The featural life of nominals

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Abstract We introduce a novel locality violation and its repair in Sierra Zapotec: an object pronoun cannot cliticize when the subject is a lexical DP. We develop an account in which pronouns and lexical DPs interact with the same probe because they share featural content. In particular, we suggest that the Person domain extends to include non-pronominal DPs, so that all nominals are specified for a feature we call \( \delta \) (to resonate with DP), while all and only personal pronouns are specified for \( \pi \). This account requires a departure from Chomsky’s (2000, 2001) classical system of featural co-variation (Agree). A functional head must be able to participate in overprobing, interacting with a goal even though its requirements appear to be met. We introduce a probe activation model for Agree in which, after applying once, the operation can but need not apply again. We also consider two other mechanisms recently proposed to derive overprobing — Deal’s (2015, 2020) “insatiable probes” and Coon & Keine’s (to appear) “feature gluttony” — though neither is able to account for the locality pattern.

Keywords pronominal cliticization, defective intervention, object shift, nominal structure, Person, features, Agree, locality

1. Pronouns and lexical DPs

How does natural language differentiate nominal classes? And how does it unify them? Within formal semantics, a lively debate continues to examine the referential trajectories of pronouns and definite descriptions, and whether they are categorically different in this respect or not. But within syntax, discussions of how these nominal classes might overlap or diverge have been surprisingly narrow. They have focused almost exclusively on the typology of nominal structure, and the degree to which pronouns should be distinguished from lexical DPs (also called full DPs) in terms of the hierarchical structure they contain: whether pronouns are associated with the same amount of external DP structure, or less (e.g., Cardinaletti & Starke 1999), and how much (silent) internal structure they posses, such as an elided NP (e.g., Patel-Grosz & Grosz 2017).

There exists, however, a family of quintessentially syntactic phenomena, involving pronominal displacement and cliticization, which sharply distinguish pronouns from lexical DPs. These include scrambling and object shift, which in many languages affect only pronouns; clitic doubling, which also targets only pronouns in many languages; restrictions on pronominal

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cliticization like the Person–Case Constraint (PCC); and, differential object marking, which in some languages differentiates between pronouns and lexical DPs.

The relevant distinctions involved here do not appear directly related to any semantic notions involving referentiality, since it places all non-pronominal DPs on the same side. Nor does the hierarchical structure inside nominals obviously seem to be the key to understanding why such different syntactic phenomena make the same cut. It seems rather that, since these phenomena involve displacement, natural language distinguishes pronominal from non-pronominals in a currency that is legible to the syntactic operations underlying movement, namely features. Are there features that all nominals possess? And are there morphosyntactic features that only personal pronouns or lexical DPs possess?

There is a rich literature on the featural representations needed to distinguish classes of pronouns (e.g., Person features), as well as on the features that are shared across nominal classes (e.g., Number). But hardly any work considers the possibility that pronouns might also be distinguished as a class, and in featural terms, from non-pronouns.

In this paper, we introduce a novel phenomenon involving the movement of pronouns, which provides a window into the featural life of nominals and suggests that just such a distinction is needed. Our analysis of nominal features defines a particular division of labor between their syntax and semantics. These features have semantic denotations which determine the co-occurrence relations among them, and as syntactic creatures, they participate in Agree relations which can set the stage for movement.

This approach is motivated by a locality violation and its repair in Sierra Zapotec. While subject pronouns can cliticize when the object is a lexical DP, as in (1a), an object pronoun cannot cliticize across a subject lexical DP, as in (1b).

(1)

\[
\begin{align*}
\text{a. } & \text{pro} > \text{DP} \\
& \text{Blenh}_4 = \text{ba}^3_1 \quad t_1 \quad \text{be}^2 \text{ku}^{t_4} = \text{nh}.
\text{carry.COMP} = 3.\text{HU} \quad \text{dog} = \text{DEF} \\
& \text{‘S/he carried the dog.’} \quad \text{(FSR, SLZ1051-s, 1)}
\end{align*}
\]

\[
\begin{align*}
\text{b. } & \text{DP} > \text{pro} \\
& \ast \text{Blenh}_4 = \text{eb}^4_1 \quad \text{Xwanh}^{x_{24}} = a^{t_4} \quad t_1.
\text{carry.COMP} = 3.\text{AN} \quad \text{Juana} = \text{DEF} \\
& \text{Intended: ‘Juana carried it (an animal).’} \quad \text{(FSR, SLZ1051, 7:30)}
\end{align*}
\]

2 What we call Sierra Zapotec is a group of closely related Northern Zapotec varieties from the southeastern Sierra Norte of Oaxaca, Mexico. The Zapotec languages (Oto-Manguean) exhibit dense variation, and it is often difficult to draw sharp language boundaries. We primarily present data from the three very closely related varieties of Santiago Laxopa, San Sebastián Guíoxi, and Santa María Yalina, for which we report our own fieldwork data; additional data is provided from Hidalgo Yalalag (Avelino Becerra 2004, Lopez and Newberg 2005) and San Bartolomé Zoogocho (Long 1993, Long & Cruz 2000, Sonnenschein 2004). All are grouped as zapoteco serrano del sureste by the Catálogo de las lenguas indígenas nacionales (Instituto Nacional de Lenguas Indígenas 2008).

The original data reported in this paper comes from meetings with three adult speakers, all living in the large diaspora community in California. They learned Zapotec as their first language and moved to the United States as adults. We have been working with all three speakers continuously since 2016; our weekly meetings took place remotely by Zoom in 2020–2021.
What makes this pattern puzzling is that the subject blocks movement of the object even though it does not itself move. In this respect, it is reminiscent of defective intervention in A-movement (McGinnis 1998); it also recalls the locality effect observed with object shift (Holmberg 1999), though it differs in important ways.

We will suggest that, although the subject does not move, it is able to Agree, and we develop an account in which pronouns and lexical DPs can interact with the same probe because they share a certain feature, which we name $[\delta]$ (to resonate with the functional head D). While pronouns have $[\delta]$ plus additional Person features, lexical DPs only have $[\delta]$. Laying out the ingredients for an account of this effect opens up a new perspective on the relationship between the system responsible for featural co-variation (that is, Agree) and the system responsible for displacement itself. It supports a particular implementation of the decomposition of movement into Agree, which is subject to an intervention-based locality constraint, plus an (internal) Merge operation that is otherwise free (Chomsky 2000).

We start, in Section 2, with a discussion of locality and its role in deriving the restriction in (1). As we will argue, only a syntactic locality constraint built into the Agree operation will suffice. Then we turn to our proposal, which has two components:

1. **Extended Person:**
   Lexical DPs and pronouns share a feature ($\delta$) that is part of the structure of Person; only personal pronouns are specified for additional Person features.

2. **Probe activation:**
   A functional head must Agree with a goal, subject to Attract Closest. Additional Agree relations with other goals are possible, though not required, just in case: (i) they are mandated by properties of the goal, and (ii) they are not featurally distinct from the probe (in the requisite way).

With the first component, which we discuss in Section 3, we aim to draw a parallel between the restriction involving lexical DPs, illustrated in (1), and another restriction on cliticization in Sierra Zapotec involving combinations of pronouns, akin to the PCC found in Romance and many other languages (Perlmutter 1971, Bonet 1991).

With the second component, introduced in Section 4, we advance a unified mechanism for deriving both restrictions in which a single probe is able to interact with multiple arguments, a situation we call *overprobing*. In particular, only one round of Agree, with the highest argument, is mandated by features of the probe, much as in Chomsky’s (2000, 2001) classical Agree system (and its attraction-based predecessor). Subsequent rounds of Agree are possible, but they are always dictated by the requirements of additional goals, never the probe (similar to a greed-motivated view of movement). Furthermore, although subsequent rounds are optional, they must fit into the footprint left by the first round of Agree; nothing may be added by subsequent rounds. We compare this *probe activation* model to two recent theories of Agree: Deal’s (2015, 2020) “insatiable probing” and Coon & Keine’s (to appear) “feature gluttony.” Neither is able to derive the interaction in (1) between pronominal cliticization and lexical DPs.
2. Introducing Lexical DP Blocking

We call the effect in (1a–b) *Lexical DP Blocking (LDB)*. It involves some kind of locality, since subject and object cliticization are not equally available: only the higher argument can cliticize.³

(2) *Lexical DP Blocking (LDB)*

An object pronoun cannot cliticize when the subject is a lexical DP.

There are related effects involving A-movement. In Romance, Greek, and Icelandic, for instance, a goal or experiencer PP intervenes for raising to subject, as shown in (3) for French (McGinnis 1998, Anagnostopoulou 1999). Just as in the LDB, a higher argument which itself does not move blocks movement of a lower argument

(3) a. Jean₁ semble (*à Marie) [avoir du talent t₁].
   John seems to Mary have some talent

b. *À Marie₁ semble t₁ [Jean avoir du talent].
   to Mary seems John have some talent (McGinnis 1988: 90)

Similarly, genitive-marked goal and experiencer DPs in Greek block movement of a theme DP in raising to subject, as well as in passive and unaccusative clauses (Anagnostopoulou 1999). Such defective intervention effects are usually linked to an intervention-based locality constraint (Rizzi 1990, Ura 1996). In contemporary theories of movement, where movement is decomposed into an Agree operation followed by an (internal) Merge operation, this constraint applies to the Agree component, i.e., Attract Closest (Chomsky 2000: 135–137). Thus, in (3), both arguments compete to satisfy the needs of the matrix T via Agree, with the higher blocking movement of the lower because it is closer.

We will argue that Agree also lies at the source of the LDB, even though it involves pronoun movement rather than movement of lexical DPs. Based on evidence reviewed below, we posit a single probe located above the subject and object, which is able to Agree with both arguments.

(4) P ... [vp ... DP ... [ ... DP ... ]

Pronominal cliticization is a reflex of this Agree relation (Borer 1984, Suñer 1988, Sportiche 1993, Anagnostopoulou 2003: 249–320, among others). This will also allow us to draw an analytical analogy between the LDB and another constraint on pronominal cliticization, akin to the PCC, which is sensitive to the animacy of the subject and object.

We also consider a parallel between the LDB and Holmberg’s Generalization. In Swedish, although two object pronouns can generally move out of the verb phrase, a dative lexical DP blocks movement of an accusative pronoun (Holmberg 1999).

³ The indirect object does not intervene for direct object cliticization in the same way (Foley & Toosarvandani 2019). We discuss the source of this variation with similar intervention effects, such as the PCC in Greek and Romance, in Section 5.2. It is worth pointing out that the PCC can also affect the subject in some languages, including Kashmiri (Nevins 2011: 963).
While syntactic accounts of Holmberg’s Generalization exist (Anagnostopoulou 2004), it has also been derived from principles of shape conservation, which constrain surface realization across levels of syntactic representation (Sells 2001, Williams 2003, and others).

After reviewing basic facts of clause structure and pronominal cliticization in Sierra Zapotec, we consider whether an account of the LDB based on shape conservation is possible. We argue that it is not, and that a syntactic account of the LDB based on Agree is required instead. We identify a parallel between the LDB and animacy-based constraints on object cliticization in Sierra Zapotec, which in turn suggests the necessary ingredients for an Agree-based account of both.

2.1. Setting the empirical scene

Sierra Zapotec has rigid verb-subject-object word order, with no case marking or verb agreement.

(6) Blenh4 Xwanh2=a4 be2ku4=nh.
carry.COMP Juan=DEF dog=DEF
‘Juan carried the dog.’ (FSR, SLZ1051-s, 2)

The subject occupies a fixed position immediately following the verb to the left of a manner adverb, whether it is a theme (7) or agent (8) (Adler et al. 2018).

