

INTERROGATIVE POSSESSORS AND THE PROBLEM WITH PIED-PIPING IN CHOL MAYAN*

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1 Introduction

- Complex possessive phrases in Chol Mayan present a problem for an analysis of pied-piping in which features from a *wh*-word “percolate” up to a higher maximal projection.
- There are 3 possibilities for questioning the possessor *Maria* in a sentence like (1), shown in (2):¹

(1) Tyi yajl-i [i-plato [i-ts'i` aj-Maria]].
PERF fall-IV 3E-plate 3E-dog GDR-Maria
'Maria's dog's plate fell.'

(2) a. [Maxki]₃ tyi yajl-i [i-plato i-ts'i` t₃]?
WHO PERF fall-IV 3E-plate 3E-dog
'Whose dog's plate fell?'

b. [Maxki i-ts'i`] ₂ tyi yajl-i [i-plato t₂]?
WHO 3E-dog PERF fall-IV 3E-plate
'Whose dog's plate fell?'

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¹Abbreviations in glosses are as follows: 1, 2, 3 = 1st, 2nd, and 3rd person; E = ergative/genitive (often labeled “Set A” in Mayan literature); GDR = gender; IV = intransitive verb; PERF = perfective; PREP = preposition.

- c. [Maxki i-plato i-ts'i`]₁ tyi yajl-i t₁?
 WHO 3E-plate 3E-dog PERF fall-IV
 ‘Whose dog’s plate fell?’

⇒ In order to account for the ordering facts in (2), feature percolation would have to both occur and not occur from the same *wh*-word at different stages in a single derivation. Consistent percolation, on the other hand, results in an ungrammaticality.

- I argue that these facts provide evidence *against* an analysis involving feature percolation. I propose instead an account along the lines of Cable (2007):
 - The operations of pied-piping and (specifier-to-dominating XP) feature percolation are eliminated from the grammar
 - *wh*-movement to Spec,CP is always the result of a relationship between C and a projection called “QP”
- I propose further that the apparent free choice between possessor extraction and so-called pied-piping constructions in (2) can be explained as a consequence of the choice of DP to which the Q head is externally merged. **No optional operations are necessary.**
- **Outline**
 - §2 Chol possessors
 - §3 Multiple possessors and the problem for pied-piping
 - §4 QP
 - §5 Conclusion

2 Chol possessors

- Chol is a Mayan language spoken in Mexico by around 150,000 people. The data presented here was collected by the author in the municipality of Tila, Chiapas, Mexico.
- In Chol, **non-*wh*-possessors obligatorily follow the possessed noun.** This contrasts with *wh*-possessors which must precede the possessed noun.

- (3) a. Tyi yajl-i [**i-plato aj-Maria**].
 PERF fall-IV 3E-plate GDR-Maria
 ‘Maria’s plate fell.’
- b. *Tyi yajl-i [**aj-Maria i-plato**].
 PERF fall-IV GDR-Maria 3E-plate
 ‘Maria’s plate fell.’

○ The possessed noun shows agreement with the possessor in the form of an ergative/genitive prefix, glossed ‘E’.

- All Chol *wh*-words obligatorily front to a preverbal position, which I take, following work by Aissen (1992, 1996) on Tzotzil Mayan, to be Spec,CP—*wh*-words left *in situ* are ungrammatical.
- While extraction out of external subjects and adjuncts is impossible in Chol (see Aissen (1996) for similar facts in Tzotzil), a *wh*-possessor inside the *internal* argument of the predicate (a transitive direct object or unaccusative subject) may front in one of two ways:

1. The *wh*-word may extract out of the possessive phrase, as in (4):

- (4) **Maxki**_i tyi yajl-i [i-plato t_i]?
 WHO PERF fall-IV 3E-plate
 ‘Whose plate fell?’

2. Or *wh*-possessors may “pied-pipe” the possessive phrase with them, as in (5):

- (5) [**Maxki i-plato**]_i tyi yajl-i t_i?
 WHO 3E-plate PERF fall-IV
 ‘Whose plate fell?’

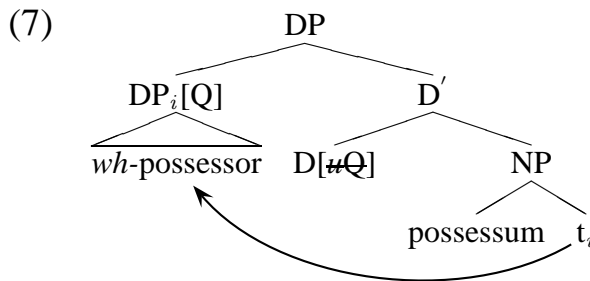
⇒ Note the difference in the order of the *wh*- and non-*wh*-possessors with respect to the possessum:

- non-*wh*-possessors obligatorily *follow* the possessed noun, as in (6a)
- *wh*-possessors inside their possessive phrases, as in (5), must *precede* the possessed noun

- (6) a. Tyi yajl-i [**i-plato aj-Maria**].
 PERF fall-IV 3E-plate GDR-Maria
 ‘Maria’s plate fell.’

- b. * [I-plate **maxki**]_i tyi yajl-i t_i?
 3E-plate WHO PERF fall-IV
 ‘Whose plate fell?’

- Following Aissen (1996) on Tzotzil, we may capture this distinction by proposing that *wh*-possessors in Chol must raise above the possessum to Spec,DP in order to check a strong uninterpretable [Q] feature on D, shown in (7).²



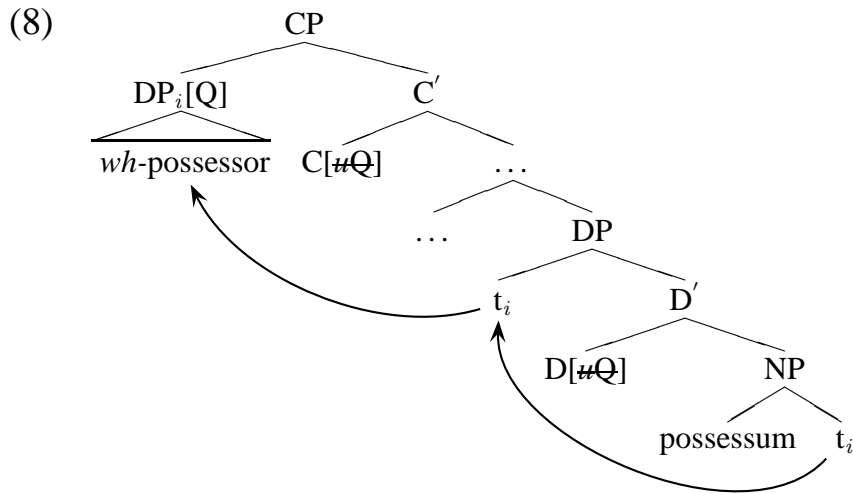
- This parallels the clausal domain, in which *wh*-words must move to Spec,CP to check a strong [Q] feature on the interrogative C.
- This account is also consistent with proposals by Cinque (1980), Torrego (1986), and subsequent work that extraction out of DP must always take place through Spec,DP.
 - Since Chol *does* allow possessor extraction, this provides further support to the proposal that Chol *wh*-possessors always undergo overt movement to DP’s specifier position.

