzzle: why is it that the PP *xten sa'adan* 'of each other's' seems to be able to be "stranded" inside a relative clause?

(53) *Apparent RC-internal "stranding" of the PP <u>xten sa'adan</u> 'of each other's'* (= (16))

  a. Nga'a naa d-kamion [CP ni   ba-yee   Els kun Beniit **xten sa'a-d-an** nai].
      blue   COP PL-car   REL PERF-see Els with Beniit of   SA'A-PL-3H yesterday
      'The cars of each other's that Els and Beniit saw yesterday are blue.'

  b. Gura'au naa d-kubet   [CP ni   gu-dee   Sofie kun Luk **xten sa'a-d-an**].
      big   COP PL-bucket   REL PERF-carry Sofie and Luk of   SA'A-PL-3H
      'The buckets of each other's that Sofie and Luk carried are big.'

- Intuitively, *xten sa'adan* 'of each other's' seems to be modifying the NP head (e.g., *kamion* 'car' or *kubet* 'bucket').

- This apparent "split constituency" would be relatively straightforward to understand if the NP head could raise out of the relative clause, stranding the PP inside the relative clause.

- But we have argued that in fact the NP <u>never</u> raises out of the relative clause in TdVZ. What to make of *xten sa'adan*–stranding, then?

- We argue that *xten sa'adan* 'of each other's' is an adjunct not to the NP head (which is never inside the relative clause at any point) but rather to its "proxy" inside the relative clause—the null operator:

(54)

```
                              DP
                         ┌────┴────┐
                        DP        PP
                        Op    ┌────┴────┐
                       [WH]   P        DP
                             xten    ┌──┴──┐
                              of   sa'adan
                                  each other
```
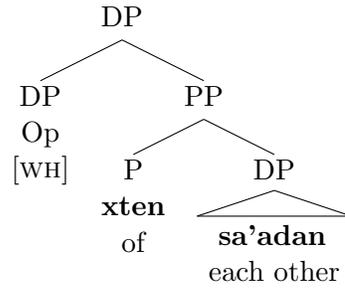
- Could it be that a "stranded" *xten sa'adan* is instead a verbal or clausal modifier—say, an adjunct to VP or *v*P—perhaps with an interpretation like 'in such a way as for each to affect the other'?

- Two strands of evidence tell against this possibility.

- First, *xten sa'adan* cannot be coordinated with other verbal modifiers:

(55) a. Gule'en kun zhape'en ku-a'a   d-guzhar **xten sa'a-d-an**.
          boy   and girl   PERF-take PL-spoon of   SA'A-PL-3H
          'The boys and the girls took each other's spoons.'
      b. Gule'en kun zhape'en ku-a'a   d-guzhar **na-geelih-te**.
          boy   and girl   PERF-take PL-spoon ADJ-fast-EMPH
          'The boys and the girls took the spoons really fast.'
      c. *Gule'en kun zhape'en ku-a'a   d-guzhar **na-geelih-te chikru xten sa'a-d-an**.
          boy   and girl   PERF-take PL-spoon ADJ-fast-EMPH and   of   SA'A-PL-3H
          lit. '*The boys and the girls took the spoons really fast and of each other's.'
      d. *Gule'en kun zhape'en ku-a'a   d-guzhar **xten sa'a-d-an chikru na-geelih-te**.
          boy   and girl   PERF-take PL-spoon of   SA'A-PL-3H and   ADJ-fast-EMPH
          lit. '*The boys and the girls took the spoons of each other's and really fast.'

- Secondly, *xten sa'adan* cannot follow a pronominal object:

(56) Sofie kun Beed ri-zhulaaz-d-an {na/dunun} (*xten sa'a-d-an).
      Sofie and Beed HAB-like-PL-3H {me/us}   (*of   SA'A-PL-3H).
      'Sofie and Beed like me/us (*of each other's).'

- An analysis of *xten sa'adan* as an adjunct to some projection in the clausal spine therefore does not seem promising.

