## Mayan animacy restrictions and dynamic interaction ${ }^{1}$

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## 1 Introduction

- In many languages subject/object combinations are subject to an animacy hierarchy restriction of some type.
- This is true in various Mayan languages (Aissen 1997, 1999; Zavala 1997, 2007; Curiel 2007; Pascual 2007; 2017; Vázquez Álvarez 2011; Polian 2013; Pérez Vail 2014): the object can't outrank the subject given (1)
(1) (HUMAN) $>$ ANIMATE $>$ INANIMATE
- There is some interesting microvariation:

1. Articulation of the scale:

- Tsotsil (Aissen 1997): 2 way scale, ANIM > INANIM
- Chuj: 3 way scale, as above
- Cajolá Mam: 6 way scale (adult vs. child, bugs, etc)

2. Where the hierarchy effect holds:

- Ch'ol, Tsotsil: hierarchy holds in both active and passive
- Chuj: animacy hierarchy in active but not passive
- There is also variation at a more macro scale (Aissen, 1997):

3. Restriction by person:

- Most Mayan: only 3rd persons count for animacy restrictions
- Chamorro (Austronesian): 2nd and 3rd persons count
- Algonquian, Cajolá Mam: all persons count
- Aissen (1997) influentially connected animacy hierarchy effects in Mayan to obviation in Algonquian, with an analysis in terms of an obviation tier

[^0]- Here we pursue an analysis of animacy restrictions that reflects the operation Agree and feature geometry, following recent work on many languages, including Algonquian (e.g. Oxford 2019, to appear; Hammerly 2020)
- Our analysis is framed in the interaction/satisfaction model of Agree, and through the lens of that theory casts new light on the workings of the Agree operation
- It also opens the door to a new view on ergative agreement in the Mayan family, an alternative to the "inherent ergative" view of e.g. Coon (2017a)
$>$ Ergative agreement in Mayan is conceptually closer to "dependent ergative" than previously thought
- Talk outline:
§2 Animacy restrictions in two Mayan languages
$\S 3$ Background on dynamic interaction and person restrictions
§4 Mayan actives: Dynamic interaction approach to animacy restrictions
§5 On the status of local persons
$\S 6$ Mayan passives: Accounting for Mayan-internal variation
$\S 7$ Theoretical consequences


## 2 Animacy hierarchy restrictions in two Mayan languages

- We'll be focusing on two Mayan languages: Chuj and Ch'ol.
- Unless otherwise attributed (as most of the Ch'ol data is), the data presented here come from Justin's fieldwork from 2017-today, obtained in Guatemala, Mexico or remotely.
(2) Chuj
a. Belongs to Q'anjob'alan sub-branch of Mayan languages (Law 2014)
b. Spoken by 70,000 speakers (Piedrasanta 2009; Buenrostro 2013)
c. Spoken mostly in Huehuetenango, Guatemala and Chiapas, Mexico
(3) Ch'ol
a. Cholan-Tseltalan sub-branch of Mayan languages (Law 2014)
b. Spoken by 252,000 speakers (Little 2020)
c. Predominantly spoken in Southern Mexico


### 2.1 Chuj animacy restrictions

- Combinations of two 3rd persons are subject to animacy restrictions.
- Active sentences: $\sqrt{ }$ HUM $>$ ANIM, ${ }^{*}$ ANIM $>$ HUM
(4) a. $\sqrt{ }$ Ix-y-il nok' chan winh winak. PFV-A3-see CLF snake CLF man 'The man saw the snake'
hum S, ANIM O
b. * Ix-y-il winh winak nok' chan. PFV-A3-see CLF man CLF snake Int. 'The snake saw the man.'
anim S , hum O
- Note: nok' chan 'the snake' CAN be the subject of 'see'; it just can't be the subject of a " 3 rd person human-seeing" active, e.g. (4b).
(5) a. $\checkmark$ Ix-y-il nok' much nok' chan. PFV-A3-see CLF bird CLF snake
'The snake saw the bird.'
anim S , ANIM O
b. $\checkmark$ Ix-\{in/ach/onh\}-y-il nok' chan. PFV-B1S/B2S/B2P-A3-see CLF snake 'The snake saw me/you/us.'
anim S , LOCAL O
- Active sentences: $\sqrt{ }$ HUM $>$ INAN, ${ }^{*}$ INAN $>$ HUM
(6) a. $\sqrt{ }$ Ix-s-mak' te' k'ab'te' waj Xun. PFV-A3-hit CLF branch CLF Xun 'Xun hit the branch.'
hum S , inan O
b. * Ix-s-mak' waj Xun te' k'ab'te'. PFV-A3-hit CLF Xun Clf branch
Int. 'The branch hit Xun.'
INAN S , HUM O
- Again, note that InAN>INAN is fine:
(7) $\checkmark$ Ix-s-mak' k'en wentana te' k'ab'te' PFV-A3-hit CLF window CLF branch
'The branch hit the window.'
inan S , inan O
- Active sentences: $\sqrt{ }$ ANIM $>$ INAN,${ }^{*}$ INAN $>$ ANIM
(8) a. $\checkmark$ Ix-s-mak' te' k'ab'te' nok' wojtin. PFV-A3-hit CLF branch CLF monkey 'The monkey hit the branch.'
anim S , inan O
b. * Ix-s-mak' nok' wojtin te' k'ab'te'. PFV-A3-hit CLF monkey CLF branch
Int. 'The branch hit the monkey.'
inan S , anim O
- To convey the meanings intended for the ungrammatical pairings above, passive constructions are used (nb. when speakers are asked to translate active sentences from Spanish, they provide a Chuj passive if an animacy restriction arises).
(9) Chuj: theme higher in animacy than agent.
a. Ix-il-j-i winh winak [obl y-uj nok' chan ] PFV-see-PASS-IV CLF man A3-by CLF snake
'The man was seen by the snake.'
b. Ix-mak'-j-i waj Xun [obl y-uj te' k'ab'te']. PFV-hit-PASS-IV ClF Xun a3-by ClF branch
'Xun was hit by the branch.'
c. Ix-mak'-j-i nok' wojtin [овь y-uj te' k'ab'te']. PFV-hit-PASS-IV CLF monkey A3-by CLF branch
'The monkey was hit by the branch.'


