1 Introduction

- Cyclic Agree (Rezac, 2003, 2004; Béjar and Rezac, 2009):
  - A probe first probes its c-command domain
  - If the probe remains unsatisfied, when the head reprojects to form an intermediate projection, the probe reprojects as well
  - The probe then probes its new, expanded c-command domain (the specifier of the head)
  - A classic example of this is with agreeing verb

(1)

- Under the assumptions of Bare Phrase Structure (BPS), there is no formal distinction between the label of intermediate and maximal projections

- In this talk, I argue that this prediction is borne out in the type of structure in (2)

(2)

- Specifically, I argue for the existence of this structure in Amahuaca (Panoan; Peru) with an agreeing adjunct C
  - Adjunct C\textsubscript{min} probes DPs in its c-command domain, the adjunct clause
  - Because the probe on C remains unsatisfied, C\textsubscript{max} also probes its c-command domain, agreeing with matrix DPs

- Thus, the Amahuaca data provide support for a cyclic Agree model and suggest that cyclic expansion of probes is fully generalizable to maximal projections

- Roadmap:
  - §1: Introduction
  - §2: Amahuaca agreeing C
  - §3: The analysis: Maximal projections as probes
  - §4: Alternative analyses
  - §5: Predictions and typology

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*I am grateful to members of the Amahuaca community for their collaboration on this project. I also thank Amy Rose Deal, Line Mikkelsen, Peter Jenks, David Pesetsky, Norvin Richards, Mark Baker, and audiences at UC Berkeley for helpful discussion of the data and analysis. This work was made possible by four Oswalt Endangered Language Grants. All errors are mine alone.*
2 Amahuaca agreeing C

- Amahuaca is an endangered Panoan language spoken in the Peruvian and Brazilian Amazon
  - Mostly head final, with a head-initial matrix C
  - Head and dependent marking
  - Tripartite alignment with ergative, nominative, and accusative case
- In temporal adjunct clauses in Amahuaca the element indicating the temporal relationship between clauses is an enclitic that typically surfaces on the verb

\[(jaa=x_i \text{ vua}=\text{(xon})=\text{mun} \quad xano=n_i \quad xuki \quad \text{3SG=NOM sing}=\text{SA.AFTER=}C_{\text{MATRIX}} \quad \text{woman}=\text{ERG corn} \quad jova=\text{xo}=\text{nu} \quad \text{cook}=\text{3.PST=DECL} \quad \text{After she, sang, the woman, cooked corn.}\]

For simplicity, the focus on this talk will be on ‘after’ clauses, but ‘while’ and ‘before’ show similar behavior

2.1 Internal syntax of ‘after’ clauses

- Amahuaca ‘after’ clauses are full CPs that can contain all arguments of the verb, including case-marked subjects, (4); adverbs, (5); and other adjunct clauses, (6)

\[(xano=n_i \quad \text{chopa patza}=\text{(xon})=\text{mun} \quad pro_i \quad \text{hatza} \quad \text{woman}=\text{ERG clothes wash}=\text{SA.AFTER=}C_{\text{MATRIX}} \quad \text{manioc} \quad jova=\text{hi}=\text{ki}=\text{nu} \quad \text{cook}=\text{IPFV=3.PRES=DECL} \quad \text{After the woman, washed clothes, she, is cooking manioc.}\]

2.2 External syntax of ‘after’ clauses

- ‘After’ clauses also allow clause-internal scrambling

\[(pro_i \quad \text{koshi ka}=\text{(xon})=\text{mun} \quad xano=n_i \quad \text{hatza} \quad \text{quickly go}=\text{SA.AFTER=}C_{\text{MATRIX}} \quad \text{woman}=\text{ERG manioc} \quad vana=\text{xo}=\text{nu} \quad \text{plant}=\text{3.PST=DECL} \quad \text{‘After she, went quickly, the woman, planted manioc.’}\]