3 Multiple possessors and the problem for pied-piping

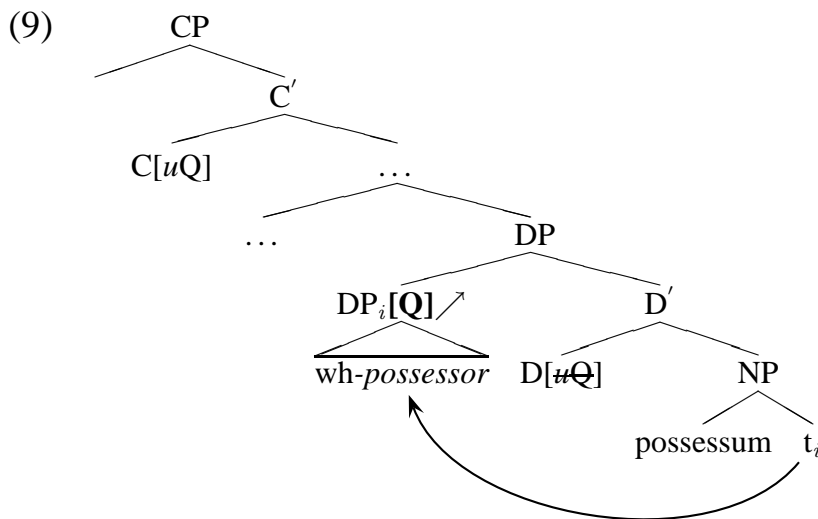
3.1 A possible percolation account

- So far, the Chol data do not seem especially problematic for a percolation account. We could offer the following account:
 - In the extraction case in (4) the *wh*-possessor *maxki* ‘who’ first raises to Spec,DP of the possessive phrase to check a strong uninterpretable [Q] feature on D.
 - This puts the DP possessor in a position from which it is able to extract out of the possessive DP to Spec,CP to check the [Q] feature on C.

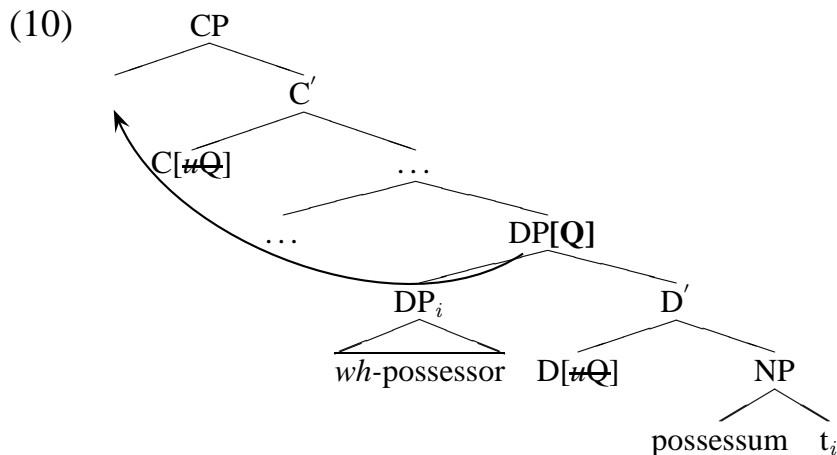
²For ease of illustration, I follow Aissen (1992) in placing Spec,NP to the right of its head in order to capture the fact that possessors are post-nominal. I argue elsewhere that all Chol specifiers precede their heads and that post-nominal possessors are the result of movement of the possessum to a DP-internal functional projection (Coon 2007).



- In the pied-piping construction in (5) the *wh*-possessor also raises to Spec,DP.
- *But* this time the [Q] feature of the possessor *maxki* “percolates” up to the higher possessive phrase DP. (**Percolation represented with ↗**)



- Now the *higher* DP is [+Q] and so the entire possessive phrase is targeted for movement to Spec,CP.



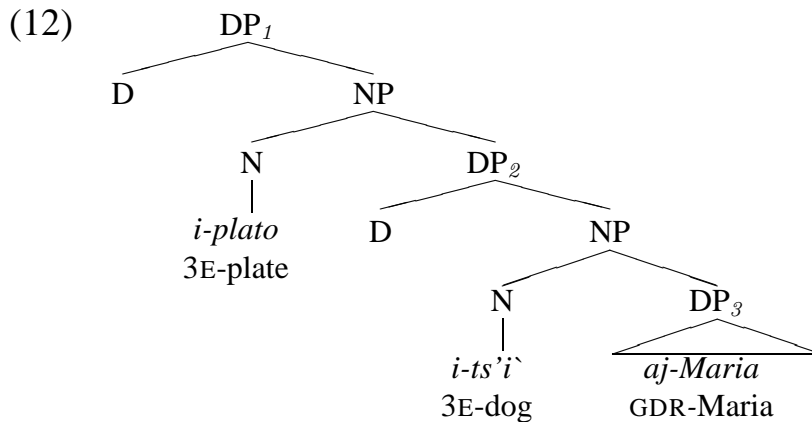
3.2 The problem

⇒ **The problem arises in the case of complex possessive phrases.**

- Possession may be recursive in Chol:

(11) Tyi yajl-i [i-plato [i-ts'i` aj-Maria]].
 PERF fall-IV 3E-plate 3E-dog GDR-Maria
 ‘Maria’s dog’s plate fell.’

- In (11), *ajMaria* is the possessor of *ts'i`* ‘dog’.
- These two together form a larger possessor, *its'i` ajMaria* ‘Maria’s dog’, which is in turn the possessor of *plato* ‘plate’.
- This complex possessive phrase has the structure in (12).



- In this case, there are **three possibilities for questioning the possessor**: any of the three DPs from the structure in (12) may front to Spec,CP.³

(13) a. [Maxki]₃ tyi yajl-i [i-plato i-ts'i` t₃]?
 WHO PERF fall-IV 3E-plate 3E-dog
 ‘Whose dog’s plate fell?’

b. [Maxki i-ts'i`]₂ tyi yajl-i [i-plato t₂]?
 WHO 3E-dog PERF fall-IV 3E-plate
 ‘Whose dog’s plate fell?’

c. [Maxki i-plato i-ts'i`]₁ tyi yajl-i t₁?
 WHO 3E-plate 3E-dog PERF fall-IV
 ‘Whose dog’s plate fell?’

