Cyclic expansion in Agree: Maximal projections as probes*

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When we couple the cyclic expansion of a probe's domain assumed in Cyclic Agree (Rezac 2003, 2004; Béjar and Rezac 2009) with the lack of formal distinction between heads, intermediate projections, and phrases emphasized in Bare Phrase Structure (Chomsky 1995a,b), an interesting prediction arises. Maximal projections should be able to probe through the same mechanisms that allow intermediate projections to probe in familiar cases of Cyclic Agree. I argue that this prediction is borne out. I analyze agreeing adjunct C in Amahuaca (Panoan; Peru) as a maximal projection that probes its c-command domain in second-cycle Agree. This account derives C's simultaneous sensitivity to DPs within its own clause and in the clause to which it adjoins. Therefore, I conclude that Amahuaca provides evidence that maximal projections can be probes. The account also yields insight into the syntax of switch-reference in Panoan and beyond.

1 Introduction

The model of Cyclic Agree (Rezac 2003, 2004; Béjar and Rezac 2009) allows variability in the search domain of a probe. A probe on a head will first probe its c-command domain – the complement of the head. However, if the probe is not satisfied by the goal(s) it encounters on this cycle of probing (or if it encounters no goal), it can reproject along with the label of the head that hosts it. This results in a probe on the intermediate-level projection. The new c-command domain of the probe contains the specifier, which can now be a goal for Agree.

As Rezac (2003:158) notes, this type of cyclic expansion is made possible by Bare Phrase Structure (BPS; Chomsky 1995a,b), in particular the assumption that there is no distinction between the label of the head and the label of the intermediate-level projection. Interestingly, given the assumptions of BPS, there is also no formal distinction between intermediate and maximal projections. Therefore, the prediction of Cyclic Agree coupled with BPS is that maximal projections should also be able to serve as probes. This falls out from the same type of cyclic expansion that is necessary to derive probes on intermediate projections to facilitate Spec-head agreement.

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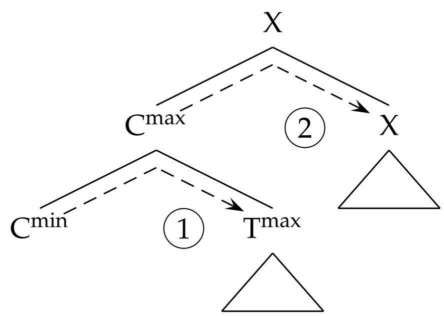
It is typically difficult to test this prediction. For many common probes for which cyclic expansion has been proposed, such as v, the c-command domain of the maximal projection only contains the head that selects it. On the assumption that this head (e.g. T, Asp, or similar) is merged without its own ϕ-features, there is no new goal for ϕ-Agree in the c-command domain of the maximal projection. It is thus difficult to tell whether the maximal projection is syntactically inert or is probing unsuccessfully. However, adjunction structures provide exactly the right type of testing ground for this prediction since adjuncts are not selected by a head and thus contain more material in their c-command domains than a single functional head.

In this article, I argue that this prediction of Cyclic Agree and BPS is borne out in the type of structure seen in (1).

(1)



In (1), the minimal projection of adjunct C first probes its c-command domain, T^{max}. However, the probe remains unsatisfied after this first cycle of Agree. When C reprojects to form a maximal-level projection, the probe on C reprojects as well as part of the label. The second cycle of Agree then involves a probe on C^{max} probing the c-command domain of the maximal projection.

Specifically, I argue for the existence of this type of structure in Amahuaca (Panoan; Peru), which displays an agreeing adjunct C that can agree not only with DPs in its own clause, but also with DPs in the clause to which it adjoins. In Amahuaca, I argue that adjunct C^{min} first probes DPs in its c-command domain, the adjunct clause. Because the probe on C remains unsatisfied, it reprojects. This allows adjunct C^{max} to probe its c-command domain and agree with DPs in the matrix clause to which it is adjoined. The data from Amahuaca therefore provide novel support for a cyclic model of Agree. They also suggest that the process of cyclic expansion and probe reprojection is fully generalizable. It is not limited to intermediate projections. Instead, even maximal projections can serve as probes.

The structure of the article is as follows. In section 2, I discuss the pattern of agreeing adjunct C in Amahuaca. I explore the syntactic structure of the relevant adjunct clauses and illustrate the various patterns of agreement that are possible on adjunct C involving both adjunct and matrix arguments. In section 3, I discuss the framework of Cyclic Agree in more depth to lay the groundwork for the analysis of the Amahuaca pattern. In section 4, I demonstrate that the pattern of agreeing adjunct C in Amahuaca can be straightforwardly derived by assuming that C probes in two cycles, with the second cycle of probing involving a probe on the maximal projection. I compare this analysis with previous analyses of similar phenomena in section 5, concluding that a Cyclic Agree account provides greater empirical coverage and requires the introduction of less additional technology than alternative accounts. Finally, I explore some questions and typological predictions raised by this style of account in section 6 and offer concluding remarks in section 7.

2 Amahuaca agreeing C

Amahuaca is an endangered Panoan language spoken in the Peruvian and Brazilian Amazon by approximately 500 speakers (Eberhard, Simons, and Fennig 2021). Data for this article were collected through my fieldwork in the district of Sepahua in Atalaya Province, Ucayali, Peru during four trips between June 2015 and July 2018. A total of 14 native speakers (9 female) ranging in age from approximately 25 to 80 were consulted, with a majority of the data coming from 4 primary consultants. Amahuaca is mostly head-final with head-initial C and Asp in matrix clauses (Clem 2021). It has base SOV word order, but this is often obscured by scrambling, which is available for both arguments and adjuncts. It is both head- and dependent-marking and shows a tripartite case alignment with nominative (=*x*), ergative (=*n*), and accusative (=∅) case. All three types of arguments – transitive subjects (A), intransitive subjects (S), and objects (O) – can also surface in a morphologically unmarked form under the right conditions. For a discussion of case patterns in Amahuaca and their analysis, see Clem 2019b.

The empirical focus of this article will be on temporal adjunct clauses in Amahuaca. In these clauses, the element that indicates the temporal relationship between clauses is an enclitic that typically surfaces on the verb, as shown in (2).[1]

(2)	[Jaa=x$_i$	vua=$\boxed{\text{xon}}$]=mun	xano=n$_i$	xuki	jova=xo=nu.
	3SG=NOM	sing=SA.AFTER=C$_{\text{MATRIX}}$	woman=ERG	corn	cook=3.PST=DECL

‘After she$_i$ sang, the woman$_i$ cooked corn.’

The morpheme =*xon* in (2) indicates that the two clauses are related sequentially (rather than simultaneously) and that the adjunct clause event (singing) took place prior to the matrix clause event (cooking). It corresponds roughly to a meaning like ‘after’. I will initially focus only on ‘after’ clauses, but ‘while’ and ‘before’ clauses show similar behavior and distribution. I return to a discussion of these other adjunct clause types in section 6.

2.1 The structure of ‘after’ clauses

‘After’ clauses in Amahuaca are large enough to contain various types of arguments and adjuncts and to allow multiple types of movement internal to them. This is consistent with their being full CPs. These clauses can contain all arguments of the verb overtly, as seen in (3) with a transitive verb and (4) with an intransitive verb.

[1] The following abbreviations are used in glossing: 1 = first person, 2 = second person, 3 = third person, AM = associated motion, C = complementizer, DECL = declarative, DFLT = default, EMPH = emphatic, ERG = ergative, GEN = genitive, INT = interrogative, IPFV = imperfective, LG = long form, NEG = negation, NOM = nominative, OS = object coreferential with intransitive subject, PFV = perfective, PL = plural, PRES = present, PST = past, RC = relative clause morphology, SA = subject coreferential with transitive subject, SG = singular, SO = subject coreferential with object, SS = subject coreferential with intransitive subject, TAM = tense/aspect/mood, TR = transitive.

(3) [**Xano=n**$_i$ chopa patza=$\boxed{\text{xon}}$]=mun *pro*$_i$ hatza
woman=ERG clothes wash=SA.AFTER=C_{MATRIX} manioc
jova=hi=ki=nu.
cook=IPFV=3.PRES=DECL
'After the woman$_i$ washed clothes, she$_i$ is cooking manioc.'

(4) [**Kiyoo-vini=x**$_i$ nokoo=$\boxed{\text{xon}}$]=mun *pro*$_i$ hatza
all-EMPH.LG=NOM arrive=SA.AFTER=C_{MATRIX} manioc
jova=kan=xo=nu.
cook=3PL=3.PST=DECL
'After everyone$_i$ arrived, they$_i$ cooked manioc.'

Like (2), these examples feature the enclitic *=mun*, a second-position clitic that is in the matrix C position. It is always preceded by exactly one syntactic constituent, regardless of that constituent's size (Clem 2019b).[2] This provides evidence in favor of the bracketing in (3) and (4). In (3), the ergative-marked subject *xanon* 'woman' and the unmarked object *chopa* 'clothes' appear overtly in the adjunct clause. Likewise, in (4) the nominative-marked subject *kiyoovinix* 'everyone' is in the adjunct clause. As mentioned before, Amahuaca shows differential case marking for subjects. I argue in Clem 2019b that ergative and nominative case assignment in Amahuaca involve agreement with T. Thus, the availability of ergative and nominative case in 'after' clauses provides evidence that there is a TP layer.

'After' clauses can also host adverbs, as seen in (5) with *koshi* 'quickly' and (6) with *moha* 'already'. (Given the possibility of overt arguments in all positions in Amahuaca 'after' clauses, I assume that missing arguments, as in (5), represent *pro* rather than PRO.)

(5) [*pro*$_i$ **koshi** ka=$\boxed{\text{xon}}$]=mun xano=n$_i$ hatza vana=xo=nu.
quickly go=SA.AFTER=C_{MATRIX} woman=ERG manioc plant=3.PST=DECL
'After she$_i$ went quickly, the woman$_i$ planted manioc.'

(6) [**Moha** xano=x$_i$ nokoo=$\boxed{\text{xon}}$]=mun jato=n$_i$ hatza
already woman=NOM arrive=SA.AFTER=C_{MATRIX} 3PL=ERG manioc
xoka=kan=xo=nu.
peel=3PL=3.PST=DECL
'After the women$_i$ arrived, they$_i$ peeled manioc.'

Finally, 'after' clauses can themselves contain other adjunct clauses, as in (7).

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

[2] The second-position effects exhibited by *=mun* are consistent with its being located in the left periphery of the clause. The fact that it disappears in embedded and interrogative contexts also suggests that this element is in the C domain.

In (7), one 'after' clause is nested within another. (Note that the entire adjunct structure occurs to the left of *=mun* in matrix C.) The resulting reading is that the woman first washed yams, then peeled manioc, then cooked corn.[3]

In addition to being able to host these various elements, these 'after' clauses allow clause-internal scrambling, like matrix clauses, as seen in (8).

(8) 'After I cooked paca, I peeled manioc.'

a. [Hiya=n hano jova=$\boxed{\text{xon}}$]=mun hun hatza vuro=ku=nu.
1SG=ERG paca cook=SA.AFTER=C_{MATRIX} 1SG manioc peel=1.PST=DECL

b. [Hano hiya=n jova=$\boxed{\text{xon}}$]=mun hun hatza vuro=ku=nu.
paca 1SG=ERG cook=SA.AFTER=C_{MATRIX} 1SG manioc peel=1.PST=DECL

In (8a) we see the base SOV word order, but in (8b) the object has scrambled above the subject to result in OSV word order in the adjunct clause.

In addition to argument scrambling, verbs can move to be clause-initial within 'after' clauses, as in (9).

(9) 'After the woman$_i$ boiled the meat, she$_i$ ate it.'

a. [Xano=n$_i$ nami kovin=xon]=mun *pro$_i$* ha=xo=nu.
woman=ERG meat boil=SA.AFTER=C_{MATRIX} do.TR=3.PST=DECL

b. [**Kovin** xano=n$_i$ nami=xon]=mun *pro$_i$* ha=xo=nu.
boil woman=ERG meat=SA.AFTER=C_{MATRIX} do.TR=3.PST=DECL

In (9b), we see that the verb *kovin* 'boil' has moved to the initial position within the adjunct clause, resulting in VSO order. This resembles matrix verb-initial orders, as in (10).

(10) **Choka**=mun xano=n kuntii=hi=ki=nu.
wash=C_{MATRIX} woman=ERG pot=IPFV=3.PRES=DECL
'The woman is washing a pot.'

I argue in Clem 2019b that matrix verb-initial orders are derived via remnant VP-fronting that targets Spec,CP. Absent evidence to the contrary, I assume that Spec,CP is the target of VP-movement within 'after' clauses, suggesting that 'after' clauses contain a CP layer.[4]

The availability of case-marked arguments and various adjuncts, as well as the acceptability of scrambling and remnant VP-fronting within 'after' clauses, suggests that they are quite large. I assume that these clauses are full CPs, in line with work on these types of clauses in other Panoan languages (Camacho 2010; Baker and Camargo Souza 2020).

[3]Given all of the material that can appear within 'after' clauses, one question that arises is whether there is any material that cannot appear in these clauses. There are some clitics that appear exclusively in matrix clauses in Amahuaca, and these are unable to appear in 'after' clauses. These include the matrix complementizers that vary with clause type, mood markers, and tense and aspect clitics that are restricted to matrix clauses (other types of clauses display different TAM morphology).

[4]Note that matrix C (*=mun* in (9) and (10)) is head-initial, occurring immediately after the constituent in Spec,CP. In contrast, I assume that adjunct C is head-final, occurring at the end of the clause, and I will argue that *=xon* in (9) is one instantiation of adjunct C.

