# Interaction and satisfaction in $\phi$-agreement *

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## 1. Introduction

We can understand the operation Agree in terms of *search*, *copying* and *valuation* steps, each of which involves features in some way:

1. *Search*. A probe initiates a search for an element with matching features (a goal).
2. *Copying*. Features are copied from the goal to the probe.
3. *Valuation*. The probe's features are valued, and the search is halted.

The usual assumption is that the features involved in each step are the same. In the Search step, elements in the c-command domain of the probe are systematically assessed for some feature (set) F. In the Copy step, F is copied to the probe. In the Valuation step, a special version of F on the probe is valued – namely [uF], the unvalued version of F.

In this paper, I argue that the usual assumption is incorrect, and offer an alternative that draws on two influential recent ideas about Agree(ment). The first is that probes may be specified for particular features in the $\phi$-set, such as [PL] or [SPKR] (Béjar 2003, Rezac 2003, Béjar and Rezac 2003, 2009, Nevins 2011, Preminger 2011a). This means that the features involved in the various subcomponents of the Agree relation may be quite fine-grained. The second idea is that these subcomponents are subject to at least partially distinct conditions, so that (for instance) Search may be obligatory while Valuation is not (Preminger 2011a). For the argument below it will be helpful to recast Preminger's distinction using the new terminology featured in this paper's title. His core proposal, in the present terms, is that a probe must *interact* with its syntactic environment; it must assess whether potential goals are present. It need not, however, be *satisfied*, by having its features

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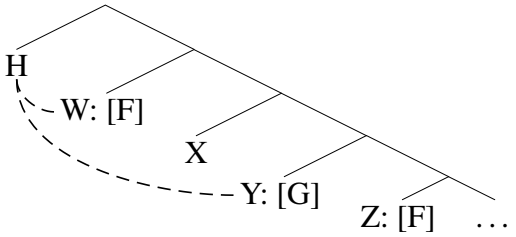
valued. The explicit distinction between interaction and satisfaction is the core conceptual contribution of this paper. I will say more about these notions directly.

The core empirical proposal of this paper is that interaction and satisfaction must be differentiated in featural terms. In particular:

(1) 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 $\phi$-features) and F $\neq$ G

Interaction with F means that the probe's domain is assessed (Search) and that, if F is located, F is copied to the probe (Copy). Satisfaction by G means that the probe's [uG] is valued and the search is halted (Valuation). To make clear how this works, consider a probe H that interacts with feature set F and is satisfied by feature set G. When H probes its domain in (2), it first encounters F on goal W; F is copied back to H. H is not satisfied by F, however, and so probing continues. X is assessed, and subsequently Y. Probing of Y values the [uG] probe on H and the search is halted. H does not interact with features on Z.

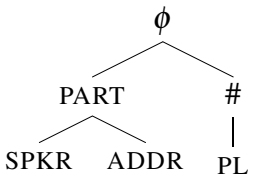
(2)




If valuation of [uG] requires copying of G from a goal, then satisfaction entails interaction; the features that satisfy a probe will always be a subset of the features that it interacts with. The new proposal is thus that satisfaction features may be a *proper* subset of interaction features. Suppose, for instance, that F = $\Phi$ and G = [ADDR(ESSEE)]. In this case, H will stop probing only when it encounters [ADDR], but it will interact with all $\phi$ features in its domain until the search is terminated.

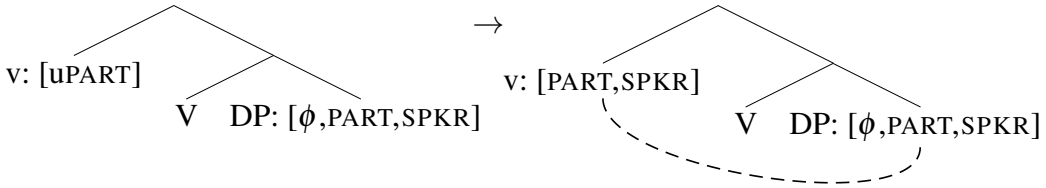
The proposal in (1) has important precedents in Béjar and Rezac 2009 and Preminger 2011a, each of which allows certain cases where a probe interacts with features that do not satisfy it. Béjar and Rezac propose, in the present terms, that a probe satisfied by feature F interacts with features entailing F in a feature geometry.[1] In the geometry in (3), for instance, the features [SPKR] and [ADDR] each entail [PART]; [PART] entails [$\phi$]; and so on. (In other words, entailment is the upward relationship in the feature-geometric tree.) A first person DP in this feature system bears at least [$\phi$,PART,SPKR]. In Béjar and Rezac's system, a probe whose satisfaction condition is [PART] interacts with both [PART] and [SPKR] on a first person goal. This is shown for a *v* probe in (4).