(7) a. Dz-i-yag4 Pe2dro2=nh4 xti2dao2.
CONT-INCH-be.cold Pedro=DEF quickly
‘Pedro is getting cold quickly.’ (FA/RM, GZY019, 1:19:07)
CONT-INCH-be.cold quickly Pedro=DEF
(FA/RM, GZY019, 1:19:20)

(8) a. Udo4 Jwanh2=a4 yet4=e’nh4 xti2do2’yes2.
eat.COMP Juan=DEF tortilla=DEF quickly-INT
‘Juan ate the tortillas very quickly.’ (FSR, SLZ1009-s, 21)
b. *Udo4 xti2do2’yes2 Jwa’nh=a4 yet4=e’nh4.
eat.COMP quickly-INT Juan=DEF tortilla=DEF
(FSR, SLZ1009, 31:15)
This suggests that the highest argument in a clause raises to a low subject position, located outside the verb phrase. Following Adler et al. (2018), we assume this is a functional projection located below T.

(9)

For concreteness, we also assume that the verb moves via predicate fronting to Spec-TP. But nothing we say distinguishes this from alternative mechanisms for verb initiality.

Up to three arguments can cliticize. These are rigidly ordered, immediately following the verb: subject, indirect object, direct object.

(10)

a. \[ T x_i^2 x = a^4 \quad t_1 \quad t_2. \]
   sneeze.CONT=1SG
   ‘I sneeze.’
   (FSR, SLZ1010-s, 15)

b. \[ Blenh^4 = ba^3 = b^2_4 \quad t_1 \quad t_2. \]
   carry.COMP=3.HU=3.AN
   ‘S/he carried it (an animal).’
   (FSR, SLZ1051-s, 3)

c. \[ Blh'i^2 = da^2_2 = ne^2 = b^4_4 \quad t_1 \quad t_2 \quad t_3. \]
   show.COMP=1SG=3.EL=3.AN
   ‘I showed it (an animal) to her/him.’
   (RDR, SLZ1029-s, 8)

We take the functional head responsible for pronominal cliticization to be in T: above the subject (since it interacts with the subject), but outside the left periphery. Evidence for this comes from sentences with non-verbal predication (Sichel & Toosarvandani 2020). These convey no tense or aspect information, suggesting that T is deficient or absent in these clauses. As expected, no subject cliticization is permitted.

(11) \( (Bi\ llinh\ dzonhu)\ ? \ ‘What\ do\ you\ do?’ \)

a. Bene’ skwelh neda’.
   person school 1SG
   ‘I am a teacher.’

b. *Bene’ skwelh=a’.
   person school=1SG
   (Sichel & Toosarvandani 2020: 110)
At the same time, wh-movement is possible to a clause-initial position, just as in finite clauses.

\[
\text{(12) } \text{Nhulhe le’e bene’ skwelh?} \quad \text{\textit{which 2PL person school}}
\]

\[
\text{‘Which of you is a teacher?’} \quad \text{(FSR, SLZ1075, 12:08)}
\]

If the functional head that Agrees with pronouns was higher, in C, we would have no understanding of the impossibility of cliticization in non-verbal predications, since their left periphery appears otherwise unaffected.

The role of a functional head in pronominal cliticization is perhaps most evident in patterns of doubling (Sichel 2001, 2002, Sichel & Toosarvandani 2020, cf. Preminger 2019). When a local person subject bears narrow focus, it is realized as a strong pronoun which must be doubled by a clitic pronoun. (Third person pronouns and lexical DPs, by contrast, can never be doubled in postverbal position.)

\[
\text{(13) (Nhu yega’an? ‘Who is going to stay?’)}
\]

\[
\begin{align*}
\text{a. } & \text{Yega’an=o’ lhe’}. \\
& \text{stay.POT=2SG 2SG} \\
& \text{‘YOU are going to stay.’}
\end{align*}
\]

\[
\begin{align*}
\text{b. } & \text{*Yega’an lhe’}. \\
& \text{stay.POT 2SG} \\
& \text{(Sichel & Toosarvandani 2020: 104–105)}
\end{align*}
\]

The obligatory cliticization in (13) can be attributed to the needs of a functional head, which must enter into a syntactic relation with the subject. It cannot be attributed to the strong pronoun itself, which is perfectly grammatical on its own, as in (11a).

2.2. Against shape conservation

The LDB bears a surface resemblance to one of the blocking effects on object shift in Swedish and other Scandinavian languages collectively known as Holmberg’s Generalization (Holmberg 1986, 1999). As we saw in (5), pronoun movement is blocked by a dative lexical DP; but it is also blocked by a verb that has not raised to T, as well as by verb particles. To account for the heterogeneity of these blocking effects, a family of shape conservation constraints have been proposed, which apply at the PF interface to preserve the linear order of elements across levels of syntactic representation (Müller 2000, Fox & Pesetsky 2005; see also Sells 2001, Williams 2003).

While these differ in their details, they all trace the ill-formedness of (5b) to a linear misalignment across syntactic domains. If the indirect object precedes the object inside say the VP, then it must also precede it in every larger domain. As a result, shape conservation is violated whenever an object pronoun moves without the indirect object moving as well.

\[
\begin{align*}
\text{(14) a. } & [_{\text{VP}} \text{gav Elsa den}] \\
& \text{VP: gav < Elsa < den} \\
\text{b. } & *[_{\text{TP}} \text{jag gav}_1 \text{den}_2 [_{\text{VP}} \text{t}_1 \text{Elsa t}_2]] \\
& \text{TP: den < Elsa}
\end{align*}
\]
In the well-formed (5a), by contrast, the additional movement of the indirect object preserves the linear order of the lower domain.

It is clear how shape conservation might be extended to account for the LDB. Assuming that, at an initial level of representation, the subject and object occur within the same domain, their order will have to be preserved in all larger domains. It will then be impossible, as shown in (15b), for an object pronoun to move across a lexical DP subject.

(15) a. \[ vP: 'Xwanha' \text{ blenh} = \text{eb} \] vP: \text{Xwanha} \text{ blenh} < \text{eb} < \text{=eb} \\
    b. *[\text{TP} \text{ blenh} \text{=eb}_1 [vP \text{Xwanha'} \text{ t}_1 \text{ t}_2]] \] TP: \text{blenh} < \text{=eb} < \text{Xwanha'}

However, this source for the LDB leads to the expectation that further shape-conserving movement should remediate the problem, just as it does in Swedish, where further A′-movement can repair a violation of Holmberg’s Generalization.

(16) Henne\textsubscript{1} visar jag den\textsubscript{2} helst inte t\textsubscript{1} t\textsubscript{2}.
her show I it rather not ‘I’d rather not show it to HER.’ (Holmberg 1999: 17)

In Zapotec, A′-moving the subject, through focus movement (17a) or wh-movement (18a), does not repair the violation. In these configurations, the object can only surface in its base position as a strong pronoun, as in (17b) and (18b).

(17) a. \*Xwanh\textsubscript{24} = \text{a}_1 \text{ blenh} = \text{b}_2 \quad t_1 \quad t_2. \] \text{Juana=DEF carry.COMP=3.AN} \text{Intended: ‘JUANA carried it.’} (FSR, SLZ1051, 14:54)

b. Xwanh\textsubscript{24} = \text{a}_1 \text{ blenh} \quad t_1 \quad \text{leb}_{24}. \] \text{Juana=DEF carry.COMP 3.AN} ‘JUANA carried it.’ (FSR, SLZ1051-s, 7)

(18) a. \*Nhu\textsubscript{42} = \text{b}_1 \text{ blenh} = \text{eb}_2 \quad t_1 \quad t_2? \] \text{who COMP.carry=3.AN} \text{Intended: ‘Who carried it?’} (FSR, SLZ1051, 16:31)

b. Nhu\textsubscript{42} = \text{b}_1 \text{ blenh} \quad \text{leb}_{24}? \] \text{who COMP.carry 3.AN} ‘Who carried it?’ (FSR, SLZ1051-s, 8)

Since LDB violations cannot be characterized in surface terms, we conclude that the locality restriction that underlies it must apply in the course of the derivation.

Instead, we are proposing that the LDB arises from the interaction of lexical DPs and pronouns with a functional head via Agree. To motivate this account, we will draw an analytical parallel between the LDB and another constraint on pronominal cliticization that makes reference to the grammatical properties of third person arguments.
2.3. Another constraint on object cliticization

In Sierra Zapotec, some object pronouns are unable to cliticize even when the subject is another pronoun, depending on the animacy of both arguments. The language realizes a four-way animacy distinction in third person pronouns: elder humans (EL) vs. non-elder humans (HU) vs. animals (AN) vs. inanimates (IN). An elder object pronoun cannot cliticize when the subject is human (19b), though a human object pronoun can cliticize when the subject is elder (19a).

(19) a. \[3.EL > 3.HU\]
    \[Wkwell=e’1=be’2\]
    \[kick.COMP=3.EL=3.HU\]
    ‘He kicked him.’

b. \[3.HU > 3.EL\]
    \[*Wkwell=be’1=be’2\]
    \[kick.COMP=3.HU=3.EL\]
    Intended: ‘He kicked him.’

This parallels the LDB, except that the subject is a pronoun. The subject pronoun blocks cliticization of an object pronoun, just as a lexical DP does; compare (19b) to (1b). But unlike a lexical DP, the subject pronoun can itself undergo movement.

It is not just the combination of clitics seen in (19b) that is prohibited: object cliticization is forbidden whenever the animacy of the object exceeds the subject’s on an intuitive hierarchy of animacy.\(^4\) By analogy to the PCC, Foley & Toosarvandani (to appear) call this restriction a Gender–Case Constraint (GCC), following traditional categorizations of animacy as part of gender.

(20) Gender–Case Constraint (GCC)
    An object clitic pronoun cannot exceed a subject clitic pronoun on the animacy hierarchy, i.e., EL > HU > AN > IN.

The GCC was illustrated for combinations of human pronouns in (18); its effects are demonstrated pairwise for the other animacy categories in (21) and (22).

(21) a. \[3.HU > 3.AN\]
    \[Bchew=be’=ba’\]
    \[kick.COMP=3.HU=3.AN\]
    ‘S/he kicked it.’

b. \[3.AN > 3.HU\]
    \[*Bdinn=ba’=be’\]
    \[bite.COMP=3.AN=3.HU\]
    ‘It bit her/him.’

\(^4\) This simplifies things somewhat, as there is variation within Sierra Zapotec in how strictly the hierarchy is obeyed. We have presented data here from the Yalálag variety, which conforms to it most completely.
The GCC permits cliticization when subject and object pronouns have the same animacy, though many such combinations are nonetheless ill-formed. Foley et al. (2019) attribute this, however, to a morphological constraint on adjacent identical exponents (cf. third person clitic pronouns in Spanish; Bonet 1991, Nevins 2011). In certain Sierra Zapotec varieties, some pronouns have more than one allomorph. As long as subject and object clitic pronouns can be realized with different exponents, same animacy combinations are well-formed.

This supports the characterization of the GCC in (20) as a relative constraint, which prohibits cliticization of an object pronoun only when it is more animate than a subject pronoun.

Foley & Toosarvandani take the GCC to arise from an Agree operation that holds between a functional head and the two pronouns. This parallels the dominant analysis of the PCC, which assigns an important role for an Agree operation that holds between a functional head and the arguments that it c-commands (Anagnostopoulou 2003, 2005 and others). This means that the four-way animacy distinction in Sierra Zapotec must be encoded in featural terms, since Agree makes reference to features. This can be done using three privative features: ELDER, HUMAN, and ANIMATE. Elder pronouns are fully specified, bearing all three features; non-elder humans and animal pronouns are partially specified; inanimates bear none of these features.

We will discuss the Agree mechanism that is involved in deriving the GCC in more detail in Section 4. For now, we simply point out that Agree must enable cliticization of two arguments when the subject is at least as featurally specified as the object, e.g., 3.EL > 3.HU (19a), but not when it is less featurally specified than the object, e.g., 3.HU > 3.EL (19b). This same mechanism can be extended, we will argue, to the LDB.
2.4. Toward a unified syntactic source

Importantly, we are not claiming that the LDB can simply be subsumed under the GCC. The LDB holds for any lexical DP subject and any pronominal object, regardless of animacy, including cases where the subject happens to denote an entity that is higher on the animacy hierarchy than the object, e.g., (1b) above. Rather, we are proposing that the Agree mechanism underlying the GCC is also responsible for the LDB. In particular, it is the intervention-based locality constraint on Agree which derives the structural asymmetry inherent to the LDB and the GCC. Attract Closest prohibits Agreement between a probe X and a goal Z when there is a closer potential goal Y (Chomsky 2000:122).