I now turn to the external syntax of these adjunct CPs. These clauses always appear relatively high in the matrix clause. The most common positions for them are clause-peripheral, either clause-initial (to the left of =*mun*), as in (11a), or extraposed to a clause-final position, as in (11b). It is also possible for these clauses to appear in a nonperipheral position. Specifically, matrix material can move to an Ā-position above the adjunct clause, as shown with the matrix subject in (11c).[5] In this case, the matrix subject appears to the left of =*mun* and the adjunct clause appears to the right of =*mun*.

(11) 'After she$_i$ sang, the woman$_i$ is washing manioc.'

a. [*pro*$_i$ vua=$\boxed{\text{xon}}$]=mun xano=n$_i$ hatza
sing=SA.AFTER=C$_{\text{MATRIX}}$ woman=ERG manioc
choka=hi=ki=nu.
wash=IPFV=3.PRES=DECL

b. Xano=n$_i$=mun hatza choka=hi=ki=nu [*pro*$_i$
woman=ERG=C$_{\text{MATRIX}}$ manioc wash=IPFV=3.PRES=DECL
vua=$\boxed{\text{xon}}$].
sing=SA.AFTER

c. Xano=n$_i$=mun [*pro*$_i$ vua=$\boxed{\text{xon}}$] hatza
woman=ERG=C$_{\text{MATRIX}}$ sing=SA.AFTER manioc
choka=hi=ki=nu.
wash=IPFV=3.PRES=DECL

The example in (11a) suggests that the adjunct clause may occupy the specifier of matrix C, accounting for its position before =*mun*. The example in (11c) suggests that these clauses may also occupy a lower position within the matrix clause. However, it is ungrammatical for 'after' clauses to appear below aspect marking, as seen by the unacceptability of the minimally different example in (12).

(12) * Xano=n$_i$=mun hatza choka=hi [*pro*$_i$ vua=$\boxed{\text{xon}}$]=ki=nu.
woman=ERG=C$_{\text{MATRIX}}$ manioc wash=IPFV sing=SA.AFTER=3.PRES=DECL
'After she$_i$ sang, the woman$_i$ is washing manioc.'

The position to the right of aspect marking that the adjunct clause occupies in (12) is where matrix arguments appear when they remain in their externally merged positions (Clem 2019b). Therefore, the ungrammaticality of (12) suggests that it is not possible for these adjunct CPs to be merged below the base position of matrix arguments. It is important to

[5]The Spec,CP position occupied by the subject in (11c) can be independently shown to be an Ā-position by weak crossover. In (i), when the object *tzova* that serves as a negative indefinite scrambles to Spec,CP before =*mun*, a bound reading of the possessor of the subject is impossible. That is, a reading where no one was followed by her own chicken is ruled out. The ungrammaticality of the bound reading is the result of a weak crossover violation, suggesting that the position targeted by movement of the object is an Ā-position (see, e.g., Mahajan 1990 on weak crossover as a diagnostic for A- vs. Ā-scrambling).

(i) **Tzova**$_j$=mun **jan**$_{i/*j}$ hatapana=n chivan-vo=yama=xo=nu.
no.one=C$_{\text{MATRIX}}$ 3SG.GEN chicken.LG=ERG follow-AM=NEG=3.PST=DECL
'Her$_{i/*j}$ chicken followed no one$_j$.'

note that this does not seem to be due to the prosodic size of these clauses. It is grammatical for nominalized internally headed relative clauses to appear in this low position, as demonstrated in (13).[6] This indicates that the restriction on the position of adjunct CPs is truly syntactic, rather than being due to their prosodic properties.

(13) Juan$_i$=mun chivan-vo=hi [jan$_i$ jono vuchi=ha]=ki=nu.
Juan=C$_{\text{MATRIX}}$ chase-AM=IPFV 3SG peccary find=PFV.RC=3.PRES=DECL
'The peccary that he$_i$ found is chasing Juan$_i$.'

In principle, the ungrammaticality of structures like (12), with an adjunct clause to the right of aspect, could reflect the unavailability of a Merge position for the adjunct in the *v*P region of the clause. Alternatively, it could reflect a requirement that the clause move to a higher position. Deciding between these two options requires consideration of connectivity effects. Since the structures in question involve multiple clauses, the clearest potential evidence comes from Condition C. If adjunct clauses originated below the main clause subject and subsequently underwent Ā-movement higher in the clause (e.g. to Spec,CP), we would expect to find reconstruction for Condition C. Thus, R-expressions in the adjunct clause would be unable to occur in the presence of a coindexed matrix subject. This expectation is not met: regardless of the relative positions of an R-expression and a coreferential pronoun in (14) and (15), no Condition C violation is triggered.[7]

(14) 'After Maria$_i$ went quickly, she$_i$ washed clothes.'

a. [*pro*$_i$ koshi ka=$\boxed{\text{xon}}$]=mun Maria=n$_i$ chopa patza=xo=nu.
quickly go=SA.AFTER=C$_{\text{MATRIX}}$ Maria=ERG clothes wash=3.PST=DECL

b. [Maria$_i$ koshi ka=$\boxed{\text{xon}}$]=mun *pro*$_i$ chopa patza=xo=nu.
Maria quickly go=SA.AFTER=C$_{\text{MATRIX}}$ clothes wash=3.PST=DECL

[6] All of the adjunct clauses that I am aware of in Amahuaca form a class with the type of 'after' adjunct clause discussed here, as discussed further in section 6. The only other class of dependent clauses that I am aware of in Amahuaca is nominalized clauses, which is why these are used as a point of comparison. The division between the type of adjunct clauses discussed here and nominalized relative clauses has been murky in the literature on Amahuaca and related languages due to many similarities in their morphosyntactic properties. See Clem 2019a (p. 34–47) for a discussion of this issue and a set of diagnostics that can be used to distinguish nominalized relative clauses from adjunct clauses in Amahuaca. The similarity between nominalized internally headed relative clauses and adjunct clauses is also discussed in section 5.1.

[7] As an anonymous reviewer points out, whether Condition C reconstruction can be reliably used to diagnose Ā-movement depends on one's analysis of Condition C violations and reconstruction involving adjunct clauses. Further, in some languages there is variability in whether R-expressions in adjunct CPs give rise to Condition C violations. Amahuaca does not seem to display the type of variable effect seen in some languages. For example, Biskup (2011) argues on the basis of data from Czech that adjunct CPs where the relevant R-expression is backgrounded do not reconstruct for Condition C. However, this type of explanation cannot account for the Amahuaca data in question. In (6), the R-expression in the adjunct clause has overt nominative case, which I argue in Clem 2019b is used with narrow-focused constituents, ruling out a backgrounding analysis of the lack of a Condition C violation in that example. In section 5.2, I show that Amahuaca adjunct clauses also differ from similar adjunct clauses in Washo, which have been argued to have a low attachment site and do show Condition C effects (Arregi and Hanink 2021). I take the differences in Condition C patterns between Amahuaca and languages where low adjunction of CPs has been argued for to be indicative of a difference in the height of adjunction rather than a difference in how movement and reconstruction operate in Amahuaca.

In (14a), we see an example of an R-expression subject, *Maria*, in the matrix clause and a coreferential *pro* subject in the adjunct clause. In (14b), we find the reverse situation. The R-expression is now in the adjunct clause and the *pro* is in the matrix clause. Thus, we can see by comparing the two examples that an R-expression can be overt in either the adjunct clause or the matrix clause with a coreferential *pro* in the other clause without triggering a Condition C violation. The lack of a Condition C violation in (14b) is especially surprising from the point of view of an account that would posit a low attachment site for adjunct clauses with subsequent Ā-movement to Spec,CP of the matrix clause. The grammaticality of this example suggests that the adjunct clause does not reconstruct to a position below the coindexed matrix *pro*. The example in (15) shows that the situation is no different if the matrix clause contains an overt pronoun.

(15) Jaa=n$_i$=mun [Maria$_i$ koshi ka=$\boxed{\text{xon}}$] chopa patza=xo=nu.
3SG=ERG=C$_{\text{MATRIX}}$ Maria quickly go=SA.AFTER clothes wash=3.PST=DECL
'After Maria$_i$ went quickly, she$_i$ washed clothes.'

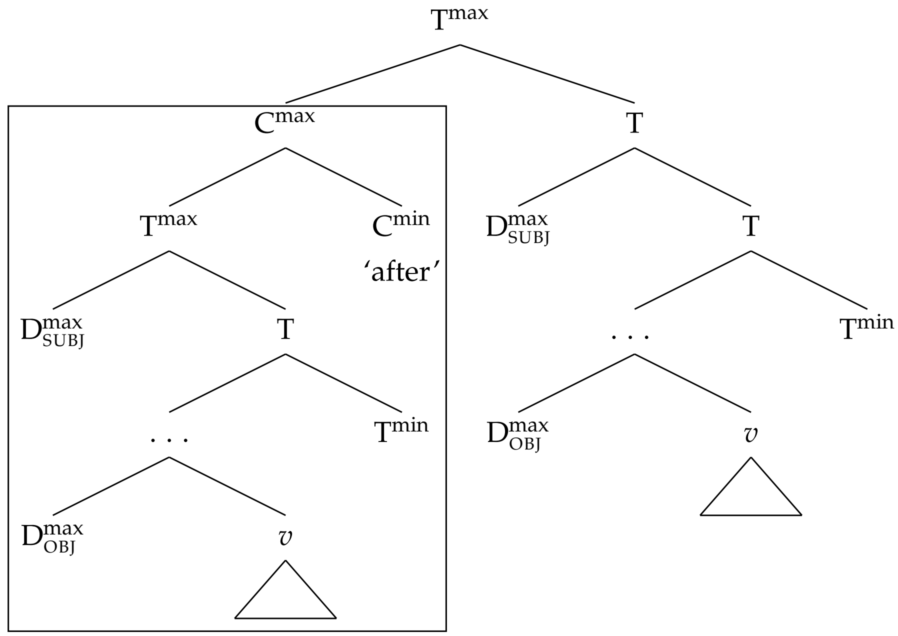
In (15), an R-expression subject appears in the adjunct clause and a coreferential overt third person singular pronoun, *jaan*, appears as the matrix subject. Here, the matrix pronoun moves to an Ā-position above the adjunct clause, but because this Spec,CP position is not an A-position, no Condition C violation is incurred. These data suggest, then, that even if adjunct CPs surface in a position higher than their base attachment site, they do not reconstruct to a position lower than the highest A-position of the matrix arguments.[8]

Given these data regarding the internal and external syntax of 'after' clauses in Amahuaca, I propose the basic structure in (16) for these temporal adjunct clauses.

[8]The lack of Condition C violations seen with 'after' clauses contrasts with the behavior of nominalized clauses, which were shown to have a low base position in (13). Even if a nominalized relative clause undergoes movement to an Ā-position higher than a matrix pronoun that is coreferential with an R-expression contained in the nominalized clause, a Condition C violation is incurred, as seen by the unacceptability of the coreferential reading in (i).

(i) [**Juanu=n**$_j$ jono vuchi=ha]=mun **jaa=n**$_{i/*j}$ chivan-vo=hi jan=ki=nu.
Juan.LG=ERG peccary find=PFV.RC=C$_{\text{MATRIX}}$ 3SG=ERG chase-AM=IPFV 3SG=3.PST=DECL
'He$_{i/*j}$ is chasing the peccary that Juan$_j$ found.'

This suggests that nominalized relative clauses do reconstruct to their low base position for Condition C. This contrast in Condition C effects between the two clause types provides further evidence that nominalized clauses have a base attachment site below the matrix subject while 'after' adjunct CPs do not.

(16)


As can be seen in (16), the adjunct clause (boxed) constitutes a maximal projection of C, with the element meaning 'after' lexicalizing C itself. These clauses adjoin to a projection of matrix T, above the position of the matrix subject and object.[9] This attachment site is consistent with the ungrammaticality of 'after' clauses appearing to the right of aspect, as shown in (12), as well as the evidence just seen from Condition C for the lack of reconstruction effects. I assume that adjunct clauses, like other adjuncts, can undergo subsequent Ā-movement from this position to occupy Spec,CP of the matrix clause.

2.2 *Agreement in 'after' clauses*

Thus far, all examples of 'after' clauses have been given with the morpheme *=xon* in C indicating the sequential temporal relationship between the adjunct and matrix clauses. However, this is not the only form that the morpheme meaning 'after' can take. In fact, there are five distinct enclitics that all indicate the meaning 'after'.[10] The choice among these morphemes is governed by coreference relationships between arguments in the matrix and adjunct clauses. This sensitivity to argument coreference between two clauses is the type of phenomenon that Jacobsen (1967) coined the term *switch-reference* (SR) to describe. He defined SR as occurring when "a switch in subject or agent . . . is *obligatorily* indicated in certain situations by a morpheme, usually suffixed, which may or may not carry other meanings in addition" (Jacobsen 1967:240, emphasis original).[11] As Jacobsen's definition suggests, SR markers often encode more information than coreference between arguments. In Amahuaca, one of the additional meanings that SR markers contribute is

[9] Here, I represent the object DPs in both clauses as being outside the VP. Evidence from remnant VP-fronting suggests that objects move to Spec,*v*P (Clem 2019b).

[10] I set aside here a sixth form that is a portmanteau of third person plural subject agreement and the element meaning 'after'. See footnote 20 for more details.

[11] A characterization of SR in terms of the reference of subjects or agents only is not sufficient. Amahuaca SR can also indicate coreference relationships involving object DPs.

information about the temporal relationship between clauses. Further, when an argument of the adjunct clause is coreferential with an argument of the matrix clause, the form of the SR enclitic is sensitive to the abstract case of the relevant arguments.[12]

The first of the five 'after' SR enclitics, the now-familiar *=xon*, is exemplified again in (17).