(3) A geometry for $\Phi$



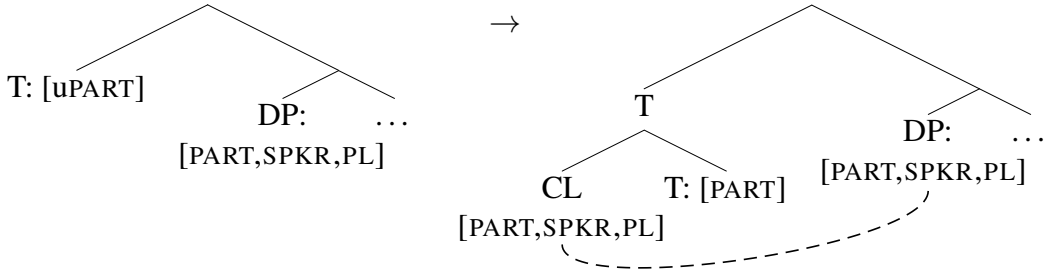

[1] See Harley and Ritter (2002) for discussion of feature geometries for $\Phi$.

(4) Satisfaction by [PART], interaction with a feature entailing [PART]:




Preminger (2011a) adopts this proposal and augments it with an additional mechanism for divergence between satisfaction and interaction features: a person probe (a probe satisfied only by person features) may interact with number features when Agree triggers clitic doubling. This is shown for a T probe in (5).

(5) Satisfaction by [PART], clitic doubling:




This is an instance of interaction in that features are copied to T as a result of Agree with DP. It is distinct from interaction in (4) in that the features are copied to the head as an independent, head-adjoined pronominal clitic.

By imposing entailment or cliticization requirements on interaction with non-satisfying features, these proposals substantially constrain the ways that interaction and satisfaction may diverge in natural language. While such constraint is attractive in theoretical terms, we will see that, empirically speaking, interaction/satisfaction divergence proves to be more general a phenomenon than these models allow. I will argue that the major constraint on featural specification for interaction and satisfaction is only that satisfaction features must be a subset of interaction features. Few if any restrictions beyond this should be imposed. In particular, a probe satisfied by G may interact with F regardless of the geometric relationship between G and F, and a probe may interact with features that do not satisfy it even in agreement proper (not clitic doubling).

My argument for these conclusions comes from a pattern of complementizer agreement in the Penutian language Nez Perce. In the next section, I introduce this pattern and provide evidence that it involves Agree. In section 3, I argue that agreeing C heads in Nez Perce instantiate the possibility sketched just below structure (2): they are satisfied only by [ADDR], but nevertheless interact with all ϕ-features. Furthermore, agreement markers on C do not behave like clitics. In section 4, I investigate the morphological consequences of C's interaction with multiple goals. Section 5 concludes.

## 2. Nez Perce complementizer agreement: preliminaries

Nez Perce has a series of clause-initial functional elements which show agreement with arguments internal to the clause. These include yes/no particle *weet(e)*, inferential eviden-

tial *'eete*, conditional/ignorance marker *ku'*, negator *neecu'*, and Ā particle *ke*. Given the position and the function of these elements, I assume that they are heads in the C domain. Throughout this paper, I exemplify the complementizer agreement system using *ke*, which is found in relative clauses, wh-questions and when-clauses.[2]

### 2.1 The basic agreement pattern

The basic pattern of complementizer agreement (CA) can be appreciated most readily in transitive clauses.[3] When all arguments are 3rd person, no overt agreement appears on C; the form of the Ā complementizer is simply *ke*.

(6) **ke** kaa A.-nim pee-cewcew-téetu T.-na
C then A.-ERG 3/3-telephone-TAM T.-ACC
**3sg/3sg**: when A. calls T.

When either the subject or the object is 1st person, and all other arguments are 3rd person, the complementizer takes the suffix *-(e)x*.

(7) a. **ke-x** kaa $pro_{subj}$ 'e-cewcew-téetu A.-ne
C-1 then PRO.1SG 3OBJ-telephone-TAM A.-ACC
**1sg/3sg:** when I call A.

b. **ke-x** kaa A.-nim hi-cewcew-téetu $pro_{obj}$
C-1 then A.-ERG 3SUBJ-telephone-TAM PRO.1SG
**3sg/1sg**: when A. calls me

When either the subject or the object is 2nd person, and all other arguments are 3rd person, the complementizer takes the suffix *-m*.