(25) *Attract Closest (Chomsky 2000:122)

\[
\begin{array}{ccc}
P & \ldots & G & \ldots & G \\
\end{array}
\]

What counts as a goal is defined in featural terms: both Y and Z are potential goals if they share a feature F that the probe is looking for. Thus, in both the LDB and GCC, object cliticization is prohibited because the subject is closer than the object to the probe, and both share some feature the probe is looking for. Both patterns are intervention effects, in other words, and are not so different from defective intervention in the end. The core computational mechanism involved in all of them is the same, with differences amongst them arising from the specific properties of the probes and goals involved.

Preliminary evidence for generalizing across these patterns comes from the repair for violations of the LDB and GCC. When the GCC is violated, the object is realized as a strong pronoun, while the subject pronoun still cliticizes (26a–b). Similarly, when the subject is a lexical DP, an object pronoun can only be realized as a strong pronoun (27).

(26) a. Udi’in\(^4\)=eb\(^4\)\(_1\) \(t_1\) \(\text{le}^2\text{ba}^3\).
    \text{bite.COMP=3.AN} \quad \text{3.HU}
    \text{‘It (an animal) bit her/him.’} \quad \text{(FSR, SLZ1051-s, 5)}

b. *Udi’in\(^4\)=ba\(^3\)\(_2\) \(t_2\).
    \text{bite.COMP=3.HU} \quad \text{3.AN}
    \text{Intended: ‘It (an animal) bit her/him.’} \quad \text{(FSR, SLZ1051, 13:45)}

(27) Blenh\(^4\) \(X\text{wa}^4\text{nh}=a\(^4\) \(\text{le}^2\text{ba}^3\).
    \text{carry.COMP} \quad \text{Juana=DEF} \quad \text{3.AN}
    \text{‘Juana carried it.’} \quad \text{(FSR, SLZ1051-s, 6)}

In principle, the two constraints could have had distinct repairs, such as realizing the higher argument as a strong pronoun (for the GCC) or moving the higher argument. But they do not. Of course, to evaluate this argument, a unified theory of both these violations and their repairs is needed. Informed by the nature of their repairs, in the rest of the paper we develop such a theory of these violations as arising from intervention.
3. Extending the domain of Person

For both lexical DPs and pronouns to be eligible as goals for the same probe, they must count as the same in some way. There must be some property that pronouns and non-pronominals share, such that a clitic is sensitive to a higher lexical DP, but not, say, to a higher PP or AP. At the same time, there must be some property that distinguishes them, since the intervention effect is asymmetric: lexical DPs intervene for clitic pronouns, but not the other way around. Finally, in anticipation of the proposal that the LDB is regulated via Agree, these properties must be represented in featural terms, since features are the kind of entity that is visible to Agree.

How feasible is it that full lexical DPs are featural interveners? It is just as feasible as the existence of a feature shared by all nominals. We do not usually think of lexical DPs and pronouns as possessing the same features (besides Number and Gender which are irrelevant in this case). Lexical DPs are usually associated with categories like N or D, whereas pronouns are associated with the more granular Person features. But it is possible that the syntactically active property that has been characterized as a nominal “category” is actually less disjoint from the Person system than the term “category” would suggest. Motivating the existence of two related features for nominals, a unifying feature and a distinctive one, is our task in this section. We will suggest that these two features are configured structurally, and that the so-called “categorical” feature of lexical DPs is an extension of Person.

In particular, we propose that all nominals are specified for a feature $\delta$, a name we have chosen to resonate with the category D. Only personal pronouns, including third person pronouns, are further specified for Person: these all have at least a $\pi$ feature (Béjar 2003). The structural configuration of these two features is crucial in the analysis. The presence of $\pi$ asymmetrically requires the presence of $\delta$, a dependency that can be represented using a feature geometry.

(28)  

\[ \begin{array}{ll}
\text{a. Lexical DPs} & \text{b. Pronouns} \\
\delta & \delta \\
\mid & \mid \\
\pi & \pi \\
\end{array} \]

In what follows, we motivate the $\pi$ feature distinguishing pronouns from lexical DPs by relating this distinction to other oppositions within third person. And, we suggest that the $\delta$ feature is common to all nominals because it is responsible for their shared ability to individuate and participate in reference tracking.

This approach assumes that Person features have semantic content and are organized structurally in virtue of their meaning. In this respect, we are pursuing a line of investigation into the structure of Person which shifts the focus from looking solely at morphological paradigms and their syncretisms to investigating their semantics and the semantic markedness relations amongst them (Béjar 2003, Sauerland 2006, Harbour 2016). Person features have meanings and these determine their structural arrangement, and it is these relations among features which matter for the theory of intervention effects. From this perspective, it is no accident that Person
and the animacy categories found in Sierra Zapotec give rise to intervention effects, while “horizontally” arranged Gender categories, such as those found in Romance or Bantu languages, do not. Such disjoint ontological or grammatical classes are not able to interact, via their featural representations, with the Agree system in the ways needed to produce intervention.

3.1. The internal structure of Person

In traditional grammars, Person is also typically conceived of as non-hierarchical, with first, second, and third person categories arranged horizontally. But the cross-linguistic typology of pronominal inventories and morphological processes that make reference to Person suggests this domain has more structure (Ingram 1978, Noyer 1992: 145–175, Harley & Ritter 2002, building on earlier work). One commonly assumed structure, suggested by Benveniste (1956), builds on the discourse roles of speech situation participants. A [PARTICIPANT] feature characterizes first and second person together, while another feature, [SPEAKER], characterizes just first person.

This means that the presence of [SPEAKER] implies the presence of [PARTICIPANT], a co-occurrence restriction that is frequently encoded using a feature geometry (Harley & Ritter 2002, Béjar 2003: 47–50).

(29) a. 1
b. 2
PARTICIPANT
| c. 3
PARTICIPANT
SPEAKER

With just these two features, third person is characterized by the absence of Person features altogether, in line with the old idea that third person is simply the elsewhere category (Forscheimer 1953, Benveniste 1956, Zwicky 1977, Noyer 1997, Harley & Ritter 2002, Ackema & Neeleman 2018: 52–56 and others).

The analytical moves which eliminate third person are only justified if the category of third person is homogenous. However, many languages distinguish two (or more) third person pronouns (Béjar 2003: 47–50). In descriptive terms, languages can have logophoric and non-logophoric pronouns (Hagège 1974, Clements 1975), personal pronouns and d-pronouns (Wiltschko 1998, Sichel 2001, Patel-Grosz & Grosz 2017, Sichel & Wiltschko 2021), proximate and obviative pronouns (Aissen 1997), or several pronouns expressing animacy distinctions, as we described for Sierra Zapotec in Section 2. These inventories require the existence of one or more additional Person features, in addition to those shown in (29).

Béjar (2003) posits a universally available [π] feature, corresponding to a cluster of properties characterizing the third person. And Sichel & Wiltschko (2021) further argue that, once [π] is added to the inventory of Person, it can be used to distinguish between third person categories, according to the logic of markedness. When [π] is present, it underlies one class and when it is absent, it underlies another. Building on Béjar and Sichel & Wiltschko, we propose that, in many languages, the [π] feature represents the boundary between pronouns and lexical
DPs. Thus, instead of (29) above, we propose (30) for these languages. All pronouns, but not lexical DPs, have $[\pi]$.\(^5\)

\[
\begin{array}{cccc}
(30) & a. & l & b. & 2 & c. & 3 & d. & \text{Lexical DP} \\
& \delta & \delta & \delta & \delta \\
& \pi & \pi & \pi \\
& \text{PARTICIPANT} & \text{PARTICIPANT} \\
& \text{SPEAKER} \\
\end{array}
\]

At the same time, we take all nominals to share the $[\delta]$ feature, which is also part of the structure of Person. The presence of $[\pi]$ asymmetrically entails the presence of $[\delta]$, just as the presence of $[\text{SPEAKER}]$ asymmetrically entails the presence of $[\text{PARTICIPANT}]$ and $[\pi]$.

We understand $[\pi]$ and its sub-categories $[\text{SPEAKER}]$ and $[\text{PARTICIPANT}]$ as grammatical features, whose presence distinguishes personal pronouns from lexical DPs. But it is not clear that the structure of Person, represented in the feature geometries in (30) above, has a grammatical source. Harley & Ritter (2002) argue that these geometries are part of Universal Grammar, based on the cross-linguistic typology and acquisition of pronouns. They do not, however, specify a particular connection between feature geometries and the semantics of the features they contain. As McGinnis (2005) points out, such a mapping is needed if these geometries are to have any crosslinguistic predictive power.

Béjar (2003) advances a strong hypothesis for mapping feature geometries to the meanings of their features. She proposes that the dominance relation in a geometry corresponds directly to asymmetric semantic entailment. Thus, a feature whose presence is mandated by another feature must be semantically entailed by it. Under this view, the feature structures in (30) must be grounded in a semantics for Person which can derive the asymmetric structural relationship that $[\pi]$ and $[\delta]$ stand in. In what follows, we provide a semantics for these features that can do this.

**3.2. The semantics of $[\pi]$**

We take $[\pi]$ to have content related to the discourse roles represented in the local person paradigm. A familiar semantics for $[\text{SPEAKER}]$ and $[\text{PARTICIPANT}]$ is given in (31a–b), in which these privative features denote one-place predicates which combine intersectively (e.g., Heim & Kratzer 1998, Sauerland 2006). Both features make reference to discourse roles, to the speaker of the speech situation or another participant in that situation.

\[
\begin{align*}
(31) & \quad a. & \text{[[SPEAKER]]}^c = \lambda x : x \text{ is } \text{SPEAKER}(c) . \ x \\
& \quad b. & \text{[[PARTICIPANT]]}^e = \lambda x : x \text{ is a participant in the conversation of } \text{SPEAKER}(c) . \ x
\end{align*}
\]

\(^5\)All personal pronouns must have the specification in (30a), whether they are clitic, weak, or strong pronouns. Cardinaletti & Starke (1999) propose that clitics contain a subset of the structure of weak pronouns, which in turn contain a subset of the structure of strong pronouns. The featural content of pronouns is orthogonal to how much structure they contain.
The denotations of these Person categories are further restricted by a markedness calculation (Sauerland 2006). Thus, the second person can only be used to refer to the addressee because of the availability of the more specific first person, which has the [SPEAKER] feature.

Sichel & Wiltschko (2021) propose that all Person features are characterized in terms of the actual or possible ability of an individual to participate in a conversation (whether spoken or signed). This includes [π], which they argue describes potential discourse participants: all those individuals who are possible discourse subjects, or in other words, all potential interlocutors who can talk as well as be talked to.

\[(\pi)\] = \(\lambda x : x \text{ is a potential participant in a conversation} \cdot x\)

Given this semantics, [SPEAKER] asymmetrically entails [PARTICIPANT] (their [LOCAL]), which in turn asymmetrically entails [π] (their [PERSON]), an arrangement they call the Person Sphere, depicted in Figure 1. The Person Sphere stretches up to include discourse objects, those individuals that can be talked about, thereby extending over the entire set of Discourse Referents (DRN). This inclusion relation between the two outer layers places the relationship between DRN and [π] on a continuum with [PARTICIPANT] and [SPEAKER].