(17)

[Jaa=x$_i$	vua=$\boxed{\text{xon}}$]=mun	**xano=n**$_i$	xuki	jova=xo=nu.
3SG=NOM	sing=SA.AFTER=C$_{\text{MATRIX}}$	woman=ERG	corn	cook=3.PST=DECL

'After she$_i$ sang, the woman$_i$ cooked corn.'

In this example, the adjunct clause subject is coreferential with the matrix subject, which is the subject of the transitive verb *jova* 'cook'. The use of *=xon* indicates that the two subjects are coreferential, as well as the fact that the matrix subject bears abstract (and in this example overt) ergative case. In (18), we see a minimally different example where the matrix subject is the subject of the intransitive verb *chirin* 'dance'.

(18)

[Jaa=x$_i$	vua=$\boxed{\text{hax}}$]=mun	**xano**$_i$	chirin=xo=nu.
3SG=NOM	sing=SS.AFTER=C$_{\text{MATRIX}}$	woman	dance=3.PST=DECL

'After she$_i$ sang, the woman$_i$ danced.'

Here, the two subject DPs are still coreferential, and this is indicated by the form *=hax* in adjunct C. The contrast between *=xon* in (17) and *=hax* in (18) indicates that these morphemes are sensitive to the distinction between the abstract nominative case associated with the intransitive subject (S) in (18) and the abstract ergative case associated with the transitive subject (A) in (17).[13] In (19), the adjunct clause subject is coreferential with the matrix object DP, as indicated by the form *=xo*.

(19)

[Jaa=x$_i$	vua=$\boxed{\text{xo}}$]=mun	hinan	**xano**$_i$	chivan-vo=xo=nu.
3SG=NOM	sing=SO.AFTER=C$_{\text{MATRIX}}$	dog.ERG	woman	chase-AM=3.PST=DECL

'After she$_i$ sang, the dog chased the woman$_i$.'

This example demonstrates that coreference relationships involving object DPs can also figure in the calculus of the form of adjunct C. This is particularly interesting since much of the literature on SR beyond Panoan has assumed that only subjects figure in SR marking.[14] The marker *=xo* here also shows sensitivity to the unmarked abstract accusative case of the language. Comparing (17), (18), and (19), then, we see sensitivity to all three case values of

[12] This pattern of sensitivity to argument coreference, temporal information, and grammatical function (or abstract case) has been discussed in the descriptive literature on Amahuaca, most notably by Sparing-Chávez (1998, 2012), who refers to it as *interclausal reference*.

[13] Note that both transitive and intransitive matrix subjects can appear in a form that is morphologically unmarked for case, as seen for the intransitive subject in (18). Both ergative-marked and unmarked transitive subjects are treated equally by the SR system, and they pattern in a way that differs from nominative-marked and unmarked intransitive subjects as well as from unmarked objects. This suggests a difference between abstract and morphological case. Transitive subjects and intransitive subjects are abstractly differentiated for case even when they do not bear overt morphological case. For an account of how unmarked DPs still bear featural indications of abstract case, see Clem 2019b.

[14] I discuss how the Amahuaca system and the analysis I offer of it relate to the broader typology of SR marking in section 6.

Amahuaca's tripartite system.[15] In (20), we see the final coreference marker of the 'after' paradigm. Here, the adjunct clause object is coreferential with the intransitive subject of the matrix clause and adjunct C takes the form =*ha*.

(20)	[Joni=n	**xano**$_i$	vuchi=$\boxed{\text{ha}}$]=mun	**xano**$_i$	ka=xo=nu.
	man=ERG	woman	find=OS.AFTER=C_{MATRIX}	woman	go=3.PST=DECL

'After the man found the woman$_i$, the woman$_i$ went.'

This example illustrates that the adjunct clause object, and not just the matrix clause object, can affect the form of adjunct clause C. Notably, if no DP arguments are coreferential, a distinct default form =*kun* of adjunct C is used, as shown in (21).

(21)	[Joni$_i$	vua=$\boxed{\text{kun}}$]=mun	xano$_j$	chirin=xo=nu.
	man	sing=DFLT.AFTER=C_{MATRIX}	woman	dance=3.PST=DECL

'After the man$_i$ sang, the woman$_j$ danced.'

I assume that this marker =*kun*, which has been considered to be a different subject marker, does not explicitly encode disjoint reference, but rather serves as a morphological default. Reason to think that this marker is a default is that it can be used when an adjunct clause object is coreferential with a matrix transitive subject or when the objects of two clauses are coreferential, as these coreference relationships lack a dedicated marker. The full paradigm of the possible forms of adjunct C in 'after' clauses as a factor of coreference across clauses is given in table 1.[16]

[15]Further evidence that the SR system is indeed sensitive to case comes from the treatment of indirect objects and objects introduced by an applicative. These DPs always surface in an unmarked (accusative) form, like direct objects. Thus, all three types of objects appear to have the same case, and indeed, they are treated identically by the SR system. When the adjunct clause subject is coreferential with the matrix clause indirect or applied object, the same form =*xo* that is seen in (19) is used. See Clem 2019c for examples and discussion.

[16]In table 1, we see that there is an asymmetry between the matrix and adjunct clauses in sensitivity to the abstract case of the subject (or, alternatively, the distinction between S and A arguments). The S vs. A status of the matrix clause subject is reflected in the choice of SR marker, but the S vs. A distinction in the adjunct clause is collapsed. Interestingly, the characterization of Amahuaca case that I argue for in Clem 2019b allows for exactly this type of asymmetry. I argue that agreement with T is necessary for morphologically overt ergative and nominative marking, while agreement with v is all that is necessary to result in abstract case distinctions.

In matrix clauses, both ergative-marked and unmarked transitive subjects are possible. I argue that this is because the transitive subject in matrix clauses always agrees with v but may or may not agree with T. That means that the only consistently available features to distinguish the abstract case or grammatical function of a matrix clause argument will be the features received from v. These features provide a three-way distinction between abstract nominative (S), abstract ergative (A), and abstract accusative (O).

In contrast to the situation found in matrix clauses, the transitive subject of an adjunct clause invariably surfaces with overt ergative case. Following the analysis given for matrix clauses, this indicates that the subject in adjunct clauses always agrees with T. The result is that adjunct clause subjects, both S and A, will consistently bear a feature [T] from agreement with T. This feature allows for a unified treatment of adjunct clause subjects in the SR system. In contrast, there is no feature that consistently unifies S and A arguments in matrix clauses, yielding the attested three-way split in the SR morphology with respect to matrix argument case.

<table>
<tr><td colspan="2"></td><td colspan="3">Matrix</td></tr>
<tr><td colspan="2"></td><td>S</td><td>A</td><td>O</td></tr>
<tr><td rowspan="3">Adjunct</td><td>S</td><td rowspan="2">=hax</td><td rowspan="2">=xon</td><td rowspan="2">=xo</td></tr>
<tr><td>A</td></tr>
<tr><td>O</td><td>=ha</td><td colspan="2">=kun (DFLT)</td></tr>
</table>

Table 1: 'After' markers

While SR has been shown to have diverse properties crosslinguistically, it has been noted that many systems of SR share similarities with complementizer agreement and can potentially be analyzed as involving an agreeing complementizer (Watanabe 2000; Arregi and Hanink 2018, 2021). Drawing on the insight of these accounts, I will argue that the pattern of SR in Amahuaca involves an agreeing adjunct C. I also follow previous accounts of SR (such as Finer 1984, 1985; Watanabe 2000; Arregi and Hanink 2018, 2021) in assuming that this agreeing head is sensitive to referential indices (which I will model as ϕ-features, following Rezac 2004), rather than being sensitive to person and number features. This allows for the sensitivity to coreference relationships. Additionally, I assume that the agreeing complementizer copies case features, allowing for the sensitivity to (abstract) case. Particularly interesting for our purposes is that this adjunct C can reflect features of both adjunct and matrix arguments. To account for this pattern, I propose that cyclic expansion of the probe on C allows it to agree directly with DPs in the clause to which adjunct CP is adjoined.[17] In the following section, I introduce the core Cyclic Agree machinery that I make use of.

3 Cyclic Agree: The framework

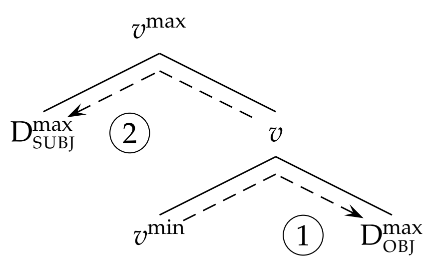
In accounting for the pattern of agreeing adjunct C in Amahuaca, I will assume that a probe's c-command domain can be cyclically expanded by successive instances of Merge, allowing the probe to agree with arguments in its own clause, but also in the matrix clause. This will be implemented via Cyclic Agree (Rezac 2003, 2004; Béjar and Rezac 2009).

The data that originally motivated Rezac's cyclic approach to Agree were patterns of *agreement displacement* (or *eccentric agreement*; Hale 2001). Agreement displacement generally refers to instances where the usual controller of agreement does not control agreement, and where ϕ-agreement is instead controlled by a different argument. Typically, this takes the form of an external argument exceptionally controlling agreement that is usually controlled by the internal argument. Rezac (2003) analyzes such cases of agreement displacement as involving a probe that usually agrees with a DP in its complement, but can exceptionally agree with a DP in its specifier if no accessible DP in the complement of the probe hosts the relevant ϕ-features.

[17] As discussed further in section 5, Arregi and Hanink (2018, 2021) and Baker and Camargo Souza (2020) also assume that the agreement relationship between the complementizer and the matrix DP is a direct agreement relationship, departing from the account of Camacho (2010), which assumes an indirect agreement relationship mediated by T, and accounts like that of Finer (1984, 1985) and Watanabe (2000), which assume an indirect relationship involving binding. In these other direct agreement accounts, however, it is assumed that C probes upward into the matrix clause from a low attachment site, which I argue is incompatible with the evidence for the high attachment site of adjunct CPs in Amahuaca.

This ability of a probe to agree with a DP in its specifier is not a stipulation and does not come with a generalized commitment to "Upward Agree." Instead, Rezac argues that it falls out naturally from the c-command condition on Agree, fine-grained cyclicity in the syntactic derivation, and the assumptions of Bare Phrase Structure (BPS; Chomsky 1995a,b). First, when a head that contains a probe is merged, the probe searches its c-command domain (Rezac 2003:159). It agrees with any eligible DPs in its complement (eligibility is determined by a combination of activity and locality (i.e. "closest c-command"), the details of which do not concern us here). If a probe cannot be valued by a DP in its complement (due to feature underspecification), this cycle of probing ends without the unvalued, uninterpretable feature on the probe being deleted. When the head hosting the probe reprojects to label the intermediate-level projection, the probe on the head that still contains an unvalued feature reprojects as well.[18] The c-command domain of this new segment of the probe is the specifier of its phrase. The probe is then able to probe this expanded c-command domain and agree with a DP in its specifier. This is exemplified for *v* in (22). First, the minimal projection of *v* probes its c-command domain, which contains the object DP (abstracting away from other VP-internal material). Next, the intermediate projection of *v* probes its c-command domain, which contains the subject DP.

(22)



This style of account based on probe reprojection relies on the lack of a formal distinction between a head (X^0) and intermediate-level projection (X'), foregrounded by BPS. Rezac argues that the search domain of a probe α cannot be naturally restricted to its complement because the complement has no privileged status. Rather, the complement is simply the sister of α on first Merge. The specifier is also a sister of α and should also be an eligible search space for α if α always probes its sister. The explanation, then, for why probes do not always agree with elements in their specifier lies in the notion of cyclicity. If all of the unvalued features on α have already been valued when the head that hosts it reprojects, it will not be able to probe again on a second cycle.

In Rezac 2003, the only instances of agreement displacement that are considered involve internal arguments that are underspecified for person or number features. Third person and singular number are taken to lack a representation in the syntax (in at least some languages). This means that a person probe cannot be valued by a third person goal because the goal lacks a person feature altogether. Béjar and Rezac (2009) expand the expected typology of agreement displacement by proposing that the feature structure of

[18] My interpretation of Rezac's analysis assumes that Merge and labeling/projection are two separate operations, with the relationship of sisterhood (and thus c-command) created by Merge, but with the resulting structure being labeled after Agree operations take place. For a precedent for the idea that labeling is not simultaneous with Merge, see Chomsky 2013. Note that, in keeping with the version of narrow cyclicity that I adopt here, I do not assume that labeling only takes place at the phase level.

probes can be more highly articulated. For example, a probe could be keyed specifically to a [SPEAKER] feature, with first person fully valuing the probe, but any local person valuing more features of a probe (i.e. [PARTICIPANT]) than a third person argument. With this revised understanding of probes, then, it is possible that a probe can agree with a goal that is specified for person features on the first cycle of Agree, but still continue to probe on a second cycle if it has not been fully satisfied.

At the heart of this Cyclic Agree account lies the observation that an unsatisfied probe is treated no differently on an intermediate projection of α than on a minimal projection of α. In both positions, it can probe its sister. Crucially, in BPS there is no formal distinction between the label of a maximal projection and the label of an intermediate-level projection. Thus, the same reasoning that leads us to expect that an intermediate projection of α should be able to serve as a probe predicts that the maximal projection of α should also be able to probe its c-command domain if the probe remains unsatisfied. This is because the same projection algorithm that labels intermediate projections is employed to label maximal projections. The same conditions that allow a head (and an associated probe) to reproject to the intermediate-level projection will allow this label to reproject to a maximal-level projection. Therefore, if an intermediate projection can host a probe, a maximal projection can host a probe as well. This is the prediction of Cyclic Agree coupled with BPS.

