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<https://escholarship.org/uc/item/9rk8k2fc>

Journal

Linguistic Inquiry, 55(1)

ISSN

0024-3892

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Publication Date

2023-12-22

DOI

10.1162/ling_a_00455

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Interaction, Satisfaction, and the PCC

Amy Rose Deal

The Person-Case Constraint (PCC) is a family of restrictions on the relative person of the two objects of a ditransitive. PCC effects offer a testing ground for theories of Agree and of syntactic features, both those on nominals and those found on agreement probes. This article offers a new theory of PCC effects in an interaction/satisfaction theory of Agree (Deal 2015a) and shows the advantages of this framework in capturing PCC typology. On this model, probes are specified for interaction, determining which features will be copied to them, and for satisfaction, determining which features will cause probing to stop. Applied to the PCC, this theory (a) captures all four types of PCC effect recognized by Nevins (2007) under a unified notion of Agree; (b) captures the restriction of PCC effects to contexts of “Double Weakness” in many prominent examples (e.g., in Italian, Greek, and Basque, where PCC effects hold only when both objects are expressed with clitics); (c) naturally extends to PCC effects in syntactic environments without visible clitics or agreement for one or both objects, as well as to the absence of PCC effects in some languages with clitics or agreement for both objects. Two refinements of the interaction/satisfaction theory are offered: a new notation for probes’ interaction and satisfaction specifications, clarifying the absence of uninterpretable/unvalued features as drivers of Agree; and a proposal for the way that probes’ behavior may change over the course of a derivation, dubbed *dynamic interaction*.

Keywords: Agree, ditransitives, Person-Case Constraint, person hierarchy, clitics

1 Introduction

Some of the most foundational questions of syntactic theory concern the properties of a small number of basic syntactic operations—at least Merge and Agree—and the nature of syntactic featural representations. These questions are deeply interconnected. One clear case of this interconnection is found in approaches to unexpectedly reduced or augmented levels of feature copying

I am grateful to many linguists for feedback on this project and for help with language data. For feedback, thanks to audiences at UC Berkeley, NYU, the University of Toronto, NELS 50, the 2017 EGG school (Olomouc), Peter Arkadiev, Madeline Bossi, Emily Clem, Jessica Coon, Brian Dillon, Emily Drummond, Stefan Keine, Julie Anne Legate, Roumyana Pancheva, Tessa Scott, and two anonymous reviewers. For language expertise, I am especially grateful to Peter Arkadiev, Roberta D’Alessandro, Rhona Fenwick, Lucero Flores Nájera, Ion Giurgea, Peter Jenks, Carol Rose Little, Wendy López Márquez, Jack Merrill, Neil Myler, Zachary O’Hagan, Michelle Sheehan, Jan Ullrich, and Robert Van Valin.

in Agree—in particular, the notion of agreement failure (Preminger 2009, 2014) and “overagreement” (Deal 2015a). This work has developed the theory of Agree in connection with new alternatives to Chomsky’s (2000, 2001) notion of probes as possessors of uninterpretable, unvalued features. A second case of interconnection is found in syntactic approaches to hierarchy effects—in particular, the Person-Case Constraint (PCC), a family of restrictions on the relative person of the two objects of a ditransitive construction. Several strands of this work have developed the theory of Agree in connection with a refinement of the notion of ϕ -features in terms of structured, geometrically organized primitives (e.g., Béjar and Rezac 2003, Nevins 2007, 2008, 2011, Rezac 2008, 2011, Preminger 2019, Yokoyama 2019b, Coon and Keine 2021, S. Foley and Toosarvandani 2022).

In this article, I offer a synthesis of these lines of inquiry: an approach to PCC effects in a model of Agree without unvalued or uninterpretable features—in particular, the interaction/satisfaction model (e.g., Deal 2015a,b, Baier 2018, Clem 2019a,b, to appear, Halpert 2019, Scott 2019, 2021, Oxford 2020, Roversi 2020, Branam and Erlewine to appear). Central to this theory is the idea that probes are specified in two ways. The first specification is an *interaction* condition, which determines what features will be copied back to the probe; the second is a *satisfaction* condition, which determines what features will cause the probe to halt its search. Notably absent from the theory is a notion of probes as necessary hosts of uninterpretable or unvalued features. Indeed, this approach makes it possible to strike such feature types from syntactic theory altogether. In bringing this approach to bear on PCC effects, I aim, first, to contribute a new demonstration of the empirical power of this conception of Agree, and second, to motivate two refinements vis-à-vis the original presentation in Deal 2015a. The first is an improved notation for probe specifications for interaction and satisfaction. The second, more substantive refinement relates to the ways in which probe behavior may change over the course of a derivation. Drawing on evidence from several types of PCC patterns, I will argue that probes’ interaction features need not be fixed once and for all; rather, they may change in the course of feature copying from goals. I refer to this type of change as *dynamic interaction*.