## $>$ Notably, passives in Chuj have NO animacy restrictions

(10) Chuj: oblique agent higher on animacy scale
a. Ix-il-j-i nok' chan [овд y -uj winh winak]. PFV-see-PASS-IV CLF snake A3-by CLF man
'The snake was seen by the man.'
b. Ix-mak'-j-i te' k'ab'te' [obl y-uj waj Xun ]. PFV-hit-PASS-IV CLF branch A3-by ClF Xun
'The branch was hit by Xun.'
c. Ix-mak'-j-i te' k'ab'te' [obl y-uj nok' wojtin ]. PFV-hit-PASS-IV CLF branch A3-by CLF monkey
'The branch was hit by the monkey.'

### 2.2 Ch'ol

- Zavala (2007) and Vázquez Álvarez (2011) show animacy restrictions in Ch'ol for combinations of 3rd persons in active and passive sentences
- See also Aissen 1997 on Tsotsil and Polian 2013 on Tseltal for same findings
- Active sentences: $\sqrt{ }$ ANIM $>$ INAN, ${ }^{*}$ INAN $>$ ANIM
(11) Ch'ol (Zavala 2007, (79)/(83))
a. $\checkmark$ Tyi i-mel-e waj k-ña'jel. PFV A3-make-TV tortilla A1-aunt 'My aunt prepared the tortilla.'
anim S , inan O
b. * Tyi i-jats'-ä aj-Pedro li chajk. PFV A3-hit-TV CLF-Pedro DET lightning
'The lightning hit Pedro.'
inan S , ANIM O
- Like Chuj, no blanket prohibition on inanimate subjects, but a restriction on the relative animacy of subj and obj - and only 3rd persons count.
Li chajk 'lightning' can be the subject:
(12) Ch'ol (Zavala 2007, (84)/(85))
a. $\checkmark$ Tyi i-jats'-ä tye' li chajk. PFV A3-hit-TV tree DET lightning 'The lightning hit the tree.'
inan S , inan O
b. $\checkmark$ Tyi i-jats'-ä-ety chajk. PFV A3-hit-TV-B2 lightning 'The lightning hit you.'
inan S , Local O
$>$ Notably different from Chuj in also showing animacy restrictions in passives:
(13) Ch'ol (Zavala 2007, (80)/(82))
a. * Tyi mejl-i waj [obl tyi k-ña'jel]

PFV make+PASS-IV tortilla PREP A1-aunt
Int. 'The tortilla was prepared by my aunt.'
cf. (11a)
b. $\checkmark$ Tyi jajts'-i aj-Pedro [obl tyi chajk ]. PFV hit+PASS-IV CLF-Pedro PREP lightning 'Pedro was hit by the lightning.'

### 2.3 Summary

- Chuj

1. Animacy hierarchy: HUM $>$ ANIM $>$ INAM
2. Animacy restrictions arise in active voice only: -3 P object can't outrank a 3P subject.

- Ch'ol (also Tsotsil; Aissen 1997)

1. Animacy hierarchy: ANIM $>$ INAM (this might actually be too coarsegrained, but we'll go with this for now; see Vázquez Álvarez 2011)
2. Animacy restrictions arise in both ACT and PASS

- ACT: 3P object can't outrank a 3P subject.
- PASS: 3P oblique agent can't outrank 3P passive subject.


## 3 Hierarchy effects in an int/sat model

- Hierarchies of the type we have seen above are reminiscent of findings in ditransitives, esp. the "ultrastrong" or strictly descending pattern.
(14) Strictly descending PCC

IO must be at least as high as DO on the hierarchy $1>2>3$
(15) Kabyle Berber (Baier, 2020)
a. ye-sken $=$ iyi $=\mathrm{k}$

3 SG. M -show $=1 \mathrm{SG} . \mathrm{DAT}=2 \mathrm{SG} . \mathrm{M} . \mathrm{ACC}$
He showed you to me.
b. * ye-sken =ak =iyi

3SG.M-show $=2$ SG.M.DAT $=1$ SG. ACC
Intended: he showed me to you.
c. * ye-wwi =yas =kem

