

# Object-sensitive switch-reference and insatiable probes\*

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## 1 Introduction

The term ‘switch-reference’ (SR) was first coined by Jacobsen (1967). He defined it 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). From this very first definition of SR, subjects have been privileged in discussions of the phenomenon. This focus on subjects is not without reason. Typologically, it would appear that SR indeed tracks the reference of subjects far more frequently than the reference of other nominals, like objects. For example, in his SR survey of 123 languages and dialects of North America McKenzie notes that “SR has never been observed in North American languages to track objects, applicatives, or any nominal arguments except subjects” (2015: 425). Because of this typological tendency, formal analyses of SR have typically focused exclusively (or at least primarily) on accounting for subject-tracking patterns of SR (see, e.g., Finer 1984, 1985; Watanabe 2000; Camacho 2010; Assmann 2012; Georgi 2012; Keine 2012, 2013; Arregi and Hanink 2018). However, crucially, it has been noted that some systems of SR do, in fact, track the reference of objects. This pattern has been discussed for several Panoan languages (Valenzuela 2003; van Gijn 2016), and it has been argued to exist in Warlpiri (Pama-Nyungan; Australia) as well (Austin 1981; Legate 2002: 125). Therefore, while object sensitivity is not as common as subject sensitivity in SR systems, a comprehensive theory of SR must be able to account for it since it is attested in some languages.

In this paper, I provide an account of SR that allows for the reference of both objects and subjects to be tracked. I base this analysis on data from Amahuaca (Panoan; Peru), in which the SR system shows sensitivity to all arguments of the verb. I argue that SR marking reflects the presence of an agreeing complementizer (cf. Watanabe 2000; Arregi and Hanink 2018). This complementizer agrees with all argument DPs in the clause, yielding a pattern of object sensitivity in SR marking. In order to account for the ability of the probe on C to agree with both subject and object DPs, I adopt an interaction and satisfaction model of Agree (Deal 2015a). Under this model, a probe’s interaction conditions (i.e. the set of features that a probe can copy) can be defined separately from its satisfaction conditions (i.e. the feature or set of features that will cause a probe to halt its search). I propose that the probe on SR C in Amahuaca is *insatiable* – it entirely lacks satisfaction conditions and will not stop probing until it exhausts its search space (Deal 2015b). This insatiability allows

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the probe to agree with all DPs in its domain, including both the subject and object. The Amahuaca system of SR thus provides empirical evidence for the existence of insatiable probes and supports a model of Agree that allows such probes to be defined.

## 2 Coreference patterns in Amahuaca switch-reference

Amahuaca is an endangered Panoan language spoken in the Peruvian and Brazilian Amazon by approximately 500 speakers (Eberhard, Simons, and Fennig 2019). All data in this paper come from the author’s fieldwork with native speakers in the town of Sepahua, in Atalaya Province, Ucayali, Peru. Data were collected over the course of 4 trips between 2015 and 2018, with most data coming from work with 4 primary consultants (3 female) ranging in age from approximately 35 to 75. Amahuaca is mostly head-final with SOV word order. Both C and Asp in matrix clauses are head-initial (Clem 2018a,b, 2019a), but functional projections in dependent clauses are consistently head-final. The base-generated SOV word order is often obscured by scrambling of arguments and adjuncts. The language is both head- and dependent-marking, and the case system shows a tripartite alignment as well as differential subject marking (Clem 2018a, 2019a).

The empirical focus of this paper is on the extensive SR system of Amahuaca, which has been described by Sparing-Chávez (1998, 2012) under the label ‘interclausal reference’. Sparing-Chávez does not systematically distinguish SR clauses from relative clauses in her description (though her Set A versus Set B largely reflects this distinction), and here I focus only on SR clauses.<sup>1</sup> In Amahuaca, SR clauses are adjunct clauses that attach high in the matrix clause (Clem 2019a,b). SR markers convey information about the temporal relationship between the adjunct clause that hosts the SR marker and the clause to which it adjoins. Due to this temporal component of SR markers, the use of these clauses often resembles the use of temporal adjunct clauses in languages like English. There are three main paradigms of SR markers in Amahuaca that can be distinguished based upon the temporal information they convey. These paradigms correspond roughly to the meanings of ‘after’, ‘while’, and ‘before’. I will focus here only on ‘after’ clauses since these show the fullest number of contrasts with respect to the reference of objects. However, the account I offer of ‘after’ clauses also extends to the two other types of SR clauses in Amahuaca.

