Agreement, locality, and the syntax of pronouns: The Person–Case Constraint and beyond*

Steven Foley and Maziar Toosarvandani
University of California, Santa Cruz

August 5, 2019

Abstract

In many languages with clitic or other weak pronouns, a *Person–Case Constraint (PCC)* (Perlmutter 1971, Bonet 1991) prohibits certain combinations of these pronouns based on their person features. This paper explores the crosslinguistic variation in such constraints, starting with several closely-related Zapotec varieties that restrict combinations of clitics based not just on person, but also on gender. Operating within a larger combinatorial space, these constraints offer a new perspective on the typology of *Phi–Case Constraints (ΦCCs)* more generally. This typology has an overall asymmetrical shape correlating with the underlying syntactic position of pronominal arguments. We develop a principled theory of this typology that incorporates three hypotheses: (i) ΦCCs arise from how a functional head Agrees with clitic pronouns, subject to intervention-based locality (Anagnostopoulou 2003, Béjar and Rezac 2003, 2009); (ii) the variation in these constraints arises from variation in the relativization of probes (Nevins 2007, 2011); and, (iii) clitic and other weak pronouns have no inherent need to Agree, though they must be local to an appropriate functional head (cf. Cardinaletti and Starke 1999).

In many languages with clitic or other weak pronouns, a *Person–Case Constraint (PCC)* (Perlmutter 1971, Bonet 1991:176–221) prohibits certain combinations of these pronouns. In Greek, for instance, while two object pronouns can both cliticize (1a), this is impossible if the direct object is first or second person (1b–c).

(1) a. Tha **mu**$_1$ **to**$_2$ stilune t_1 t_2.
FUT **1SG.DAT** **3SG.N.ACC** send.3PL
'They will send it to me.' (Anagnostopoulou 2005:202)

b. * O Kostas **su**$_1$ **me**$_2$ sístise t_1 t_2.
the Kostas **2SG.DAT** **1SG.ACC** introduced
Intended: 'Kostas introduced me to you.'

*We are extremely grateful to Fe Silva Robles, Raquel Robles, and two other native speakers of Zapotec for teaching us about their language. The initial work on this project took place in collaboration with Nick Kalivoda (Foley et al., to appear). We have learned a lot from audiences at CLS 53, WSCLA 22, WSCLA 23, and NELS 49, as well as at Geneva, MIT, Queen Mary, Stanford, UC Berkeley, and UC Santa Cruz. We are particularly thankful to Pranav Anand and Ivy Sichel for their questions, suggestions, and other help along the way, as well as to two reviewers and to Heriberto Avelino Becerra, Mitcho Erlewine, Julia Nee, Omer Preminger, Ur Shlonsky, and Coppe van Urk.

c. * O Kostas **mu**$_1$ **se**$_2$ sístise t_1 t_2.
the Kostas **1SG.DAT 2SG.ACC** introduced
Intended: 'Kostas introduced you to me.' (Bonet 1991:178)

The literature on the PCC has sought to understand how the person of a pronoun can be linked to its grammatical relation in this way. In one line of reasoning, a significant role is assigned to a functional head that Agrees (Chomsky 2000, 2001) with pronominal arguments (Anagnostopoulou 2003, 2005, Béjar and Rezac 2003, 2009, Nevins 2007, 2011, a.o.). The properties of this probe and how it interacts with clitic or other weak pronouns have been subject to intense scrutiny, informed by the extensive crosslinguistic variation that has been attested for the PCC. Not all languages have a constraint prohibiting the same combinations that, say, Greek does.

This paper explores the typology of such constraints with the goal of achieving a better understanding of the syntax underlying them. Our empirical starting point is the pronoun system in Sierra Zapotec, a group of closely-related Zapotec varieties of the Sierra Norte region of Oaxaca, Mexico.[1] As in other languages, not all combinations of clitic pronouns are allowed. But, in Sierra Zapotec, the constraints on cliticization make reference to a finely articulated, largely animacy-based gender system. In one variety, for instance, while an an elder human subject and an animal object can both cliticize (2a), the inverse is not possible (2b).

(2) a. Blenh**=e'**$_1$**=b**$_2$ t_1 t_2.
hug.COMP**=3.EL=3.AN**
'S/he (an elder) hugged it (an animal).' (Laxopa: FSR, SLZ1012, 15:16)

b. * Udi'in**=eb**$_1$**=ne'**$_2$ t_1 t_2.
bite.COMP**=3.AN=3.EL**
Intended: 'It (an animal) bit her/him (an elder).' (Laxopa: FSR, SLZ1012, 19:25)

These *Gender–Case Constraints (GCCs)* are interesting for two reasons. First, they are *relative* constraints: they compare the relative positions of two arguments on a feature hierarchy. This contrasts with Greek's *absolute* constraint, which absolutely bans arguments of a particular type from a particular syntactic position. Second, these constraints operate over a four-way gender system (comprising elder human, non-elder human, animal, and inanimate categories), rather than the typical three-way person system.

The GCCs in Sierra Zapotec thus operate within a larger combinatorial space, offering a new perspective on the crosslinguistic variation that has been observed over the years in PCCs (see Nevins 2011 and Pancheva and Zubizarreta 2017 for a survey). In the first half of this paper, we consider these constraints together, showing that *Phi–Case Constraints (ΦCCs)* form a highly constrained typology. This is characterized by two crosslinguistic generalizations, one over absolute constraints and another over relative constraints. Looking across both types of constraints, the overall typology of ΦCCs has an asymmetrical shape, correlating with the underlying hierarchical position of the arguments involved.

[1]The Zapotec languages are a branch of the Oto–Manguean family spoken throughout Oaxaca, Mexico. There is dense variation across the family, with distinct dialects spoken in towns only a few miles apart. We use *Sierra Zapotec* to refer specifically to the mutually intelligible varieties spoken in the towns of Santiago Laxopa (for which we report our own fieldwork data), Hidalgo Yalálag (López and Newberg 2005, Avelino Becerra 2004), and San Bartolomé Zoogocho (Long and Cruz 2000, Sonnenschein 2004).

In the second half of the paper, we aim to develop a principled account of this typology. We adopt the hypothesis, due to Anagnostopoulou (2003) and Béjar and Rezac (2003, 2009), that these constraints arise from how a functional head Agrees with clitic pronouns, subject to intervention-based locality (Rizzi 1990, Chomsky 2000). This permits us to develop a theory that translates the inherent asymmetry between pronominal arguments into the asymmetrical shape of the ΦCC typology. At the same time, we take the variation in these constraints to arise from variation in the relativization of the probe, as Nevins (2007, 2011) proposes in his theory of PCCs. His theory differs from the one that we develop in assuming that the probe finds all arguments in its domain in parallel via Multiple Agree (Hiraiwa 2000). While such a theory can generate a wide range of ΦCCs, it does not incorporate a unified notion of locality, and so cannot capture the generalization about the asymmetrical typology of these constraints.

An underlying assumption, which our theory shares with others in the literature on PCCs, is that pronominal cliticization is in some sense a reflex of Agree. Often, a fairly tight connection is assumed: each clitic pronoun is licensed by entering into an Agree relation with a functional head (Béjar and Rezac 2003, Anagnostopoulou 2003, Nevins 2007, 2011). We offer a different articulation of the relationship between Agree and pronominal cliticization. Building on Cardinaletti and Starke's (1999) theory of pronominal structure, we propose that clitic and other weak pronouns have no inherent need to Agree with a functional head. Rather, they must be local to a functional head that has matching φ-features. Agree will thus need to apply before a pronoun can cliticize, but a separate Agree relation is not required for each clitic pronoun. By loosening the connection between Agree and pronominal cliticization in this way, this permits an understanding of the asymmetrical typology of ΦCCs as a product of how a functional head finds its goals subject to locality.

1 The Person–Case Constraint

The most well-known form of the *Person–Case Constraint (PCC)* is the *Strong* PCC. It rules out a local person (first or second) direct object clitic, regardless of what the indirect object is, as in Greek in 1 above. Canonically, this PCC restricts the cooccurrence of clitic and other weak pronouns, as in Greek (Bonet 1991:178) and Romance (Perlmutter 1971, Bonet 1991:178–179). But, the syntactic mechanism underlying the PCC has also been argued to shape the realization of verbal agreement (Bonet 1991:184–185), as well as derive the unavailability of local-person nominative objects in Icelandic (Béjar and Rezac 2003:55–56, Anagnostopoulou 2003:272–306). For now, we focus on how the PCC restricts combinations of clitic pronouns, coming back to these empirical extensions in Section 1.3 below.

While the Strong PCC is sometimes linked to the syntax of ditransitives (e.g., Adger and Harbour 2007, Pancheva and Zubizarreta 2017), the same constraint is attested with other combinations of arguments (Nevins 2011:948–949). In Sierra Zapotec, for instance, both a subject and an object can cliticize (3a–b), but not if the object is first- or second-person (4a–d).

(3) a. *1 ≫ 3*
Bet=gak**=a'=ba'**.
kill.COMP=PL**=1SG=3.AN**
'I killed them [the animals].' (Yalálag: Avelino Becerra 2004:25)

b. *2 ≫ 3*
B-a-yilj**=o'=e'**.
COMP-ITER-look.for**=2SG=3.EL**
'You used to look for him.' (Yalálag: Avelino Becerra 2004:29)

(4) a. *1 ≫ 2*
* Bi llre'**=la'=o'**.
NEG see.HAB**=1SG=2SG**
Intended: 'I don't see you.'

b. *2 ≫ 1*
* Bi llre'**=lo'=a'**.
NEG see.HAB**=2SG=1SG**
Intended: 'You don't see me.'

c. *3 ≫ 1*
* Bnaw**=ba'=a'**.
follow.COMP**=3.AN=1SG**
Intended: 'It followed me.'

d. *3 ≫ 2*
* Bet=te**=ba'=o'**.
kill.COMP=ASS**=3.AN=2SG**
Intended: '[It] killed you.' (Yalálag: Avelino Becerra 2004:32–33)

In Sierra Zapotec, the Strong PCC prohibits an object clitic pronoun just in case it is first or second person.

(5) *Strong PCC (Sierra Zapotec)*
An object clitic pronoun cannot be local (first or second) person.

This also characterizes the Strong PCC in Greek, illustrated in 1, though in that language it is combinations of object clitics that are relevant. Since indirect objects asymmetrically c-command direct objects in that language (Anagnostopoulou 1999:42), it is always the lower clitic that, according to the Strong PCC, cannot be local person. This is what we might call an *absolute* constraint, since it bans one or more categories from a particular syntactic position.

Béjar and Rezac (2003) offer an influential account of the Strong PCC, building on work by Anagnostopoulou (2003:280–306), in which illicit clitic combinations do not succeed because local-person pronouns have a special licensing requirement. This creates an important role for a functional head that Agrees with these arguments, as in Chomsky's (2000, 2001) theory of case. But, as we will argue, a licensing condition tied to a specific person category cannot underlie a general theory of the crosslinguistic variation in such constraints.

1.1 Person licensing and the Strong PCC

For Béjar and Rezac (2003), the Strong PCC arises because local-person pronouns are subject to the *Person Licensing Condition*, a requirement that they Agree with a functional head in person (cf. Anagnostopoulou 2005:212, Béjar and Rezac 2009:46–47, Preminger 2011:925–934).

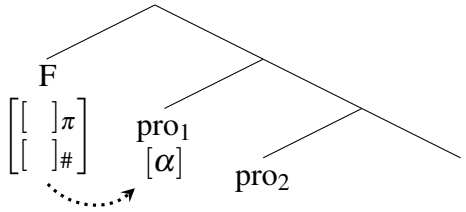
(6) *Person Licensing Condition (cf. Béjar and Rezac 2003:53)*
A first- or second-person pronoun must enter into an Agree relation for person.

The PLC is intended as a component part of case theory, though it shapes the distribution of just one class of prononominal elements. In some sense, it is a more fine-grained version of the Case Filter, which in its traditional formulation imposes a uniform requirement on all noun phrases.

Béjar and Rezac assume a theory of case like the one developed by Chomsky (2000, 2001), in which case assignment is parasitic on agreement. Thus, for a local-person pronoun to be licensed, a certain functional head (the probe) must find and Agree with this pronoun (its goal) in person features. A functional head's ability to Agree in a given feature is represented in its *relativization*, a set of unvalued features. To derive the Strong PCC, Béjar and Rezac assume (pp. 53–54) that a probe's relativization can be sequenced (cf. Anagnostopoulou 2003:280–306). After a probe finds and is valued for one feature, it can then look again for a goal to value another feature.[2]

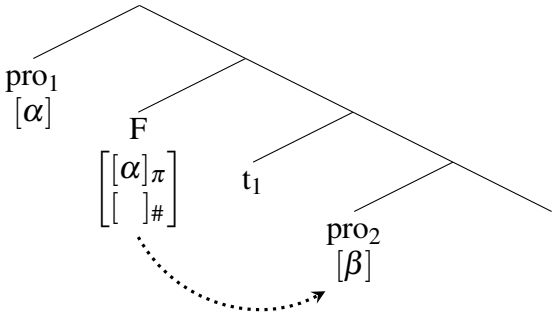
The probe implicated in pronominal cliticization is a functional head looking for φ-features (person, number, gender). It is sequenced, however, so that person (π) probes first, subject to an intervention-based locality constraint, e.g., Relativized Minimality (Rizzi 1990) or Attract Closest (Chomsky 2000:122). It finds the closest pronoun, regardless of whether this is local person or third person. This pronoun values the probe and is able to move out of its domain. (Following Preminger 2014:47–49, "unvalued features" are represented as "empty slots" into which features are copied from the goal.)

