Binding and the LOW/HIGH-ABS parameter in Mayan

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NELS 51 — UQÀM — November 7th 2020

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1 Context

Given traditional views on binding (e.g. Reinhart 1976, 1983; Chomsky 1981, 1986), the distribution of co-indexed nominals depends in part on c-command.[1]

- Since subjects c-command objects, Condition C will enforce that only the subject DP should be an R-expression in a VOS configuration like (1)—regardless of surface word order:

  (1) verb $[_{\text{OBJ}} \ldots [_{\text{POSS}} \text{pronoun}_1]]$ $[_{\text{SUBJ}} \underline{\text{R-expression}_1}]$

- Some VOS languages, like Ch'ol, pattern as expected given binding principles:

  (2) Tyi i-chok-o $[_{\text{OBJ}}$ i-tyuñ $[_{\text{POSS}}$ Ø $]_i]$ **abi** $[_{\text{SUBJ}}$ jiñi alob $]_i$.
  PFV A3-throw-TV A3-stone his yesterday DET boy
  'The boy$_i$ threw his$_i$ stone yesterday.' Ch'ol (Mayan)

- The subject (R-expression) binds the possessor of the object (pronoun); linear order is irrelevant.

But not all VOS languages are "well-behaved" like Ch'ol.

- In Chuj, another Mayan language, **linear order—and not c-command**—is what seems to govern the distribution of co-indexed nominals (sometimes in apparent violation of Condition C):[2]

  (3) verb $[_{\text{OBJ}} \ldots [_{\text{POSS}} \underline{\text{R-expression}_1}]]$ $[_{\text{SUBJ}} \text{pronoun}_1]$

- Similar data in closely-related Popti' (Jakaltek) led Craig (1977), Hoekstra (1989), and Aissen (2000) to suggest that binding principles do not apply in the same way across languages.

[1] I would like to thank the Chuj consultants who generously and patiently contributed to this project: Matal Torres and Matin Pablo. For judgements and help with other cited Mayan languages, I thank Morelia Vázquez Martínez, Jessica Coon, and Carol-Rose Little (Ch'ol); Gilda Ixem Cum (Kaqchikel), Henry Sales and Tessa Scott (Mam); Pedro Mateo Pedro and Jorge Juárez (Q'anjob'al); Hugo Héctor Vázquez López (Tojol-ab'al), and Jaime Pérez González (Tseltal). I am especially thankful to Jessica Coon and Aron Hirsch for valuable guidance, and I also thank Peter Jenks, Carol-Rose Little, Martina Martinović, Jaime Pérez González, Tessa Scott, Hugo Héctor Vázquez López, and the McGill syntax-semantics reading group and Fieldwork lab for discussion.

[2] Chuj is a Mayan language from the Q'anjob'alan branch spoken by approximately 70,000 speakers in Guatemala and Mexico (Piedrasanta 2009; Buenrostro 2013). All Chuj data come from original fieldwork conducted with speakers of the San Mateo Ixtatán variant of Chuj. Data were collected in Canada using a hypothesis-driven fieldwork methodology (Matthewson 2004, Davis, Gillon, and Matthewson 2014). For more on Chuj grammar, see Hopkins 1967, Maxwell 1981, García Pablo 2007, and Buenrostro 2013).

Plan.

- Novel data showing that linear precedence governs co-indexed nominals in Chuj.
- Argue that the role of linear precedence in Chuj and Popti' is not due to the absence of traditional binding principles (contra previous work), but is conditioned by a syntactic configuration, namely:
  - (i) Objects consistently move over subjects in ("HIGH-ABS") languages like Popti' and Chuj, but not in ("LOW-ABS") languages like Ch'ol, as independently-proposed in Coon et al. 2014.
  - (ii) Object raising bleeds c-command relations between co-indexed DPs so no binding violations arise.
  - (iii) Given (ii), two coreferring DPs are generated and PF elides the one that comes linearly second.
- Argue that binding under c-command is actually still needed in these languages.
  - ➽ *Typological consequence*: Binding as a new correlate of HIGH-ABS vs. LOW-ABS Mayan languages.
  - ➽ *Theoretical consequence* (building on Aissen 2000): Indices are needed in syntax.

2 The puzzle from Chuj: Linear precedence matters

Chuj is like Popti' in showing surprising patterns of nominal co-reference.

(4) Generalization on the realization of co-indexed DPs in Chuj (and Popti')
If there are two co-indexed DPs within a certain domain,[3] the linearly second DP is Ø.

2.1 Background on Chuj

- Chuj is VOS, and has postnominal possessors.
- Subjects and possessors trigger identical "Set A" prefixes (bold), on the verb and noun respectively.

(5) **A**-VERB [OBJECT] [SUBECT]

(6) [**A**-POSSESSEE [POSSESSOR]]

- Chuj also features a set of noun classifiers, which are used as third person pronouns in certain environments (Buenrostro et al. 1989; Royer 2019).

(7) Ix-w-il [**ix** unin].
PFV-A1S-see **CLF** girl
'I saw the girl.'

(8) Ix-w-il [**ix**].
PFV-A1S-see **CLF.PRON**
'I saw her.'

- These classifier pronouns alternate with null pronouns in certain environments discussed below.

[3] Aissen (2000) shows that the relevant domain is the minimal CP including relative clauses. The same domain applies Chuj.