(8) a. **ke-m** kaa $pro_{subj}$ 'e-cewcew-téetu A.-ne
C-2 then PRO.2SG 3OBJ-telephone-TAM A.-ACC
**2sg/3sg:** when you call A.

b. **ke-m** kaa A.-nim hi-cewcew-téetu $pro_{obj}$
C-2 then A.-ERG 3SUBJ-telephone-TAM PRO.2SG
**3sg/2sg**: when A. calls you

The pattern here is *promiscuous* (Béjar 2003) or *omnivorous* (Nevins 2011) agreement in person features: agreement is controlled either by the subject or the object, depending on the features present in the clause, and the same morphemes are used in both cases.

### 2.2 CA involves Agree

The cases of omnivorous person agreement discussed by Béjar (2003) and Preminger (2011b) involve agreement within the TP domain. Baker (2008) suggests that person agreement within the CP domain may work in a fundamentally different way. CA in person, he

[2] On the Ā status of *ke* and its behavior in relative clauses in particular, see Deal To appear a.

[3] A full paradigm for CA in the transitive clause is presented in the appendix to Deal To appear b.

suggests, reflects agreement not between C and an element within TP, but rather between C and a covert operator in Spec,CP. This operator licenses person indexicals within the CP in a way not sensitive to syntactic locality. To adjudicate between this type of approach and an alternative based on the operation Agree, we must ask whether CA obeys locality restrictions. There are several type of evidence that indeed it does. First, there is no CA into an embedded CP, such as the complement of *neki* 'think'. While C may agree with an object, it may not agree with an object inside an embedded clause.

(9) ke(*x) kaa Beth hi-nak-sáqa [$_{CP}$ 'íin-e-cim *pro$_{subj}$*
C-(*1) then Beth.NOM 3SUBJ-think-TAM [ 1SG-ACC-only PRO.3SG
hi-weqy-úu-yu' ]
3SUBJ-rain-APPL-TAM ]
when Beth thought it was going to rain on only me

Second, there is no CA into an oblique phrase, such as the standard of comparison in a comparative construction like (10). Note that, in this structure, *-x* 'from' assigns oblique case to the pronoun in its complement. The ability of this element to case-mark its complement suggests that it belongs to category P.

(10) ke(*m) 'isíi híi-we-s [$_{PP}$ 'im-ím-x ] qétu kuhét
C-(*2) who.NOM 3SUBJ-be-TAM [ 2SG-OBL-from ] more tall
someone who is taller than you

These restrictions on the scope of CA are expected if this phenomenon involves Agree, which is phase-bounded, and CPs and PPs are phases.[4]

### 2.3 No interaction between CA and verbal agreement

In addition to CA, Nez Perce shows verb agreement with both subjects and objects. Agreement is on a nominative-accusative alignment; full paradigms are provided in Deal (To appear b). The relationship between CA and verb agreement is of interest in view of the variety of approaches to CA, particularly in Germanic, that posit a close relationship between C and the lower head T/Agr/Infl (i.a. Zwart 1997, Watanabe 2000, Chomsky 2008). For Chomsky (2008), for instance, the ϕ-probe on T is inherited from C, the phase head, and CA may result when this shared probe is morphologically realized on C. Against this backdrop it should be noted that, in Nez Perce, the presence of CA has no effect on subject (or object) agreement, and the features exponed on C need not match those exponed on the verb. This may be seen clearly in cases where CA is controlled by the object, as in (11), but overt agreement on the verb is controlled by the subject.

(11) ke-x kaa A.-nim hi-cewcew-téetu *pro$_{obj}$*
C-1 then A.-ERG 3SUBJ-telephone-TAM PRO.1SG
when A. calls me

[4] A further type of evidence, omitted here for reasons of space, concerns the DP phase. In Deal (2013), I discuss two types of possessive constructions for kinship terms, one with the possessor in Spec,DP and another with the "possessor" as complement to N. As expected, only the former type of possessive construction allows CA with the possessor, since the possessor is on the edge of the DP phase. See Deal (2015a).

Such data may be taken as evidence that the participation of C in Agree is independent of the behavior of lower agreement heads; as Haegeman and van Koppen (2012) have argued for West Flemish, C and T simply probe independently. Alternatively, the pattern may be understood morphologically: C and T obtain the same overall set of features (crucially, those of *both* the subject and the object), but C primarily expones participant features (1st and 2nd person) while T primarily expones nonparticipant features (3rd person).