In most cases, it is not possible to test this prediction of the model. With common probes, such as v and T, the sister of the maximal projection will be the head that selects it. Therefore, the expanded c-command domain will not contain any goals that are merged with the types of inherent features that the probe is searching for. In this scenario, it is not possible to tell whether the maximal projection probes fruitlessly or is inert. However, in the following section I will argue that agreeing adjunct C yields exactly the right testing grounds to evaluate this prediction, and that the prediction is borne out.

4 Cyclic expansion and maximal projection probes

As outlined in the previous section, the prediction of a Cyclic Agree model, given the assumptions of BPS, is that maximal projections should be able to probe their c-command domain if the probe associated with the projection remains unsatisfied. No further additions to the theory are necessary to derive this outcome – rather, some stipulation would be needed to block it. I will argue that the pattern of agreeing adjunct C in Amahuaca 'after' clauses is derived via this type of cyclic expansion of the probe's domain to the c-command domain of the maximal projection. Therefore, this prediction of Cyclic Agree is borne out in the Amahuaca system.

In order to account for the Amahuaca pattern of agreeing C, I will adopt one further piece of technology that, like Cyclic Agree, is independently motivated from outside the domain of SR. I have so far spoken informally of a probe's remaining unsatisfied after probing, as a necessary condition for its probing again. This notion of satisfaction (and, correspondingly, unsatisfiedness) draws on Deal's (2015a) notion of *satisfaction features* for probes. Satisfaction features can be defined as particular featural specifications that cause probes to stop probing. Following Deal, I assume that a probe can interact with (i.e. copy back) other features in the set of ϕ-features even if those features will not serve to satisfy the probe. I illustrate this system of interaction and satisfaction with an example of Nez Perce complementizer agreement drawn from Deal 2015a. In Nez Perce (Sahaptian; USA), the ϕ-probe on C is specified as having the satisfaction feature [ADDR(ESSEE)] – it is satisfied by and halts its probing only upon reaching a second person argument. However, the probe can interact with (copy back to itself) all ϕ-features. If it encounters a first person argument, it can also copy the features of that argument onto the probe and may expone those features. It can also expone other features in the ϕ-feature geometry, such as number features. The fact that the probe on Nez Perce C is satisfied only by the feature [ADDR] but can interact with other features yields a pattern of agreement that is sensitive to the syntactic position of second person arguments relative to other arguments in the clause. Compare (23) with (24).

(23) ke-**m** kaa pro_{subj} cewcew-téetum pro_{obj}
C-2 then 2SG telephone-TAM 1SG
'when **you** call me' (Nez Perce; Deal 2015a: 184)

(24) ke-**m-ex** kaa pro_{subj} cewcew-téetu pro_{obj}
C-2-1 then 1SG telephone-TAM 2SG
'when **I** call **you**' (Nez Perce; Deal 2015a: 184)

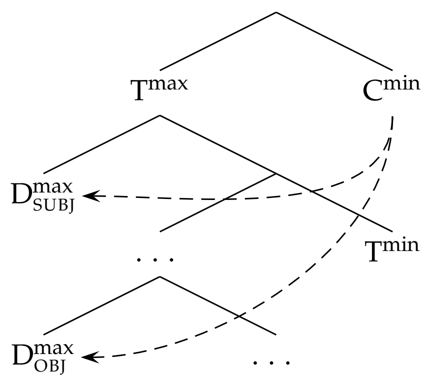
In (23), the subject is second person and the complementizer only expones second person features; it does not show agreement with the first person object. In contrast, in (24) the object is second person and the complementizer expones the first person features of the subject as well as the second person features of the object. The reason that only the complementizer in (24) shows first person agreement stems from the fact that the second person argument occupies a lower position in (24) than in (23). In (23), the second person argument is highest. The probe on C will encounter the second person subject first and will be satisfied by the [ADDR] feature, causing it to halt its search. In (24), on the other hand, the first argument that C's probe encounters will be the first person subject. It will interact with this argument, copying its features back to the probe, but it will not be satisfied since first person arguments lack an [ADDR] feature. This means that C will continue to probe past the subject to the second person object. Because C interacts with both a first and a second person argument (and because the agreement morphemes for first and second person are not in direct competition in Nez Perce), it will expone both first person and second person agreement. It is the ability to define satisfaction conditions that allows the probe to keep searching its c-command domain after interacting with a goal (see Halpert 2019 for another example of this type of pattern analyzed under an interaction-and-satisfaction model). Defining broader interaction conditions ensures that the probe will be able to copy back and expone more features in the geometry than the feature that satisfies it.

A distinctive feature of this theory is the natural way in which the separation of interaction and satisfaction conditions makes it possible to define an "insatiable" probe (Deal 2015b). If a probe entirely lacks satisfaction conditions, it will probe until it reaches a phase boundary; that is, it will probe and interact with all potential goals in its search domain.[19] With this notion of probe insatiability and Cyclic Agree, we are ready to examine the Amahuaca system of agreeing C in detail.

[19]What is needed to model the Amahuaca system is a way for a probe to enter into an Agree relation with all DPs in the adjunct and matrix clauses. Probe insatiability is one way to model this. Any competitor for an

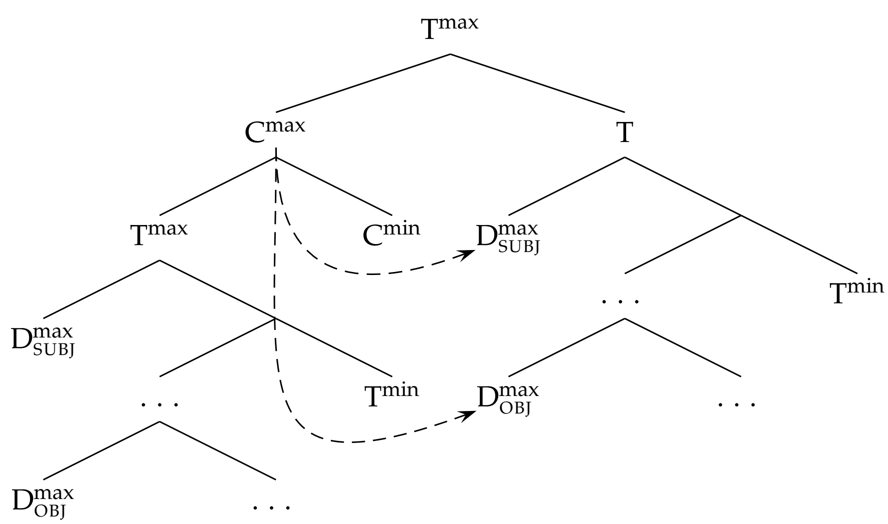
I propose that Amahuaca adjunct C hosts an insatiable probe. This means that adjunct C will probe all DPs in its c-command domain. First, when C^{min} is merged, it will probe its sister. This will contain the subject and the object of the adjunct clause, since object DPs undergo shift to the *v*P edge, escaping the *v*P phase. (See footnote 9 and Clem 2019b for additional details.) In this first cycle of agreement, the probe on C will copy features from both of the arguments of the adjunct clause, as schematized in (25).

(25)



Because C's probe is insatiable, C will remain unsatisfied after first-cycle probing, regardless of the feature specifications of the adjunct clause arguments. This means that when C reprojects to form a maximal projection, the probe on C will be reprojected as well and can probe again on a second cycle. The c-command domain of this new segment of C, C^{max}, will contain the matrix clause arguments. This is because C^{max} adjoins high in the matrix clause, above the highest A-position of the matrix subject and object, as evidenced by the lack of Condition C effects discussed in section 2.1. This means that on the second cycle of Agree, C^{max} will be able to probe into the matrix clause directly and agree with the matrix subject and object, as seen in (26).

(26)



interaction-and-satisfaction model of Agree must provide some way of allowing a probe to target all DPs in its c-command domain.

After this cycle of probing, C will not reproject again, and neither will the probe that it hosts. This means that C's probing will come to an end after this second cycle of probing. At this point, C will contain the features of both the matrix and adjunct clause arguments.

It is now worth considering what features on C will be relevant for determining the form of the Vocabulary Item that is inserted. Unlike prototypical ϕ-probes, Amahuaca adjunct C does not generally covary with the person and number features of any arguments of the two relevant clauses.[20] Instead, it is sensitive to argument coreference and to the abstract case of arguments. Sensitivity to coreference can be captured by assuming that C copies syntactically represented referential indices, which I assume are part of the bundle of ϕ-features, following Rezac (2004; see also Hicks 2009, Kratzer 2009, Moulton 2009, and Deal 2017b, among others, for the idea that indices can be present through the syntactic derivation and are similar to other features that DPs can bear, such as person features).

Now we must consider how abstract case features are transmitted to C under Agree. Recall that Amahuaca's case system is tripartite, showing a morphological distinction between nominative, ergative, and accusative case. This means that all three types of arguments (S, A, and O) are distinct in terms of case features. I assume, following the analysis I give in Clem 2019b, that the abstract featural representation of case is sufficient to differentiate all three types of DPs for the purpose of selecting the correct morpheme to spell out adjunct C, even when case is unmarked morphologically. The question, though, is how such features are copied to C, since case features are not typically assumed to be part of the ϕ-geometry. The idea that case can affect Agree relations is not without precedent in the literature (see, e.g., Chomsky 2000 on activity, Béjar and Rezac 2003 on Person-Case Constraint effects, Preminger 2014 on case-discriminating agreement, and Deal 2017a on syntactic ergativity). However, it is not typically assumed that case features are copied onto probes (though see Georgi 2013 for an analysis that does utilize case feature copying).

Recall that we are assuming a distinction between a probe's interaction and satisfaction conditions. Deal (2015a) hypothesizes that a probe that is satisfied by a ϕ-feature interacts with the full set of ϕ-features, according to the formulation in (27).

(27) Interaction (Deal 2015a:180)
A probe may interact with feature set F even if it may only be satisfied by feature set G, where F,G $\subseteq \Phi$ (the set of ϕ-features) and F $\neq$ G

Under these assumptions, a probe may essentially interact with all ϕ-features, regardless of its satisfaction conditions.The problem, then, is that case features are not typically assumed to fall into the set of ϕ-features. Notably, this is only an issue if we assume that interaction conditions are uniformly restricted to ϕ for all ϕ-probes. If instead we assume that interaction conditions, like satisfaction conditions, can vary by probe, this is not an issue. Specifically, the sensitivity of a ϕ-probe to case features is not problematic if we allow interaction conditions to be specified in terms of multiple disjoint sets of features. If we

[20] This is true for instances of C that indicate argument coreference, but is more complicated for those that are used when there is no coreference between arguments. Here, person and number features are relevant for the spell-out of C. Specifically, if the subject of an 'after' clause is a third person plural DP, the form of C will be *=havan* instead of the default *=kun*. This suggests that the probe on C does copy person and number features from the DPs that it interacts with, even if it does not typically expone those features.

make this assumption, then defining a probe that will copy back case features is straightforward. We can specify the interaction conditions of the probe on Amahuaca adjunct C as $\{\phi, \mathcal{K}\}$ (with $\mathcal{K}$ representing the set of features that are used to differentiate DPs via abstract case). This will allow the probe to copy back ϕ-features, including referential indices, as well as case features from all DP goals.

I now turn to the details of Vocabulary Insertion. If two of the DPs that Amahuaca C has agreed with share the same referential index, this will license the insertion of one of the various coreference markers in C. The choice of marker will be determined by the abstract case features of the DPs that are involved. The proposed Vocabulary Items for the series of 'after' markers are given in (28).

(28) 'After' Vocabulary Items

$\{\{$AFTER,$\{i$,T$\}\}$, $\{i$,NOM$\}\}$	$\leftrightarrow$	/hax/
$\{\{$AFTER,$\{i$,T$\}\}$, $\{i$,ERG$\}\}$	$\leftrightarrow$	/xon/
$\{\{$AFTER,$\{i$,T$\}\}$, $\{i$,ACC$\}\}$	$\leftrightarrow$	/xo/
$\{\{$AFTER,$\{i$,ACC$\}\}$, $\{i$,NOM$\}\}$	$\leftrightarrow$	/ha/
$\{\{$AFTER$\}\}$	$\leftrightarrow$	/kun/

Note, first, that for each of the four coreference markers there are five relevant features that must be matched for a Vocabulary Item to be inserted. The feature [AFTER] indicates that a sequential temporal relationship holds between the two clauses. This feature serves to distinguish markers in this paradigm from SR markers in other paradigms, such as the simultaneous paradigm. In addition to this temporal meaning, each of the coreference markers indicates something about the featural content of two DPs that the probe has agreed with, indicated in two separate feature sets within braces.[21] In formulating these Vocabulary Items, I assume that the features on probes are structured as nested sets, as indicated by the use of braces.[22] I propose that feature sets on probes are structured in two different ways. First, a set of features copied from a single goal remains differentiated as a set from the features copied from distinct goals (see Deal's (2015a) discussion of first person plural inclusive morphology in Nez Perce for an argument that such differentiation is needed at some stages of Vocabulary Insertion). This type of structure is needed to ensure that index and case features copied from a single DP remain associated with each other and are together differentiated from the index and case features copied from all other DPs. Second, I assume that when a probe reprojects, the set of features present on the probe prior to reprojection forms a nested set within the set of features present on the probe after reprojection. This means that the features received on a second cycle of Agree (in this case, features of the matrix clause arguments) will be distinguishable from features received on the first cycle of Agree (in this case, features of the adjunct clause arguments).[23]

[21]If one or both of the clauses involved is transitive, C will have agreed with more than two DPs. Only the features of DPs in coreference relationships will be relevant for choosing between Vocabulary Items. The features of the other DPs will be ignored, as discussed in relation to (29).