2.2 Evidence for the role of linear precedence from possessors

- First consider (9), where the subject and possessor have obligatory disjoint reference:

(9) Ix-s-chonh [$_{OBJ}$ s-wakax [$_{POSS}$ **ix**]] [$_{SUBJ}$ ix Ana].
PFV-A3-sell A3-cow CLF.PRON CLF Ana
'Ana$_1$ sold her$_{2/*1}$ cow.'

(10) sold [$_{OBJ}$ cow [$_{POSS}$ her$_2$]] [$_{SUBJ}$ Ana$_1$]

- Consider now an example where the subject and possessor are co-indexed:

(11) Ix-s-chonh s-wakax ix Ana.
PFV-A3-sell A3-cow CLF Ana
'Ana$_1$ sold her$_{1/*2}$ cow.'

- As per (9)/(10), a null expression must either occupy the possessor or subject position in (11):

(12) a. sold [$_{OBJ}$ cow [$_{POSS}$ Ø$_1$]] [$_{SUBJ}$ Ana$_1$] (lit: Ana$_1$ sold her$_1$ cow)
b. sold [$_{OBJ}$ cow [$_{POSS}$ Ana$_1$]] [$_{SUBJ}$ Ø$_1$] (lit: She$_1$ sold Ana$_1$'s cow)

- Given basic assumptions about binding, (12b) should be out on the basis of Condition C.
- Nevertheless, there's evidence that the right parse is (12b)—i.e. only *linear precedence* matters and traditional binding principles are not operative.

2.2.1 Adverb placement

- Adverbs can normally intervene between subjects and objects:

(13) S-b'o' tek {ewi} **waj Xun** {ewi}.
A3-make meal yesterday CLF Xun yesterday
'Xun made the meal yesterday.'

- But in minimal pairs in which the object is possessed, and the possessor co-indexed with the subject, the adverb placement options change (notice contrast with Ch'ol in (2)):

(14) S-b'o' s-tek {*ewi} **waj Xun** {ewi}.
A3-make A3-meal yesterday CLF Xun yesterday
'Xun$_k$ made his$_k$ meal yesterday.'

- Assuming adverb placement options remain constant, this suggests that in (14), the possessor is overt and the subject is null, as schematized in (15b).

(15) a. made [$_{OBJ}$ meal] {yesterday} [$_{SUBJ}$ Xun] {yesterday} = (13)
b. made [$_{OBJ}$ meal [$_{POSS}$ Xun$_i$]] {yesterday} [$_{SUBJ}$ Ø$_i$] {yesterday} = (14)

- In other words, (14) literally translates as *He$_i$ made Xun$_i$'s meal yesterday.*

2.2.2 Object extraction

- When an object A-bar extracts, as in the focus example in (16), the possessor is overt and the co-indexed subject is null:

(16) [$_{OBJ}$ Ha s-mam [$_{POSS}$ **waj Xun**]]$_i$ ix-y-il-a' ___$_i$ [$_{SUBJ}$ Ø].
FOC A3-father CLF Xun PFV-A3-see-TV PRON
'Xun$_1$ saw *his$_1$ father*.'
Lit: 'He$_1$ saw *Xun$_1$'s father*

- The opposite configuration is ungrammatical:

(17) *[$_{OBJ}$ Ha s-mam [$_{POSS}$ Ø]]$_i$ ix-y-il-a' ___$_i$ [$_{SUBJ}$ waj Xun].
FOC A3-father PFV-A3-see-TV CLF Xun
Intended: 'Xun$_1$ saw his$_1$ father.'

– And note that in LOW-ABS Ch'ol, the pattern is opposite:

(18) CH'OL
[$_{OBJ}$ I-wakax [$_{POSS}$ Ø]]$_i$ tyi i-choñ-o ___$_i$ [$_{SUBJ}$ **aj-Ana**].
A3-cow PRON PFV A3-sell-TV CLF-Ana
Lit: 'Ana$_{i/*j}$ sold *her$_i$ cow*.' (compare with Chuj (16))

2.3 Evidence for linear precedence from relative clauses

- Relative clauses provide further evidence for the claim that *precedence* is what governs the distribution of co-indexed nominals in Chuj.

- Consider first a VOS sentence without any co-indexed DPs:

(19) Man y-ojtak-ok laj [$_{OBJ}$ ni unin [$_{RC}$ ix-il-an **ix** t'a parke]] [$_{SUBJ}$ **ix Ana**].
NEG A3-know-IRR NEG CLF boy PFV-see-AF CLF.PRON PREP park CLF Ana
'Ana$_1$ doesn't know the boy who saw her$_{2/*1}$ in the park.'

- When the subject is co-indexed with a DP inside the object, it's *the DP inside the object* that gets realized in VOS sentences:

(20) Man y-ojtak-ok laj [$_{OBJ}$ ni unin [$_{RC}$ ix-il-an **ix Ana** t'a parke]] [$_{SUBJ}$ Ø] .
NEG A3-know-IRR NEG CLF boy PFV-see-AF CLF Ana PREP park PRON
'Ana$_1$ doesn't know the boy who saw her$_1$ in the park.'
Lit: 'She$_1$ doesn't know the boy who saw Ana$_1$ in the park.'