Figure 1: Person Sphere (Sichel & Wiltschko 2021:53)

The animal and inanimate pronouns in Sierra Zapotec raise a problem for Sichel & Wiltschko’s original semantics for [π]. The referents of these third person pronouns cannot plausibly be characterized as potential discourse subjects, even though we are committed to all personal pronouns having [π]. The LDB in Sierra Zapotec affects all object pronouns, regardless of their animacy, as shown in (33a–d).

\[(33)\]  a. \(DP > 3.EL\)  
*Blenh\(^4\)e\(^{t_1}\)  
Xwanh\(^{24}\)a\(^{t_1}\)  
COMP.carry=3.EL  
Juana=DEF  
Intended: ‘Juana carried her/him.’  
(FSR, SLZ1054, 10:00)

b. \(DP > 3.HU\)
One possibility for incorporating these pronouns into Sichel & Wiltschko’s proposal would be to expand the denotation of \([\pi]\) universally to include both animals and inanimates. This would require a revision to their semantics for \([\pi]\), so that this feature ranges over both discourse subjects (who can talk) and discourse objects (who can be talked about). While this would admit non-human referents, it would undercut the explanation for Sichel & Wiltschko’s analysis of a pejorative effect that arises when demonstrative pronouns are used to refer to humans.

Another possibility is that both semantics for \([\pi]\) are in principle available, and languages choose which they encode. Béjar (2003) suggests that there may, in fact, be a finely-articulated hierarchy of such semantic categories from which languages pick the semantic range for \([\pi]\). On this interpretation, the Person Sphere can be understood extensionally, defining a range of semantic categories and the relations between them to which linguistic entities such as \([\text{SPEAKER}], [\text{PARTICIPANT}], [\pi], \text{or } [\delta]\) would be mapped. While these semantic categories, along with the relations of asymmetrical entailment encoded in the Person Sphere, would be universal, languages could vary in terms of where they locate \([\pi]\): either immediately above discourse subjects, in which case \([\pi]\) would be restricted to potential interlocutors (i.e., humans), or slightly higher, in which case this feature would range over non-interlocutors as well, as in the Sierra Zapotec animal and inanimate pronouns.\(^6\) Regardless, it is clear that a substantive discourse-role semantics for \([\pi]\) is possible, which corresponds to the entailment relations encoded in the Person Sphere.

---

\(^6\) One way in which \([\pi]\) might be distinguished from \([\delta]\) in a language like Sierra Zapotec involves the concrete-abstract distinction. An inanimate pronoun does not, for instance, seem to be able to refer to propositions:

(i) Q: \(\text{E}^1\ \text{nhezd}^{14} = \text{u}^{14} \ \text{wxe}^{2} \ \text{ye}^{2}\text{ha'}^{2} \ \text{bi}^{4}\text{zanh}^{4} = \text{a}^{14}?\)
    \(\text{Q} \ \text{STAT} \text{.know} = 2\text{SG} \ \text{tomorrow} \ \text{POT} \text{.arrive} \ \text{sister} = 1\text{SG}\)
    ‘Do you know that my sister is arriving tomorrow? ’
A: \(\text{nhezd}^{14} = \text{a}'(\text{*=nh})^4.\)
    \(\text{STAT} \text{.know} = 1\text{SG} = 3\text{.IN}\)
    ‘I know (it).’

(RM, GZYZ096, 2:00)

This follows if \([\pi]\) only describes concrete entities (see Sichel & Wiltschko 2021 for discussion).
3.3. A semantics for $[\delta]$  

Since we are proposing that all nominals bear the $[\delta]$ feature, its meaning must be general enough to encompass both pronouns and lexical DPs. There have been similar proposals for a general nominal feature, including Harley & Ritter’s (2002) [REFERING EXPRESSION] and Béjar & Kahnemuyipour’s (2017) [d]. However, the semantics of these features are tied to a linguistic expression’s ability to refer. In Sierra Zapotec, it is not just referential expressions (definite descriptions, possessive descriptions, proper names) that participate in the LDB. All lexical DPs, including quantificational ones, block object cliticization.

\[
(34) \quad \begin{array}{llll}
\text{a.} & \text{Ts-ja}^2\text{-se}^2\text{-naw}^{23} & \text{to}^4\text{to}^4 & \text{bi}^1\text{dao}^1 \leb^{24}.
\text{CONT-AND-PL-follow} & \text{every} & \text{child} & \text{3.AN}
\end{array}
\]

‘Every boy chased the dog.’

\[
(34) \quad \begin{array}{llll}
\text{b.} & *\text{Ts-ja}^2\text{-se}^2\text{-naw}^{2}=b_i^1 & \text{to}^4\text{to}^4 & \text{bi}^1\text{dao}^1 \text{t}_i.
\text{CONT-AND-PL-follow}=3.AN & \text{every} & \text{child}
\end{array}
\]

Thus, a semantic property is required for $[\delta]$ which characterizes both referential and quantificational nominals, but does not hold of other categories (e.g., adjectives or verbs).

We call the semantic property implicated by this most inclusive Person category determination and identify it with Baker’s (2003:94–189) notion of “individuation,” a property that is unique to nominals (following Geach 1962, Gupta 1980, and Larson & Segal 1995). Whereas all lexical categories have “criteria of application” which make it possible to decide whether an individual is a member of that category, nominals have an additional “criterion of identity”. This makes it possible to individuate entities and to determine whether particular individuals are the same entity or not, as required by expressions such as: That is the (same) book that you left here yesterday. Determination is a precondition for quantification, since in order to count it is necessary to individuate entities, or to know how many entities there are of a particular type. For this reason it is also a precondition for reference tracking, explaining why only nominal elements can directly form referential or quantificational expressions. For adjectives or verbs to serve these functions, additional morphology is usually required.

While we adopt this characterization of nominals as implying individuation, and ultimately determination, we see no compelling reason to associate this property with the category N, as Baker does. It is clearly also associated with pronouns, which contain no N, as well as nominalizations, which similarly do not contain an N, under the hypothesis that they are mixed nominal-verbal projections (Borsley & Kornfilt 2000 and others). For this reason, we associate the determination property with $[\delta]$, a feature which all nominals by hypothesis possess.

Importantly, Baker’s notion of individuation is not the same as “individuation” as it is understood in the domains of Number and Gender, though the two concepts are closely related. The typological and semantic literature on Number inflection refers to individuation as the concept underlying the distinction between countable and non-countable entities (Corbett 2000, Grimm 2018; for its role in Gender, see also Audring 2009). Specifically, count nouns — those bearing number inflection — are used to refer to entities which are construed as individuated, whereas mass nouns are used to refer to entities construed as non-individuated. If this notion of
individuation were implicated in the semantics of $[\delta]$, the LDB should be sensitive to whether the intervening subject is headed by a mass noun or not. But it is not: lexical DPs headed by mass nouns induce the same intervention effect for object cliticization as all other lexical DPs.

(35)  

a. $Ba^{2} bia^{4}$ nhis$^{4}=$enh$^{4}$ leb$^{24}$.  
   already carry.away.COMP water=DEF 3.AN  
   ‘The water carried it (an animal) away.’ (RM/FA, GYZ148, 36:48)  

b. *$Ba^{2} bia^{4}=b$ nhis$^{4}=$enh$^{4}$.  
   already carry.away.COMP=3.AN water=DEF  
   (RM/FA, GYZ148, 37:07)

This implies that lexical DPs headed by mass nouns do have criteria of identity, just like other nouns. And indeed, Baker shows (p. 101) that mass nouns can be used in an identity frame such as “X is the same N as Y” (37), on a par with count nouns (36).

(36)  

a. That is the same man as you saw yesterday.  

b. Those are the same women as we saw last night.

(37)  

a. That is the same water as was in the cup this morning.  

b. The French want to have the same liberty as the Americans have.

Although a mass may not be comprised of atoms which are internally individuated (i.e., discrete atoms of water), the mass as a whole is determined in our sense. A mass noun picks out determinated entities since it allows for identification and reference, above and beyond its internal make-up.

We can think of the individuation implicated in Number as an internal property of DPs, whereas determination is outward looking, to the integration of the nominal with the sentential/propositional scaffolding, recalling the relationship between TP and CP. This enables an understanding of the $[\delta]$ feature as part of Person, due to the relation of the determination property to discourse roles. By picking out which entities can be talked about, it is the most inclusive discourse “role,” which includes all the individuals who can talk (see also Hopper & Thompson 1984).

Our semantic characterization of $[\delta]$, which links it directly to Person, may also relate it to Number more indirectly, opening the door to a view of these categories as less conceptually distinct than they might seem. In traditional $\varphi$-feature classifications, Person and Number features are represented separately, as in familiar feature geometries. Harley & Ritter (2002), for instance, locate Participant and Individuation in distinct nodes of their geometry. However, a connection between reference and counting is already suggested in the line of thought leading up to Baker’s (2003) proposal. If we add the assumption that Person and Number are both categories which classify all nominals, it follows that $[\delta]$ — the most inclusive Person category — must also range over both count and mass entities, as shown above. This follows from the semantic nature of Person categories coupled with the logic of inclusion.

Some independent support for this characterization of Person and its relation to Number can be found in the cross-linguistic typology of Number morphology. Corbett (2000) proposes that languages only mark Number on nominals according to an implicational hierarchy (sometimes
referred to as the “animacy” or “individuation” hierarchy), ranging from the speaker to inanimate entities (cf. Smith-Stark 1974); see Audring 2009 for a parallel claim about Gender.

\[(38) \quad \text{speaker} > \text{addressee} > \text{third person} > \text{kin} > \text{human} > \text{animate} > \text{inanimate}\]

This scale can be described as the conflation of three hierarchies: a Person hierarchy (1 > 2 > 3), a nominal hierarchy (pronouns > nominal), and an animacy hierarchy (human > animate > inanimate). Focusing on the first two, our semantic characterization of \([\pi]\) corresponds to the conflation of the Person hierarchy and the nominal hierarchy: \([\pi]\) defines all and only personal pronouns as a class and third persons, more specifically, via the logic of markedness. From this perspective, it is only natural that a hierarchy beginning with the speaker would extend to entities corresponding to nominals with descriptive content, i.e., lexical DPs. The semantic understanding of \([\pi]\) thus connects the Person hierarchy and the nominal hierarchy via a single semantically coherent continuum defined by semantic entailment.

### 3.4. Features or categories?

In advancing a semantic characterization for the \([\pi]\) and \([\delta]\) features, we are not suggesting that their denotations directly affect the intervention calculation for locality. Their meaning is relevant only for determining the structural dependencies amongst features. They must still be represented formally on nominals in the syntactic currency appropriate for interacting with the Agree mechanism.

While we have been assuming that this involves features, there is another possibility: \([\pi]\) and \([\delta]\) could correspond to syntactic categories that project as heads in the syntax. The choice between features and categories might seem like a purely theory-internal matter, depending on how a particular theory views the relationship between categories and features. For us, the substantive question involves how structure is encoded within Person. Are the dependencies between Person categories defined featurally, as in (30), via feature geometries or other feature co-occurrence rules? Or are they encoded in syntactic terms, through the selectional properties of heads?

We do not think an account of the LDB is possible if \([\pi]\) and \([\delta]\) are viewed as categories, as opposed to features. If they were categories, they would be syntactic heads that project functional structure (e.g., Carstens 1991, Ritter 1993, Déchaine & Wiltschko 2002, Oxford 2017). The structure within Person would then have to be represented in terms of the hierarchical ordering of functional heads. As shown in (39), \(\delta P\) would dominate \(\pi P\) in pronouns, while \(\pi P\) would not be projected at all in lexical DPs. (More specific Person categories could presumably project as functional heads below \(\pi P\), as for instance Bianchi (2006) proposes.)

---

7 As originally conceived, categories determine distribution through selection, while features are morphological, interacting with movement in a (morpho-)syntactic guise. The theory of bare phrase structure (Chomsky 1995) calls into question the existence of a discrete boundary between these concepts. Similarly, within a nano-syntactic approach, there might be no difference between \([\delta]\) and \([\pi]\) being “features” or “syntactic heads,” since the elements which project are individual features.
Both pronouns and lexical DPs would be δPs, which would contain other nominal structure, including but not necessarily limited to NP. With all nominals belonging to the same category, selection by external heads (e.g., V or P) could be stated simply in terms of selection for the highest category; this would (correctly) prohibit selection for person and other φ-features.