[22]I depart from the typical use of square brackets around features in Vocabulary Items to emphasize that bundles of features are treated as nested sets. This assumption will be crucial for the discussion of how the Subset Principle applies to these feature sets.

[23]It is necessary for Béjar and Rezac (2009) to assume that features received on the first cycle of agreement are sometimes treated differently than features received on the second cycle of agreement for the purpose of

Consider now the specific Vocabulary Items in (28). We see that the Vocabulary Item for =*hax* indicates that an adjunct clause argument and a matrix argument share a referential index, represented by *i*. An additional condition on the insertion of this Vocabulary Item is that the adjunct clause DP, which corresponds to the first, most embedded DP set, is a subject. This is achieved through the feature [T], which results from subject agreement with T.[24] This feature is one of several features that I argue in Clem 2019b is involved in the calculus of case spell-out, and is therefore copied as part of the feature set $\mathcal{K}$. The final condition on the insertion of =*hax* is that the matrix DP is an intransitive subject (i.e. that it has abstract nominative case). This final condition is enforced by the feature [NOM] on the matrix DP. The Vocabulary Item =*xon* is minimally different from =*hax*. It indicates that the coreferential matrix argument is a transitive subject, via the feature [ERG]. The enclitic =*xo* indicates that the relevant matrix argument is an object bearing an [ACC] feature. The morpheme =*ha* is inserted when the adjunct clause object ([ACC]) is coreferential with a matrix clause intransitive subject ([NOM]). Finally, the marker =*kun* is sensitive only to the temporal relationship between the clauses and not to coreference relationships. Assuming standard competition mechanisms in Distributed Morphology (Halle and Marantz 1993), this marker will serve as the default and will be inserted when no more highly specified Vocabulary Item can be inserted in C.

To see how this proposal works for an example, consider the sentence in (29).

(29) [Jaa=x$_i$ vua=$\boxed{\text{xon}}$]=mun xano=n$_i$ xuki$_j$ jova=xo=nu.
3SG=NOM sing=SA.AFTER=C$_{\text{MATRIX}}$ woman=ERG corn cook=3.PST=DECL
'After she$_i$ sang, the woman$_i$ cooked corn.'

When the adjunct clause C has completed both cycles of probing, it will have agreed with the adjunct clause subject and the matrix clause subject and object. This means that adjunct C will (minimally) have the features shown in (30a).[25]

(30) a. Features of adjunct C in (29)
{{AFTER,{i,NOM,T,Foc}}, {i,ERG,T}, {j,ACC}}
b. Features of =*xon* Vocabulary Item
{{AFTER,{i,T}}, {i,ERG}}

Here, C contains sequential temporal information, the features of an overtly nominative-marked DP from the first cycle of agreement (abstract [NOM], plus a [T] feature and a [Foc]

Vocabulary Insertion. They accomplish this by assuming that morphemes are sensitive to which projection of the probe they spell out (e.g. v^{min}, v). This approach will not yield the desired results in Amahuaca, since all SR morphology is inserted after both cycles of probing. However, the nested feature sets I assume provide an alternative way of capturing this sensitivity that is compatible with the Amahuaca data, as well as the data discussed by Béjar and Rezac (2009). Hammerly (2020:213–214) assumes ordered sets to capture sensitivity to cyclic probing. For SR, though, since more than one DP will be agreed with in each clause, it is not sufficient to reference the order in which they are agreed with. Rather, direct sensitivity to whether the probe has reprojected is what distinguishes adjunct from matrix arguments.

[24]See footnote 16 for a discussion of how this featural characterization of adjunct clause subjects is in line with evidence from the patterns of case assignment in adjunct clauses and the analysis of Amahuaca case I give in Clem 2019b.

[25]I do not represent person and number features here. Since these will be third person singular for all of the involved DPs, they may actually be unspecified.

feature),[26] the features of an overtly ergative-marked DP from the second cycle (abstract [ERG] plus a [T] feature), and the features of an object (accusative) DP from the second cycle. Crucially, the nominative and ergative DPs share a referential index. We can see that for each nested set of features, the features of the SR marker =*xon* in (30b) are a subset of the features on C. In order to allow this Vocabulary Item to be inserted, we need an implementation of the Subset Principle that allows it to apply to each nested set. I propose that the Subset Principle can apply recursively to nested sets. Specifically, I assume that the subset calculation begins with the innermost level of embedding in the nested representation.[27] In this instance, it will begin by comparing the set {*i*,NOM,T,Foc} on C with the set {i,T} on the Vocabulary Item. Since the set within the Vocabulary Item is a proper subset of the set on C, these sets will be treated as identical for future calculations. I assume that when two sets have already been evaluated and have been determined to conform to the Subset Principle, the set on the syntactic terminal will be updated to exactly match the corresponding set on the Vocabulary Item for future cycles of evaluation.[28] After the innermost level of embedding is evaluated, the set that contains it will be evaluated with respect to the Subset Principle. In this case, with the innermost set on C undergoing replacement, the set {AFTER,{*i*,T}} will appear both on C and in the Vocabulary Item, conforming to the Subset Principle. This calculation will continue recursively until the outermost set is determined to conform to the Subset Principle.

With this implementation of the Subset Principle, the Vocabulary Item =*xon* will match the features on C in (30a). Moreover, there is no Vocabulary Item in (28) that matches a larger subset of the features on C. Therefore, =*xon* will be inserted. In this derivation, the features of the object DP, while copied to C, do not affect Vocabulary Insertion, because there is not a Vocabulary Item that matches the features of the coreferential subject DPs and indicates anything about the object (nor is there a Vocabulary Item that indicates explicitly that either subject is disjoint from an object). Further, many of the features related to the morphological exponence of case on the two subject DPs do not affect the choice of SR marker since there is no SR marker that is more highly specified to indicate the full set of features needed for morphologically overt nominative or ergative case rather than abstract case.

The account outlined here builds on the insight of Watanabe (2000) and Arregi and

[26]See Clem 2019b for a discussion of the relationship between overt nominative case and focus.

[27]One question that arises for this conceptualization of the Subset Principle is what will happen if there is not parallelism in the levels of nesting on the probe compared with the Vocabulary Item. In such a situation, we might ask how it is to be determined which sets should be compared. Note that for the current account, since C is insatiable, it is assumed that C will always probe its c-command domain and reproject to probe the c-command domain of the maximal projection. This issue of a lack of parallelism will therefore not arise. However, a lack of parallelism could arise in configurations where the number of cycles of probing is variable and is sensitive to the features of the goals. I leave it as a question for future research how such situations should be handled.

[28]There are other imaginable ways of implementing this. It could be that the full feature set from C replaces the corresponding feature set on the Vocabulary Item after it is evaluated, as an anonymous reviewer suggests. Another possibility is that both sets are replaced with a placeholder feature. For the current case, each of these options could derive the desired results. However, I choose the current implementation as it preserves information about the exact number of features on C that are matched by the Vocabulary Item. While inconsequential here, this level of granularity may be needed to adjudicate between competing Vocabulary Items in some cases.

Hanink (2018, 2021) that SR is a form of complementizer agreement. It is complementizer agreement that is sensitive to the features of arguments in two different clauses. An advantage of the current account's formalization of this idea is its parsimony: each major component of the technology needed to account for this pattern of SR has been argued to be independently necessary on the basis of evidence from distinct empirical domains. There are independent arguments for Cyclic Agree (see Rezac 2003 and Béjar and Rezac 2009 on agreement displacement crosslinguistically),[29] for insatiable probes (see Deal 2015b on Nez Perce verbal agreement), and for treating indices as ϕ-features (see Rezac 2004 on English copy-raising constructions). The combination of these existing technologies and assumptions yields the correct results for SR. In the following section, I compare the current analysis with previous accounts of similar phenomena and demonstrate that this account gives better empirical coverage while also avoiding the introduction of additional mechanisms into the theory.

5 Previous analyses

Many recent accounts of SR have assumed, as I do, that Agree is involved in the calculus of SR marking. Within these types of accounts, a division can be made between accounts that assume that the relationship between the head involved in SR and the relevant matrix argument is direct an accounts that assume it is parasitic on another agreement relationship. In addition to Agree-based accounts, there have been analyses of SR that assume it can be reduced to some more familiar structure, such as coordination or control, with no recourse to agreement involving referential indices. In this section, I discuss all three types of accounts.[30] I demonstrate that previous approaches face empirical challenges in light of the full range of Amahuaca data. Here, I will focus on three specific facets of the Amahuaca pattern that prove to be difficult to capture under competing analyses: (a) the sensitivity of SR to the reference of object DPs, (b) the high attachment site of SR clauses, and (c) the simultaneous availability of overt coreferential subjects in both the adjunct and the matrix clause.

5.1 Accounts of switch-reference parasitic on agreeing T

The first set of Agree-based accounts of SR that I will consider posits that patterns of SR are parasitic on agreement on T (or some close equivalent – Infl, AgrS, etc.). These accounts propose that subject agreement on T is interpreted as SR through some mechanism at the CP level, the exact details of which vary from account to account. Since subject agreement is what is relevant for SR, these accounts (implicitly or explicitly) rule out object tracking

[29]Note, however, that my implementation of sensitivity to the cycle of probing in Vocabulary Items differs from that assumed by Béjar and Rezac (2009).

[30]The set of accounts considered here is not exhaustive. Among other things, I set aside most accounts that concern themselves with what has been called *noncanonical switch-reference* (Stirling 1993). This term refers to a phenomenon where subjects that are disjoint can trigger "same subject" marking or subjects that are coreferential can trigger "different subject" marking – that is, it is not the referential indices of arguments, or any notion of sameness of arguments, that is tracked. In systems that allow such "unexpected" same- or different-subject marking, it has been argued that the SR system is sensitive to sameness of topic situation rather than argument coreference (McKenzie 2012). The Amahuaca system (along with many other systems of SR) does not show evidence of this noncanonical pattern of SR marking.

of the type found in Amahuaca. They take this to be a welcome prediction, to the extent that they address it, since it has been widely assumed (often implicitly) that subjects are the only arguments relevant for SR. Instead, they predict that all examples that involve noncoreferential subjects should receive a default marker (like Amahuaca =*kun*), regardless of coreference relationships involving other arguments. In this section, I show how the predictions of these accounts are problematic, given the Amahuaca data.

The first account I will consider is that of Watanabe (2000). Watanabe offers an update of Finer's (1984; 1985) binding theory account of SR into Minimalism.[31] Following Finer, he views the distinction between same-subject (SS) markers and different-subject (DS) markers as mirroring the distinction between anaphors and pronominals. The basic idea is that the matrix C and the embedded C,[32] which surfaces as a SR marker, each have features of the subjects of their respective clauses. If they share the same features, the embedded C is bound and surfaces as a SS marker. If they have different features, the embedded C is free and surfaces as a DS marker.

For Watanabe, the features present on C in each clause are always the features of the subject of the clause. This is because C receives features from T via head movement and T receives the features of the subject via subject agreement. Therefore, only subject coreference relationships figure in SR.

An account that differs somewhat from the Finer-style binding approach to SR but that also involves direct reference-tracking parasitic on agreeing T is that of Camacho (2010). Like other Agree-based theories, it involves exchange of ϕ-features between clauses to yield SS marking. However, it differs from accounts like Watanabe's in assuming that the SR head does not establish a referential dependency with a superordinate C.

Camacho's analysis of SR is designed to account for the transitivity sensitivity of Panoan SR systems, based on data from Shipibo. Like those in Amahuaca, SS constructions in Shipibo are sensitive to whether the matrix subject is a transitive or intransitive subject. Camacho argues that SS marking is triggered by an uninterpretable case feature on the SR marker. He posits that the case feature is composed of an uninterpretable ϕ-feature and an uninterpretable tense feature. The [$u\phi$] feature on the SS marker triggers the SR morpheme in C to agree with the subject of its clause, which has also agreed with T. Camacho assumes that only the matrix T has valued interpretable T features, so the [uT] feature on the SS marker will result in its probing matrix T.[33] Since matrix T will have agreed with the matrix clause subject, it will bear the matrix subject's ϕ-features. Camacho assumes that the ϕ-features on SR C and matrix T must be the same in order for the Agree operation to be successful.[34] This means that if the subjects of the two clauses have the same features,

[31]Finer's (1984, 1985) account served as a departure point for many later generative accounts of SR (e.g. Hale 1992; Watanabe 2000; Nonato 2014). I will not consider here all of the updates that have been proposed to Finer's theory since most rely on the same basic mechanisms of binding.

[32]Throughout, I uniformly refer to T and C, even though the accounts I consider may use slightly different, but essentially equivalent, labels for these projections.

[33]Note the similarity here to Assmann's (2012) treatment of Quechua SR. Assmann assumes that the SR clause T in Quechua has an unvalued tense feature, which causes it to probe the matrix T. The two T heads can only successfully enter an Agree relation if all of the features on them match. Since each instance of T will have agreed with the subject of its respective clause, this means the subject must be the same for Agree to take place. Under Assmann's account, SS marking is the reflex of successful tense agreement, while DS marking is a default value inserted when Agree fails.

[34]Camacho (2010) discusses a few possible scenarios with respect to the ϕ-features from the two subjects.

Agree will be successful, resulting in a SS clause.

