

Feature Gluttony

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This article develops a new approach to a family of hierarchy-effect-inducing configurations, with a focus on Person Case Constraint effects, dative-nominative configurations, and copula constructions. The main line of approach in the recent literature is to attribute these effects to failures of ϕ -Agree or, more specifically, failures of nominal licensing or case checking. We propose that the problem in these configurations is unrelated to nominal licensing, but is instead the result of a probe participating in more than one Agree dependency, a configuration we refer to as *feature gluttony*. Feature gluttony does not in and of itself lead to ungrammaticality; rather, it can create irresolvably conflicting requirements for subsequent operations. We argue that in the case of clitic configurations, a probe that agrees with more than one DP creates an intervention problem for clitic doubling. In violations involving morphological agreement, gluttony in features may result in a configuration with no available morphological output.

Keywords: Agree, hierarchy effects, Person Case Constraint, ϕ -features

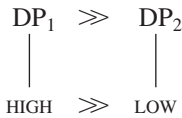
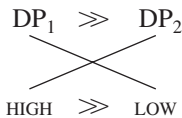
1 Introduction

This article develops a new model of syntactic *hierarchy effects*, including those found with the Person Case Constraint (PCC) (Perlmutter 1971, Bonet 1991, Anagnostopoulou 2003, Nevins 2007), in Icelandic dative-nominative constructions (Sigurðsson 1996, Sigurðsson and Holmberg 2008), and in German copula constructions (Coon, Keine, and Wagner 2017, Keine, Wagner, and Coon 2019). The distinguishing feature of hierarchy effects is that a configuration containing two DPs is grammatical or ungrammatical depending on the relative ranking of the two DPs with respect to some grammatical hierarchy—for example, $1 > 2 > 3$ for person, or $PL > SG$ for number.¹ We follow previous work in taking these hierarchies to be not encoded directly in the grammar, but rather to emerge from the feature specifications of the DPs involved, discussed further below.

This project grew out of collaborative work with Michael Wagner, who suggested putting the problem in the probe. Many thanks to Jon Ander Mendia for Basque judgments and data help, to Rajesh Bhatt for help with Hindi-Urdu, and to Filipe Hisao Kobayashi for help with Brazilian Portuguese. For valuable comments, feedback, and discussions, we are grateful to David Adger, Nico Baier, Mark Baker, Rajesh Bhatt, Kenyon Branan, Steven Foley, Clarissa Forbes, Martin Haspelmath, Laura Kalin, Martha McGinnis, Roumi Pancheva, Omer Preminger, Betsy Ritter, Carson Schütze, Zach Stone, and Maziar Toosarvandani. Special thanks are due to two anonymous *LI* reviewers, Amy Rose Deal, and Ethan Poole for providing extensive comments on an earlier draft. Versions of this work have been presented at the Manitoba Workshop on Person (University of Manitoba), the Workshop on Comparative Syntax and the Workshop on Approaches to *Wh*-Intervention (National University of Singapore), NELS 50 (MIT); at these universities: McGill, Cornell, UCLA, Princeton, Maryland, UC Berkeley, Calgary, MIT, and Leipzig; and to students in the 2019 McGill Syntax Seminar. We thank the audiences for their questions and feedback. Authors' names are listed in alphabetical order.

¹ What we call “hierarchies” here have also been referred to as “scales” in the literature (see, e.g., Aissen 1999, 2003, Haspelmath 2004, to appear).

Such configurations are grammatical if the structurally higher DP is ranked higher on these hierarchies than the structurally lower DP (as in (1); e.g., 1>3); but these configurations are ungrammatical if the structurally higher DP is ranked lower on these hierarchies than the structurally lower DP (as in (2); e.g., 3>1), a configuration that may be termed *inverse*. Hierarchy-violating inverse configurations commonly require a special form or rescue construction to obviate the violation.

(1) *Direct*(2) *Inverse*

One of most well-studied instances of a hierarchy effect is the PCC, an example of which is provided in (3), from Basque.² Basque displays what is known as the Strong PCC. The Strong PCC rules out configurations in which a 1st or 2nd person direct object cooccurs with an indirect object (with some important qualifications to be discussed in section 2.3). In the ditransitive constructions in (3), the indirect object (italicized) structurally c-commands the direct object (boldfaced). The 3>3 and 1>3 configurations in (3a) and (3b) are grammatical, while the 3>1 combination in (3c) and the 1>2 combination in (3d) result in ungrammaticality.³

(3) *Basque ditransitives*

- a. Zu-k *harakina-ri* **liburua** saldu d-i-o-zu.
 you-ERG butcher-DAT book.ABS sold 3ABS-AUX-3DAT-2ERG
 ‘You have sold the book to the butcher.’ (✓3DAT > 3ABS)
- b. Zu-k *ni-ri* **liburua** saldu d-i-da-zu.
 you-ERG me-DAT book.ABS sold 3ABS-AUX-1DAT-2ERG
 ‘You have sold the book to me.’ (✓1DAT > 3ABS)
- c. *Zu-k *harakina-ri* **ni** saldu n-(a)i-o-zu.
 you-ERG butcher-DAT me.ABS sold 1ABS-AUX-3DAT-2ERG
 Intended: ‘You have sold me to the butcher.’ (*3DAT > 1ABS)
- d. *Haiek *ni-ri* **zu** saldu z-ai-da-te.
 they.ERG me-DAT you.ABS sold 2ABS-AUX-1DAT-3ERG
 Intended: ‘They have sold you to me.’ (*1DAT > 2ABS)

² Abbreviations in glosses follow the Leipzig glossing conventions, with the following additions: ADDR – addressee; CL – clitic; DO – direct object; IO – indirect object; PART – participant; SPKR – speaker. In some cases, glosses have been modified from the original sources for consistency.

³ The examples in (3a,d) are due to Jon Ander Mendia (pers. comm.); (3b–c) are from Laka 1993:27. Below, Basque examples not otherwise attributed are due to Jon Ander Mendia (pers. comm.).

Much previous work on hierarchy effects has argued that these and other hierarchy-effect-inducing configurations arise in environments in which two accessible DPs are found in the same domain as a single agreeing verbal head (e.g., Anagnostopoulou 2003, 2005, Béjar and Rezac 2003, Nevins 2007, Preminger 2014, 2019, Pancheva and Zubizarreta 2018, Oxford 2019, Stegovec 2020, among many others). This is schematized in (4). Descriptively, hierarchy violations generally emerge when the lower DP is featurally more highly specified or marked than the higher DP, as in (2).

(4) [Probe⁰ [... DP₁ ... [... DP₂ ...]]]

While such hierarchy effects have been productively approached from a considerable range of perspectives (see, e.g., Anagnostopoulou 2017 for an overview of approaches to the PCC), many accounts share the basic analytical intuition that these effects are the result of *failed agreement*, whereby an obligatory Agree or movement dependency between DP₂ and a verbal head (Probe⁰ in (4)) is rendered impossible due to the presence of the higher DP₁ (Anagnostopoulou 2003, 2005, Béjar and Rezac 2003, Nevins 2007, Baker 2008, 2011, Richards 2008, Preminger 2019, Stegovec 2020; also see Adger and Harbour 2007). The necessity for this Agree or movement dependency can be framed in terms of case assignment and/or nominal licensing (e.g., Anagnostopoulou 2003, 2005, Béjar and Rezac 2003, Adger and Harbour 2007, Baker 2008, 2011, Richards 2008, Kalin 2019, Preminger 2019) or in the need of the DP/clitic to acquire interpretable ϕ -features (Stegovec 2020). Despite significant differences in their technical underpinnings, scope, and execution, what these approaches share is the intuition that the PCC is due to the disruption of this Agree or movement dependency with DP₂ by the intervening DP₁.

In this article, we explore a new take on hierarchy effects that does not view them as resulting from failed Agree or failures of nominal licensing. Rather, we propose that hierarchy effects are the result of having *too much Agree*. Specifically, we argue that in hierarchy-violating structures, a probe participates in more than one Agree relation, effectively “biting off more than it can chew,” a configuration that we refer to as *feature gluttony*. For example, in the structure in (4), feature gluttony (and hence a hierarchy effect) arises when the probe enters into Agree with *both* DP₁ and DP₂.

(5) [Probe⁰ [... DP₁ ... [... DP₂ ...]]] → *feature gluttony*



Feature gluttony—that is, Agree between a single probe and multiple DPs—does not in and of itself cause ungrammaticality, but it can create irresolvably conflicting requirements for subsequent operations, which gives rise to ineffability. The view that we are proposing thus amounts to a reversal of the standard explanation for hierarchy effects like the PCC: hierarchy effects do not arise if Agree between a probe and a DP is blocked by a higher DP; rather, they arise when such Agree takes place *in addition to* Agree with a higher DP. A second key difference between gluttony and traditional approaches is that the gluttony account does *not* attribute hierarchy effects to failures of nominal licensing; in fact, nominal licensing plays no role at all.

In order to characterize the configurations in which double Agree takes place, as in (5), we draw on recent work on Cyclic Agree by Béjar (2003) and Béjar and Rezac (2009) (also see the

distinction between *interaction* and *satisfaction* in Deal 2015). From these works, we adopt the idea that probes may consist of hierarchies of subfeatures (or “segments”), which can agree independently and with distinct DPs. On our account, gluttony configurations such as (5) are characterized by DP_2 being featurally more specified than DP_1 relative to the specification of the probe. In such configurations, some segments of the probe will agree with DP_1 , while others will agree with DP_2 , giving rise to feature gluttony as in (5).

An important motivation for this shift in perspective on the syntax of hierarchy effects comes from the observation that hierarchy effects (including PCC effects) frequently disappear in configurations in which no agreement or cliticization takes place (e.g., certain nonfinite clauses) and are wholly absent in languages that lack agreement or clitics altogether (Preminger 2019). In a nutshell, if hierarchy effects are due to failed Agree with a verbal head, then it is unexpected that they should disappear in configurations in which no Agree at all takes place with a verbal head. By contrast, on our proposal that hierarchy effects are the result of too much Agree with a verbal head, it follows directly that configurations that lack such Agree should not display hierarchy effects. Additional motivation comes from variation in the different possible effects of feature gluttony and the corresponding repair strategies used to circumvent them.

The rest of this article is organized as follows. We begin in section 2 with an overview of licensing-based accounts of the PCC. This section provides necessary empirical and theoretical background, and also highlights some of the concerns raised by this family of accounts. Section 3 introduces our notion of feature gluttony. In PCC configurations, also discussed in section 3, a probe that interacts with more than one DP creates an intervention problem for clitic doubling. In violations involving agreement, examined for German copula constructions and Icelandic dative-nominative configurations in section 4, feature gluttony results in a configuration with no available morphological output. Section 5 concludes with a summary and possible extensions.

2 Against the PCC as Failed Agree

As mentioned in section 1, many current accounts analyze the PCC in terms of failed Agree: an obligatory Agree relationship between a DP/clitic and a verbal head cannot be established, leading to ungrammaticality. Our goal here is not to give a comprehensive overview or assessment of such accounts; rather, it is to examine some of their core properties and then to highlight a class of challenges to the broad view that PCC effects are due to failed Agree. We show that PCC effects (and, as we will show, hierarchy effects more generally) disappear in environments that lack agreement or clitics, such as certain nonfinite clauses (Preminger 2011, 2019). This observation is surprising on a failed-Agree account.

To facilitate discussion, we will illustrate the challenge on the basis of highly influential licensing-based approaches to the PCC. On these approaches, failed Agree between a verbal head and a DP leads to ungrammaticality because it leaves the DP unlicensed/caseless (Anagnostopoulou 2003, 2005, Béjar and Rezac 2003, Adger and Harbour 2007, Baker 2008, 2011, Kalin 2019, Preminger 2019). In section 2.1, we present some additional background on PCC effects; in section 2.2, we illustrate how a licensing-based account derives the core effects. In section 2.3, we lay out various empirical challenges for the view that PCC effects result from failures of nominal licensing or failed Agree more generally. These challenges then pave the way for our

proposal in section 3 that PCC effects are the result of *too much* Agree, or in our terms, feature gluttony.

2.1 *Some Background on the PCC*

The PCC bans certain combinations of person features across multiple phonologically weak arguments, most commonly pronominal clitics (though we will give examples from other multiple-DP constructions below; see also Béjar and Rezac 2009 and Kalin and Van Urk 2015 for extensions of a licensing account to transitive configurations in certain languages).⁴ In the Basque example in (3), for example, a 1st or 2nd person direct object is banned in the presence of an indirect object. PCC effects have been documented in a wide range of unrelated languages, including Greek, Spanish, Basque, Passamaquoddy, Warlpiri, Slovenian, Kiowa, French, Sambia, Yimas, Georgian, and Albanian, to name a few (e.g., Perlmutter 1971, Bonet 1991, Laka 1993, Anagnostopoulou 2003, Haspelmath 2004, Adger and Harbour 2007, Nevins 2007, Ormazabal and Romero 2007, Riedel 2009, Doliana 2013, Pancheva and Zubizarreta 2018, Stegovec 2020); see Anagnostopoulou 2017:3006 for an extensive list of languages and references.

Despite crosslinguistic commonalities, different “strengths” of PCC have been observed (e.g., Perlmutter 1971, Bonet 1991, 1994, Anagnostopoulou 2005, 2017, Bianchi 2006, Nevins 2007, Doliana 2013, Pancheva and Zubizarreta 2018, Stegovec 2020). The Strong PCC, instantiated, for example, by Basque in (3), bans any clitic combination in which the lower direct object is 1st or 2nd person. By contrast, the Weak PCC bans 1st or 2nd person direct objects only if the indirect object is 3rd person. Varieties of the PCC are represented in table 1. Despite this variability, what they have in common is that violations arise when the lower direct object is 1st or 2nd person.⁵

2.2 *PCC Effects as Licensing Failures*

Many current accounts of the PCC attribute the restriction to failed Agree, and in particular, to failures of nominal licensing (see Albizu 1997 and Rezac 2008b for arguments from Basque that

⁴ The PCC is frequently stated as a restriction on certain *combinations* of phonologically weak ϕ -exponents, but Albizu (1997:4n8) notes that Tsotsil presents an apparent exception. As in other Strong PCC patterns shown below, Tsotsil prohibits 1st or 2nd person direct objects in all ditransitives. This restriction holds even though Tsotsil has no overt exponent for 3rd person indirect objects and never allows for the cooccurrence of two object agreement markers/clitics (Tsotsil is a primary/secondary object language in the sense of Dryer 1986, where only the highest object controls the verbal agreement marker). This PCC effect hence cannot be attributed to a restriction on *combinations* of morphemes (Aissen 1987; see also Shklovsky 2012 on related Tselal). Because our proposal here does not attribute the PCC to a restriction on combinations of morphemes, instead attributing it to competition among multiple elements for a single slot, it extends to the Tsotsil pattern if the null 3rd person object agreement is treated as a phonologically null morpheme or clitic (see Baker 2006 for the need to distinguish between absence of agreement and phonologically null agreement).

⁵ Here we set aside the “Super-Strong PCC” (Haspelmath 2004) and the “Giga PCC” or “Total PCC” (Doliana 2013, Preminger 2019). The Super-Strong PCC rules out $3>3$ in addition to $3>1/2$, a pattern found in Kambara (Malayo-Polynesian; see Klamer 1997); the Total or Giga PCC bans *all* combinations of weak pronouns (e.g., Cairene Arabic; see Doliana 2013). Following others, we suggest that these less common bans may be better suited to a morphophonological or prosodic explanation (see, e.g., Nevins 2007 on Spanish “spurious *se*” and Preminger 2019 for discussion). For example, in Kambara the two object clitics bear the same case and occur adjacent to each other. The ban on $3>3$ combinations may thus be attributed to a constraint on adjacent clitics with identical person and case features. The Total or Giga PCC might plausibly be the result of a prosodic constraint (Preminger 2019:3).

Table 1

Types of the Person Case Constraint

	Indirect object	>	Direct object	Examples
Strong	*1/2/3	>	1/2	Basque (Laka 1993), Greek (Anagnostopoulou 2003), Kiowa (Adger and Harbour 2007)
Weak	*3	>	1/2	Varieties of Catalan (Bonet 1991) and Italian (Bianchi 2006), Samba (Riedel 2009)
Me-First	*1/2/3	>	1	Romanian (Nevins 2007), Bulgarian (Pancheva and Zubizarreta 2018)
Ultrastrong	$\left\{ \begin{array}{l} *3 \\ *2 \end{array} \right.$	$\left\{ \begin{array}{l} > \\ > \end{array} \right.$	$\left\{ \begin{array}{l} 1/2 \text{ \&} \\ 1 \end{array} \right.$	Classical Arabic (Fassi Fehri 1988, Nevins 2007)

the PCC is syntactic in nature, not purely morphological; also see Perlmutter 1971 for relevant discussion). We illustrate this line of approach with the Person Licensing Condition (PLC) from Béjar and Rezac 2003, which is stated in (6) (also see Béjar and Rezac 2009). It is possible to analyze (6) in terms of the Case Filter (Anagnostopoulou 2003), but we will abstract away from the relationship between the two here (see also Baker 2008, 2011, Preminger 2014).