The empirical substance of this choice, between categories and features, would then involve the kind of locality implicated in the LDB. Is it the locality that deals in hierarchical depth, as in classical phase-based locality (as opposed to the locality involved in Attract Closest, which deals in relative distance from a probe)? We do not think so. If clitic pronouns were πPs, they would be too deeply embedded to be directly extracted, assuming that the containing δP is a phase (for related ideas, see Oxford 2017 and Preminger 2019). For a clitic pronoun to be sub-extracted, the phase would first need to be “opened up,” for instance by Agree (Rackowski & Richards 2005). The impossibility of object cliticization across a lexical DP could then be understood as a product of phase impenetrability. If Agree with a higher lexical δP “uses up” the phase-opening potential of a probe, then the lower δP would remain “closed” to cliticization. Without saying anything more, this would imply that all subjects, including pronominal subjects, should prohibit object cliticization. Since this is not the case, an account of the LDB in terms of phase-based locality, based on the structures in (39), does not seem to be tenable.

Nor does it help to give up our initial assumption that all nominals belong to the same category, and assume instead that pronouns are πPs and only lexical DPs are δPs (with or without an internal πP). Besides the question of why δP and πP would interact in this way, it is not clear why δP would block movement of a lower πP, but a subject πP would not. One could appeal to the fact that, when the higher argument is a pronoun, it moves, thereby getting out of the way of the lower argument’s movement trajectory. But this would be an account based on position, not internal structure, and we already showed in Section 2 that an exclusive appeal to position, as in shape conservation approaches, does not cover the full empirical terrain.

Therefore, it seems that internal structure and classical phase-based locality do not play a role in LDB. That is not to say that there can be no πP projection within δP, only that this is not involved in the account of the LDB.

The alternative is to treat [π] and [δ] as features, as we have been suggesting. On this approach, Agree interacts directly with these features in the familiar way: a functional head probes into its domain, subject to Attract Closest; it finds the highest argument and Agrees with it. But to derive the LDB, something more than this needs to be said. Sometimes the probe is able to look again and find an additional, lower argument; and sometimes, if the higher argument is a lexical DP, it cannot. That is, a probe’s ability to Agree depends, in some way, on what it has already Agreed with. We turn to the mechanism that enables this next.
4. The probe activation model of Agree

The featural representations proposed in Section 3 for lexical DPs and pronouns create an asymmetry across nominal classes. Pronouns are more specified than lexical DPs, since they bear other person features beyond the [δ] shared by all nominals. This asymmetry opens the door to a uniform understanding of the LDB (40) and the GCC (41).

(40)  *Lexical DP Blocking (LDB)*
An object pronoun cannot cliticize when the subject is a lexical DP.

(41)  *Gender–Case Constraint (GCC)*
An object clitic pronoun cannot exceed a subject clitic pronoun on the animacy hierarchy, i.e., EL > HU > AN > IN.

In both patterns, cliticization of an object pronoun is prohibited when it is more featurally specified than the higher argument.

(42)  *This correspondence can be translated into a grammatical mechanism by building on work on the PCC. Anagnostopoulou (2003, 2005) proposes to account for this family of restrictions on clitics and other weak pronouns based on their location on a Person hierarchy in terms of the interaction of a single functional head with multiple arguments via Agree. She hypothesizes that whether a probe can Agree with and move an object pronoun depends on the Agree relation it enters into with the higher argument. There is more than one possible implementation of Anagnostopoulou’s basic idea, which we call overprobing and describe in neutral terms in (43). The possibility of an Agree relation with a lower goal depends on the features the probe finds when it Agrees with a higher goal.*

(43)  *Overprobing*
A probe P can Agree with a goal G when there is a closer goal G’ only if P Agrees with G’ in some feature(s) F.

This assumes that cliticization is, in some way, the reflex of agreement, so that Agree is a precondition for pronominal cliticization (Borer 1984, Suñer 1988, Sportiche 1993, Preminger
2019). It is clear how overprobing might underlie the LDB/GCC. Object pronoun cliticization requires Agree, which in turn depends on the Agree relation between the probe and the higher argument.

But how does the Agree mechanism permit overprobing in the first place? At least superficially, it is incompatible with the classical Minimalist theory of agreement and movement. In Chomsky’s (2000, 2001) original version of Agree, it can only take place when a probe bears some uninterpretable features, which must be matched against interpretable feature(s) on a goal. Once the closest suitable goal with matching features has been found, subject to Attract Closest, the uninterpretable feature(s) on the probe are deleted. If the matching goal is eligible for movement, it is Merged in a local configuration to the probe. Once its uninterpretable feature(s) are deleted, the probe cannot interact with any other goals. This permits only a single Agree relation between the probe and the closest goal, and hence only this one goal is able to move.

One approach to this problem would be to abandon the restrictions on the probe by adopting Hiraiwa’s (2001) Multiple Agree (Anagnostopoulou 2005, Nevins 2007, 2011). However, there are a growing number of proposals that aim to derive overprobing by revising the classical theory of Agree in more targeted ways (e.g., Anagnostopoulou 2003, Béjar & Rezac 2003, 2009, Deal 2020, Coon & Keine, to appear, Foley & Toosarvandani, to appear). We advance our own revision here, which we call the probe activation model of Agree, to derive the ill-formedness of the configuration in (41).8

(43) Probe activation

(i) Locality:
The probe \(P\) c-commands all goals and Agrees subject to intervention-based locality (i.e., Attract Closest). Thus, it must Agree with the highest goal \(G\) in its domain.

(ii) Activation:
After Agreeing with \(G\), the probe is “activated” and is able, though it is not required, to Agree with another goal \(G'\), just in case \(G'\) is not featurally distinct from the probe: i.e., it is not more featurally specified than the probe (\(G' \subseteq P\)).

The first hypothesis, which is just the familiar locality condition, requires the probe to Agree with the closest goal it c-commands. The second hypothesis, which is novel, allows for the probe to be “activated” by Agreeing with the highest goal. It is free to interact with lower matching goals, though this is not required for the derivation to converge. What counts as a matching goal

8 We are building here on Foley & Toosarvandani's (to appear) account of the GCC. They locate the source of both grammatical and ungrammatical combinations in the mechanism underlying cliticization. They propose that a pronoun can cliticize just in case the condition in (i) is satisfied.

(i) Condition on Pronominal Cliticization
For a functional head \(H\) that has been valued (i.e., VALUE(H) ≠ \(\emptyset\)), a clitic pronoun \(P\) can (internal) Merge with \(H\) iff, for the set of relevant features \(F\) on \(P\), \(F \subseteq\) VALUE(H).

While the motivation for the additional cliticization is much the same, as are the featural preconditions that must be met for this additional stage of cliticization to take place, we attribute the mechanism explicitly to Agree. This is motivated by our goal to assimilate the grammatical mechanisms underlying the LDB and GCC.
for these subsequent relations is determined by (43ii), which makes reference to the features of the higher goal.

We discuss the conceptual and empirical motivations for this proposal below, comparing it to some other recent attempts to derive overprobing. It differs from Deal’s (2015, 2020) proposal to allow for “insatiable probes,” which must interact with all accessible goals in their domain. In the probe activation model, only the first round of Agree is obligatory relative to the probe needs. It also diverges from Coon & Keine’s (to appear) “feature gluttony” approach, in which a probe’s featural requirements can be articulated and sequenced to allow it to enter into Agree relations with multiple goals (cf. Anagnostopoulou 2003, Béjar & Rezac 2003, 2009). When the probe is activated and enters into subsequent Agree relations, by contrast, its featural requirements no longer need to be satisfied; further rounds are never required by the probe, only by the goal.

As we will show below, while all three approaches can derive the GCC, only the probe activation model is able to assimilate the LDB and the GCC. The LDB thus provides a crucial wedge into the grammatical mechanism that underlies overprobing, and a different perspective on what a restrictive theory of Agree should look like.

### 4.1. Probe activation

Our central claim is that, in a given derivation, only the first round of Agree is syntactically obligatory due to the probe’s needs. We are uncommitted about how these needs are represented: whether via an interface constraint requiring that uninterpretable features be deleted (Full Interpretation) or a derivational obligation triggered by a probe, which might be compatible with even a global failure to Agree (Béjar 2003, Preminger 2014). However the probe’s needs are represented, once they are satisfied, any additional Agree relations are strictly optional as far as the Agree operation is concerned. Agree can iterate if it has to, but when it does, it is not due to Agree itself.

The reason for this optionality is simple: the Agree operation itself is optional. This understanding in fact underlies the classical theory of Agree, in which it only takes place to value uninterpretable features and delete them from the derivation. It is the removal of the uninterpretable feature which is grammaticality mandated (by Full Interpretation), not the application of Agree itself. So, it can be required for a given derivation to converge, even though the mechanism is strictly optional. Under this classical view, Agree is also subject to economy considerations, which mandate as few derivational steps as possible, so that Agree becomes possible only in derivations with an uninterpretable feature.

We adopt this core aspect of Agree, as a syntactic operation which is, in essence, optional. But in a given derivation, there may be other factors, beyond the needs of the probe, which require its application. In particular, some goals may have syntactic needs of their own, such as pronominal clitics, which must Agree as a precondition for cliticization. If a derivation contains one such goal or more, subsequent Agree relations may be necessary for the derivation to converge. Hence, in derivations containing additional clitics beyond the subject, the Agree operation will iterate, even after satisfying the requirements of the probe, in order to satisfy the requirements of clitics.\(^9\)

\(^9\) An additional obligatory component in this situation is the obligatoriness of using a clitic whenever possible and limiting strong pronouns to cases in which a clitic does not work. We attribute this to an economy principle which
The possibility for these subsequent rounds of Agree obeys conditions of its own. While the Agree operation is strictly optional, its application is limited by the condition in (43ii): once a probe has been valued by a goal, subsequent Agree relations cannot alter these values. This recalls a fundamental aspect of the strict cyclicity of grammatical operations, with no option to erase or revise information recorded at an earlier stage. Thus, after interacting with the highest goal, the probe can go on to Agree only with goals which would not affect the signature left by the highest goal. In other words, the probe can only Agree with those goals that are not more featurally specified than it. As long as a goal’s features can fit into the footprint created by the highest goal, it is free to Agree.

Switching metaphors, if we imagine the probe’s feature specification in mechanical terms, as levers that get pulled, we can think of overprobing as resulting from “activation”: the subject activates the levers that it needs, and this then primes the probe for subsequent rounds. Alternatively, we could think of this in terms of “deactivation”: whatever levers were not activated by Agree with the subject atrophy and become deactivated. Either way, the result is the same.

This component of the probe activation model is responsible for deriving the featural asymmetry underlying overprobing. To see how it derives the GCC/LDB, consider the grammatical configurations in (44). In both, the subject pulls more levers than the object.

(44) a. \(3.HU > 3.AN\)  b. \(3.HU > DP\)

favors local licensing, i.e., internal Merge over “case licensing,” or to any other economy preference which would replace the preference for less structure in Minimize Structure (Cardinaletti & Starke (1999)), which is no longer an option if all pronouns are specified for \(\delta\), and potentially project \(\deltaPs\).

It might be tempting to think about this in purely morphological terms: that Agree with the highest goal results in a morphological signature for the probe, which cannot be altered. This, however, might lead us to expect that the probe could only Agree with both subject and object clitics in Sierra Zapotec if they were formally identical. But of course, this is not the case: the object may have a different realization, as when it is less featurally specified than the subject.

At first glance, this view might appear in conflict with Béjar & Rezac’s (2009) proposal that some probes are articulated, so that their needs can be satisfied by more than one goal. But the probe activation model is actually silent on the question of how probes are valued. This may be the exclusive responsibility of the first goal encountered by a probe, as we consider in the main text. Or, as Béjar & Rezac propose, a failure to match some of a probe’s features on one round of Agree could leave those features unvalued. We are committed only to there being some probes that are not articulated, and that once a probe has its needs satisfied, subsequent Agree relations must maintain the featural integrity of the probe.
When Agree with a human subject pronoun pulls the [HUMAN] lever and the [ANIMATE] lever, as in (44a), an animal object pronoun is also able to Agree by pulling just the [ANIMATE] lever, and so able to cliticize.\(^{12}\) When the object is a lexical DP, as in (44b), an additional round of Agree is also possible. But since the lexical DP does not demand it, it does not take place.