In DS clauses, Camacho argues that no such Agree relation is established between the SR marker (C) and other elements. He assumes that DS markers lack [$u\phi$] and [uT] (i.e. they lack an uninterpretable case feature) and thus do not participate in Agree. There is therefore nothing in the derivation of a DS structure that actually rules out coreference of subjects. Camacho relies on a type of economy condition to rule out coreferential DS structures. He argues that spreading ϕ-features via Agree (as in a SS derivation) is more economical than merging the same ϕ-features twice in two separate DPs. So the availability of a SS derivation with Agree will block a more costly DS structure.[35]

Like other parasitic agreement accounts, Camacho's system is not designed to allow for object tracking since agreement between clauses is mediated through T, which agrees with the subject. Interestingly, Valenzuela (2003) argues that Shipibo has a SR marker *-a* that indicates that the object of the SR clause is coreferential with the subject of the matrix clause. This marker is cognate with Amahuaca's SR marker *=ha*, which indicates coreference of the adjunct clause object with the matrix intransitive subject. Camacho briefly mentions the purported SR marker *-a* in Shipibo, but notes that, at the very least, a homophonous marker exists in the relative clause system. He analyzes *-a* as a relative clause marker rather than as a true SR marker, putting it outside the scope of his account.

Interestingly, the cognate Amahuaca *=ha*, when used in constructions where the adjunct clause object is coreferential with the matrix intransitive subject, does show behavior of a SR marker. This is in addition to the use of a homophonous marker *=ha* that functions as a perfective aspect marker in relative clauses. The fact that there are two separate *=ha* markers, one for relative clauses and one for SR clauses, can be shown via extraction tests. Relative clauses are islands while SR clauses are not. This can be seen in the contrast between (31) and (32). In (31), we see an example of a SR clause with the SR marker *=xon*. The example in (31b) demonstrates that it is possible to move an argument out of the SR clause to the initial position before *=mun*, which is a focus position (Clem 2019b).

One scenario is that one of the two subjects is *pro* and lacks valued ϕ-features. In this case, the link established via Agree will result in feature valuation of the ϕ-features of *pro* with the ϕ-features of the overt argument in the other clause. This valuation can happen from SR clause to matrix clause or vice versa. However, as in Amahuaca, in Shipibo it is possible to have an overt subject in both clauses (Camacho and Elías-Ulloa 2010). In this case, Camacho assumes that both subjects have their own valued ϕ-features, but that "some grammatical principle ensures that the ϕ-feature values of the two agreeing categories cannot have contradictory indices" (Camacho 2010:261).

[35] It is not clear to me how this solution rules out DS structures with two overt subjects when SS structures with two overt subjects are possible. Camacho (2010) remarks that this economy condition is not at play when there is an overt subject in both clauses since overt DPs will enter the derivation with valued ϕ-features. However, he only considers an example with disjoint subjects. The other point he makes regarding a scenario with two overt subjects is this: "Notice that if both clauses have a coindexed DP, the structure would result in a violation of [Condition] C of the Binding Theory" (Camacho 2010:263). However, this would clearly not be the case if the two DPs were pronouns (pronouns are not subject to Condition C), and a Condition B violation could not rule out such a configuration either since the pronouns would be in separate CPs (a fact that presumably allows two pronominal subjects in SS constructions).

(31) ‘After the woman$_i$ cooked meat, she$_i$ washed manioc.’

a. [Xano=n$_i$ nami jova=$\boxed{\text{xon}}$]=mun *pro*$_i$ hatza
woman=ERG meat cooked=SA.AFTER=C$_{\text{MATRIX}}$ manioc
choka=xo=nu.
wash=3.PST=DECL

b. **Nami**$_j$=mun [xano=n$_i$ t$_j$ jova=$\boxed{\text{xon}}$] *pro*$_i$ hatza
meat=C$_{\text{MATRIX}}$ woman=ERG cooked=SA.AFTER manioc
choka=xo=nu.
wash=3.PST=DECL

The situation seen with the SR clause in (31) contrasts with the situation found in (32). Here, we have an internally headed relative clause with the final morphology *=haton*, which indicates a perfective relative clause marked with ergative case in the matrix clause.

(32) ‘The man who found a howler monkey is eating meat.’

a. [Joni roho vuchi=hato]=n=mun nami
man howler.monkey find=PFV.RC.LG=ERG=C$_{\text{MATRIX}}$ meat
pi=hi=ki=nu.
bite=IPFV=3.PRES=DECL

b. * **Roho**$_i$=mun [joni t$_i$ vuchi=hato]=n nami
howler.monkey=C$_{\text{MATRIX}}$ man find=PFV.RC.LG=ERG meat
pi=hi=ki=nu.
bite=IPFV=3.PRES=DECL

In the example in (32b), a nonhead argument from within the relative clause has been moved to the initial focus position before *=mun*. The result is ungrammatical. This indicates that relative clauses, unlike SR clauses, are islands for extraction.

With this difference between SR clauses and relative clauses in mind, we now return to the status of the marker *=ha*. When *=ha* is used in constructions where the adjunct clause object is coreferential with the matrix intransitive subject (which is where Shipibo *-a* should be used as a SR marker), the *=ha*-marked clause is not an island for movement. This is demonstrated in (33).

(33) ‘Who cooked the manioc that fell?’ (*Literally* ‘After who cooked the manioc$_i$, it$_i$ fell?’)

a. [Tzova=n hatza$_i$ jova=$\boxed{\text{ha}}$]=ra *pro*$_i$ pakuu=hax?
who=ERG manioc cook=OS.AFTER=INT fall=TAM

b. **Tzova=n**$_j$=ra [t$_j$ hatza$_i$ jova=$\boxed{\text{ha}}$] *pro*$_i$ pakuu=hax?
who=ERG=INT manioc cook=OS.AFTER fall=TAM

In (33), we see *=ha* clauses whose object, *hatza* ‘manioc’, is coreferential with the *pro* matrix subject. The subject of each *=ha* clause is a *wh*-word, *tzovan*. In *wh*-questions in Amahuaca, the *wh*-word need not overtly move to a position before the second-position interrogative clitic *=ra*. However, movement of the *wh*-word to a position before *=ra* is possible and mirrors the focus movement of a constituent to the position before the second-position clitic =*mun* in declaratives that was seen in (31b). In (33a), we see a configuration where the entire =*ha* clause that contains a *wh*-word appears before =*ra*, while the *wh*-word itself remains in its usual subject position within the =*ha* clause. In (33b), we see that it is also possible for the *wh*-word *tzovan* to move out of the =*ha* clause to the position before =*ra*. The clause marked with =*ha* here is not an island. We can therefore conclude that this clause must be a SR clause rather than a relative clause. This means that =*ha* can function as a SR marker in Amahuaca.

As mentioned previously, there appears to be another homophonous =*ha* in Amahuaca that serves as a relative clause aspect marker. That is, not all clauses marked with =*ha* behave like SR clauses. Some =*ha* clauses are islands, as demonstrated in (34).

(34) 'Who saw the man that the alligator bit?' (*Literally* 'The alligator bit the man that who saw?')

a. [Tzova=n joni hiin**=ha**]=ra kaputo=n pi=hax?
who=ERG man see=PFV.RC=INT alligator.LG=ERG bite=TAM

b. * **Tzova=n**$_i$=ra [t$_i$ joni hiin**=ha**] kaputo=n pi=hax?
who=ERG=INT man see=PFV.RC alligator.LG=ERG bite=TAM

In (34), we see =*ha* clauses whose object serves as the matrix clause object. Once again, the subject of the =*ha* clauses is the *wh*-word *tzovan*. In (34a), the entire =*ha* clause appears before =*ra*. Interestingly, in (34b), when the *wh*-word *tzovan* moves out of the =*ha* clause to appear before =*ra*, the result is ungrammatical. This means that the =*ha* clause here is an island, consistent with its being a relative clause. Thus, in Amahuaca, =*ha* clauses that involve coreference between their object and the matrix clause intransitive subject can be SR clauses, while other =*ha* clauses are relative clauses. This matches what has been reported for Shipibo -*a* by Valenzuela (2003) – namely, that -*a* can appear in relative clauses or in SR clauses where the adjunct clause object is coreferential with the matrix subject. Therefore, in Amahuaca at least, we cannot set aside clauses with =*ha* as outside the scope of an account of SR, as Camacho (2010) proposes to do for Shipibo -*a* clauses. This means that inability to accommodate object tracking is a true shortcoming of Camacho's account.

One of the persistent issues we have seen in both accounts of SR discussed so far can be summarized as follows. Because both accounts involve C receiving ϕ-features from an instance of T that has agreed with the subject, they predict that only subject tracking should be possible in SR. SR markers should never be sensitive to coreference relationships involving object DPs. This is not the pattern that we find in Amahuaca. Instead, Amahuaca SR markers can be sensitive to features of both the matrix object (=*xo*, as in (19)) and the adjunct clause object (=*ha*, as in (20)). Crucially, accounts that assume that only coreference relationships of subjects matter for SR would predict that the default marker =*kun* would be used instead of dedicated object-sensitive SR markers. Therefore, if we take Watanabe's (2000) and Camacho's (2010) accounts at face value, they are unable to account for the full pattern of SR in Amahuaca.

We could imagine an extension of these accounts that would admit object tracking. If T hosts an insatiable probe, it could agree with both the subject and the object. Thus, when the features from T are on C, the features of the object would be present on C as well. While this type of account is certainly possible, it would require substantially reworking the mechanisms at the C level in each account that determine which SR marker is grammatical, since the features of more than one argument from each clause would be present on C. It is also hard to reconcile this type of insatiable-T account with the attested pattern of agreement on T in Amahuaca. Amahuaca matrix tense markers indicate the person of the subject, as shown in (35) and (36).

(35) Hiya=x=mun hun rakuu=**ku**=nu.
1SG=NOM=C_{MATRIX} 1SG be.afraid=1.PST=DECL
'I was afraid.'

(36) Vaku=x=mun rakuu=**xo**=nu.
child=NOM=C_{MATRIX} be.afraid=3.PST=DECL
'The child was afraid.'

In (35), the subject is first person and the past tense marker is =*ku*. In (36), in contrast, the subject is third person and the past tense marker is =*xo*. Even in transitive clauses, T always indexes the subject of the clause and never the object, as shown by (37) and (38).

(37) Maria=n=mun hiya hiin=xo=nu.
Maria=ERG=C_{MATRIX} 1SG see=3.PST=DECL
'Maria saw me.'

(38) Maria=n=mun jaa hiin=xo=nu.
Maria=ERG=C_{MATRIX} 3SG see=3.PST=DECL
'Maria saw her/him.'

Even though the object in (37) is first person and the object in (38) is third person, both clauses use the past tense marker =*xo* to index the third person subject *Maria*.

The fact that Amahuaca T never inflects for object person would be puzzling were we to assume that T hosts an insatiable ϕ-probe. It would simply be a morphological accident that T always agrees with all DPs in its clause but only ever reflects the features of the subject. Instead, the more straightforward assumption is that T and C probe separately (e.g. Carstens 2003; Haegeman and van Koppen 2012). T in Amahuaca hosts a probe that is satisfied by any ϕ-features, deriving a pattern where it invariably agrees with the highest DP in its c-command domain: the subject. In contrast, as already discussed, C's probe lacks satisfaction conditions; it is insatiable. This means that C will agree with all DPs in its c-command domain, deriving the pattern of object-sensitive SR.

Another type of issue for the accounts of SR discussed in this section is that they require additional mechanisms to be added to the grammar, and these mechanisms are not motivated beyond the domain of SR. For example, Watanabe's (2000) account relies on a mechanism of binding between matrix and adjunct C. Outside the domain of SR, this type of binding is unnecessary and unmotivated. Camacho's (2010) account requires something like an output filter that penalizes merging two pronouns with the same ϕ-features in a single derivation to avoid undesired instances of DS marking. This type of filter does not appear to be necessary for domains beyond SR. This is another way in which the account proposed here is more attractive than its competitors. All of the necessary technology used in the current account has been argued to be independently needed on the basis of evidence from domains outside SR. The current account of SR therefore relies only on combining mechanisms that are already available in the grammar.

5.2 Accounts of switch-reference involving direct Upward Agree

Another set of Agree-based accounts of SR assumes, as I do, that the relationship between agreeing C in the dependent clause and the DP in the matrix clause is direct. However, these accounts differ from the one presented here in that they assume that this direct agreement relationship involves Upward Agree (e.g. Baker 2008; Zeijlstra 2012; Bjorkman and Zeijlstra 2019). Under these accounts, SR clauses are assumed to have a low attachment site, with C probing upward out of its clause to agree with the matrix subject. This style of analysis is difficult to reconcile with the evidence for the high attachment site of SR clauses in Amahuaca.

Arregi and Hanink (2018, 2021) provide an analysis of SR that is designed to account for the patterns found in Washo (Isolate; USA), where SR marking occurs in adjunct clauses and clausal nominalizations, including in nominalizations used as complement clauses and internally headed relative clauses. They propose that C of the clause that displays SR marking probes downward into its own clause as well as upward into the matrix clause. They assume that C can successfully agree only with nominative DP goals, which, in Washo, consistently restricts SR to tracking subjects. Under their account, C copies back an index from each DP that it agrees with. If the indices match (i.e. if there is only a single index value on C), the default SS marker (null in Washo) is inserted. If, however, the indices do not match, the DS marker is inserted as an indication of feature conflict (building on Harbour's (2008, 2011) account of the Kiowa (Kiowa-Tanoan; USA) inverse system).[36]

Another account that assumes a similar Upward Agree relationship is that of Baker and Camargo Souza (2020), who analyze patterns of SR in two Panoan languages: Shipibo and Yawanawa. Under their account, a crucial distinction is made between Agree-Link (which creates a dependency or "pointer" between a probe and a goal) and Agree-Copy (which transfers features from the goal to the probe), following Arregi and Nevins (2012). They argue that in SS constructions, T in the adjunct clause probes the subject, establishing an Agree-Link. T then undergoes head movement to C and C subsequently probes upward to the matrix subject from a low adjunction site, establishing another Agree-Link. Baker and Camargo Souza assume that Agree-Copy never occurs, but instead these two pointers from a single complex head to two distinct DPs are interpreted as a referential dependency between the two DPs. Under this account, the SS marker does not directly indicate anything about coreference; rather, it spells out the T+C complex head. In constructions where the adjunct clause object is coreferential with the matrix clause subject, they assume that it is v of the adjunct clause that establishes an Agree-Link with the object and undergoes head movement to C, with v+T+C being spelled out as an object=subject SR marker.[37] In

[36] Aside from the issue of the attachment site of SR clauses, another aspect of Arregi and Hanink's (2018, 2021) analysis that does not transfer well to the Amahuaca data is the treatment of SR marking as an indication of feature conflict. In Amahuaca, there are multiple different markers that indicate coreference of arguments (i.e. nonconflicting indices) and it is the DS marker that appears to be the default.