(6) *Person Licensing Condition (PLC)*

An interpretable [PART(ICIPANT)] feature must be licensed by entering into an Agree relation with a functional category.

(adapted from Béjar and Rezac 2003:53)

The feature [PART] is borne by 1st and 2nd person DPs, but not by 3rd person DPs. Individual analyses differ as to whether only 1st and 2nd person DPs need to be licensed (Béjar and Rezac 2003; also see Ormazabal and Romero 1998) or whether all DPs require licensing (i.e., abstract Case), but 1st/2nd person DPs must receive it in a special way (Baker 1996, Anagnostopoulou 2003); see Rezac 2008b for discussion. What licensing accounts of the PCC have in common is the proposal that there is something special about 1st and 2nd person DPs, to the exclusion of 3rd (see also for example Nichols 2001 and work discussed there) and that this property requires special licensing through ϕ -Agree. This is what (6) encodes.

Abstracting away from specific proposals, the general idea underlying this line of analysis is that PCC violations arise when the higher DP *intervenes* between the probe and a lower [PART] DP, preventing licensing of the [PART] DP. This is schematized for a PCC-violating 3>1 configuration in (7) (such as the Basque example in (3c)). Here, the object-licensing probe (typically located on *v*) first matches the 3rd person indirect object, but due to intervention, the probe cannot agree with the lower 1st person direct object, which hence remains unlicensed. This violates the PLC (6), leading to ungrammaticality.

$$(7) \text{ *}[\text{Probe}^0 [\dots \text{DP}_{[3\text{SG}]} [\dots \text{DP}_{[1\text{SG}]}]]] \rightarrow \text{licensing failure for DP}_{[1\text{SG}]}$$

By contrast, the structure for a PCC-obeying 1>3 configuration, like (3b), is shown in (8). As before, the relevant probe matches the indirect object, but it cannot agree with the direct object. In this case, however, because the direct object is 3rd person and hence does not bear a [PART] feature, it is not dependent on licensing through Agree with the probe. This lack of Agree is therefore harmless, and the structure converges.

$$(8) [\text{vP} \text{ Probe}^0 [\dots \text{DP}_{[1\text{SG}]} [\dots \text{DP}_{[3\text{SG}]}]]]$$

As a result, on this general line of analysis, 1st and 2nd person DPs remain unlicensed if they are separated from *v* by an indirect object. This derives the Strong PCC. For other varieties of PCC, more needs to be said (see, e.g., Anagnostopoulou 2005 and Nevins 2007 for relevant proposals and discussion). Because we will ultimately argue against a licensing account of the PCC, we will not review its extensions to varieties other than the Strong PCC in detail here (though see footnotes 17 and 20).

2.3 Caveats for Licensing Accounts

While a licensing-based approach elegantly captures many of the special properties of [PART] DPs in hierarchy-violating configurations, recent work has shown that it cannot be the case that *all* [PART] DPs need licensing through ϕ -Agree, as in the original formulation in (6). Instead, additional caveats are required, and these caveats pose an analytical challenge to licensing-based accounts of the PCC. The most explicit exploration of such caveats is found in Preminger 2011, 2019. Preminger argues that the PLC does not apply to all DPs; rather, it applies only to those DPs that occur in a clause that contains a ϕ -probe. This revised version of the PLC is stated in (9); also see Preminger 2019:7 for a more detailed formulation that is also compatible with our proposal here.⁶

(9) *Person Licensing Condition (PLC)*

A [PART(ICIPANT)] feature on a DP *in the same clause as a person ϕ -probe* must be agreed with by that ϕ -probe.

(adapted from Preminger 2011:931; our emphasis)

(9) is weaker than the original PLC in (6) as it includes an additional caveat: licensing of [PART] through Agree is required only for those DPs that appear in a clause that also hosts a ϕ -probe. DPs in clauses that do not contain a ϕ -probe do not need to be licensed by Agree even if they

⁶ Preminger (2019) adds another caveat: namely, that DPs that are in case forms inaccessible to Agree must also be exempt from the requirement that they be licensed by a ϕ -probe.

bear [PART]. (9) thus amounts to the claim that the licensing need of a [PART] DP is not absolute, but relative to the syntactic context of this DP.

Crucial evidence for the need for this caveat comes from Basque (Preminger 2011, 2019). Here, PCC effects disappear in nonfinite (i.e., probeless) environments (Laka 1993:27, Albizu 1997:5, Arregi and Nevins 2012:65–69). Recall from (3) that Basque exhibits PCC effects in ditransitive constructions, such that inverse “indirect object>direct object” combinations such as 3>1 are ruled out (see (10a)). Surprisingly, if the same argument configuration appears in a nonfinite clause, no PCC effect obtains, as shown for case-marked infinitival clauses in (10b) (based on Laka 1993:27; using Preminger’s 2009 terminology) and for adpositional clauses in (10c).

- (10) *Basque PCC effects disappear in nonfinite clauses*
- a. *Zu-k harakina-ri ni saldu n-(a)i-o-zu.
 you-ERG butcher-DAT me.ABS sold 1ABS-AUX-3DAT-2ERG
 ‘You have sold me to the butcher.’ (*3DAT > 1ABS)
- b. Gaizki iruditzen Ø-zai-t [zu-k harakina-ri ni
 wrong look.IPFV 3ABS-AUX-1DAT you-ERG butcher-DAT me.ABS
 sal-tze-a].
 sell-NMLZ-ART.ABS
 ‘It seems wrong to me for you to sell me to the butcher.’ (✓3DAT > 1ABS)
- c. Zu-k [harakina-ri ni sal-tze-n] probatu d-u-zu.
 you-ERG butcher-DAT me.ABS sell-NMLZ-LOC attempted 3ABS-AUX-2ERG
 ‘You have attempted to sell me to the butcher.’ (✓3DAT > 1ABS)

Why is it that the same combination of verb, indirect object, and direct object results in a PCC violation in finite clauses (10a), but not in nonfinite clauses (10b–c)? An important difference between (10a) and (10b–c) is that the direct and indirect objects in (10b–c) are not clitic-doubled or agreed with in either the embedded clause or the matrix clause as these nonfinite clauses do not contain ϕ -agreement. Following Preminger (2019), we take this to mean that no ϕ -Agree with these objects has taken place (also see Anagnostopoulou 2003:315, 320 on Greek). It seems to be the absence of this ϕ -Agree that underlies the absence of PCC effects in these configurations.

Effects like those in (10) are not limited to Basque. The disappearance of hierarchy effects in environments that lack ϕ -agreement or cliticization has also been documented for nominalized clauses in Georgian (Bonet 1991:189–191, Béjar and Rezac 2003:50; Léa Nash, pers. comm.) and—as we will show in section 4—in nonfinite clauses in Icelandic (Sigurðsson and Holmberg 2008, Preminger 2011) and German (Keine, Wagner, and Coon 2019). In a similar vein, repairs to the PCC in languages like Greek and Spanish involve the absence of cliticization, discussed in section 3.5.

The observation that hierarchy effects like the PCC disappear in configurations in which no Agree takes place should find an explanation in the analysis of hierarchy effects. But as Preminger (2011, 2019) points out, a blanket licensing requirement on [PART] DPs such as the PLC in (6) does not lend itself to such an explanation. Recall that the standard PLC in (6), which requires

all [PART] DPs to be licensed through ϕ -Agree, explains the ungrammaticality of (10a) as a licensing failure because the direct object *ni* cannot be agreed with. However, given that the direct object is not agreed with in (10b–c) either, the original PLC in (6) would predict (10b–c) to also give rise to a licensing failure, contrary to fact.⁷ Conversely, given that the direct object is clearly licensed in (10b–c), whatever licensing mechanism applies in (10b–c) should also be available in (10a). But this would undermine the licensing-based account of the ungrammaticality of (10a). The original PLC in (6) therefore leaves the crucial contrast in (10) unaccounted for.

Preminger's (2011, 2019) revised PLC in (9) is designed to resolve this paradox within the confines of a licensing account. It does so by stipulating that only [PART] DPs that have a clausemate ϕ -probe need to be licensed through ϕ -Agree. Because the direct object in (10b–c) does not have a clausemate ϕ -probe, it is exempted from the licensing requirement, and no PCC effect arises. A related proposal is advanced by Anagnostopoulou (2003, 2005), who appeals to a default licensing mechanism to account for grammatical Greek configurations that lack clitic doubling. Applied to the Basque facts in (10), her proposal would require that such default licensing be available in nonfinite clauses, but not in finite clauses. Another related suggestion is made by Pancheva and Zubizarreta (2018:1321–1322), who stipulate that their "P-Constraint" only targets agreeing DPs, exempting the object in (10b–c).

We conclude with Preminger (2011, 2019) that facts like those in (10) cast doubt on the original version of the PLC in (6)—or any account that attributes the PCC to failed obligatory ϕ -Agree with a DP. Preminger's (2011, 2019) weakened version of the PLC is empirically more adequate because it stipulates that DPs that occur in a clause without a ϕ -probe are exempt from the licensing requirement. While this stipulation derives the facts in (10), it raises important new questions. As it stands, this caveat is successful because it effectively restates the empirical puzzle as part of the analytical constraint. That is, it does not explain *why* a nominal's licensing needs should be suspended in contexts in which a licensing probe is absent or how the sensitivity of the licensing requirement to the presence of a clausemate ϕ -probe could be derived from more basic principles.

Rather than supplementing the PLC with these caveats, we take the empirical evidence to suggest that a different approach is warranted, one that severs PCC effects from nominal licensing altogether. Specifically, we take the discovery that PCC effects disappear in the absence of ϕ -Agree to suggest that *the problem lies with the ϕ -probe*. We propose a significant shift in perspective on hierarchy effects. Rather than attributing them to failures of nominal licensing or failed Agree more generally, we explore the view that these effects arise from a problem *created by* the ϕ -probe.

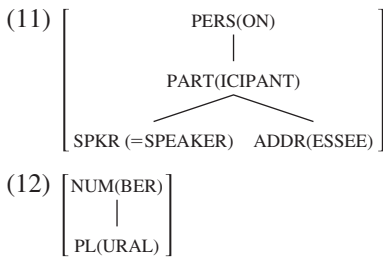
⁷ In fact, in (10b–c) neither the direct nor the indirect object is agreed with. To the extent that we might expect a contrast between the two cases, a PLC account might lead one to expect the licensing problem to be *worse* in (10b–c) than in (10a)—the opposite of what we find.

3 Gluttony and Clitics

In this section, we lay out an alternative means of deriving the PCC effects examined in section 2. We attribute PCC and other hierarchy effects to what we term *feature gluttony*. Because our account is not based on nominal licensing, the caveat described above is not necessary. We begin by developing our account for clitic doubling and the PCC in this section; in section 4, we then apply the proposal to hierarchy effects in the domain of agreement.

3.1 Proposal: Probe Gluttony

3.1.1 Feature Geometries We take person and number features to be arranged in feature geometries (Harley and Ritter 2002, Béjar 2003, among many others), shown in (11) and (12) for person and number, respectively.



These geometries encode entailment relations among features, such that features on lower nodes entail the features on higher nodes. For example, the specification for 1st person is internally complex, containing not only the feature [SPKR], but the full set of entailed features, [PERS [PART [SPKR]]]. A 2nd person DP is specified as [PERS [PART [ADDR]]], while 3rd person DPs are specified simply as [PERS] (i.e., they are characterized by the absence of the three other features; see Nevins 2007 for arguments that 3rd person does not simply correspond to the wholesale absence of person features). The situation is analogous for number: singular is characterized by the feature [NUM], whereas plural consists of [NUM [PL]]. More complex specifications are possible, but not discussed here.⁸

We furthermore assume that ϕ -probes too may vary in the degree to which they are articulated, in a way analogous to the hierarchies in (11) and (12). In Deal's (2015) terms, they may vary in what kinds of features they are *satisfied by*—in other words, what kinds of features must be matched in order for the probe to stop searching for a goal (Béjar 2003, Béjar and Rezac 2009,

⁸ Because these feature structures determine the application of the syntactic operation Agree, they must be syntactically represented, not part of PF or morphology. We assume that these structures are universally constrained in that they represent semantic entailments, though crosslinguistic variation may exist in the number of contrasts present in a given system, discussed in detail in Harley and Ritter 2002. The features could either be part of Universal Grammar or assembled in a presyntactic generative lexicon; see also footnote 24. We thank a reviewer for raising this question.

Preminger 2014, Oxford 2019). Specifically, we assume that probes may consist of hierarchically organized *segments* (adopting terminology from Béjar and Rezac 2009). Examples are provided in (13). The probe in (13a), for instance, is fully satisfied by any DP with person features. The probes in (13b) and (13c) are pickier: the probe in (13b) is fully satisfied by 1st and 2nd person DPs, while the probe in (13c) is fully satisfied only by 1st person DPs.

(13) a. [$uPERS$] $_{\pi}$ – fully satisfied by any person-bearing DP

b. $\left[\begin{array}{c} uPERS \\ | \\ uPART \end{array} \right]_{\pi}$ – fully satisfied by 1st and 2nd person DPs

c. $\left[\begin{array}{c} uPERS \\ | \\ uPART \\ | \\ uSPKR \end{array} \right]_{\pi}$ – fully satisfied by 1st person DPs

3.1.2 Agree Against this background, we adopt the definition of Agree in (14). Adopting a proposal by Béjar and Rezac (2009), Agree is *segment-based* in that it is initiated by probe segments. Segments on a probe agree simultaneously and independently of each other, by targeting the closest accessible DP that bears a matching segment. Continuing to use Deal's (2015) terminology, an agreeing segment [uF] *interacts* with the DP it agrees with in the sense that the entire feature geometry that contains [F] is copied over to the probe (see Béjar and Rezac 2009:45–46 for a similar view). In other words, feature copying is *coarse* in that it operates on entire feature geometries, not individual segments.

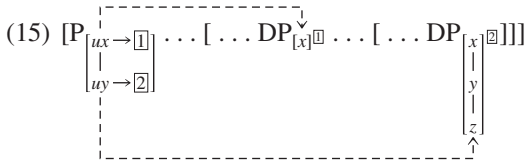
(14) *Agree*

A probe segment [uF] agrees with the closest accessible DP in its domain that bears [F]. If Agree is established, the hierarchy of segments containing [F] is copied over to the probe, valuing and thus removing [uF].

We adopt Preminger's (2014) obligatory-operations model, according to which Agree is obligatory if it is possible, but failure of [uF] to locate a matching [F] on a DP does not crash the derivation.

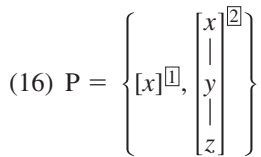
3.1.3 A Dry Run We begin by illustrating how the system works schematically, since it will be employed in our accounts of hierarchy effects involving both pronominal clitics (the remainder of this section) and morphological agreement (section 4), where different aspects of the overall proposal will be relevant. The goal at this point is to illustrate the mechanics of the system and introduce the notation to be used in the more detailed applications to follow. Specifically, we show how the Agree system in (14) operates with derivations representing the three types of possible configurations found between two goal DPs with respect to the unvalued segments of a higher probe: (a) the lower DP has *more* segments than the higher DP (as in $3 > 1$ for person features); (b) the lower DP has *fewer* segments than the higher DP ($1 > 3$); and (c) the two DPs have *identical* segments ($3 > 3$). The first type of configuration corresponds to an inverse configuration (see (2)), and it is only this configuration that results in gluttony.

Consider first the abstract structure in (15).



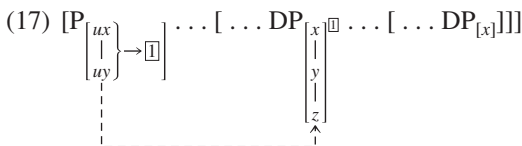
Here, the articulated probe P contains the unchecked segments $[ux [uy]]$. Both segments probe a structure that contains two DPs. The higher DP contains only the feature $[x]$; the lower DP contains the feature hierarchy $[x [y [z]]]$; as noted above, for person features, this could correspond to a $3 > 1$ configuration. In accordance with (14), both $[ux]$ and $[uy]$ probe the structure and agree with the closest DP that contains a matching segment. As a result, $[ux]$ agrees with the higher DP, and $[uy]$ agrees with the lower DP. For ease of notation, we depict such segment-based Agree using the identifiers $[1]$ and $[2]$. For example, “ $ux \rightarrow [1]$ ” in (15) expresses that $[ux]$ agrees with the DP bearing index $[1]$. “ $uy \rightarrow [2]$ ” expresses that $[uy]$ agrees with the DP bearing $[2]$.

Because in (15) both DPs are agreed with, the feature geometries of both DPs are copied over onto the probe, in accordance with (14). The corresponding content of the probe after Agree is given in (16).