3SG.M-show $=3$ SG.M.DAT $=2$ SG.F.ACC
Intended: he brought you to him

- This pattern is crucially relative: there is no ban on 2 nd person DOs, just a ban on $3 \mathrm{IO} / 2 \mathrm{DO}$ combinations.
- Compare Mayan: no ban on inanimate subjects, just a ban on inanimate subject/animate object combinations.
$>$ We build on the analysis of strictly descending PCC in Deal (to appear)
- An important difference in looking at animacy features, rather than person, is that it's always possible to have two arguments with the same features, e.g. ANIM/ANIM (cf. *2IO/2DO, for binding reasons)
- This fact will prove crucial in shaping the analysis we present
- We follow a substantial tradition of syntactic work seeking to model hierachy effects via Agree (e.g. Béjar 2003; Béjar and Rezac 2003, 2009; Anagnostopoulou 2003; Nevins 2007, 2011; Baker 2008; Coon and Keine 2021; Deal to appear, among many others)
- Two theoretical tools in our Agree toolbox:

1. interaction/satisfaction theory of probes (Deal, 2015): probes are separately specified for what they copy (interaction specification) and what makes them stop (satisfaction specification)
2. Cyclic Agree theory of search dynamics (Rezac, 2003; Béjar and Rezac, 2009): probing is always under c-command, probes can search multiple times including after reprojection

- Application to hierarchy effects in ditransitives (PCC): Deal (to appear)
- The probe agrees with the DO first ("DO preference")
- Agree with the DO can bleed Agree with the IO, depending on the features of the probe and the objects
- IO clitics depend on Agree with the IO. If no Agree with the IO happens, IO clitics can't be generated.
- E.g. in Kabyle Berber, if the DO is 2nd person, that prevents Agree with a 3rd person IO. So, this form isn't generated (and is thus ungrammatical):

$$
\begin{aligned}
& \text { (16) * ye-wwi =yas }=\text { kem } \\
& \text { 3SG.M-show }=3 \text { SG.M.DAT }=2 \text { SG.F.ACC } \\
& \text { Intended: he brought you to him }
\end{aligned}
$$

- Why would a probe not be able to Agree with an IO?

1. Satisfaction: it is specified to stop at a certain feature, and it encounters that feature (on DO) before it has a chance to Agree with IO
2. Interaction: the probe is only able to copy (from elements with) certain features and the IO lacks those features (on the parenthesis, §7.2)

- Dynamic interaction: capturing the relative hierarchy effect
- Core idea: Agree with a first goal (DO) can change the probe's interaction specification
- In the strictly descending PCC, Agree with a 2 nd person DO makes the probe only able to Agree with bearers of the feature [PART]
- After a 2 nd person DO, Agree with a 1st person IO is possible; 1st person has [PART]
- After a 2 nd person DO, Agree with a 3 rd person IO is not possible; 3rd person lacks [PART]
- Notation: dynamically interacting [PART] is written [PART] $\uparrow$
- Note that dynamic interaction features are borne by the DP
- For a formalization of dynamic interaction, see Deal 2022
- Final piece: insatiability

If an insatiable probe has no satisfaction specification at all, the probe will not stop until it inspects everything in its domain (see e.g. Clem 2019b, to appear)

## 4 Capturing animacy restrictions in active voice

### 4.1 Background on Mayan: Actives

- In the active voice, all Mayan languages above show a hierarchy effect.
- These languages however are syntactically diverse in terms of their clause structure as concerns absolutive agreement:
(17) Chuj is a high-abs language

TAM - Set B (ABS) - Set A (ERG) - ROOT - (VOICE) - SS
(18) Ch'ol is a low-abs language

$$
\text { TAM }- \text { Set A }(\text { ERG })-\text { ROOT }-(\text { VOICE })-\text { SS }- \text { Set B }(\text { ABS })
$$

- Following Coon, Mateo Pedro, and Preminger 2014 and Coon, Baier, and Levin 2021, we assume that absolutive agreement varies across Mayan in whether it reflects a probe on T (high-abs), or a probe on $v$ (low-abs)
- We follow these authors and others (Coon 2017a, 2019; Coon and Carolan 2017) in assuming that ergative agreement (set A) reflects Agree with $v$ across the family.
- In low-abs languages, e.g. Ch'ol, $v$ Agrees with both arguments, in situ. Given Cyclic Agree, we assume it Agrees with the object first.
(19) Both subject and object Agree with v

- In a low-abs language, 1 produces Set B (absolutive) morphemes, whereas (2) produces ergative agreement (Set A)
- In high-abs languages, e.g. Chuj, the object moves past the subject and Agrees with T, resulting in a Set B (absolutive) morpheme.
(20) Obj agrees with T in a high-abs language (Chuj)