An example of a SR clause is given in (1).<sup>2</sup> This example illustrates the use of the SR marker =xon, which is one of the markers in the ‘after’ SR paradigm.<sup>3</sup>

- (1) [jaa=x<sub>i</sub>    vua=xon]=mun            xano=n<sub>i</sub>    xuki jova=xo=nu  
 3SG=NOM sing=SA.AFTER=C<sub>MATRIX</sub> woman=ERG corn cook=3.PST=DECL  
 ‘After she<sub>i</sub> sang, the woman<sub>i</sub> cooked corn.’

<sup>1</sup>I refer interested readers to Clem 2019a for a discussion of morphosyntactic diagnostics that can be used to distinguish SR from relative clauses in Amahuaca.

<sup>2</sup>SR clauses often appear before =mun, a matrix second position clitic. Clem (2018a,b, 2019a) argues that =mun lexicalizes matrix C, with the constituent to its left occupying Spec,CP of the matrix clause.

<sup>3</sup>The following abbreviations are used in glossing: 3 = third person, AM = associated motion, APPL = applicative, C = complementizer, DECL = declarative, DFLT = default, ERG = ergative, HAB = habitual, IPFV = imperfective, NOM = nominative, OS = object coreferential with intransitive subject, PL = plural, PRES = present, PST = past, SA = subject coreferential with transitive subject, SG = singular, SO = subject coreferential with object, SS = subject coreferential with intransitive subject.

In (1) the adjunct SR clause is given in square brackets, with the SR marker itself boxed. Here the subject of the adjunct clause is coreferential with the subject of the matrix clause, which is a transitive subject with ergative case. This coreference relationship between the two DPs triggers the use of the SR marker =*xon*.

In (2) we see another example involving coreferential subjects, but here the SR marker =*hax* is used instead.

- (2) [jaa=*x<sub>i</sub>* vua=hax]=mun xano<sub>*i*</sub> chirin=*xo*=nu  
 3SG=NOM sing=SS.AFTER=C<sub>MATRIX</sub> woman dance=3.PST=DECL  
 ‘After she<sub>*i*</sub> sang, the woman<sub>*i*</sub> danced.’

The example in (2) is minimally different from the one in (1). The crucial distinction is that in (2) the matrix clause is intransitive and its subject has abstract nominative case.<sup>4</sup> Thus, we can see from comparing (1) and (2) that the SR system of Amahuaca is sensitive to the distinction between transitive and intransitive subjects (a feature common to other Panoan systems of SR; see, e.g., Valenzuela 2003; Camacho 2010; van Gijn 2016), which I will model as a sensitivity to abstract case.<sup>5</sup>

A third SR marker in the ‘after’ paradigm, =*xo*, is exemplified in (3). This is the first example of a SR marker in Amahuaca that is sensitive to coreference involving an object DP.

- (3) [jaa=*x<sub>i</sub>* vua=xo]=mun hinan xano<sub>*i*</sub> chivan-vo=*xo*=nu  
 3SG=NOM sing=SO.AFTER=C<sub>MATRIX</sub> dog.ERG woman chase-AM=3.PST=DECL  
 ‘After she<sub>*i*</sub> sang, the dog chased the woman<sub>*i*</sub>.’

The sentence in (3) involves coreference between the subject of the adjunct clause and the direct object of the matrix clause. The marker =*xo* conveys this coreference relationship. Interestingly, this marker can be used to indicate coreference of the adjunct clause subject with any argument of the matrix clause that bears abstract accusative case (with accusative always being unmarked in Amahuaca). This is shown for an indirect object in (4) and an object introduced by an applicative in (5).

- (4) [jaa=*x<sub>i</sub>* vua=xo]=mun vaku-vaun xano<sub>*i*</sub> jau jova  
 3SG=NOM sing=SO.AFTER=C<sub>MATRIX</sub> child-PL.ERG woman flower  
 hinan=*xo*=nu  
 give=3.PST=DECL  
 ‘After she<sub>*i*</sub> sang, the children gave the woman<sub>*i*</sub> a flower.’
- (5) [jaa=*x<sub>i</sub>* vua=xo]=mun vaku-vaun xano<sub>*i*</sub>  
 3SG=NOM sing=SO.AFTER=C<sub>MATRIX</sub> child-PL.ERG woman  
 chirin=*xon*=*xo*=nu  
 dance=APPL=3.PST=DECL  
 ‘After she<sub>*i*</sub> sang, the children danced for the woman<sub>*i*</sub>.’

