THE ROOTS OF PRONOUNS AND VALUATION[1]

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November 18, 2020

1 Introduction

It is still an open issue how precisely pronominals and anaphors are internally structured and how their components interact with the syntactic environment in order to represent interpretive dependencies.[2] As I will argue a key role is played by the relation between φ -features and a null-element that occurs as the root.

While traditional lexicalist approaches to the structure of pronouns raise significant problems, recent approaches based on post-syntactic spell out face problems as well.

I will show that some of these problems can be resolved in terms of the approach to anaphor binding presented in Zubkov (2018) and Reuland and Zubkov (2019/2020, submitted). However a number of issues – in part conceptual - remain. I will show that these can be resolved by reassessing the status of the pronominal root. As I will argue, this root represents an arbitrary individual and has inherent properties that - unlike what is often assumed – are visible to the syntactic computation, be it through a narrow channel. In this sense, there is a parallel between what the theta-system of Reinhart (2000/2016) expresses for the verbal domain and the approach to pronouns I present.

2 Some preliminaries

The discussion is inspired by the minimalist program (Chomsky 1995). As Chomsky argues, syntactic indices violate the *inclusiveness condition*. The only types of elements entering into the syntactic derivation are those realized in the lexicon of at least some language, and no annotations are to be introduced in the course of the derivation. In particular, the syntactic derivation does not contain indices, lambda's, etc. Thus, indices have to be dispensed with.

Since anaphoric dependencies are subject to syntactic constraints, the question comes up how these dependencies are represented syntactically. Syntax has two operations to do so, namely *Move* and *Check/Agree*, see Reuland (1995/2001, 2005, 2011, 2017b), Hornstein (2000), Hicks (2009), Kratzer (2009), and many others. The question is, then, how precisely this is achieved.

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[1] I am indebted to Mark Baker and Peter Zubkov for their very helpful comments on an earlier version.

[2] Since Chomsky (1981) introduced what can be referred to as the Canonical Binding Theory (CBT), the notions of *pronominal* and *anaphor* are generally taken for granted. However, it becomes increasingly clear that these notions deserve more careful scrutiny. Reuland (2011:239) shows that the term 'anaphor' as it was used in the Canonical Binding Theory lacks theoretical significance. What can be defined is 'being used as an anaphor'.

(i) A particular element is used as an anaphor ... iff it is linked to its antecedent by a syntactic operation such as Move or Agree.

This takes care of exempt uses of *himself* and explains why true anaphors, unlike exempt anaphors and pronominals don't allow split antecedents (Giorgi 1984).

As argued in Reuland (2005 and subsequent work), *Check/Agree* applies in interpretative dependencies involving simplex anaphors (SE-anaphors), such as Dutch *zich*, Norwegian *seg*, etc., whereas *Move* applies in the local binding of complex anaphors (see already Reinhart and Reuland 1991), reducing condition A of the canonical binding theory (Chomsky 1981) and its exceptions to independent properties of the syntactic system.

SE-anaphors are underspecified for φ -features. This is a property of a cross-linguistically pervasive class of anaphors that no theory of anaphor binding should take to be accidental. The proposal in Reuland (2005, 2011) is that unvalued features of a SE-anaphor are valued by Agree with the value from an occurrence of that feature on the antecedent. In line with Pesetsky and Torrego (2007), this effects unification of these occurrences and the formation of a feature chain, which is subsequently interpreted as binding at the C-I interface.[3] Thus, it is the *x-is-a- copy-of-y* relation, which is intrinsic to the basic syntactic operations, that underlies the syntactic encoding of binding. With a fully specified pronominal in the position of the SE-anaphor, Agree will be attempted, but the derivation will be cancelled since a violation of the Principle of Recoverability of Deletions (PRD) ensues. This gives rise to the complementarity observed in local binding domains.

2.1 The status of φ -features

Much of the work on binding in the earlier stages of the minimalist program implicitly or explicitly adopted a *lexicalist* perspective on structure building:[4]

(1) Lexicalist assumptions

- There are lexical items (LI's) representing feature bundles that are combined into a hierarchical structure by Merge.
- Features are essentially represented as cells in a LI.

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[3] It is important to note that not all binding, and not even all anaphor binding, is taken to be represented in this way. It is also unclear whether anyone ever argued that all binding relations are encoded by Agree. This is certainly not a claim made in Reuland (2011), contra to what Preminger (2019a) suggests, where he writes: " ….This has led to work that takes the AAE as support for theories where syntactic '-agreement is a necessary condition for binding, theories that will be referred to here as reductionist (e.g. Reuland 2011). The basic idea in such work is that anaphors are, by their very nature, deficient or underspecified with respect to phi-features, and therefore an phi-agreement probe seeking to establish a syntactic relationship with an anaphor will not come upon a fully-fledged, valued set of phi -features." Contrary to what this quote suggests for a substantial class of anaphors, including SELF–anaphors and 'Bodypart Reflexives', the analysis proposed in Reuland (2011) does not involve Agree, but rather covert SELF-movement.

[4] What I am addressing here is a relatively traditional form of lexicalism, as represented in Chomsky (1995), which is not susceptible to the criticism of lexicalism in for instance Sigurðsson (2019). That is, the building blocks are minimal form-meaning combinations, or rather minimal combinations of an instruction for realization and an instruction for interpretation, as in Reuland (2017a).

- Some pronouns are specified for all of the φ-features, others are not.
- A pronoun can be underspecified for a feature, by having a cell for hat feature that is empty.
- A pronoun can also lack a cell for a particular feature altogether.

This view provides a prima facie natural representation of the contrast between valued and unvalued features. It also gives rise to problems, though (apart from the general considerations that led to Distributed Morphology and Nanosyntax, see Halle and Marantz 1993 and subsequent work, or Baunaz et al 2018):

(2) - In the case of adjectival agreement, etc. the spelled-out form represents the output of Agree (as in Russian *naš – koška* $_{NOM,FEM,\ SING}$ → ***naša*** $_{NOM,FEM,\ SING}$ *koška* $_{NOM,FEM,\ SING}$, *naš – koški* $_{NOM,\ FEM,\ PLUR}$ → ***naši*** $_{NOM,\ FEM,\ PLUR}$ *koški* $_{NOM,\ FEM,\ PLUR}$ 'our cat(s)') in the case of binding by Agree the spelled-out form represents the input to Agree, and in languages like Dutch or Russian does not change after valuation (Rusian: *Vanja* $_{3rd,\ Sing}$ *protivorečil sebe* $_{3rd,\ Sing}$ 'V contradicted himself' versus *My* $_{1st,\ Plur}$ *protivorečili sebe* $_{1st,\ Plur}$ 'We contradicted ourselves'
- If features are cells in a LI, they are objects *sui generis*.