- While it is T that is responsible for Set B morphemes here, we follow Coon et al. (2021) in assuming that the object must still Agree with v in order for inversion past the subject to occur inside $v P$
- In particular: v in a high-abs language bears an EPP feature that causes the object to move to its spec (cp. Aldridge 2004)
Assuming all long-distance dependencies reflect Agree, EPP-driven movement is just Agree once again: v finds the object via Agree, then moves it to its spec
$>$ This means that the vP structure in (19) obtains BOTH in low-abs and high-abs languages
- In a high-abs language, (1) produces object movement, and (2) again produces ergative agreement (set A)
- Summarizing the role of v in the two language types:
(21) v in a low-abs language (e.g. Ch'ol)
a. Agrees with both object (first) and subject (second)
b. Assigns ABS to the object
c. Assigns ERG to the subject
(22) v in a high-abs language (e.g. Chuj)
a. Agrees with both object (first) and subject (second)
b. Attracts the object to its spec
c. Assigns ERG to the subject
- Given that point (a) is in common across both languages, we will use the structure in (19) to explain hierarchy effects for both high-abs and low-abs languages


### 4.2 Deriving 3/3 animacy restrictions in Ch'ol actives

- We assume for the sake of argument that in Ch'ol the hierarchy is anim>INAM, as stated by Vázquez Álvarez (2011)
- We propose that the relevant probe is v , which is insatiable: [INT: $\phi$, SAT:-]
- The feature [ANIM] interacts dynamically. (That is, animates have [ANIM $\uparrow$ ])
- Objects interact with the probe on $v$ before subjects do. When the object is animate, it changes the probe and makes it able only to interact with animates subsequently.
(23) Ch'ol
(Vázquez Álvarez, 2011, 21)
Tyi y-il-ä wiñik x-ixik.
PFV A3-see-TV man CLF-woman
'The woman saw the man.'
anim S , anim O

- Now, if the subject is inanimate, this means that no Agree with the subject is possible. But forms like (24) can only be generated if the subject Agrees!
(24) * Tyi i -jats'-ä aj-Pedro li chajk. PFV A3-hit-TV CLF-Pedro DET lightning
Intended: 'The lightning hit Pedro.'
INAN S , AN O
- Dynamic interaction with [ANIM $\uparrow$ ] on the object prevented the subject from Agreeing
- If the subject doesn't Agree, set A is not generated
- If the object is inanimate, it lacks a [ANIM $\uparrow$ ] feature to change the probe. The probe remains able to Agree again once the object has Agreed.
- So inanimate objects are compatible with both animate and inanimate subjects:

T Tyi i-jats'-ä tye' li chajk.
PFV A3-hit-TV tree DET lightning
'The lightning hit the tree.'
(Zavala 2007)
(26)
$\checkmark$ Tyi i-jats'-ä tye' aj-Pedro.
PFV A3-hit-TV tree cLf-Pedro.'
'Pedro hit the tree/stick.'

- By comparison to the derivation above, the dynamic interaction step is missing:
(27)



### 4.3 Deriving 3/3 animacy restrictions in Chuj actives

- Recall that in Chuj, the hierarchy is HUMAN $>$ ANim $>$ INAM
- We capture this by assuming that Chuj has both [HUM $\uparrow$ ] and [ANIM $\uparrow$ ]
- If the object is...

1. Human: it has [HUM $\uparrow, \operatorname{ANIM} \uparrow$ ]

A subject can only Agree if it also is human
Non-human subjects fail to Agree; set A cannot be generated for them.
2. Nonhuman animate: it has [ANIM $\uparrow$ ]

A subject can only Agree if it also is animate (whether human or not)
Non-animate subjects fail to Agree; set A cannot be generated for them
3. Inanimate: it has no dynamically interacting features

The subject will also Agree, no matter what

## 5 On the status of local persons

- For most Mayan languages, animacy hierarchies hold among 3rd persons only: only when both arguments are 3rd person is there an effect. ${ }^{2}$
- Local persons are outside the restriction, even though semantically they denote humans

[^1](28)

Chuj
a. * Ix-y-il winh winak nok' chan. PFV-A3-see CLF man CLF snake 'The snake saw the man.'

ANIM $>$ HUM
b. $\checkmark$ Ix-\{in/ach/onh \}-y-il nok' chan. PFV-B1s/B2s/B2P-A3-see CLF snake 'The snake saw me/you/us.' ANIM $>$ LOCAL PERSON

- We consider three possible approaches to this fact:

1. No animacy features on local persons
2. Animacy features on local persons, but not accessible to Agree
3. Animacy features on local persons, but not dynamic

- On theory 1, local persons may well denote animates, but this is not recorded in their feature structures.
a. 1st person: $[\phi$, PART,SPKR $]$
b. 2nd person: $[\phi, \mathrm{PART}]$
c. 3rd person: $[\phi],[\phi, \operatorname{ANIM} \uparrow]$, or $[\phi, \operatorname{HUM} \uparrow, \operatorname{ANIM} \uparrow]$

This is like saying that these languages "only have gender in the 3rd person"

- On theory 2, we could say that features like [ANIM] are somewhere in the projection of local persons, but not accessible to Agree from the outside
- e.g. the structure of a local person pronoun includes an outer shell with [ $\phi$, PART,SPKR], and a phase boundary protects the [HUM,ANIM] features from outside probes
- Challenge for both views: this doesn't make local persons outside the system, it makes them like inanimates
- Local persons can be subjects with animate objects:
(30) Ix-k-il nok' tz'i'.