In what follows, we refer to configurations in which segments of a single probe agree with distinct DPs as *feature gluttony* or simply *gluttony*. We call probes like (16), which have agreed with, and hence acquired values from, two DPs *gluttonous*. As discussed at length in the remainder of this article, gluttony and gluttonous probes do not by themselves give rise to ungrammaticality, but they may result in irresolvably conflicting requirements for subsequent operations, hence ineffability.

As a second example, consider the structure in (17). Here, the higher DP is featurally more specified than the lower DP (as would be the case, for example, with a $1 > 3$ configuration). Because the higher DP contains both $[x]$ and $[y]$, both $[ux]$ and $[uy]$ agree with it. The DP’s entire feature geometry containing $[x [y [z]]]$ is copied over onto the probe as a result. No Agree with the lower DP is established.



The content of P that results from (17) is given in (18). In this case, P is not gluttonous, as it has only agreed with a single DP.⁹

$$(18) P = \left\{ \begin{array}{c} [x] \\ | \\ y \\ | \\ z \end{array} \right\}$$

Finally, gluttony also does not arise if the two DPs are equally specified, as in a 3>3 configuration. This is illustrated in (19), where both DPs bear only [x]. [ux] agrees with the higher DP, and [x] is copied over onto the probe. [uy] is not matched by either DP and so does not agree. The resulting probe bears the specification in (20).

$$(19) [P \begin{array}{c} \uparrow \\ ux \rightarrow \\ | \\ uy \end{array} \dots [\dots DP_{[x]} \dots [\dots DP_{[x]}]]]$$

$$(20) P = \{ [x] \}$$

As noted above, failure to agree due to the absence of a matching goal is not fatal (Preminger 2014).

A general consequence of this system is that gluttony arises only if the lower DP contains *more* segments than the higher DP relative to the specification of the probe (assuming that the relevant features are hierarchically organized and thus not entirely disjoint). This is the case in (15), but not in (17) or (19). Gluttony is therefore limited to inverse configurations.¹⁰

Finally, as will become clear as we proceed, gluttony also does not, in and of itself, cause the derivation to crash. In sections 4 and 5, we will present specific cases in which gluttonous configurations converge. Nonetheless, a probe that has entered into multiple Agree relationships may precipitate other independently motivated problems, to which we turn next.

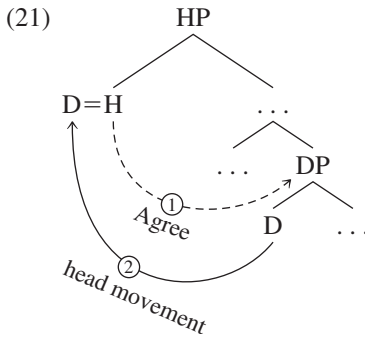
3.2 The Syntax of Cliticization: Auxiliary Assumptions

In order to apply this abstract system to the PCC, we adopt a few additional assumptions, which have been argued for independently in the recent literature on the PCC and cliticization. First, because the PCC is most commonly described for combinations of clitics, we need to make explicit our assumptions about cliticization. While morphological agreement (discussed further in section 4) is the morphological spell-out of valued ϕ -features, we follow much previous work

⁹ It is immaterial whether the DP's feature geometry is copied over twice (i.e., once by each agreeing segment) or once because of the assumption that probes are sets and the set-theoretic axiom that $\{A, A, \dots\} = \{A, \dots\}$.

¹⁰ Note that while our account may appear to bear some resemblance to Multiple Agree (Hiraiwa 2001, 2005, Anagnostopoulou 2005, Nevins 2007), in the system proposed here every individual Agree operation is strictly limited insofar as each *segment* of a complex probe agrees with (at most) one DP. Genuine Multiple Agree is ruled out.

that takes pronominal cliticization to be an instance of long head movement of a D head, triggered by an underlying ϕ -Agree relationship between the probe (clitic host) and the goal DP (see Anagnostopoulou 2003, Preminger 2019, and references cited there), as shown in (21). Here, the probe on the head H enters into Agree with the DP. By assumption, clitic-doubling probes then require that the D head of the goal DP be moved onto the head hosting the probe (H in this case). A number of specific implementations are conceivable, and the choice will not matter for our purposes here.¹¹



We have nothing new to say about *why* a clitic-doubling probe triggers head movement; we will take it as a matter of parametric variation whether ϕ -probes additionally trigger cliticization or not.

Second, we follow Béjar and Rezac (2003) in assuming that person and number are separate probes. For ease of reference, we will notate the person probe as π and the number probe as # (see also Laka 1993, Taraldsen 1995, Béjar 2003, Rezac 2003, Sigurðsson 2004a, Sigurðsson and Holmberg 2008, Kalin 2019). Furthermore, these two probes are universally ordered such that π probes before # (Béjar and Rezac 2003, Preminger 2011).¹²

Third, with Anagnostopoulou (2003), Béjar and Rezac (2003), and Preminger (2009), we assume that pronominal cliticization of a DP removes that DP as an intervener for subsequent operations because it makes this DP behave like the trace of A-movement (Chomsky 2000).

3.3 How This Works for the PCC

With these assumptions in place, we now turn to our account of PCC effects. The core difference between our proposal and standard licensing-based approaches is that these approaches attribute

¹¹ One option is the *big-DP* analysis (Uriagereka 1995, Cecchetto 2000, Belletti 2005, Arregi and Nevins 2008, 2012, Van Craenenbroeck and Van Koppen 2008, Roberts 2010). Other examples of accounts that involve both Agree and movement in the derivation of clitic doubling include Harizanov 2014 and Preminger 2019.

¹² However, for arguments in favor of the opposite approach, where # probes before π , see Sigurðsson and Holmberg 2008.

hierarchy violations to a failure of Agree and hence failed nominal licensing, while on our account the problem results instead from an overapplication of Agree.

Our initial illustration of the system will focus on the Weak PCC, as found for example in Catalan, which bans [PART] DPs from appearing in direct object position when the indirect object is 3rd person (*3>[PART]); all other combinations are grammatical, as shown in (22).

- (22) *Weak PCC*
 *3 > 1/2

Unlike in the Strong PCC, combinations of [PART] DPs are grammatical. To account for the Weak PCC, we propose that *v* contains a person probe π and a number probe #, specified as in (23). Crucially, π is articulated as [*u*PERS [*u*PART]]. For the sake of concreteness, we depict # as articulated to [*u*NUM [*u*PL]], on the assumption that split probes of this type are always internally articulated, though nothing hinges on this (see also the discussion in section 3.4.3). As noted in the previous section, we assume that π universally probes before #, which we indicate with the notation “[$\pi \triangleright \#$].”¹³

$$(23) \ v \left[\begin{array}{c} [uPERS] \\ | \\ [uPART]_{\pi} \end{array} \right] \triangleright \left[\begin{array}{c} [uNUM] \\ | \\ [uPL]_{\#} \end{array} \right]$$

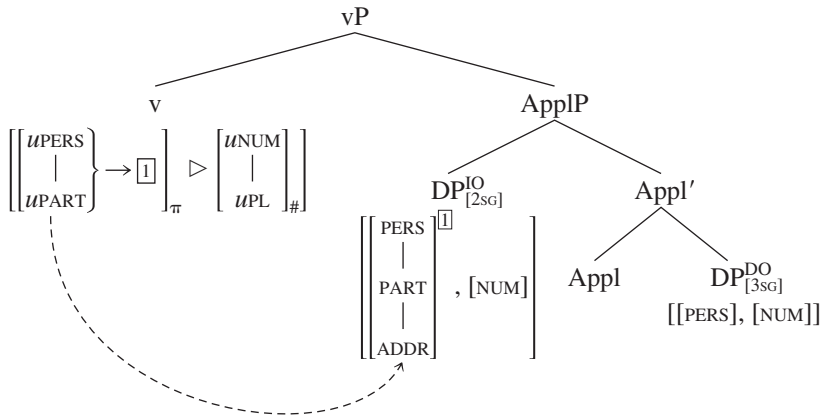
We now show how our account derives the Weak PCC in (22), illustrating with examples from Catalan. We first demonstrate a PCC-compliant 2>3 configuration like that in (24).

- (24) *Catalan*
 En Josep, **te** 'I va recomenar la Mireia.
 the Josep 2_{DAT.CL} 3_{ACC.CL} recommended the Mireia
 ‘She (Mireia) recommended him (Josep) to you.’ (✓2 > 3)
 (Bonet 1991:178)

In this derivation, both [*u*PERS] and [*u*PART] are matched by the indirect object and hence agree with it. Because π is a clitic-doubling probe in Catalan, the D of the indirect object DP undergoes head movement to *v*, creating the 2nd person clitic *te* in (24). This step is shown in (25).

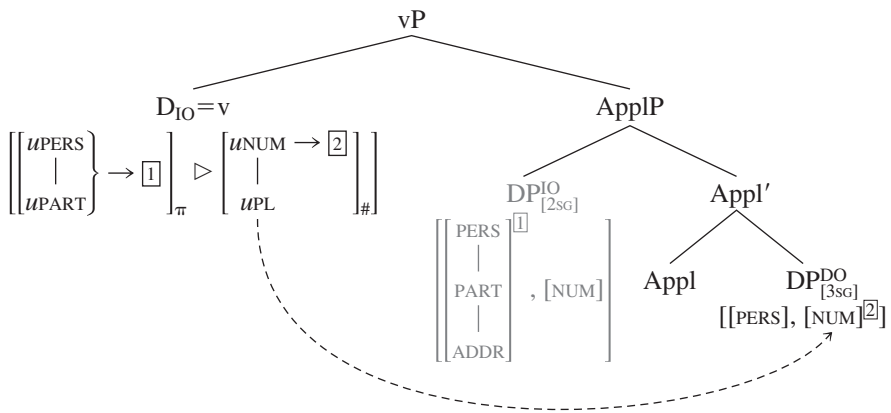
¹³ This might be implemented as extrinsic ordering of features on a head. See, for example, Müller 2010 and Georgi 2017 for proposals in a variety of domains.

(25) π -Agree in 2>3 configuration (24)



In the next step, shown in (26), # probes. As noted above, we assume, following Anagnostopoulou (2003), Béjar and Rezac (2003), and Preminger (2009), that clitic doubling of a DP removes that DP as an intervener for subsequent operations. Because the indirect object has been clitic-doubled as a result of π -Agree, it thus no longer intervenes for #-probing; # locates the lower direct object, agrees with its [NUM] feature, and creates the 3rd person direct object clitic double ('l in (24)).

(26) #-Agree in 2>3 configuration (24)



Because the probes on v have thus separately agreed with both objects and both have been clitic-doubled, the resulting configuration contains two clitics on v; setting aside possible language-specific morphological ordering restrictions on clitic combinations, this is shown in (27).

(27) $D_{DO}=D_{IO}=v$

Our proposal inherits from Béjar and Rezac (2003) the idea that the direct object clitic is the result of #-Agree, whereas the indirect object clitic results from π -Agree (for our account, the feature identity of the second probe will not play a role in PCC patterns; see also the discussion

in section 3.4.3). Because clitic doubling involves movement of a D head (see section 2.1), both clitics nonetheless express person and number features. On this “featural coarseness of clitic doubling,” see Preminger 2014:50–54.

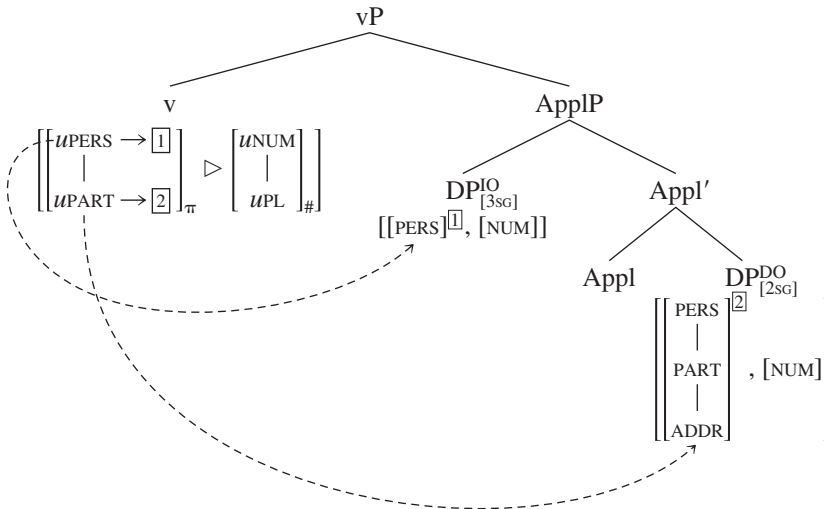
Next, we consider a PCC-violating 3>2 configuration, an example of which is provided in (28).

(28) *Catalan*

*A en Josep, **te** **li** va recomanar la Mireia.
 to the Josep 2ACC.CL 3DAT.CL recommended the Mireia
 Intended: ‘She (Mireia) recommended you to him (Josep).’ (*3 > 2)
 (Bonet 1991:179)

The schematic structure of π -Agree in (28) is shown in (29). Here, the segments on π agree with different DPs: [*uPERS*] agrees with the 3rd person indirect object; [*uPART*] finds no match on the higher indirect object and instead agrees with the lower 2nd person direct object.

(29) π -Agree in 3>2 configuration (28)



The two Agree relations in (29) give rise to gluttony: a single probe (i.e., π) has agreed with two DPs. Assuming that the clitic-doubling property of π in Catalan is a property of π 's individual segments, each segment demands that the DP it has agreed with cliticize (in other words, each segment is strong or has an EPP property). This requirement is stated in (30).

(30) If a segment of a clitic-doubling probe on a head H has agreed with a DP, this DP must cliticize onto H.

(30) is unproblematic for nongluttonous probes, where all agreeing segments agree with the same DP: cliticization of this DP then satisfies (30) for all relevant segments. By contrast, for gluttonous probes like π in (29), (30) gives rise to a conflict. First, because the segments of π have agreed

with two DPs, it is clear that cliticizing only one of these two DPs or neither DP violates (30) and is hence ruled out. Second, it is not possible to cliticize the two DPs *sequentially*, that is, to first cliticize one and then cliticize the other. Doing so would temporarily violate (30) for one of the two segments: cliticizing one DP but not the other in the first step means that there is a DP that a segment of π has agreed with, but that has not cliticized onto v , violating (30). In a standard Markovian system, where every step of the derivation must be well-formed, this temporary violation of (30) is fatal. As a consequence, a derivation that sequentially cliticizes the two DPs is ruled out.

The last remaining option would be to attempt to cliticize the two DPs *simultaneously*. Doing so would not violate (30). But it would require simultaneous head movement of two Ds to v , hence an application of Merge that relates three distinct elements in one step. On the standard assumption that Merge is binary and can hence only ever combine two elements at a time, it is not possible to merge two Ds onto a third head in a single step of the derivation, ruling out this possibility.

As a consequence, there is no way to satisfy (30) if the probe is gluttonous. This results in ineffability: the structure in (29) invariably leads to ungrammaticality regardless of how the derivation proceeds.¹⁴ Moreover, because Agree is obligatory if it is possible (Preminger 2014), gluttony—and hence ineffability—is unavoidable in the configuration in (29).¹⁵ This derives the PCC: 3>2 and 3>1 configurations result in gluttony and hence ungrammaticality due to a violation of (30).

We next consider combinations of two [PART] DPs—namely, 1>2 and 2>1—that are grammatical in Weak PCC languages, as illustrated in (31).

(31) *Catalan*

Te'm van recomanar per a la feina.

2CL.1CL recommended for the job

'They recommended me to you for the job.'

($\sqrt{2} > 1$)

'They recommended you to me for the job.'

($\sqrt{1} > 2$)

(Bonet 1991:179)

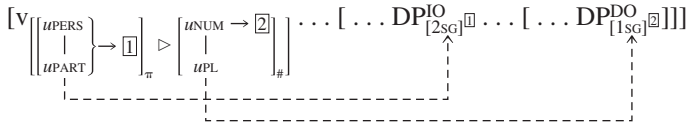
As shown in (32), both [*UPERS*] and [*UPART*] are matched by the indirect object. No gluttony arises, and the indirect object cliticizes onto v . Subsequently, # agrees with and clitic-doubles the direct object, ignoring the already clitic-doubled higher DP, as in (26).¹⁶

¹⁴ As noted above, we assume that all segments on a probe agree simultaneously. It is therefore not possible for π in (29) to first agree with the indirect object, followed by cliticization of the indirect object, and to subsequently agree with the direct object, followed by cliticization of the direct object. There simply is no stage of the derivation in which [*UPERS*] on π has agreed with the indirect object but [*UPART*] has not agreed with the direct object.

¹⁵ For a discussion of cases in which cliticization is optional, and of its impact on the PCC, see section 3.5.