## 3. Interaction vs. satisfaction

With these preliminaries in place, we now come to two aspects of the CA pattern that call for a featural distinction between interaction and satisfaction. The first, involving person features, can be handled using the limited interaction/satisfaction distinction made available in the Béjar and Rezac (2009) system. The second, involving number features, calls for a more radical division between interaction and satisfaction features.

### 3.1 Relativized probing and the 1/2 asymmetry

So far we have seen CA in clauses with no more than one participant argument. What happens when a clause contains two participant arguments? Here, structure matters. When the subject is 2nd person and the object is 1st person, there is agreement only with the 2nd person subject, (12). When the arguments are reversed, however, as in (13), there is agreement with *both* the subject and the object.

(12) ke-m kaa $pro_{subj}$ cewcew-téetum $pro_{obj}$
C-2 then PRO.2SG telephone-TAM PRO.1SG
**2sg/1sg**: when you call me

(13) ke-m-ex kaa $pro_{subj}$ cewcew-téetu $pro_{obj}$
C-2-1 then PRO.1SG telephone-TAM PRO.2SG
**1sg/2sg**: when I call you

The pattern here is what I call the 1/2 asymmetry:[5]

(14) **The 1/2 asymmetry:**
There is CA with both arguments when 1 is structurally higher than 2, but only with 2 when 2 is structurally higher than 1.

This asymmetry raises a question concerning the structure of the probe(s) on C. Does C probe separately for [SPKR] and [ADDR], or does it have just one probe that relates both to 1st person and to 2nd person? If there are two separate probes on C, why is there no agreement with the 1st person object in examples like (12)? But if there is only one probe on C, why does C agree both with the subject and with the object in examples like (13)?

[5]Reference to structural height of course raises the question of whether the asymmetry is affected by changes in word order. The answer is no: clauses with 2nd person subjects forbid agreement with objects regardless of overt object scrambling. This pattern is discussed in Deal (2015a).

The solution lies in recognizing a featural distinction between interaction and satisfaction. The 1/2 asymmetry can be modeled in the system of Béjar and Rezac (2009) if C is a relativized probe bearing both [uPART] and [uADDR]. A 2nd person subject bears both features, and thus interaction with the subject fully satisfies the probe:

(15) [PART,ADDR]

| ke-m | kaa | $pro_{subj}$ | cewcew-téetum | $pro_{obj}$ |
|---|---|---|---|---|
| C-2 | then | PRO.2SG | call-TAM | PRO.1SG |

**2sg/1sg**: when you call me

When the subject is 1st person, on the other hand, interaction with the subject satisfies [PART] only. Interaction with a 2nd person object takes place to satisfy [ADDR]:

(16) [ADDR] [PART]

| ke-m-ex | kaa | $pro_{subj}$ | cewcew-téetu | $pro_{obj}$ |
|---|---|---|---|---|
| C-2-1 | then | PRO.1SG | call-TAM | PRO.2SG |

**1sg/2sg**: when I call you

C ends up with two different morphological forms in the two examples thanks to the distinction between interaction and satisfaction features built in to Béjar and Rezac's system. In this system, recall, a probe satisfied by F interacts with features geometrically entailing F. That means that the [uPART] probe on C interacts with both [PART] and [SPKR] on a first person subject, given that [SPKR] entails [PART]. Therefore, even though C probes for [PART,ADDR] in both (15) and (16), it ends up with an additional feature in (16) beyond what was initially probed for (and beyond what it ends up with in (15)). The form *ke-m* in (15) realizes C, [PART] and [ADDR] only. The form *ke-m-ex* in (16) realizes [SPKR] as well.

### 3.2 Person, number, and 2nd person blocking

A further dimension of the CA system requires a more thoroughgoing distinction between interaction and satisfaction, which will cause us to revise the proposal that C bears [uPART] along with [uADDR]. The crucial data involve agreement for plural number. In addition to the basic paradigm of person agreement, complementizers may show plural agreement via suffix *pe*. This, too, behaves omnivorously, as we see in (17) and (18).

(17)

| ke-pe-m | kaa | $pro_{subj}$ | 'e-cewcew-tée'nix | A.-ne |
|---|---|---|---|---|
| C-PL-2 | then | PRO.2PL | 3OBJ-telephone-TAM | A.-ACC |

**2pl/3sg**: when you(pl) call A.

(18)

| ke-pe-m | kaa | A.-nim | hi-cewcew-téetu | $pro_{obj}$ |
|---|---|---|---|---|
| C-PL-2 | then | A.-ERG | 3SUBJ-telephone-TAM | PRO.2PL |

**3sg/2pl**: when A. calls you(pl)

The generalization about number CA is as follows:

(19) **Plural complementizer agreement generalization**
C bears plural suffix *pe* whenever [PL] is alongside or higher than [ADDR].