- The opposite configuration is again impossible:

(21) *Man y-ojtak-ok laj [$_{OBJ}$ ni unin [$_{RC}$ ix-il-an Ø$_i$ t'a parke]] [$_{SUBJ}$ **ix Ana**]
NEG A3-know-IRR NEG CLF boy PFV-see-AF PRON PREP park CLF Ana
Intended: 'Ana$_1$ doesn't know the boy who saw her$_1$ in the park.'

2.4 Summary: Linear precedence matters

- Linear precedence governs the distribution of co-indexed nominals in Chuj, as Craig (1977), Hoekstra (1989), and Aissen (2000) proposed for Popti'.
- These facts are surprising from a cross-linguistic perspective, especially since they are not observed in other Mayan languages like Ch'ol (see e.g. (2)).

Crossroads — Either...

1. traditional binding principles are not universal; or
2. traditional binding principles *are* universal, but there's something special about the syntax of Mayan languages like Chuj and Popti'.

- Craig and Aissen took the first route:
  - ► Aissen, building on Craig, proposed that binding in Popti' is conditioned by prosody (see appx. A).[4]
- In what follows, we will take the second route: traditional binding principles are universal.

3 Analysis: Object raising bleeds c-command relations

Main proposal: Mayan languages for which *linear precedence* seems to matter (like Chuj) exhibit a different syntax than languages where only *structure* seems to matter (like Ch'ol).

§3.1 Background: Objects consistently raise to a position above the subject in a subset of Mayan languages, like Chuj and Popti' (Coon et al. 2014).

§3.2 Proposal (part 1): Object raising bleeds c-command relations between objects and subject.

§3.3 Proposal (part 2): A PF constraint against cataphora kicks in.

[4] As discussed in Aissen 2000, Hoekstra (1989) argues that the Popti' facts can be explained if binding principles are parameterized such that in some languages they apply at Deep Structure (e.g. English), while in others at Surface Structure (Popti'). However, Aissen (2000) shows that this analysis is not viable for Popti'. In Chuj, this analysis also runs into a number of issues. For instance, it cannot account for basic data like (14).

3.1 Background: The LOW-ABS/HIGH-ABS Mayan languages and object raising

- Chuj and Ch'ol differ on another syntactic level: While Chuj features a subject extraction constraint known as the "Ergative Extraction Constraint" (EEC, Aissen 2017), Ch'ol doesn't (Coon et al. 2014).

(22) Chuj → EEC

a. Ix-ach-y-il ix ix.
PFV-B2S-A3-see CLF woman
'The woman saw you.'

b. *Mach$_j$ ix-ach-y-il-a' t_j?
who PFV-B2S-A3-see-TV
'Who saw you?'

(23) Ch'ol → no EEC

a. Tyi y-il-ä-yety x-ixik.
PFV A3-see-DTV-B2 CLF-woman
'The woman saw you?'

b. Maxki tyi y-il-ä-yety?
who PFV A3-see-DTV-B2
'Who saw you?'

- Coon et al. (2014), Assmann et al. (2015), and Coon et al. (2020) propose that the presence or not of the EEC maps to a deep syntactic difference among two types of Mayan languages, so-called LOW-ABS and HIGH-ABS languages:[5]

(24) Objects do *not* raise in LOW-ABS languages like Ch'ol
[$_{v\text{P}}$ SUBJECT [$_{\text{VP}}$ V OBJECT]]]

(25) Objects raise in HIGH-ABS languages like Chuj
[$_{v\text{P}}$ OBJECT [SUBJECT [$_{\text{VP}}$ V <OBJECT>]]]

– Object movement is proposed to be driven by an EPP feature on v; for reasons discussed below, I take this to be an instance of A-movement.

- They propose that raising of the object in HIGH-ABS languages creates an **intervention problem** (formalized differently in different works, but not relevant here):

(26) Raising of object in HIGH-ABS languages blocks subject extraction
[$_{\text{CP}}$ __ … [$_{v\text{P}}$ OBJECT [SUBJECT [$_{\text{VP}}$ V ~~OBJECT~~]]]]

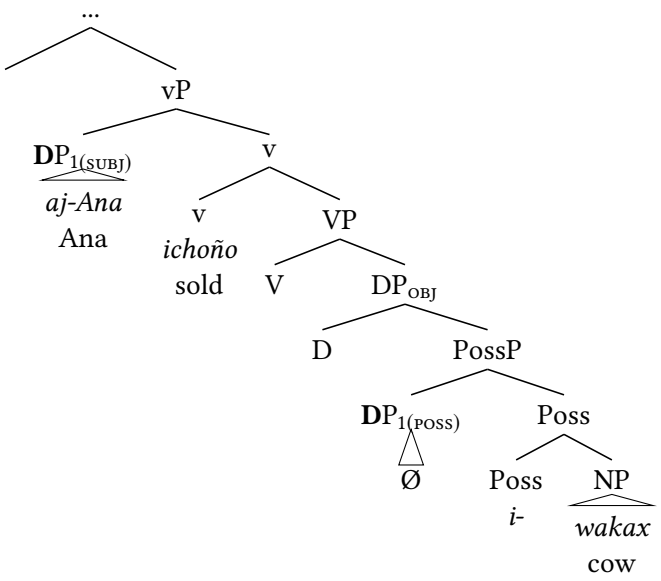
3.2 Object raising bleeds c-command relations

LOW-ABS-languages: In LOW-ABS languages like Ch'ol, the object does **not** raise.