What changes for binding theory under an approach based on Post Syntactic Spell-out (PSS), all structure is the result of Merge, without a distinction between 'lexical' and 'syntactic' structure building.

(3) Brief characteristics of PSS:
i) there is a strict separation between conceptual structure, represented as the 'encyclopedia' in the root, which is not visible to the syntax, and functional structure which embodies the instructions for the syntactic computation.
ii) the linguistic lexicon is an inventory of basic elements represented as separate functional heads (X^0's), combined by Merge into hierarchical structures
iii) subtrees are matched with 'vocabulary items' that are inserted post-syntactically, and which contain instructions for realization.

However, this approach also faces non-trivial questions. For instance, what kind of objects are syntactic features? Are they just like any other elementary syntactic object, that is heads/X^0s? Or are they also objects *sui generis*. Another question is how to understand notions such as valuation and values. What does it mean for a feature to be (un)valued? These questions are independent of the question of whether the 'traditional' φ-features Person, Number, Gender are simplex or complex, as Béjar and Rezac (2009) proposal that different person values are constructed from more primitive elements, as in (4=58):

(4)

58)

Person specifications

A: Person specifications			B: Shorthand 1>2>3		
3rd	2nd	1st	3rd	2nd	1st
[π]	[π]	[π]	[3]	[3]	[3]
	[participant]	[participant]		[2]	[2]
		[speaker]			[1]

The minimal assumption is, then, that such complex structures are built from their elementary components by Merge. For instance, if one takes π as the root the general structure could be represented as in (5) (abstracting away from issues concerning the precise order of merger).[5]

(5) [[[[[π] Participant] Speaker] Number] Gender]

But if these elements are to be combined by Merge, they must be straightforward morpho-syntactic elements, namely heads/X^0's, on the same footing as the other members of the morpho-syntactic vocabulary, with no room for syntactically visible internal structure. This would resolve the first question we faced. Φ-features are just heads. But if elements such as *Participant*, *Speaker*, etc., lack syntactically visible internal structure, this makes the second question even more pressing. I will address this issue in section 5. First, I will introduce what is a core issue raised by PSS, for the moment abstracting away from the issues the notion of valuation raises.

2.2 Valuation and spell-out

A consequence of PSS is that the result of valuing is all there is. There is no access to a 'stage at insertion' as conceivable in a lexicalist approach. Once a feature or feature bundle has become valued by Agree it should be indistinguishable from a feature bundle that was valued right at Merge.

Hence, assuming that binding of SE-anaphors is effected by Agree, a bundle representing the Dutch SE-anaphor *zich* with {*VPerson, uval#,*

[5] See again our question of how to represent being 'unvalued' and what it means. A notation is available, but its theoretical status is unclear, as it entails the existence of higher order properties:

(i) [[[[[π] Participant] Speaker] α Number] β Gender]

There are a number of open issues here. As we saw, Béjar and Rezac propose that Person is built from more elementary components. A similar issue arises for number (see Preminger (2011) and Ghomeshi and Massam (2019) for relevant discussion). The same applies to Gender. Sigurðsson (2019) proposes that there is a low and a high gender location in the DP with different properties. Pursuing these issues would lead us beyond the scope of this article.

These issues all reflect a very general question: How are v*aluatio*n and *interpretabilit*y represented? This issue will be taken up in section 5.

uvalGender} should after valuation by a 3rd person singular masculine antecedent be identical to {*VPerson, Sing, Masc*} and in Dutch be spelled out as the pronominal *hem*. But, clearly, this is not what we find. Rooryck and Vanden Wyngaerd (2011) propose that features that are valued by Agree are especially marked by a diacritic, so these values would not count for spell-out, unlike feature values that are present at merge. This, however, violates the inclusiveness condition, and hence doesn't solve the problem.

So the puzzle is, where do spell-out forms like Dutch *zich* or Russian *sebja* come from?[6] In Reuland (2010a) their existence was taken as evidence against Kratzer (2009), who argued that bound 1st and 2nd person pronouns originated from a minimal unspecified pronoun enriched with features from the antecedent transmitted by Agree, which determined the spell-out form. As I argued there, Kratzer's approach would predict such underspecified elements to be always realized as full pronominals. Hence what underlies the encoding of binding should not be Agree (i.e. valuation by sharing feature values), but rather a checking relation, (as in Reuland 2001). Such a relation does not involve feature valuation, but just inspects whether feature values match.

However, pace Reuland (2001), it remains a question whether just checking is enough to establish a dependency of the kind that is needed to establish identity. So one may wonder whether this does not constitute a crucial problem for a 'binding by Agree' approach, however desirable it may seem from a theoretical perspective. In section 5, we sill see how this problem can be overcome, but first I will introduce another challenge.

Recently, Preminger (2019a) provided an extensive criticism of 'binding-as-agreement'. However, it is important to distinguish between a claim that all binding can be reduced to agree (a full r*eductionist* position, see footnote 3), and the claim that binding of SE-anaphors is mediated by Agree, the *modular* view. Preminger's arguments against the full reductionist position seem convincing. Most of his arguments don't bear on the modular view, but the argument based on the Anaphor Agreement Effect (AEE) (e.g. Rizzi 1990, Woolford 1999)) potentially does.

The core of his argument runs as follows. The *Anaphor Agreement Effect* reflects a cross-linguistic ban on φ-feature agreement with anaphors. For instance, anaphors are banned from the spec, TP position of finite clauses in languages where this requires agreement with the T-system. Given some standard assumptions, Preminger argues, binding by Agree gives rise to a timing problem: one must assume that the anaphor will be valued by Agree on time for the dependency to be seen at the handover point to the interpretation system, but then, at the same time, the anaphor will be fully valued, spelled out as a pronominal and no longer be able to trigger the AAE.