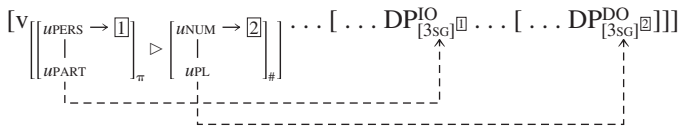
¹⁶ In the interest of space, we will not show ϕ -features on DPs as full-blown feature structures from now on, though this is a notational simplification. Thus, [2SG] in (32) is an abbreviation for a [PERS [PART [ADDR]]] feature structure for person and a [NUM] feature structure for number.

(32) *Agree in 2SG>1SG (31)*



Finally, the structure for grammatical 3>3 configurations is provided in (33) (no example shown in the interest of space). As before, [*uPERS*] agrees with the indirect object. Because [*uPART*] is not matched by either of the two objects, it does not enter into an Agree relationship with either DP. Therefore, no gluttony arises. As before, the indirect object is clitic-doubled, and # agrees with the direct object across it.

(33) *Agree in 3SG>3SG*



In sum, a gluttonous probe arises only if the direct object is more specific than the indirect object relative to the specification of the probe. As shown above, this is the case in 3>1 and 3>2 configurations, but not in any other configuration.¹⁷ Consequently, it is in precisely these two configurations that an irresolvable conflict arises with respect to the movement operation necessary to create pronominal clitics.

The analytical shift from nominal licensing to gluttonous probes enables an immediate explanation of the observation that PCC effects disappear in nonfinite environments that lack agreement and clitic doubling (see (10)), and that they more generally are present only when ϕ -morphology is involved. As discussed in section 2.3, the disappearance of PCC effects in environments that apparently lack Agree makes it necessary to weaken the PLC such that a DP that normally requires licensing through ϕ -Agree no longer requires such licensing if it is not clausemate to a ϕ -probe (i.e., Preminger’s (2011) version of the PLC in (9)). A gluttony account offers a more principled way of understanding this complication: because the PCC arises when a *probe* enters into ϕ -

¹⁷ While a gluttony account naturally handles the grammaticality of [*PART*]>[*PART*] configurations in a Weak PCC language, further complications are required on a licensing account. On a licensing account, which requires [*PART*] DPs to be licensed through π -Agree, a [*PART*] direct object can be targeted by π -Agree across a [*PART*] intervener, but not across a 3rd person intervener. Anagnostopoulou (2005) and Nevins (2007) develop a licensing-based account for the Weak PCC that incorporates Multiple Agree (Hiraiwa 2001, 2005). Nevins’s (2007) account relies on Contiguous Agree, a condition on Multiple Agree that permits the probe to license contiguous DPs with marked (i.e., [+*PART*]) features. Contiguous Agree allows both DPs to be licensed by a single probe in [*PART*]>[*PART*] configurations, but rules out 3>[*PART*] configurations, in which an unmarked (i.e., [−*PART*]) feature intervenes. The upshot is that Agree is blocked by unmarked features, but not by marked features. While this restriction on Multiple Agree achieves the desired contrast, it is worth noting that it seems to be at odds with established locality principles like Relativized Minimality (Rizzi 1990), and it is unnecessary on the account developed here.

Agree with more than one DP, we immediately predict that the PCC disappears in environments that lack this probe. This is illustrated in (34), which represents the structure of a 3>1 or 3>2 configuration in a probeless nonfinite clause. Due to the absence of a ϕ -probe, no gluttony arises, and the structure emerges as well-formed.¹⁸

- (34) *Licit hierarchy configuration with no probe* \rightarrow *no gluttony*
 [. . . DP_[3SG] . . . [. . . DP_[1/2SG] . . .]]

Because our account does not rely on special licensing requirements for 1st and 2nd person DPs, no caveat that specifically exempts such DPs from the licensing requirement in structures that lack a clausemate ϕ -probe is necessary. Rather, the contrast between finite and nonfinite clauses in Basque in (10) follows immediately from the independently observable contrast between occurrence and nonoccurrence of clitic doubling.

3.4 PCC Variation

In the previous section, we illustrated the gluttony account for a Weak PCC system. Recall from table 1 that there is crosslinguistic (and, in some cases, interspeaker) variation in the precise set of configurations that is ruled out. In this section, we consider two independently motivated points of variation within our system that result in the attested variation across PCC types: (a) the nature of the indirect object DP, and (b) the degree of articulation of the ϕ -probe.

3.4.1 Datives and the Strong PCC We begin with the Strong PCC, which rules out not only 3>[PART] configurations but also [PART]>[PART] structures. One example of a Strong PCC language is Basque; a relevant 1>2 configuration is repeated from (3d) in (35) (cf. the grammatical equivalent configuration in Weak PCC Catalan in (31)).

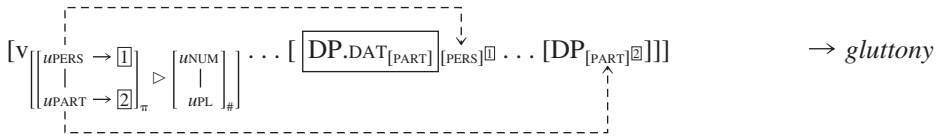
- (35) *Strong PCC in Basque*
 *Haiek ni-ri zu saldu z-ai-da-te.
 they.ERG me-DAT you.ABS sold 2ABS-AUX-1DAT-3ERG
 Intended: ‘They have sold you to me.’ (*1DAT > 2ABS)

We propose that the difference between Weak PCC and Strong PCC languages coincides with an independently proposed point of crosslinguistic variation: some dative DPs behave syntactically as 3rd persons, regardless of their actual interpretation (see, e.g., Boeckx 2000, Richards 2008, Sigurðsson and Holmberg 2008; also discussed for Icelandic in section 4.2). We thus suggest that not all of the ϕ -features of dative DPs in Basque are visible from the outside and that, from the point of view of the ϕ -probe, all datives in Basque behave as 3rd person DPs. A number of

¹⁸ Importantly, we do not predict that all nonfinite environments give rise to PCC obviation. The crucial prediction is that PCC effects should disappear in the absence of an agreeing probe. Thus, in languages in which arguments in nonfinite clauses are still associated with clitics, PCC effects are predicted to remain. This is the case, for instance, in Spanish (Jon Ander Mendia, pers. comm.), not illustrated here for reasons of space.

implementations of this claim are possible. For example, dative DPs could be encapsulated under a K(ase)P shell, which is formally 3rd person and which insulates the interpreted person features of the dative DP from outside probing (see Atlamaz and Baker 2018 for a related proposal along these lines for Icelandic datives). As a consequence, [PART]>[PART] configurations will behave formally as 3>[PART] *inverse* configurations as far as the agreeing ϕ -probe is concerned, again resulting in gluttony. This is schematized in (36) for a sentence like (35). Here, the internal [PART] feature of the dative DP is invisible to π , and π consequently agrees with [PERS] only. As a result, [μ PART] on the probe agrees with the direct object, leading to gluttony and hence ungrammaticality.¹⁹

(36) π -Agree in 1>2 in Basque (35)



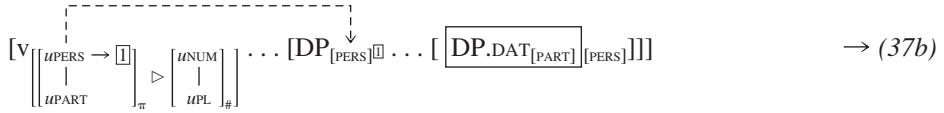
Independent evidence for our proposal that dative DPs in Basque are formally 3rd person comes from the contrast between two different types of dative-absolutive constructions, shown in (37). While both sentences in (37) involve configurations with a dative and an absolutive DP, Rezac (2008b) provides evidence that they differ in their structure: in dative experiencer configurations like (37a), the dative DP c-commands the absolutive (DAT>ABS), while for motion+location verbs like the one in (37b), the structure is ABS>DAT. Crucially, hierarchy effects arise in the former—which mirrors the configuration of the lower two objects in a ditransitive like (3c)—but not in the latter (Albizu 1997, Rezac 2008b).

(37) Basque

- a. *Ni Itxaso-ri gustatzen n-atzai-o.
me.ABS Itxaso-DAT like.IPFV 1ABS-AUX-3DAT
Intended: ‘Itxaso likes me.’ (*3DAT > 1ABS)
- b. Itxaso ni-ri etortzen Ø-zai-t.
Itxaso.ABS me-DAT come.IPFV 3ABS-AUX-1DAT
‘Itxaso comes to me.’ (✓3ABS > 1DAT)

If Basque dative DPs behave formally as 3rd person DPs, we correctly predict the absence of gluttony in (37b): because the lower [PART]-bearing DP is encased in a dative, the configuration is effectively 3>3, as shown in (38).

¹⁹ Note that the cross-referencing of the dative argument on the agreeing auxiliary reflects the actual person specification of the dative (e.g., examples (3d) and (37b)). This is arguably related to the fact that this cross-referencing involves a dative clitic rather than genuine agreement (see Preminger 2009 and Arregi and Nevins 2012 for arguments to this effect). Suppose, for the sake of concreteness, that the D head incorporates into the K head, which then jointly undergo head movement to v, giving rise to the dative clitic. Because this clitic involves the dative DP’s D head, it reflects the ϕ -features of this D head, not the dummy 3rd person specification of the K head.

(38) π -Agree in Basque (37b)

Both the *presence* of a PCC effect in (35) (represented in (36)) and the *absence* of a PCC effect in (37b) (represented in (38)) now receive a unified account: dative DPs only have a [PERS] feature visible from the outside and thus behave as 3rd person DPs. This leads to gluttony in (36) but prevents gluttony in (37b). We predict more generally that for languages (or speakers) with Weak PCC effects, 1st and 2nd person datives have visible [PART] features, stopping the probe from entering into gluttony in [PART]>[PART] configurations. Strong PCC effects occur when the higher dative DP does not have visible [PART] features (also see footnote 22 for another possible analysis of the Strong PCC effect). Samba and Haya, two Bantu languages discussed by Riedel (2009:chap. 5), obey the Weak PCC, permitting [PART]>[PART] configurations but ruling out 3>[PART]. This is consistent with the fact that indirect objects in these languages lack morphological case marking and our account thus correctly predicts that they should behave like Catalan since the features of the unmarked indirect objects should be fully accessible to the higher probe. We leave as a topic for future work independent evidence for a distinction between dative indirect objects in Weak and Strong PCC variants outside of Basque and Bantu, noting for now that the Strong PCC seems to be the more common variety crosslinguistically and that datives also frequently do not have accessible 1st and 2nd person features.

3.4.2 Features of the Probe By modulating the specifications of the feature probe, the same basic mechanisms of the gluttony approach laid out in section 3.3 can be used to capture the other types of PCC effects seen in table 1.²⁰ Universal constraints on the organization of feature geometries independently rule out unattested patterns.

Probe articulations that derive the remaining PCC patterns from table 1 are given in (39). As noted above for (23), we assume that if a probe is split into person and number probes, they will be articulated to some degree.²¹ (39a) shows a probe structure that gives rise to the Weak PCC, discussed in detail in section 3.3. The Ultrastrong PCC, which rules out the same combinations as

²⁰ Walkow (2013) derives the difference between the Strong and the Ultrastrong PCC in a licensing-based approach by modulating the degree of articulation of the probe. He locates the probe on a lower head and adopts a Cyclic Agree approach to licensing, as in Béjar and Rezac 2009. Yokoyama (2018) accounts for PCC variation by modulating (a) interpretable features on the DPs themselves and (b) a hierarchy of unvalued ϕ -features on the Appl head that mediates between the two DPs in PCC configurations. Yokoyama appeals not to feature licensing directly, but to a condition on Merge that requires feature valuation to take place for each Merge operation (Wurmbrand 2014); PCC violations occur when the lower DP has valued all of Appl's unvalued ϕ -features, preventing a DP from merging in its specifier. Both accounts face the concerns raised in section 2 in being unable to explain the absence of PCC effects in environments that lack agreement or clitics.

²¹ Note that an unarticulated π -probe would predict the possibility of a language with object clitics/agreement that lacks PCC effects altogether. Haspelmath (2004) lists several languages that he claims lack PCC effects for combinations of ϕ -exponents; see, however, Riedel 2009 on the presence of PCC effects in Haya, and Franks to appear for Polish. Additionally, Van Valin (1977:12) notes that a special agreement pattern arises in the Lakhota example given by Haspelmath.

the Weak PCC, but additionally bans 2>1 configurations, follows from the more articulated probe in (39b). Like the probe in (39a), (39b) will result in gluttony in 3>[PART] configurations, but gluttony will also arise in 2>1 configurations (as [uSPKR] is matched only by a 1st person DP). The Me-First PCC, which bans all 1st person direct objects, regardless of the features of the higher DP, may be treated as the result of the probe in (39c). Due to the absence of the intermediate [uPART] segment, this probe results in gluttonous configurations only when the lower DP has [SPKR].²²

(39) PCC probe variation

- a. $\left[\begin{array}{c} uPERS \\ | \\ uPART \end{array} \right]_{\pi} \Rightarrow \text{Weak PCC}$
- b. $\left[\begin{array}{c} uPERS \\ | \\ uPART \\ | \\ uSPKR \end{array} \right]_{\pi} \Rightarrow \text{Ultrastrong PCC}$
- c. $\left[\begin{array}{c} uPERS \\ | \\ uSPKR \end{array} \right]_{\pi} \Rightarrow \text{Me-First PCC}$

²² As Amy Rose Deal (pers. comm.) and a reviewer point out, allowing for probe structures with missing intermediate segments such as (39c) is not innocuous. First, if these feature hierarchies represent semantic entailment relationships, this raises the question of why [uSPKR] can exist without an accompanying [uPART]. But crucially, (39c) concerns the feature hierarchy on the probe. This might allow for missing segments because these segments are not semantically interpreted on probes.

Second, the reviewer notes that if missing intermediate segments *are* permitted, then we predict variation for other features as well—for example, for the behavior of duals in omnivorous number systems (see footnote 23 and section 5.2). Depending on the feature hierarchy involved in a three-way number system, if an intermediate segment could be missing from the number probe, we might expect a dual DP to pattern either as singular or as plural with respect to the probe (see Cowper 2005 for discussion of different proposals for feature geometries of three-way number systems). At this time, we do not have enough information about hierarchy effects in three-way number systems and therefore save this as a topic for future work.

As an alternative to the probe in (39c), one might maintain the assumption that missing segments are ruled out (prohibiting (39c)) and that the Me-First PCC is not caused by gluttony. Indeed, Yokoyama (2018) proposes that the Me-First PCC is a restriction on ordering of clitics and does not have the same status as the other varieties described above. If this is correct, then the probe in (39c) is rendered unnecessary.

There is also at least one more possible probe structure not discussed in the main text: a highly articulated probe as in (i). This probe would provide another means to derive Strong PCC effects, since the presence of both [uSPKR] and [uADDR] nodes would ensure gluttony in [PART]>[PART] combinations even if the features of the dative DP are externally visible.

- (i) $\left[\begin{array}{c} uPERS \\ | \\ uPART \\ / \quad \backslash \\ uSPKR \quad uADDR \end{array} \right]_{\pi} \Rightarrow \text{Strong PCC}$

The probe in (i) could be used to analyze strong PCC effects in configurations with a ϕ -accessible indirect object or to analyze the reversible Strong PCC in Slovenian, discussed in footnote 26. Because the PCC in Basque is not symmetric (see section 3.4.1), our account of the Strong PCC in Basque is unaffected by the possibility of (i).

Importantly, universal restrictions on the arrangement of feature geometries, combined with the system of gluttony proposed here, immediately rule out certain unattested patterns. For example, a hypothetical language that banned only $[\text{PART}] > 3$ combinations would require gluttony in such configurations. But given the independently motivated feature geometry in (11), this is impossible. The gluttony account therefore derives the fact that no such PCC pattern exists. Similarly, we correctly predict that a language that rules out $[\text{PART}] > [\text{PART}]$ must also rule out $3 > [\text{PART}]$, again due to the nature of feature geometries.

3.4.3 Person, Number, and Gender In addition to variation in the degree to which a given probe may be articulated, we address predictions with respect to variation in the possibilities for the features in split ϕ -probes. Here, we tentatively propose that split ϕ -probes are subject not only to a universal ordering of person before number (section 2.2), but also to an implicational relationship such that if a ϕ -probe is specified beyond simply probing for ϕ -features ($u\phi$), it will necessarily be specified to probe for person features ($u\pi$); if it is split into multiple probes, it will contain a person probe and only second, a number probe ($[u\pi \triangleright u\#]$).²³ Finally, a gender probe will only be added after a number probe ($[u\pi \triangleright u\# \triangleright u\Gamma]$; see Preminger 2012).²⁴

(40) *Probe specification hierarchy*

$[u\phi] \rightarrow [u\pi] \rightarrow [u\pi \triangleright u\#] \rightarrow [u\pi \triangleright u\# \triangleright u\Gamma]$

This assumption, together with our account of PCC effects above, derives the crosslinguistic generalization that the PCC applies only to person features—there is no analogous “Number Case Constraint” effect (Nevins 2011). An illustrative example from Basque is provided in (41). The absolute direct object is more specified for number than the indirect object, yet no hierarchy effect obtains.