(7)



Number (#) probes next. With the higher pronoun no longer intervening, the lower pronoun can value the number probe.

(8)



When the lower pronoun — that is, the direct object — is third person, the derivation succeeds: it can value the number probe. However, when this pronoun is first or second person, the PLC is not satisfied. Since it can only Agree in number, not in person, the derivation crashes. Under

[2]In principle, there are other ways to sequence probing. Each of a probe's unvalued features could be located on a distinct functional head (cf. Bianchi 2006, Preminger 2014:31–39). Or, a probe's features, while not intrinsically ordered, could be valued independently of one another (Béjar 2003, Béjar and Rezac 2009, Walkow 2012).

Béjar and Rezac's account, then, a local-person pronoun can never cliticize from the lower argument position: by the point in the derivation when it can Agree, the probe's person feature has already been valued.

1.2 Agree and pronominal deficiency

In Sierra Zapotec, only clitic pronouns are subject to the Strong PCC, not all pronouns. When some combination of clitic pronouns is impossible, the lower one is realized as a strong pronoun: compare 9a and 9b to 4a and 4b, respectively.

(9) a. Bi llre'=la'$_1$ t$_1$ **lue'**$_2$.
NEG see.HAB=1SG **2SG**
'I don't see you.'

b. Bi llre'=o'$_1$ t$_1$ **nada'**$_2$.
NEG see.HAB=2SG **1SG**
'You don't see me.' (Yalálag; Avelino Becerra 2004:32)

These strong pronouns cannot be subject to the PLC in the same way that their corresponding clitic pronouns are. Else, their presence, too, would be ill-formed in 9a–b.

Béjar and Rezac (2003:54–55, 2009:46–47) argue that this difference between clitic and strong pronouns can be represented structurally, as in Cardinaletti and Starke's (1999) theory of pronominal syntax. For those authors, all strong pronouns contain a clitic pronoun. Clitic pronouns are missing certain functional structure that strong pronouns possess, in particular, a case-assigning functional head. This deficiency is the source of the *greediness*, in Chomsky's (1995:201) terms, of clitic pronoun: they must move to be local to a corresponding functional head in the clausal spine.

In assuming Chomsky's (2000, 2001) theory of case, Béjar and Rezac add another dimension to the deficiency of clitic pronouns. They missing some functional structure that requires them to Agree with a functional head. For local-person clitic pronouns, the PLC requires them to Agree specifically in person. Third-person clitic pronouns are less discriminating, but they still Agree in either person or number (Béjar and Rezac 2009:47). By contrast, strong pronouns inherently contain all the functional structure they need. Thus, they do not have to Agree or move.

1.3 Beyond the Strong PCC

While Béjar and Rezac's account derives the Strong PCC, it has long been known that there is substantial variation in the PCC. Take the *Weak PCC*, which is found for some speakers of Spanish. Here, while a local-person direct object is still ruled out when indirect object is third person, as in the Strong PCC (10a), any combination of local-person clitic pronouns is allowed (10b–c) (Perlmutter 1971:62–63, Pancheva and Zubizarreta 2017:19).

(10) a. *3 ≫ 1, 2*
* Pedro **le**$_1$ {**me**, **te**}$_2$ envía t$_1$ t$_2$.
Pedro **3SG.DAT** {**1SG.ACC, 2SG.ACC**} send.PRES.3SG
Intended: 'Pedro sends {me, you} to him.'
(Ormazabal and Romero 2007:316–317)

b. *1 ≫ 2*

Te$_2$ **me**$_1$ recomendaron t_1 t_2.
2SG.ACC 1SG.DAT recommend.PAST.3PL
'They recommended you to me.'

c. *2 ≫ 1*

Te$_1$ **me**$_2$ recomendaron t_1 t_2.
2SG.DAT 1SG.ACC recommend.PAST.3PL
'They recommended me to you.' (Perlmutter 1971:62)

The Weak PCC is also attested between objects for some speakers of Catalan (Bonet 1991:180) and Italian (Bianchi 2006:2028), as well as between subjects and objects in Kashmiri (Nevins 2011:963). This constraint is stated in a maximally general way in 11: the lower argument is the direct object, while the higher one can be either the subject or indirect object.

(11) *Weak PCC (general)*
A lower clitic pronoun cannot be local (first or second) person if the higher clitic pronoun is third person.

It is clear that the Weak PCC is a *relative* constraint, since it rules out cliticization of a lower pronoun only if it and the higher pronoun belong to certain person categories. This contrasts with the Strong PCC, which forbids any first- or second-person clitic in the lower argument position.

For this reason, as Anagnostopoulou (2005) recognizes, a constraint like the PLC can have little role to play in deriving the Weak PCC. In a language with the Weak PCC, local-person clitic pronouns are only sometimes ungrammatical in direct object position. If a requirement like the PLC prohibits the cliticization of local-person pronouns in 10a, then it should prohibit it in 10b-c, too. The relevant generalization, rather, is that local-person pronouns are not able to cliticize only *when the higher argument is third person*. If the PLC is linked to structural deficiency, as discussed in Section 1.2, a relative constraint of this kind simply cannot be encoded in terms of whether a pronoun lacks some functional structure or not.

Nevertheless, the PLC appears to be a more general constraint: it extends beyond just clitic and other weak pronouns. There are patterns parallel to the Strong PCC that involve strong pronouns: in Icelandic, for instance, an in-situ local-person pronoun is generally not licensed as the nominative object of a dative-subject predicate.

(12) a. * Honum mund-um alltaf líka **við**.
him.DAT would-1PL always like **we.NOM**
Intended: 'He would always like us.'

b. * Honum mund-uð alltaf líka **þið**.
him.DAT would-2PL always like **you.PL.NOM**
Intended: 'He would always like you (pl.).'

c. Honum mund-u alltaf líka **þeir** .
him.DAT would-3PL always like **they.NOM**
'He would always like them.' (Sigurðsson 2004:148)

Béjar and Rezac (2003:55–56) extend their account, along with the scope of the PLC, to derive this pattern (cf. Anagnostopoulou 2003:249–321). If the dative subject Agrees with the probe in person, then a nominative object never can; a first- or second-person pronoun is thus ruled out in this position. Similar patterns have been identified in Italian (D'Allessandro 2004:89–131), as well as in Spanish and Romanian (Rivero and Geber 2003).

By contrast, the Weak PCC appears to be restricted just to combinations of clitic pronouns: this is, for instance, true both for Kashimiri and Romance. As far we know, there are no languages in which *all* pronouns are subject to a relative constraint like the one in 11 — nor to the other variants of the PCC, which we have not yet discussed here: namely, the *Me-First* PCC, found in Romanian (Farkas and Kazazis 1980), and the *Ultrastrong* PCC, attested in Classical Arabic (Fassi Fehri 1993). Setting aside for the moment how these constraints differ from the Strong and Weak PCC, they both also seem to restrict only combinations of clitic pronouns.

Moving forward, we set aside the PLC in trying to understand this variation in PCCs.[3] And, to uncover the syntactic mechanisms underlying these constraints, it seems reasonable to begin by looking at relative constraints like the Weak PCC, where the PLC is not involved. So, we start by looking at a family of relative constraints where the PLC is not relevant in the first place. These constraints in Sierra Zapotec, which we turn to next, make reference to gender rather than person, prohibiting certain combinations of third-person clitics based on their relative position on a gender hierarchy.

2 Introducing Gender–Case Constraints

In Sierra Zapotec, there is a four-way gender distinction based on animacy, humanness, and formality. It opposes *elder* humans (EL), *non-elder* humans (HU), *animals* (AN), and *inanimates* (IN). These gender categories are realized formally in the pronoun inventory only in the third person, as shown in Table 1 for the Zapotec variety of (Santiago) *Laxopa*. The pronoun inventory has the same structure in the two other Sierra Zapotec varieties we consider, from (Hidalgo) *Yalálag* and (San Bartolomé) *Zoogocho*.[4]

The gender system is also constant across all three varieties. It is a strictly semantic system. The inanimate and animal categories are eponymous. The elder category describes elderly humans (above a certain age), as well as individuals with high social status (e.g., the president of the town, the priest, teachers); the non-elder category describes all other humans. We call this a gender system, since this is the traditional name for φ-categories that are neither person nor number. It is worth recognizing, though, that animacy distinctions often show a tight connection to person across a number of domains (e.g., Silverstein 1981, Aissen 2003).[5]

[3]It is worth pointing out that the Strong PCC is by far the most common constraint. We can maybe understand this if the PLC is an independent restriction on local-person pronouns, which languages can avail themselves of. The other PCCs arise from a different mechanism involved specifically in the licensing of clitic and weak pronouns.

[4]For Yalálag and Zoogocho Zapotec, we use data from descriptive grammars (Long and Cruz 2000, Sonnenschein 2004, Avelino Becerra 2004, López and Newberg 2005). For data on Laxopa Zapotec, we draw on our own fieldwork with four native speakers residing in Santa Cruz, Los Angeles, and Santiago Laxopa itself. One of these speakers is originally from the smaller neighboring town of San Sebastián Guiloxi. While there are very minor differences between the Guiloxi and Laxopa varieties, there is no variation between them, as far as we know, in the phenomena that we consider.

[5]It is relevant here that other Zapotec languages have gender systems that are not organized along the same lines as

	STRONG	CLITIC		STRONG	CLITIC
1SG	*neda'*	*=a'*	**3.EL**	***lè'***	***=e'* ∼ *=ne'***
1PL.EXCL	*dziu'*	*=dzu*	**3.HU**	***leba'***	***=ba'***
1PL.INCL	*netu'*	*=tu'*	**3.AN**	***leb***	***=(e)b***
2SG	*lhé'*	*=u'*	**3.IN**	***lenh***	***=(e)nh***
2PL	*le'e*	*=lhe*			

Table 1: Strong and clitic pronouns in Santiago Laxopa Zapotec (Toosarvandani 2017:129)

In all persons and genders, there are two series of pronouns, corresponding to strong and clitic pronouns in Cardinaletti and Starke's (1999) typology. As we will see below, combinations of clitic pronouns are subject to three constraints: the Strong PCC, a GCC, and an additional constraint on identical adjacent pronouns. The forms of the GCCs differ across Laxopa Zapotec and the other two varieties we consider. Before looking at these constraints in detail, we first describe the difference between clitic and strong pronouns in Sierra Zapotec.

2.1 Clitic and strong pronouns

The two series of pronouns in Table 1 are used across a range of syntactic environments, as arguments of the verb (subject, direct object, and indirect objects), possessors, and complements of some prepositions. For arguments of the verb, up to three pronouns can cliticize; their form is, for the most part, invariant across these grammatical functions.[6]

(13) a. Blenh**=ba'=b**.
hug.COMP**=3.HU=3.AN**
'S/he hugged it.' (Laxopa: FSR, SLZ1012, 16:53)

b. Tsgaw**=a'=ba'=nh**.
feed.CONT**=1SG=3.HU=3.IN**
'I feed it to her/him.' (Laxopa: FSR, SLZ1017, 36:30)

These clitic pronouns occur in a fixed position, immediately following the verb, in a rigid order: subject – indirect object – direct object. We take this to indicate that these clitic pronouns move to a position adjacent to the verb. This obligatory syntactic movement is supported by two additional facts: (i) a clitic pronoun cannot originate inside an island, e.g., a coordination (14a), and (ii) an object clitic pronoun cannot stay in situ, attaching to a preceding subject (14b).

in Sierra Zapotec. They can have up to eight categories, including adult male or female, child, baby, young unmarried man, deity, and disparaged referent (Marlett 2010). And, these are not strictly semantic: in Tilquiapan Zapotec, mushrooms belong to the animal category, while in San Juan Guelavía, thunder, potable water, rain, corn, and edible corn products belong to the deity category (Marlett 2010:4). Many of these varieties with more elaborate gender systems are not documented, but even when there is a description available, GCC effects are generally not mentioned.

[6]There is only one exception that we know of. In some varieties, there is a separate series of clitics used for the subjects of experiencer verbs and causativized experiencer verbs (see fn. 10). The vowel in the third person animal and inanimate clitics is only epenthetic, inserted to avoid certain consonant clusters. And, the two allomorphs of the third person elder clitic, *=e'* and *=ne'*, are conditioned by linear order, as we discuss in Section 2.3 below.