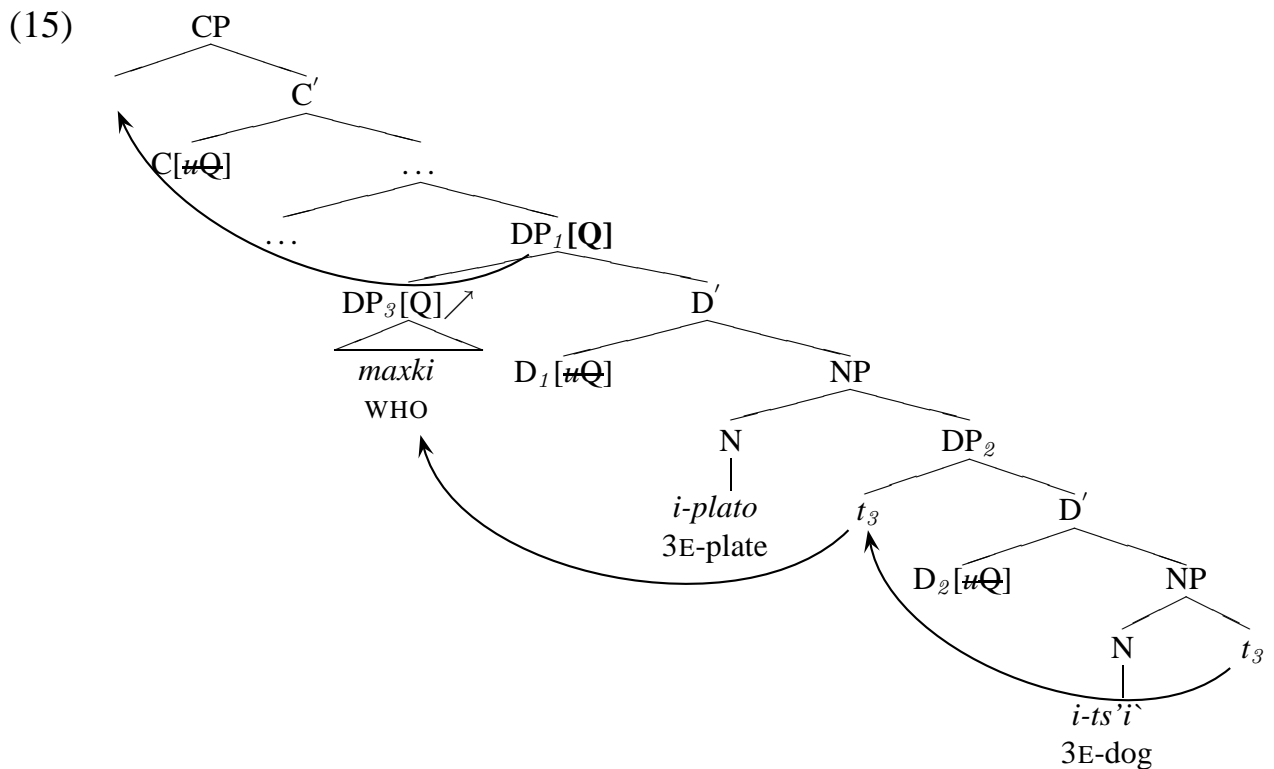
³Initial data suggest that there may be independent factors governing which possessor extracts in Chol. For example, speakers seem to prefer to keep inalienably possessed nouns with their possessors, though more work is needed to determine if this is the correct generalization.

- In (13a) the *wh*-possessor DP₃ extracts out of the possessive phrase and fronts to Spec,CP
- In (13b) the intermediate possessor DP₂ fronts
- In (13c) the entire possessive phrase DP₁ fronts
- What will concern us here is the **order of elements *within* the fronted possessive phrases**.
 - As in the case of simple possessive phrases, the *wh*-possessor *maxki* always appears at the left edge of the fronted constituent.
 - But note that in (13c)—repeated as (14b)—the other two words **appear in their base order**.

(14) a. Tyi yajl-i [i-plato [i-ts'i` aj-Maria]].
 PERF fall-IV 3E-plate 3E-dog CL-Maria
 ‘Maria’s dog’s plate fell.’

b. [Maxki i-plato i-ts'i`] t₁?
 WHO 3E-plate 3E-dog PERF fall-IV
 ‘Whose dog’s plate fell?’

- How is this order derived? A possible derivation is given in (15).



Step 1: As in the derivations above, the possessor *maxki* raises to Spec,DP₂ to check the uninterpretable strong [Q] feature on D₂.

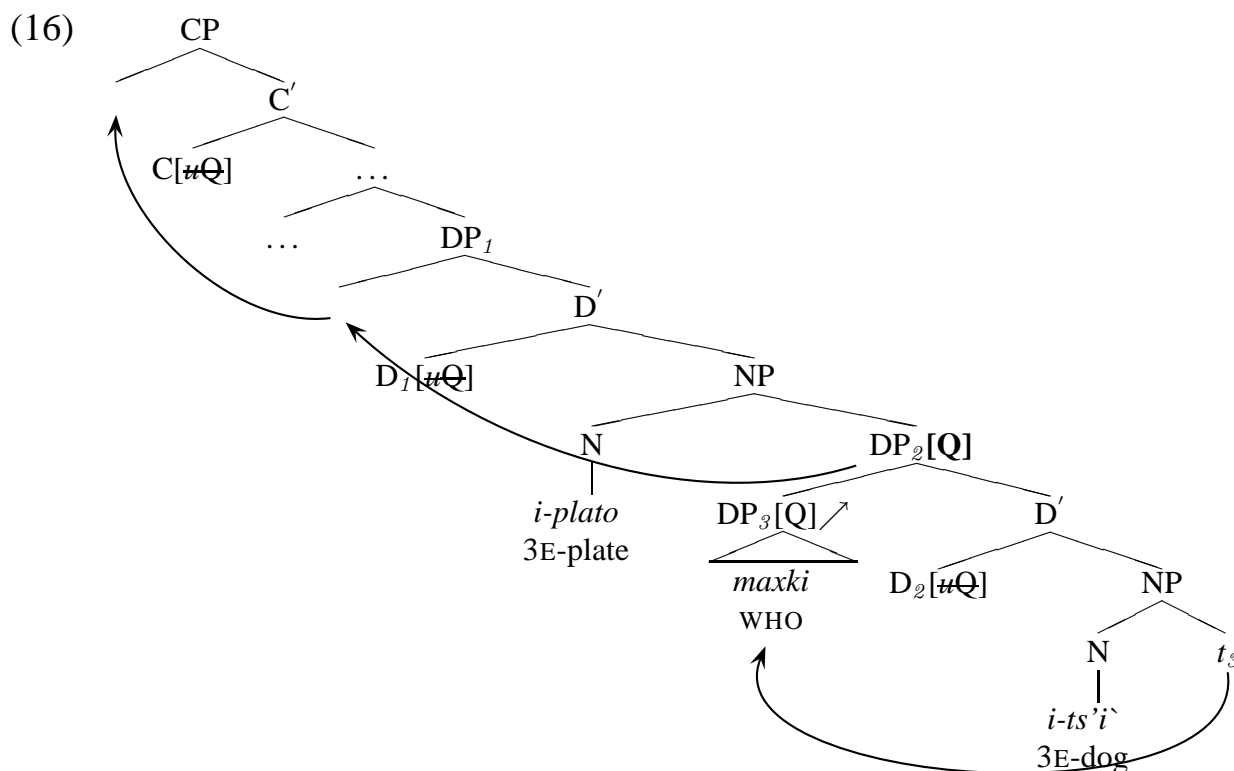
Step 2: The *wh*-possessor *maxki* again raises, this time to the specifier of the higher DP₁ to check D₁'s [Q] feature.