<sup>4</sup>Nominative case is spelled out overtly as =*x* under narrow focus (Clem 2018a, 2019a). This can be seen on the adjunct clause subject pronoun in (2).

<sup>5</sup>See Clem 2018a on the distinction between abstract and morphological case in Amahuaca. Clem (2019a) discusses how these proposed abstract case features can be used to model case sensitivity in SR.

In (4), the indirect object *xano* ‘woman’ of the matrix clause is coreferential with the subject of the adjunct clause, and *=xo* is still used as the SR marker.<sup>6</sup> Likewise, in (5) *xano* is an object introduced by the applicative *=xon* in the matrix clause, and the SR marker *=xo* is used to indicate that it is coreferential with the adjunct clause subject.

Matrix clause objects are not the only object DPs that can affect the form of SR marking. Coreference of the object of the adjunct clause with the subject of the matrix clause can also be indicated, as seen in (6).

- (6) [joni=*n* **xano**<sub>*i*</sub> vuchi=**ha**]=mun **xano**<sub>*i*</sub> ka=*xo*=*nu*  
 man=ERG woman find=OS.AFTER=C<sub>MATRIX</sub> woman go=3.PST=DECL  
 ‘After the man found the woman<sub>*i*</sub>, the woman<sub>*i*</sub> went.’

In (6) the object of the adjunct clause is coreferential with the intransitive subject of the matrix clause. This is indicated by the SR marker *=ha*.

If no DPs in the two clauses stand in a coreference relationship with one another, the form *=kun* of the SR marker is used, as shown in (7).

- (7) [joni<sub>*i*</sub> vua=**kun**]=mun xano<sub>*j*</sub> chirin=*xo*=*nu*  
 man sing=DFLT.AFTER=C<sub>MATRIX</sub> woman dance=3.PST=DECL  
 ‘After the man<sub>*i*</sub> sang, the woman<sub>*j*</sub> danced.’

The marker *=kun* and markers like it in other languages have typically been called different subject markers. However, the analysis I pursue will treat *=kun* as a morphological default rather than a marker that indicates disjoint reference explicitly. That disjoint subjects do not automatically result in the insertion of *=kun* can be seen by the fact that coreference relationships involving object DPs in (3)-(6) result in a SR marker other than *=kun*. Within a system where the reference of object DPs figures in the calculus of the form of SR marking, non-coreference of subjects does not seem to be a sufficient criterion for selecting the so-called “different subject” marker. We might instead think that the relevant notion is disjointness of all arguments. However, in configurations that lack a dedicated coreference marker, such as cases where the adjunct and matrix clause objects are coreferential, the marker *=kun* is used. This suggests that *=kun* does not directly encode disjointness of arguments but rather is used whenever a more specific coreference marker cannot be used. The table in (8) summarizes the inventory of SR markers in the ‘after’ paradigm as a factor of argument coreference. S, A, and O indicate intransitive subject, transitive subject, and object, respectively, and can equivalently be thought of as indicating abstract nominative, ergative, and accusative case.

- (8) ‘After’ SR markers

		Matrix		
		S	A	O
Adjunct	S	<i>=hax</i>	<i>=xon</i>	<i>=xo</i>
	A	<i>=hax</i>	<i>=xon</i>	<i>=xo</i>
	O	<i>=ha</i>	<i>=kun</i> (DFLT)	

<sup>6</sup>For sentences with both a direct and indirect object, the marker *=xo* is ambiguous in which object it indicates coreference of the adjunct subject with.

As can be seen in the table in (8) the reference of both the matrix object and the adjunct clause object figure in the determination of which SR marker to use. This means that the mechanism underlying SR must provide a way to track features of any core argument in the two clauses. Analyses of SR that only allow for sensitivity to subject coreference are therefore not powerful enough to account for the Amahuaca system.