The configurations in (45), on the other hand, are ungrammatical because a subsequent round of Agree is required by these objects, but the activated properties of the probe are insufficient. In (45a), Agree with a human subject pronoun pulls the [ANIMATE] and \([\pi]\) levers, and so Agree with a human object pronoun cannot pull the [HUMAN] lever. Similarly, if Agree with the subject only pulls the \([\delta]\) lever, then Agree with the object cannot pull \([\pi]\) or any other person or animacy features.

\[
\begin{align*}
(45) \quad &\text{a. } *3.AN > 3.HU \\
&\text{b. } *DP > 3.HU
\end{align*}
\]

In sum, in the cases that we are looking at, Agree with the subject is primary, as dictated by Attract Closest; it is obligatory, and it sets the parameters for future rounds of Agree. The object can get a free ride just as long as it fits into the footprint left by the subject.

### 4.2. Empirical evidence for the optionality of Agree

Given this somewhat opaque mapping from syntax to surface form, what empirical support is there for the idea that Agree with lower goals is optional as far as the Agree operation itself is concerned? In Sierra Zapotec, the evidence is indirect, but clear. The essential optionality of Agree can be detected in the nature of the strategy for overcoming violations of the LDB/GCC. When a second round of Agree is not sanctioned by (43ii), a strong pronoun surfaces instead of a clitic. We will argue that unlike a clitic, this strong pronoun does not Agree (Anagnostopoulou 2003, Rezac 2011), and this is not a problem, for neither the pronoun nor for Agree. Thus, it is perfectly fine if, after the first round, Agree fails to iterate.

We can start by considering a configuration in which Agree is required and sanctioned, such as (46a). The object human clitic is less specified than the subject elder clitic, and hence permitted. In (46b), by contrast, Agree with the object pronoun is impossible, as it is ruled out by (43ii) because the object is more specified than the subject. Since the object cannot Agree, it

\(^{12}\) For local person subjects, something must be added to enable cliticization of third person objects. One possibility is that first and second person pronouns possess all animacy features. But these features would then need to include the speaker and hearer in their denotations, which may be especially problematic for [ELDER] (see Foley & Toosarvandani, to appear for discussion). Alternately, person and animacy could be evaluated independently for the purposes of probe activation, and local person pronouns could lack animacy features altogether.
cannot cliticize. The ungrammaticality of (46b) is therefore attributable solely to the needs of the clitic, which is not able to move.

\[(46)\]

a. \[3.\text{HU} > 3.\text{AN}\]
\[\text{Blenh}^4=\text{ba}^{13}_1=\text{b}^4_2\quad t_1\quad t_2.\]
\[\text{bite.COMP}=3.\text{HU}=3.\text{AN}\]
\[\text{‘S/he carried it.’}\]  
(FSR, SLZ1012, 16:53)
b. \[3.\text{AN} > 3.\text{HU}\]
\[\ast\text{Udi’i}n^4=\text{eb}^4_1=\text{ba}^{13}_2\quad t_1\quad t_2\]
\[\text{bite.COMP}=3.\text{AN}=3.\text{HU}\]
\[\text{Intended: ‘It bit her/him.’}\]  
(FSR, SLZ1012, 19:45)

When the object cannot be realized as a clitic, because it cannot be Agreed with, it must be realized as a strong pronoun, as in (47b) and (48b) below. This is true whenever the activation condition in (43ii) is not satisfied, whether it is the GCC which is violated (47a), or the LDB (48a).

\[(47)\]

a. \[3.\text{AN} > 3.\text{HU}\]
\[\ast\text{Udi’i}n^4=\text{eb}^4_1=\text{ba}^{13}_2\quad t_1\quad t_2\]
\[\text{bite.COMP}=3.\text{AN}=3.\text{HU}\]
\[\text{Intended: ‘It bit her/him.’}\]  
(FSR, SLZ1012, 19:45)
b. \[\text{Udi’i}n^4=\text{eb}^4_1\quad t_1\quad \text{le}^3\text{ba}^{13}_3\]
\[\text{bite.COMP}=3.\text{AN}\]
\[\text{3.\text{HU}}\]
\[\text{‘It bit her/him.’}\]  
(FSR, SLZ1051-s, 5)

\[(48)\]

a. \[DP > \text{pro}\]
\[\ast\text{Blenh}^4=\text{eb}^4_1\quad \text{Xwanh}^{24}=\text{a}^{14}_1\quad t_1.\]
\[\text{carry.COMP}=3.\text{AN}\]
\[\text{Juana}=\text{DEF}\]
\[\text{Intended: ‘Juana carried it (an animal).’}\]  
(FSR, SLZ1051, 7:30)
b. \[\text{Blenh}^4\quad \text{Xwa}^{24}\text{nh}=\text{a}^{14}_4\quad \text{leb}^{24}_4.\]
\[\text{carry.COMP}\]
\[\text{Juana}=\text{DEF}\]
\[\text{3.\text{AN}}\]
\[\text{‘Juana carried it.’}\]  
(FSR, SLZ1051-s, 6)

Why does a strong object pronoun, with the very same features as its clitic counterpart, not run afoul of the activation constraint in (43ii)? Since it is not a clitic, it need not move. This implies that it need not Agree. There is no Agree in the derivations of (47b) and (48b) beyond the first round, which can only be possible if Agree is strictly speaking optional.

This can be shown more transparently by looking at local person pronouns. Typically, local strong pronouns must be doubled by a clitic in Sierra Zapotec (Sichel & Toosarvandani 2020), much as in French (Kayne 2000). This is true across grammatical positions, including for subjects (49a), possessors (49b), and prepositional objects (49c).

\[(49)\]

a. \[(\text{Nhu}^{2}_4\text{de}^{2}_4\text{ye}^{1}\text{ga’}^{1}\text{an}^{1}_4? \text{‘Who is going to stay?’})\]
\[\text{Ye}^{1}\text{ga’}^{1}\text{an}^{1}_4\text{(*)=u}^{1}_2.\]
\[\text{stay.POT}=\text{2SG}\]
\[\text{2SG}\]
‘YOU are going to stay.’ (FSR, SLZ1061, 5:45)

b. \((\text{Nhu}^{a2} \text{xna}^a \text{benh}^b \text{bia}^d \text{Xwa}^\text{nh}=a^d? \ ‘Whose mother did Juana meet?’})

\[
\begin{align*}
\text{Benh}^b \text{bia}^4 &= \text{ba}^3 \\
\text{xna}^* &= \text{(#o)^4} \\
\text{meet.COMP} &= \text{3.HU} \\
\text{mother} &= \text{2SG} \\
\text{She met YOUR mother.} & \quad \text{(RM, GZYZ101, 6:50)}
\end{align*}
\]

\(\text{Nhu}^{a2} \text{tse}^t \text{dzekd}^r \text{Xwa}^\text{nh}=a^d? \ ‘Who does Juana love?’)

\[
\begin{align*}
\text{Dzekd}^r &= \text{ba}^3 \\
\text{tse}^4 &= \{\text{ts}^t, \text{ts}^t = \text{a}^4\} \\
\text{love.COMT} &= \text{3.HU} \\
\text{of, of} &= \text{1SG} \\
\text{She loves ME.} & \quad \text{(RM, GZYZ101, 22:17)}
\end{align*}
\]

In all three environments, clitic doubling of the highest argument is obligatory, presumably because the probe must Agree. When the LDB is violated and the object is a local person pronoun, however, only a strong pronoun appears; doubling is impossible.\(^{13}\)

\[
\begin{align*}
\text{a. Dza}^d \text{la}^4 \text{lle}^a & \quad \text{Xwa}^\text{nh}=a^d \quad \text{lhe}^* \\
\text{forget.COMT} & \quad \text{Juana}=\text{DEF} \quad \text{2SG} \\
\text{‘Juana forgot you.’} & \quad \text{(FSR, SLZ1061, 11:45)}
\end{align*}
\]

b. \(*\text{Dza}^d \text{la}^4 \text{ll} = \text{u}^* \quad \text{Xwa}^\text{nh}=a^d \quad \text{lhe}^* \\
\text{forget.COMT} = \text{2SG} \quad \text{Juana}=\text{DEF} \quad \text{2SG} \\
\text{‘Juana forgot you.’} & \quad \text{(FSR, SLZ1061, 12:50)}
\]

If cliticization is only possible when there is an Agree relation, then the absence of clitic doubling with the object in (50a) demonstrates that Agree does not apply after the first round in this derivation. The derivation succeeds because there is no need for Agree to iterate and the strong pronoun itself has no need to Agree.

There is independent support that strong pronouns do not need to Agree, coming from syntactic environments in which cliticization is suspended for reasons which have nothing to do with the LDB/GCC. In non-verbal predications, for instance, only a strong pronoun appears, whether for local person (51a) or third person (51b). (These are the same forms that emerge when the LDB/GCC is violated.)

\[
\begin{align*}
\text{a. } (\text{Bi}^{t2} \text{llin}^t \text{dzunh}^{23} \text{u}^3? \ ‘What do you do?’) \\
\text{Be}^\text{e}^n & \quad \text{skwel}^{24}(*=\text{a}^4) \quad \text{ne}^d \text{da}^4. \\
\text{person} & \quad \text{school} = \text{1SG} \quad \text{1SG} \\
\text{‘I am a teacher.’} & \quad \text{(FSR, SLZ1061, 14:45)}
\end{align*}
\]

b. \((\text{Bi}^{t2} \text{llin}^t \text{dzunh}^{23} \text{Xwanh}^a^3? \ ‘What does Juana do?’) \\
\text{Be}^\text{e}^n & \quad \text{skwel}^{24}(*=\text{ba}^3) \quad \text{le}^\text{ba}^3. \\
\text{person} & \quad \text{school} = \text{3.HU} \quad \text{3.HU} \\
\text{‘She is a teacher.’} & \quad \text{(FSR, SLZ1061, 15:45)}
\]

\(^{13}\) More generally, local person pronouns in object position can never be clitic doubled, even if the subject is a pronoun. It is important to point out that this Strong PCC is an additional constraint on object cliticization based on Person, which independently rules out a subset of cases prohibited by the LDB. It is not entirely parallel to the LDB, which only prohibits cliticization when the object is more featurally specified than the subject. See Section 5 for a way of incorporating the Strong PCC into the theory of the LDB/GCC advanced here.
As we argued in Section 2.1, the probe is plausibly either absent or inactive in non-verbal predications. Since there is nothing for the strong pronoun to Agree with, it follows that it does not have to Agree. Similarly, in fragment answers, doubling of a subject strong pronoun is grammatically suspended.

$$(Nhu^{42} \ ye^2\ yej^2? \ ‘Who \ is \ going \ to \ go?’)$$

Lhe'^2.

2SG

‘You.’

Here, too, it may be that a strong pronoun is tolerated without clitic doubling because the probe is missing. Fragment answers plausibly involve no more structure than what meets the eye (Stainton 1998, Ginzburg & Sag 2000, Jacobson 2013).\(^{14}\)

In sum, the same repair — a strong pronoun — surfaces in non-verbal predications and fragments, as well as when the LDB/GCC is violated. This supports the claim that a strong pronoun is possible when Agree is not invoked because it does not require Agree. And this, in turn, supports our claim that Agree is optional beyond the first round.

4.3. Comparison with other approaches to overprobing

We can compare the probe activation model to two recent theories of Agree designed to enable overprobing: Deal’s (2015, 2020) “insatiable probing” and Coon & Keine’s (to appear) “feature gluttony.” The former denies the first hypothesis in (43i), and the latter denies the second hypothesis in (43ii). Neither allows for a unified understanding of the LDB and GCC in terms of the Agree mechanism, confirming the necessity of both ingredients of the probe activation model.