(14) a. * Ts-ja-wi**=e'**$_1$ [t_1 na xna'=a'] taw=a'.
CONT-AND-visit**=3.EL** and mother=1SG grandmother=1SG
'S/he and my mother went to visit my grandmother.'
(Laxopa: RM, GZYZ052, 57:32)

b. * Bdel Maria**=b**.
hug.COMP Mara**=3.AN**
Intended: 'Maria hugged it.' (Laxopa: RM, GZYZ013, 4:40)

Clitic and strong pronouns are not freely interchangeable. In subject position, for instance, a clitic is obligatory in information-structurally neutral contexts, e.g., out of the blue or with broad focus.

(15) a. Dzaw{**=a'**, ***neda'**} yet.
eat.CONT**=1SG** **1SG** tortilla
'I am eating a tortilla.' (Laxopa: RM, GZYZ048, 05:08)

b. Tsini'a{**=ba'**, ***leba'**} behle' jed.
cook.CONT**=3.AN** **3.AN** meat chicken
'S/he is cooking chicken.' (Laxopa: RDR, SLZ1029, 22:26)

The strong form appears elsewhere. For instance, in a coordination, out of which cliticization is impossible (14a), only a strong pronoun can appear.

(16) Ts-ja-wia [**le'** na xna'=a'] taw=a'.
CONT-AND-visit **3.EL** and mother=1SG grandmother=1SG
(Laxopa: RM, GZYZ052, 56:25)

To account for this complementary, we follow Cardinaletti and Starke (1999) in taking clitic and strong pronouns to be in competition with one another. The choice is mediated by an economy constraint, *Minimize Structure*, which prefers a clitic whenever one is possible, because it contains less structure. A strong pronoun can only appear when an independent principle blocks the availability of a clitic pronoun.

We assume that clitic pronouns move via phrasal movement to the specifier of a functional head (Nevins 2007, 2011, a.o.), though this is simply for concreteness. As far as we know, everything we say is compatible with clitics moving by head movement, as Preminger (2019) has recently proposed. We also set aside the issue of clitic doubling. While all of the examples above involve just a clitic pronoun, these can double a strong pronoun or an R-expression under certain circumstances. It may be that clitics originate inside a "big DP" (Uriagereka 1995, Nevins 2011, a.o.), or that they are simply a copy of D (Preminger 2019); see Anagnostopoulou 2006 for an overview of these issues. We focus here on the constraints on clitic combinations.

2.2 Three constraints on clitic combinations

In Sierra Zapotec, a subject of any gender can cliticize — as well as any person, though this is not shown below.

		OBJECT					
		1SG	2SG	3.EL	3.HU	3.AN	3.IN
SUBJECT	1SG	–	*V=a' rwe'*	*V=e'*[8]	*V=a'=be'*	*V=a'=ba'*	*V=a'=n*
	2SG	*V=o' nada'*	–	*V=o=e'*	*V=o'=be'*	*V=o'=ba'*	*V=o'=n*
	3.EL	*V=e' nada'*	*V=e' rwe'*	*V=e' le'e*	*V=e'=be'*	*V=e'=ba'*	*V=e'=n*
	3.HU	*V=be' nada'*	*V=be' rwe'*	*V=be' le'e*	*V=be' lebe'*	*V=be'=ba'*	*V=be'=n*
	3.AN	*V=ba' nada'*	*V=ba' rwe'*	*V=ba' le'e*	*V=ba' lebe'*	*V=ba' leba'*	*V=ba'=n*
	3.IN	*V=en nada'*	*V=en rwe'*	*V=en le'e*	*V=en lebe'*	*V=en leba'*	*V=en len*

Table 2: *Pronoun combinations in Yalálag (López and Newberg 2005:8) (dark gray = Strong PCC; medium gray = GCC; light gray = *X–X Constraint)*

(17) a. Shlag**=e'** beku'.
kick.CONT**=3.EL** dog
'S/he is kicking out the dog.' (Laxopa: FSR, SLZ067-s, 5)

b. Shle'e**=ba'** yet=e'n.
smell.CONT**=3.HU** tortilla=DEF
'S/he smells the tortilla.' (Laxopa: FSR, SLZ003-s, 3)

c. Shtahs**=eb**.
sleep.CONT**=3.AN**
'It is sleeping.' (Laxopa: FSR, SLZ056-s, 11)

d. Bllu'u**=nh**.
rip.COMP**=3.IN**
'It ripped.' (Laxopa: FSR, SLZ032-s, 3)

But, cliticization of an object is subject to three constraints based on the person and gender.

This is perhaps most clear in Yalálag Zapotec. Setting aside plural pronouns, the realization of all possible person–gender combinations of subject and object pronouns is shown in Table 2.[7] In cells with no shading, the object pronoun cliticizes. In shaded cells, the object pronoun does not and is instead realized as a strong pronoun. This happens because one of three constraints is violated. The first is the familiar Strong PCC (in dark grey), which is found not just in Yalálag, as illustrated in 4 above, but also in Laxopa (Toosarvandani 2017:131) and Zoogocho (Sonnenschein 2004:54). In addition, there is a *Gender–Case Constraint* (*GCC*; in medium gray) and a morphological constraint on identical clitic combinations, which we call the **X–X Constraint* (in the lightest shade of gray).

In all three varieties, regardless of which constraint is violated, the repair is the same: the use of a strong object pronoun. This was already shown for the Strong PCC in Yalálag Zapotec in 9b; it is shown for the GCC in 18a and the *X–X Constraint in 18b (see Foley et al. 2019 for Laxopa and Sonnenschein 2004:38 for Zoogocho).

[7]The two combinations with identical local-person pronouns are ruled out for binding theoretic reasons, and so we set them aside.

[8]For this combination, a general phonological process of vowel coalescence turns the underlying sequence of *=a'=e'* into *=e'*.

(18) a. *3*.AN ≫ *3*.HU

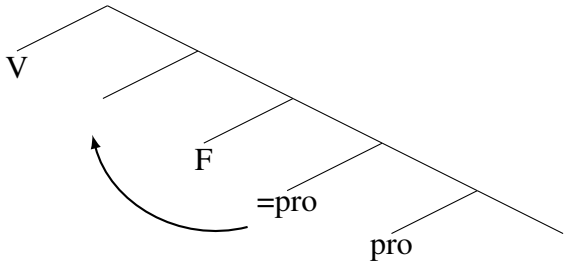
Bdin=**ba'**$_1$ t$_1$ **lebe'**$_2$.
bite.COMP=**3.AN** **3.HU**
'It bit [her]/him.'

b. *3*.AN ≫ *3*.AN

Bdin=**ba'**$_1$ t$_1$ **leba'**$_2$.
bite.COMP=**3.AN** **3.AN**
'It (animal) bit it (animal).' (Yalálag: Avelino Becerra 2004:34–35)

There is a ready explanation for this in Cardinaletti and Starke's theory of pronoun deficiency. Minimize Structure requires a pronoun to be realized as a clitic, if this is at all possible. The subject is most local, as the highest argument, and can always cliticize.

(19)



The object, too, will cliticize when it can. But, when one of the three constraints above rules out cliticization of both arguments, it is realized instead as a strong pronoun.

While this works for Sierra Zapotec, the crosslinguistic picture is somewhat more complicated. As Rezac (2011:177–279) discusses extensively, there is variation in how violations of the PCC are repaired across languages. For instance, in French, it is the higher argument (the indirect object) that is realized as a strong pronoun, and not the lower one, as in Sierra Zapotec. This variation is somewhat surprising if a clitic pronoun is preferred whenever one is possible, as Minimize Structure dictates. We could, however, follow Rezac here, who proposes a unified account of these repairs that maintains the structural relationship between clitic and strong pronouns, even while abandoning Minimize Structure. He argues for a syntactic operation that instead *adds* functional structure, creating a strong pronoun out of a clitic pronoun. This operation can apply in different ways across languages: in Zapotec, it would add structure to the direct object pronoun, but in French to the indirect object pronoun.

Moving forward, we will condense overfull representations like Table 2 into more manageable matrices like 20. The vertical axis represents the structurally higher argument, while the horizontal axis represents the structurally lower argument. For Sierra Zapotec, this is the subject and object, respectively, but in other languages it may be the indirect and direct objects.

(20) *Yalálag*

	1SG	2SG	3.EL	3.HU	3.AN	3.IN
1SG	–	*	✓	✓	✓	✓
2SG	*	–	✓	✓	✓	✓
3.EL	*	*	(✓)	✓	✓	✓
3.HU	*	*	*	(✓)	✓	✓
3.AN	*	*	*	*	(✓)	✓
3.IN	*	*	*	*	*	(✓)

A checkmark indicates that some combination of clitic pronouns is syntactically grammatical, while an asterisk indicates that it is syntactically ungrammatical.

Before turning to the Strong PCC and the GCC, we briefly first discuss the third-person combinations on the major diagonal. These are, as we will argue, filtered morphologically, despite being syntactically well-formed, a status indicated in 20 with parentheses around a checkmark. This morphological source for the *X–X Constraint contrasts with the syntactic source for the PCC and GCC.

2.3 The morphological source of the *X–X Constraint

In Yalálag Zapotec, all combinations of third-person clitic pronouns with identical gender — those on the diagonal in 20 — are ill-formed.

(21) a. * Bchew**=e'=e'**.
kick.COMP**=3.EL=3.EL**
Intended: 'He kicked him.' (Avelino Becerra, p.c.)

b. * Llne'**=be'=be'**.
speak.HAB**=3.HU=3.HU**
Intended: 'He is speaking to him.'

c. * Bdinn**=ba'=ba'**.
bite.COMP**=3.AN=3.AN**
Intended: 'It bit it.'

d. * Bchochj**=en=en**.
bite.COMP**=3.IN=3.IN**
Intended: 'It hit it.' (Yalálag: after Avelino Becerra 2004:34–35)

Foley et al. (2019) argue that this is the result of a morphological constraint that prohibits adjacent clitic pronouns from being exponed identically (cf. Nevins 2007 on third-person combinations in Spanish).

(22) **X–X Constraint (cf. Foley et al. 2019)*
Adjacent clitic pronouns cannot have the same morphological exponent.

The combinations in 21a–d thus are syntactically well-formed, though they are filtered morphologically. The morphological nature of this constraint cannot be determined solely by looking at Yalálag, since the combinations along the diagonal are also featurally identical. But, comparison across Sierra Zapotec varieties shows that the *X–X Constraint really is a morphological one.

In Laxopa, as well as in Zoogocho (see Sonnenschein 2004:54), the elder clitic pronoun has two allomorphs conditioned entirely by morphological environment: *=e'* appears immediately following the verb (23a), while *=ne'* appears elsewhere (23b).

(23) a. Ba gut**=e'**.
already die.COMP**=3.EL**
'S/he already died.' (Laxopa: RDR, SLZ1029-s, 12)

b. Ba betw=u'**=ne'**.
already hit.COMP=2SG**=3.EL**
'You already hit her/him.' (Laxopa: RDR, SLZ1029-s, 13)

This allomorphy is not conditioned by syntactic position, but entirely by linear adjacency to the verb. In positive imperatives, which do not have an overt subject, the initial allomorph *=e'* is used for a third-person elder object.

(24) B-ja-wi**=e'**!
COMP-AND-visit**=3.EL**
'Go visit her/him!' (Laxopa: RDR, SLZ1029-2, 14)

The crucial point here is that, in Laxopa[9] and Zoogocho, a combination of two elder clitic pronouns is well-formed, since the *X–X Constraint is not violated in these varieties, which have distinct exponents for them.[10]

(25) a. Bdel**=e'=ne'**.
hug.COMP**=3.EL=3.EL**
'S/he (an elder) hugged her/him (an elder).' (Laxopa: RM, GZYZ030, 34:15)

[9]There is some interspeaker variation within Laxopa Zapotec in the grammaticality of 25a. We suspect that the morphological constraint in 22 may, for some speakers, be stated in terms of featural makeup and not morphological exponents. We do not find such variation within a speech community to be surprising: for three out of four gender categories, featural and phonological identity are indistinguishable.

[10]Foley et al. (2019) provide another argument for the morphological source of the *X–X Constraint, based on the realization of experiencer subjects. In Zoogocho, when an elder clitic pronoun is the subject of an experiencer verb, it receives a distinct realization as *=de'* (Sonnenschein 2004:45). It can occur with an elder clitic object pronoun.

(i) Bi blhe'e**=de'=ne'**.
NEG see.COMP**=3.EL=3.EL**
'S/he didn't see her/him.' (Zoogocho; Long and Cruz 2000:467)

Here, Zoogocho can be contrasted with a yet fourth Sierra Zapotec variety that we have not focused on in the main text. In San Baltazar *Yatzachi* el Bajo, elder clitic pronouns also have a distinct realization when they appear as an experiencer subject, though this is *=ne'* (Butler 1980:55). This is not able to occur with an object clitic pronoun, which has an identical form.