Consequently, he argues, the relevant dependency cannot have been established by Agree and a different process must be involved, which he does not specify.

I will not discuss his arguments in detail at this point (see Reuland 2020a for some further comments), but focus on the crucial assumption that binding by agree entails *full valuation*. That is, Preminger's argument assumes that after a

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[6] Note that Dutch *zich* does appear to reflect 3rd person, while Russian *sebja* and *svoj* don't mark the antecedent's person at all.

value exchange sufficient to establish binding no characteristic of the original anaphoricity survives. In the next section I will show that this argument does not go through.

3 How the property of being anaphor can survive binding by Agree

In this section I will discuss three recent analyses of binding patterns in rather different languages that all converge on this issue.

3.1 Russian

Zubkov (2018) and Reuland and Zubkov (2019/2020, submitted) provide an Agree-based analysis of the argumental anaphor *sebja* and the possessive anaphor *svoj* in Russian. I will summarize its main features here, and refer to Zubkov (2018) and Reuland and Zubkov (2019/2020, submitted) for details. Both anaphors can be bound locally and non-locally (roughly with a 'subject' intervening).

Binding is effected by *Multiple Agree* (Hiraiwa 2001, 2005, see also Boeckx 2003, Chomsky 2008, and Giblin 2016) with dependencies expressed via probe-goal relations. A High probe with unvalued Person (P) and Number (#) is located in the C-domain, and is valued by a Nominative ('privileged') NP-goal. Occurrences of a Low probe with unvalued # are located in a position in the extended V-projection, with the vP in its domain, and within the NP in a position below the possessor, but with all thematic arguments, including the author–POSS phrase, in its domain.

Anaphors (*sebja*, *svoj*) are inserted into the derivation with unvalued Person (uP) and unvalued Number (u#) and serve as goals. A probe can value a multiplicity of goals (but not vice versa). A probe is valued by the nearest eligible goal in its c-command domain, and a goal is valued by the nearest probe.

Intuitively: Once a probe is valued this value spreads to goals (anaphors) in the probe's c-command domain.

Probe-goal relations are subject to minimality, that is, a goal can be valued by a probe across another probe only if the probes differ in features. Hence a Person probe can value a goal across Number probes, but a Number probe cannot value a goal across an occurrence of a Number probe.

An important feature of the system is that, in contrast to Reuland (2001) and subsequent work, a binding dependency is established with a feature chain based on a single probe. Due to the distribution of the probes, and the sensitivity to intervention an anaphor may end up being valued for Person or for Number but not for both.

In Russian, non-local binding goes with an animacy effect; that is, the antecedent must be animate, in fact aware of the dependency involved. This is a consequence of the fact that that animacy is directly associated with Person, and due to minimality only the Person probe is able to effect non-local dependencies.

The system provides a solution to Preminger's concern: there are no derivations that result in both features of the anaphor being valued. Hence, once spell-out applies and/or the AAE configuration arises the 'original' anaphor will still have one feature unvalued; hence will not meet the requirements for the vocabulary item of a pronominal to be inserted. Consequently, Preminger's

argument against an Agree based approach to anaphor binding doesn't go through.[7]

The approach discussed has so far been worked out Russian only. It entails that also SE-anaphors in Germanic enter a single-feature based chain, leaving one feature unvalued. So far, this is still pending investigation, but prima facie its basic idea seems quite generalizable. Let's therefore consider two other recent approaches, starting with Baker and Camargo Souza (2020), and Baker (2019).

3.2 Agree without agreement

Baker and Camargo Souza (B&C) analyze switch reference in Shipibo-Konibo (SK) and Yawanawa (YW), languages of the Panoan family from the Amazonian area of Peru (Shipibo) and nearby areas of Brazil (Yawanawa).[8] Both languages have three-way reference marking systems with morphology on adjunct clauses that marks that the embedded *subject* is coreferential with matrix subject (SS), that the embedded *object* is coreferential with the matrix subject (OS), or that neither core argument of the embedded clause is coreferent with the matrix subject (DS). The relevant patterns are represented in (6) and (7) (B&C's (1) and (2)):

(6)

a. José=ra [Rosa oin-**ax**] xobo-n ka-ke. (SK)
José=EV Rosa see-SS.ABS house-LOC go-PFV
'He$_i$ seeing Rosa$_j$, José$_i$ went home.' (see also PV: 414-16; Baker 2014)
(Note: =*ra* EV is a second position evidential clitic)

b. [José-kan Rosa oin-**a**]=ra, xobo-n ka-ke.
José-ERG Rosa see-OS=EV house-LOC go-PFV
'When José$_i$ saw Rosa$_j$, she$_j$ went home.' (see also PV: 424-425; Baker 2014)

c. [José-kan Rosa oin-ke-**tian**]=ra, (ja) xobo-n ka-ke.
José-ERG Rosa see-PFV-DS=EV 3SG home-LOC go-PRV
'When José$_i$ saw Rosa$_j$, he$_m$/she$_k$ (someone else) went home.' (see also PV: 420-421)

(7)

[7] Of course, an <uval P, uval #> element IN the privileged position will not lead to valuation of the probes.

[8] As they note, both belong to the Nawa group in the Main line branch of Panoan; Shipibo is in the Chama subgroup, and Yawanawa is one of the languages of the Yaminawa dialectal complex.

a. [Tata u-**ashe**] saik-a. (YW)
Tata.NOM come-SS.NOM sing-PFV
`Tata came and sang.'

b. [Tika=nẽ Shaya nuku-**a**], shetxi-a.
Tika-ERG Shaya meet-OS smile-PFV
Tika met Shaya$_i$ and she$_i$ smiled.

c. [Ẽ Sana-ve tsãik-ai-**nũ**] vakehu pake-a.
I.NOM Sana-with speak-IPFV-DS child fall-PFV
`I was talking to Sana and the kid fell.'

The leading idea of their analysis is that this phenomenon is the result of Agree:

- SS: T Agrees with subject and fuses with C, which Agrees with the matrix subject
- OS: v Agrees with object and fuses with C, which Agrees with the matrix subject
- DS: no special Agree or fusion – but blocked pragmatically by SS and OS

However, as they note, SS and OS markers crucially don't vary with the φ-features of the tracked DP's. This is shown in (8) (their (3)):

(8)

a. [Jawe onan-ma ik-*ax*] no-a jainka-ma nokó-yam-ai. (SK, PV: 427)
what knowledgeable-NEG do-SS.ABS we-ABS there-NEG meet.MID-NEG-IPFV
'If we are not knowledgeable we will not meet our goals.'