Step 3: Finally, the entire possessive phrase, DP₁, must raise to Spec,CP.

- The problem for a percolation analysis is as follows:
 - In order for the larger possessive phrase DP₁ to be selected for movement to Spec,CP, the [Q] features of the *wh*-word must “percolate” up to DP₁ (end of Step 2).
 - But after the first the first step of movement the [Q] feature of DP₃ must *not* percolate to DP₂, as DP₂ is *not* targeted for movement.

⇒ In order to derive (13c), feature percolation *must not* occur from the *wh*-possessor to DP₂, but *must* occur from the *wh*-possessor to DP₁.

- Turning now to the sentence in (13b), we find the *exact opposite*:



Step 1: As in the derivations above, the possessor *maxki* raises to Spec,DP₂ to check the uninterpretable strong [Q] feature on D₂. *Features percolate to DP₂*.

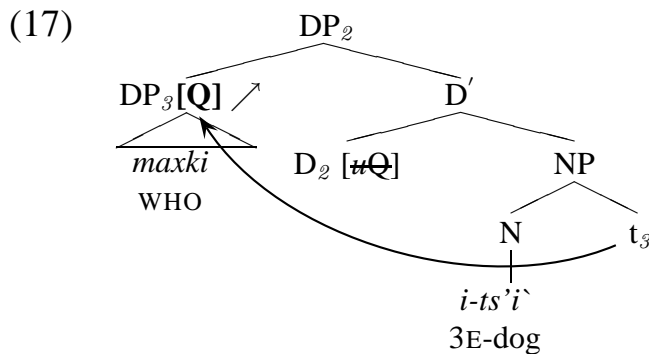
Step 2: DP₂[Q] raises specifier of DP₁ to check D₁'s [Q] feature. *Features do not percolate to DP₁.*

Step 3: DP₂[Q] raises *out* of DP₁ to Spec,CP.

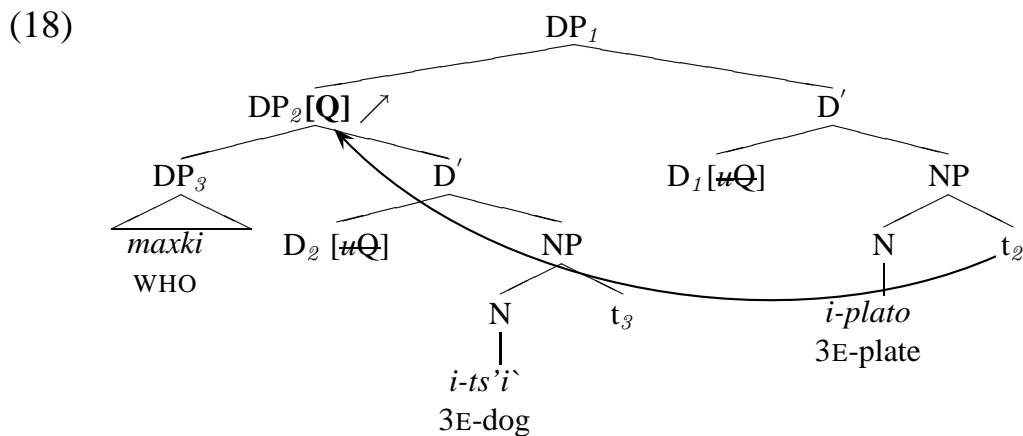
⇒ To derive (13b), feature percolation must first occur and then not occur.

- If feature percolation happened consistently at each point in the derivation, we would expect a “roll up” structure, derived as follows:

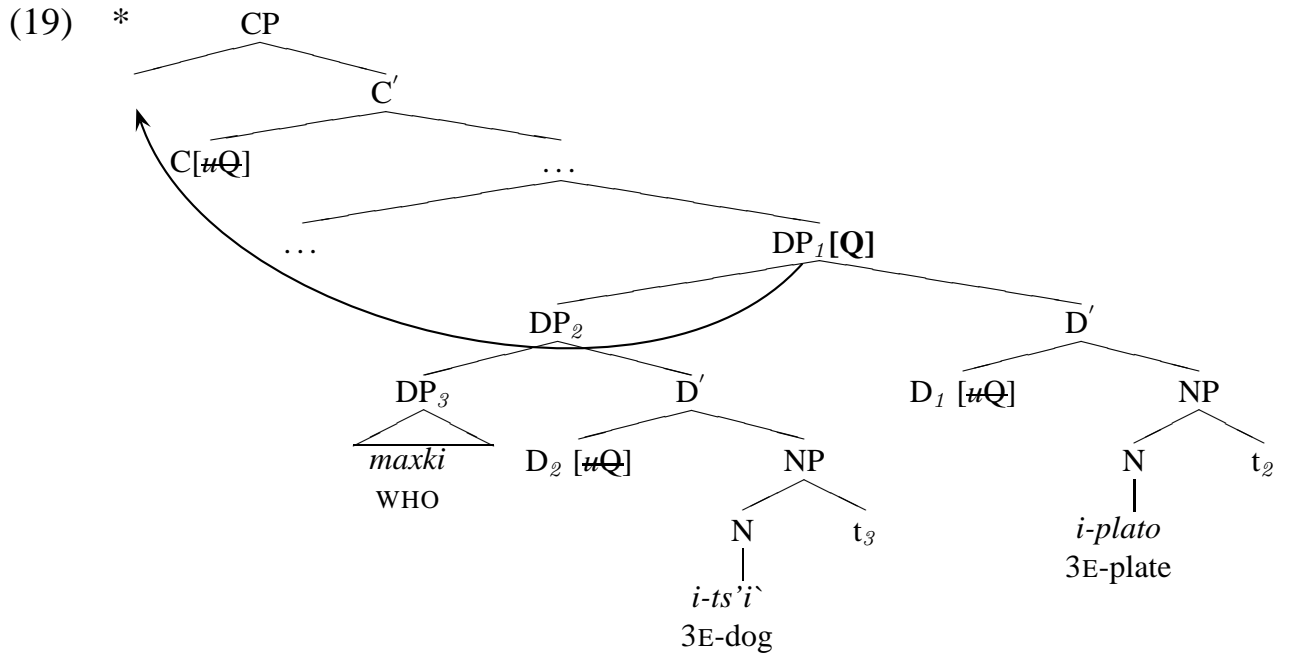
Step 1: D₂ is merged; its strong [Q] feature attracts the wh-possessor DP₃ to Spec,DP₂. **[Q] features percolate from DP₃ to DP₂.**