\[[\text{pro}_i \quad \text{kari choka}=\text{(xon}) \quad \text{pro}_i \quad \text{hatza} \quad \text{xoka}=\text{(xon})=\text{mun} \quad \text{yam wash}=\text{SA.AFTER=}\quad \text{manioc peel}=\text{SA.AFTER=}C_{\text{MATRIX}} \quad xano=n_i \quad \text{xuki jova}=\text{xo}=\text{nu} \quad \text{woman}=\text{ERG corn cook}=\text{3.PST=DECL} \quad \text{‘[After she, peeled manioc [after she, washed yams]], the woman, cooked corn.’}\]

\['\text{After ‘clauses also allow clause-internal scrambling}‘

\[(\text{pro}_i \quad \text{pro}_i \quad \text{kari yam} \quad \text{choka}=\text{(xon}) \quad \text{wash}=\text{SA.AFTER=}\quad \text{manioc peel}=\text{SA.AFTER=}C_{\text{MATRIX}} \quad xano=n_i \quad \text{xuki jova}=\text{xo}=\text{nu} \quad \text{woman}=\text{ERG corn peel}=\text{3.PST=DECL} \quad \text{‘After she, peeled manioc [after she, washed yams]], the woman, cooked corn.’}\]

\[\text{2.2 External syntax of ‘after’ clauses}\]

- ‘After’ clauses typically appear in high peripheral positions
- It is ungrammatical for ‘after’ clauses to appear below aspect marking
  (Note that nominalized internally-headed relative clauses can appear in this position)
(8) ‘After she sang, the woman is washing manioc.’
   a. \[ pro_i \ vua=\{xon\} = mun \ xano=n_i \ hatza \\
       \text{sing}=\text{SA.AFTER}=\text{C}_{\text{MATRIX}} \ \text{woman}=\text{ERG} \ \text{manioc} \\
       \text{choka}=\text{hi}=\text{ki}=\text{nu} \\
       \text{wash}=\text{IPFV}=3.\text{PRES}=\text{DECL} \]
   b. * \[ xano=n_i = mun \ hatza \ choka=\text{hi} [pro_i \ \text{woman}=\text{ERG}=\text{C}_{\text{MATRIX}} \ \text{manioc} \ \text{wash}=\text{IPFV} \\
       \text{vua}=\{xon\} = \text{ki}=\text{nu} \\
       \text{sing}=\text{SA.AFTER}=3.\text{PRES}=\text{DECL} \]

   • ‘After’ clauses do not reconstruct below matrix arguments for Condition C: regardless of the relative position of matrix and adjunct material, a Condition C violation is never triggered.

(9) ‘After Maria went quickly, she washed clothes.’
   a. \[ pro_i \ koshi \ ka=\{xon\} = mun \ Maria=n_i \ chopa \\
       \text{quickly} \ \text{go}=\text{SA.AFTER}=\text{C}_{\text{MATRIX}} \ \text{Maria}=\text{ERG} \ \text{clothes} \\
       \text{patza}=\text{xo}=\text{nu} \\
       \text{wash}=3.\text{PST}=\text{DECL} \]
   b. \[ Maria_i \ koshi \ ka=\{xon\} = mun \ pro_i \ chopa \\
       Maria \ \text{quickly} \ \text{go}=\text{SA.AFTER}=\text{C}_{\text{MATRIX}} \ \text{clothes} \\
       \text{patza}=\text{xo}=\text{nu} \\
       \text{wash}=3.\text{PST}=\text{DECL} \]
   c. \[ jaa=n_i = mun \ [Maria_i \ koshi \ ka=\{xon\} \ chopa \\
       \text{3SG}=\text{ERG}=\text{C}_{\text{MATRIX}} \ \text{Maria} \ \text{quickly} \ \text{go}=\text{SA.AFTER} \ \text{clothes} \\
       \text{patza}=\text{xo}=\text{nu} \\
       \text{wash}=3.\text{PST}=\text{DECL} \]

   • The proposed syntax for these ‘after’ clauses is as given in (10)