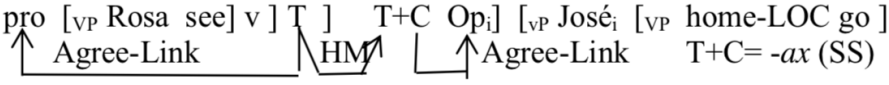
b. [[Jawen tapon bi-*xon*] kobin-'a-*xon*] naka-kati-kan-ai. (SK, PV: 415)
it.POSS root get-SS.ERG boil-do-SS.ERG chew-PST-PL-IPFV
'After getting its (i.e., the *yotokonti* plant's) root and boiling it, they chewed it.'

B&C conclude that we have "Agree without agreement". On a conceptual level this is not so different from what we see in the case of anaphors in Russian. There too we have an Agree-based dependency that is not manifested in morphological agreement. In Zubkov's analysis this is due to the fact that the anaphor's feature specification is still incomplete after Agree. It is quite conceivable that such an analysis could carry over to these markers in Shipibo-Konnibo and Yawanawa.

Baker explores a different option, which I will briefly discuss. The idea is that the Agree operation consists of two components, namely in his terms (from Arregi and Nevins 2012) *Agree-Link* and *Agree-Copy*. He proposes that Agree-Link without Agree-Copy leaves pointers in place, which are subsequently interpreted as a referential dependency. This is illustrated in (9), B&C's (4):

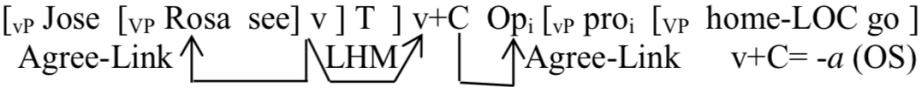
(9)

a. [[[[$_{vP}$ pro [$_{VP}$ Rosa see] v] T] T+C Op$_i$] [$_{vP}$ José$_i$ [$_{VP}$ home-LOC go] v]



=(6a)

b. [[[[$_{vP}$ Jose [$_{VP}$ Rosa see] v] T] v+C Op$_i$ [$_{vP}$ pro$_i$ [$_{VP}$ home-LOC go] v]



=(6b)

In a nutshell, we have 'Look, but don't Touch'. This idea is reminiscent of the checking approach to binding in Reuland (2001) (see also Reuland 2010a), where checking is enough to establish a dependency. Clearly, an 'Agree without Copy' approach avoids Preminger's dilemma as well. There is a potential problem with such an approach, though, namely that the pointers in this analysis violate the inclusiveness condition.

If the inclusiveness condition is respected, there are few options. As noted earlier, syntax has exactly one relation that underlies the syntactic encoding of dependencies, namely the copy-of relation. In the case of internal merge the remerged constituent is in relevant respects a copy of the first merged constituent; in the case of Agree a component of the unvalued element receives a copy of a component (value, feature) of the valued element. As a consequence, different occurrences of an item become different instantiations of an item within a chain.

But this is precisely something that cannot be achieved by an Agree without Copy type of approach. It looks, but doesn't alter, hence cannot identify.

Baker and Camargo Souza (2020) observe that there are some facts that prima facie are hard to reconcile with an Agree/copy based approach.[9] One is the fact that one can have R-expressions in both subject positions in an SS construction. The other is that languages allow SS marking in cases in which the two subjects overlap in meaning, without being identical. I will take these two issues up in section 6.

3.3 Agree with ID

Raynaud (2019) presents a very interesting discussion of person effects with reflexives, which I cannot do justice here. For present purposes I will focus on her analysis of reflexivization in Swahili, which I will just summarize. In Swahili, as she reports, like in many other Bantu languages reflexivity is expressed by a verbal reflexive marker (RFM) that is realized in the position of the object marker (OM). Regular class 1 object morphology *–m(u)-* is replaced by a special anaphoric agreement morpheme *–ji*.

An overt anaphor may co-occur with the RFM but is most often omitted. The OM and RFM are in complementary distribution. [10]

[9] Thanks to Mark Baker (p.c.) for drawing my attention to the fact that this is discussed in the published version of Baker and Camargo Souza (2020).

[10] For sake of completeness, Mark Baker (p.c.) informed me that this complementarity does not hold in all Bantu languages. In Lubukusu, for instance, the RFM is very near the OM, but not in exactly the same position (the RFM is a little

RFM's and OM's are taken to be agreement markers (although the essentials of Raynaud's analysis don't hinge on the agreement versus clitic distinction as she indicates). Like regular OM's such RFM's can also be used to indicate IO reflexivization in the case of a di-transitive.

Like 1st and 2nd person marking, *–ji* is obligatory in di-transitives, and cannot be omitted. If there is a reflexive object and another object, then the reflexive cannot be the DO (if IO, then DO 3rd, not REFL).

There is a Person Case Constraint with 1st/2nd and reflexives in Swahili, as summarized in (10 = Table 2 from Raynaud 2019):

(10)

Table 2: PCC effects with $1^{st}/2^{nd}$ and reflexives in Swahili

IO	DO	Swahili
3	1/2	✗
3	REFL	✗
3	3	✓
1/2	3	✓
REFL	3	✓

Raynaud argues that, since 1st and 2nd person behave the same as the RFM they must share a feature. The first option to consider would be a φ-feature and in particular a Person/Participant feature. Indeed, as she notes, standard accounts of the PCC rely on the Person Licensing Condition, which is based on Participant φ -features. However, as she argues, these fail for the Swahili data. In particular in Swahili, φ-features are not enough to capture the anaphoric agreement, since the marker *–ji* does not co-vary with the antecedent. It is φ-invariant and surfaces with antecedents of all person, number and noun classes (Raynaud 2019: p 8, 20-21). It does not qualify as default agreement either, since it does not show up with coordinated objects with mismatching φ-features, or impersonal subjects.