- A DP containing *xten sa'adan* can be merged as the direct object of a verb (such as *bayee* 'saw'), and further structure building can produce a subtree like the following:

(57)

```
                    ┌───────────┴──────────────┐
                    C                           
                    ni                          
                  [uWH]                          
                  [EPP]    ┌────────────────────┴──────────────┐
                  that   bayee Els kun Beniit [DP Op xten sa'adan] nai
                         Els and Beniit saw [DP Op of each other's] yesterday
```
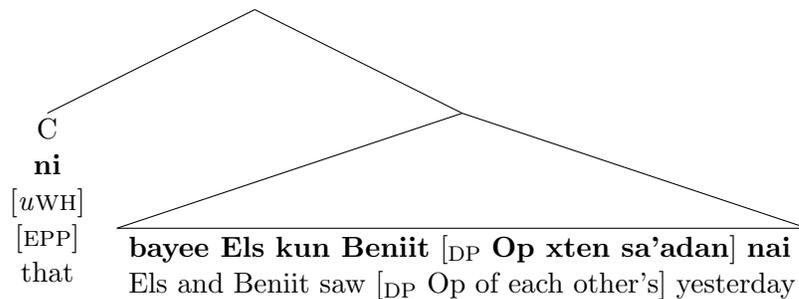
- On our analysis, the relative complementizer *ni* inherently bears an unvalued WH-feature.

- It therefore probes its c-command domain for a goal bearing a valued WH-feature, finds one, and enters into an Agree relation with it, thereby valuing its own [uWH] feature.

- *Ni* also bears an EPP feature, which is satisfied by internally merging the goal of Agree with the root of the tree (i.e., moving it to [Spec,CP]).

- However, there is a problem. What exactly is the goal that *ni* finds and agrees with in a derivation like the one snapshotted in (57)?

- If it is Op, then we apparently have exactly what we want:

(58)

```
                        CP
             _____
            /                        \
          DP                          \
          Op_i                    _____
          [WH]                   /            \
                 C             /               \
                 ni          /                  \
                [uWH]       /                     \
                [EPP]   bayee Els kun Beniit [DP t_i xten sa'adan] nai
                 that   Els and Beniit saw   [DP t_i of each other's] yesterday
```
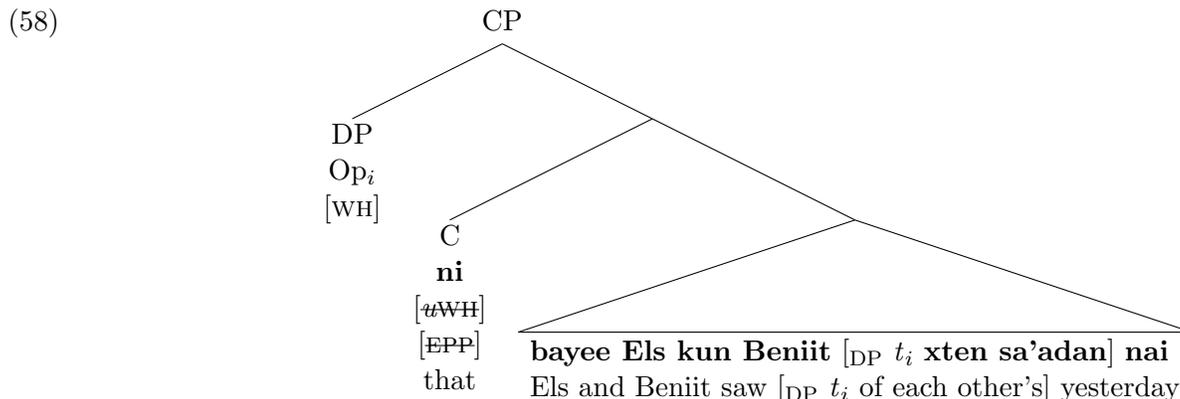
- However, recall that [PP *xten sa'adan*] 'of each other's' is <u>adjoined</u> to [DP Op].

- This being so, the WH-feature on the lower segment of the DP will project to its higher segment, as in (59), on the assumption that all the segments of a single category have identical featural content.

(59)

```
                      DP
                    [ [WH] ]
                 _____|_____
                /             \
              DP              PP
              Op          _____|_____
              [WH]       /           \
                        P            DP
                      xten       _____
                       of         sa'adan
                                 each other
```
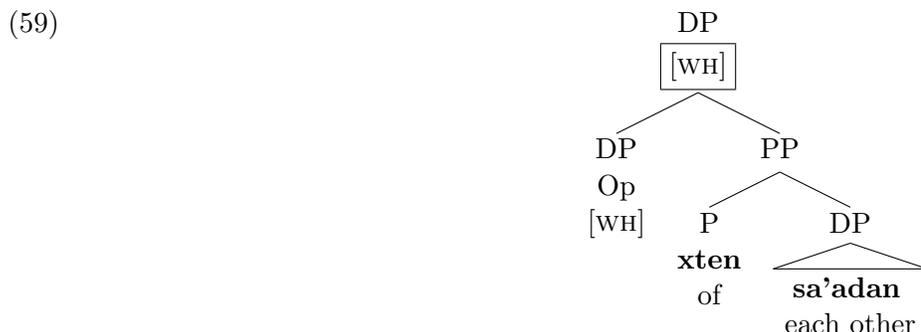
- Therefore, the Agree search conducted by the complementizer *ni* in a derivation like (58) should find the *maximal* DP in (59), and this entire constituent should be attracted to [Spec,CP]...