(ii) * Chle'i**=ne'=ne'**
see.CONT**=3.EL=3.EL**
Intended: 'S/he (an elder) sees her/him (an elder).' (Yatzachi; following Butler 1980:176)

The contrast between Zoogocho and Yaztachi follows directly if the *X–X Constraint is morphological in nature, since the two clitics in (i) have distinct exponents, while those in (ii) have the same form.

b. Na da Dolor=en' dxe**=e=ne'**...
and late Dolores=DEF say.CONT**=3.EL=3.EL**
'And the late Dolores said to him...' (Zoogocho: Sonnenschein 2004:384)

By analogy, we take all the third-person combinations on the diagonal to be syntactically grammatical, though some of them may be ruled out morphologically in certain varieties.

2.4 Constraints based on gender

Alongside the Strong PCC, which, as an absolute constraint, rules out two entire columns in the matrix in 20 above, all three Sierra Zapotec varieties also have a GCC. This further restricts combinations of third-person pronouns based on a hierarchy of gender categories.

(26) *Gender Hierarchy in Sierra Zapotec*
EL > HU > AN > IN

Given the semantics of these gender categories, they form an intuitive hierarchy: the higher a category is, the more animate its referents are.

The GCC in Yalálag, which is stated in 27, prohibits an object pronoun from cliticizing when it exceeds the subject pronoun on this hierarchy.

(27) *Gender–Case Constraint (Yalálag)*
An object clitic pronoun cannot exceed a subject clitic pronoun on the gender hierarchy.

In contrast to the Strong PCC, this GCC in Yalálag is a relative constraint. Clitic pronouns from a given gender category — say, animal — are not prohibited categorically from occupying object position, just if they are more animate than the subject.

(28) a. Bchew**=be'=ba'**.
kick.COMP**=3.HU=3.AN**
'[S/h]e kicked it.'
b. * Bdinn**=ba'=be'**.
kick.COMP**=3.AN=3.HU**
'It bit [her]/him.' (Yalálag: Avelino Becerra 2004:34)

So, unlike the Strong PCC, it does not rule out one or more columns in the matrix in 20, which is repeated in 29 below.

(29) *Yalálag*

	1SG	2SG	3.EL	3.HU	3.AN	3.IN
1SG	–	*	✓	✓	✓	✓
2SG	*	–	✓	✓	✓	✓
3.EL	*	*	(✓)	✓	✓	✓
3.HU	*	*	*	(✓)	✓	✓
3.AN	*	*	*	*	(✓)	✓
3.IN	*	*	*	*	*	(✓)

Rather, the GCC in Yalálag rules out the part of several rows that lies below the diagonal. This is the characteristic shape of a relative constraint, which only prohibits one clitic pronoun if it exceeds another on the hierarchy.

While all three Sierra varieties have a relative GCC, their shapes vary (Sonnenschein 2004:51–54, Foley et al. 2019):

- Yalálag enforces the gender hierarchy strictly, as stated in 27: no object clitic can ever outrank a subject clitic (Avelino Becerra 2004:33–34, López and Newberg 2005:8).

- Laxopa generally obeys the same gender hierarchy, prohibiting most of the same combinations of clitic pronouns, except one: an elder object is possible with a non-elder subject (Toosarvandani 2017:131).

(30) *Laxopa*

	1SG	2SG	3.EL	3.HU	3.AN	3.IN
1SG	–	*	✓	✓	✓	✓
2SG	*	–	✓	✓	✓	✓
3.EL	*	*	(✓)	✓	✓	✓
3.HU	*	*	✓	(✓)	✓	✓
3.AN	*	*	*	*	(✓)	✓
3.IN	*	*	*	*	*	(✓)

In one way of understand this GCC, the hierarchy is only enforced for combinations involving non-human subject pronouns.

(31) *Gender–Case Constraint (Laxopa)*
If a subject clitic pronoun is non-human, an object clitic pronoun cannot exceed it on the gender hierarchy.

- Zoogocho is the most lenient variety. The only combinations it disallows are ones with inanimate subject clitic pronouns (Sonnenschein 2004:54).

(32) *Zoogocho*

	1SG	2SG	3.EL	3.HU	3.AN	3.IN
1SG	–	*	✓	✓	✓	✓
2SG	*	–	✓	✓	✓	✓
3.EL	*	*	(✓)	✓	✓	✓
3.HU	*	*	✓	(✓)	✓	✓
3.AN	*	*	✓	✓	(✓)	✓
3.IN	*	*	*	*	*	(✓)

This GCC can be understood as applying the gender hierarchy only when the subject is an inanimate pronoun.

(33) *Gender–Case Constraint (Zoogocho)*
If a subject clitic pronoun is inanimate, an object clitic pronoun cannot exceed it on the gender hierarchy.

Looking across these GCCs in Sierra Zapotec, it is hard not to notice that the variation has a certain organization to it. As we will show next, this overall shape also characterizes the typology of PCCs.

3 A typology of Phi–Case Constraints

Since these GCCs in Sierra Zapotec operate over a four-way gender distinction, they offer a new perspective on the attested variation in PCCs, which operate just over a three-way person distinction. Alongside the *Strong* PCC in Greek, there is another absolute constraint, the *Me-First* PCC, which has been identified in Romanian (Farkas and Kazazis 1980, Nevins 2007:294). And, in addition to the Weak PCC, another relative constraint, the *Ultrastrong* PCC, has been described for Classical Arabic (Fassi Fehri 1993, Nevins 2007:297–299). See Pancheva and Zubizarreta 2017 for a comprehensive survey of languages with each constraint.[11]

When considered together, we argue that these *Phi–Case Constraints (ΦCCs)* form a highly constrained typology, characterized by two crosslinguistic generalizations (Foley et al., to appear).

(34) a. *Growing Staircase*

(✓)	✓	✓	✓
✓	(✓)	✓	✓
✓	✓	(✓)	✓
*	*	*	(✓)

(✓)	✓	✓	✓
✓	(✓)	✓	✓
*	*	(✓)	✓
*	*	*	(✓)

(✓)	✓	✓	✓
*	(✓)	✓	✓
*	*	(✓)	✓
*	*	*	(✓)

b. *Moving Wall*

–	✓	✓
*	–	✓
*	✓	✓

–	*	✓
*	–	✓
*	*	✓

The first generalization, *Growing Staircase*, characterizes relative constraints, like the GCCs in Sierra Zapotec (34a). The second, *Moving Wall*, characterizes absolute constraints, such as the Strong PCC (34b).

3.1 Relative constraints

Starting with the relative constraints on pronoun movement, if we look across the higher-resolution paradigms of GCCs, a striking pattern emerges. Moving from Zoogocho to Laxopa to Yalálag, starred cells are arranged in successively taller "staircases."

(35) a. *Zoogocho*

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	✓	✓	✓
3.HU	✓	(✓)	✓	✓
3.AN	✓	✓	(✓)	✓
3.IN	*	*	*	(✓)

[11] Pancheva and Zubizarreta (2017) also recognize a "Superstrong" PCC, which differs from the Strong PCC only in prohibiting identical third-person combinations as well. However, as we discussed in Section 2.3, combinations of third-person pronouns are often ruled out for morphological reasons (see Nevins 2007 for a similar discussion of third-person combinations in Spanish).

b. *Laxopa*

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	✓	✓	✓
3.HU	✓	(✓)	✓	✓
3.AN	*	*	(✓)	✓
3.IN	*	*	*	(✓)

c. *Yalálag*

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	✓	✓	✓
3.HU	*	(✓)	✓	✓
3.AN	*	*	(✓)	✓
3.IN	*	*	*	(✓)

For any of these constraints, a combination is ungrammatical only if it is below the diagonal and all combinations below it and to its left are also ungrammatical. This generalization is defined more formally in 36.

(36) *Growing Staircase*
For every ungrammatical combination of a higher pronoun α and a lower pronoun β, (i) $\beta > \alpha$ (on a feature hierarchy), and (ii) every combination of a higher pronoun δ and a lower pronoun γ such that $\delta < \alpha$ or $\gamma > \beta$ is also ungrammatical.

The GCCs in the three Sierra Zapotec varieties we considered exhaustively attest the possible relative constraints allowed by Growing Staircase in a four-by-four paradigm.

As it happens, Growing Staircase also characterizes the typology of relative PCCs, albeit in miniature, since these paradigms are smaller (three by three).

(37) a. *Weak PCC*

	1	2	3
1	–	✓	✓
2	✓	–	✓
3	*	*	(✓)

b. *Ultrastrong PCC*

	1	2	3
1	–	✓	✓
2	*	–	✓
3	*	*	(✓)

The Weak PCC, found in varieties of Catalan and Spanish between objects, forms the shortest staircase. The Ultrastrong PCC, attested between indirect and direct object clitic pronouns in Classical Arabic (Fassi Fehri 1993), for some speakers of Spanish (Perlmutter 1971:21), and for some speakers of Catalan (Bonet 1991:179), has an additional step. It requires total conformity to a person hierarchy ($1 > 2 > 3$).[12]

3.2 Absolute constraints

In the absolute constraints, a different generalization emerges. Starting this time in the person domain, where it is most clear, the Me-First PCC in Romanian (Farkas and Kazazis 1980, Nevins

[12]It is worth noting that the Weak and Ultrastrong PCC are often, though not always, found as variants within a speech community that also has the Strong PCC, as in Spanish and Catalan. By contrast, the GCCs in Sierra Zapotec are, as far as we know, uniform within each speech community. For Laxopa, the four speakers we have consulted all agree, though for the other varieties, we only have published descriptions available.

2007:297–299) prohibits cliticization of a first-person direct object pronoun.[13] The Strong PCC, found in Greek and Sierra Zapotec, is more stringent, banning any local-person pronoun from cliticizing from this position.

(38) a. *Me-First PCC*

	1	2	3
1	–	✓	✓
2	*	–	✓
3	*	✓	(✓)

b. *Strong PCC*

	1	2	3
1	–	*	✓
2	*	–	✓
3	*	*	(✓)

In other words, if a clitic is prohibited as the lower argument in a combination, then so too is any clitic higher on the person hierarchy. This generalization, which we call *Moving Wall*, is stated in a more general form in 39.

(39) *Moving Wall*
For every ungrammatical combination of a higher pronoun α and a lower pronoun β, every combination with a lower pronoun γ such that $\gamma > \beta$ (on a hierarchy) is also ungrammatical.

The Strong PCC and Me-First PCC exhaust the possible absolute constraints permitted by Moving Wall in a three-by-three paradigm.

In the domain of gender, we have to be a bit more speculative, since the GCCs in Sierra Zapotec are all relative constraints. But, for the same four-way gender system, Moving Wall would permit only the absolute constraints in 40a–c.

(40) a.

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	✓	✓	✓
3.HU	*	(✓)	✓	✓
3.AN	*	✓	(✓)	✓
3.IN	*	✓	✓	(✓)

b.

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	*	✓	✓
3.HU	*	(✓)	✓	✓
3.AN	*	*	(✓)	✓
3.IN	*	*	✓	(✓)

[13]The details are somewhat more complicated in Romanian. For example, while a 1SG ≫ 2SG cluster is acceptable, a 1SG ≫ 2PL cluster is not (Farkas and Kazazis 1980:79–80; see also Nevins and Săvescu 2010). As we will discuss in Section 6, these kinds of interactions are predicted if, as we propose, probe relativizations are the union of unvalued features, which might include ones from both person and number domains. A similar number-based constraint is found in Teotitlán del Valle Zapotec.

c.

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	*	*	✓
3.HU	*	(✓)	*	✓
3.AN	*	*	(✓)	✓
3.IN	*	*	*	(✓)

While we have not yet found a Zapotec language with an absolute GCC corresponding to 40a or 40b, Teotitlán del Valle Zapotec, a Central Zapotec language, essentially has the constraint in 40c. Only inanimate direct object clitics are permitted in combination with a subject clitic (Gutiérrez Lorenzo 2014:45–47, Julia Nee, p.c.).[14] Future fieldwork will have to discover whether the GCCs in 40a–b in fact exist, completing the typology of absolute constraints.

3.3 A further generalization

Growing Staircase and Moving Wall are generalizations over the typology of ΦCCs. They characterize which constraints are attested and which are not. Taken together, Growing Staircase and Moving Wall reveal a deep asymmetry in this typology. A staircase can be anchored in the bottom left corner of the paradigm, but not any other; walls move across the paradigm from the left (and perhaps also bottom) edge, but not the right edge. There are no attested relative constraints that look like 41a, nor absolute constraints that look like 41b.

(41) a.

(✓)	*	*	*
✓	(✓)	*	*
✓	✓	(✓)	*
✓	✓	✓	(✓)

b.

✓	✓	*	*
✓	✓	*	*
✓	✓	(✓)	*
✓	✓	*	(✓)

That is to say, it is always *the lower clitic* whose person or gender cannot exceed some cutoff on the relevant hierarchy, whether this is fixed, as in an absolute constraint, or set by the higher clitic, as in a relative constraint.