- This means that the subject will necessarily c-command co-indexed expressions inside the object.
- Given Condition C—the R-expression will have to be in subject position:

[5]The literature on subject extraction asymmetries across Mayan is rich, and won't be discussed here. For relevant overview and list of references, see Aissen 2017 and Coon et al. 2020.

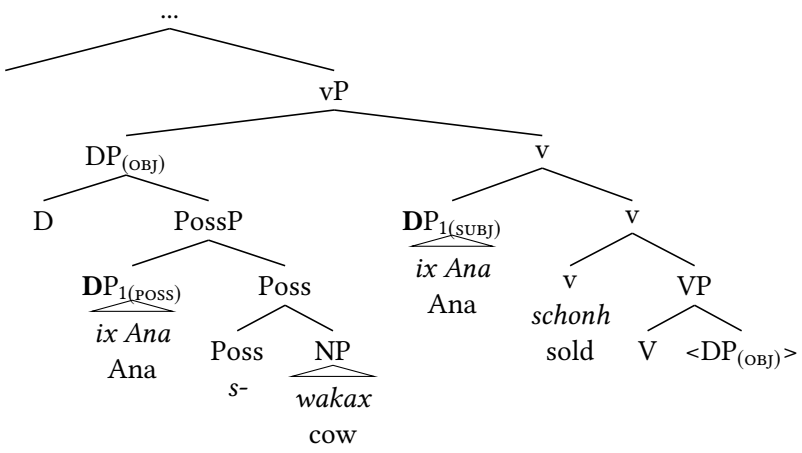
(27) Structure for 'Ana$_1$ sold her$_1$ cow' in Ch'ol'[6]



HIGH-ABS-languages: Object raising in HIGH-ABS languages will have crucial consequences for binding:

(28) *Consequence of object raising for binding*:
Object raising bleeds c-command relations between subjects and co-indexed DPs inside the object.

(29) Tree for 'Ana$_1$ sold her cow$_1$' in Chuj :



- The subject DP in (29) won't c-command the possessor—and vice-versa; standard binding principles won't rule out the possessor from being overtly realized.

Reconstruction? To account for the HIGH-ABS binding facts, it will be important that either:

- ► A-movement does not reconstruct for binding (Chomsky 1995, Lasnik 1999, Baltin 2010, etc.);
- ► A-movement reconstruction sometimes happens (e.g. Boeckx 2001; Takahashi 2010), but not in (29).

[6] I am intentionally ignoring how word order is derived here for purposes of illustration only. See England 1991, Aissen 1992, Coon 2010, Clemens and Coon 2018, and Little 2020 for varying accounts of VOS/VSO order in Mayan.

3.3 Linear precedence: A constraint against cataphora

Question: Why does linear precedence govern the distribution of co-indexed nominals in Chuj *in the absence of c-command relations*?

Hypothesis: Without c-command between co-indexed DPs, a constraint against cataphora kicks in.

- One way to formalize this is a PF constraint which distinguishes bound vs. *accidentally coreferring* DPs.
- Assuming that DPs must be interpreted as bound variables if they can (Reinhart 1983; Grodzinsky and Reinhart 1993; Büring 2005), a co-indexed Ø will only *accidentally corefer* with another nominal expression in the absence of c-command relations:

(30) With c-command, Ø is a bound variable[7] (as in Ch'ol (27))
[DP [λ1 … [$Ø_1$ …]]]

(31) Without c-command, Ø is accidental coreferring: (as in Chuj (29))
[[[DP_1] …] … $Ø_1$]

- I suggest that there's a syntactic distinction between accidentally coreferring pronouns and bound variables that is visible to PF.[8]

(32) *PF constraint against cataphora in* HIGH-ABS *languages:*
When two DPs in a given domain *accidentally corefer*, delete the linearly second DP.

- (32) will guarantee that the possessor gets overtly realized in (29), and the subject is null:

(33) [[[$DP_{1/POSS}$] …] … ~~$DP_{1/SUBJ}$~~] (revision of (31))

. . . . . .

- The PF rule in (32) is perhaps surprising (at least coming from English), given the reported possibility of "backwards pronominalization" with accidentally coreferring DPs (e.g. Ross 1967; Kayne 2002).

(34) a. [The woman that saw $Felipe_1$] scolded him_1.
b. [The woman that saw him_1] scolded $Felipe_1$.

- But as Kayne (2002) points out, the availability of backwards pronominalization is subject to cross-linguistic variation: many languages actually don't allow it (see e.g. Huang 1982 on Chinese).

[7] One way to handle variable binding could be via movement (e.g. Heim 1993; Hornstein 2001; Kayne 2002; Zwart 2002). See Newman 2020 for a proposal specific to Mayan languages that is compatible with movement of the possessor to subject position.

[8] One possibility is that accidentally coreferring subject and possessor DPs in Chuj are "repetitions" which are both externally merged (in the sense of e.g. Chomsky 2013, Collins and Groat 2018, and Chomsky et al. 2019). In Ch'ol, on the other hand, the co-indexed possessor could be the copy of a DP which has re-merged in subject position (if variable binding is done through movement). If PF can distinguish repetitions from copies, then we can make sense of the generalization in (32).

- Backwards pronominalization is always judged as ungrammatical in Chuj.