2.3 Agreement in ‘after’ clauses

   • There are several different forms of the enclitic used to mean ‘after’
     - These morphemes vary depending on coreference relationships between arguments (Sparing-Chávez, 1998, 2012)
     - If there is coreference between an argument in the adjunct clause and one in the matrix clause, the form of the morpheme is sensitive to the grammatical function of the relevant arguments
     - In (11), the subject of the adjunct clause is coreferential with a matrix transitive subject (S=A), and the agreeing adjunct C takes the form =xon

(11) \[ jaa=x_i \ vua=\{xon\} = mun \ xano=n_i \ xuki \\
     \text{3SG}=\text{NOM} \ \text{sing}=\text{SA.AFTER}=\text{C}_{\text{MATRIX}} \ \text{woman}=\text{ERG} \ \text{corn} \\
     \text{jova}=\text{xo}=\text{nu} \\
     \text{cook}=3.\text{PST}=\text{DECL} \]

   ‘After she sang, the woman cooked corn.’
- In (12), the subject of the adjunct clause is coreferential with a matrix intransitive subject (S=S), and the agreeing adjunct C takes the form =\( hax \)

(12) \[ jaa=x_1 \quad vua=[\text{\( hax \)]} \quad \text{mun} \quad \text{xano}_i \quad \text{chirin}=xo=nu \]
\[ 3\text{SG}=\text{NOM} \quad \text{sing}=\text{SS.AFTER}\text{=C}\text{\text{-MATRIX} woman dance}=3.\text{PST}=\text{DECL} \]

‘After she, sang, the woman danced.’

- In (13), the subject of the adjunct clause is coreferential with a matrix object (S=O), and the agreeing adjunct C takes the form =\( xo \)

(13) \[ jaa=x_1 \quad vua=[\text{\( xo \)]} \quad \text{mun} \quad \text{hinan} \quad \text{xano}_i \quad \text{chivan-vo}=xo=nu \]
\[ 3\text{SG}=\text{NOM} \quad \text{sing}=\text{SO.AFTER}\text{=C}\text{\text{-MATRIX dog,ERG woman chase-AM}=3.\text{PST}=\text{DECL} } \]

‘After she, sang, the dog chased the woman.’

- In (14), no adjunct clause DP is coreferential with any matrix DP, and adjunct C is spelled out as the different subject marker =\( kun \)

(14) \[ joni \quad vua=[\text{\( kun \)]} \quad \text{mun} \quad \text{xano}_i \quad \text{chirin}=xo=nu \]
\[ \text{man sing}=\text{DS.AFTER}\text{=C}\text{\text{-MATRIX woman dance}=3.\text{PST}=\text{DECL} } \]

‘After the man, sang, the woman danced.’

- The full paradigm of ‘after’ morphemes is given in (15)

(15) ‘After’ markers

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- The Amahuaca pattern looks like complementizer agreement that is sensitive to referential index and case

- Interestingly, the agreeing complementizer is sensitive to features of DPs in its own clause and the clause to which \( C^{\text{\text{-max}} \) is adjoined

3 The analysis: Maximal projections as probes

- Cyclic Agree coupled with BPS (Rezac, 2003) predicts that an unsatisfied probe should be able to probe the c-command domain of its maximal projection

- I argue that the pattern of agreeing adjunct C in Amahuaca is derived via this type of cyclic expansion of the probe’s domain

- The ingredients:

  1. Bare Phrase Structure (Chomsky, 1995)

     - There is no formal distinction between intermediate and maximal projections

  2. Cyclic expansion (Rezac, 2003, 2004; Béjar and Rezac, 2009)

     - When a label reprojects, an unsatisfied probe associated with it may reproject

     - Probe reprojection serves to expand the c-command domain of the probe and thus the agreement possibilities

  3. Probe insatiability (Deal, 2015)

     - A probe’s interaction conditions can differ from its satisfaction conditions

     - If a probe lacks satisfaction conditions, it will continue probing all possible goals in its c-command domain until reaching a phase boundary