A plural feature appears alongside the [ADDR] feature in (17) and (18); C interacts with both features on one goal. In (20) and (21) we see C interacting with a plural feature on a goal higher than [ADDR]. In (20), the 3rd person plural subject interacts with C in number. In (21), the 1st person plural subject interacts with C in both person and number.

(20) ke-pe-m kaa A.-nim kaa T.-nm hi-cewcew-tée'nix $pro_{obj}$
C-PL-2 then A.-ERG and T.-ERG 3SUBJ-telephone-TAM PRO.2SG
**3pl/2sg:** when A. and T. call you(sg)

(21) ke-pe-m-ex kaa $pro_{subj}$ cewcew-tée'nix $pro_{obj}$
C-PL-2-1 then PRO.1PL telephone-TAM PRO.2SG
**1pl/2sg**: when we call you(sg)

By contrast, plural CA is not possible when plural appears only lower than [ADDR]. In (22), C fails to interact in number with a 3rd person plural object; in (23), C fails to interact in either person or number with a 1st person plural object.

(22) ke-m kaa $pro_{subj}$ 'ee 'e-nees-cewcew-téetu $pro_{obj}$ (Cf. (20))
C-2 then PRO.2SG 2SG.CL 3OBJ-O.PL-telephone-TAM PRO.3PL
**2sg/3pl**: when you(sg) call them

(23) ke-m kaa $pro_{subj}$ 'ee nees-cewcew-téetum $pro_{obj}$ (Cf. (21))
C-2 then PRO.2SG 2SG.CL O.PL-telephone-TAM PRO.1PL
**2sg/1pl**: When you(sg) call us

The generalization about [PL] parallels the generalization about [SPKR]. C interacts with these features if they occur higher than [ADDR], but once the probe has interacted with [ADDR], probing stops. The overall generalization subsumes the 1/2 asymmetry:

(24) **2nd person blocking:**
C does not probe past a 2nd person argument.

Note that 2nd person blocking describes the satisfaction conditions on C – C is satisfied by [ADDR]. Why does C interact with [PL], then? For this case, the Béjar and Rezac-style analysis outlined in the previous subsection will not be sufficient. There is no entailment relationship between [ADDR] and [PL] (or [PART] and [PL]), so interaction with [PL] does not come for free from probing for [ADDR] (or [PART]). The problem cannot be solved by treating C as bearing a separate [PL] probe: if C bore [ADDR,PL] (or [ADDR,PART,PL]), probing would stop only when both [ADDR] and [PL] have been located. No asymmetry would be expected between 3pl/2sg, as in (20), and 2sg/3pl, as in (22), and so an important part of 2nd person blocking is not explained. Nor can the problem be solved by having C probe for a superordinate feature such as [#] or even [$\phi$]: in this case, [#] or [$\phi$] will invariably be located on the subject, and only [ADDR] may be probed for in the object. On this approach, omnivorous number agreement as in (17) and (18) would be unexplained.

The remaining alternative is to say that C has just one satisfaction condition – the feature [ADDR] – which will make it stop probing. The features that C interacts with need not entail those that satisfy it, and so there is no need to posit a [PART] probe on C in addition. C simply interacts with all $\phi$ features it encounters until probing stops (due to satisfaction, or exhaustion of possible goals).

### 3.3 Against a clitic doubling analysis

The ability of an [ADDR] probe to interact with all $\phi$ features is reminiscent of a property that Preminger (2011a) calls 'the featural coarseness of clitic doubling', writing:

> If a syntactic probe $H^0$ is relativized to look for some particular subset F of the entire $\phi$-set, it seems reasonable to assume that only the values of features belonging to F will be copied onto $H^0$ from whatever target it finds [...]. This contrasts with clitic-doubling: if clitic-doubling is a form of pronominalization, it is expected to behave like other forms of pronominalization in treating the $\phi$-set of the doubled noun-phrase as an atomic unit, which must be copied as a whole. It should therefore be impossible, under clitic-doubling, to tease apart different subparts of the $\phi$-set, and copy some but not all of the $\phi$-features of the noun-phrase onto the clitic. (p. 63)

This featural coarseness property suggests a potential analysis of Nez Perce CA: C bears [uADDR], and probing triggers clitic doubling of every argument C interacts with, bringing [SPKR] and [PL] back to the probe as part of a pronominal clitic. Could this be the explanation for the division between interaction and satisfaction in Nez Perce CA?