It seems likely that this deep asymmetry originates in a syntactic mechanism. However, as we discussed in Section 1.3, no condition like the PLC that Béjar and Rezac propose for the Strong PCC can account for it. To start, for any given relative constraint, such as the Weak PCC or one of the GCCs in Sierra Zapotec, there is no single class of pronouns that must Agree: whether or not an object can cliticize always depends both on its gender and that of the subject. In Yalálag, for instance, a human object is possible if the subject is elder or human, but not if it is animal or

[14]This simplifies things slightly. Teotitlán del Valle Zapotec actually has a five-way gender distinction, which includes the four categories familiar from Sierra Zapotec plus a deity category, which plausibly occupies the highest rung on the hierarchy. In addition, the constraint represented in 40c only holds when the subject is singular, a constraint we discuss further in Section 6. There are some additional idiosyncrasies of Teotitlán del Valle that we are setting aside here, as they are not relevant (see Gutiérrez Lorenzo 2014:45–47 for full details).

inanimate. Moreover, even if each of these individual constraints could originate in a condition like the PLC, it would bear responsibility for deriving the attested crosslinguistic variation. Each language would have to have a different condition stating which pronouns would have to Agree. This seems extremely unlikely (cf. Coon and Keine 2018), a point brought home most clearly in Sierra Zapotec: neither the gender hierarchy nor the inventory of pronouns varies across these varieties, yet their GCCs do.

That does not mean that we have to give up on all of Béjar and Rezac's theory. They include a central role for a functional head that Agrees with the closest clitic pronoun it can find. It would be reasonable to keep this component of their theory to provide some purchase on the asymmetrical typology of ΦCCs. Since this probing is subject to locality, it inherently distinguishes the highest goal from other possible goals. To derive the typology, though, the relationship between this functional head and clitic pronouns has to be further articulated. The PLC served, in part, to link the presence of an Agree relation to the possibility of cliticization. Without it, another way is needed for mediating the relationship between the functional head and clitic pronouns.

4 Toward a theory of ΦCCs

In what follows, we advance a theory of ΦCCs that tries to capture the asymmetrical shape of their typology. This incorporates the following three hypotheses:

1. There is a functional head that Agrees in φ-features with clitic pronouns one at a time, subject to an intervention-based locality constraint, e.g., Attract Closest (Béjar and Rezac 2003, 2009).

2. Clitic pronouns need not Agree with the probe. But, they can only move to be local to this head if its φ-features match their own.

3. The relativization of the functional head can vary across languages and is responsible for the attested variation in ΦCCs (Nevins 2007, 2011).

Like Béjar and Rezac's account of the Strong PCC, this theory assumes the presence of a functional head that Agrees in φ-features with the closest goal. This serves to distinguish the higher clitic pronoun from the lower one.

This theory does, however, abandon a critical assumption of Béjar and Rezac's account, namely that every clitic pronoun must Agree in order to be licensed. As we discussed in Section 1.2, while the PLC requires certain pronouns to Agree in person, all other clitic pronouns must also Agree, even if this is in number or some other feature. We propose to loosen the link between Agree and clitics. For a clitic pronoun to move to a functional head, their φ-features must match. Since the head can only get these features through Agree, there will thus always have to be an application of Agree before cliticization is possible. But, there need not be a one-to-one relation between clitic pronouns and Agree relations.

This derives the typology of ΦCCs with one final ingredient: the variation in constraints arises from variation in the relativization of the probe. This hypothesis is advanced by Nevins (2007, 2011), though he folds it into a theory of the PCC that uses Multiple Agree (Hiraiwa 2001) to establish a relation between a functional head and clitic pronouns, building on earlier work by

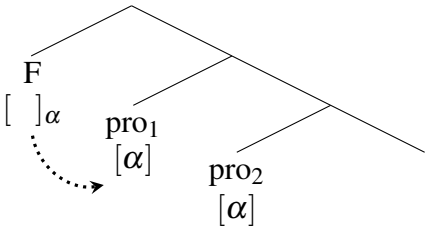
Anagnostopoulou. While the conditions that he imposes on Multiple Agree derive the variation in the PCC, we argue this does not suffice to capture the generalizations embedded in Growing Staircase and Moving Wall.

4.1 Clitic pronouns need not Agree

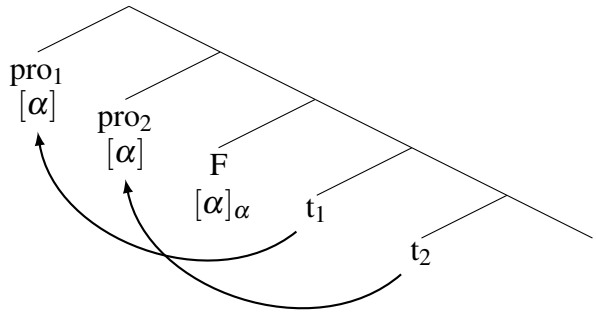
It is an old intuition in the literature on clitic doubling that clitic pronouns are the reflexes, in some way, of agreement (Borer 1984, Suñer 1988, Sportiche 1993, Anagnostopoulou 2003:249–320, a.o.). Béjar and Rezac's (2003) include a specific version of this intuition in their account of the Strong PCC: each clitic pronoun must Agree with a functional head in φ-features (see also Anagnostopoulou 2003:315, Nevins 2011:952–954). For them, this follows from the theory of case developed by Chomsky (2000, 2001), in which case assignment is parasitic on Agree in φ-features. If clitics lack case, each clitic will necessarily have to enter into an Agree relation with a suitable functional head.

But this not the only way to link clitic pronouns to agreement. Specifically, we propose that clitics do not inherently have any need to Agree with a functional head. Rather, a clitic pronoun can only move to be local to a functional head if it has φ-features that match — in some sense yet to be made precise — those on that head. If the head starts out with unvalued φ-features, an application of Agree will be necessary before a pronoun can cliticize. But since clitic pronouns do not directly require Agree, there need not be a separate Agree relation for each clitic. If there is more than one clitic present in a derivation (42a), they can all move based on just a single Agree relation, as long as their φ-features match the features that have been valued on the probe (42b).

(42) a.



b.



By decoupling cliticization from Agree in this way, we are backing off from Béjar and Rezac's attempt to link the deficiency of clitic pronouns to Chomsky's (2000, 2001) theory of case. Clitic pronouns have a purely structural deficiency, much as in Cardinaletti and Starke's (1999)'s original theory of pronouns: all they need is to be local to a functional head with a certain featural makeup.

This allows for a grammatical explanation of the asymmetrical ΦCCs typology, one grounded in the syntax of pronominal cliticization. By contrast, assuming that there is a one-to-one relation between applications of Agree and clitic pronouns shifts the burden of explanation to the lexicon. To see why, recall that Béjar and Rezac (2003) propose to derive the Strong PCC by sequencing

the relativization of the probe. For each pronoun that cliticizes, there is an unvalued feature on the probe that must be valued via Agree. For clarity, this is shown extensionally in 43, by listing the pronouns that are able to cliticize on each cycle.

(43) $\begin{bmatrix} [\ ]_{\{1,\,2,\,3\}} \\ [\ ]_{\{3\}} \end{bmatrix}$

If only a third-person pronoun can Agree with the probe on the second cycle, a local-person pronoun is never able to cliticize from direct object position.

For other ΦCCs, the probe's relativization would have to be sequenced in a different way. The GCC in Yalálag (27), for instance, would correspond to the very fine-grained probe in 44, since pronouns can only cliticize in descending order down the gender hierarchy.

(44) $\begin{bmatrix} [\ ]_{\{1,\,2,\,3.\text{EL}\}} \\ [\ ]_{\{3.\text{EL},\,3.\text{HU}\}} \\ [\ ]_{\{3.\text{HU},\,3.\text{AN}\}} \\ [\ ]_{\{3.\text{AN},\,3.\text{IN}\}} \\ [\ ]_{\{3.\text{IN}\}} \end{bmatrix}$

But once this probe is available, what prohibits a probe like 45a, which corresponds to the unattested constraint in 45b, in which some combinations above or along the diagonal are ungrammatical? Similarly, what rules out the probe in 46a, which also corresponds to an unattested in which combinations under the diagonal are ruled out that do not form a step?

(45) a. $\begin{bmatrix} [\ ]_{\{3.\text{EL}\}} \\ [\ ]_{\{3.\text{EL},\,3.\text{HU},\,3.\text{AN},\,3.\text{IN}\}} \\ [\ ]_{\{3.\text{IN}\}} \end{bmatrix}$

b.

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	✓	✓	✓
3.HU	*	*	*	✓
3.AN	*	*	*	✓
3.IN	*	*	*	(✓)

(46) a. $\begin{bmatrix} [\ ]_{\{3.\text{EL},\,3.\text{HU}\}} \\ [\ ]_{\{3.\text{HU}\}} \\ [\ ]_{\{3.\text{AN}\}} \\ [\ ]_{\{3.\text{EL}\}} \\ [\ ]_{\{3.\text{AN},\,3.\text{IN}\}} \\ [\ ]_{\{3.\text{IN}\}} \end{bmatrix}$

b.

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	✓	✓	✓
3.HU	✓	(✓)	✓	✓
3.AN	✓	*	(✓)	✓
3.IN	*	*	*	(✓)

To derive Growing Staircase, Moving Wall, or the deeper asymmetry they encode, it would be necessary to impose an independent restriction on the possible probes available in language. It may be that such a lexical restriction is forthcoming. But, by decoupling cliticization from Agree in the way that we are proposing, we can understand these generalizations as having a grammatical source, one originating in the locality that constrains how a probe Agrees with its goals.

4.2 Deriving Growing Staircase

Concretely, we propose the clitic pronouns are subject to the condition in 47, which can be understood as arising from a purely structural need that they have, as in Cardinaletti and Starke's (1999) theory of pronominal deficiency.

(47) *Condition on Pronominal Cliticization*
For a functional head H that has been valued (i.e., $\textsc{value}(H) \neq \varnothing$), a clitic pronoun P can move to H iff, for all relevant features F on P, $F \subseteq \textsc{value}(P)$.

Clitic and other weak pronouns are missing some functional structure, and so must surface in the specifier of a functional head in the clausal spine. Of course, this cannot be just any functional head: category features presumably matter. The condition in 47 requires that features the probe is valued for also be taken into account.

By hypothesis, the condition in 47 does not require total identity between a clitic and the functional head: a pronoun can cliticize as long as its features are a subset of the probe's value. The relevant features here are φ-features — specifically, person and gender features — which are organized into feature geometries (Harley and Ritter 2002), like the one for person in 48a (Béjar 2003:48). The four-way gender distinction in Sierra Zapotec, which is a strictly semantic one, corresponds to four features totally ordered by entailment ($\textsc{el(der)} \subset \textsc{hu(man)} \subset \textsc{an(imate)} \subset \gamma$), as in 48b.

(48) a. 1 $\begin{bmatrix} \pi \\ | \\ \textsc{pa} \\ | \\ \textsc{sp} \end{bmatrix}$ 2 $\begin{bmatrix} \pi \\ | \\ \textsc{pa} \end{bmatrix}$ 3 $[\pi]$

b. EL $\begin{bmatrix} \gamma \\ | \\ \textsc{an} \\ | \\ \textsc{hu} \\ | \\ \textsc{el} \end{bmatrix}$ HU $\begin{bmatrix} \gamma \\ | \\ \textsc{an} \\ | \\ \textsc{hu} \end{bmatrix}$ AN $\begin{bmatrix} \gamma \\ | \\ \textsc{an} \end{bmatrix}$ IN $[\gamma]$

For now, we remain uncommitted about the relationship between these gender features and other feautres in the φ-domain. Harley and Ritter (2002:514–518) take gender to entail number, but the animacy-based gender system in Sierra Zapotec plausibly also has some formal connection to person. We will continue to look at person and gender more or less independently, since the ΦCCs that refer to them have such different shapes.

With these feature geometries, the shapes of relative constraints arise from the locality constraint on Agree and the condition in 47. Take the GCC in Yalálag, the Zapotec variety where the gender hierarchy is most transparently reflected:

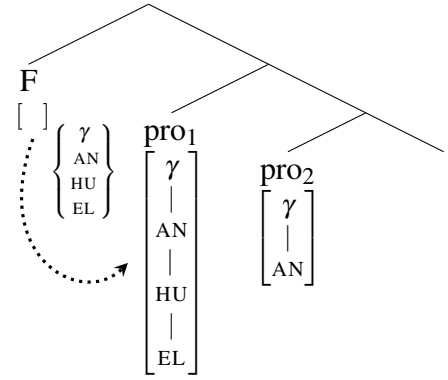
(49) *Yalálag*

	1SG	2SG	3.EL	3.HU	3.AN	3.IN
1SG	–	*	✓	✓	✓	✓
2SG	*	–	✓	✓	✓	✓
3.EL	*	*	(✓)	✓	✓	✓
3.HU	*	*	*	(✓)	✓	✓
3.AN	*	*	*	*	(✓)	✓
3.IN	*	*	*	*	*	(✓)

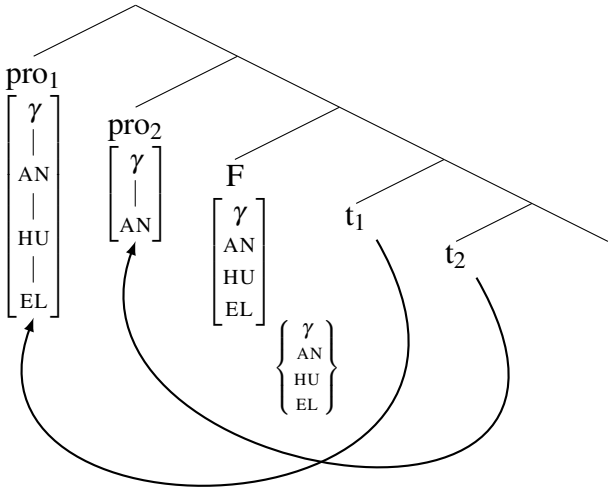
In a derivation containing an elder subject clitic and an animal object clitic, the probe first finds the subject, in keeping with Attract Closest (50a). Assuming that the probe in Yalálag is relativized to all gender features, it copies every gender feature on this elder pronoun.