(35) Context: Xun was doing something bad.

a. Ix-t'um-ej [$_{OBJ}$ **waj Xun**] [$_{SUBJ}$ ix ix ix-il-an-i Ø].
PFV-scold-DTV CLF Xun CLF woman PFV-see-AF-IV PRON
'The woman that saw Xun$_1$ scolded him$_1$.'

b. *Ix-t'um-ej [$_{OBJ}$ Ø] [$_{SUBJ}$ ix ix ix-il-an-i **waj Xun**].
Intended: 'The woman who saw him$_1$ scolded Xun$_1$.'

- This supports the existence of an active PF constraint like (32) in Chuj.

4 C-command matters for binding, even in Chuj

- I've argued that the surprising patterns of nominal coreference in Chuj involve a special syntax in which object raising bleeds c-command relations and a PF deletion rule subsequently applies.
- This means we no longer need to deny the universality of traditional binding principles.

> **Question:** Is binding under c-command ever necessary in Chuj?
>
> **Answer:** Yes! And in such cases linear precedence no longer matters...

- For binding under c-command (between subjects and objects) to take place in Chuj, either:

(i) The object exceptionally does not raise (in which case it can be c-commanded by the subject).

(ii) A-movement reconstruction is exceptionally possible.

- Coon et al. (2020) argue for (ii) when a DP inside the object is bound by a non-referring subject DP.
- Below, I argue that reflexives need to be bound (i.e. Condition A), and that they don't raise.

Reflexives. Reflexives across Mayan pattern like possessed nouns in appearing with Set A agreement and serving as the thematic object of transitive verbs (give a minimal pair) (Aissen 2017):

(36) Ix-y-il s-**b'a** waj Xun.
PFV-A3-see A3-self CLF Xun
'Xun$_1$ saw himself$_1$.'

(37) Ix-y-il s-**tz'i'** waj Xun.
PFV-A3-see A3-dog CLF Xun
'Xun$_1$ saw his$_1$ dog.'

- But there's reason to think that (36) and (37) are structurally different.
- Reflexive objects allow identical adverb placement options as regular transitive clauses:

(38) Y-il s-**b'a** {ewi} waj Xun {ewi}.
A3-see A3-self yesterday CLF Xun yesterday
'Xun$_1$ saw himself$_1$ yesterday.'

- Contrast this with regular cases of co-indexed possessors, which don't allow these adverb placement options (as already shown in (14)):

(39) Y-il s-**tz'i'** {*ewi} waj Xun {ewi}.
A3-see A3-dog yesterday CLF Xun yesterday
'Xun$_1$ saw his$_1$ dog yesterday.'

- This suggests that the subject is exceptionally overt and possessor null in reflexive constructions:

(40) a. see [$_{\text{OBJ}}$ self [$_{\text{POSS}}$ Ø]] {yesterday} [$_{\text{SUBJ}}$ Xun] {yesterday} = reflexive (38)
b. see [$_{\text{OBJ}}$ dog [$_{\text{POSS}}$ Xun$_i$]] {yesterday} [$_{\text{SUBJ}}$ Ø$_i$] {yesterday} = (39)

Proposal:

- ▶ Reflexive objects don't raise because they must be c-command by subjects (i.e. Condition A is operative).
- ▶ When the subject c-commands the object (as in (40a)), traditional binding principles prevail and linear precedence becomes irrelevant.

- Q'anjob'al, another HIGH-ABS language that is normally *rigidly VSO*, provides independent evidence that reflexive objects do not raise.
- Reflexives exceptionally trigger *VOS* word order:

(41) Max y-il s-**b'a** ix ix.
PFV A3-see A3-self CLF woman
'The woman$_1$ saw herself$_1$.' (Q'anjob'al: Coon et al. 2014, (77b)).

In sum: There is evidence that binding under c-command is sometimes necessary in HIGH-ABS languages, and so that traditional views on binding should still apply at some level.

5 Conclusion: Typological and theoretical consequences

- In Mayan languages like Chuj and Popti', we find surprising patterns of nominal coreference, where on the surface, structure seems to be ignored and only linear precedence seems to matter.
- I argued that the "linear precedence effect" is conditioned by a syntactic configuration, namely in HIGH-ABS languages, objects raise above subjects (Coon et al. 2014), with pervasive effects on grammar:

1. Transitive subjects can't extract (Coon et al. 2014, Assmann et al. 2015 and Coon et al. 2020).
2. **Object raising bleeds the possibility of binding under c-command, so two accidentally coreferring DPs are generated, and PF elides the one that comes linearly second.**

- The proposal is conceptually appealing, since it allows to maintain the universality of binding principles (see e.g. Grodzinsky and Reinhart 1993; Reuland 2010; 2011), in opposition to previous accounts.
- I finally discuss two consequences of my proposal, one typological and one theoretical.

5.1 Typological consequence: A new correlate of the LOW-/HIGH-ABS parameter

- Since the proposal is tied to the LOW-/HIGH-ABS parameter, we predict that HIGH-ABS languages might behave like Chuj regarding binding, and vice-versa for Ch'ol.
- Preliminary evidence shows this prediction is borne out (see also discussion in Coon et al. 2020).
  - ▶ Kaqchikel, Mam, Popti', and Q'anjob'al (HIGH-ABS) behave like Chuj.
  - ▶ Tojol-ab'al and Tseltal (LOW-ABS) behave like Ch'ol.
- See Appendix B for supporting data.