In view of this, Raynaud argues that it is not φ-features that are involved in the agree relation, but what she refers to as a referential ID-feature. I include her summary (p. 9) in (11):

(11) Referential ID-features
- are distinct from φ
- can enter Agree relations
- can encode coreference of arguments

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closer to the verb stem). There are some very limited situations in which OM and RFM can co-occur, and they occur in that order, whereas one cannot have two OMs in comparable circumstances. But in other Bantu languages strict complementarity of the OM and RFM as in Raynaud's analysis does in fact obtain.

Raynaud then proposes that anaphoric agreement is analyzed as the morphological expression of matching ID features on a functional head v as in (12) (=Raynaud's 27):

(12) a. [ID: i, i] ←→ -ji-
b. [ID: i, j] ←→ regular φ

Thus, as we see, Swahili shares an important feature with the pattern found in Russian, Shipibo-Konnibo and Yawanawa, namely an element representing an Agree-based dependency with an antecedent, without co-varying with the antecedent's φ-features.[11] In Raynaud's discussion, the nature of the ID-feature was not further specified, nor how it can be visible to agree. Leaving the details of the execution aside (without underestimating these) it seems fair to conclude that an analysis based on structured φ-features and partial agreement (along similar lines as Zubkov's proposal for Russian) could in principle also account for the Swahili pattern Raynaud discusses. But her proposal leads to an interesting issue, taken up in the next section.

4 The structure of pronominal elements: Open positions and roots

Raynaud's analysis postulates a referential ID-feature as part of the make-up of pronominal elements. She does not discuss the status of this feature, or the status of features in general. Quite plausibly, it could be construed as a null head of the pronominal projection. This would put it line with earlier proposals postulating that pronouns contain a null nominal element in addition to their φ -features, for instance as definite articles with a null NP sister (see for instance Postal 1966 or Elbourne 2001, see also Wiltschko 2002), or Hicks (2009), who proposes that anaphors have a VAR (variable) feature. In what follows I will explore the contribution such as null head could make.

As a starting point, note that any proposal based on forming a structured representation of a pronominal or anaphor by merging more elementary components will have to specify a particular element as the head.

One possibility is that one of the φ -features is in fact the head, for instance Person, as suggested by Johnson (2012). However, since Person itself is complex, this raises the question of which one of its components would qualify, but none of these seems a plausible candidate.

In pursuing this issue, I will first provide first some clarification of the notion of a variable.

As discussed in Reuland (2017a,b) there is an equivocation in the way variables are treated in current versions of 'logical form', or 'logical syntax' (in terms of Reinhart 2006). It is commonly assumed that pronominals and anaphors are translated as variables in logical syntax representations. But, on the other hand, the logical syntax representations of verbal or nominal concepts contain variables without a pronominal source, as for instance in (13):

[11] In the main text I compared Swahili *–ji-* to elements like Rusin *sebja* or Dutch *zich*, but in fact it may be more similar to reflexive affixes such as Russian *sja/s'*, Tegi Khanty *-ij(ł)*, or Meadow Mari *-alt-* (Volkova and Reuland 2014), (Volkova 2017). I will leave this issue open here.

(13) λx. λy. (admire x, y)

As argued in detail in Reuland (2017a), there is one sense of a variable that is basic and indispensable: verbal concepts such as *admire*, *hit*, *wash*, intrinsically have *open positions*. They express relations between objects/individuals that can be freely chosen as values. Similarly, property concepts such as *brown* or *bear* must have open positions, arguably reflecting Higginbotham (1983)'s variable in the set expression, since they can be ascribed to different individuals. In this sense such open positions are there - and can be variably filled - by conceptual necessity.

Concepts by themselves are independent of language, and having concepts is in all probability not uniquely human, but the capacity to manipulate them, combine them, and interpret their combination is. As pointed out in Reinhart (2000/2016, and 2006), crucial for our linguistic combinatory system to be usable is that concepts are legible to it. Legibility proceeds through a restricted channel. For instance although verbal concepts may be quite rich in many respects, legible to the syntax are only thematic roles in a form that passes through the narrow channel [+/- m] - where m stands for *mentally involved* - and [+/-c] - where c stands for *perceived cause* - (note that there is no guarantee that a perceived cause is an actual cause, but only the perceived cause is linguistically relevant).

In this, Reinhart's approach differs from current assumptions within Distributed Morphology (Halle and Marantz 1993 and subsequent work) that posit an impermeable boundary between the encyclopedia as the locus of lexical semantic information and the syntactic system. Horvath and Siloni (2008, 2016) present arguments against this position and recent work such as Wood and Marantz (2017) comes closer to Reinhart's view, and allows information to be shared between the lexical/conceptual system and the syntactic system.[12]

The same legibility considerations apply to open positions in nominals. Interpreting an expression like 'brown bear' as modification requires that the open positions in *brown* and *bear* be *legible* to the linguistic system and then accessed and identified. Reuland (2017a) proposes that it is the φ -features that play a crucial role in making open positions legible to the syntactic computational system. Thus the equivocation in the use of the term variable disappears. If so, it is no accident that in many languages adjective-noun modification is characterized by agreement.[13]

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[12] In a realistic model language is embedded in a mental space rich with information. Not every bit of information is legible to the language system. But *being legible* need not be the same as *being linguistically represented*. It is conceivable that the mental space contains units representing information that is only legible in part. But I will leave these speculations aside for now.

[13] An open question is whether we only have variable expressions as elements derivative of open positions in concepts, or whether they have some form of independent occurrence. The only, but primarily suggestive, evidence I can think of is implicit arguments. In Russian, for instance, despite not being overtly realized they must minimally carry a number feature in order to be able to bind *svoj* or *sebja* (Zubkov 2018), which Zubkov argues they indeed can.

What I will propose is that open positions and their legibility rest on the concept of an *individual*. This concept I take to be available in the mental space, and to be independent of a specific value. Like other concepts it may well be evolutionarily prior to language. I will abbreviate it as IND_{Uval}. Like verbal concepts the properties of the concept of an individual can be accessed by the computational system, but only through a narrow channel.

Just like theta-roles represent the link between the conceptual and the syntactic system in the verbal domain, in the nominal domain this link is provided by the categories underlying person, number and class (general enough to cover Indo-European type languages with a gender system, Bantu languages with an extensive class system, etc.). Thus, the mental lexicon contains the concept of an individual IND_{Uval} with the *potential* of being assigned directly, or indirectly, a value from the discourse domain.