- ...or, at the very least, this should be possible. So why is *xten sa'adan* pronounced in its base position?

- A clue comes from the fact that it appears that TdVZ <u>never</u> allows overt material to be pronounced in the specifier of the relative complementizer *ni*...

- ...suggesting that the language has the following spellout condition:

(60) **TdVZ Relative CP Filter** *(enforced on the PF branch)*
    *[CP X [C_[REL] Y]], where X has phonological content

- The filter in (60) makes it impossible to spell out the WH-DP [DP Op *xten sa'adan*] in [Spec,CP]...

- ...forcing an unconventional spellout option: pronunciation of the lower copy of *xten sa'adan* ((61)).

(61) *Low pronunciation of PP adjoined to Op*

```
                              CP
              ┌───────────────┴───────────────┐
             DP                                │
             [WH]                      ┌────────┴──────────────────┐
       ┌──────┴──────┐                 C                           │
      DP            PP                 ni                           │
      Op       ┌────┴─────┐           [uWH]                         │
      [WH]   xten sa'adan             [EPP]        ┌────────────────┴───────────────┐
             of each other's          that     bayee Els kun Beniit [DP Op xten sa'adan] nai
                                                Els and Beniit saw [DP Op of each other's] yesterday
```

- This analysis makes a couple of predictions.

- **Prediction 1:** TdVZ relative clauses should not allow pied-piping of an overt preposition to [Spec,CP].

- This prediction is borne out.

- When *bangu* 'chair' is relativized out of (62a) below, the preposition *lo* 'on' may appear in situ with a resumptive pronoun ((62b)), or it may disappear ((62c)), but it may not be pied-piped to the left periphery of the relative clause ((62d)).

(62) *TdVZ equivalents of English PP-relatives*
   a. Sofie zub-an   **lo** te bangu.
      Sofie is.sitting-3H on a   chair
      'Sofie is sitting on a chair.'

   b. bangu **ni**   zub   Sofie **la'agu-en**
      chair   REL is.sitting Sofie on/face-3INAN
      semilit. 'the chair that Sofie is sitting on it'
      id.   'the chair that Sofie is sitting on'

   c. bangu **ni**   zub   Sofie
      chair   REL is.sitting Sofie
      semilit. 'the chair that Sofie is sitting'
      id.   'the chair that Sofie is sitting on'

   d. bangu ⟨*lo⟩ ni   ⟨*lo⟩ zub   Sofie
      chair ⟨*on⟩ REL ⟨*on⟩ is.sitting Sofie
      'the chair that Sofie is sitting on'

- Interestingly, it turns out that when there is no overt resumptive, the P cannot appear overtly either, in any position:

(63) bangu ⟨*lo⟩ ni   ⟨*lo⟩ zub   ⟨*lo⟩ Sofie ⟨*lo⟩
     chair ⟨*on⟩ REL ⟨*on⟩ is.sitting ⟨*on⟩ Sofie ⟨*on⟩
     'the chair that Sofie is sitting on'

- This we attribute to a second TdVZ-specific spellout condition:

(64) **TdVZ PP Filter** *(enforced on the PF branch)*
     *[PP P X], where P has phonological content and X is null.

17

- When a preposition like *lo* 'on' obeys this filter by "disappearing," we assume that a silent counterpart of *lo* has been chosen from the lexicon, or the P node has simply not been spelled out by any overt Vocabulary Item.[6]

- **Prediction 2:** Locative and temporal relatives should not begin with a sequence "X *ni*," with X a locative or temporal (*wh-*)adverbial.

- This prediction too is correct. The locative and temporal relativizers *kud* 'where' and *chi* 'when' cannot cooccur with the relative complementizer *ni*:

(65) Ri-zhulaaz-a ye'e ⟨***ni**⟩ <u>kud</u> ⟨***ni**⟩ gu-zi Mart yexih.
      HAB-like-1.SG market ⟨*REL⟩ where ⟨*REL⟩ PERF-buy Mart avocado
      'I like the market where Mart bought avocados.'