5.2 Theoretical consequence: On the necessity of indices in syntax:

- Aissen (2000) noticed that the coreference facts had implications for the status of indices in grammar—PF rules like (32) require that PF *have access to information about indices*:

  (42) *Linear precedence generalization in HIGH-ABS languages:*
  When two DPs in a given domain co-refer, delete the linearly second DP.

- And if PF sees indices, then they must be syntactically-represented, in violation of Chomsky's (1995, 2001) Inclusiveness condition, an assumption that has played a major role in recent theories of binding, e.g. Hornstein 2001, Safir 2004, Rooryck and vanden Wyngaerd 2011; Reuland 2001, 2011:

  (43) *Inclusiveness* (Chomsky 2001, 2-3) (cited from Collins and Groat 2018).
  [Inclusiveness] bars introduction of new elements (features) in the course of computation: **indices**, traces, syntactic categories or bar levels, and so on.

- So HIGH-ABS Mayan facts provide a challenge for Inclusiveness: PF needs to know which DPs are co-indexed in order for the linear precedence generalization in (42) to kick in.
- And they provide support for recent work arguing indices are syntactically-represented.
- See e.g. Heim 1993; Rezac 2004; Hicks 2009; Kratzer 2009; Grosz 2015; Collins and Stabler 2016; Deal 2017; Collins and Groat 2018; and Arregi and Hanink 2018 and Clem 2019 in the context of switch-reference, and Hanink 2020 and Jenks 2020 in the context of anaphoric definites.

References

Aissen, Judith. 1992. Topic and focus in Mayan. *Language* 68:43–80.

Aissen, Judith. 2000. Prosodic conditions on anaphora and clitics in Jakaltek. In *The Syntax of Verb Initial Languages*, eds. Andrew Carnie and Eithne Guilfoyle. Oxford University Press.

Aissen, Judith. 2017. Correlates of ergativity in Mayan. In *Oxford Handbook of Ergativity*, eds. Jessica Coon, Diane Massam, and Lisa Travis. New York, NY: Oxford University Press.

Arregi, Karlos, and Emily A. Hanink. 2018. Switch reference in Washo as multiple subject agreement. In *NELS 48: Proceedings of the Forty-Eighth Annual Meeting of the North East Linguistic Society*, eds. Sherry Hicklebridge and Max Nelson, volume 1, 39–48. GLSA.

Assmann, Anke, Doreen Georgi, Fabian Heck, Gereon Müller, and Philipp Weisser. 2015. Ergatives move too early: On an instance of opacity in syntax. *Syntax* 18:343–387.

Baltin, Mark. 2010. The copy theory of movement and the bindingtheoretic status of a-traces: You can't get there from here. Ms. NYU.
Boeckx, Cedric. 2001. Scope reconstruction and A-movement. *Natural Language and Linguistic Theory* 19:503–548.
Buenrostro, Cristina. 2013. La voz en Chuj de San Mateo Ixtatán. Ph.D. dissertation, El Colegio de México, Mexico City.
Buenrostro, Cristina, José Carmen Díaz, and Roberto Zavala. 1989. Sistema de clasificación nominal del Chuj. In *Memorias del Segundo Coloquio Internacional de Mayistas*, volume II. Mexico City: UNAM.
Büring, Daniel. 2005. *Binding Theory*. Cambridge: Cambridge University Press.
Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
Chomsky, Noam. 1986. *Barriers*. Cambridge, MA: MIT Press.
Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A life in language*, ed. Michael Kenstowicz, 1–52. Cambridge, MA: MIT Press.
Chomsky, Noam. 2013. Problems of projection. *Lingua* 130:33–49.
Chomsky, Noam, Ángel Gallego, and Dennis Ott. 2019. Generative grammar and the faculty of language: Insights, questions, and challenges. *Catalan Journal of Linguistics* 229–261.
Clem, Emily. 2019. Agreement, case, and switch-reference in Amahuaca. Ph.D. dissertation, University of California, Berkeley.
Clemens, Lauren Eby, and Jessica Coon. 2018. Deriving verb initial order in Mayan. *Language* 94:237–280.
Collins, Chris, and Erich Groat. 2018. Copies and repetitions. Ms. NYU.
Collins, Chris, and Edward Stabler. 2016. A formalization of minimalist syntax. *Syntax* 19:43–78.
Coon, Jessica. 2010. VOS as Predicate Fronting in Chol. *Lingua* 120:354–378.
Coon, Jessica, Nico Baier, and Theodore Levin. 2020. Mayan agent focus and the ergative extraction constraint: Facts and fictions revisited. Ms. McGill.
Coon, Jessica, Pedro Mateo Pedro, and Omer Preminger. 2014. The role of case in A-bar extraction asymmetries: Evidence from Mayan. *Linguistic Variation* 14:179–242.
Craig, Colette Grinevald. 1977. *The Structure of Jacaltec*. Austin, TX: University of Texas Press.
Davis, Henry, Carrie Gillon, and Lisa Matthewson. 2014. How to investigate linguistic diversity: Lessons from the Pacific Northwest. *Language* 90:180–226.
Deal, Amy Rose. 2017. Towards an etiology of outer indices. In *A schrift to fest Kyle Johnson*, eds. Nicholas LaCara, Keir Moulton, and Anne-Michelle Tessier, volume 1. Linguistics Open Access Publications.
England, Nora. 1991. Changes in basic word order in Mayan languages. *International Journal of American Linguistics* 57:446–86.
García Pablo, Pascual Martín Domingo Pascual, Gaspar. 2007. *Gramática Descriptiva Chuj*. Guatemala: Academia de Lenguas Mayas de Guaatemala.
Grodzinsky, Yosef, and Tanya Reinhart. 1993. The innateness of binding and coreference. *Linguistic Inquiry* 24:69–101.
Grosz, Patrick. 2015. Movement and agreement in right-node raising constructions. *Syntax* 18:1–38.
Hanink, Emily A. 2020. DP structure and internally headed relatives in Washo. *Natural Language & Linguistic Theory* .
Heim, Irene. 1993. Anaphora and semantic interpretation: A reinterpretation of Reinhart's approach. In *The interpretive tract*, eds. Uli Sauerland and Orin Percus. MIT Working Papers in Linguistics.
Henderson, Robert. 2012. Morphological alternations at the intonational phrase edge: The case of K'ichee'. *Natural Language and Linguistic Theory* 30:741–787.
Hicks, Glyn. 2009. *The derivation of anaphoric relations*. Linguistik Aktuell.
Hoekstra, Eric. 1989. A parameter for anaphor binding: The case of Jacaltec. In *Configurationality: The Typology of Asymmetries*, eds. L. Marácz and P. Muysken. Foris.
Hopkins, Nicholas. 1967. The Chuj language. Ph.D. dissertation, University of Chicago, Chicago, IL.
Hornstein, Norbert. 2001. *Move! A minimalist theory of construal*. Oxford: Blackwell Publishers.
Huang, Cheng-Teh James. 1982. Logical relations in Chinese and the theory of grammar. Doctoral dissertation, MIT, Cambridge, MA.
Jenks, Peter. 2020. Are indices syntactically represented? Paper presented at *McGill University Colloquium Series*.
Kayne, Richard. 2002. Pronouns and their antecedents. In *Derivation and Explanation*, eds. Samuel David Epstein and T. Daniel Seeley. Oxford: Blackwell Publishers.
Kratzer, Angelika. 2009. Making a pronoun: Fake indexicals as windows into the properties of pronouns. *Linguistic*