(41) *Basque*

Zu-k *merkataria-ri* **liburuak** saldu d-i-zki-o-zu.

you-ERG merchant-DAT book.PL.ABS sold 3ABS-AUX-PL-3DAT-2ERG

‘You have sold the books to the merchant.’ (\checkmark 3SG.DAT > 3PL.ABS)

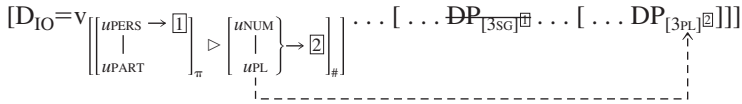
Building on insights by Béjar and Rezac (2003), also discussed in Coon, Keine, and Wagner 2017, we attribute the absence of “Number Case Constraint” effects to (a) the claim in (40) that

²³ While omnivorous number effects, to be discussed briefly in section 5, might seem to require a lone number probe, these effects generally involve person features as well. For example, omnivorous number in both Georgian (Béjar 2003, 2011) and Onondaga (Barrie 2005) must crucially make reference to both person and number features.

²⁴ A reviewer asks how these split and articulated probes come into being. Here we might speculate, following discussion in Preminger 2019, that ϕ -probes do not come as defaults supplied by Universal Grammar, but rather emerge during the acquisition process when a learner is presented with sufficient evidence that such a probe must be posited. One could then speculate further that the first probe to be posited by a learner would be a simple unarticulated probe ($u\phi$). A learner faced with, for example, multiple clitics, or perhaps the need to expone ϕ -features not accessed by the first probe, would need to posit additional probes (as in the sequence in (40)). The order of probes might in turn correspond to the order in which ϕ -features are accessed inside the nominal projection, with person being in an outer layer, number features lower down, and gender features more deeply embedded still (see e.g., Danon 2011, Kalin 2018). For now, we acknowledge this as speculative and leave a full understanding of the nature of articulated probes and crosslinguistic variation in probe structure as a puzzle for future work.

the presence of a #-probe entails the presence of a π -probe, (b) the fact that the π -probe agrees first, and (c) the fact that clitic doubling of a DP renders this DP invisible to subsequent probing. Because the indirect object is clitic-doubled after Agree with π , subsequent #-probing can see only the direct object. This is shown in (42). As a consequence, with only one DP in the search space of #, there is no potential for gluttony.

(42) #-Agree in (41)



This line of explanation does not attribute the person-number asymmetry in this domain to universal ontological differences between person and number features (contra Nevins 2011; see also footnote 41). Furthermore, it predicts that number effects should arise if the higher DP is not removed as an intervener. Evidence from German, discussed in section 4.1, suggests that this prediction is borne out.

Turning finally to gender, predictions for gender effects vary depending on where and how gender is represented in the grammar. If we assume that gender may be part of the ϕ -probe complex, ordered [$u\pi \triangleright u\# \triangleright u\Gamma$], then—following the reasoning and assumptions above—we similarly expect the absence of a Gender Case Constraint in combinations of two clitic-doubled DPs. Indeed, in a recent survey of PCC effects, Stegovec (2020) lists a “Gen-CC” alongside Num-CC as nonexistent. Interestingly, Toosarvandani (2017), Foley, Kalivoda, and Toosarvandani (2019), and Foley and Toosarvandani (2019, 2020) discuss what they call a “Gen-CC” in several varieties of Zapotec. Nonetheless, the relevant Zapotec features (ELDER HUMAN>HUMAN>ANIMATE>INANIMATE) involve animacy, not prototypical gender. Foley and Toosarvandani (2020) themselves recognize that animacy distinctions have a plausible connection to person (hence π in our system), and elsewhere animacy distinctions are treated as part of the same hierarchy that contains person (see, e.g., Silverstein 1976 and the references in Aissen 1999). Ritter (2014, to appear) provides arguments that animacy contrasts are distinct from gender. Strikingly, Foley and Toosarvandani (2020:fn. 6) note that some Zapotecan languages *do* have traditional noun-class-based gender systems, and these gender systems do not seem to participate in the restrictions on clitic combinations. Therefore, as Foley and Toosarvandani (2020) acknowledge, while it is certainly possible to treat animacy as a distinct type of gender, it seems to us at least a priori possible to analyze the Zapotec restrictions by means of a more highly articulated person probe.²⁵

Finally, a reviewer notes that our account makes predictions about combinations involving more than two ϕ -triggering DPs. Specifically, on our account number effects do not arise in (42)

²⁵ To give a brief illustration of this line of approach, Yalálag Zapotec combines a Strong PCC with a ban on clitic combinations in which the indirect object is higher than the subject on the hierarchy ELDER HUMAN>HUMAN>ANIMATE>INANIMATE. This pattern can be derived within our system by means of the entailment-relationship-encoding π geometry in (i).

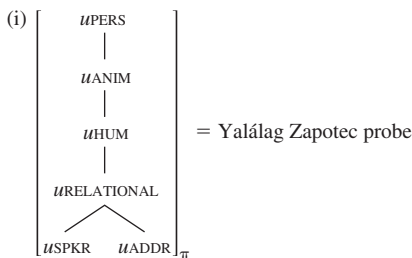
because the number probe has access to only the lower of the two DPs. If a third lower accessible DP were added, we might expect that a number effect could arise if the third DP were more highly specified for number features than the second DP, as in (43).

(43) *Hypothetical Number Case Constraint effect*



Crucially, in order to test this, we require a configuration in which three DPs are accessible to a *single* probe complex. While Foley and Toosarvandani (2019) propose that Zapotec subject, indirect object, and direct object clitics are all created by a single probe, it is important to note that the gender hierarchy effects they observe between the subject and primary object DPs (i.e., monotransitive theme and ditransitive recipient/goal) are described as being *absent* for the lower theme argument in a ditransitive. This might seem to indicate that a separate probe (plausibly on Appl) is responsible for cliticization of the ditransitive theme, though Foley and Toosarvandani (2019) discuss complications for this approach as well. For now, we set this case aside as not obviously instantiating the configuration in (43).

At this time, we are unaware of other systems for which three ϕ -exponents have been proposed to be generated via a single probe. For example, while some Bantu languages permit three ϕ -markers, the source of subject agreement is typically taken to be finite T, while the object markers are generated lower (Riedel 2009); as expected, hierarchy effects emerge only between objects. Another example is Senaya (Kalin and Van Urk 2015). In this language, the verb can host three clitics; however, these seem to be the result of distinct probes, not a single probe



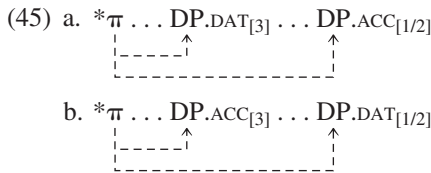
We tentatively suggest that “elder human” may be treated as part of a node that also encompasses the features borne by 1st and 2nd person participants, labeled [RELATIONAL]. Note that the “elder human” clitic is described as “formal 3rd person” in one variant of Zapotec by López Nicolás (2016), and Operstein (2003:167) writes that in Zapotecan languages, the human class may be “further split into a number of categories depending on such parameters as sacredness, relative social status, relative age, personal worth, relation to the community, and sex of the referent.” Crucially, like standard 1st and 2nd person [PART] pronouns, this category requires calculating a *relationship* to the speaker. Though details would need to be further worked out, under such an account the “gender” system in Zapotec would be more akin to the proximate/obviative contrast in Algonquian, also commonly treated as part of the person hierarchy (see, e.g., Oxford 2019 for a recent account).

agreeing with multiple DPs. As a consequence, we are not aware of languages that would allow us to empirically test (43).

3.4.4 *Reverse PCC* Another PCC pattern that gluttony derives straightforwardly is what Stegovec (2020) dubs the “Reverse PCC” in Slovenian. In Slovenian, the order of the dative and accusative clitics is variable, which Stegovec attributes to optional reordering of the direct object DP to a position just above the indirect object, but still below the probe on *v*. Crucially, when the order of the clitics is flipped, so is the PCC effect. In standard configurations in which the dative outranks the accusative, 3>[PART] configurations are ungrammatical, as shown in (44a). When the accusative is higher than the dative, it is not the case values of the DPs that matter, but their structural configuration. As shown in (44b), in DAT>ACC configurations the person restriction now targets the dative.

- (44) *Slovenian*
- a. Mama *mu* **ga/*me/*te** bo predstavila.
 Mom 3M.DAT 3M.ACC/*1ACC/*2ACC will introduce
 ‘Mom will introduce him/me/you to him.’ (3DAT > 3ACC/*1ACC/*2ACC)
 - b. Mama **ga** *mu/*mi/*ti* bo predstavila.
 Mom 3M.ACC 3M.DAT/*1DAT/*2DAT will introduce
 ‘Mom will introduce him to him/me/you.’ (3ACC > 3DAT/*1DAT/*2DAT)
 (Stegovec 2020:264, based on (8a–b) and (10a–b))

This symmetrical intervention pattern is consistent with our account. Following Stegovec (2020), we assume that the direct object can undergo optional movement above the indirect object, but still below *v*. If the π -probe first encounters a 3rd person DP (either the indirect object as in (45a) or a reordered direct object as in (45b)) and the lower DP is 1st or 2nd person, the probe then agrees with the [PART] feature of the lower DP, causing gluttony and hence ungrammaticality.



The existence of Reverse PCC effects is thus compatible with our proposal.²⁶

²⁶ While Stegovec (2020) dissociates the PCC from abstract Case assignment, the model he proposes instead still instantiates a failed-Agree account in the sense that it requires a DP (here, a weak object clitic) to enter into Agree with a verbal head, and that PCC effects result from this Agree failing to be established. In this respect, his model differs from the perspective taken here.

Interestingly, Slovenian shows the Reverse PCC for both the Strong and the Weak PCC. This indicates that in Slovenian, the ϕ -features of the dative DP are always visible to the ϕ -probe (unlike what we argued for Basque in section 3.4.1). This provides an argument that in Slovenian at least, the Strong PCC is due to the probe in footnote 22. We thank Amy Rose Deal for discussion.

3.5 PCC Repairs

Finally, we turn to repair strategies for PCC violations. Languages vary as to whether and how PCC violations may be repaired. In the interest of space, we do not review licensing-based approaches to repairs here (see, e.g., Béjar and Rezac 2003, Rezac 2010, 2011); instead, we focus on demonstrating how a gluttony approach can naturally account for different attested repair strategies.

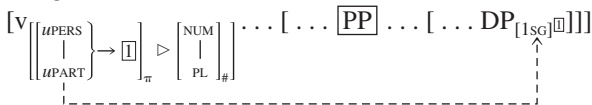
One type of repair described for PCC effects is to express one of the DPs in the offending configuration as a PP. A French PCC-violating 3>1 configuration is shown in (46a). The intended meaning can instead be expressed in French if the indirect object is realized not as a pronominal clitic, but as a full PP, as in (46b).

(46) *French PCC and repair*

- a. *Paul **me** *lui* présentera.
 Paul CL.1SG CL.3SG will.introduce
 Intended: ‘Paul will introduce me to him.’ (*3_{DAT} > 1_{ACC})
- b. Paul **me** présentera [*à lui*].
 Paul CL.1SG will.introduce to him
 ‘Paul will introduce me to him.’ (✓3_{DAT} > 1_{ACC})
 (Anagnostopoulou 2003:311)

This repair is consistent with the gluttony account. On the reasonable assumption that a DP encased in a PP is not accessible for the ϕ -probe, the only available goal in (46b) is the direct object, as shown in (47). Agree with the direct object cliticizes it, and no gluttony arises in (47). A similar strategy for circumventing PCC effects is found in Catalan, Spanish, Kiowa, and Samba (see Bonet 1991, Anagnostopoulou 2003, Adger and Harbour 2007, Riedel 2009).

(47) π -Agree in (46b)



Another means of avoiding PCC effects, utilized for example in Greek, is to not cliticize the direct object DP (Anagnostopoulou 2003:312–313). In Greek, accusative pronouns can appear in their strong form, in which case they do not cliticize. (48a) shows that 3>2 configurations are ungrammatical if the 2nd person direct object is cliticized. By contrast, in (48b) the direct object is a strong pronoun and no PCC violation arises.

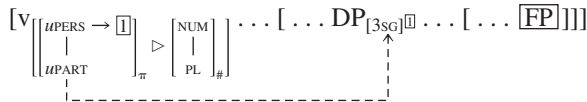
(48) *Greek PCC and repair*

- a. *Tha *tu* **se** stilune.
 FUT CL.GEN.3SG.M CL.ACC.2SG send.3PL
 Intended: ‘They will send you to him.’ (*3_{DAT} > 2_{ACC})

- b. Tha *tu* stilune esena.
 FUT CL.GEN.3SG.M send.3PL you.ACC
 ‘They will send you to him.’ (✓_{3DAT} > _{2ACC})
 (Anagnostopoulou 2017:3004, 3006)

Recall from sections 3.2 and 3.3 that we assume that cliticization is parasitic on ϕ -Agree, which is obligatory if possible. This raises the general question of how to treat instances of optional cliticization. One possibility explored in the literature (see discussion and references in Preminger 2019) is that such apparent optionality does not reflect optionality in the operation that triggers cliticization; rather, it reflects a difference in the structural position and accessibility of the goal DP. Under this line of approach, cliticization contexts involve a DP that is accessible to the probe (e.g., a definite/specific DP that has moved to a higher position), while contexts that lack cliticization do not contain an accessible goal for the probe. For the sake of concreteness, we follow Béjar and Rezac (2003:54) in treating strong object pronouns as encapsulated inside a functional projection FP, which—like a PP—renders the object’s ϕ -features invisible to the ϕ -probe. No Agree between the ϕ -probe and the DP can be established, with two consequences: no cliticization takes place, and no gluttony arises. This is shown in (49).

(49) π -Agree in (48b)



A similar account is possible for Kabyle, in which clitic-doubling the *indirect object* is optional, and PCC effects do not arise in the absence of a clitic (Baier to appear).

Both strategies reviewed so far are compatible with the gluttony approach insofar as they involve *less* cliticization. Additional structure on top of a DP shields this DP from a ϕ -probe and thus prevents the probe from becoming gluttonous.

While some PCC repairs exploit mechanisms that are independently available in a language (e.g., it is generally possible in Greek to not cliticize accusative objects; see Anagnostopoulou 2003:313), other strategies are possible *only* in order to avoid a hierarchy effect (e.g., in French, realizing an indirect object as a PP without the addition of focus is possible only in PCC configurations; see Rezac 2011:107–109).²⁷ The latter type of repair strategy seems to require a transderivational constraint. For example, Rezac (2011) proposes a last-resort interface mechanism \mathfrak{R} , which sanctions additional (PP/FP) structure if otherwise a licensing failure would arise.²⁸ This line of approach can be translated into our gluttony account: additional structure is sanctioned as a last resort if otherwise a probe would become gluttonous.

Another construction that is possible only to repair a PCC violation is that in at least some varieties of French, the indirect object can be realized with the locative clitic *y* in repair contexts

²⁷ We thank a reviewer for helpful comments on the second class of repairs.

²⁸ Though see Kalin 2014 for a reanalysis of an apparent last-resort phenomenon without appeal to \mathfrak{R} .

(Couquaux 1975). Since *y* cliticizes \bar{a} -headed PPs, Rezac (2010) takes this to mean that in these varieties the repaired PP indirect object (e.g., *à lui* in (46b)) can be cliticized. This repair is thus a variant of the one shown in (46b) insofar as the ϕ -features of the PP are presumably inaccessible, and the *y* clitic is produced by Agree with a probe other than π .

The final last-resort PCC repair to be discussed here is absolutive displacement in Basque (Rezac 2008b, 2010, 2011). For some speakers, a PCC violation with unaccusative DAT>ABS verbs may be repaired by promoting an absolutive internal argument to ergative. This repair is only available for verbs that lack a thematic ergative subject. An example is provided in (50). The structure is ungrammatical with an absolutive 2nd person object, as this would involve a DAT>2ABS configuration (see (37a)). The repair is to advance the object to ergative. This advancement is possible only to repair a PCC violation.

(50) *Basque absolutive displacement*

Itxaso-ri zu-k / *zu gustatzen d-i-o-zu.
 ITXASO-DAT YOU-ERG / *YOU.ABS like.IPFV 3ABS-AUX-3DAT-2ERG
 'Itxaso likes you.'
 (Rezac 2008b:81)

Building on Rezac 2008b, 2010, 2011, we assume that this repair involves movement of the absolutive object around the dative, which feeds dependent ergative-case assignment to the absolutive. For the sake of concreteness, we assume that the absolutive moves around π before π probes (e.g., to a local specifier). The domain of π then only contains the dative DP and no gluttony arises (the ergative clitic must then be produced by a different head). The last-resort character of the repair then means that this movement is possible only to prevent a gluttonous probe. See also Rezac 2010 for a similar pattern in Chinook, originally described by Silverstein (1976).