4.3.1. Insatiable probing

Deal (2015, 2020) systematically overhauls the Agree operation to allow for overprobing, while still taking the operation to apply cyclically, subject to Attract Closest. She takes probes to be specified separately for their interaction conditions (what they can match and be valued by) and their satisfaction conditions (what stops them from interacting further). Some probes are “insatiable” and have no satisfaction conditions, so they are capable of interacting with any goal in its domain. In addition, probes’ interaction conditions can be dynamically updated, so that once they are valued by a goal for some feature $F$, they can only interact on subsequent rounds with goals that have $F$. In this framework, the restrictions on cliticization would follow from the possible Agree relations, just as in the probe activation model. What these are would be dictated by dynamic update of a probe’s interaction conditions in the course of the derivation.

\(^{14}\) Alternatively, the entire structure is present, Agree is triggered by the probe, and everything except the fragment is subsequently deleted at PF (Giannakidou 2000, Merchant 2004, Weir 2014), in which case, absence of doubling in fragment answers is not directly relevant for the argument that absence of doubling signals absence of Agree; there could be more than one reason for the absence of overt doubling.
This is able to derive the GCC in Sierra Zapotec, if the probe is located between the subject and object arguments. Under Deal’s account, once the argument closest to the probe is Agreed with, it can only interact with goals that are equally or more specified. This means that, to derive the specifical asymmetry inherent to the GCC, the probe must first find the object before it finds the subject. Since subjects asymmetrically c-command objects, one possibility that Deal mentions is for the probe to be located on v, looking first into its complement and then looking into its specifier via cyclic expansion (Béjar & Rezac 2009).

In a grammatical configuration like (44a), then, an insatiable probe that is able to find a less specified object will be able, after it has been dynamically updated, to go on to find a more specified subject. Conversely, the configuration in (45a) is ungrammatical because the probe, once it has been updated by the object, will no longer be able to interact with a less specified subject. After the probe Agrees with the object (Step 1), its interaction condition is updated with all the object’s features, including \([\text{HUMAN}]\) (Step 2). Once this has happened, the probe can no longer interact with the subject, which lacks this feature.

(53) *3.AN > 3.HU
Step 1: Agree with object

\[
\begin{array}{c}
\text{DP} \\
\text{\[\delta, \pi, \text{ANIMATE}\]}
\end{array}
\]

\[
\begin{array}{c}
v \\
\text{\[i: \delta\]}
\end{array}
\]

\[
\begin{array}{c}
\text{DP} \\
\text{\[\delta, \pi, \text{ANIMATE, HUMAN}\]}
\end{array}
\]

Step 2: Dynamic update

\[
\begin{array}{c}
vP \\
\text{\[\text{v}\]}
\end{array}
\]

In other words, by the logic of dynamic interaction update, the probe must interact with the subject and object in the reverse order that it does under the probe activation model.

While this reversal in the order of interaction yields an account of the GCC that is mostly equivalent, it does not allow for the LDB to be assimilated to the GCC. This is simply because lexical DP subjects do not move. In a derivation parallel to (53) with a lexical DP subject, the probe will still Agree first with the object. After its interaction conditions are dynamically updated, the probe will no longer be able to Agree with the subject, which lacks \([\text{HUMAN}]\), as well as any other person features beyond \([\delta]\).

(54) *Lexical DP > 3.HU
Step 1: Agree with object

\[
\begin{array}{c}
\text{DP} \\
\text{\[\delta, \pi, \text{ANIMATE, HUMAN}\]}
\end{array}
\]

Step 2: Dynamic update

\[
\begin{array}{c}
vP \\
\text{\[\text{v}\]}
\end{array}
\]

15See Adler et al. (2018) for the binding data that demonstrates this.
Since the object pronoun is Agree with, it can cliticize. Thus, unlike the derivation in (53), this derivation should encounter no difficulties due to the absence of an Agree relation with the subject. It is a lexical DP, and so does not have to move. Yet, this configuration is ungrammatical.

The account also incorrectly predicts ungrammaticality for the inverse situation, where the probe first interacts with a nominal that does not need to move, i.e., a lexical DP object, and then subsequently interacts with a subject clitic. Deal considers this type of configuration in Tseltal, where only indirect objects cliticize: direct objects are not realized as weak pronouns. Nonetheless, in Tseltal and other Mayan languages, a local person direct object is ungrammatical when the indirect object is a local person clitic pronoun.

\[(55) \quad \text{Lah y-aʔ-bat joʔon-eʔ.} \]
\[\text{PFV 3.ERG-give-APPL.2.ABS 1SG-CL} \]
\[\text{Intended: ‘She gave you me.’} \quad \text{(Shklavosky 2012: 445)} \]

For Deal, the probe Agrees first with the direct object and so is not able to reach the indirect object, which must Agree in order to cliticize. In the subject-object counterpart in Sierra Zapotec, as in (1a) above, this configuration is of course perfectly well-formed. But it should be ungrammatical if the probe Agrees first with the direct object, dynamically updating its interaction condition to \([\pi]\) (plus any other person/animacy features it might have), so that it is not able to interact with a lexical DP subject. Thus, reversing the order of interaction in order to account for the GCC, first object and then subject, leads to false predictions for the LDB in both directions: pronoun > lexical DP is predicted to be ungrammatical, while lexical DP > pronoun is expected to be grammatical.

4.3.2. Feature gluttony

Coon & Keine (to appear) take a different approach, extending the abilities of the probe by adding more structure to it. Thus, while they maintain hypothesis (43i), along with the probe activation model, they deny hypothesis (43ii). In particular, they allow (i) a probe’s requirements to be sequenced into “subprobes” that can be satisfied through separate Agree relations
(Taraldsen 1995, Anagnostopoulou 2003, Béjar & Rezac 2003, among others) and (ii) each subprobe is articulated, so it can be checked by more than one goal (Béjar 2003, Béjar & Rezac 2009). When a probe Agrees with more than one goal on a single subprobe, this leads to what Coon & Keine call “feature gluttony.” While this configuration is not inherently problematic, they take it to lead to a problem of derivational timing for pronominal clitization: two pronouns cannot both move if they Agree on the same subprobe.

As Coon & Keine show, it is possible to develop an account of the GCC within this framework, if animacy features are sequenced with person features. Feature gluttony will then result whenever a subject pronoun has fewer animacy features than an object pronoun. In (56), for instance, the probe cannot check all the features in its first subprobe by Agreeing with the subject, and so it Agrees with the object on the same subprobe to check the remaining features.

As a consequence, both pronouns are not able to cliticize.

(56) *3.AN > 3.HU

But this account cannot be extended to the LDB, again for the simple reason that lexical DPs are not clitics and do not have to move. Consider the nearly parallel configuration in (57) in which the subject is a lexical DP.

(57) *Lexical DP > 3.HU

It would not be sufficient to adopt only articulated probes, as same animacy clitic combinations are syntactically well-formed, as discussed in Section 2.1. At the same time, we do not deny the possibility that probes might be sequenced or articulated. We are arguing simply that this additional structure cannot be the sole means by which a probe is able to interact with more than one goal (see the discussion in footnote 11).
The probe Agrees with both arguments using the same subprobe, since the subject does not check all Person and animacy features. The result is feature gluttony, but unlike the situation with two pronominal clitics, there is no derivational problem. The lexical DP does not move, and so the object pronoun should have no problem cliticizing.

Thus, feature gluttony and the articulated probes that underlie it cannot be at the root of the LDB. While some probes may indeed be sequenced and articulated, and feature gluttony may indeed result in ill-formed derivations in other cases that Coon & Keine consider, these considerations do not underlie the LDB. In other words, the Agree mechanism must allow overprobing when something other than the probe demands it. Attributing overprobing entirely to “insatiable” probes with dynamically updated interaction conditions or to probes that are articulated to enable “feature gluttony” ties it entirely to the needs of probes. Under the probe activation model, by contrast, only the first round of Agree is mandated by the probe. Everything else is motivated by other considerations.

5. Parameters of variation in the probe activation model

Our account of the LDB/GCC and its repair has led to a view of Agree in which it can iterate freely. Why, then, is overprobing not found in every probe-goal interaction? Generally speaking, economy considerations will militate against it, so that Agree will only occur when needed. Beyond the first round of Agree, further rounds must be motivated by other requirements, e.g., clitic pronouns’ syntactic need to Agree.

Thus, even if overprobing is possible in principle, many syntactic configurations will only permit a one-to-one relation, as in the classical theory of Agree. In canonical subject verb agreement in English, T will only agree with a single argument, the highest DP, since the language lacks clitic (or weak) pronouns, and only one Agree relation is motivated by the probe’s requirements.

(58) T DP DP
[φ:] [φ] [φ]

More generally, if a language lacks clitic pronouns, we expect to see only one-to-one Agree relations (unless there are other morphological reasons to pronounce the features on the probe that would motivate overprobing).

5.1. Probe relativizations and the typology of the PCC and GCC

If a language does have clitic pronouns, the featural relativization of the probe may also modulate the opportunities for overprobing, enabling more or less sensitivity to person and animacy hierarchies. For the PCC, there is a significant amount of variation attested along this dimension (see Nevins 2011 and Pancheva & Zubizaretta 2017 for typological overviews). Some languages with a relative constraint, prohibiting cliticization of an object when it exceeds a higher argument on a person hierarchy, only distinguish local vs. non-local arguments, as in the Weak PCC (see Bonet 1991:180 for some Catalan varieties, Perlmutter 1971:62–63 and
Pancheva and Zubizarreta 2017:19 for some Spanish varieties, Bianchi 2006:2028 for some Italian varieties, and Nevins 2011: 963 for Kashmiri). Others exhibit the more fine-grained Ultrastrong PCC, which distinguishes all three persons: 1 > 2 > 3, e.g., in Classical Arabic (Fassi Fehri 1988).

Following Anagnostopoulou (2005) and Nevins (2007, 2011), this variation is typically attributed to the feature relativization of the probe (Coon & Keine, to appear, Foley & Toosarvandani, to appear, cf. Deal 2021). In the Ultrastrong PCC, where the person hierarchy is most fully active, the probe is fully specified so that it seeks to match all Person features. Insensitivity to part of the person hierarchy then corresponds to a more impoverished feature relativization on the probe. For the Weak PCC, the probe might be specified just for [PARTICIPANT] (and not [SPEAKER]), thereby treating first and second person pronouns alike. If a probe was even less specified, relativized just to [π], it would treat all personal pronouns alike, and object cliticization would not be constrained by a PCC at all.

Foley & Toosarvandani identify parallel variation in the GCC within Sierra Zapotec. One variety enforces the full animacy hierarchy — 3.EL > 3.HU > 3.AN > 3.IN — much as in the Ultrastrong PCC. Other varieties are only partially sensitive to the animacy hierarchy, as in the Weak PCC: one treats all humans as a class, and another groups all animates together. This variation can be accounted for along entirely parallel lines to the PCC. The more animacy features a probe is relativized to look for, the more sensitivity to the animacy hierarchy there will be. If the probe is not relativized to any animacy features, it will not give rise to a GCC in the first place.

By the same logic, the LDB will only arise in languages when the probe is relativized to [δ], since this is the only feature shared by both pronouns and lexical DPs. If the probe is relativized just to other Person or animacy features, this will yield a PCC or GCC without the LDB. And, a probe that is not specified to look for [δ] will not give rise to the LDB.

Encoding variation in this way predicts that all logically possible feature relativizations should be attested, all other things being equal. Most of the attention in the literature has focused on whether this is, in fact, the case within the PCC or GCC (Nevins 2007, 2011, Deal 2020, Coon & Keine, to appear, Foley & Toosarvandani, to appear, a.o.). But our approach of attributing both the PCC and GCC, along with the LDB, to a common grammatical source raises the question of to what degree this is true across domains. Sierra Zapotec exhibits all three constraints, but does having the GCC imply having the PCC? And does having the LDB imply having the GCC or PCC? Unless there are independent restrictions on the featural specifications of probes, no such dependencies are expected.