[37] Shipibo and Yawanawa do not have a SR marker like Amahuaca =*xo* that indicates coreference of the adjunct clause subject with the matrix object. It is unclear how such a pattern could be captured under Baker and Camargo Souza's (2020) account without assuming systematic variability in the adjunction site of SR

DS constructions, they assume that no heads agree or undergo head movement.[38]

While these two approaches differ substantially in their overall assumptions, one assumption they have in common is that C probes upward to agree with the matrix subject. This is incompatible with the structures that have been assumed for Amahuaca SR to this point, where SR CPs are adjuncts to matrix TP. There are two main motivations for this high attachment site of Amahuaca SR clauses, as discussed in section 2.1. First, there is no distributional evidence that suggests that Amahuaca adjunct clauses can ever appear in a position sufficiently low in the clause to be below the highest A-position of the matrix arguments. SR clauses must always surface in high positions in the matrix clause. Second, there are no Condition C effects between matrix and adjunct clause arguments, suggesting that the high surface position is not the result of obligatory Ā-movement of the CP from an attachment site below the matrix arguments. This is illustrated again in (39).

(39) [Floria=n$_i$ Maria$_j$ hiin=$\boxed{\text{xo}}$]=mun Maria=n$_j$ Floria$_i$
Floria=ERG Maria see=SO.AFTER=C$_{\text{MATRIX}}$ Maria=ERG Floria
chivan-vo=xo=nu.
chase-AM=3.PST=DECL
'After Floria$_i$ saw Maria$_j$, Maria$_j$ chased Floria$_i$.'

Here, the R-expressions *Maria* and *Floria* appear both in the adjunct clause and in the matrix clause and there is no Condition C violation. Crucially, this example contains the SR marker *=xo*, which indicates coreference of the adjunct subject with the matrix object. Thus, under an account that assumes Upward Agree with the coreferential matrix argument, the SR adjunct clause would need to attach below an A-position of the matrix object in order to probe it from below. Thus, the lack of Condition C reconstruction effects is unexpected here.

Interestingly, the lack of Condition C effects seen with SR clauses in Amahuaca differs notably from the situation found in Washo, one of the languages for which an account of SR involving Upward Agree was proposed.[39] Arregi and Hanink (2021) discuss the fact

clauses or the movement of object DPs, neither of which finds empirical support in the Amahuaca data.

[38] As with Camacho's (2010) account, there is nothing in the syntactic component of Baker and Camargo Souza's (2020) account that rules out DS marking with accidentally coreferential subjects. Instead, Baker and Camargo Souza rely on pragmatic blocking to rule out coreferential interpretations due to competition with the dedicated constructions available to indicate coreference.

[39] Baker and Camargo Souza (2020) present data from Shipibo that show that there are no Condition C effects in adjunct clauses. However, they still argue for an Upward Agree account of Shipibo SR, assuming that movement of the adjunct clause after agreement can bleed Condition C. Part of the reason they assume Upward Agree is that they demonstrate that SR clauses in Shipibo and Yawanawa can be interpreted inside the scope of certain heads in the matrix clause, including aspect and negation. This leads them to propose that SR clauses are adjoined to *v*P and probe upward to the subject after it has moved to Spec,SubjP. Even if one were to assume a *v*P adjunction site rather than a higher TP adjunction site in Amahuaca, there is still no need to posit Upward Agree. In Amahuaca, subjects do not obligatorily move to Spec,TP (or Spec,SubjP); rather, they can remain in their base position in Spec,*v*P to the right of aspect marking (Clem 2019b). In-situ subjects can still be tracked by the SR system of Amahuaca, as seen in (i).

(i) [*pro*$_i$ hoxa=shara=$\boxed{\text{xon}}$]=mun kuntii choka=hi **xano**$_i$=ki=nu.
sleep=well=SA.AFTER=C$_{\text{MATRIX}}$ pot wash=IPFV woman=3.PRES=DECL
'After she$_i$ slept well, the woman$_i$ is washing pots.'

that even though SR clauses in Washo can appear in high surface positions, they do reconstruct to a lower position, resulting in Condition C violations. Condition C violations are found not only with complement SR clauses in Washo but also with adjunct SR clauses, suggesting a difference in the attachment sites of Washo adjunct clauses and Amahuaca adjunct clauses. These differences in connectivity effects suggest that, in contrast to the situation found in Washo, Amahuaca SR clauses do attach above the matrix arguments. This high attachment site of adjunct clauses is hard to reconcile with accounts of SR involving Upward Agree with the matrix argument, but is not an issue for the current account, which assumes that adjunct CPs probe downward through cyclic expansion to agree with the matrix goals.[40]

To capture data like (i), a *v*P-adjoined adjunct CP would have to probe downward to the matrix subject in Spec,*v*P, which is possible via cyclic expansion, as proposed in the current account. Given that subject movement is not obligatory and that scrambling in Amahuaca has properties of Ā-movement (Clem 2019a:25–33), it is plausibly the case that SR agreement always targets the *v*P edge position of the matrix arguments. This is compatible with the Downward Agree account proposed here, regardless of whether adjunct CPs adjoin to TP or *v*P, but it is not consistent with the assumptions of the Upward Agree account proposed by Baker and Camargo Souza (2020).

[40]Given the evidence for the low attachment site of Washo SR clauses, one might wonder how the analysis of SR argued for here could be extended to account for such patterns. One potential way of accounting for Washo SR (and for SR in complement clauses more generally) while assuming purely Downward Agree would be to pursue an Indirect Agree account similiar to the one Diercks (2013) proposes for upward-oriented complementizer agreement in Lubukusu (Bantu; Kenya). Diercks argues that Spec,CP of the embedded clause hosts a null anaphor that is bound by the subject of the superordinate clause. Thus, while embedded C in Lubukusu appears to be agreeing upward into the matrix clause, it is actually agreeing with the bound anaphor, which covaries in ϕ-features with the higher subject.

If this account were to be extended to SR, we could assume that C^{min} of the clause with SR marking first probes downward into its clause to agree with the dependent clause arguments. C then reprojects and the intermediate projection of C probes its c-command domain to agree with the bound anaphor in Spec,CP. (Note that the account of SR sketched in Baker and Camargo Souza 2019 also involves agreement with a bound anaphor in Spec,CP.) When the probe reprojects again, C^{max} could probe its c-command domain. However, if the CP is attached below the matrix arguments, it will not encounter a suitable DP goal with a referential index in its c-command domain on this third cycle of agreement. Karlos Arregi (pers. comm.) notes that, because Washo complement clauses are nominalizations, the c-command domain of C^{max} will contain the D of the nominalization, which could bear an index. While this certainly does add a layer of complication to the Washo data compared to languages with SR in nonnominalized complement clauses, nominalized complement clauses in Washo will be accusative, not nominative. Something like case discrimination is already needed to account for the fact that only nominatives can be tracked by the SR system in Washo (Arregi and Hanink 2021). Therefore, this same mechanism could potentially be invoked to account for the lack of agreement with the D layer of the nominalization in complement clauses. See section 6 for additional discussion of the possible role of case discrimination in strictly subject-oriented SR.

While an Indirect Agree analysis may possibly be able to account for Washo SR with the same type of cyclic expansion proposed here, not all instances of SR can be straightforwardly accounted for via Indirect Agree. In Amahuaca, SR adjunct clauses attach too high in the clause for an anaphor in Spec,CP to be bound by a matrix argument. In order for the anaphor to be bound, the CP would need to reconstruct to a position below the coreferential matrix argument, but this reconstruction for anaphor binding should force reconstruction for Condition C, resulting in Condition C violations, contra the attested pattern in (39). Therefore, while SR clauses with low attachment sites, such as those found in Washo, can be accounted for with Indirect Agree coupled with cyclic expansion of the probe on C, SR clauses with high attachment sites, such as those found in Amahuaca, cannot be straightforwardly modeled via Indirect Agree.

5.3 *Non-reference-tracking accounts of switch-reference*

Some recent accounts of SR that do not rely on Agree as the core mechanism have departed from the traditional assumption that referential index tracking lies at the heart of SR. These accounts instead seek to reduce SR to a special case of some more widely attested phenomenon like control (Georgi 2012) or coordination (Keine 2012, 2013). These accounts differ substantially in their implementation, but what they have in common is the assumption that a SS construction should be able to contain only one instance of a subject DP, a prediction that does not align with the empirical picture we see in Amahuaca (Clem 2018).[41]

First, consider the account proposed by Georgi (2012), who argues for a control-based analysis of SR. She argues that SS structures are obligatory control structures, while DS structures do not involve control. Georgi assumes that SS clauses are TPs with a defective T. This T is unable to case-mark the subject DP of its clause, whether that subject is an external argument, or the internal argument of an unaccusative v, which does not assign case. This means that the subject of the embedded clause remains active in the derivation since it has not been assigned case. Adopting the movement theory of control (Boeckx, Hornstein, and Nunes 2010), Georgi argues that a DP that remains active in a lower clause can move to check the selectional feature of the superordinate v. In the upstairs clause, this DP is then assigned case. Georgi argues that SS marking is the spell-out of defective T in the embedded clause, and specifically assumes that it spells out a T that does not c-command a DP in its accessible domain – that is, a T in a clause out of which the subject has been moved.[42]

In contrast to the T in SS clauses, Georgi argues, the T in DS clauses is able to assign case to its subject. That means this version of T is not defective. Georgi takes the fact that DS markers are sometimes fused with subject agreement markers as evidence for the nondefective nature of this T. She argues that DS marking is the spell-out of nonroot, nondefective T that c-commands a DP in its phase.

Under Georgi's account, then, SS vs. DS marking comes down to how many DPs are in the numeration and what type of T is merged in the lower clause. If there are fewer DPs than are needed to meet selectional requirements and a defective T is merged, the subject of the lower clause will check the selectional features of the higher v, resulting in SS marking. If a nondefective T is merged, the derivation will crash since the selectional requirements of the upstairs v will not be met due to a shortage of DPs. If there is a sufficient number of DPs in the numeration and a nondefective T is merged, no DP-movement from the lower clause to the higher clause will occur. If a defective T is merged, the embedded subject will not move and will not be case-marked, causing the derivation to crash. This type of account is hard to reconcile with the fact that Amahuaca SS constructions can have overt subjects in both clauses. If SS marking is always the spell-out of a defective T, the subject of the SS clause in such constructions should not be licensed and the derivation should crash.

Keine (2012, 2013), like Georgi (2012), argues that SS constructions involve fewer DPs

[41] I choose to highlight the problem of overt subjects for these two accounts. However, both accounts face additional challenges, such as how to account for the high attachment site of Amahuaca SR clauses and how to derive distinct SR markers that indicate reference relationships involving object DPs.

[42] Georgi (2012) notes that for her this means that the moved subject leaves no copy or trace in the lower clause.

than DS constructions. However, his approach is rather different in that he analyzes SR clauses as involving coordination, rather than subordination, and argues that the SS/DS distinction reflects a difference in coordination height. Keine argues that SS marking reflects low coordination, that is, VP coordination. In a VP coordination structure, there will only be one subject DP, which will be introduced by *v* above the coordinate structure. Therefore, the two predicates will have the same subject. Keine argues that the SS marker is the context-sensitive spell-out of the coordinator when it coordinates VPs. In contrast, Keine argues that DS marking involves high coordination, that is, *v*P coordination. When two *v*Ps are coordinated, each will contain its own subject. Therefore, the two predicates will have different subjects. The DS marker is the context-sensitive spell-out of the coordinator when it coordinates two *v*Ps.[43]

This account has the same drawbacks as Georgi's (2012) analysis. It predicts that a SS construction should only be able to have one overt subject DP. Additionally, because SS vs. DS marking comes down to a difference between whether coordination is above or below the external argument, this account cannot derive patterns where a SR marker indicates coreference between the object of one clause and the subject of another; even VP coordination will allow for two distinct internal arguments at all times.

While the two non-Agree-based accounts considered here differ significantly in terms of the technology used, they share an unwelcome prediction. Both of these accounts explicitly predict that SS clauses should only contain one subject DP, either because the same DP occupies the external argument position in both clauses at some point in the derivation or because a single external argument is introduced by one instance of *v* above the level of coordination. This prediction does not align with the attested distribution of overt subject DPs in SS structures in Amahuaca (Clem 2018). As discussed previously, SR adjunct clauses in Amahuaca can contain all arguments of the verb overtly, including the subject. This holds regardless of whether the adjunct clause is marked as SS or "DS" (i.e. default). As seen in (40), an overt nominative-marked subject DP appears in the adjunct clause. A coreferential ergative-marked subject pronoun appears in the matrix clause.

(40) [Moha **xano=x**$_i$ nokoo=$\boxed{\text{xon}}$]=mun **jato=n**$_i$ hatza
already woman=NOM arrive=SA.AFTER=C$_{\text{MATRIX}}$ 3PL=ERG manioc
xoka=kan=xo=nu.
peel=3PL=3.PST=DECL
'After the women$_i$ arrived, they$_i$ peeled manioc.'