- Adjunct C in Amahuaca is an insatiable probe

- First, \( C^{\text{\text{-min}} \) probes its c-command domain, which contains the subject and object of the adjunct clause
Cyclic expansion in Agree

Note that evidence from remnant VP-fronting suggests that objects undergo shift to Spec,vP (Clem, 2018b)

(16) Agreement inside the adjunct clause

- Given that C’s probe is insatiable, it remains unsatisfied after probing the c-command domain of C_{min}
- When C reprojects to form a maximal projection, the probe is reprojected as well and can probe again
- The c-command domain of this new segment of C, C_{max}, contains the matrix subject and object, keeping with the evidence from Condition C

(17) Agreement into the matrix clause

- The probe on C agrees in:
  - Referential indices (modeled as φ-features; Rezac 2004)
  - Abstract case features
- If two DPs that C agrees with share a referential index, one of the coreference markers will be inserted
  - The form of the marker will be determined by the case of the coreferential DPs
- If no DPs share a referential index, the default different subject marker will be inserted
- Sample vocabulary items are given in (18)²

(18) ‘After’ vocabulary items

\[
\begin{align*}
&[[\text{AFTER}[i,\text{NOM}^*]] [i,\text{NOM}]] \leftrightarrow /hax/ \\
&[[\text{AFTER}[i,\text{NOM}^*]] [i,\text{ERG}]] \leftrightarrow /xon/ \\
&[\text{AFTER}] \leftrightarrow /kun/
\end{align*}
\]

4 Alternative analyses

- The account outlined here builds on the insight of Watanabe (2000) that switch-reference (SR) shares many similarities with complementizer agreement (CA)
- One advantage of the current account is its simplicity – there are independent arguments for all of the necessary technology
  - Cyclicality in Agree (Rezac, 2003; Béjar and Rezac, 2009)
  - Probe insatiability (Deal, 2015)
  - Treating indices as φ-features (Rezac, 2004)
- Additionally, previous accounts of SR and/or CA face empirical challenges given the Amahuaca data

²What I label here NOM* is a feature that is common to all embedded subjects, nominative or ergative. Given independent evidence from case assignment in Amahuaca (Clem, 2018b), a good candidate for this feature is a [T] feature that indicates agreement with T.
4.1 Non-reference-tracking accounts of SR

- Some recent analyses of SR assume that reference tracking is not directly involved
  - Georgi (2012) argues that same subject marking is a special case of control
  - Keine (2012, 2013) argues that SR reflects coordination height, with same subject clauses being VP coordination
- Both of these accounts predict that a clause bearing a same subject marker should be unable to host an overt subject DP (Clem, 2018a)
- In Amahuaca, ‘after’ clauses can host all arguments of the verb overtly, including case-marked subjects

(19) [moha xano=x̄ nokoo=xon=mun jato=n, hatza already woman=NOM arrive=SA.AFTER=C MATRIX 3PL=ERG yuca xoka=kan=xo=nu peel=3PL=3.PST=DECL ‘After the womeni arrived, theyi peeled yuca.’

4.2 Accounts of SR parasitic on agreeing T

- Some direct reference-tracking accounts of SR assume that SR is parasitic on agreement on T (Finer, 1984, 1985; Watanabe, 2000; Camachó, 2010)
  - These accounts posit subject agreement on T which is interpreted as SR through some mechanism at the CP level
  - These accounts (sometimes explicitly) rule out object tracking since the probe on T is assumed to only agree with the subject
- These accounts cannot straightforwardly capture the Amahuaca pattern in which C can show agreement with both the matrix and adjunct object

(20) [jaa=x̄ vua=xo=mun hinan xanoj̄ 3SG=NOM sing=SO.AFTER=C MATRIX dog,ERG woman chivan-vo=xo=nu chase-AM=3.PST=DECL ‘After shei sang, the dog chased the womani.’