Step 2: D₁ is merged; its strong[Q] feature attracts the intermediate possessor (now [+Q]) to Spec,DP₁. **[Q] features percolate from DP₂ to DP₁.**



Step 3: When C is merged, its uninterpretable [Q] features probes the derivation and finds DP₁. DP₁ is attracted to Spec,CP.



- This “roll-up” derivation results in the sentence in (20a), which is judged by Chol speakers to be completely impossible. The correct version is repeated in (20b) for comparison.

- (20) a. * [Maxki i-ts'i` i-plato]_i tyi yajl-i t_i?
 WHO 3E-dog 3E-plate PERF fall-IV
 ‘Whose dog’s plate fell?’
- b. [Maxki i-plato i-ts'i`]_i tyi yajl-i t_i?
 WHO 3E-plate 3E-dog PERF fall-IV
 ‘Whose dog’s plate fell?’

⇒ In order to achieve the correct surface orders for the three sentences in (13) using a percolation account, we have to say that **the interrogative DP *maxki* both does and does not percolate features at different steps in the same derivation.**

- extraction of DP₃: No feature percolation.
- extraction of DP₂: The [Q] feature first percolates, then does not percolate.
- extraction of DP₁: The [Q] feature first does *not* percolate, then percolates.
- We could stipulate that feature percolation in Chol may occur *at most once* during the derivation.
- Specifically, certain features have some property, which is “used up” by percolating.

- We want to know what kind of property this is, and what it means for it to be used up.
 - Furthermore, we would want to know why it doesn't have to be used, as when no percolation occurs in the *wh*-possessor extraction case.
- ⇒ My proposal won't require this special property.

3.3 Previous accounts

- Similar ordering facts within complex possessors were first noted for Chol's cousin Tzotzil by Aissen (1996) and then for unrelated San Dionicio Zapotec by Broadwell (2001).
- Both authors rule out the ungrammatical roll-up derivation in (19) by appealing to the CONSISTENCY PRINCIPLE proposed in Longobardi (1991):

(21) CONSISTENCY PRINCIPLE (as reformulated by Aissen 1996):⁴
 An XP immediately expanding a [+N] category on the non-recursive side is directionally consistent in every projection.

- **The idea:** Tzotzil and Zapotec are generally right-branching; in the ungrammatical (19) we find an expanded a left-side specifier.

⇒ My proposal doesn't need branching principles.

4 QP

- *Wh*-movement is standardly thought to involve a relationship between C and a *wh*-word.
- Cable (2007) argues that in fact there are *three* crucial elements: **C**, a ***wh*-word**, and a “question phrase” **QP**.
 - Each of these, Cable shows, plays a role in the semantics of questions.
- Drawing on evidence from Tlingit (Na-Dene), in which the Q head is overt, Cable (2007) provides cross-linguistic support for his claim **Q is present in all languages**.

⁴As originally formulated for Italian by Longobardi, the Consistency Principle was restricted to *lexical* categories because the specifiers of I and C in Italian *can* be complex. Aissen (1996, 484) notes that Longobardi did not assume the DP hypothesis. DP is a not a lexical category, but Longobardi would still want it to be subject to the Consistency Principle, so she argues that it should be restricted to [+N] rather than lexical categories.

- The Q head merges with a phrase containing the *wh*-operator.
 - Under this account *wh*-movement *never* involves a relationship between the interrogative C and the *wh*-word itself.
 - Instead, overt *wh*-movement to Spec,CP targets QP which *contains* the *wh*-word.
 - In “pied-piping” cases, the QP simply dominates the *wh*-word and other material. QP undergoes regular XP movement to Spec,CP.
- ⇒ Pied-piping is an illusion. Feature percolation is eliminated from the grammar.
- Here I do not go into details of Cable’s analysis, but show how this approach can explain the patterns we find in Chol without recourse to special restrictions.

4.1 How it works

- Recall that there are three possibilities for questioning the possessor of a complex possessive phrase, repeated in (22):

- (22) a. [Maxki]₃ tyi yajl-i [i-plato i-ts’i` t₃]?
 WHO PERF fall-IV 3E-plate 3E-dog
 ‘Whose dog’s plate fell?’
- b. [Maxki i-ts’i`] ₂ tyi yajl-i [i-plato t₂]?
 WHO 3E-dog PERF fall-IV 3E-plate
 ‘Whose dog’s plate fell?’
- c. [Maxki i-plato i-ts’i`] ₁ tyi yajl-i t₁?
 WHO 3E-plate 3E-dog PERF fall-IV
 ‘Whose dog’s plate fell?’