(50) *Yalálag: 3.EL ≫ 3.AN*

a.



b.



Then, the subject and object pronouns can cliticize, as the gender features of both are a subset of the probe's value (50b).[15]

[15]Since the probe is only valued by the highest pronoun, there should be no restrictions based on gender between any pronouns lower down. They should be able to cliticize as long as they have a subset of the features of the first goal. This prediction is borne out in ditransitives in Sierra Zapotec, where up to three pronouns can cliticize. While the GCC holds between the first pronoun and each of the second and third pronouns, it does not constrain the two object pronouns. (Note: This data point is from Laxopa, whose GCC allows any combination of human and elder pronouns.)

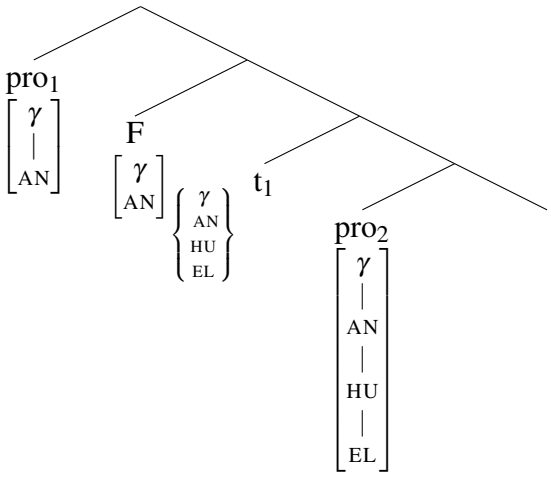
(i) Ba blhu'id=ba'$_1$**=b$_2$=ne'**$_3$ t_1 t_2 t_3.
already show.COMP=3.HU**=3.AN=3.EL**
'S/he already showed it (an animal) him/her (an elder).' (Laxopa: RM, GZYZ070, 11:42)

(ii) Ba blhu'id=ba'$_1$**=ne'**$_2$**=b**$_3$ t_1 t_2 t_3.
already show.COMP=3.HU**=3.AN=3.EL**
'S/he already showed him/her (an elder) it (an animal).' (Laxopa: RM, p.c., 06/17/2019)

In Laxopa Zapotec, both combinations of an animal and an elder pronoun are permitted when these are objects. This contrasts with the combination of a subject and an object pronoun, where the elder pronoun must be structurally higher

At the same time, with this relativization in Yalálag, the lower pronoun in any combination below the diagonal will not be able to cliticize, e.g., 51.

(51) *Yalálag: 3.AN ≫ 3.EL*



The probe is now able to copy only some of the features it is looking for from the higher pronoun. While the subject pronoun is able to cliticize according to the condition in 47, the lower pronoun cannot: it has more relevant features than have been valued on the probe. The logic here is fully general and extends to all other third-person combinations, giving rise to the full GCC in Yalálag.

Under this account, no relative constraint that violates Growing Staircase is possible, regardless of the probe's relativization. It excludes, for instance, the existence of a constraint like that in 41a, which would allow a lower pronoun to cliticize when its relevant features are a *superset* of the probe's value. This arises directly from how the probe must Agree with the closest goal it can find. It is always the highest pronoun the values the probe, setting the threshold for which pronouns are able to cliticize.

In addition, it is not possible to give rise to an unattested constraint in which a combination on or along the diagonal is ungrammatical, as in (45) above. In all hierarchy-satisfying combinations along or above the diagonal, the lower clitic has fewer features than the higher clitic, and so they will both be able ot move. Nor can an unattested constraint like 46 ever arise, where some combinations under the diagonal are ruled out that do not form a step. If the probe has been valued for some feature (say, AN), *all* pronouns with that feature will be able to cliticize, thereby ruling in every combination in that row below the diagonal.

The variation in relative constraints that is permitted under this account — which is restricted almost entirely to the constraints that are attested — arises from how the probe is relativized. The GCC in Yalálag, which enforces the gender hierarchy strictly, corresponds to a probe that is looking for all gender features. The increasingly lax constraints found in Laxopa and Zoogocho correspond, as shown in 52a, to probes that are relativized to fewer features.

than the animal pronoun, as in 2 in the main text. See Foley and Toosarvandani (to appear) for further discussion of the GCC in ditransitives.

(52) a. [ ]$_{\{\gamma,\ \text{AN, HU, EL}\}}$ Yalálag GCC

[ ]$_{\{\gamma,\ \text{AN, HU}\}}$ Laxopa GCC

[ ]$_{\{\gamma,\ \text{AN}\}}$ Zoogocho GCC

b. [ ]$_{\{\pi,\ \text{PA, SP}\}}$ Ultrastrong PCC

[ ]$_{\{\pi,\ \text{PA}\}}$ Weak PCC

When a feature is subtracted from the probe's relativization, it is never copied onto the probe as part of its value, and hence it is never relevant for pronoun cliticization. For the GCC in Laxopa, for instance, once the probe is valued for HU by any human clitic, whether elder or non-elder, it is able to cliticize. The varying sensitivities of relative PCCs to the person hierarchy can similarly be traced to the probe's relativization, as in 52b.

Not every logically possible relativization is listed above. There are eight such relativizations for person, drawing from three features, and 16 for the four-way gender system in Sierra Zapotec. Some of these seem desirable, such as [ ]$_{\{\pi\}}$ and [ ]$_{\{\gamma\}}$, which permit any combination of clitic pronouns. Similarly, there is [ ]$_{\{\ \}}$, which does not allow for any pronoun movement at all. The remaining possible realizations yield constraints that conform to Growing Staircase, as it is defined in 36 above, though they are not currently attested. For instance, [ ]$_{\{\gamma,\ \text{AN, EL}\}}$ creates a staircase with one very large step.

(53)

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	✓	✓	✓
3.HU	*	(✓)	✓	✓
3.AN	*	✓	(✓)	✓
3.IN	*	*	*	(✓)

If such constraints are never attested, it would be possible to restrict the relative constraints to just those in 52a–b by imposing a very natural condition on possible probes (cf. Béjar and Rezac 2009:43).

(54) *Entailment Condition on Probe Relativizations*
If the relativization for a probe includes feature F, it also includes every feature F' such that $F \subset F'$.

But, even without such a restriction on relativizations, there is no probe that gives rise to a ΦCC violating Growing Staircase under the account that we propose.

4.3 A parallel alternative

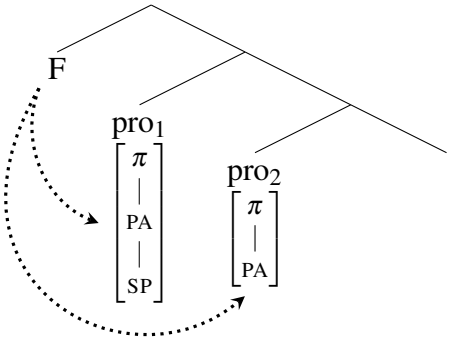
Our account is inspired, in part, by Nevins's (2007, 2011) theory of the PCC, which also locates the source of variation in the relativization of the probe. For this reason, there is a certain superficial resemblance between them, though they have deeper empirical and conceptual differences. To start, Nevins builds his theory on Anagnostopoulou's (2005) analysis of the Weak PCC, which assumes that a probe is able to interact with all of the goals in its domain in parallel via Multiple Agree (Hiraiwa 2001). No one goal is closer than another since they are all found simultaneously. As a consequence, for Nevins, PCCs arise from independent conditions on when Multiple Agree can hold.

One such condition is responsible for the relative constraints: *Contiguous Agree* prohibits a probe from Multiple Agreeing with a goal in some feature for which it is relativized just in case there is a higher goal that lacks that feature.[16]

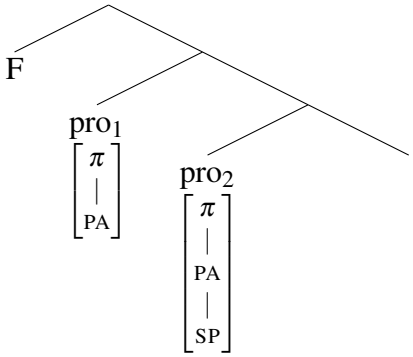
(55) *Contiguous Agree (cf. Nevins 2007:291)*
For a probe P relativized to a feature F with a goal G that bears F, there can be no G' such that:
(i) P c-commands G' and G' c-commands G, and
(ii) G' does not bear F.

The Ultrastrong PCC, for instance, is produced by a probe relativized to at least the SP and PA features. Contiguous Agree is satisfied when the higher clitic has all the features of the lower clitic (56a). But if the lower clitic has either SP or PA and the higher clitic does not, then Multiple Agree is impossible (56b).[17]

(56) a. *1 ≫ 2*



b. **2 ≫ 1*



Each step in the staircase is produced by adding a feature to the relativization. The Weak PCC thus would arise from a less-specified probe, one relativized just to PA. This can be extended straightforwardly to the GCCs in Sierra Zapotec. In Yalálag, where the gender hierarchy is obeyed most closely, the probe would be relativized to EL, HU, and AN. In Laxopa, it would be relativized to HU and AN, and in Zoogocho just to AN.

As in our theory, some degree of partial identity is enforced between clitic pronouns based on a probe's relativization. Moreover, this relation is asymmetrical: the lower clitic must have a subset of relevant features that the higher clitic does. Under Nevins' theory, however, the asymmetrical status of the highest clitic is enforced in the definition of Contiguous Agree. The Multiple Agree relation between a probe and its goals is not inherent constrained by locality; it interacts simultaneously with all of them. To be fair, Nevins (2011:941 *et passim.*) does draw an analogy between Contiguous Agree and an intervention-based locality condition, such as Relativized Minimality. However, while Relativized Minimality in its traditional form prohibits a syntactic dependency

[16]Nevins (2011) argues that person features are bivalent. We adapt his theory to the assumptions we use here, where these are privative. This does not affect in any significant way his account of PCCs, though it does elide the differences that he seeks to draw between person and number.

[17]It is unclear how, under Nevins' theory, just the higher pronoun is, in fact, able to cliticize in this circumstance. If Multiple Agree is not constrained by locality, as Hiraiwa (2001) originally intends, either it should apply simultaneously to all goals, in which case they all cliticize, or not apply at all, in which case none should cliticize.

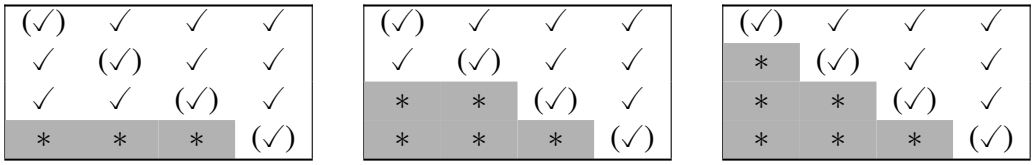
between two elements if there is an intervening element that bears the same feature, Contiguous Agree imposes the *opposite* condition: it prohibits an intervener that *lacks* some shared feature (see also Coon and Keine 2018). The similarity to a locality constraint might thus be somewhat less close than appears at first.

More importantly, by tying the asymmetry of relative constraints to one condition on probing, Contiguous Agree, it does not capture the deeper generalization that we saw characterized the typology of ΦCCs in Section 3.3. In particular, the absolute constraints exhibit the same asymmetry that the relative constraints do. The overall unity to the ΦCC typology deserves a principled account, one that is not forthcoming if a probe can find all the pronouns in its domain in parallel. As we argue next, it is possible to capture this generalization if a probe finds its goals one at a time, subject to locality.

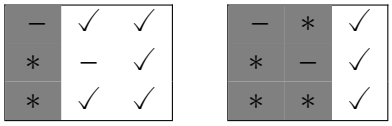
5 Accounting for Moving Wall

Both Growing Staircase and Moving Wall exhibit the same asymmetry. They are anchored in the bottom left corner of the paradigm; ungrammatical combinations are only permitted if they are connected to this cell.