### 3 Deriving object sensitivity through probe insatiability

As mentioned in the introduction, many formal analyses of SR focus primarily on accounting for the morphological marking of (non-)coreference of subjects (Finer 1984, 1985; Watanabe 2000; Camacho 2010; Assmann 2012; Georgi 2012; Keine 2012, 2013; Arregi and Hanink 2018, among others). Given the data that was just discussed for Amahuaca, the primary desideratum of the current analysis is to account for the presence of distinct SR markers that indicate coreference relationships involving non-subject arguments. I follow many previous analyses in assuming that agreement is implicated in SR (Finer 1984, 1985; Watanabe 2000; Camacho 2010; Assmann 2012; Arregi and Hanink 2018, among others). Specifically, I draw on the insight of Watanabe (2000) that SR shares many similarities with complementizer agreement, and I assume that SR involves an agreeing complementizer (see also Arregi and Hanink 2018). Crucially, in order to allow for sensitivity to the reference of object DPs, the agreeing complementizer involved in SR must be able to establish an Agree relation with object DPs. In this section I will argue that an insatiable probe (Deal 2015b) straightforwardly allows for such dependencies to be formed.

Assuming that SR involves an agreeing complementizer, two things are necessary to ensure that objects are able to enter an Agree relation with the SR probe. First, objects must be high enough in the clause to be accessible to a probe on C. Second, the presence of a subject DP must not be able to block agreement with the object. That is, subjects cannot act as interveners. I will discuss each of these issues in turn.

Consider first the issue of the position of the object and its accessibility to C. If we assume that Agree is a local operation, constrained by phases, the object must be within the same phase as the agreeing C. This means that the object must be able to escape the *v*P phase. There is evidence from patterns of remnant VP fronting in Amahuaca that objects undergo shift to the *v*P edge (Clem 2018a, 2019a). An example involving remnant VP fronting is given in (9), where the verb appears clause-initially before the second position clitic =*mun*. Here the object *jono* ‘peccary’ appears below the subject *joni* ‘man’ on the *v*P edge, suggesting that the object DP tucks in (Richards 1999).

- (9)  $[_{VP} t_i \text{ rutu}] =\text{mun}=\text{hi}$        $[_{vP} \text{ joni } \text{ jono}_i \text{ } t_{VP}] =\text{ki}=\text{nu}$   
       kill = $C_{\text{MATRIX}}=\text{IPFV}$     man peccary      =3.PRES=DECL  
       ‘The man is killing the peccary.’

Interestingly, object shift to the *v*P edge appears to be obligatory since it is ungrammatical to front a full VP containing the object, as shown in (10b).

- (10) ‘The man finds capybaras.’  
       a.  $[_{VP} t_i \text{ vuchi}] =\text{mun}$      $\text{hamun}_i =\text{nox}$      $\text{joni} =\text{ki} =\text{nu}$   
           find = $C_{\text{MATRIX}}$  capybara=HAB man=3.PRES=DECL

- b. \* [<sub>VP</sub> hamun vuchi] =mun=nox joni=ki=nu  
 capybara find =C<sub>MATRIX</sub>=HAB man=3.PRES=DECL

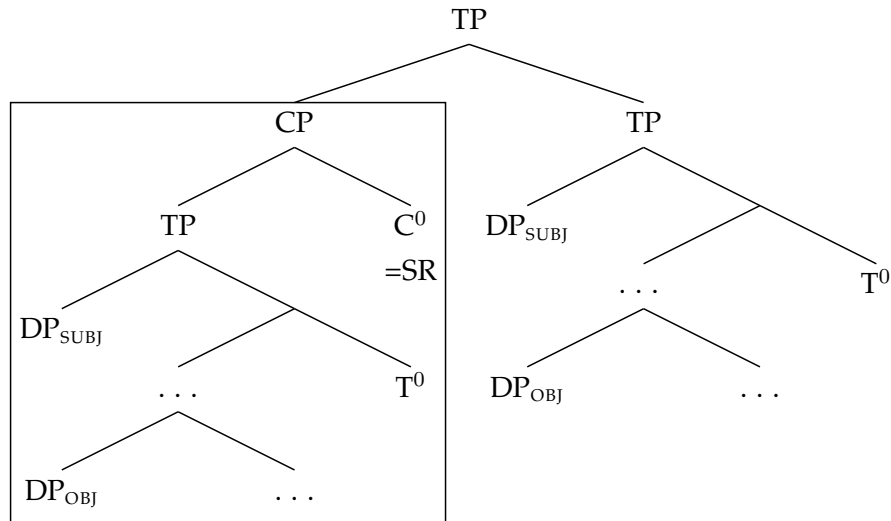
The obligatory nature of object shift is consistent with the fact that objects almost always scramble to a position in the middle field to the left of aspect marking, as in (10a). This occurs even in the absence of remnant VP movement. Therefore objects must be able to consistently escape the *v*P phase by moving to the *v*P edge, and I propose that this happens uniformly for all object DPs in Amahuaca. The fact that objects escape the lower *v*P phase means that they will be accessible to a probe high in the clause, such as a probe on C.