(66) zhman ⟨***ni**⟩ <u>chi</u> ⟨***ni**⟩ ba-zub Juan te yu'u
      week ⟨*REL⟩ when ⟨*REL⟩ PERF-build Juan a house
      'the week when Juan built a house'

- *Kud* 'where' and *chi* 'when' cannot be in the highest [Spec,CP] in the relative clauses they introduce, since this would violate the TdVZ Relative CP Filter.

- Therefore, we analyze them as special realizations of the relative complementizer *ni*.

6 Conclusion

- We have argued that relative clauses in TdVZ <u>do not have the head-raising derivation available to them</u>.

- A reciprocal in the head of a TdVZ relative clause cannot be bound by a relative-clause-internal nominal phrase, even though reciprocals reconstruct for binding under Ā-movement generally.

- On our analysis, this is because the head of a TdVZ relative clause is never inside the relative clause at any stage of the derivation.

- Analogously, a would-be bound variable inside an RC-head cannot be bound by a relative-clause-internal quantifier. The reason is the same: the head is never RC-internal.

- The curious phenomenon of "stranding" of *xten sa'adan* 'of each other's' inside certain relative clauses comes about when this PP is adjoined to the null operator:

  – The resulting adjunction structure, a WH-DP, is attracted to [Spec,CP]. . .
  – . . .but spelled out in its base position owing to an independently motivated PF filter similar to the Doubly-Filled COMP Filter.

- In summary, externally headed relative clauses are derived by head-raising in some languages (e.g., English) but not in others (e.g., TdVZ).

The takeaway: Externally headed relative clauses are a cross-linguistically heterogeneous category. Garden-variety relative clauses in Teotitlán del Valle Zapotec and English look quite similar on the surface, but have very different derivational histories.

---

[6]Not all prepositions in TdVZ have the ability to evade the TdVZ PP Filter in this way. *Zha* 'under', for example, has no silent counterpart.

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Appendix: a sketch of our semantic reconstruction analysis of low readings of *-zi* 'only'

(67) [Context: Mart said, "Felip saw the movie *Dbel* [*The Snakes*]. Oh wait, no—the only movie he saw was *Dbedund* [*The Hummingbirds*]."] (= (43))

D-bedund naa tee-**zi** pelikuh ni **gu-ni** Mart ba-yee Felip.
PL-hummingbird COP one-only movie REL PERF-say Mart PERF-see Felip