Under accounts that predict only one subject DP in a SS structure, it is unclear how to derive the presence of two overt subjects in (40). The problem is especially acute since the two DPs do not match in case and since one is a pronoun while the other contains a full NP. The difference in case and other content of these two DPs suggests that they constitute two separate subject DPs.

[43] This presentation of Keine's (2012, 2013) analysis oversimplifies his Vocabulary Insertion account. The languages he considers differ in patterns of SR involving things like weather predicates and in the use of SR markers for other types of coordination. Therefore, which coordinator Keine analyzes as default vs. context-sensitive differs by language.

5.4 Summary of alternative accounts

In conclusion, all of the alternative accounts examined here face empirical challenges given the full range of data in Amahuaca. The distribution of overt subject DPs, the sensitivity of SR to object DPs, and the lack of Condition C reconstruction effects for SR adjunct clauses are all problematic for previous accounts of SR. Not only is the current analysis able to account for the full range of data, but it does so utilizing only technology that has been independently argued to be necessary for phenomena beyond SR. In contrast, other accounts of SR often rely on some mechanism that is specific to SR or require unattractive stipulations to derive the desired patterns. Thus, both the empirical coverage and the simplicity of the current account give it an advantage over competing analyses.

6 Predictions and typology

Now that we have seen how the current Agree-based account of SR compares with its competitors in terms of empirical coverage of the Amahuaca data, it is worth considering the predictions of the current style of account as well as how it can be extended to handle a broader typological range of SR systems.[44] In this section, I will focus on two particular questions that the current analysis raises. First, why do most SR systems look empirically different from Amahuaca in allowing only subjects to be tracked? Second, why do we not see more evidence for maximal projections serving as probes?

With respect to the first question, it is first worth emphasizing that Amahuaca indeed displays a profile that is typologically unusual for SR systems. The majority of SR systems only allow subject coreference relationships to figure in the calculus of SR marking.[45] However, sensitivity to objects is not entirely absent in other SR systems. For example, it is found in many Panoan languages (e.g. Valenzuela 2003; van Gijn 2016; Baker and Camargo Souza 2020), and it has been argued to exist in Warlpiri (Pama-Nyungan; Australia) as well (Austin 1981; Legate 2002:125). The question is then how to derive a subject-only tracking system under the current style of analysis, which was developed with both subject and object tracking in mind. The current account suggests several possibilities of how such systems could arise.

First of all, a language could lack object shift. Object shift in Amahuaca is what allows objects to be visible to a high probe on C. If objects remained within the vP phase, they would be inaccessible goals for Agree. Therefore, if a language lacked object shift, it could display a subject-only pattern of SR, even if everything else involved in the syntax of SR functioned as in Amahuaca. The insatiable probe on C would encounter only the adjunct clause subject on the first cycle of Agree. Upon reprojection of the probe, second-cycle Agree would only encounter the matrix subject. Therefore, the pattern of SR would be

[44] It is plausibly the case that not all systems that have been described under the label of SR should actually be given a unified treatment. For example, McKenzie (2012), Weisser (2012), and Baker and Camargo Souza (2019) all discuss the fact that noncanonical SR seems to involve a different structure than what is seen in canonical SR and should potentially receive a different treatment.

[45] Further typological work on SR that spans multiple geographic areas is needed to assess how strong this trend is. There are surveys focusing on particular geographic locations (see, e.g., McKenzie 2015 for North America and Roberts 1997 for Papua New Guinea). In the surveys that have been done, subject tracking is the norm. For example, McKenzie (2015:425) states, "SR has never been observed in North American languages to track objects, applicatives, or any nominal arguments except subjects."

sensitive only to referential indices of the two subject DPs, giving the simple SS vs. DS pattern found in the majority of languages with SR.

A second option for deriving subject-only tracking lies in the nature of the probe on C and the case alignment of the language. If a language displayed accusative alignment, a case-discriminating probe on C could yield a pattern of subject-only tracking (as Arregi and Hanink (2021) assume for Washo). It is well-known that many languages restrict agreement to DPs with certain case values, suggesting that probes can be case-discriminating (Preminger 2014; Deal 2017a). Further, if such patterns of case discrimination in agreement are constrained by a case hierarchy like that proposed by Marantz (1991), the expected patterns of case-sensitive agreement are not random (Bobaljik 2008). We expect the most unmarked case values to be the most likely to be goals. In an accusative system, the unmarked value for case will be nominative. Therefore, with a probe on C that agreed only with the unmarked case, only nominative DPs would be able to be tracked by the SR system. This could yield a pattern of subject tracking even if object DPs were high enough in the structure to be accessible to C. Due to the more marked case of the object, it would not be able to be a goal for Agree.

A final route to a subject-only tracking system that is suggested by the current account is morphological syncretism. The probe on C could successfully agree with objects, but the language could lack dedicated morphology to spell out patterns of coreference involving objects due to syncretism in the paradigm. One reason to think that morphological syncretism may be one factor responsible for a paucity of object tracking crosslinguistically comes from within Amahuaca itself. When we compare different paradigms of SR markers in Amahuaca, it appears that morphological syncretism is involved in collapsing several of the possible distinctions. In this article, I have focused on 'after' clauses, since it is the 'after' paradigm that displays the fullest number of contrasts. If we compare this paradigm, shown in table 2, with the paradigms for 'while' and 'before' clauses, shown in tables 3 and 4, respectively, we see successively more syncretisms in the paradigms.

<table>
<tr><td colspan="2"></td><td colspan="3">Matrix</td></tr>
<tr><td colspan="2"></td><td>S</td><td>A</td><td>O</td></tr>
<tr><td rowspan="3">Adjunct</td><td>S</td><td rowspan="2">=hax</td><td rowspan="2">=xon</td><td rowspan="2">=xo</td></tr>
<tr><td>A</td></tr>
<tr><td>O</td><td>=ha</td><td colspan="2">=kun (DFLT)</td></tr>
</table>

Table 2: 'After' series

<table>
<tr><td colspan="2"></td><td colspan="3">Matrix</td></tr>
<tr><td colspan="2"></td><td>S</td><td>A</td><td>O</td></tr>
<tr><td rowspan="3">Adjunct</td><td>S</td><td rowspan="2">=hi</td><td rowspan="2">=kin</td><td rowspan="2">=haito</td></tr>
<tr><td>A</td></tr>
<tr><td>O</td><td colspan="3">=hain (DFLT)</td></tr>
</table>

Table 3: 'While' series

<table>
<tr><td colspan="2"></td><td colspan="3">Matrix</td></tr>
<tr><td colspan="2"></td><td>S</td><td>A</td><td>O</td></tr>
<tr><td rowspan="3">Adjunct</td><td>S</td><td rowspan="2">=katzi/
=xanni</td><td rowspan="2">=xankin</td><td rowspan="2"></td></tr>
<tr><td>A</td></tr>
<tr><td>O</td><td colspan="3">=non (DFLT)</td></tr>
</table>

Table 4: 'Before' series

In the 'after' series of SR markers, the default marker *=kun* is used for only two cells of the coreference paradigm. In this paradigm, tracking of both the adjunct and matrix clause objects is possible. In the 'while' series, the default marker *=hain* is used for all coreference relationships involving the adjunct clause object. Only the object in the matrix clause triggers a distinct coreference marker. Finally, in the 'before' series, all object tracking in both clauses has been collapsed to the default marker *=non*. There is no evidence that 'while' and 'before' clauses differ significantly in their syntax from their 'after' counterparts. Their distribution in matrix clauses and ability to host overt material is the same. They differ morphologically only in the form of the SR marker. Therefore, it appears that morphological syncretism is plausibly responsible for the variation that we find in the ability of SR markers to indicate coreference relationships involving objects across the paradigms. Given that syncretism plays a role even within the Amahuaca system, it is reasonable to assume that at least some languages may lack object tracking in some or all of the paradigm due to similar syncretisms.

In languages that display subject-only tracking, it should be possible to test for some of the relevant properties to see which path to subject-only tracking is utilized. Is there independent evidence for object shift from domains such as binding and crossover? If not, the object may remain too low to be accessible to C's probe. Can only DPs bearing a single (unmarked) case value be targeted for SR or can quirky-case subjects also be tracked? If only the most unmarked DPs can be tracked via the SR system, then C's probe may be case-discriminating. If there is no evidence in a given language for the first two ways of deriving subject-only tracking, then morphological syncretism may play a role. Given that there are multiple routes to a subject-only tracking system, such systems are predicted to arise frequently. This aligns with the typological picture that we see, where these systems are much more common than those that allow for the tracking of objects.

Another question that the current account raises is why we do not find more maximal projections that function as probes. In order to answer this question, it is worth considering where we tend to find probes to begin with. Some of the most commonly assumed probes in the clausal domain are v, T, and complement C. For each of these heads, the c-command domain of the maximal projection will contain only the head that selects it. For instance, the c-command domain of T^{max} will contain only C. Thus, the only way that we would be able to tell whether the maximal projection had searched its c-command domain would be if it successfully agreed with the selecting head. Since functional heads in the clausal spine are typically not merged with the type of features that ϕ-probes are searching for, Agree will fail to find a goal in the c-command domain of the maximal projection. Therefore, it is possible that maximal projections probe, but that Agree (at least on this cycle of probing) fails in the sense of Béjar 2003 (see also Preminger 2014).

In contrast, the c-command domain of adjuncts provides a more illuminating testing ground. If we turn to adjunct C, as in the current account, it is possible that we actually see quite a number of languages that have probing maximal projections, given that a large number of languages have SR systems. It is also plausible that other types of agreeing adjuncts may involve cyclic expansion leading to maximal projections that probe their c-command domain. For example, Lubukusu 'how' agrees in ϕ-features with the highest argument in its c-command domain (Carstens and Diercks 2013). Carstens and Diercks note that this behavior is somewhat puzzling if we assume that the probe is located on the head, but can be easily accounted for if we assume that the probe is instead located at the maximal projection level.[46] This pattern can be very straightforwardly derived in the current system without assuming that probes can originate on maximal projections. Because this adjunct only contains the agreeing 'how' element itself, if the probe originates on the minimal projection of this adjunct, its c-command domain will not contain any possible goals. This means that the probe will remain unsatisfied and will be able to reproject to the maximal projection level, accounting for the ability of 'how' to agree with elements in the c-command domain of its maximal projection. (For a similar treatment, see also Carstens 2016.)[47] Nominal concord has also been analyzed in a similar way by Carstens (2011, 2016). She assumes that concord on adjectives is the result of AP probing the NP to which it is adjoined and agreeing with N. This structure, too, is compatible with the account of cyclic expansion argued for here. Examining further instances of agreeing adjuncts (and specifiers)[48] may prove to be a fruitful line of inquiry in discovering how common this pattern of maximal projections serving as probes through cyclic expansion is crosslinguistically.

7 Conclusion

In this article, I have argued that the coupling of Cyclic Agree with BPS logically predicts that maximal projections should be able to probe their c-command domain (that is, if a probe remains unsatisfied after earlier cycles of Agree). I have shown that this prediction is borne out in the domain of agreeing adjunct C in Amahuaca. Therefore, I take the assumption that maximal projections can indeed be probes to be desirable in two respects. First, it avoids unattractive (and potentially difficult-to-implement) stipulations in a cyclic theory of Agree. It is unclear how we could ensure that maximal projections could never serve as probes through cyclic expansion, given the evidence that intermediate projections can probe and the lack of formal distinction between intermediate and maximal projections. Even stipulating a limit on the number of possible cycles of Agree could not derive this

[46]While it has been argued that this adverbial 'how' element in Lubukusu actually hosts a probe, not all instances of agreeing adverbs have been argued to involve a probe on the adverb (or AdvP). For example, D'Alessandro (2011) argues that agreeing adverbs in the Ripano dialect of Italian actually result from a probe in the T-v field that is simply realized as an affix on the closest host, which can be an adverb or another element.

[47]Carstens (2016) does not assume that the Lubukusu probe must originate on the maximal projection, but she does not employ systematic cyclic expansion to derive this result. Instead, she assumes that probing is limited to the c-command domain of the head for one round of probing but then becomes directionality-free if the features of the probe are not matched by any goal in its c-command domain.

[48]Cyclic expansion should also, in theory, allow specifiers to probe their sisters. For example, if a probe on D of the external argument remains unsatisfied and reprojects to the maximal projection level, this should allow the external argument to probe its sister (an intermediate projection of v or some equivalent), possibly agreeing with the internal argument. One potential but not uncontroversial example of agreeing specifiers of this sort involves a pattern of agreement between arguments found in some Nakh-Daghestanian languages. In certain configurations, it is possible for a nonabsolutive argument to show agreement with the absolutive argument. However, whether this constitutes true agreement between arguments is not settled. Polinsky, Radkevich, and Chumakina (2017) argue that in Archi this pattern actually reflects features the higher argument receives from v. However, Rudnev (2020) argues that adjuncts in Avar that agree with the absolutive do involve an XP adjunct probing a DP argument directly, and Kaye (2019) suggests that for instances of seeming agreement between arguments in Andi, a direct agreement account should not be ruled out. This type of construction across Nakh-Daghestanian languages therefore merits further investigation as a possible instance of the maximal projection of a specifier probing its c-command domain.

outcome, since not all projections will contain segments between the minimal and maximal projections. Second, it yields a simple and straightforward way of accounting for SR that has greater empirical coverage than previous analyses and that does not resort to introducing any new SR-specific technology. By assuming this type of Cyclic Agree model, we account for the seemingly nonlocal nature of SR, without sacrificing well-supported assumptions about locality and directionality in Agree. Rather than circumventing conditions on c-command, the type of apparent long-distance agreement seen in SR can be taken simply as an indication of cyclic expansion of the probe's domain.

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