Given this, I propose that this IND_{Uval}, is the null-head serving as the root of pronominals and anaphors to which the functional material reflecting φ-features is all merged; in a sense, then, IND_{Uval} is indeed reminiscent of Raynaud's ID feature and similar proposals. [14]

In the next section I will pursue this idea further together with a more detailed assessment of the notions of legibility and valuation.

5 What are Feature Values Values of?

First of all let's examine the notion of a feature, which plays a prominent role in the study of syntactic dependencies.

Conceptually, the idea of features in morphosyntax has been derived from features in phonology. In phonology their status raises few epistemological concerns, since in the end they relate – directly or indirectly- to instructions to the articulatory system.

In morphosyntax features started out as instructions associated with lexical items (LI's). In the conception of Chomsky (1965) LI's were two-faced, not unlike Saussurean signs. They combine instructions for realization (a *form*) with a mix of instructions driving the computation, and instructions for interpretation (a *meaning*). Thus, in addition to phonological features, every LI contained a list of syntactic features, some valued (φ -features for Nouns), some as a label of a property to be specified by the syntactic environment (e.g. Case for nouns, φ -features for adjectives), some as requirements on the syntactic environment (subcategorization and selection features for verbs).

Since these features constituted a rather mixed bag over the years attempts were made towards a more principled conception.[15]

A significant change took place with the reconceptualization of a subclass of features including the φ -features number, person, etc., as heads on a nominal or verbal spine. Relations between heads are subject to standard syntactic

[14] In a sense this is close to Hick's VAR, or a *minimal pronoun* in the sense of Kratzer 2009, or somehow more remotely to Safir 2014's *D-bound*. Importantly the null element I take as the head is not specific to anaphors.

[15] For instance, selectional features were reinterpreted as part of the meaning and outside the purview of syntax, and the role of subcategorization (c-selection) minimized, and largely relegated to the functional system.

principles including minimality conditions, so conditions on their relations could be explored on a unified basis.

Whereas quite early on it was established that DP's contain a separate number projection (Ritter 1992), this was initially less clear for pronouns. However with the development of approaches based on post-syntactic spell-out also pronominals and anaphors were analyzed as subtrees resulting from merging more elementary components such as number or person, with the latter being further analyzed as in (4=58) from Béjar and Rezac (2009) repeated here as (14):

(14)

58)

Person specifications

A: Person specifications			B: Shorthand 1>2>3		
3rd	2nd	1st	3rd	2nd	1st
[π]	[π]	[π]	[3]	[3]	[3]
	[participant]	[participant]		[2]	[2]
		[speaker]			[1]

With IND_{Uval} as the root, a plausible structure is given in (15), modifying Ghomeshi and Massam (2019):[16]

(15) Pronominal structure

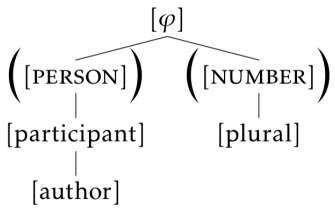
$[_{DP}\ D\ [_{\phi P}\ \varphi\ [\ldots.\ [_{\sqrt{P}}\ IND_{Uval}\ ]]]]$

(φ includes #, π)

[16] As far as I can see this is quite compatible with feature structures as in Preminger (2011), see his (37) given in (i), if one may substitute his φ for φ in (19):

(i)

(37) *A SIMPLIFIED φ-FEATURE GEOMETRY*



Ghomeshi and Massam make an interesting further claim. Whereas in standard nominals Person and # are both directly attached to the nominal spine, they argue that the position of # in pronominals is subordinate to that of Person. As argued in Reuland (2020b) this is an option realized in Germanic, but not in for instance Slavic, which accounts for differences in the local binding of 1st and 2nd person pronouns.

Reanalyzing features as heads is conceptually a step forward since 'being a head' comes with some relatively well-understood syntactic properties. However, at least since Chomsky (1995), the use of categories like number and person in syntactic computations was taken to involve secondary properties like [+/- interpretable] and [+/- valued]. Subsequently interpretability was relativized to position, and effectively only the property [+/-valued] remained (Pesetsky and Torrego 2007).

Feature valuation started playing an important role in driving syntactic computation. Together with (Internal) Merge, Agree is one of the two core syntactic operations. But just like in the case of the [+/- interpretable], one may wonder what [+/- valued] really means. Of course, one may view [+/-valued] as a useful diacritic in regulating the computation of syntactic dependencies, but it raised a fundamental question, acknowledged in the literature from early on, namely how is valuation syntactically represented. That is, one may wonder:

(16) How does syntax see whether a head is valued or unvalued?

On the PF side it is intuitively clear what an unvalued feature stands for. For instance in order to spell out an adjectival structure, information about the adjective itself is needed (for instance, its declension class), together with information about the noun it modifies, and information about the structure it appears in. The deficiency of an adjective is, then, that its instructions for realization are only partial; they cannot apply unless completed. Since the details of the spell-out are outside the purview of syntax, features must represent 'packages of instructions' that can be copied from a source and moved in terms of their label into positions within the subtree headed by the adjective. So, Agree can be conceived of as copying a constituent and merging it.[17]

The question is, then, how this transfers to the relation between syntax and the interpretation system, specifically the representation of anaphoric dependencies. From this perspective the question in (16) merits some thought.

To see this, consider first a personal pronoun like *I*. Effectively it gets valued only in a specific context of use in an utterance, namely as me as the author of this text when I write that I have to think this issue through, or as you when you are using the expression *I* in a response to me. In the absence of a specified context of use (e.g. in example sentences) it is *never truly valued*, but only *visible for valuation*, that is *valuable*, at the interface with the interpretation system.

Valuation is relative to a coordinate system (with speaker, participant, but also 'others' that are involved) that is intrinsically related to the utterance. Delfitto and Fiorin (2011) propose that Person-features on arguments are not interpreted 'independently'. Their interpretation is always established 'via' a link to the C-system (see Reuland 2015 and the literature cited there for more discussion). I will base my discussion on this proposal.