3.6 *Interim Summary*

In sum, we have proposed that hierarchy effects arise due to a system of feature gluttony. The model of Agree in (14) ensures that multiple Agree relations are established only when two DPs are found in the domain of a single articulated probe, and the lower DP has more of the features sought by the probe than the higher DP—exactly inverse configurations. For PCC effects (as well as other possible effects involving clitics), we propose that once a probe has established more than one Agree relationship, an irresolvable conflict occurs for the movement operation necessary to create clitics. For constructions that contain an articulated ϕ -probe, this then results in ungrammaticality. Conversely, in nonfinite configurations that lack clitics (and hence a ϕ -probe), gluttony—and hence a PCC effect—does not occur. This account differs from much of the recent literature in that it does not appeal to (failures of) nominal licensing. As a result, it avoids the need for the caveats required for licensing-based approaches. It also predicts variation based on independently motivated parameters and restrictions. Finally, we have shown that it is consistent with observed repair strategies employed in various languages. Next, we turn to another domain in which hierarchy effects are found: ϕ -agreement.

4 Gluttony and Agreement

In this section, we zoom in on the feature structure of gluttonous probes themselves by looking at hierarchy effects in the domain of morphological agreement. As outlined above, when a probe enters into an Agree relationship with more than one DP, ϕ -features from each DP are copied to the probe. Here, we show how problems can then arise when (a) each value on the probe demands a different Vocabulary item (VI) and (b) only a single VI can be inserted. The empirical bases for this investigation are hierarchy effects in German copula constructions in section 4.1 and Icelandic dative-nominative constructions in section 4.2. We discuss possible extensions and repairs in section 5.

4.1 German Copula Constructions

4.1.1 The Pattern Coon, Keine, and Wagner (2017) and Keine, Wagner, and Coon (2019) investigate a curious person and number restriction in so-called assumed-identity sentences in German. In such sentences, one DP is assigned the role of another DP (e.g., in a play or a game of charades; see Heycock 2012, Béjar and Kahnemuyipour 2017). Examples are provided in (51a) and (52a). For instance, (51a) conveys the meaning that the hearer is assigned the role of Martin to impersonate in a play or a game; analogously, (52a) conveys that a group of children are together playing the role of a tree. Coon, Keine, and Wagner (2017) and Keine, Wagner, and Coon (2019) present experimental evidence indicating that these types of sentences display restrictions akin to hierarchy effects. For example, while the $2 > 3$ configuration in (51a) is grammatical, the $3 > 2$ configuration in (51b) is not. In addition, there is a number hierarchy effect such that the $PL > SG$ configuration in (52a) is possible, but the $SG > PL$ configuration in (52b) is degraded.

(51) *Person hierarchy*

- a. *Du* bist **Martin**.
 you.NOM are Martin.NOM
 ‘You are Martin.’ (✓ $2 > 3$)
- b. *?*Martin* ist **du**.
 Martin.NOM is you.NOM
 cf. ‘Martin is you.’ (* $3 > 2$)

(52) *Number hierarchy*

- a. *Die Kinder* sind **der Baum**.
 the children.NOM are the tree.NOM
 ‘The children are the tree.’ (✓ $PL > SG$)
- b. *?*Maria* ist **die Bäume**.
 Maria.NOM is the trees.NOM
 cf. ‘Maria is the trees.’ (* $SG > PL$)

Coon, Keine, and Wagner’s (2017) and Keine, Wagner, and Coon’s (2019) experimental evidence suggests that the ungrammatical configurations are those in (53). That is, an assumed-identity sentence in German is ungrammatical if it violates one of the two hierarchies. The authors cited

also provide evidence that the effect is not present in English, and hence that it is not plausibly merely pragmatic in nature.

(53) *Hierarchy effects in German copula constructions*

- a. *3 > [PART]
b. *SG > PL

The person hierarchy effect in (53a) bears a clear resemblance to the PCC (in particular, the Weak PCC), with the notable difference that the person restriction is accompanied by a number restriction (i.e., (53b)), a restriction that is absent in the PCC (see section 3.4.3). Coon, Keine, and Wagner (2017) and Keine, Wagner, and Coon (2019) set out to unify the person restriction in (53a) with the PCC, adopting a Nevins 2007–style licensing account. While we will follow their basic analytical intuition that the two effects should be unified, the licensing account that they propose encounters the same obstacles as licensing-based accounts of the PCC (section 2.3). The most severe problem is that, like PCC effects in Basque (see (10)), these effects are ameliorated in nonfinite clauses, as in (54), noted as a problem for a licensing account by Keine, Wagner, and Coon (2019:642).

- (54) a. *Martin* scheint [**du** zu sein].
Martin.NOM seems you.NOM to be
'Martin seems to be you.' (✓3 > 2)
- b. *Maria* scheint [**die Bäume** zu sein].
Maria.NOM seems the trees.NOM to be
'Maria seems to be the trees.' (✓SG > PL)

As was the case for the PCC, these data are difficult for a licensing account to handle because on such an account the licensing requirement of a DP would need to be suspended if that DP occurs inside a nonfinite clause, by stipulation.

4.1.2 A Gluttony Account A gluttony account allows us to understand these facts in a more principled manner. First, we note that what distinguishes the copula constructions in (51)–(52) from regular transitive predicates in German is that both DPs are nominative, hence accessible to the verbal ϕ -probe, which as a matter of principle only agrees with nominative DPs in German (see, e.g., Heycock 2012). It is thus precisely in these copula constructions that the ϕ -probe could agree with two DPs, giving rise to gluttony. Second, in English, where these hierarchy effects are absent, the second DP is accusative, hence invisible to the ϕ -probe. In English, then, there is never a risk of gluttony, as the ϕ -probe is only ever able to see a single DP.

To develop this account in greater detail, we propose that the German π -probe and #-probe located on finite T are articulated as in (55), again with π probing before #.²⁹

²⁹ Note that the particular specification of the π -probe in (55) does not correspond to the available morphological distinctions in verb agreement. In particular, even though π is specified only up to [uPART], verb agreement morphologically distinguishes between 1st and 2nd person agreement. This follows from the coarseness of feature copying. In line with (14) and Béjar and Rezac 2009:45–46, a probing segment interacts (in Deal's (2015) terms) with the entire feature geometry of the goal DP, and it hence copies back all person segments of the DP. Analogously, Agree triggered by any segment of # interacts with all number-feature segments on a DP.

$$(55) \text{ T } \left[\begin{array}{c} [uPERS] \\ | \\ [uPART] \end{array} \right]_{\pi} \triangleright \left[\begin{array}{c} [uNUM] \\ | \\ [uPL] \end{array} \right]_{\#}$$

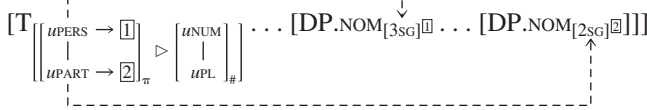
We first look at an ungrammatical person hierarchy effect in a 3>[PART] configuration, as in (53a), exemplified in (51b), repeated here as (56).

$$(56) \text{ *?Martin } \quad \text{ist du.} \quad \quad \quad (*3 > 2)$$

Martin.NOM is you.NOM

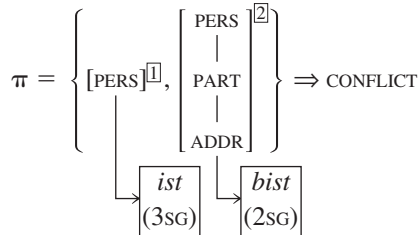
The relevant part of the derivation is shown in (57). As before, π probes first: [uPERS] agrees with the higher, 3rd person DP, while [uPART] agrees with the lower predicate nominal. The entire person-feature geometries of the two DPs are copied over onto π .

(57) π -Agree in (56)



As a result of (57), two person values have been copied over to π , in accordance with the definition of Agree in (14): [PERS] from the higher DP (i.e., [1]), and [PERS [PART [ADDR]]] from the lower DP (i.e., [2]). π has thus acquired a *pair of values*, as shown in (58). (Subsequent Agree by # establishes singular number agreement, not illustrated here for reasons of space.)

(58) *Gluttonous π -probe in (57)*



The problem here, we propose, is not the double Agree itself (just as double Agree in and of itself was not the problem in the clitic-doubling cases), but the morphological realization of the feature structure in (58). We will assume a standard late-insertion model of morphology like Distributed Morphology, where abstract syntactic heads are postsyntactically realized through Vocabulary Insertion. We adopt the requirement that Vocabulary Insertion must realize a feature value by insertion of the most specific Vocabulary item (VI) whose morphosyntactic specification is a subset of the specification of the syntactic head. Correspondingly, the 3rd person value [PERS] calls for the VI for 3rd person agreement in German, which is *ist*. By contrast, the 2nd person feature [PERS [PART [ADDR]]] demands the 2nd person agreement marker *bist*. Assuming further that only a single VI may be inserted into a given head (see, e.g., Halle and Marantz 1993, 1994, Arregi and Nevins 2012), a fatal conflict arises: the conflicting VI demands of each person value must be met, but only a single VI may be inserted into T. As a result, the process of Vocabulary

Insertion is unable to pick a VI for the multivalued probe in (58), leading to ineffability in the morphological insertion process. The syntactic structure containing this head thus cannot be morphologically realized, ruling out configurations that give rise to it, such as (51b).³⁰

A remaining question is why default agreement cannot be used to morphologically realize the gluttonous probe in (58).³¹ Default agreement in German is a last resort in the sense that it is possible only in the absence of a nominative DP. In this sense, default agreement is either the realization of an unvalued ϕ -probe (Preminger 2014) or the realization of a maximally underspecified VI that is inserted only if the feature value does not demand a more specific VI. Neither condition is met in (58): first, the probe contains a value; second, insertion of a maximally underspecified VI is blocked by the availability of a more specific VI (even if this VI is itself blocked by a competing VI). For these reasons, default agreement does not constitute a valid realization of a gluttonous probe either.

There is independent evidence for morphological ineffability of the sort in (58). Case-matching effects in across-the-board (ATB) movement provide one such piece of evidence. Citko (2005) and the references cited there show that ATB movement is possible only if the two gaps are associated with the same case form. While Citko's (2005) evidence is drawn primarily from Polish, the effect also holds in German, as shown in (59). In (59a), the ATB-moved element *wen* 'who.ACC' is associated with the object position of the two verbs *hasst* 'hates' and *mag* 'likes'. Both verbs assign accusative case to their objects, and the resulting structure is well-formed. In (59b), on the other hand, the two verbs are *vertraut* 'trusts' and *mag* 'likes'. As before, *mag* assigns accusative case to its object, but crucially *vertraut* assigns dative case. As shown, the resulting structure is ungrammatical, regardless of whether the ATB-moved DP appears in its accusative or its dative form (or any other case form).

(59) *Case mismatch effects in German ATB movement*

- a. Ich weiß [**wen** Jan ___ hasst und Maria ___ mag].
 I know **who.ACC** Jan ___.ACC hates and Maria ___.ACC likes
 'I know who Jan hates and Maria likes.'
- b. *Ich weiß [**wen/wem** Jan ___ vertraut und Maria ___ mag].
 I know **who.ACC/who.DAT** Jan ___.DAT trusts and Maria ___.ACC likes
 'I know who Jan trusts and Maria likes.'

Assuming a multidominance structure for ATB movement, Citko (2005) explains this restriction by saying that the ATB-moved DP is assigned two distinct case values in (59b), and these then

³⁰ As Gereon Müller (pers. comm.) has pointed out to us, conflicts between competing feature values are typically resolved by appealing to an extrinsic feature hierarchy (e.g., Lumsden 1992, Noyer 1992, 1997, Müller 2004). This raises the question why no such hierarchy is able to resolve the conflict in (58). One possibility is that these feature hierarchies only order *types* of features (such as "number >> class >> case" in Müller 2004). If so, then it is precisely in combinations of multiple values of the *same* feature that hierarchies fail to resolve the conflict and ineffability arises. We note, however, that this is not compatible with all analyses in the literature that invoke feature hierarchies in this way, so further work is warranted.

³¹ We thank a reviewer, Laura Kalin, and Omer Preminger for raising this possibility.

create a morphological conflict: the morphology cannot determine which VI to insert, leading to ineffability. This type of account clearly parallels our explanation for the ungrammaticality of person hierarchy violations in German copula constructions, as in (58). A similar line of reasoning is also employed by Kratzer (2009) to account for morphological restrictions on the availability of fake indexicals in German, by Lumsden (1992) and Schütze (2003) for free relatives in German, by Asarina (2011) for Right Node Raising constructions in Russian, and by Bjorkman (2016) for *go-get* constructions in English. We take these clear parallels in other domains to indicate that the crucial ingredient of our account—morphological ineffability due to overvaluation—is justified on independent grounds. Because overvaluation is the result of gluttony, our account assimilates the restriction in copula clauses to this range of other phenomena.³²

Let us now compare this state of affairs with configurations that do not display hierarchy effects. (61) provides the schematized structure for π -Agree in a grammatical 1>3 configuration (such as (51a), repeated in (60)). Here, both $[u_{\text{PERS}}]$ and $[u_{\text{PART}}]$ agree with the subject DP, and hence no gluttony arises.

(60) Du bist Martin. ($\sqrt{2} > 3$)
 you.NOM are Martin.NOM

(61) π -Agree in (60)



π then has the resulting specification in (62). Because π only contains a single value, Vocabulary Insertion is straightforward, yielding the structure in (60) (again, abstracting away from the SG feature contributed by #). The situation is analogous for π -agreement in grammatical 3>3 and $[\text{PART}] > [\text{PART}]$ configurations.

³² The assimilation of the German hierarchy effects to the ATB movement facts in (59) makes an interesting prediction. Citko (2005) observes that case-mismatching effects disappear if the two case forms are *syncretic*, because in this instance both case values demand the same VI and no conflict arises. While the judgments are not entirely clear-cut, there is evidence to suggest that this prediction is borne out for German (see also Keine, Wagner, and Coon 2019). As (i) shows, 3>1 combinations are much improved in the past tense or the subjunctive, where the form of the verb is syncretic between 1SG and 3SG agreement.

- (i) a. ?Martin war ich.
 Martin.NOM was.3SG/1SG I.NOM
 ‘Martin was me.’
 b. ?Wenn Martin ich wäre, ...
 if Martin.NOM I.NOM were.3SG/1SG
 ‘If Martin were me, ...’

Similar amelioration of hierarchy effects in copula constructions under syncretism exists in Hindi-Urdu (Bhatia and Bhatt 2019) and Brazilian Portuguese (Filipe Hisao Kobayashi, pers. comm.); see footnote 34. Sigurðsson and Holmberg (2008), and the references they cite, observe a similar effect for Icelandic dative-nominative constructions, discussed in section 4.2.

(62) *Nongluttonous π -probe in (61)*

$$\pi = \left\{ \begin{array}{c} \left[\begin{array}{c} \text{PERS} \\ | \\ \text{PART} \\ | \\ \text{ADDR} \end{array} \right]_{\text{[1]}} \end{array} \right\} \rightarrow \text{VI: } \textit{bist} \text{ (2SG)}$$

The same line of reasoning extends to the number hierarchy effect. As illustrated in (52), SG>PL configurations are ungrammatical, whereas PL>SG configurations are grammatical. The ungrammatical SG>PL configuration is repeated in (63). This restriction is the result of the specification of the #-probe in (55). In an ungrammatical 3SG>3PL configuration, number agreement is established as in (64) (note that π has already agreed with the higher DP). [*u*NUM] agrees with the higher DP, but [*u*PL] agrees with the lower DP.

(63) *?Maria ist die Bäume. (*SG > PL)
 Maria.NOM is the trees.NOM

(64) #-Agree in (63)



Because the gluttonous number probe in (64) carries two number values, an irresolvable conflict arises in the morphological realization of the probe, shown in (65). As in (58), this conflict leads to ineffability, and the resulting structure crashes in the morphology. This rules out (52b).

(65) *Gluttonous #-probe in (64)*

$$\# = \left\{ \begin{array}{c} \left[\text{NUM} \right]_{\text{[1]}} \\ | \\ \left[\begin{array}{c} \text{NUM} \\ | \\ \text{PL} \end{array} \right]_{\text{[2]}} \end{array} \right\} \Rightarrow \text{CONFLICT}$$

\swarrow \searrow
ist sind
(3SG) (3PL)

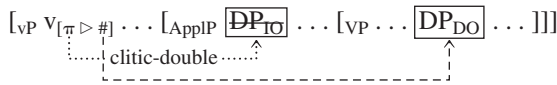
No such gluttony arises in SG>SG, PL>PL, or PL>SG configurations, because here the lower DP is not more specific than the higher DP.

Because gluttony for either π or # leads to ineffability, these structures are well-formed only if neither π nor # is gluttonous. Consequently, structures are ungrammatical if they violate either the person hierarchy (53a) or the number hierarchy (53b), as desired.