There are several reasons to think that the answer will be negative: CA reflects Agree, not clitic-doubling. First, it should be pointed out that the features present on the complementizer in CA do not behave as an atomic unit in morphological terms. In (25), for instance, the subject's [PL] and [SPKR] features are realized on C by *-pe* and *-ex*, respectively, with the object's [ADDR] feature realized in between:

(25) ke-pe-m-ex kaa $pro_{subj}$ cewcew-tée'nix $pro_{obj}$
C-PL-2-1 then PRO.1PL telephone-TAM PRO.2SG
**1pl/2sg**: when we call you(sg)

The (essentially templatic) morphology of CA is particularly unexpected on the clitic doubling analysis, where the baseline expectation is that a clitic should remain pronoun-like both in morphology and in syntax.

A second argument draws on the tense-invariance test proposed by Nevins (2011). The logic of this test is as follows. Suppose T undergoes Agree and is realized as an agreement morpheme. Since both $\phi$-features and tense features are present on the probe, the realization of the former may well be sensitive to the latter. By contrast, suppose T hosts a pronominal clitic (a D element, for Nevins) by head-adjunction. In this case, Nevins proposes that realization of the clitic cannot be sensitive to the particular tense feature present on T. The essential claim is that clitics have the same form no matter what features are present on the heads they are cliticized to. Against this backdrop, note that Nez Perce contains a set of uncontroversial 2nd-person pronominal clitics, listed in table (26).

(26) Second person clitics

| | |
|---|---|
| 'ee | 2nd person singular |
| 'eetx | 2nd person plural |
| kiye | 1st person plural inclusive (1st person + 2nd person) |

These elements are optional, as shown in Deal (To appear b); compare Kramer (2014) on distinctive properties of pronominal clitics. They are case- and TAM-invariant, as shown in Deal (To appear c); compare Nevins (2011) on distinctive properties of pronominal clitics. They are impossible to modify, as shown in (27) below, and able to double full pronouns, as shown in (28)-(29) below; compare Cardinaletti and Starke (1999) on distinctive properties of pronominal clitics.

(27) ’iim-cim ’imee-cim *’ee-cim *’eetx-cim
2SG.NOM-only 2PL.NOM-only *2SG.CLITIC-only *2PL.CLITIC-only

(28) *Pro*$_{subj}$ ’ime-né ’ee ’iyóox̂oo-sa.
PRO.1SG 2SG-ACC 2SG.CLITIC wait.for-TAM
I’m waiting for you (sg).

(29) ’Iim ’ee wee-s wepcúux.
2SG.NOM 2SG.CLITIC be-PRES smart
You (sg) are smart.

If *’ee/’eetx/kiye* are indeed pronominal clitics, and the form of clitics may not change depending on the features of the head they are adjoined to, then 2nd person CA marker *-m* cannot be a clitic. It must be an agreement suffix.

A third argument relates to the common observation that clitics resemble pronouns morphologically (Preminger 2011a, Kramer 2014). Setting aside *-m* in 2nd person, just discussed, Nez Perce CA affixes don’t resemble pronouns at all, either in their templatic morphology or in their phonology. The paradigm of strong personal pronouns is shown in (30a); compare the CA paradigm in (30b).

(30) a. Strong personal pronouns

| | Singular (NOM) | Plural (NOM) |
|---|---|---|
| 1 | ’iin | nuun |
| 2 | ’iim | ’imé |
| 3 | ’ipí | ’imé |

b. CA affixes[6]

| | |
|---|---|
| 1 | -(e)x |
| 2 | -m |
| 1+2 (1pl inclusive) | -nm |
| pl | -pe |

By contrast, there are two major ways that CA resembles agreement. First, agreement in Nez Perce is generally arranged templatically, with separate slots for number affixes and for person affixes. The three bolded verbal prefixes in (31) realize the person, subject number, and object number prefix slots.

(31) **hi-pa-náac**-’yax̂-na
3SUBJ-S.PL-O.PL-find-TAM
They found us. (Deal To appear b)

There is also a phonological resemblance: plural CA *-pe* is phonologically identical to the subject plural agreement prefix seen in (31) (though this prefix, underlyingly *pe-*, has undergone vowel harmony to *pa-* in this example). This prefix is demonstrably agreement,

[6]The featural characterization of *-nm* and *-pe* is further discussed in section 4. Note that there is no dedicated strong pronoun for 1st person plural inclusive; *nuun* is used both for inclusive and exclusive 1pl.

rather than a clitic, by a generalized version of Nevins (2011)'s test: its appearance is restricted to perfect(ive), future and optative aspect/mood, rather than imperfective, habitual, or imperative aspect/mood. In the minimal pair below, *pe* appears in the perfect(ive) variant (32a), but is replaced by the suffix *-ii* in the imperfective variant (32b).