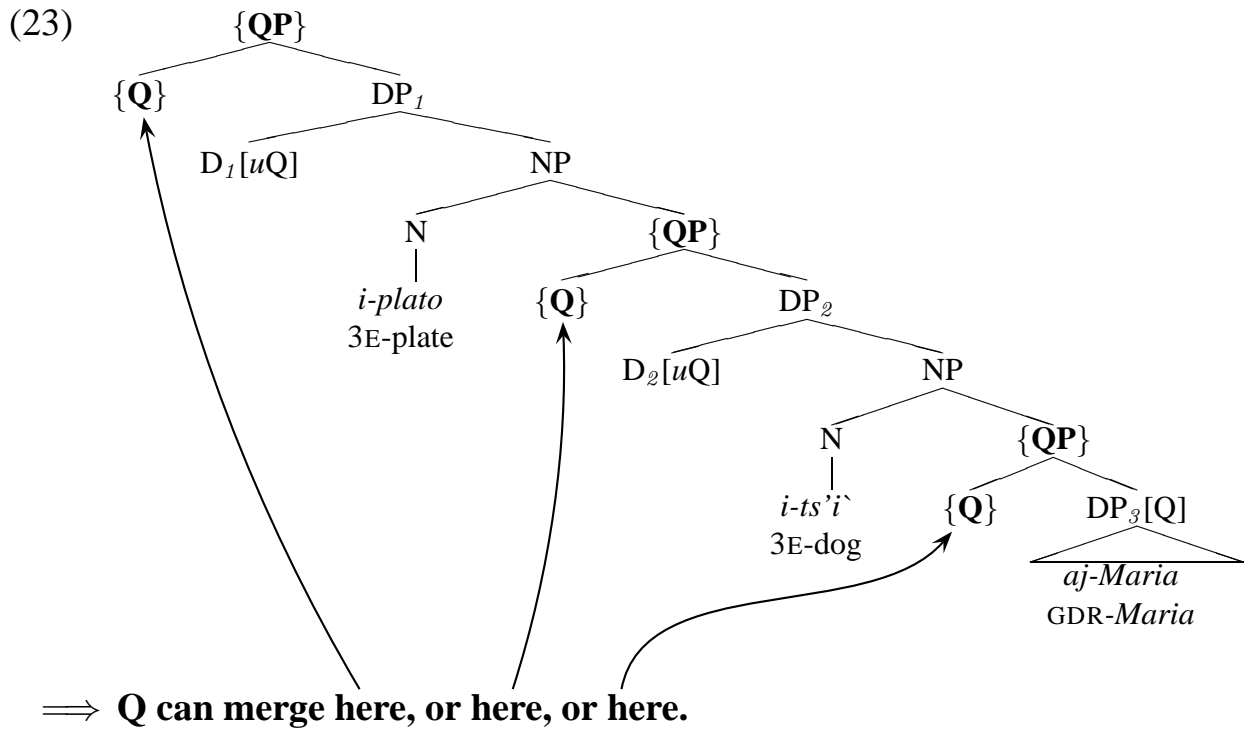
- In addition to yielding the correct order of elements within the fronted complex possessive phrases (as I’ll show below) a QP-fronting analysis also gives us a straightforward manner of explaining the apparent optionality between the *wh*-extraction and the different “pied-piped” forms in (22).

⇒ The difference is **not the result of an optional operation** . . .

The difference is structural, stemming from where in the derivation the Q head merges.

- A single Q head merges in the derivation. The Q head may merge with any one of the three DPs, as shown in (23).

- The DP with which the Q head merges is the one that will front to Spec,CP.

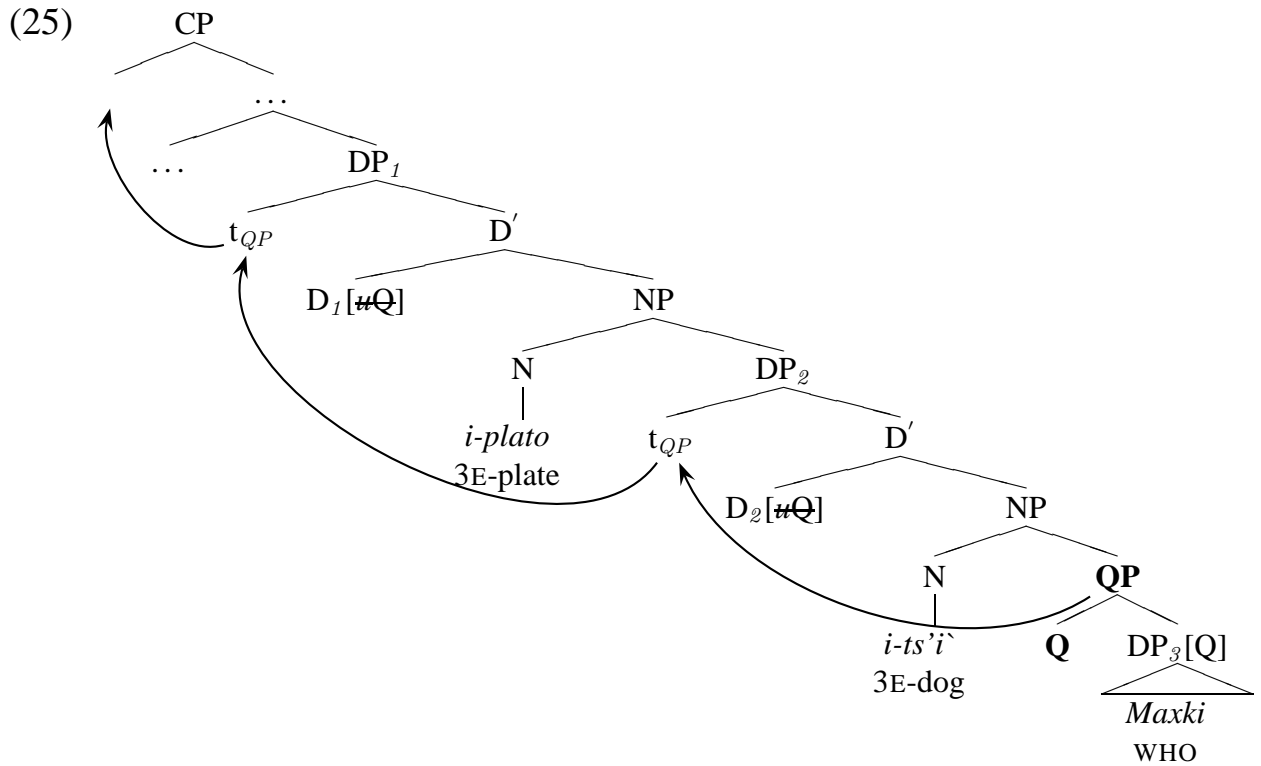


- As above, each D head in an interrogative Chol possessive phrase contains a strong uninterpretable [Q] feature.
- This strong feature must be checked by an interpretable [Q] feature. Now we have two elements with interpretable [Q] features:
 1. interrogative DP (like *maxki* ‘who’ above), or
 2. QP
- As in the cases above, the interrogative C, like the D, also contains a strong [Q] feature, which must be checked in the same way.
- These assumptions, combined with the proposal that all movement obeys locality (Chomsky 1995, Richards 1997), give us the correct order.

4.1.1 Extraction of DP₃

(24) [Maxki]₃ tyi yajl-i [i-plato i-ts'i` t₃]?
 WHO PERF fall-IV 3E-plate 3E-dog
 ‘Whose dog’s plate fell?’

⇒ The Q head merges with DP₃ which contains only the *wh*-possessor *maxki*.



Step 1: D_2 is merged; its strong [Q] feature probes for a [Q] feature. It finds QP, and attracts it to Spec, DP_2 .

Step 2: Repeat for D_1 : its [Q] feature probes down, finds QP, and attracts it to Spec, DP_1 .