While we have focused on these relative constraints, it is important to acknowledge the existence of the Strong PCC in Greek and some varieties of the same Romance languages that have the Weak PCC (see Anagnostopolou 2005 and the references above). This is an absolute constraint, which prohibits all local person object pronouns from cliticizing, regardless of what the higher argument is.

(59) **Strong PCC**
A local person object pronoun cannot cliticize.
The literature on the PCC has generally taken the Strong PCC to arise from the same grammatical mechanism as the other relative constraints. Beyond parsimony, one reason might be that the Strong and Weak PCC often coexist in a single speech community with significant idiolectal variation, as in Catalan, Italian, and Spanish.

How the Strong and Weak PCC are unified, and what the precise locus of grammatical variation is, depends on the specific theory of overprobing. Since these all account for the Weak PCC and other relative constraints, such as the LDB and GCC, in the first instance, they require some additional ingredient to derive the Strong PCC. Coon & Keine (to appear), for instance, attribute the variation to properties of the goal: the Strong PCC arises when the intervening argument has a [PARTICIPANT] feature that is not visible to the probe. They focus on cases where this higher argument is a dative, whose additional structure could potentially shield certain features of the goal. In Sierra Zapotec, however, it is the subject that intervenes in the Strong PCC (just as in the GCC and LDB). It seems implausible that its features could be hidden in the same way as with a dative argument. On the other hand, in Deal’s (2015, 2020) system, the Strong PCC arises when a probe is specified for a [PARTICIPANT] satisfaction condition, and hence is not insatiable. In the probe activation model, the probe never has to keep on probing, so we cannot appeal to such a distinction.

Instead, we propose to account for the variation between absolute and relative constraints in the same way that we accounted for the variation within relative constraints, in terms of the probe’s featural relativization. Foley & Toosarvandani (to appear) observe that the partial identity required in (43i), between a probe that has been valued by the highest argument and a lower goal, can also derive the Strong PCC, if the probe is specified to look, not for individual features, but feature trees in a geometry. If a probe is relativized to a feature tree rooted in a given feature—say, [PARTICIPANT]—then once it is valued by copying an actual feature tree, it will only be able to Agree with subsequent goals that have exactly the same features (not a subset of them). In other words, in moving from features to feature trees, identity is also no longer evaluated simply in terms of features, but whole feature trees.

Take, for instance, the configuration in (60a), which differentiates the Strong PCC from the Weak PCC (along with the inverse configuration: 2 > 1). The probe is valued by the highest goal, a first person pronoun, copying a feature tree comprised of [PARTICIPANT] and [SPEAKER]. By (43ii), the probe is unable to Agree with the lower goal, a second person pronoun, and so it cannot cliticize.

(60) a. *1 > 2

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(60) a. *1 > 2

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b. *2 > 1

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b. *2 > 1
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If the probe and goals’ values are sets of features or feature trees, the lower goal’s value in (60a), the set containing a single [PARTICIPANT] feature, is not a subset of the probe’s value, the set containing a single feature tree comprised of [PARTICIPANT] and [SPEAKER]. This is true for the inverse configuration in (60b) as well.

Locating the variation between the Strong and Weak PCC in the probe’s relativization predicts that there should be absolute versions of the other constraints as well. That is, there should be “Strong” GCCs. While Foley & Toosarvandani describe three Sierra Zapotec varieties, each with a different relative GCC, they do not identify any absolute versions of a GCC. If these are never attested, then it might suggest that we go back and revise the starting assumption that the two types of constraints have the same basic grammatical source.

5.2. The location and number of probes

There is also variation in the arguments that are involved in these intervention effects. In Sierra Zapotec, it is always the subject and object that are involved in both the GCC and Strong PCC (as they are for the Weak PCC in Kashmiri; Nevins 2011: 963). By contrast, in other languages, it is the indirect object which intervenes for object cliticization: e.g., the PCC in Romance and in Greek. By analogy to this variation, it does not seem so improbable that a language could exhibit the LDB for some arguments and not others. In Sierra Zapotec, it is again the subject and object that are involved in the LDB. This variation can be attributed, in the most general terms, to the location of a probe: if it c-commands the subject, then the subject will be implicated in these intervention effects; but if the probe only c-commands the indirect and direct objects, then only these arguments will be involved.

To make the analytical choices here more clear, we can compare the LDB in Sierra Zapotec to the subcases of Holmberg’s Generalization in which a dative argument blocks object shift of an accusative pronoun in Swedish (see Section 2.2), since this effect is essentially the same as the LDB. In other words, why is the intervener in Sierra Zapotec a subject, but not an indirect object? And why is the intervener in Swedish an indirect object, but not a subject?17 (It may turn

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17 As a reviewer points out, in Icelandic, object shift is permitted across a quantificational subject in the transitive expletive construction, though the subject likely remains inside vP in this case (Bobaljik & Jonas 1996: 208 fn. 7, Alexiadou & Anagnostopoulou 2001: 199–200). However, it is not clear whether Icelandic has the LDB for dative arguments to begin with. But in Swedish, object shift is permitted across a high subject. For us, this so-called “long”
out that this part of Holmberg’s Generalization is not derived from the LDB. But we assume here that it is, for the sake of identifying the possible locus of variation involved in this type of intervention.)

For the LDB to be active in both languages, there would have to be a probe relativized to $[\delta]$ in both. To derive the difference between them, there are multiple paths forward. It might be possible, for example, that the two languages have distinct probes in distinct locations: in Sierra Zapotec the probe is higher, taking the subject in its scope, whereas in Swedish, the probe is lower, so that only the indirect object is implicated. This could be because there is a single probe in each language and it has a variable position relative to the arguments. Or, it could be because there are multiple probes in each language, recalling the Chomskyan separation of Agr$_S$ (or T) and Agr$_O$ (v) for subject vs. object case/agreement, and the probe that is relativized to $[\delta]$ varies: a higher probe (in T) for Sierra Zapotec and a lower probe (in v) for Swedish. While either path is consistent with our proposal for overprobing, we think that a more parsimonious account would exclude variation of this sort, and try instead to derive the difference from independent properties of the two languages.

We assume, therefore, that the probe occupies a uniform position in T, and attribute the variation in the subject’s intervention potential to variation in its position. In Swedish, the subject is preverbal and resides in specTP (Holmberg & Platzack 1995); in Sierra Zapotec, the subject is postverbal, residing in a derived position higher than vP and lower than specTP (see Section 2.1). Thus, if the probe is in T, the subject is within its domain in Sierra Zapotec, whereas the subject in Swedish is higher than the probe. Since the indirect object is in the probe’s domain but still higher than the direct object, it is the indirect object which intervenes in Swedish instead.

This leaves us with the last part of this cross-linguistic paradigm: Why does the indirect object not intervene for the direct object in Sierra Zapotec?

(61)  
\[
\text{Bnhe}^{\text{a}}\lljw=\text{a}^1_1=\text{b}^4_2 \quad \text{t}_1 \quad \text{Be}^2\text{dw}=\text{nh}^4 \quad \text{t}_2. \\
\text{give.COMP=1SG=3.AN} \quad \text{Pedro}=\text{DEF} \\
\text{‘I gave it to Beto.’}
\]

(Foley & Toosarvandani 2019: 257)

There are at least two feasible options: an absolute approach, rooted in properties of the indirect object, and a relative approach, capitalizing on the interaction with subjects. First, for the absolute approach, the indirect object could be embedded under additional functional material, hence simply invisible for Agree with the probe (Preminger 2014: 137–140). Whether this functional material is present and is sufficient to enable the probe to skip past the DP inside it are factors that are plausibly subject to variation, so we would not necessarily expect all indirect objects to behave alike. Another account of this type might attribute the variable intervention behavior of indirect objects to a difference in the height of the direct object relative to the indirect object: it is higher than the indirect object in Sierra Zapotec (but lower than it is in Swedish).

[Object shift would have to require a higher probe, in the C area; this may account for the additional restrictions on this movement (Vikner 2005: 431 fn. 8). Further afield, Classical Arabic, a VSO language, exhibits indirect object intervention for the PCC, without exhibiting subject intervention (Walkow 2013). This would challenge our general claim that the choice of intervener depends on the height of the subject, relative to the probe, only if the subject is as low as it is in Sierra Zapotec. We leave this for future investigation.]
Turning to the relative approach, it might be possible to attribute the absence of indirect object intervention to the presence of subject intervention, as in the Principle of Minimal Compliance (Richards 1998). That is, once the probe Agrees with the subject, satisfying Attract Closest, this locality constraint no longer needs to be obeyed: the indirect object, thus, cannot intervene. Importantly, for such an account to go through, there must be a single probe. This is consistent with the account of subject intervention above.

While the details of these two approaches need to be worked out, we note, in closing, a difference in their predictions. The absolute approach leads us to expect the existence of languages with “double” intervention, in which both a subject and an indirect object function as interveners for the PCC/GCC. The relative approach, by contrast, forecloses this possibility: it predicts that, in a given language, the intervener must be either the subject or the indirect object, never both.

6. Conclusions and open questions

Hierarchical intervention effects offer a window into the physiology of Agree: how it interacts with the broader syntactic structure in which it is embedded, how it interacts with movement, the nature of the featural entities that it deals in, and whether and how Agree is iterative. Our study of the LDB assimilates it to constraints like the GCC and the Weak PCC, and contributes to the consolidation of a subcategory of such hierarchical intervention effects, in which the constraint is relative. In all of these, a second round of Agree is possible as long as the features of the goal do not exceed the footprint left by the first round. This leads to a novel perspective on the interaction between movement and Agree and to a novel understanding of the location of optionality in the system: limited to non-initial round(s), and modulated by properties of goals.

The specificational asymmetry, common to all three intervention effects, also suggests a particular understanding of what features are, and how they interact with syntactic operations. Specificational asymmetries support an approach to feature specification in which traditional categories such as person and animacy are internally structured by asymmetrical entailment. This is the representational basis for the asymmetries at the core of these constraints. We have suggested that while Person features (in addition to animacy features) are semantic in nature, they interact with the syntax, such that the contribution of the semantics of features to syntactic computation is minimal. There is no need to have actual denotations driving syntactic computation. We speculate that hierarchical intervention arises only between features structured in this way, by asymmetric entailment.

Our examination of the LDB has led to another novel conclusion. The person domain stretches to include lexical DPs. In particular, there is a person feature [δ], which is maximally underspecified, shared by both pronominals and non-pronominals; in some languages, the presence of this feature makes lexical DPs interveners for cliticization. Combined with our conclusion about the obligatoriness of Agree limited to the first round, this generates a new question regarding the source of obligatory cliticization, and how to formulate the preference for clitics over independent pronouns.

In Sierra Zapotec, specifically, we have seen obligatory movement and Agree by the clitic, which we have attributed to the preference for a clitic over a strong pronoun whenever possible, a requirement that may have a morphophonological source, rather than a syntactic one. Our
analysis of nominals, in which pronominal and non-pronominals alike possess $[\delta]$, makes a structural principle such as Cardinaletti & Starke’s (1999) Minimize Structure unlikely. Their economy principle would require that clitic pronouns contain less nominal functional structure than a lexical DP, even though they also possess $[\delta]$. While this is not inconsistent with the letter of our approach, it leaves very little substance to its spirit. It is more likely, given the distribution of $[\delta]$ that we propose, that all nominals possess the same external structure, so there is no sense in which pronouns are smaller than other nominals. But Minimize Structure is not the only way to account for the difference between clitics and independent pronouns. It may be possible to do this within a realizational model such as Distributed Morphology by having the notion of a minimal pronoun correspond to clitic pronouns (Kratzer 2009, Rooryck & Wyngaerd 2011, Safir 2014), with an optimizing calculus (Burzio 1998, Bresnan 2001), some other global calculation (Rezac 2011), or other economy and expressivity constraints on morphological exponence (Foley 2020). We leave this choice, and the nature of the clitic-independent pronoun alternation, for future exploration.

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