Note that syntax cannot see values; what it can see is that all the preconditions for receiving a value are met, that is that the expression is

[17] If one assumes that this process is mediated by D^0 or an element that is at least as high in the structure as D^0, the configuration meets the requirements of Multiple Agree.

valuable. Thus, being valuable means *being able to participate in a process for receiving a value*. And, given a decompositional analysis for Person, as in (17), if some element has a property like Speaker, or Participant this property must be a meaningful instruction for the interpretation system. Briefly, then, grammatical features like Speaker, Participant, etc. but also Number features like Singular and Plural are pieces of meaning – instructions for interpretation - that are visible to the computational system as labels of minimal elements – X^0/heads.

Then the question comes up how to understand it when features such as Person or # are unvalued, as when they function as probes in probe-goal relations. Given a system with Post-syntactic spell-out where form and meaning are fundamentally decoupled, the identity of an element just cannot be borne by some constant part of its instructions for realization (its 'form' in a traditional view on LI's). Hence, the question of what is the 'it' that is unvalued merits some thought. What we see is that being unvalued is always relative to a particular domain. It does not so much involve the absence of an instruction for interpretation. Just like we saw in the discussion of the PF side, an unvalued element represents a partial instruction. In this case a partial instruction for interpretation. Merge, then, builds structures using elements representing full and partial instructions for interpretation, where partial instructions for interpretation are to be completed using material merged elsewhere. The notion of *partial instruction* is then what underlies the syntactic notion of being *unvalued* also in the case of the relation between syntax and the interpretation system.[18]

While the interpretive relation between functional elements and the constituent in their complement standardly reflects local function application, the hall-mark of 'unvalued' elements is that, in order to be able to apply, they rely on access to elements that are not strictly locally available.

Thus, an *uval* Person probe in the C-domain is a defective instruction, in the sense that it *needs the instruction from a constituent located elsewhere (but within reach for probing) to complete the instruction for interpretation* it represents, namely whether to link the utterance to the coordinate system via the speaker, the addressee, or some other participant. To put it in terms of Béjar and Rezac's system, an *uval* Person probe is an element that is merely labeled for *Person*; it is to be completed by probing and finding a goal (the nearest qualifying DP) containing a substructure with π, Participant or Speaker; this substructure is then copied and attached to the Person node, forming a chain.

The same applies to the #-Probe. An utterance can have more than one addressee, more than one individual responsible for a speech act, etc. So, like Person, also an *uval* #-Probe has an independent status in the C-domain. Similarly, a low #-Probe with the vP in its domain, has an independently given status, since plurality/distributivity may effectively apply to vPs instead of the arguments they contain. A head merely labeled # constitutes a partial

[18] This raises important further issues, since it entails that the elements that are usually conceived of as the building blocks of the syntactic structure are far from primitive, and instead of reconceptualizing features as heads, the unifying notion is *instruction for interpretation*, whereas the primitives consist of the vocabulary needed to formulate these. Further discussion, however, would lead us too far afield.

instruction, to be completed by probing for a goal containing Singular or Plural, thus supplying the latter with 'valuability' (and a value once the sentence is put to use). [19]

This paves the way for an analysis of IND_{Uval}. While IND_{Uval} has the potential of being valued, this potential can only be realized through a syntactic computation. Φ-features, then, have a dual role. On the one hand, they define the space of the properties that can be channeled from the conceptual system to linguistic computational system, on the other hand, when merged in syntax they mediate and constrain the value to be eventually assigned.

Briefly, *being unvalued for Person*, means 'being as yet compatible with all person values', *being unvalued for #* means 'being as yet compatible with all # values'.[20] Thus, representations of arguments get their roles in the speech act assigned by a computation involving the φ -features that make them visible.

Merging φ -features to an IND_{Uval} root as in (15) creates a structure

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[19] Omer Preminger (personal communication) argues that an Agree based analysis of binding runs into problems due to the privative character of φ-features. As he argues in Preminger (2019b) 3rd person ≡ the absence of person (more precisely: absence of [participant]), singular is the singular ≡ the absence of number (more precisely: absence of [group]). So, he argues, in the case of 3rd person or singular there is just nothing to share, and binding by Agree fails. However, this is an oversimplification. The argument presupposes that this characterization of the set of φ-features is exhaustive, which it is not. At least in Russian there is ample evidence that also the category of animacy is relevant. Person in Russian goes with animacy. In line with Preminger one might assume this feature to be privative: <-*animate*> being the absence of a marking as *animate*. But then, sharing the bare feature *animate* will be enough to form an Agree-chain. There are other candidates. As Mark Baker (personal communication) informs me, Magahi, a language of India, seems to have incorporated honorificity features (nonhonorific vs honorofic vs. high honorific) into the feature set of at least pronouns. Also in the domain of number one may observe that not all singulars are created equal. What comes to mind are, for instance, distinctions like count-mass, or concrete-abstract. There is no reason to assume by fiat that such properties could not support Agree chains. More generally, it is precisely because of the problems posed by the notion of an unvalued feature that I am proposing that the theoretical basis resides in the notion 'instruction for interpretation'. I don't think it will work to assume that the interpretative component freely assigns interpretations unchecked by the input of the syntactic computational system. If one were to assume that <singular> is really the absence of number this still cannot entail the absence of any instruction to the interpretive system at all, since that would produce a failure to be interpreted. It is enough that some sort of instruction is associated with the structure, to guarantee that Agree can operate non-vacuously.

[20] Note that there is a difference between the verbal domain and the pronominal domain: the interpretation of the verbal concept is restricted by its specific theta-properties, the interpretation of the pronominal concept is not restricted by a specific choice of φ -features, only by the space they together define. The pronominal concept is unvalued precisely because in the initial stage all options are equally available.

corresponding to a φ-feature bundle, and represents the fact that φ -features are constituents *of* a syntactic object. But during the derivation φ -feature bundles will always be *without a value*; that is, until the sentence is put to use, they will be *valuable* for person and number, but *not yet valued*. So, the notion of valuation we have arrived at is different from the notion of valuation in the traditional morphosyntactic sense. This perspective on valuation can be summarized as in (17):

(17) *Valuing pronouns*

a. the X^0 's represnting φ -features are merged to a null root representing an individual variable IND_{Uval} and embody the instructions for its interpretation
b. personal pronouns have to be linked to the coordinate system of the sentence/-utterance via the C-system (see Delfitto and Fiorin 2011 for speaker oriented pronouns, and Sigurδsson 2011 for conditions on argument drop)
c. syntactically, *being valued* effectively means *being valuable*, that is *being linkable* to the C-system: being unlinked **IS** being unvalued (so far).
d. semantically, *being valued* means *being linked* to the C-system, with the latter being linked to the coordinate system of the utterance (the context of utterance).
e. *being uninterpretable* means: *being unlinkable*.
f. the positions in the C-system that represent the link with the coordinate system, must themselves be linked to suitable expressions in the complement of C (the 'sentence'): they are probes searching for a goal to complete the partial instruction they represent (value them in the syntactic sense), enabling them to transmit a value to this and other goals in the semantic sense.