PFV-A1P-see CLF dog
'We saw the dog.' (Chuj)

- We proposed that the animate object dynamically interacts, requiring an [ANIM] feature on the subject in order for the subject to Agree
- We must therefore conclude from (30) that local persons do have an [ANIM] feature accessible to Agree
- This brings us to theory 3: local persons have animacy features, but not dynamic ones
a. 1st person: [ $\phi$, PART,SPKR,HUM,ANIM $]$
b. 2nd person: [ $\phi$, PART,HUM,ANIM]
c. 3rd person: $[\phi],[\phi, \operatorname{ANIM} \uparrow]$, or $[\phi, \mathrm{HUM} \uparrow, \mathrm{ANIM} \uparrow]$
- This theory predicts that local persons aren't really outside the system either - it's just that they don't have the same behavior for Agree as objects as 3rd persons do.
- We expect that if the 2nd person were clearly non-human, it should be ruled out as subject with a human object.
(Hard to assess because e.g. dogs may well be honorary humans)
- Two implications:


## 1. Implications for macro-variation:

- Aissen (1997) notes that Chamorro includes both 2nd and 3rd persons in its animacy hierarchies; Algonquian includes all persons.
- We suggest that languages vary as to whether they confine their dynamic features to their third persons, extend them to 2 nd persons, or extend them to all persons


## 2. Implications for the theory of Agree:

- This analysis confirms the (sometimes misunderstood) idea in Deal (to appear, 2022) that dynamic interaction features are borne by goals

Table 1: Possible/impossible anim/inan combinations in Chuj and Ch'ol

|  | Chuj |  | Ch'ol |  |
| :--- | :---: | :---: | :---: | :---: |
| Configuration | ACT | PASS | ACT | PASS |
| ANIM AGENT, ANIM THEME | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |
| ANIM AGENT, INAN THEME | $\checkmark$ | $\checkmark$ | $\checkmark$ | $*$ |
| INAN AGENT, INAN THEME | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |
| INAN AGENT, ANIM THEME | $*$ | $\checkmark$ | $*$ | $\checkmark$ |

## 6 Capturing variation in Mayan passives

- Comparing animate/inanimate combinations only, animacy restrictions for combinations of 3rd person arguments in Chuj vs Ch'ol: Table 1
- Crucially, passives behave differently in the two languages
(32) Chuj (repeated from above)
a. $\sqrt{ }$ Ix-mak'-j-i te' k'ab'te' [obl y-uj waj Xun ]. PFV-hit-PASS-IV CLF branch A3-by ClF Xun 'The branch was hit by Xun.'
b. $\checkmark$ Ix-mak'-j-i waj Xun [obl y-uj te' k'ab'te' ]. PFV-hit-PASS-IV CLF Xun A3-by CLF branch 'Xun was hit by the branch.'
(33) Ch'ol (repeated from above)
a. * Tyi mejl-i
waj [obl tyi k-ña'jel PFV make+PASS-IV tortilla PREP A1-aunt Int. 'The tortilla was prepared by my aunt.'
$\checkmark$ Tyi jajts'-i aj-Pedro [овц tyi chajk ]. PFV hit+PASS-IV CLF-Pedro PREP lightning 'Pedro was hit by the lightning.'


### 6.1 Assumptions about passives

- We follow previous work (e.g., Coon et al. 2014; Coon 2017b, 2019; Coon et al. 2021) in assuming that Set B morphemes in intransitives (passives included) come from Agree with T
(34) Set B assignment in passive

- All Mayan languages are the same in this respect (Coon et al. 2014).
- We propose that there is nonetheless variation in:

1. the satisfaction specifications of the probe on T
2. the position of oblique arguments

### 6.2 Passives in Ch'ol

- T is insatiable, [ $\mathrm{I}: \phi, \mathrm{s}:-]$
- By-phrase is generated in the agent position, Spec,vP (Collins 2005, i.a.)
- $\phi$-features are accessible on the by-phrase: either it's a PP that has agreed with an internal DP (Rezac, 2008), or it's itself a DP (as per Coon et al. 2021, $\S 3.3$ for Ch’ol)
(35) Ch'ol

- Insatiable T agrees first with the PP, then with the theme (if possible)
- As above, [ANIM $\uparrow$ ] interacts dyanmically
- If the by-phrase has [ANIM $\uparrow$ ] and the underlying object does not, the underlying object cannot Agree with T
- This bleeds object Case and Set B morphology.
(36) Tyi il-än-ty-i li wiñik tyi x-'ixik.

PFV see-DTV-PASS-IV the man PREP CLF-woman
'A woman was seen by the man.'