(57) a. *Growing Staircase*



b. *Moving Wall*



There are no relative constraints attested in which an "icicle" of ungrammatical combinations descends from the top right corner, as in 57a above. Nor are there absolute constraints attested that rule out columns starting at the right edge of the paradigm, as in 57b above.

In Nevins's (2007, 2011) theory based on Multiple Agree, Contiguous Agree derives the attested relative constraints, and hence Growing Staircase, but an additional constraint is needed to take care of the absolute constraints. Whatever this is — Nevins identifies it as *Matched Values*, as we will detail below — it involves a different mechanism from the one that generates relative constraints. And so, even if this derives only the attested absolute constraints, Moving Wall and Growing Staircase are treated as independent facts. Since it does not bake locality into the probing mechanism, such a theory cannot capture the fundamental asymmetry underlying all ΦCCs.

We still have to develop one aspect of our theory — the valuation mechanism involved in Agree — so that it can do this. We assume that "valuing" a probe consists of copying a subtree of a feature geometry, a *feature treelet*, from its goal. We suggest that this can either be a trivial (non-branching) treelet, consisting of just the feature the probe is relativized to search for, or a branching treelet, consisting of that feature and all the features it dominates in the geometry (Preminger

2014:47–49). With these two possible copying mechanisms, the locality that constrains Agree ensures that any ΦCC is always anchored in the bottom left corner of the paradigm.

5.1 Absolute constraints and Matched Value

First, we should consider how absolute constraints are derived in a theory that assumes a probe finds its goals in parallel. In addition to Contiguous Agree, Nevins proposes a second restriction on Multiple Agree, whose effects are felt when a probe is relativized to the *contrastive* value for a feature.

(58) *Matched Values (cf. Nevins 2007:291)*
For a probe P relativized to a contrastive value for feature F, either all goals G that are contrastive for F must have F or they do not have F.

Contrastiveness is defined paradigmatically: a pronoun G is contrastive for F if there is another pronoun G' that is featurally identical to G, except that: (i) if G has F, G' does not have F, and (ii) if G does not have F, G' has F (cf. Nevins 2007:289). So, for instance, first and second person pronouns are contrastive for SP, but not PA or π.

A probe with a contrastive relativization rules out any two adjacent columns in a paradigm. For person, this means that Matched Values can give rise to the Strong PCC (59a). But, as Nevins (2007:300) notes, Matched Values also predicts an unattested "Me-Last" constraint that is somewhat "strange" (59b).

(59) a. *Contrastive* [SP] *(Strong PCC)*

	1	2	3
1	–	*	✓
2	*	–	✓
3	*	*	(✓)

b. *Contrastive* [PA] *(unattested)*

	1	2	3
1	–	*	*
2	✓	–	*
3	✓	*	(✓)

Extended to the gender domain, Matched Values would predict an even more extravagant range of constraints with the four-way contrast in Sierra Zapotec. While one of these conforms to Moving Wall (60a), the others do not (60b–c).

(60) a. *Contrastive* [EL] *(unattested)*

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	*	✓	✓
3.HU	*	(✓)	✓	✓
3.AN	*	*	(✓)	✓
3.IN	*	*	✓	(✓)

b. *Contrastive* [HU] *(unattested)*

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	*	*	✓
3.HU	✓	(✓)	*	✓
3.AN	✓	*	(✓)	✓
3.IN	✓	*	*	(✓)

c. *Contrastive* [AN] *(unattested)*

	3.EL	3.HU	3.AN	3.IN
3.EL	(✓)	✓	*	*
3.HU	✓	(✓)	*	*
3.AN	✓	✓	(✓)	*
3.IN	✓	✓	*	(✓)

So, while Matched Value can generate the absolute constraints comprising Moving Wall, it also generates unattested absolute constraints, and so it does not account for the generalization itself.

More generally, a theory based on Multiple Agree is not restrictive enough to derive Moving Wall in a principle way. While it would be possible, no doubt, to define a new constraint that only generates absolute ΦCCs anchored in the bottom-left corner of the paradigm, this would fail to capture the generalization that this asymmetry characterizes the typology of relative constraints as well, as embodied in Growing Staircase. This is simply because a probe that enters into a Multiple Agree relation finds all of its goals simultaneously. No one argument is inherently more prominent than another.

By contrast, on the theory developed here, a functional head Agrees subject to locality. The closest clitic pronoun to the probe thus enjoys a special status: its features are copied onto the probe, and they are the metric by which it and other clitics are able to move. This accounts for Growing Staircase. To extend it to Moving Wall, one aspect of the theory remains to be fleshed out to which we turn now: the valuation mechanism involved in Agree.

5.2 Probing for feature treelets

We have been assuming that φ-features are privative features arranged in a feature geometry (Harley and Ritter 2002). And, we have been assuming that the relativization of a probe is comprised of empty slots into which features are copied from the goal (Preminger 2014:47–49). While it is admittedly still unclear how syntactically real feature geometries are, it is worth entertaining a strong hypothesis: the geometrical organization of φ-features on a pronoun is a syntactic object, which we will call a *feature treelet*, that can be manipulated by the grammar like any other syntactic object.

Following Preminger (2014:47–49), we thus assume that, when a probe copies some features from a goal, it is a feature treelet that is copied. The label for a treelet, like other syntactic objects, is the root node, and so a probe's relativization will contain features that it will seek to match to the root node of a treelet. Once a probe finds a node on its goal that matches its relativization, there are, in principle, two things that might happen. It might copy the (nonbranching) treelet that contains just that feature or it might copy the entire (branching) treelet rooted in that feature. We adopt the view that both modalities are, in principle, available:

(61) *Feature Treelet Copying*
For a probe P whose relativization contains a feature F, when P finds a matching goal G, it copies from G onto P either:
(i) F, or (nonbranching treelet)
(ii) F and any nodes that F dominates. (branching treelet)

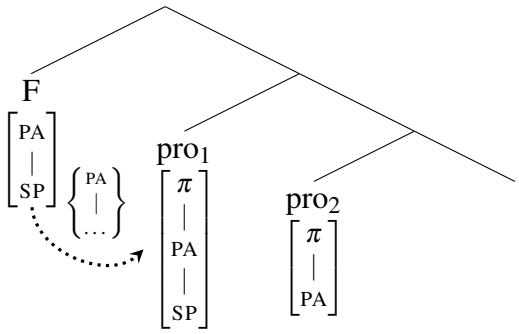
While we will not attempt here to derive these two copying modalities from more general principles, we can draw a parallel to another, more familiar syntactic mechanism: movement. This can target either a single syntactic node, as in head movement, or a node and all the nodes it dominates, as in phrasal movement. Likewise, we are positing that a probe can copy an individual feature or a whole subconstituent of a feature geometry from a goal.

Feature treelet copying in 61 permits a unification of absolute and relative constraints. First, a slight reformulation of the condition in 47 is needed, so that it refers to feature treelets rather than just features.

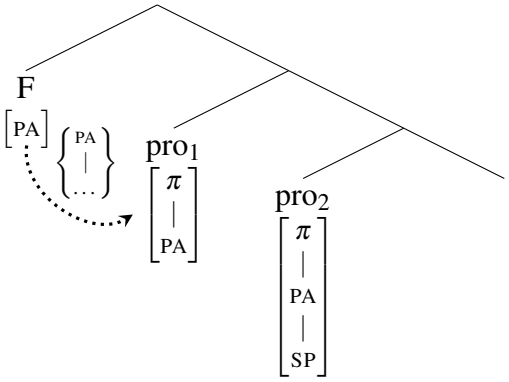
(62) *Condition on Pronominal Cliticization (final version)*
For a functional head H that has been valued (i.e., $\textsc{value}(H) \neq \varnothing$), a clitic pronoun P can move to H iff, for all relevant feature treelets F on P, $F \subseteq \textsc{value}(P)$.

This leaves the account of relative constraints untouched (since individual features are just nonbranching treelets). At the same time, it derives the Strong PCC and other absolute constraints. If the probe is relativized to copy a whole feature treelet rooted in PA, a local-person pronoun can never cliticize from object position. We notate such a probe as $[\ \ ]_{\left\{\begin{smallmatrix}\text{PA}\\|\\\dots\end{smallmatrix}\right\}}$.

(63) a. *1 ≫ 2*



b. *2 ≫ 1*



When the higher clitic is first person (63a), the probe will copy a branching feature treelet rooted in PA (with SP as its daughter). A lower pronoun that is second person will not then be able to cliticize, since the relevant feature treelet rooted in PA that it bears — namely just PA — is not an element of the probe's valuation set. The same logic holds when the higher clitic is second person and the lower clitic is first person (63b). By contrast, a third-person pronoun in object position will always be able to cliticize because it does not have any features relevant to the probe (and the empty set is a subset of every set).[18]

5.3 Deriving Moving Wall

With a probe copying an entire branching feature treelet, there are three possible relativizations for person, thus deriving Moving Wall. Two of these correspond to the Me-First and Strong PCCs, while the third derives a language in which only the highest pronoun can move.

(64) $[\ ]_{\{\text{SP}\}}$ Me-First PCC

$[\ ]_{\left\{\begin{smallmatrix}\text{PA}\\|\\\dots\end{smallmatrix}\right\}}$ Strong PCC

$[\ ]_{\left\{\begin{smallmatrix}\pi\\|\\\dots\end{smallmatrix}\right\}}$ No movement of (non-identical) lower pronouns

Similar relativizations (for treelets rooted in EL, HU, AN, or γ) derive the more speculative absolute GCCs in (40a–c).

Though we talk about these relativizations as probes in and of themselves, the Strong PCC does coexist alongside relative GCCs, as in Sierra Zapotec. This means that both copying modalities must be able, by hypothesis, to coexist in the same language. Since we assume no entailment relation between the person and gender feature geometries, these relativizations will not interact and can simply be added to one another. Thus, in Sierra Zapotec, the coexistence of a PCC and a GCC results simply from a probe that is relativized to search for nonbranching gender treelets and for a branching person treelet.

6 Conclusions and future prospects

This paper has had two main goals. First was to establish a typology of ΦCCs, constraints on combinations of clitic pronouns sensitive to their φ-features and structural position. We saw that the attested PCCs and GCCs conform to two remarkably asymmetrical patterns, which we dubbed Growing Staircase (a pattern characterizing relative constraints, whereby a lower clitic may not outrank a higher clitic on a feature hierarchy if the higher one is below a particular threshold on that hierarchy) and Moving Wall (a pattern characterizing absolute constraints, whereby a lower clitic may not be above a particular threshold on a feature hierarchy).

[18] A third-person pronoun in the higher position will, strictly speaking, not be able to cliticize solely through the action of the probe in 63, since it does not have PA. But a probe may have other relativizations (say, for gender or number) that a third-person pronoun can value.

The second goal was to relate this typology to the syntax underlying the ΦCCs. Its fundamentally asymmetrical shape points to a theory in which a functional head Agrees with clitic pronouns constrained by intervention-based locality. This required a new articulation of the relationship between Agree and the syntax of pronominal cliticization. We proposed that clitic pronouns do not inherently need to Agree, though they can only move to a functional head if their φ-features match. Pronominal cliticization thus must be preceded by the establishment of an Agree relation, though not every clitic pronoun needs to establish its own Agree relation.

In essence, this theory translates the inherent hierarchical asymmetry between pronominal arguments into the asymmetrical shape of the ΦCC typology. This feature may be best appreciated by comparing it to a class of theories that we have so far not considered. In theories framed within Optimality Theory, the PCC arises from the interaction between two primitive hierarchies: one for person categories and another for grammatical relations (or, as a proxy, case values). In her analysis of the Strong PCC, for example, Grimshaw (2001:225–227) posits a constraint that penalizes clitic with marked values for person (namely first or second) and case (dative) features. This markedness constraint, when ranked above another constraint which behaves much like Cardinaletti and Starke's (1999) Minimize Structure, filters out clitic combinations that would violate the Strong PCC. Or, in a more elaborate theory that captures for a wider swath of the PCC typology, Doliana (2014) employs harmonic alignment (Prince and Smolensky 1993:161) on person and case scales (cf. Aissen 2003), ranking a faithfulness constraint at various positions within the resulting constraint hierarchy to produce PCCs of various stringencies. In contrast to these, the theory developed here does not posit a primitive grammatical relation or case hierarchy, since the same information is read directly off of the hierarchical position of arguments.

Of course, there is another hierarchy — the hierarchy of person or gender categories — that our account still assumes as a primitive. We took φ-features to be arranged in a feature geometry without deriving this organization from any independent principles. Harbour (2008:51–115, 2011, 2014:223–225) has argued extensively against the use of feature geometries for this reason. He takes them to be explanatorily unsound if they are not grounded in semantics, and conceptually unnecessary if they are indeed grounded in the meanings of features.

In this light, it is not insignificant that we find GCCs in Sierra Zapotec, where gender categories can be characterized in entirely semantic terms, but apparently not in Romance or Bantu, whose gender (or noun class) systems do not display a similar semantic organization. Indeed, while we have developed a theory of ΦCCs that makes significant use of feature geometries, it may be possible to translate it partially into a theory that makes reference instead to semantic entailment relations between φ-features.