(21) [joni=n hinoj̄ hiin=ha=mun pro, koshi man=ERG dog see=OS.AFTER=C MATRIX quickly ka=hi=ki=nu go=IPFV=3.PRES=DECL ‘After the man saw the dog, iti is running.’

- If we were to allow the probe on T to be insatiable, this could accommodate object tracking
- However, this is hard to reconcile with the attested agreement on Amahuaca T
  - Amahuaca tense markers indicate the person of the subject
  - The person of the object is never indicated on T
- Since Amahuaca T never inflects for object person, the more straightforward assumption is that T and C probe separately (Haegeman and van Koppen, 2012)
  - T’s probe is satisfied by any person features (it always agrees with the highest DP)
  - C’s probe has no satisfaction conditions (i.e. it is insatiable; it agrees with all DPs in its c-command domain)
- An additional issue with the accounts of Finer (1984, 1985) and Watanabe (2000) is that they require a mechanism of binding between matrix and adjunct C which is otherwise unnecessary

4.3 Bound anaphor accounts of CA

- Patterns of upward-oriented CA have been argued to involve local agreement between C and a bound anaphor in its specifier (Diercks, 2013)
- We could imagine that SR as a type of downward-and-upward-oriented CA may involve agreement with a DP argument in the adjunct clause and a bound anaphor in the specifier of the adjunct CP
- However, this type of account is inconsistent with the Amahuaca data
  - There is no distributional evidence that suggests adjunct CPs begin low enough in the structure to allow binding of an anaphor
– Even if adjunct CPs began low and obligatorily moved higher, they do not reconstruct for Condition C, (22)

– If there is no reconstruction for Condition C, it is unclear how there could simultaneously be reconstruction for anaphor binding

(22) [Floria=n_i, Maria_j, hiin-{xo}]=mun Maria=n_j, Floria_i, Floria=ERG Maria see=SO.AFTER=C MATRIX Maria=ERG Floria chivan-vo=xo=nu chase-AM=3.PST=DECL
‘After Floria_i saw Maria_j, Maria_j chased Floria_i.’

• An additional potential issue with this style of account lies in the nature of the agreement relationship between C and the anaphor
  – If the anaphor is in Spec,CP, purely downward Agree requires some additional mechanism to derive Spec-Head agreement
  – One proposal for how to subsume Spec-Head agreement under a general theory of downward Agree is through cyclic expansion
  – If cyclic Agree is assumed, we would need some stipulation to rule out the possibility of adjunct C_{max} continuing to probe

5 Predictions and typology

➤ SR can be accounted for with existing Agree technology
  • One question we might ask is why the majority of languages with SR only allow tracking of subjects
  • The current account suggests several possibilities for how such systems could arise

1. No object shift
  – In Amahuaca, object shift allows the object to escape the vP phase and be accessible to C’s probe
  – If a language lacks object shift, C will be unable to agree with object DPs, resulting in a subject-only tracking pattern

2. Case discriminating probe
  – It is possible that in a language with accusative alignment the probe on C is case-discriminating, agreeing only with nominative DPs
  – This would allow for subject-only tracking even in a language with object shift

3. Syncretism
  – It is possible that a language could have a probe on C that agrees with objects but lack dedicated morphology to spell out an object coreference relationship
  – Evidence that morphological syncretism may be a relevant factor comes from comparing the paradigms of different temporal adjunct Cs in Amahuaca
  – Even within a single language, different paradigms have differing degrees of syncretism with respect to the morphology available to indicate object coreference
(24)  a. ‘After’ series

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探射依存投影是可充分广义化的，即使到最大投影。

• 一个我们可能问的问题是我们为什么没有看到更多的最大投影作为探射。
  - 有许多常见的探射（v，T，补语C），c-依存域的最大力量仅包含选择它的头，通常不会具有正确的特征类型。
  - 与补语C，这个模式可能实际上其实是稍微被证实的，因为SR系统是相对常见的。

References