The second issue facing an account that relies on agreement between C and an object DP is the non-intervention of subject DPs. Unfortunately, object shift does not solve this issue. As seen in (9), object shift targets an inner specifier of *v*P. That is, the object moves to a position below the subject. Therefore, we cannot simply appeal to a reordering of subject and object to account for the ability of the SR system to be sensitive to objects. Further, in configurations involving SR markers that convey information about the object DP, the relevant object DP need not appear in a position above the subject but rather can remain lower than the subject, as seen in (3)-(6). Finally, the SR system also shows sensitivity to subjects, meaning that just as subject DPs do not act as interveners for object DPs, neither do object DPs act as interveners for subjects. It seems, then, that the probe on C must be able to enter into an Agree relation with both the subject and the object regardless of their relative position with respect to one another. This means that when the probe on C encounters the subject DP, it must be able to agree with the subject but also continue to probe past the subject to agree with the object.

In models of Agree that assume that the feature structure of  $\phi$ -probes can be articulated (e.g. Béjar 2003; Béjar and Rezac 2009), it is possible for a probe to successfully agree with a DP but to continue to probe farther if that DP does not satisfy the probe. For example, if a probe is keyed to the feature [PART(ICIPANT)], it can agree with a third person DP but continue to probe past that DP in search of a local person DP. What is unique about the Amahuaca situation is the fact that there is no feature that the higher subject DP can have that will cause the probe on C to be unable to continue probing the object DP. That is, the subject will never satisfy the probe, regardless of the subject's  $\phi$ -features. In order to capture this generalization, I adopt an interaction and satisfaction model of Agree (Deal 2015a). Under this model, each probe is specified with two types of conditions. Interaction conditions specify the feature or set of features that a probe is able to copy back to itself (e.g. the set of  $\phi$ -features). Satisfaction conditions specify the feature or set of features that will cause a probe to halt its search (e.g. [PART]). A welcome consequence of this separation of interaction and satisfaction is that it straightforwardly allows us to define a probe that entirely lacks satisfaction conditions. We can call this type of probe *insatiable* (Deal 2015b). An insatiable probe will continue to probe all possible goals in its c-command domain until it reaches a phase boundary. Probe insatiability provides a simple way to model the sensitivity of Amahuaca C's probe to all arguments in its domain. C will agree with the subject, but will continue to probe any remaining DPs in its phase, including all object DPs.

We now turn to the implementation of this Agree-based account of SR using an insatiable probe. I assume the syntactic structure in (11) for constructions involving SR clauses.

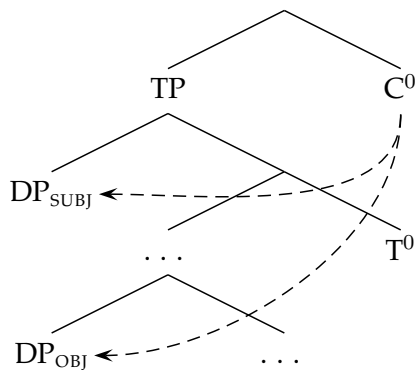
(11)



I propose that SR clauses (boxed) are full CPs in Amahuaca.<sup>7</sup> This is in line with work on SR clauses in the related language Shipibo (Panoan; Peru; Camacho 2010). I assume that the SR marker lexicalizes C itself. These SR CPs adjoin at the matrix TP level, above the position of the matrix subject and object, deriving their high surface position.