(32) a. hi-**pe**-tiim'e-n-e.
3SUBJ-S.PL-write-PERF-REM.PST
They wrote.

b. hi-tiim'e-c-**ii**-qa.
3SUBJ-write-IMPERF-S.PL-REC.PST
They were writing.

There is no remotely similar form among noun-plural suffixes (***C**i-, he-, -me*; see Deal 2015b) or pronouns. The use of *pe* for plural seems to be restricted to agreement systems.

Taken together, the facts in this subsection make it unlikely that there is any clitic doubling at all in an example like (33), where C interacts with the subject before being satisfied by the object:

(33) ke-pe-m kaa A.-nim kaa T.-nm hi-cewcew-tée'nix $pro_{obj}$
C-PL-2 then A.-ERG and T.-ERG 3SUBJ-telephone-TAM PRO.2SG
**3pl/2sg:** when A. and T. call you(sg)

I conclude that Nez Perce CA reflects Agree proper, in a way that distinguishes interaction from satisfaction. C is satisfied by [ADDR]; it interacts with all ϕ-features.

## 4. More on the result of Agree

If probes satisfied by particular elements in the ϕ geometry may nevertheless interact with Φ overall, then the results of Agree include more featural content than initially meets the eye. A probe appearing to agree just with a 1st person subject or object, as in (7), turns out to interact both with the subject and with the object, and furthermore with the entire Φ set on each. This raises a question about the results of multi-goal interaction. When C interacts with feature sets on multiple goals, does it copy these features back as a single, undifferentiated set–a "bag of features"? Or does it copy them back in a structured list, wherein features from each goal are kept separate from features from all other goals?

These questions can be addressed in part by considering the way that Vocabulary Insertion applies to agreeing Cs. If Insertion is sensitive to a distinction between features that originate on separate goals versus features that originate together on a single goal, that supports a structured list analysis. This type of distinction is indeed found in the CA paradigm in the realization of agreement with 1st person plural inclusive. In this case, C agrees with a single goal bearing [SPKR], [ADDR], and [PL], and CA is realized as *-nm*, (34). By contrast, when C agrees with separate goals for these features, CA is realized as *-pe-m-ex*, (35).

(34) ke-nm kaa $pro_{subj}$ kíye 'e-pe-xté-nu' $pro_{obj}$
C-1INCL then PRO.1PL.INCL 1PL.INCL.CL 3OBJ-S.PL-visit-TAM PRO.3SG
**1pl.incl/3sg:** when we(inclusive) visit him

(35) ke-pe-m-ex kaa $pro_{subj}$ cewcew-tée'nix $pro_{obj}$
C-PL-2-1 then PRO.1PL telephone-TAM PRO.2SG
**1pl/2sg**: when we call you(sg)

On a structured list analysis, the post-Agree representation of C in these examples can be given by a feature structure $\mathscr{F}$ as in (36).

(36) a. $\mathscr{F}(C)$ in (34) = $< \{\phi, \text{PART}, \text{SPKR}, \text{ADDR}, \#, \text{PL}\} >$
b. $\mathscr{F}(C)$ in (35) = $< \{\phi, \text{PART}, \text{SPKR}, \#, \text{PL}\}, \{\phi, \text{PART}, \text{ADDR}, \#\} >$

Vocabulary Insertion applies to these structures by considering whether particular sets in the list support a match with particular vocabulary items, such as those in (37).

(37) Vocabulary items for CA affixes
a. nm ↔ [SPKR,ADDR,PL]
b. m ↔ [ADDR]
c. (e)x ↔ [SPKR]

By contrast, evidence for the alternative, "bag of features"-style representation would come from *in*sensitivity to the origin of features on one goal versus two separate goals. Curiously, we find a pattern of this type in Nez Perce CA as well, concerning the realization of plural *-pe*, the final affix in the CA paradigm. So far we have seen this affix appearing in cases where C interacts with both [PL] and [ADDR], as in (38). (See also (17) and (18).)