### 6.3 Passives in Chuj

- In Chuj, objects always Agree with T - it's a high-abs language
- We assume that T does not Agree with both arguments in a transitive, only the object
- This means that T is not insatiable.
- We propose that T is a "flat" probe: [INT: $\phi$, SAT: $\phi$ ]
- With a flat T probe in Chuj, a ( $\phi$-bearing) PP at the edge of vP would always intervene and prevent T from Agree with the underlying object
Thus the difference in probe specification naturally leads to a difference in oblique placement.
- In Chuj:
- By-phrase PP is outside the domain of T
- T is [INT: $\phi$, SAT: $\phi$ ]
(37) Chuj

- Since no PP can intervene, T will always find the theme DP (trivially first).
- Independent evidence that PPs are low in Ch'ol, high in Chuj:

1. Royer (2022): active intransitive subjects can bind inside PPs in Ch'ol, but not in Chuj.

- Note: we still need to find out if passive subjects in particular also bind inside PPs.
- This will let us assess whether there is actually movement of the $\mathrm{DP}_{\text {theme }}$ to $\mathrm{Spec}, \mathrm{TP}$ in the passive, or instead just Agree without movement

2. Royer (2022): PPs in Chuj and Ch'ol have a different distribution, observable in transitive sentences: PPs must be peripheral in Chuj but not in Ch'ol
(38) Chuj
a. ${ }^{`}$ Ix-s-man [o ixim ixim ] [s ix Rosa ] [pP t'a merkado ]. PFV-A3-buy CLF corn CLF Rosa PREP market
'Rosa bought corn at that market.
b. ${ }^{\checkmark}$ [pp T'a merkado ] ix-s-man [o ixim ixim ] [s ix Rosa ].
c. *Ix-s-man [pp t'a merkado ] [o ixim ixim ] [s ix Rosa ].
d. *Ix-s-man [o ixim ixim ] [pp t'a merkado ] [s ix Rosa ].
(39) Ch'ol
a. ${ }^{\wedge}$ Tyi i-mäñä [o ixim ] [s aj-Rosa] [pp tyi merkadu]. PFV A3-buy corn aj-Rosa PREP market 'Rosa bought corn at the market.
b. ${ }^{\prime}$ [pp Tyi merkadu ] tyi i-mäñä [o ixim ] [s aj-Rosa ].
c. *Tyi i-mäñä [pp tyi merkadu ] [o ixim ] [s aj-Rosa ].
d. ${ }^{\checkmark}$ Tyi i-mäñä [o ixim ] [pp tyi merkadu ] [s aj-Rosa ].

## 7 Conclusion and discussion

We accounted for animacy restrictions in Mayan actives and passives and its variation using an int/sat model of Agree.
(40) Our main proposal: 3rd person DPs have dynamically interacting ([HUM $] \uparrow$ and) $[\mathrm{ANIM}] \uparrow$ features.

- Across Mayan actives, $v$ must Agree first with the theme and second with the agent
- In the situation where one probe Agrees with two goals, the effect of dynamic interaction is that the first goal (here: theme) can't be more featurally specified than the second goal (here: agent).
- In Ch'ol passives: T agrees first with the by-phrase (semantic agent) and then with the subject theme, so again, the first goal (by-phrase) can't be more featurally specified than the second goal (theme).
- In Chuj passives: PPs are base-generated higher (Royer, 2022). T only finds the theme subject, and so no animacy restrictions arise at all.
- Local persons don't participate in Chuj or Ch'ol animacy restrictions because their [HUM] and [ANIM] features do not dynamically interact.

We conclude with three more points of discussion.

### 7.1 Rethinking ergative case assignment in Mayan

- The data seen in this paper cast new light on the status of ergative case assignment in Mayan.
- Recent work in Mayan has proposed that Set A (ergative) case is an inherent case assigned by $v$ to its specifier (e.g., Coon 2017a, Coon 2019).
(41) Inherent case analysis of ergative

- Inherent ergative in general: ergative is assigned to the DP in Spec,vP because it is semantically an agent; ergative is connected to $\theta$-assignment (see e.g. Woolford 1997; Aldridge 2004; Legate 2008).
- A competing view is that ergative is a dependent case, with the details of case dependency understood in diverse ways (Yip et al. 1987; Marantz 1991; Deal 2010; Baker 2014, 2015; Clem 2019a, etc.).
- These views differ in what kinds of rules assign case, in what component of grammar, etc.
- Abstract commonality (what we mean by "dependent case"): The subject is ergative because there is an object present in the domain
- To capture the Mayan animacy hierarchy effect via Agree, we've followed the standard analysis for hierarchy effects via Agree: one probe/two goals
- Building on prior work on Mayan vP structure, we've proposed that the relevant probe is $v$ : it Agrees with both the object (first) and the subject (second), in both high-abs and low-abs languages.
(42) Both subject and object Agree with $v$


Recall: © can either produce Set B (low-abs) or trigger movement to spec vP (high-abs)

- This invites a particular kind of dependent approach to ergative case assignment, reminiscent of the approach in Deal 2010 and Clem 2019a, where ergative is argued to encode agreement of a probe with both the object and the subject.
(43) Proposal:

Set A (ergative) arises when a single probe on $v$ (or Poss; see below) agrees with a second goal

- Mayan languages don't seem to have true unergatives (with Set A assigned on the external argument); unergatives either involve a dummy transitive verb (Coon 2012) or involve special morphology with Set B agreement (Coon 2019)
- Note that Mayan Set A also cross-references possessors on possessa:
'Xun's mother'
- We conjecture that Set A in the nominal domain also results from agreement with two goals; the possessor is cross-referenced with Set A because it's second to agree with Poss ${ }^{0}$.
(45)

Possessive DPs


- Note that our analysis sidesteps issues for other certain formulations of dependent case, which have been argued against for Ch'ol by Coon (2016)
- Coon argues against dependent case theory as formulated by e.g. Baker and Bobaljik (2017):