In this structure, the probe on C probes its c-command domain. Because the probe is insatiable and because no phase boundary intervenes between the probe and the arguments of the adjunct clause, the probe will agree with both the subject and object of the adjunct clause, as schematized in (12)

(12)

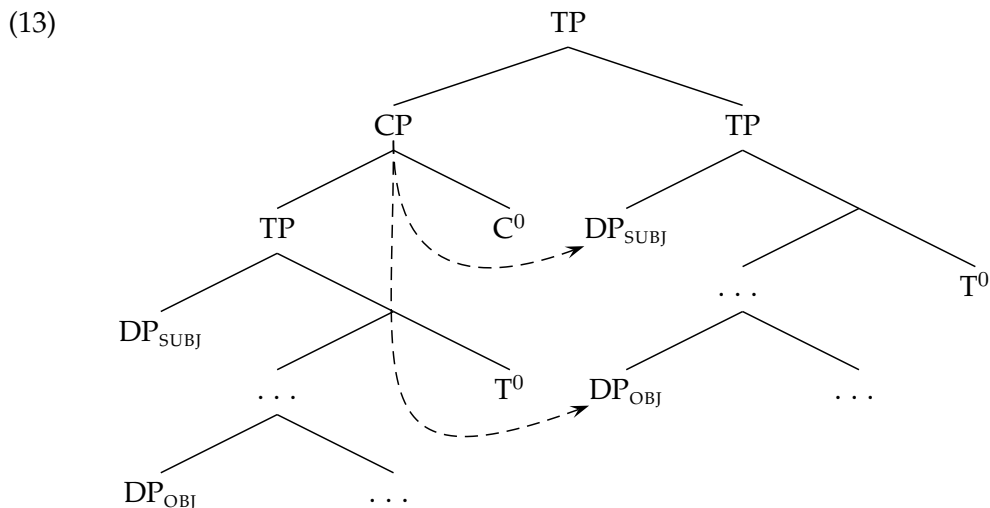


Once C participates in these Agree operations, it will bear the features of all arguments in the adjunct clause.

The question that now arises is how to ensure that C will also come to bear the features of the matrix arguments. This is potentially problematic because C does not c-command the matrix arguments, nor do the matrix arguments c-command the probe on C. Interestingly, probe insatiability provides a way of solving this problem. Under the framework of Cyclic Agree (Rezac 2003, 2004; Béjar and Rezac 2009) a probe that remains unsatisfied after a first cycle of probing is able to reproject as part of the label of a branching node. The

<sup>7</sup>See Clem 2019a,b for arguments that SR clauses are structurally quite large, consistent with them being CPs.

probe is then able to probe again from its new position, probing an expanded c-command domain. Since C's probe is insatiable in Amahuaca, it will always remain unsatisfied after it probes the DPs of the adjunct clause. This means that when C reprojects to label the maximal projection, CP, the probe on C will be reprojected as well. On a second cycle of probing, the probe will then be able to probe the c-command domain of the adjunct CP, which contains the matrix arguments. This second cycle of probing is schematized in (13). Because C's probe is insatiable, it once again agrees with all goals in its c-command domain, agreeing with both the matrix subject and object.



Once C has completed both cycles of probing, it will bear the features of all of the arguments of both clauses. I assume that C copies back referential indices, which I model as  $\phi$ -features following Rezac (2004), allowing it to be sensitive to argument coreference (cf. Finer 1984, 1985; Arregi and Hanink 2018, among others). In addition to  $\phi$ -features, I assume that the probe on C copies case features (cf. Georgi 2013). If two DPs that C has agreed with share the same referential index, one of the coreference SR markers will be inserted, with the choice of marker being determined by the abstract case of the involved DPs. Sample vocabulary items are given in (14).

- (14) 'After' vocabulary items
- |                                     |                   |       |
|-------------------------------------|-------------------|-------|
| [[AFTER, $[i,NOM^*]$ ] [ $i,NOM$ ]] | $\leftrightarrow$ | /hax/ |
| [[AFTER, $[i,NOM^*]$ ] [ $i,ACC$ ]] | $\leftrightarrow$ | /xo/  |
| [AFTER]                             | $\leftrightarrow$ | /kun/ |

The marker =hax is used to indicate coreference of the subject of the adjunct clause with the intransitive subject of the matrix clause. Argument coreference is indicated by the shared referential index  $[i]$  that is present in two feature bundles, corresponding to two distinct DPs. The feature  $[NOM^*]$  in the first DP bundle indicates that the DP is the subject of an adjunct clause.<sup>8</sup> The feature  $[NOM]$  in the second DP bundle indicates that that DP is an