To derive Moving Wall, however, our account makes crucial use of feature geometries as syntactic objects. If one was committed to the elimination of features geometries, it is hard for us to see any path forward except to give up on assimilating absolute constraints to the same syntactic mechanism as relative constraints. While future research will have to settle the issue, we can point out one prediction that the theory developed here makes. It predicts that we should find ΦCCs in any domain that is organized into a feature geometry, regardless of whether this feature geometry is semantically grounded or not. In closing, we consider one domain where such a constraint may exist.

It is commonly assumed that #CCs do not exist (Nevins 2011:965–966). But Teotitlán del Valle Zapotec constrains combinations of clitics based on their number. This variety, which belongs to the Central branch of the Zapotec family, contrasts singular and plural pronouns, unlike Sierra

Zapotec. While singular and plural subjects alike may cliticize (65a–b), only singular direct object pronouns may cliticize (65b–c) (Gutiérrez Lorenzo 2014:45–46).[19]

(65) a. Ru-kin**=dan** kub.
HAB-consume**=3PL.EL** tejate
'They drink tejate.'

b. Gu-zi**=æn=en**.
COMP-buy**=3SG.HU=3SG.IN**
'S/he bought it.'

c. * Ba-tá'w**=an=dum**.
COMP-sell**=3SG.HU=3PL.AN**
Intended: 'S/he sold them [the animals].' (Gutiérrez Lorenzo 2014:45–46)

While Gutiérrez Lorenzo's description only includes a partial paradigm, it is possible to characterize this potential #CC in a way that conforms to Growing Staircase, assuming the number hierarchy: PL > SG.

(66)

	3PL	3SG
3PL	(✓)	✓
3SG	*	(✓)

This would correspond to a feature geometry in which PL is more specified than SG. The question, then, is whether this formal relation has any correspondence in the meaning of these features.

Under the semantics for number that we are familiar with, it does not. In one semantics, it is singular that entails plural (Sauerland et al. 2005, Sauerland 2006), and in another, neither category entails the other (Harbour 2014, Harbour 2016:129–168). While the semantics of number in Teotitlán del Valle Zapotec awaits more detailed examination, this putative #CC suggests, at least initially, that the task of extracting feature geometries from the syntax of ΦCCs might be a tall order. Only further exploration of the typology of these constraints will tell.

References

Adger, David and Daniel Harbour. 2007. Syntax and syncretisms of the Person Case Constraint. *Syntax* 10:2–37.

Aissen, Judith. 2003. Differential object marking: Iconicity vs. economy. *Natural Language and Linguistic Theory* 21:435–483.

Anagnostopoulou, Elena. 1999. On clitics, feature movement, and double object alternations. *North East Linguistic Society (NELS)* 29:41–55.

Anagnostopoulou, Elena. 2003. *The syntax of ditransitives: Evidence from clitics*. Berlin: Mouton de Gruyter.

Anagnostopoulou, Elena. 2005. Strong and weak person restrictions: A feature checking analysis. In *Clitic and affix combinations: Theoretical perspectives*, eds. Lorie Heggie and Francisco Francisco Ordóñez, 199–235. Amsterdam: John Benjamins.

[19] More precisely, only singular inanimate direct object pronouns may cliticize, as the result of a GCC that is also active in the language.

Anagnostopoulou, Elena. 2006. Clitic doubling. In *The Blackwell companion to syntax*, eds. Martin Everaert and H. C. van Riemsdijk, 519–581. Oxford: Blackwell.

Avelino Becerra, Heriberto. 2004. Topics in Yalálag Zapotec, with particular reference to its phonetic structure. Ph.D. Dissertation, University of California, Los Angeles.

Béjar, Susana. 2003. Phi-syntax: A theory of agreement. Ph.D. Dissertation, University of Toronto.

Béjar, Susana and Milan Rezac. 2003. Person licensing and the derivation of PCC effects. In *Romance linguistics: Theory and acquisition*, eds. Ana Teresa Pérez Leroux and Yves Roberge, 49–62. Amsterdam: John Benjamins.

Béjar, Susana and Milan Rezac. 2009. Cyclic Agree. *Linguistic Inquiry* 40:35–73.

Bianchi, Valentina. 2006. On the syntax of personal arguments. *Lingua* 116.

Bonet, Eulàlia. 1991. Morphology after syntax: Pronominal clitics in Romance. Ph.D. Dissertation, Massachusetts Institute of Technology.

Borer, Hagit. 1984. Restrictive relatives in Modern Hebrew. *Natural Language and Linguistic Theory* 2:219–260.

Butler, Inez M. 1980. *Gramática zapoteca: Zapoteco de Yatzachi el Bajo*. Mexico City: Instituto Lingüístico de Verano.

Cardinaletti, Anna and Michal Starke. 1999. The typology of structural deficiency: A case study of the three classes of pronouns. In *Clitics in the languages of Europe*, ed. H. C. van Riemsdijk, 145–233. Berlin: Mouton de Gruyter.

Chomsky, Noam. 1995. Bare phrase structure. In *Evolution and revolution in linguistic theory*, eds. Héctor Campos and Paula Kempchinsky, 57–109. Washington: Georgetown University Press.

Chomsky, Noam. 2000. Minimalist inquiries: The framework. In *Step by step: Essays on Minimalist syntax in honor of Howard Lasnik*, eds. Roger Martin, David Michaels, and Juan Uriagereka, 89–156. Cambridge, MA: MIT Press.

Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A life in language*, ed. Michael Kenstowicz, 1–52. Cambridge, MA: MIT Press.

Coon, Jessica and Stefan Keine. 2018. Feature gluttony. Ms., McGill University and University of Southern California, URL https://ling.auf.net/lingbuzz/004224.

D'Allessandro, Roberta. 2004. *Impersonal Si constructions: Agreement and interpretation*. Berlin: De Gruyter.

Doliana, Aaron. 2014. The super-strong person–case constraint: Scarcity of resources by scale-driven impoverishment. In *Console xxii: Proceedings of the 22nd conference of the student organization of linguistics in europe, lisbon, january 2014*, eds. Martin Kohlberger, Kate Bellamy, and Eleanor Dutton, 58–80.

Farkas, Donka and Kostas Kazazis. 1980. Clitic pronouns and topicality in Rumanian. *Chicago Linguistic Society (CLS)* 16:75–82.

Fassi Fehri, Abdelkader. 1993. *Issues in the structure of Arabic clauses and words*. Amsterdam: Springer.

Foley, Steven, Nick Kalivoda and Maziar Toosarvandani. 2019. Forbidden clitic clusters in Zapotec. *Chicago Linguistic Society (CLS)* 53:87–102.

Foley, Steven, Nick Kalivoda and Maziar Toosarvandani. To appear. Gender–Case Constraints in Zapotec. *Workshop on Structure and Constituency in Languages of the Americas (WSCLA)* 22.

Foley, Steven and Maziar Toosarvandani. To appear. Pronoun cliticization, *wh*-movement, and the Principle of Minimal Compliance. *North East Linguistic Society (NELS)* 49.

Grimshaw, Jame. 2001. Optimal clitic positions and the lexicon in romance clitic systems. In

Optimality-theoretic syntax, eds. Géraldine Legendre, Jane Grimshaw, and Sten Vikner, 205–240. MIT Press.

Gutiérrez Lorenzo, Ambrocio. 2014. Construcciones de verbos seriales en el zapoteco de Teotitlán del Valle. Master's thesis, Centro de Investigaciones y Estudios Superiores en Anthropología Social.

Harbour, Daniel. 2008. *Morphosemantic number: From Kiowa noun classes to UG number features*. Dordrecht: Springer.

Harbour, Daniel. 2011. Valence and atomic number. *Linguistic Inquiry* 42:561–594.

Harbour, Daniel. 2014. Paucity, abundance, and the theory of number. *Language* 90:185–229.

Harbour, Daniel. 2016. *Impossible persons*. Cambridge, MA: MIT Press.

Harley, Heidi and Elizabeth Ritter. 2002. Person and number in pronouns: A feature-geometric analysis. *Language* 78:482–526.

Hiraiwa, Ken. 2000. On nominative-genitive conversion. *MIT Working Papers in Linguistics* 39:66–124.

Hiraiwa, Ken. 2001. Multiple Agree and the defective intervention constraint in Japanese. *MIT Working Papers in Linguistics* 40:67–80.

Long, Rebecca and Sofronio Cruz. 2000. *Diccionaria Zapoteco de San Bartolomé Zoogocho Oaxaca*. Mexico City: Instituto Lingüístico de Verano.

López, Filemón and Ronaldo Newberg. 2005. *La conjugación del verbo zapoteco, zapotevco de Yalálag*. Mexico City: Instituto Lingüístico de Verano.

Marlett, Stephen A. 2010. Personal pronouns: Inventory. In *The Zapotec grammar files*, eds. Cheryl A. Black, H. Andrew Black, and Stephen A. Marlett. SIL International.

Nevins, Andrew. 2007. The representation of third person and its consequences for person-case effects. *Natural Language and Linguistic Theory* 25:273–313.

Nevins, Andrew. 2011. Multiple agree with clitics: Person complementarity vs. omnivorous number. *Natural Language and Linguistic Theory* 29:939–971.

Nevins, Andrew and Oana Săvescu. 2010. An apparent 'number case constraint' in romanian. In *Romance linguistics 2008: Interactions in romance. selected papers from the 38th linguistic symposium on romance languages (lsrl), urbana-champaign, april 2008*, 185–200.

Ormazabal, Javier and Juan Romero. 2007. The object agreement constraint. *Natural Language and Linguistic Theory* 25:315–347.

Pancheva, Roumyana and Maria Luisa Zubizarreta. 2017. The Person Case Constraint: The syntactic encoding of perspective. *Natural Language and Linguistic Theory* .

Perlmutter, David. 1971. *Deep and surface structure constraints in syntax*. New York: Holt, Reinhart, and Winston.

Preminger, Omer. 2011. Asymmetries between person and number in syntax: A commentary on Baker's SCOPA. *Natural Language and Linguistic Theory* 29:917–937.

Preminger, Omer. 2014. *Agreement and its failures*. Cambridge, MA: MIT Press.

Preminger, Omer. 2019. What the PCC tells us about "abstract" agreement, head movement, and locality. *Glossa* 4:13.

Prince, Alan and Paul Smolensky. 1993. Optimality theory: Constraint interaction in generative grammar.

Rezac, Milan. 2011. *Phi-features and the modular architecture of language*. Dordrecht: Springer.

Rivero, María Luisa and Dana Geber. 2003. Quirky subjects and person restrictions in Romance: Rumanian and Spanish. *Cahiers Linguistiques d'Ottawa* 31:53–66.

Rizzi, Luigi. 1990. *Relativized minimality*. Cambridge, MA: MIT Press.
Sauerland, Uli. 2006. On the semantic markedness of phi-features. In *Phi theory: Phi-features across interfaces and modules*, eds. Daniel Harbour, David Adger, and Susan Béjar, 57–82. Oxford: Oxford University Press.
Sauerland, Uli, Jan Anderssen and Kazuko Yatsushiro. 2005. The plural is semantically unmarked. In *Linguistic evidence: Empirical, theoretical, and computational perspectives*, 413–434. Berlin: De Gruyter.
Sigurðsson, Halldór Ármann. 2004. Icelandic non-nominative subjects: Facts and implications. In *Non-nominative subjects*, eds. Peri Bhaskararao and K. V. Subbarao, volume 2, 137–159. Amsterdam: John Benjamins.
Silverstein, Michael. 1981. Case marking and the nature of language. *Australian Journal of Linguistics* 1:227–244.
Sonnenschein, Aaron. 2004. A descriptive grammar of San Bartolomé Zoogocho Zapotec. Ph.D. Dissertation, University of Southern California.
Sportiche, Dominique. 1993. Clitic constructions. In *Phrase structure and the lexicon*, eds. Johan Rooryck and Laurie Zaring, 213–276. Dordrecht: Springer.
Suñer, Margarita. 1988. The role of agreement in clitic-doubled constructions. *Natural Language and Linguistic Theory* 6:391–434.
Toosarvandani, Maziar. 2017. On reaching agreement early (and late). In *Asking the right questions: Essays in honor of Sandra Chung*, eds. Jason Ostrove, Ruth Kramer, and Joseph Sabbagh, 124–138. Santa Cruz, CA: Department of Linguistics, University of California, Santa Cruz.
Uriagereka, Juan. 1995. Aspects of the syntax of clitic placement in Western Romance. *Linguistic Inquiry* 26:79–123.
Walkow, Martin. 2012. Cyclic agree derives restrictions on cliticization in Classical Arabic. In *Papers from Arabic Linguistics XXVI: Papers from the annual symposium on Arabic linguistics, 2012*, eds. Reem Khamis-Dakwar and Karen Froud, 135–160. Amsterdam: John Benjamins.