Inquiry 40:187–237.
Lasnik, Howard. 1999. Chains of arguments. *Current Studies in Linguistics Series* 32:189–216.
Little, Carol-Rose. 2020. Mutual dependencies of nominal and clausal syntax in ch'ol. Ph.D. dissertation, Cornell University.
Matthewson, Lisa. 2004. On the methodology of semantic fieldwork. *International Journal of American Linguistics* 70:369–415.
Maxwell, Judith. 1981. How to talk to people who talk *chekel* 'different': The chuj (mayan) solution. Ph.D. dissertation, University of Chicago, Chicago, IL.
Newman, Elise. 2020. On the movement/(anti)agreement correlation in Romance and Mayan. Ms. MIT.
Piedrasanta, Ruth. 2009. *Los Chuj, Unidad y rupturas en su espacio.* Guatemala City, Guatemala: Amrar Editores.
Reinhart, Tanya. 1976. The syntactic domain of anaphora. Ph.D. dissertation, MIT, Cambidge, MA.
Reinhart, Tanya. 1983. *Anaphora and semantic interpretation.* London: Croom Helm.
Reuland, Eric. 2001. Primitives of binding. *Linguistic Inquiry* 32:439–492.
Reuland, Eric. 2010. The universality of binding principles. In *Structure Preserved: Studies in syntax for Jan Koster*, eds. Jan-Wouter Zwart and Mark de Vries, 277–287. John Benjamins Publishing Company.
Reuland, Eric. 2011. *Anaphora and Language Design (Linguistic Inquiry Monographs).* MIT Press.
Rezac, Milan. 2004. Elements of Cyclic Syntax: Agree and Merge. Doctoral dissertation, University of Toronto. URL http://ling.auf.net/lingBuzz/000050.
Rooryck, Johan, and Guido vanden Wyngaerd. 2011. *Dissolving Binding Theory*. Oxford University Press.
Ross, John R. 1967. Constraints on variables in syntax. Doctoral dissertation, MIT, Cambridge, MA.
Royer, Justin. 2019. Domain restriction and noun classifiers in Chuj. In *NELS 49: Proceedings of the forty-ninth annual meeting of the North-East Linguistics Society*, eds. Maggie Baird and Jonathan Pestesky, volume 3, 87–97.
Royer, Justin. to appear. Prosody as syntactic evidence: The view from mayan. *Natural Language & Linguistic Theory* .
Safir, Ken. 2004. *The syntax of anaphora.* Oxford: Oxford University Press.
Takahashi, Shoichi. 2010. Traces or copies, or both: Part I: Characterizing movement properties. *Language and Linguistics Compass* 4:1091–1103.
Zwart, Jan-Wouter. 2002. Issues related to a Derivational Theory of Binding. In *Derivation and explanation in the Minimalist Program*, eds. Samuel David Epstein and T. Daniel Seeley, 269–304. Oxford: Blackwell Publishers.

Appendix

A Aissen 2000: An account based on precedence

Below, I summarize Aissen's (2000) prosodic account of Ø in Popti'.