<sup>8</sup>I use  $[NOM^*]$  here to represent a feature that is common to all adjunct clause subjects. Evidence from case assignment suggests that a likely candidate for this feature is  $[T]$ , indicating that the subject DP agreed with T (Clem 2019a).



intransitive subject, something with abstract nominative case, in the matrix clause. The second marker =*xo* is used when the adjunct clause subject is coreferential with the matrix object. The featural specifications of this vocabulary item are minimally different from the specifications for =*hax*. The only difference is that the coreferential matrix DP is an object and thus bears the feature [ACC], indicating abstract accusative case. Nothing more needs to be said about the features of vocabulary items to allow for the reference of the object to affect the form of the SR marker. The final vocabulary item shown in (14) is =*kun*. This is the marker that is used as the default, including in constructions where no DPs are coreferential. Note that there is nothing in the featural specifications of =*kun* that explicitly enforces disjoint reference of arguments. The only feature that this marker explicitly indicates is the temporal relationship between the two clauses. Assuming standard competition mechanisms within Distributed Morphology (Halle and Marantz 1993), it will be inserted if no more highly specified vocabulary item can be inserted.

The account outlined above is able to correctly derive patterns of object sensitivity in Amahuaca's SR system. By allowing the probe involved in SR to be insatiable, it can agree with both subjects and objects. The insatiability of C's probe also accounts for the ability of adjunct C to continue to probe into the matrix clause via probe reprojection after it has already agreed into its own clause. Probe insatiability therefore provides a straightforward means of modeling SR that has greater empirical coverage than alternative accounts which focus only on subject DPs. In the next section I discuss how a model that relies on insatiable probing can be reconciled with the fact that many SR systems only show sensitivity to the reference of subjects.

#### 4 Deriving subject-only sensitivity despite insatiable probing

Accounts of SR which do not admit sensitivity to objects often take the lack of object sensitivity as a welcome prediction, assuming that such patterns are unattested (see, e.g., Camacho 2010). These analyses are not without reason in assuming that only subjects figure in the calculus of SR marking. As mentioned in the introduction, object-sensitive SR appears to be far less common crosslinguistically than SR that is sensitive only to subjects. We might ask then whether an account of SR that assumes insatiable probing is able to be extended to account for languages that lack object sensitivity in their SR system. In this section, I highlight a few ways in which SR systems that only display sensitivity to the reference of subject DPs can be captured while maintaining an insatiable SR probe.

The first way in which a language could lack object-sensitive SR comes down to the position of the object. As noted in Section 3, two ingredients are necessary to allow a probe on C to agree with an object DP. First, the object must be high enough in the clause to be accessible to the probe on C – it must not remain trapped within a lower phase. Second, C must be able to agree with and look past intervening goals, such as the subject. The second issue is solved via insatiable probing. However, insatiable probing does not solve the first issue. While an insatiable probe will not halt its search upon encountering a goal, it will stop probing upon reaching a phase boundary (assuming that Agree, like other syntactic operations, is phase-bound; Chomsky 2000). Therefore, if the object remains within the *v*P phase it will not be a goal for agreeing C. As demonstrated above, in Amahuaca the object undergoes object shift to the *v*P edge, escaping the *v*P phase and becoming accessible to

a probe high in the clause. If a language does not have object shift to a position outside of the *vP* phase, it will lack object-sensitive SR. This is because the SR probe will exhaust its search space before it ever encounters an accessible object DP. The probe on C will agree into the dependent clause and agree with the subject. When it reaches the *vP* phase boundary without finding any additional goals it will be unable to probe further. Because the probe is insatiable, it will reproject and probe the matrix clause. The same situation will hold here as well. The probe will encounter the subject DP, but it will stop probing when it reaches the *vP* phase. The result is that the probe on C will only bear features of the subjects of the two clauses. Therefore, only the reference of subjects will be able to affect the choice of SR marker.