(38) a. ke-pe-m-ex kaa $pro_{subj}$ cewcew-tée'nix $pro_{obj}$
C-PL-2-1 then PRO.1PL telephone-TAM PRO.2SG
**1pl/2sg**: when we call you(sg)
b. ke-pe-m kaa A.-nim kaa T.-nm hi-cewcew-tée'nix $pro_{obj}$
C-PL-2 then A.-ERG and T.-ERG 3SUBJ-telephone-TAM PRO.2SG
**3pl/2sg:** when A. and T. call you(sg)

Notably, the *-pe* affix cannot appear when C interacts with [PL] but not [ADDR]. In (39), both arguments are plural, but *-pe* cannot appear on C.

(39) a. ke-x kaa $pro_{subj}$ 'e-nees-cewcew-tée'nix $pro_{obj}$
C-1 then PRO.1PL 3OBJ-O.PL-telephone-TAM PRO.3PL
**1pl/3pl**: when we call them
b. ke-x kaa $pro_{subj}$ hi-nees-cewcew-tée'nix $pro_{obj}$
C-1 then PRO.3PL 3SUBJ-O.PL-telephone-TAM PRO.1PL
**3pl/1pl**: when they call us

The generalization is that *pe* appears only if C expones 2nd person. Observe that in this case, the overall set of features on C is used to calculate its form: *pe* appears when C contains both [PL] and [ADDR], *whether or not* they come from the same argument. On a "bag of features" representation, the pattern could be captured by treating *pe* as the realization of {ADDR,PL} (whatever the origin of these features), so that [ADDR] is multiply exponed in examples like (38). In Müller (2007)'s system, for instance, we might posit an 'enrichment' rule for [ADDR], duplicating this feature and allowing both *-pe* and *-m* to expone it.

The major question that arises from these data is how Insertion works such that sometimes the structure of multi-goal interaction is respected, as in the 1st person inclusive

data, but sometimes it isn't, as in the data on *-pe*. One possible answer is essentially derivational, positing structured and unstructured representations for the probe as two steps in the Insertion algorithm. Subsequent to Agree, the probing head is left with a structured representation as in (36). Insertion then proceeds through the list of feature sets, realizing as much as possible for each set individually. This explains the contrast between (34) and (35) exactly as above. The additional piece needed for (38) comes in next: the list-structure is collapsed into a bag of features in a step of *Smashing*. Finally is a second-pass, *Scavenging* round of Insertion: Insertion proceeds through the bag of features, again realizing as much as possible. If the [ADDR] and [PL] features are contributed by a single argument, as in (17) and (18), {ADDR,PL} is available for realization on the initial Insertion step. If, on the other hand, the two features come from two separate arguments, as in (38), {ADDR,PL} is available for realization only on the Scavenging step, not before Smashing.

## 5. Conclusions and prospects

What I have advocated in this paper is a version of the Cyclic Agree theory of Rezac (2003) and Béjar and Rezac (2003, 2009). A single probe may interact with multiple goals, and interaction is not simultaneous, but proceeds cyclically as the probe searches its domain (cf. Multiple Agree, Hiraiwa 2005, Nevins 2011). In the Nez Perce complementizer agreement paradigm, this cyclicity makes itself known in the 2nd person blocking condition: C may not probe past a 2nd person argument. I have argued that this condition results from C's satisfaction condition, viz. the feature [ADDR]. Notably, while other $\phi$-features do not *satisfy* the C probe, C nevertheless *interacts* with them. The features C interacts with need not stand in an entailment relationship to those that satisfy it (*pace* Béjar and Rezac 2009); nor need interaction with non-entailing, non-satisfying features reflect clitic doubling (*pace* Preminger 2011a). The Nez Perce facts call for a theory of Agree proper wherein probes may quite generally interact with features that do not satisfy them. Interaction and satisfaction must be regulated by the theory in largely independent terms.

Probes that interact with multiple goals are of interest both syntactically and morphologically. The Nez Perce facts suggest that the post-Agree representations of such probes begin as structured lists, but may be collapsed into unstructured, "bag of features" representations by a step of Smashing taking place in the morphological component. Insertion is possible both before and after Smashing.

I would like to conclude with the observation that the literature on relativized probes describes only the satisfaction condition on probes, which appear to vary substantially. The data discussed here raise a new question about the dimensions of variation in agreement: given that interaction and satisfaction may be differentiated featurally, to what extent is there variation in the interaction conditions on probes? One attractive hypothesis consistent with the Nez Perce facts is that there is no variation in this dimension at all. Probes satisfied by any particular feature in $\Phi$ always interact with all $\phi$-features; variation is in satisfaction conditions only. If this hypothesis is borne out, Nez Perce agreeing C is simply C:[uADDR]. There is no need to specify an interaction condition for a particular probe – only the morphological results of interaction (as is needed on all theories).

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