- Building on data in Craig 1977 and Hoekstra 1989, Aissen (2000) argues that the distribution of Popti' Ø is governed exclusively by phonological factors:

(44) Conditions on Ø (Aissen 2000, (20))
The anaphor Ø must be co-indexed with a nominal which precedes it within the same intonational phrase.

- The domain of the intonational phrase is in turn determined via a syntax-prosody mapping algorithm, based on Aissen 1992 (which also seems right for Chuj, see Royer to appear):[9]

(45) (TOPICS)$_{\text{IntP}}$ (main CP + RC)$_{\text{IntP}}$ (CP ADJUNCTS / COMPLEMENTS)$_{\text{IntP}}$

[9] Additional support that intonational phrases are so derived in Mayan languages comes from Henderson 2012 on K'iche' and Royer to appear on Chuj.

- As Aissen shows, this analysis successfully derives the distribution of Ø in Popti'.
- Aissen's analysis makes almost all the right predictions for Chuj, e.g.:

(46) a. Ix-y-il [$_{OBJ}$ s-mam [$_{POSS}$ waj Xun]] [$_{SUBJ}$ Ø].
PFV-A3-see A3-father CLF Xun PRON
'Xun$_1$ saw his$_{1/*2}$ father.'

b. *Prosody:* (ixyil smam waj Xun$_1$ Ø$_1$)$_{IntP}$

(47) a. Ix-y-al waj Xun [$_{CP}$ to ol-b'at winh/*Ø].
PFV-A3-say CLF Xun COMP PROSP-go CLF.PRON
'Xun$_1$ said that he$_{1/2}$ will go.'

b. *Prosody:* (ixyal waj Xun$_1$)$_{IntP}$ (to olb'at winh/*Ø$_1$)$_{IntP}$

- However, it does not account for reflexive data (see (38) above).
- And suffers a conceptual issue: under this theory, binding can no longer be considered universal, despite its cross-linguistic prevalence (e.g. Reuland 2010; 2011), including in other Mayan languages (like Ch'ol).

B Cross-Mayan prediction

The proposal put forth in this paper makes a clear prediction for Mayan languages:

> **Prediction:** HIGH-ABS languages should pattern with Chuj in terms of binding, while LOW-ABS languages should pattern with Ch'ol.

We should be able to test this across Mayan in cases of object extraction, when the possessor and subject are co-indexed.

(48) a. LOW-ABS languages (possessor should be null and subject overt):
[$_{OBJ}$ … [$_{POSS}$ Ø$_1$] [$_{SUBJ}$ R-expression$_1$]
b. HIGH-ABS languages (possessor should be overt and subject null):
[$_{OBJ}$ … [$_{POSS}$ R-expression$_1$] [$_{SUBJ}$ Ø$_1$]

- Preliminary investigation support this prediction.
- Languages treated as LOW-ABS in Coon, Mateo Pedro, and Preminger 2014 that were surveyed behave like Ch'ol in terms of binding. We can see this most clearly when the object undergoes A-bar extraction:

(49) Ch'ol
[$_{OBJ}$ I-wakax [$_{POSS}$ Ø]]$_i$ tyi i-choñ-o ___$_i$ [$_{SUBJ}$ **aj-Ana**].
A3-cow PRON PFV A3-sell-TV CLF-Ana
'Ana$_{i/*j}$ sold *her$_i$ cow*.'

(50) Tojol-ab'al

[$_{OBJ}$ Ja' ja s-wakax [$_{POSS}$ Ø]] x-chon-a [$_{SUBJ}$ ja Jwan-i'].
FOC DET A3-COW PRON A3-sell-TV DET Jwan-DET
'Jwan$_1$ sold *his*$_{1/*2}$ *cow*.'

(51) Tseltal

[$_{OBJ}$ Ja' x-wakax [$_{POSS}$ Ø]] la x-chon [$_{SUBJ}$ te j-Wan-e].
FOC A3-COW PRON PFV A3-sell DET CL-Wan-DET
'Wan$_1$ sold *his*$_{1/*2}$ *cow*.'

- Languages listed as HIGH-ABS in Coon, Mateo Pedro, and Preminger 2014 that were surveyed seem to behave like Chuj in the relevant binding patterns (Popti' is also like Chuj, as shown in Aissen 2000):

(52) Q'anjob'al

[$_{OBJ}$ A no' s-wakax [$_{POSS}$ naq Xhunik]] max s-txon-o' [$_{SUBJ}$ Ø].
FOC CLF A3-COW CLF Xhunik PFV A3-sell-IV PRON
'Xhunik$_1$ sold *his*$_1$ *cow*.'

(53) Mam

[$_{OBJ}$ A t-chej [$_{POSS}$ Xwan]] o tz'-ok t-b'yo-'n [$_{SUBJ}$ Ø] .
DET A3S-horse Xwan PFV B3S-DIR A3S-hit-DS
'Xwan$_1$ hit *his*$_1$ *horse*.'

(54) Kaqchikel

[$_{OBJ}$ Ja ri ru-wakx [$_{POSS}$ ri xta Ana]] x-u-k'ayi-j [$_{SUBJ}$ Ø] .
FOC DET A3S-COW DET CLF Ana PFV-A3-sell-DTV PRON
'Ana$_1$ sold *her*$_1$ *cow*.'