Thus, a pronominal is an IND_{Uval} root to which all relevant φ -heads have been merged within its local projection (DP, or perhaps smaller in some languages). Hence the syntactic operations linking it to the C-system can apply, making it ready for use.

As in the case of pronominals, the head of anaphors such as Russian *sebja* or *svoj* or SE-anaphors like Dutch *zich* and its counterparts in other languages is taken to be an IND_{Uval} root. The IND_{Uval} root is compatible with each value for Person and # within the space defined by those properties. By assumption, in the case of an anaphor neither number nor person values have been merged to it. Hence, within its local projection it is just unvalued for Person and #.

Consequently, such anaphors are truly deficient, since locally no procedure is available that allows them to be interpreted, and unless such a procedure is added they cannot be used.[21] By the assumption of permeability of the root the properties *uval*Person and *uval*# are visible to the syntactic system.

[21] It is important to distinguish between the formal properties of a syntactic operation, and how it contributes to the way a structure is used. The following quote from Reinhart (2006) may clarify my position on this issue: "Capturing

Valuation, then, takes place along the lines indicated in section 3.1. The *uval* Person probe in the C-domain (or the *uval #*-probe above the vP) probes into the nearest qualifying DP projection, and finds a goal, carrying a suitable piece of instruction. By Multiple Agree it probes further and sees an IND_{Uval} wihich is *uval P* and *uval* #, and is visible as such. The effect of Multiple Agree is that for Person, either π, Participant of Speaker is merged to the IND_{Uva} root, or for #, either Singular or Plural (or Dual where applicable). By sharing the nearest goal's feature the operation supplies the IND_{Uval} with 'valuability' (and a value once the sentence is put to use).

The result that the head/root of an anaphor or pronoun is an IND_{Uval} that must be supplied with valuability through the computational system solves the conceptual problems identified.[22]

6 Further issues

As noted in section 3, Baker and Camargo Souza (2020) observe in their discussion of Same Subject marking some facts that prima facie may seem hard to reconcile with an Agree/copy based approach. One is the fact that one can have R-expressions in both subject positions in an SS construction. Examples of this are not common in texts, but it isn't ruled out either. Baker and Camargo Souza (2020) discuss one example from Yawanawa (their (62)), which I repeat here:

(18) Nixiwaka u-sh-ũ,
Nixiwaka.NOM come-SS.PFV-ERG
e wẽ taxi /#Nixiwakã yuma pi.
1.SG GEN cousin.ERG/#Nixiwaka.ERG fish eat.IPFV
'After Nixiwaka arrived, my cousin/*Nixiwaka is already eating fish.'

Here *Nixiwaka* is the speaker's cousin. So we have two expressions referring to the same person. According to informants it is better to have "my cousin" in the matrix clause than to repeat *Nixiwaka*. That repeating *Nixiwaka* is not felicitous may be taken to reflect a standard discourse strategy. In contrast, "my cousin" adds some new information. However, as Baker notes, this preference is the

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correctly the interface is the crucial adequacy criterion of any syntactic theory. …. Systems of inference, use and communication are consistent with many possible languages, and they cannot explain why the particular human language got selected. On the other hand, it is a crucial fact about human language that it can be used to argue, communicate, think, etc. If our formal analysis of the computational system turns out inconsistent with basic facts of language use, e.g. if it can be shown that the representations it generates are unusable for inference or cannot adjust to varying contexts of use, this cannot be the correct analysis, since the actual sentences of human language can be used for such purpose.

[22] A reader might wonder whether one could conceive of a 'half-anaphor', in which either Person or # is merged to the IND_{Uval} and the other one left open. The open one would be accessible to probing, the other to independent interpretation. This would lead to an inconsistency in the interpretation of the IND_{Uval}, and hence be ruled out.

opposite of what a simple copy theory expects. Repeating *Nixiwaka* could be copy without deletion, whereas relating *Nixiwaka* and *taxi* 'my cousin' by a copying operation seems impossible.

The other empirical issue is that many languages allow SS marking in some cases in which the two subjects overlap in meaning, without being identical, as in Baker and Camargo Souza's (63), repeated here:

(19) [(No-a) jema-n nokó-x-on]=ra e-a koshi-bo
1.PL-ABS village-LOC arrive-SS.PFV-ERG=EV I-ABS chief-PL.ABS
bena-i kai.
seek- SS.IPFV go.IPFV
'When we arrive at the village, I will look for the authorities.'

Again one could not say that "I" is a copy of "we" in a simple, literal sense here, since they differ in both form and reference.

As Baker notes, in both case it would not be so hard to argue that a 'pointer' is involved, from *Nixiwaka* to *taxi* and from *e-a* to *no-a* and leave some flexibility in exactly how the pointer is interpreted at the interface. The question is how an Agree based analysis with copying and overwriting would fare.

Clearly an analysis should make use of the fact that such expressions are not simplex. Thus, what is copied and identified are not these expressions in full, but a component of these expressions, namely the IND_{Uval} variable we discussed. Of course this raises non-trivial issues since in R-expressions this position is generally not accessible from the outside. It may, however, be relevant that (18) involves a proper name and a kinship term, which are not unknown to have pronominal characteristics in certain languages. For a proper assessment one would need to know more about the scope of the phenomenon.

The same applies to the pair *e-a* - *no-a* 'I-we'. Here an analysis along these lines would require the IND_{Uval} at the root, and person and number to be separately accessible in 1st person. However, as argued in Reuland (2020b) we need that possibility anyway to account for the fact that in Russian complementarity in local binding obtains for all persons, instead of 3rd person only.

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