4.1.3 The Emergence of Number Hierarchy Effects Our account thus unifies the hierarchy effects in German copula constructions with more familiar PCC effects. But this unification gives rise to an immediate question. We showed that German copula constructions display a number hierarchy effect. However, no parallel number hierarchy effects have been described for combinations of objects in traditional ditransitive PCC environments, which only restrict person features

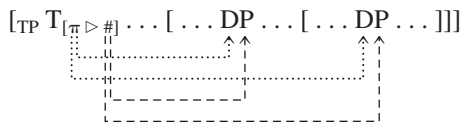
(see section 3.4.3). This contrast might be taken to cast doubt on the unification just proposed. However, following Keine, Wagner, and Coon (2019), we suggest that this difference is in fact predicted. An important distinction between German and PCC languages is that German lacks clitic doubling. Recall from the discussion in section 3.3 that we assumed—following Anagnostopoulou (2003), Béjar and Rezac (2003), Preminger (2009), and others—that clitic doubling of a DP removes that DP as an intervener for subsequent Agree operations. In PCC effects involving clitics, this has the consequence that π -Agree with the indirect object removes it as an intervener for subsequent $\#$ -Agree. As a result, the $\#$ -probe probes past the indirect object, agreeing only with the lower direct object (see (66)). Consequently, there is no possibility for gluttony in $\#$ -Agree, and number hierarchy effects are correctly predicted to be absent.

(66) *Ditransitive PCC*



Contrast this to the situation in German. Because German lacks clitic doubling, π -Agree with the higher DP does not remove it as an intervener for subsequent $\#$ -Agree. The $\#$ -probe thus also agrees with the higher DP, giving rise to gluttony in $SG > PL$ configurations, as in (64). This is schematized in (67).

(67) *German copula*



If this reasoning is on the right track, the crucial contrast with respect to the presence or absence of number hierarchy effects follows from an independently motivated difference—namely, the presence or absence of clitic doubling—and is hence in line with our unification of the two phenomena.³³

4.1.4 Copula Hierarchy Effects beyond German We have proposed that the hierarchy effect in German copula constructions arises because in this construction two nominative DPs are in the domain of a single ϕ -probe. This not only accounts for the absence of such an effect in English, it also predicts that analogous effects arise in other languages in which both DPs appear in a case form that is visible to verb agreement. A detailed investigation of this prediction is beyond the scope of this article, but it seems that these effects arise in other languages as well. A first example

³³ As above, predictions with respect to gender effects depend on the representation of gender in the grammar (see section 3.4.3). All else being equal, if gender features are arranged in a feature hierarchy like person and number features, then we might expect gender hierarchy effects in copula constructions in languages in which (a) the verb agrees for gender, (b) the higher DP is not clitic-doubled, and (c) both nominals are in accessible case forms. Note however that it is not a priori clear whether gender features are hierarchically organized. In fact, if feature hierarchies encode *semantic* entailments, then one might expect at least uninterpretable gender to not form hierarchies. We have not systematically tested gender effects, and leave an assessment of these theoretical options for future research. We thank a reviewer for helpful comments.

is Hindi-Urdu. Bhatia and Bhatt (2019) observe person hierarchy effects in copula constructions in the language, illustrated in (68).

- (68) a. [Context: A Bollywood movie where two people are swapping identities]
 aaj-se mĒ Ramesh hū:
 today-from I Ramesh be.PRS.1SG
 ‘From today onward, I am Ramesh.’ (i.e., ‘I am taking on the role of a 3rd person.’)
 (✓1 > 3)
- b. [Context: A Bollywood movie where someone is swapping identities with me]
 *aaj-se Ramesh mĒ hai/hū:
 today-from Ramesh I be.PRS.3SG/be.PRS.1SG
 Intended: ‘From today onward, Ramesh is me.’ (✓3 > 1)
 (Bhatia and Bhatt 2019:3)

Moreover, Hindi-Urdu seems to display a number hierarchy effect as well, as illustrated in (69).

- (69) a. is naaTak-mē do log Ram hĒ
 this play-in two people Ram be.PRS.3PL
 ‘In this play, two people are Ram.’ (✓PL > SG)
- b. ??is naaTak-mē Ram do paatr hai
 this play-in Ram two characters be.PRS.3SG
 ‘In this play, Ram is two characters.’ (*SG > PL)
 (Rajesh Bhatt, pers. comm.)

A second example is Brazilian Portuguese, which also displays a person hierarchy effect, as shown in (70).

- (70) a. Eu sou ele.
 I am he (✓1 > 3)
- b. *Ele é eu.
 he is I (*3 > 1)
 (Filipe Hisao Kobayashi, pers. comm.)

There is thus converging evidence that the German pattern is by no means isolated or exceptional.³⁴ Just how widespread it is remains to be determined. A reviewer points out that Icelandic,

³⁴ A further parallelism to German (see footnote 32) is that these hierarchy effects seem to disappear under syncretism; that is, the morphological form of the verb is syncretic between agreement with the two DPs. For example, Bhatia and Bhatt (2019) note that the hierarchy effect disappears in the past tense, where the auxiliary *tha*: does not express person distinctions, as shown in (i).

- (i) [Context: A Bollywood movie where I swapped identities with Ramesh]
 us din mĒ Ramesh tha: aur Ramesh mĒ tha:
 that day I Ramesh be.PST.M.SG and Ramesh I be.PST.M.SG
 ‘That day I was Ramesh and Ramesh was me.’ (✓1 > 3/✓3 > 1)
 (Bhatia and Bhatt 2019:6)

We develop an analysis of the rescuing effect of syncretism in section 4.2.

in which predicate DPs appear in nominative case, does not seem to exhibit hierarchy effects. This is illustrated in (71) and (72), both of which are marked but possible according to the reviewer's intuitions.

(71) Hann er þú.
 he.NOM is.3SG you.SG.NOM
 'He is you.' (✓3 > 2)

(72) Hann er trén.
 he.NOM is.3SG trees.NOM
 'He is the trees.' (✓SG > PL)

We do not at present have a full account of this disparity between Icelandic and the other languages reviewed above, but we would like to offer some suggestions. One factor that is likely to play a role is that Icelandic displays a great deal of interspeaker and intraspeaker variability in agreement in predicational and specificational copula clauses, as investigated experimentally by Hartmann and Heycock (2017). Because Hartmann and Heycock do not investigate assumed-identity sentences in Icelandic, it stands to reason in light of this variability that constructions like (71) and (72) ought to be investigated experimentally in a way analogous to German before firm conclusions can be reached. One empirical factor that plausibly plays a role here is that in some constructions, Icelandic does not require verbs to agree with nominative DPs that are not in Spec,TP (and in this respect Icelandic differs from German). As noted by Thráinsson (1979: 466), Sigurðsson (1996), and Sigurðsson and Holmberg (2008), a finite verb in a dative-nominative construction (to be discussed further in the next section) may, but in many varieties does not have to, agree with the nominative object. This is shown in (73), where the finite verb appears in its 3SG default agreement form even though the nominative DP is plural. This seems to be the case as well if the nominative DP is 1st or 2nd person, at least for some speakers (Sigurðsson 1996:35, (74c), (75b)).

(73) að henni líkaði þeir
 that her.DAT liked.3SG they.NOM
 'that she liked them'
 (Sigurðsson and Holmberg 2008:260)

Thus, if Icelandic has the means of shielding a nominative DP that is not in Spec,TP from agreeing with the verb in at least some constructions (however this is technically achieved; see Sigurðsson 1996 for a proposal), this might offer an explanation for the absence of hierarchy effects in (71) and (72). Specifically, if these sentences have a parse in which the lower DP (*þú* and *trén*, respectively) is shielded from agreement with T, these DPs are invisible to the probes, and as a result no gluttony arises. This analysis gives rise to the expectation that the possibility of (71) and (72) should correlate, across speakers, with the option of default agreement in (73). We cannot assess this prediction within the scope of the present article, but note it as a promising avenue for future work.

4.2 *Syncretism and Icelandic Dative-Nominative Constructions*

The final phenomenon for which we develop a gluttony account in some detail is the well-known agreement restrictions in Icelandic dative-nominative (DAT-NOM) constructions (see Sigurðsson 1991, 1996, Taraldsen 1995, Holmberg and Hróarsdóttir 2003, Sigurðsson and Holmberg 2008). These bear a clear resemblance to PCC effects, which has been taken to suggest a uniform account (see, e.g., Boeckx 2000, Anagnostopoulou 2003, 2005, Béjar and Rezac 2003, Richards 2008, Walkow 2012).

In what follows, we will focus on a person restriction in these environments. There is also a number restriction, though for the number effect, the pattern is subject to considerable interspeaker variation, and the relevant generalizations are less well-understood (see Holmberg and Hróarsdóttir 2003, Sigurðsson and Holmberg 2008, Kučerová 2016, Ussery 2017). We will therefore put the number effect aside here in the interest of space, though we see no principled reason why the feature gluttony account could not be extended to this effect as well.³⁵

An example of an Icelandic DAT-NOM construction is given in (74). It is well-established that the dative DP in these constructions occupies the true subject position and that the nominative DP is a true object (see Zaenen, Maling, and Thráinsson 1985). For many speakers, the verb then agrees with the nominative object, as shown in (74).

- (74) Henni leiddust strákar.
 her.DAT bored.3PL the.boys.NOM
 ‘She found the boys boring.’ (✓3 > 3PL)
 (Sigurðsson 1996:1)

But as Sigurðsson (1996), Sigurðsson and Holmberg (2008), and others have shown, agreement with the lower nominative is subject to the restriction in (75).

- (75) *Person restriction*
 In DAT-NOM constructions, only 3rd person NOM may control agreement.
 (Sigurðsson and Holmberg 2008:254)

Consequently, verb agreement with 1st and 2nd person nominatives is impossible, as shown in (76).

- (76) a. *Henni leiddumst við.
 her.DAT bored.1PL we.NOM
 Intended: ‘She found us boring.’ (*3 > 1PL)
 (Sigurðsson and Holmberg 2008:270)

³⁵ Possibilities include whether and how number features are represented on the dative DP, and/or variation in the timing of subject movement with respect to ϕ -probing. See Hoover to appear for a gluttony account of Icelandic number effects.

- b. ***Henni** líkaðir þú.
 her.DAT like.2SG you.SG
 Intended: ‘She likes you.’ (*3 > 2SG)
 (Sigurðsson 1996:33)

Sigurðsson (1996), Schütze (1997, 2003), and Sigurðsson and Holmberg (2008) demonstrate that the problem is not the 1st or 2nd person object itself, but the fact that the verb agrees with it. Important evidence comes from configurations like (77), in which the DAT-NOM configuration is inside a nonfinite clause. Because nonfinite verbs do not agree in Icelandic, there is no agreement with the nominative object in (77), and this configuration is judged as “quite acceptable” by Sigurðsson and Holmberg (2008:271, 276) (the authors cite other potential factors for the “?” judgment); also see Sigurðsson 2004b:155n14.

(77) *Nonagreement fix*

- ?Hún vonaðist auðvitað til [að leiðast við /þið /þeir ekki mikið].
 she hoped of.course for to find.boring.INF we /you /they.NOM not much
 ‘She of course hoped not to find us/you/them very boring.’
 (Sigurðsson and Holmberg 2008:271)

The sentence in (77) involves a control structure. In light of evidence that PRO bears dative case in configurations like (77) (see Sigurðsson 1991, 2008), (77) involves a DAT-NOM configuration just like (76). The crucial distinguishing factor is that the infinitival verb in (77) does not agree with the nominative object.

Further evidence supporting (75) comes from configurations like (78), which involve a matrix verb that takes a dative subject and embeds a nonfinite or small clause that in turn contains a nominative DP. As (78a) demonstrates, it is possible, all else being equal, for the matrix verb to agree with this nominative DP. This is not possible, however, if the nominative DP is 1st or 2nd person and verb agreement would therefore involve person agreement. In (78b), the agreeing form *þyki* is ruled out. Significantly, agreement is optional in these constructions. The verb may also agree with the embedded clause as a whole instead of the nominative DP (the form *þykir* in (78b)). In this case, the structure is grammatical regardless of the person of the nominative DP (Sigurðsson 1996, Schütze 1997, Hrafnbjargarson 2002, Sigurðsson and Holmberg 2008, Pre-minger 2011).³⁶

(78) *Nonagreement fix*

- a. **Mér** þykja þau góð í fótbolta.
 me.DAT think.3PL they.NOM good in soccer
 ‘I think they are good at soccer.’

³⁶ In addition, Sigurðsson (1996) shows that at least some speakers allow 1st and 2nd person nominative objects if the verb shows default agreement, which Sigurðsson proposes involves an inherent nominative invisible to verb agreement. The judgments of these speakers are of course in line with the person restriction in (75).

- b. **Ykkur** **þykir** / *þyki **ég** góður í fótbolta.
 you.PL.DAT think.3SG / *think.1SG I.NOM good in soccer
 ‘You think I am good at soccer.’
 (Hrafnbjargarson 2002:2)

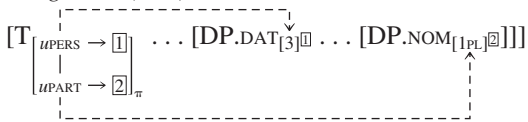
The generalization that the person restriction disappears in the absence of agreement is strikingly parallel to the situation we observed for PCC effects in section 2.3 and German copula clauses in section 4.1. It therefore seems natural to extend the gluttony account to the Icelandic restriction. We propose that the Icelandic π -probe is articulated as in (79).

$$(79) \begin{array}{c} [uPERS] \\ | \\ [uPART]_{\pi} \end{array}$$

We furthermore follow recent proposals that dative DPs in Icelandic behave externally as 3rd person DPs (Chomsky 2000:128, 149n90, Boeckx 2000, Richards 2008, Sigurðsson and Holmberg 2008; also see Atlamaz and Baker 2018 for another proposal that Icelandic datives are featurally deficient from the outside)—regardless of their internal person features—paralleling a similar behavior we observed for Basque dative DPs above.

A schematic π -Agree structure for (76a) is provided in (80). [*uPERS*] agrees with the dative DP, and [*uPART*] agrees with the nominative DP, resulting in a gluttonous probe.³⁷

(80) π -Agree in (76a)



The situation that results from (80) is analogous to what we showed for German in section 4.1: the gluttonous probe cannot be morphologically realized. To illustrate this conflict, (81) provides the relevant past tense mediopassive inflectional paradigm for the verb in (76a) (Thráinsson 1994: 162).

³⁷ As a reviewer notes, because it is the dative DP that moves to Spec,TP in Icelandic DAT-NOM constructions like (80), our account requires that person agreement not require a Spec-head relation, contra Baker’s (2008) Structural Condition on Person Agreement (SCOPA; see also Preminger 2011:920–921 for an argument against SCOPA from Basque). The reviewer also observes that this assumption is in fact independently motivated for Icelandic by the existence of what Sigurðsson (2004a, 2006) calls Reverse Predicate Agreement, as in (i), where Spec,TP is occupied by the expletive subject *það* and the verb agrees with *við* ‘us’.

- (i) Það erum bara við.
 it are.1PL only we.NOM
 ‘It’s only us.’
 (Sigurðsson 2006:223)

Sigurðsson (1996, 2004a, 2006) and Sigurðsson and Holmberg (2008) suggest that *það* lacks ϕ -features. If so, then the ϕ -probe in (i) agrees only with *við* ‘us’, and hence no gluttony arises.

(81) *Past tense mediopassive suffixes*

	SG	PL
1	-ist	-umst
2	-ist	-ust
3	-ist	-ust

From the paradigm in (81), we can extract the VIs in (82).

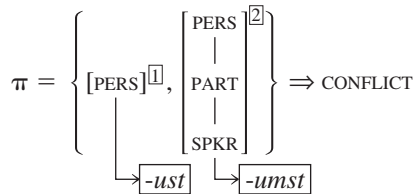
(82) *Vocabulary items*

- ist ↔ []_π / ___ [SG]_# (underspecified for person)
- ust ↔ []_π / ___ [PL]_# (underspecified for person)
- umst ↔ [PERS [PART [SPKR]]]_π / ___ [PL]_#

The VI *-ist* is underspecified for person (meaning that it is compatible with all person values), but it bears a contextual singular specification; *-ust* is likewise underspecified for person but bears a contextual plural specification; and *-umst* is specified for 1st person and plural. Because it is more specific than *-ust*, it is inserted in 1PL configurations.

The outcome of applying these VIs to the gluttonous probe in (80) is represented in (83). Due to the contextual plural specification on the #-probe (not shown in (83)), the 3rd person value calls for the VI *-ust*, whereas the 1st person value demands *-umst*. Because only a single VI can be inserted into a syntactic head, these conflicting demands lead to ineffability and hence ungrammaticality in the way discussed for German in section 4.