1. Case is assigned by special configurational rules that apply first
2. Agreement is second, determined by Case

- For Baker and Bobaljik (2017), agreement rules cannot target ergatives only; unmarked case (absolutive) should "win" for control of agreement
- Thus the Baker/Bobaljik theory struggles to make v Agree with ergatives only, producing set A
- On our analysis:
- Case reflects Agree, not special configurational rules separate from it
- v doesn't only Agree with ergatives, it Agrees with both arguments (and that's why there's a hierarchy effect)
- In Ch'ol: v spells out Agree with the goal that Agrees last; it cliticdoubles the goal that Agrees first
- In Chuj: v just spells out Agree with the goal that Agrees last


### 7.2 How interaction works

- Our analysis also speaks to a foundational question for the int/sat theory, concerning how interaction is understood.
(46) Int/sat Agree theory in a directive:

Copy all $\alpha$ from anything that has $\beta$; stop when you hit $\gamma$

- Contrasting two notions of what interaction is:
- Set specification view: $\alpha=\beta=$ the set of interaction features
- "Gate" view: $\alpha=$ features; $\beta=$ the interaction feature So: copy all features from anything that has $\beta$.
- In Deal (2022), AR explicitly adopts the set specification view.
- Interaction features are a set.
- Only features in that set are copied.
- Abbreviation: [INT:PART] for a probe that copies \{PART,SPKR,ADDR \}
- Extending this: [INT:ANIM] for a probe that copies \{ANIM, HUM,PART,SPKR,ADDR\}
- In principle the two conceptions of interaction can be told apart as follows:
- Find a probe whose interaction specification is relatively narrow-e.g. [INT:ANIM], not [INT: $\phi$ ]
- On the set specification view, such a probe copies only the features in \{ANIM,HUM,PART,SPKR,ADDR\}
- On the gate view, such a probe copies all features from anything that has [ANIM]
- It is often harder to tell these apart than one might think, because it requires distinguishing clitics from agreement.
- Clitic-formation can be triggered by Agree in only some $\phi$-features, but nevertheless the clitic bears all $\phi$-features.
- So when we say that only F is being copied to the probe (interacting), but F and G are realized morphologically, this could be because [FG] is a clitic.
- The Mayan data however present a rare case where clitic vs. agreement status has been addressed at length, e.g. in Coon (2017a)
- Coon argues that set A (ergative) is agreement proper, not a clitic.
- If this is so, our analysis presents a case for the gate conception of interaction, contra Deal (2022).
- After Agree with an animate, the probe is able to interact only with bearers of [ANIM]
- However the probe actually copies more than the features in \{ANIM, HUM, PART,SPKR,ADDR\}: it also copies plural
- This is why there is still a distinction in subject number when the object is animate:
(47) Chuj
a. Ix-w-il nok' chan. PFV-A1S-see CLF snake
'I saw the snake.'
b. Ix-k -il nok' chan.

PFV-A1P-see CLF snake
'We saw the snake.'

### 7.3 Hierarchy effects

- The analyses above provide an empirical means of comparing the int/sat approach to hierarchy effects with Coon and Keine's (2021) Feature Gluttony approach
- Under Feature Gluttony, hierarchy effects are expected where both arguments clitic-double or both arguments morphologically agree
- E.g. Baier (2020) follows this approach for PCC in Kabyle Berber:
(48) $\begin{array}{rll}* \text { ye-wwi } & =\text { yas } & =\text { kem } \\ 3 \text { SG.M-show } & =3 \text { SG.M.DAT } & =2 \text { SG.F.ACC }\end{array}$

Intended: he brought you to him

- The probe triggers clitic-doubling
- Segments of the same probe simultaneously Agree with both objects ("feature gluttony")
- This requires simultaneous clitic movement from both objects, which is impossible
- Hierarchy effects in Mayan are interesting in this perspective in that they involve one clitic (set B) and one agreement (set A)
(dos Santos 2022 finds a similar situation in Kawahíva [Tupian])
- This means that:
- A single probe must be able to either clitic-double or not
- No situation of two clitics "competing" to be moved first
- Similarly, no situation of two agreement exponents "competing" to be pronounced
- Coon and Keine (2021) emphasize that "gluttony and gluttonous probes do not by themselves give rise to ungrammaticality, but they may result in irresolvably conflicting requirements for subsequent operations"
- The challenge is that there is no obvious source for such a conflict in Mayan
- Only the object participates in movement (whether clitic-doubling set B in low-abs, or phrasal movement to Spec,vP in high-abs)
- Only the subject has its features exponed as a result of pure Agree
- These behaviors are compatible with each other, as every well-formed transitive example attests.
- A further challenge relates to Coon and Keine's (2021) stipulation that segments of the same probe Agree simultaneously
- If one step of Agree took place first, clitic doubling of the Agreeing goal would immediately follow, with no conflicts
- So, C\&K require Agree with both goals at the same time
- Problem: Cyclic Agree
- For a probe on $v$, we expect the object agreement step to be first
- The probe then reprojects and can Agree with the DP in Spec,vP
- We conclude that these challenges favor an interaction/satisfaction approach to hierachy effects over a feature gluttony approach
- Hierarchy effects really just depend on the syntactic fact of one probe/multiple goals
- It doesn't matter what the outcome of Agree is (e.g., pronounced agreement, clitic doubling, movement).
- It doesn't matter if the probe would have to reproject in order to Agree with the second goal.