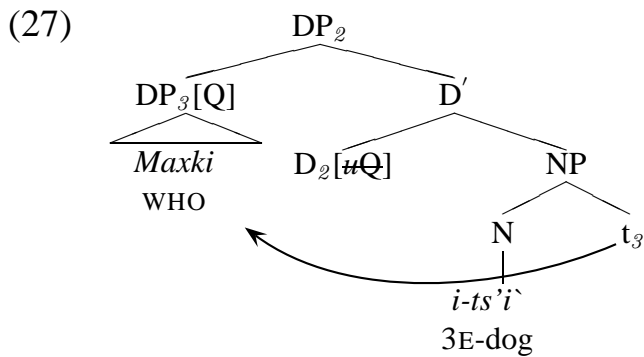
Step 3: The [Q] feature on C attracts the highest [+Q] element, QP. In this case, QP contains only the *wh*-possessor *maxki*, correctly giving us the sentence in (24).

4.1.2 Extraction of DP_2

(26) [Maxki i-ts'i]₂ tyi yajl-i [i-plato t₂]?
 WHO 3E-dog PERF fall-IV 3E-plate
 'Whose dog's plate fell?'

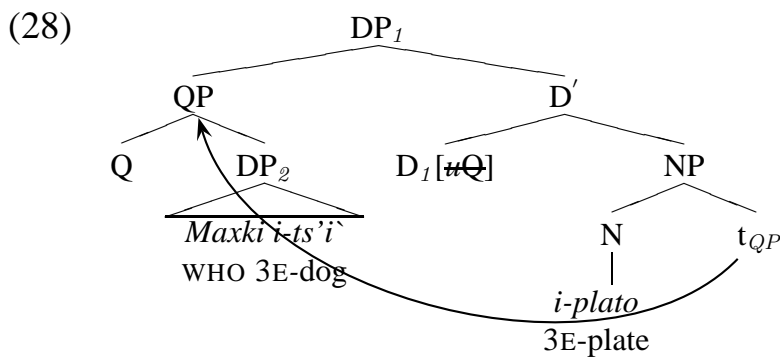
⇒ The Q head merges with the intermediate possessor, DP_2 .

Step 1: D_2 merges above the *wh*-possessor. The [+Q] *wh*-possessor DP_3 is attracted to Spec, DP_2 .

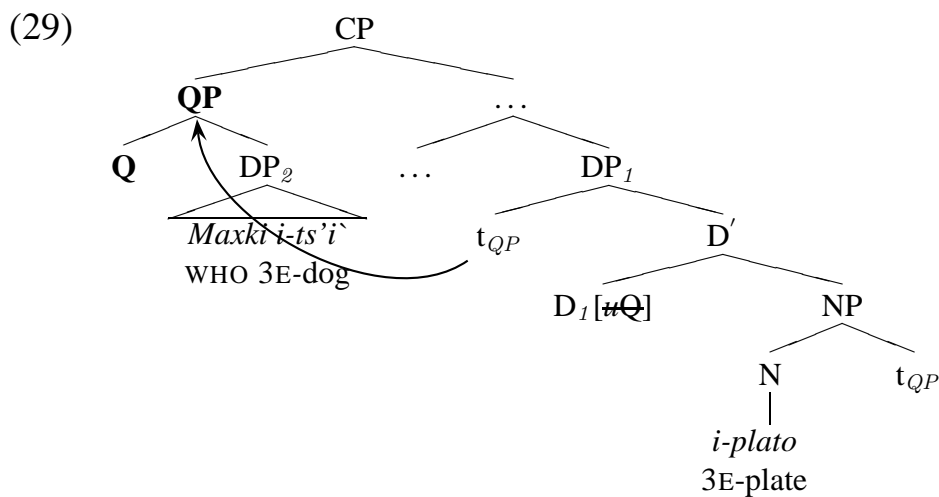


Step 2: Q merges with DP₂, projecting QP.

Step 3: D₁ is merged. Its [Q] feature probes the structure and finds the closest [Q] feature on QP. QP—containing the intermediate possessor—is attracted to Spec,DP₁.



Step 4: C is merged and probes for a [Q]. It attracts QP to Spec,CP.

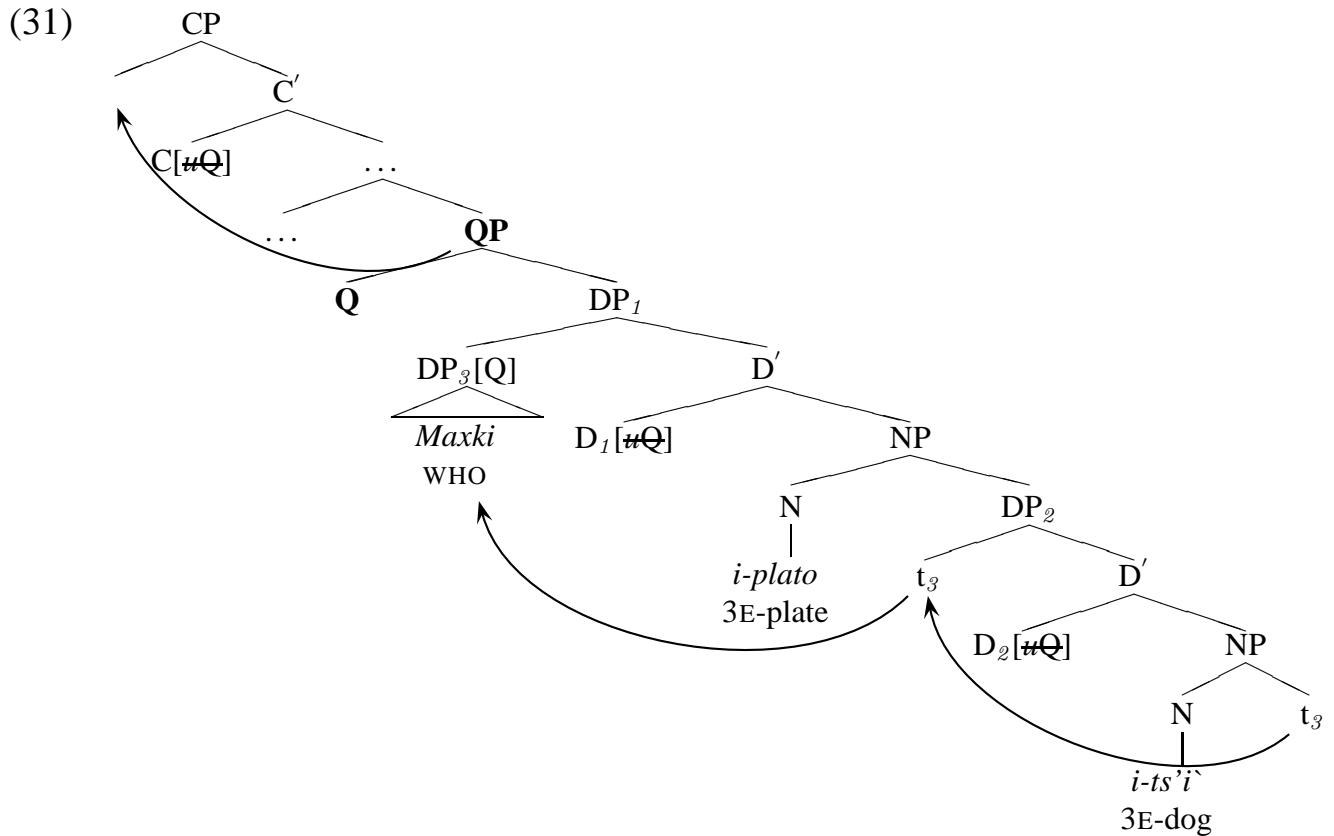


⇒ Since QP contains all of DP₂, the result is what appears to be pied-piping, but is in fact regular XP movement.