(83) *Gluttonous π-probe in (80) (in context of plural number agreement)*



The core idea that what underlies the ungrammaticality of (76) is a morphological conflict that results from attempting to agree with both DPs was first proposed by Schütze (2003), though he leaves open what the syntactic derivation that results in this conflict is. Our gluttony account can thus be seen as providing the syntactic underpinning for Schütze’s proposal. Other proposals that invoke a morphological conflict have been made by Sigurðsson and Holmberg (2008) and Atlamaz and Baker (2018), but the specifics of their proposals differ significantly from our account.³⁸

³⁸ Atlamaz and Baker’s (2018) account invokes Multiple Agree in the traditional sense, whereby a probe agrees with all accessible DPs in its domain (see also Sigurðsson and Holmberg 2008, where it is proposed that the person probe agrees with both the dative and the nominative DP). As a consequence, their account does not straightforwardly extend to hierarchy effects, as Multiple Agree arises regardless of whether the two DPs stand in a 1>3 or a 3>1 configuration. Our gluttony account derives the fact that 1>3 and 3>1 configurations are not symmetrical.

Recall that the restriction on the person of the nominative DP disappears if no verb agrees with it (i.e., if it is inside a nonfinite clause; see (78) and (80)). This follows naturally from our account. Without an agreeing probe, there is no gluttony, and as a result, the morphological-realization problem does not arise in the first place. The structure is therefore grammatical regardless of the person of the nominative DP.

A second important configuration that leads to obviation of the person restriction is the following: in environments where agreement with the 1st or 2nd person nominative object is syncretic with 3rd person agreement in the same number, the restriction is lifted for most speakers (Sigurðsson and Holmberg 2008:272; see also Sigurðsson 1991, 1996, Taraldsen 1995, Schütze 2003, Thráinsson 2007). An example is provided in (84). In (84a), the nominative DP is *þið* ‘you.PL’ and the embedding verb is *virtust* ‘seems’. The conjugation of this verb follows the paradigm in (81), and the 2PL form is hence syncretic with the 3PL form. In this case, the 2PL nominative DP is grammatical. A minimally different configuration is provided in (84b), where the nominative DP is *við* ‘we’. Importantly, the 1PL form of the verb is not syncretic with 3rd person agreement, and the structure is ungrammatical.

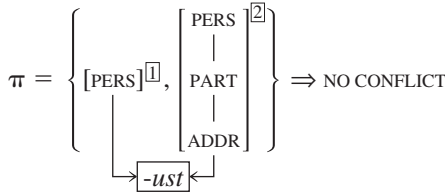
(84) *Syncretism fix*

- a. Henni *virtust* **þið** eitthvað einkennilegir.
 her.DAT seemed.2PL/3PL you.PL.NOM somewhat strange
 ‘You seemed somewhat strange to her.’
- b. *Henni *virtumst* **við** eitthvað einkennilegir.
 her.DAT seemed.1PL we.NOM somewhat strange
 (Sigurðsson and Holmberg 2008:270)

Note that grammaticality is improved for all configurations that display the relevant syncretism. This includes simple transitive clauses, and it encompasses both main verbs and auxiliaries (Sigurðsson 1996, Schütze 2003, Thráinsson 2007, Sigurðsson and Holmberg 2008, Atlamaz and Baker 2018). Moreover, the person restriction is completely lifted in the singular of past tense mediopassive verbs, where all cells are syncretic (see (81)), as shown by Sigurðsson and Holmberg (2008:270).

Because our account attributes the ungrammaticality of 1st/2nd person nominative objects not to gluttony itself but to its morphological aftermath, the rescuing effect of syncretism receives a principled account. Syntactically, (84a) results in a gluttonous π -probe, which acquires both a 3rd person value and a 2nd person value. In combination with plural agreement by the number probe, the person probe and its morphological realization are schematized in (85). Due to the syncretism pattern of the verb, both 3rd person and 2nd person agreement demand the same VI: *-ust* in (82). There is hence no conflict between the morphological requirements of the two values, and it is possible to simultaneously satisfy both by inserting a single VI.

(85) *Gluttonous π -probe in (84a) (in context of plural number agreement)*



Citko (2005) demonstrates that analogous obviation effects under syncretism arise in ATB extraction (see (59)); Kratzer (2009) shows the same for fake indexicals in German; Asarina (2011) observes an analogous pattern for Russian Right Node Raising; Bjorkman (2016) observes it in English *go-get* constructions; also see footnotes 32 and 34 for parallel evidence from German and other languages. This is of course consistent with our claim in section 4.1 that what underlies hierarchy effects is the same general restriction that also governs the case restriction in ATB movement configurations. Under a licensing approach to hierarchy effects, it is unclear why idiosyncrasies of syncretism should affect the grammaticality of the output.

Note finally that our proposal characterizes probes as gluttonous if they have agreed with more than one DP, but not the other way around. That is, it is permissible for one DP to agree with multiple probes. A relevant configuration from Icelandic, suggested by a reviewer, is given in (86).

- (86) **þeir** mundu vera **taldir** vera **sagðir** hafa verið
 they.NOM.M.PL would be believed.NOM.M.PL be said.NOM.M.PL have been
kosnir.
 elected.NOM.M.PL
 ‘They would be believed to be said to have been elected.’
 (Sigurðsson 2004a:86)

In (86), multiple probes agree with the same DP. Because none of these probes agrees with multiple DPs, no gluttony arises.

To summarize, gluttony and hence hierarchy effects are found in Icelandic exactly in those environments in which (a) two ϕ -accessible DPs are located in the domain of a single ϕ -probe and (b) the lower DP is more specified than the higher one. In Icelandic, this is the case only in configurations in which the lower DP is nominative. In NOM-ACC or NOM-DAT constructions, either the lower DP is completely inaccessible to the ϕ -probe, or it maximally bears a $[PERS]$ feature externally (i.e., as a “quirky” DP; see discussion on datives in Basque in section 3.4.1 and in this section above) and is hence never more featurally specific than the higher DP. As a result, no gluttony can arise in such configurations. Combined with the gluttony system, the assumption that dative DPs have visible 3rd person features yields a unified account not only of (a) the person effect, (b) the nonagreement fix, and (c) the syncretism fix, but also (d) the fact that these restrictions are limited to DAT-NOM constructions, in which the lower DP is in an accessible case form.

5 Conclusion and Outlook

5.1 Summary

In this article, we have proposed a new approach to hierarchy effects. The central difference between this approach and more traditional accounts is that we do not attribute hierarchy effects to failed Agree or a failure of nominal licensing. Rather, we suggested that hierarchy effects are due to *too much* Agree in the sense that a single probe agrees with more than one DP. Such feature gluttony configurations are not syntactically ill-formed as such, but they may give rise to irresolvable conflicts for subsequent operations, be they syntactic (in the case of clitic doubling; section 3) or morphological (in the case of agreement; section 4).

The crucial motivation for this departure from nominal licensing came from the observation that hierarchy effects commonly disappear in environments in which the clitic doubling or agreement associated with them does not arise. This is most directly the case in nonfinite clauses that lack clitics or agreement, and we have presented evidence that PCC effects as well as the agreement restrictions in German and Icelandic disappear in such environments. We argued that such effects present difficulties for a licensing-based approach: if hierarchy effects are due to licensing failures resulting from insufficient Agree, then having less Agree should not rectify these failures. While it is possible to complicate the definition of the licensing condition in a way that exempts DPs from the licensing requirement in precisely such cases—as for example Preminger (2011, 2019) does—such complications remain stipulated on a licensing account and hence do not explain why obviation should occur in these configurations.

We suggested that a more principled explanation of these obviation effects becomes available if the burden of the account is shifted away from nominal licensing and toward verbal probes. If hierarchy effects are caused by gluttonous probes, it follows immediately that hierarchy effects should disappear in structures that do not contain such probes. We are then in a position to dispense with the added caveats of the revised licensing condition, while still accounting for the range of facts that motivated these caveats. Furthermore, to the extent that the gluttony account is on the right track, no appeal to licensing requirements of particular features is necessary anymore in at least this domain.

Because our account attributes ungrammaticality not to gluttony itself but to its aftermath (cliticization or the realization of morphological agreement), it predicts that such effects are limited to configurations with overt agreement or clitics. We showed that this is the case for the PCC, but it also generalizes to different constructions within a language. For example, a reviewer notes that Icelandic does not show PCC effects in ditransitives despite exhibiting hierarchy effects in another corner of its grammars (see Schütze 1997); the same is true for German. This contrast follows straightforwardly on our account. Because objects of ditransitives are not associated with agreement or clitics in either German or Icelandic, no hierarchy effect could arise. The generalization that hierarchy effects only arise with agreement or clitics is explicitly argued for by Preminger (2019); our account offers a way to derive it.³⁹

³⁹ See Preminger 2019 for discussion of combinations of weak object pronouns in English; though hierarchy effects are sometimes reported for weak pronouns in English ditransitives (e.g., *They showed him her* vs. *They showed him me*;

A gluttony-based account furthermore makes principled predictions about the kinds of structures that give rise to hierarchy effects. First, because gluttony by definition only arises if a probe agrees with more than one DP, hierarchy effects are expected to be limited to such environments. Second, a probe must be articulated (i.e., “picky”) enough to not be completely satisfied by the first DP that it encounters. Third, the lower DP must have more features than the higher DP in order to be able to value features of the probe that have not been valued by Agree with the higher DP. This last property is of course the defining characteristic of hierarchy effects.

5.2 Possible Extensions

In closing this article, we will briefly lay out possible extensions of our system. While we have focused primarily on gluttony that arises in particular corners of certain grammars (ditransitives, copulas, and DAT-NOM constructions), for many languages of the world hierarchy effects appear to play a more widespread role. Our account predicts that the factors that contribute to gluttony (i.e., two accessible DPs in the domain of a single agreeing probe) might be especially prevalent in languages that (a) are agreement-rich and (b) for which the *lower* of two DPs is typically in a case form accessible to the relevant agreeing probe—as in languages that lack morphological case, or in ergative-absolutive languages in which the ergative has at least [PERS] visible and the lower absolutive is accessible, on par with Icelandic DAT-NOM constructions.

Hierarchy-based restrictions in transitives are attested in many languages that fit this description (see, e.g., Klaiman 1992, Aissen 1999, Zúñiga 2006, Bliss, Ritter, and Wiltschko 2020).⁴⁰ Languages of the Algonquian family, for example, require special inverse verb forms in hierarchy-violating transitives. In Lummi (Salish), transitive sentences with 3rd person subjects and participant objects are ungrammatical (Jelinek and Demers 1983); varieties of Neo-Aramaic ban the same configurations just in the perfective aspect (Kalin and Van Urk 2015). In Chukchi (Chukotka-Kamchatkan), certain inverse configurations are similarly banned in transitives, requiring instead a “spurious antipassive” (Bobaljik and Branigan 2006). In keeping with our system, Algonquian languages are caseless and head-marking, Lummi is a head-marking ergative language, and Chukchi has ergative case marking and unmarked absolutes. Neo-Aramaic is similarly caseless and head-marking, and Kalin and Van Urk (2015) argue specifically that what sets the perfective apart from the imperfective (which lacks the hierarchy effect) is that in the perfective a probe on T is responsible for *both* subject and object ϕ -indexing morphemes. Rezac (2008a) notes that person effects akin to the one described for Icelandic in section 4.2 are found with oblique subjects (not necessarily dative) in Finnish, Chinook, Tamil, Choctaw, Gujarati, and Breton.

see Bonet 1991, Haspelmath 2004), these effects are described as subtle, and speakers we have consulted do not detect a reliable person-based contrast. This suggests that these effects should not be unified with PCC effects, a conclusion also reached by Preminger (2019).

⁴⁰ Klaiman (1992) explicitly discusses the prevalence of inverse systems in head-marking languages—namely, languages that mark grammatical relations via morphological agreement and lack nominal case. He also lists ergativity as a factor contributing to inverse systems.

Some languages may have systematic strategies to resolve widespread hierarchies. As we have emphasized throughout, our account does not attribute ungrammaticality to gluttonous probes as such. Rather, gluttonous probes can give rise to irresolvably conflicting requirements for subsequent operations, which in turn leads to ineffability. We already showed on the basis of German and Icelandic that conflicts in the domain of gluttonous agreement do not arise in cases of syncretism in which both values on the probe demand the same VI. In addition, the system lends itself to other strategies for dealing with gluttonous agreement probes, with distinct empirical signatures. In what follows, we briefly outline three such strategies predicted to lead to a converging structure, even in the presence of a gluttonous agreement probe: (a) morphological fission, (b) portmanteau forms, and (c) the absence of a VI. Note that because the problem for cliticizing probes involved movement and was hence syntactic, these rescue strategies should be available to agreement probes, but not to cliticizing probes.

The first morphological strategy for dealing with a gluttonous agreement probe is through morphological fission. Fission rules are a standard type of operation in Distributed Morphology that splits a single head into two heads (Noyer 1992, Halle 1997). Crucially, fission applies after syntax, but before Vocabulary Insertion. The effect of fission is schematized in (87). Here, a gluttonous probe π on T with the ϕ -values $\{\phi_1, \phi_2\}$ is split into two syntactic heads T' and T'', each with only one feature value. Because Vocabulary Insertion targets heads, it can apply to each without running into the competition problem.

(87) *Rescue by fission*

$$[\{\phi_1, \phi_2\}_\pi]_T \Rightarrow [\phi_1]_{T'} [\phi_2]_{T''}$$

The result of such a fission rule would be agglutinative agreement with two DPs that is established by a single probe. Deal (2015) develops an account for complementizer agreement in Nez Perce in which a single articulated probe may show agreement with two DPs when the lower DP matches more of the probe's features. The features of each DP are realized as separate morphemes, compatible with morphological fission (though Deal's analysis does not involve fission).

A second possible rescue strategy for gluttonous agreement probes is portmanteau morphology. In this case, a special VI is inserted that realizes the features of both agreed-with DPs (see, e.g., Heath 1991, 1998, Georgi 2013, Woolford 2016). Because this VI simultaneously realizes the features of both DPs, it is more specific than any VI that only realizes one of the two values. As a result, no conflict arises, and ineffability is averted. See, for example, Oxford 2019 for a proposal governing the distribution of portmanteau morphemes in Algonquian languages; Oxford proposes that portmanteau forms appear only in environments in which an articulated probe agrees with both the subject and the object.

A third conceivable rescue strategy for gluttonous agreement probes involves cases in which one of the two feature values does not correspond to any VI (as opposed to a phonologically null VI). In the context of the gluttony account, this strategy can be used to analyze omnivorous number-agreement systems (Nevins 2011). Omnivorous agreement is characterized by a particular agreement morpheme indexing features of a more highly ranked DP, regardless of that DP's

position. For example, in the Kichean Agent Focus construction, in 3>3 configurations the verb bears plural agreement (-e) if the subject, object, or both are plural, and it is not overtly marked for number if both are singular (Preminger 2014; see (88)).

(88) *Verbal number agreement in Kichean Agent Focus 3>3 configurations* (Preminger 2014:21)

Subject	Object		Verb agreement
SG	SG	→	∅
SG	PL	→	-e
PL	SG	→	-e
PL	PL	→	-e

To reach a plural object across a singular subject, the #-probe in Kichean must be specified as [*u*NUM [*u*PL]]. SG>PL configurations then result in gluttony because # agrees with both the singular subject and the plural object.⁴¹ One line of analysis compatible with our account is that singular agreement in Kichean is not associated with a VI at all. That is, the only VI available to expone number agreement is -e, which realizes plural. “∅” in (88) is the absence of a VI. If this line of analysis is correct, then the gluttonous probe in a SG>PL configuration does not result in ineffability: because only the plural value is associated with a VI, no competition between VIs arises. The descriptive result is an omnivorous agreement pattern. All else being equal, we might then expect singular agreement to correspond to the absence of overt number marking across all omnivorous number systems. Though more systematic work is needed, we are unaware of counterexamples to this potential generalization (e.g., Georgian and Ch’ol fit this pattern; see Béjar 2011 and Vázquez Álvarez 2011, respectively).

In sum, because ineffability does not arise from gluttony itself, but rather from its aftermath, at least gluttonous agreement probes can be repaired in a variety of ways, including syncretism, fission, portmanteau morphology, and the absence of a VI. In languages with more systemic gluttony—as in agreement-rich systems in which both subject and object DPs are accessible to a single probe—we might expect to find widespread use of one or more of these strategies. We leave a comprehensive exploration of such strategies within the current proposal for the future, but we hope that the proposal ultimately extends beyond the hierarchy effects discussed here.

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⁴¹ Another possibility for explaining omnivorous number would be the absence of [+SG] specifications on nonplural DPs. If in a given language, nonplural DPs are simply unspecified for number features, then no gluttony will occur in configurations in which a probe agrees with a lower plural DP across a higher nonplural DP. This echoes the account in Nevins 2011, in which number features are privative, but it allows for crosslinguistic variation. See, for example, Corbett 2000 and Wiltschko 2008 on “number-neutral” or “general number” systems.

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