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## Appendix: Obviation, topicality, and coreference

- Aissen (1997) and much subsequent work have related Mayan animacy restrictions to Algonquian patterns of obviation.
(49) Obviation scale:
(local) $>$ proximate $>$ obviative
- In Algonquian, direct voice is required whenever the subject is proximate and the object obviative.
- Aissen's core thesis: in Tsotsil, active voice is required whenever the subject is proximate and the object obviative.
- Otherwise, an inverse/passive is needed.
- While proximate vs obviative DPs are overtly distinguished in Algonquian, they are not in Mayan. So why connect the Mayan patterns to obviation?

1. The same animacy effects hold in Algonquian languages: the obviation scale aligns with the animacy scale, i.e., for combinations of 3rd person animates/inanimates (and only for such combinations), the animate must be proximate (otherwise inverse voice is required).
2. Proximates in Algonquian are generally more "topical/definite" than obviatives (see Oxford to appear and references therein), and Aissen (1999) argues that might also be the case for Tsotsil.
3. Given additional assumptions, two constraints on the distribution of coreferential nominals can be made to follow, in particular:
(a) Possessives. Sentences of the type $[x$ 's $y \mathrm{~V} x]$ are not possible when $x$ and $y$ are third persons.
(b) Attitudes. Sentences of the type $\left[x \mathrm{~V}_{\text {speech/attitude }}[\mathrm{CP}\right.$ that $y \mathrm{~V}$ $x$ ] are also not possible when $x$ and $y$ are third persons.

- For our comments here, we focus on possessives, but we believe the analysis can be extended to attitudes.
- Possessive coreference effects in Chuj and Ch'ol:
(50) Chuj

$$
\begin{aligned}
& \text { * Ix-y-il waj Xun [subs ix } \left.\begin{array}{l}
\text { ix } \\
\text { PFV-nun }
\end{array} \quad \text { pro }\right] \text { ].see CLF Xun } \\
& \text { CLF A3-mother }
\end{aligned}
$$

Intended: 'His ${ }_{1}$ 's mother saw Xun $_{1}$.'
(51) Ch'ol

$$
\begin{aligned}
& \text { * Tyi i-tyaj-a pro [subs i-ñox'a pro ] tyi } \\
& \text { PFV A3-find-TV PRON } \\
& \text { A3-husband PRON }
\end{aligned}
$$

Yermosaj.
Villahermosa
Intended: 'Her ${ }_{1}$ husband found her $_{1}$ in Villahermosa.'
Could mean: 'She ${ }_{1}$ found her $_{1}$ husband in Villahermosa.'

- Like for animacy effects in these languages, local persons don't count:
(52)
a. Ix-in-y-il ix hin-nun.
PFV-B1S-A3-see CLF A1S-mother
'My mother saw me.'
b. Tyi i-ts'äk-ä-y-oñ k-alo'b-il.

PFV A3-cure-TV-EPEN-B1 A1-son-NML
'My son cured me.'
(Ch’ol, Zavala 2007: 77)

- To capture these data, we take two steps. First, what we previously analyzed as an insatiable probe on $v$ and Poss should instead be [SAT:Prox].

- This rules out structures with set A agreement and:
- Proximate objects
- Proximate possessa

Agree will stop at the first goal and set A cannot be generated.

- Second, we make two additional assumptions, which match parts of the analysis of Aissen (1997)
(54) Obviation tracks reference If two expressions co-refer, they must match wrt the feature [PROX] (Ideally derivable from a proper semantics from obviation features)
(55) Third person dissimilation If there are two third persons in a clause, one must be proximate (i.e. bear the feature [PROX]).
- This rules out the generation of examples like (56), from above:
(56) * Ix-y-il waj Xun [subs ix s-nun pro ]. PFV-A3-see ClF Xun ClF a3-mother Pron
Intended: 'His,'s mother saw Xun ${ }_{1}$.' (Chuj)
- Given set A agreement in the clause and DP, neither the object (Xun) nor the possessum ('mother') is proximate.
- The pronominal possessor cannot be proximate because it is coreferential with a non-proximate (Xun)
- This means that no argument is proximate, which violates Third Person Dissimilation
- Local persons are outside this generalization because the constraint is specifically third person dissimilation.
- This is part of a broader pattern of dissimilation effects specifically in $3 / 3$ contexts, within Mayan and beyond
- E.g. in Tsotsil, agent focus is only used in $3 / 3$
- Could be related, as Aissen has suggested, to processing issues arising in a verb-initial, pro-drop language.


[^0]:    ${ }^{1}$ We thank the Chuj consultants, Petul Felipe Gómez, Matin Pablo and Matal Torres, for generously contributing to this project. Many thanks also to Jessica Coon and Carol Rose Little for their feedback on some ideas here and for Carol Rose's help with Ch'ol data.

[^1]:    ${ }^{2}$ Cajolá Mam is the only reported exception (Pérez Vail 2014; Zavala Maldonado 2017).