'*The Hummingbirds* is the only movie Mart said Felip saw.' ⟦ *said* ≫ *only* ⟧

(68) *Structure of the postcopular nominal in (67) (irrelevant projections omitted)*
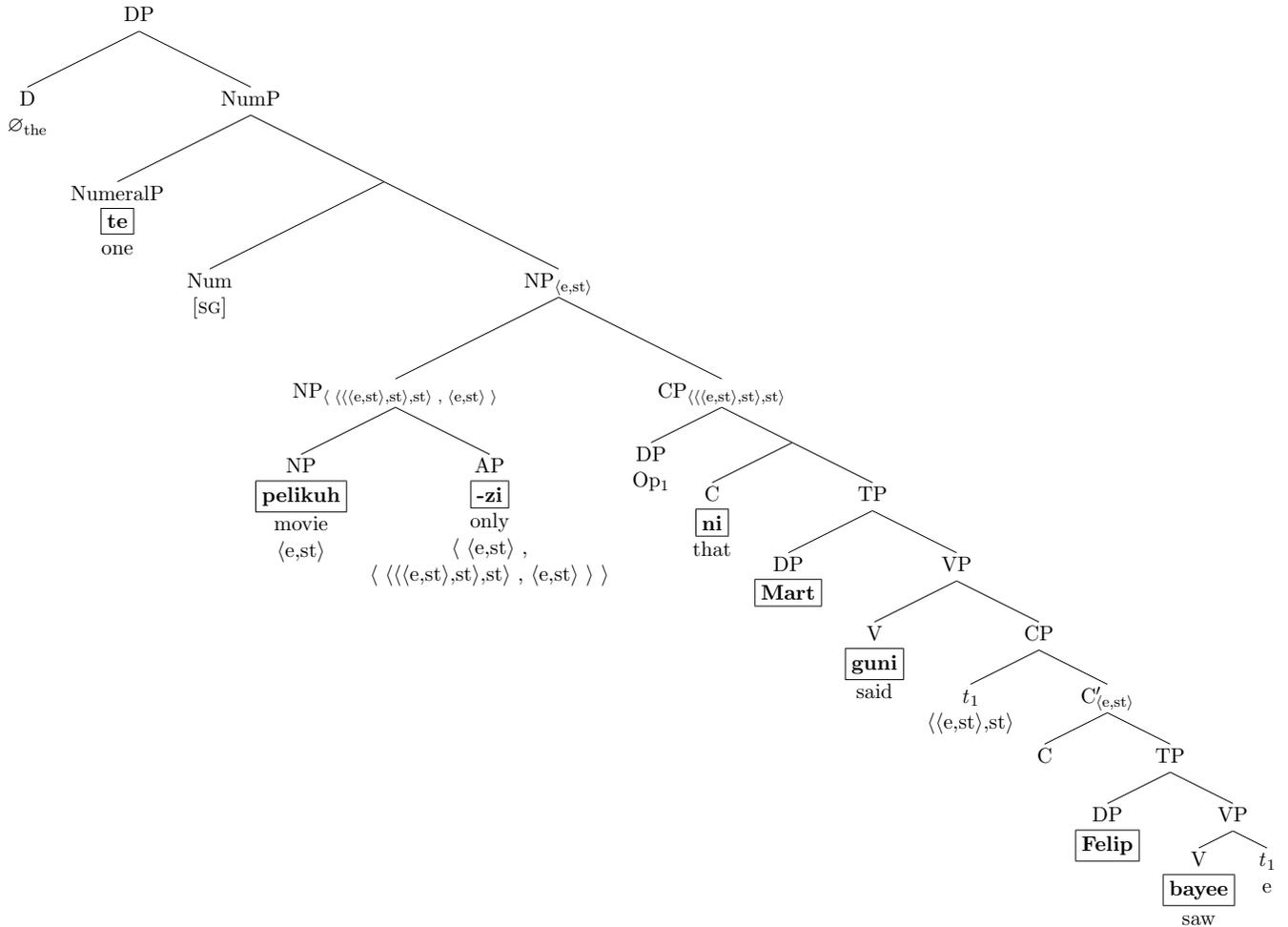
A sketch of the semantic composition yielding the denotation of the maximal NP in (68)

(69) *Workspace 1*

a. ⟦ [$_{C'}$ **C Felip bayee t_1**] ⟧ $= \lambda x$. λw . Felip saw x in w

b. ⟦ [**guni**] ⟧ $= \lambda p_{st}$. λx . λw . x said something in w and $\forall w'$: w' is compatible with what x said in w [p(w') = 1]

c. ⟦ [$_{CP}$ **Op$_1$ ni Mart guni t_1 C Felip bayee t_1**] ⟧ $= \lambda P_{\langle\langle e,st\rangle,st\rangle}$. λw . Mart said something in w and $\forall w'$: w' is compatible with what Mart said in w [P(λx . λw . Felip saw x in w)(w') = 1]

(70)   *Workspace 2*

    a. $⟦$ $[_{\text{NP}}$ **pelikuh**$]$ $⟧$ $= \lambda y$. λw . y is a movie in w

    b. $⟦$ $[_{\text{AP}}$ **-zi**$]$ $⟧$ $= \lambda f_{e,st}$. $\lambda Q_{⟨⟨⟨e,st⟩,st⟩,st⟩}$. λz . λw . f(z)(w) $= 1 = Q(\lambda g_{e,st}$. $\lambda w''$. g(z)(w'') and $\neg\exists v$ [v $\neq$
       z and f(v)(w'') $=$ g(v)(w'') $= 1])(w)$

    c. $⟦$ $[_{\text{NP}}$ **pelikuh -zi**$]$ $⟧$ $=$
       $\lambda Q_{⟨⟨⟨e,st⟩,st⟩,st⟩}$. λz . λw . z is a movie in w and $1 = Q(\lambda g_{e,st}$. $\lambda w''$. g(z)(w'') and $\neg\exists v$ [v $\neq$ z and v
       is a movie in w'' and g(v)(w'') $= 1])(w)$

    d. $⟦$ $[_{\text{NP}}$ **pelikuh -zi Op$_1$ ni Mart guni t_1 C Felip bayee t_1**$]$ $⟧$ $=$
       λz . λw . z is a movie in w and Mart said something in w and $\forall w'$: w' is compatible with what Mart
       said in w [Felip saw z in w' and $\neg\exists v$ [v $\neq$ z and v is a movie in w' and Felip saw v in w']]