A second way in which a language may lack object-sensitive SR relates to the properties of the probe. It is well known that languages differ in which DPs can serve as goals for Agree. One way in which languages differ is in which case value(s) a DP goal may have. For example, in some languages only the most unmarked DPs (nominative/absolutive) can be goals for Agree (Bobaljik 2008). Such patterns can be modeled by assuming that probes can be case discriminating (Preminger 2014; Deal 2017). If an insatiable probe were case discriminating, it could agree with all DPs in its search space, so long as they had the correct case value. In a language with accusative case alignment, a case-discriminating probe that could agree only with nominative arguments could derive a system of SR that was sensitive only to subject DPs.<sup>9</sup> In such a system, even if objects were high enough in the clause to be accessible to C, they would not be possible goals because they bear accusative case. Therefore, the probe on C would only be able to copy the features from the nominative subjects of the two clauses.

A final way in which a language could lack object-sensitive SR markers in part or all of the paradigm is through morphological syncretism. Evidence that morphological syncretism may play a role in deriving the paucity of object-sensitive SR markers crosslinguistically comes from the fact that syncretism seems to be a relevant factor in reducing the number of object-related SR contrasts even within Amahuaca. In this paper, I have focused on the series of SR markers that correspond to a meaning like ‘after’. If we compare this paradigm to the paradigms of ‘while’ and ‘before’ SR markers, we see that there is successively more syncretism, the net result of which is fewer SR markers that reference objects. This can be seen by comparing the paradigms in (15)-(17).

(15) ‘After’ SR markers

		Matrix		
		S	A	O
Adjunct	S	= <i>hax</i>	= <i>xon</i>	= <i>xo</i>
	A			
	O	= <i>ha</i>	= <i>kun</i> (DFLT)	

<sup>9</sup>Arregi and Hanink (2018) do not make use of insatiable probing in their account of SR, but they do assume that the probe involved in SR in Washo (Isolate; USA) is case-discriminating in order to derive the sensitivity to subjects.

(16) 'While' SR markers

		Matrix		
		S	A	O
Adjunct	S	= <i>hi</i>	= <i>kin</i>	= <i>haito</i>
	A			
	O	= <i>hain</i> (DFLT)		

(17) 'Before' SR markers

		Matrix		
		S	A	O
Adjunct	S	= <i>katzi/</i>	= <i>xankin</i>	
	A	= <i>xanni</i>		
	O	= <i>non</i> (DFLT)		

In (15) we see the paradigm for 'after' markers. Only two cells of the coreference paradigm are filled by the default marker =*kun*. In (16) we see that all coreference relationships involving the adjunct clause object are now leveled to the default marker =*hain* in the 'while' paradigm. Finally, in the 'before' paradigm in (17) there are no SR markers that indicate a coreference relationship involving an object in either clause. All of these cells have been collapsed to the default marker =*non*. There is no evidence from within Amahuaca that suggests that the syntax of 'while' and 'before' clauses is systematically different from the syntax of 'after' clauses. Therefore, a likely explanation for this pattern is syncretism. The presence of such syncretisms within the SR system of Amahuaca suggests that morphological syncretism may also play a role in reducing the number of object-sensitive SR markers crosslinguistically.

We have seen in this section that there are multiple ways to arrive at a SR system that is sensitive only to the reference of subjects even while assuming insatiable probing. This means that an account of SR that relies on probe insatiability is not only able to capture typologically less common systems that involve object sensitivity, such as Amahuaca's system, but it is also able to be extended to account for the more typical systems of SR that only show sensitivity to subjects.

## 5 Conclusion

In this paper I have provided an analysis of SR that is able to account for systems that show sensitivity to the reference of object DPs. One key technology that this account makes use of is insatiable probes – probes that can agree with all possible goals in their search space. By utilizing insatiable probing, we can account for a SR probe's ability to agree with and look past the subject DP to encounter non-subject arguments lower in the clause. Further, probe insatiability coupled with probe reprojection is able to explain how a SR probe can establish a direct Agree relationship with DPs in the matrix clause to which the clause hosting the SR probe attaches. In addition to demonstrating how an insatiable probing account of SR is able to account for Amahuaca's object-sensitive SR system, I have also shown how this analysis can be extended to account for systems of SR that only exhibit sensitivity to subject DPs. I conclude, therefore, that SR in Amahuaca and beyond provides

support for the existence of insatiable probes. The broader implication for a theory of Agree is that our model must allow us to define a type of probe that can agree with every goal in its domain rather than being satisfied by a particular feature.

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