4.1.3 Extraction of DP₁

- (30) [Maxki i-plato i-ts'i']₁ tyi yajl-i t₁?
 WHO 3E-plate 3E-dog PERF fall-IV
 'Whose dog's plate fell?'

⇒ The Q head is merged with DP₁.



Step 1: The strong [Q] feature on D₂ probes and finds the [+Q] *wh*-possessor DP₃, which it attracts to its specifier position.

Step 2: The second step proceeds similarly: D₁ attracts [+Q] possessor DP₃ to its specifier.

Step 3: The Q head merges with DP₁. C's strong [Q] feature probes and finds QP. QP, this time containing the entire possessive phrase, is raised to Spec,CP.

⇒ Again, the result creates the illusion of pied-piping, but is again nothing more than XP-fronting.

4.2 Ruling out roll-up

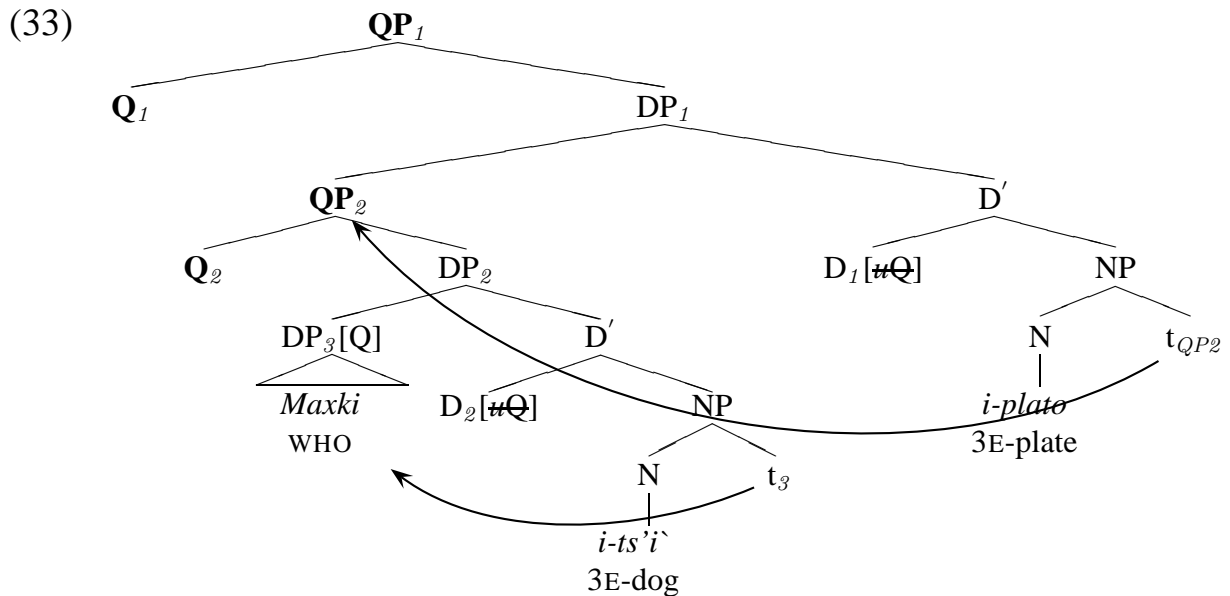
- We have seen that the QP story, along with standard assumptions about locality of movement, can correctly derive the three grammatical Chol structures without

recourse to percolation.

⇒ We also want to rule out the ungrammatical roll-up structure.

- (32) * [Maxki i-ts'i` i-plato]_i tyi yajl-i t_i?
 WHO 3E-dog 3E-plate PERF fall-IV
 ‘Whose dog’s plate fell?’

- The only way to derive the roll-up structure would be to merge multiple Q heads in the derivation.



- But Cable’s theory predicts that a structure like (33) will be **uninterpretable by the semantics**:
 - Q particles are **focus-sensitive operators** (Rooth 1985).
 - Focus-sensitive operators (e.g. English ‘only’) take **focus-semantic values** as arguments. The focus-semantic value of a focused element is a set of alternatives of the same semantic type.
 - *wh*-words have **only a focus-semantic value**: the set of focus-alternatives of identical semantic type and animacy, i.e., for ‘who’ the set of all humans (Beck 2006).
 - When the lower Q head is merged it **closes off the focus-alternatives** projected by the *wh*-word *maxki*. The focus-alternatives are then not passed up to the higher Q-particle.

- Since no focus-alternatives are passed up, and since Q takes focus-semantic values as arguments, **the higher Q particle does not receive an argument of the right semantic type.**

⇒ **For any *wh*-word, at most one Q particle may be present** (see Cable (2007, 130–158) for details).

⇒ While a percolation account must stipulate that percolation can happen **at most once** to rule out roll-up, the fact that only one Q can merge is independently required by the semantics of Q.

5 Conclusion

- In this paper I have presented original data from possessive constructions in Chol Mayan, and argued that the cases that seem to involve pied-piping of complex possessors cannot easily be explained by standard analyses of feature percolation.
 - In order to derive the correct order within the fronted possessive phrase, we must stipulate that feature percolation may occur at most once during the derivation—but it may occur late or early in the derivation.
 - Percolation is also free to *not* occur at all, as when the *wh*-possessor extracts.
 - I argued that a QP analysis is able to explain the Chol facts without the use of this special operation.
- I illustrated how an analysis of *wh*-movement which involves a relation between a C head and a QP (rather than between C and the *wh*-word itself), as proposed by Cable (2007), straightforwardly captures the Chol facts.
 - The apparently optionality between extraction and pied-piping is not the result of an optional operation, but rather, stems from where in the derivation the Q head merges: Q is free to combine with any [+Q] DP.
 - The ungrammatical roll-up derivation—which percolation proposals must rule out by stipulation—is automatically rejected in this account by the semantics of Q.
 - The grammar is simplified: what gave the illusion of a separate mechanism (percolation, pied-piping), is nothing more than phrasal movement.
- Future work:
 - How does a speaker decide which construction (of the three possible in (2) to use?

- Do these sentences have different answers? i.e. ‘John’s’ vs. ‘John’s dog’s’?
(Data needed)

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