The theory of PCC effects to be proposed responds to three central desiderata highlighted in the PCC literature. The first desideratum, following Nevins (2007), concerns coverage vis-à-vis various types of PCC effects found in natural language. Perhaps best-known is the strong PCC pattern, according to which the direct object (DO) must be third person in the presence of an indirect object (IO). As many have pointed out, however, the restriction also comes in at least three additional varieties, schematized in (1) and in (2b–d).¹ Frequently discussed examples are Basque, French, and Greek, for the *strong PCC* (respectively, Laka 1993; Perlmutter 1971, Bonet 1991, Rezac 2011; Anagnostopoulou 2003); varieties of Catalan for the *weak PCC* (Bonet 1991);

¹ Some work also recognizes a fifth variety, the so-called *superstrong PCC*, which consists of a strong PCC effect plus an additional restriction on combinations of two third person objects (e.g., Haspelmath 2004, Pancheva and Zubizarreta 2018, Yokoyama 2019b). I return to the status of restrictions on pairs of third persons in section 7.2, as well as the potential for other types of PCC patterns (e.g., “you-first”; see Nevins 2007, Stegovec 2017b) in section 6.1.

Romanian and Bulgarian for the *me-first PCC* (Nevins 2007, Pancheva and Zubizarreta 2018); and Classical Arabic and additional varieties of Catalan for the *strictly descending* (or “*ultrastrong*”) PCC (Nevins 2007, Walkow 2012, Anagnostopoulou 2017).

(1) *PCC varieties*²

Strong			Weak			Me-first			Strictly descending (a.k.a. “Ultrastrong”)		
IO	DO		IO	DO		IO	DO		IO	DO	
1	3	OK	1	3	OK	1	3	OK	1	3	OK
1	2	*	1	2	OK	1	2	OK	1	2	OK
2	1	*	2	1	OK	2	1	*	2	1	*
2	3	OK	2	3	OK	2	3	OK	2	3	OK
3	1	*	3	1	*	3	1	*	3	1	*
3	2	*	3	2	*	3	2	OK	3	2	*

(2) In certain combinations of direct and indirect objects . . .

a. *Strong PCC*

The direct object must be third person.

b. *Weak PCC*

If there is a third person, the direct object must be third person.

c. *Me-first PCC*

If there is a first person, it must be the indirect object.

d. *Strictly descending* (or “*ultrastrong*”) *PCC*

The indirect object must outrank the direct object on the hierarchy $1 > 2 > 3$.

The first desideratum is thus:

- D1. The theory should capture all four types of PCC, without multiplying the number of basic Agree(-type) operations necessary in natural language.

The second desideratum concerns a common, though not universal, restriction on the contexts in which PCC effects obtain. (It is in view of this type of restriction that I have stated the generalizations in (2) as applying only in *certain* combinations of DO and IO, rather than necessarily across the board.) In various well-known instances of PCC effects, person restrictions are in force specifically in cases where the DO and IO are both, in Bonet’s (1991) terms, *phonologically weak*;

² The names *weak* and *strong* are Bonet’s (1991). The names *me-first* and *ultrastrong* are Nevins’s (2007). As an alternative to *ultrastrong*, the (arguably more appropriate) term *strictly descending* is in use in Nevins 2008, Sturgeon et al. 2011, and Franks 2020, among other works; “descendingness” is in reference to a person hierarchy, as in (2d).

that is, they are both clitics, other atonic pronouns, or agreement markers.³ Bonet accordingly states the strong PCC as in (3), a formulation that has proven influential.

(3) *Strong PCC* (per Bonet 1991:177)

- a. In a combination of a direct and an indirect object, the direct object has to be third person
- b. [when] both the direct object and the indirect object are phonologically weak.

I will refer to the (3b)-type putative condition on application of the PCC, both for the strong PCC and for other varieties, as *Double Weakness*. Empirical effects of the Double Weakness condition have been much discussed (e.g., Albizu 1997, Anagnostopoulou 2003, 2017, Bianchi 2006, Ormazabal and Romero 2007, Nevins 2011, Preminger 2019, Stegovec 2019, 2020, Sheehan 2020, Coon and Keine 2021, S. Foley and Toosarvandani 2022). In Italian, for instance, a PCC effect holds when both the IO and the DO are clitic pronouns, (4a), but the effect disappears when either clitic is replaced with a tonic pronoun, (4b–c).

(4) *Italian*

- a. *Mi gli presenteranno.
1SG.CL 3SG.CL 3PL.will.introduce
Intended: ‘They will introduce me to him.’
- b. Mi presenteranno a lui.
1SG.CL 3PL.will.introduce to him.TONIC
‘They will introduce me to him.’
- c. Gli presenteranno me.
3SG.CL 3PL.will.introduce me.TONIC
‘They will introduce me to him.’
(Bianchi 2006:2041)

A generalization about such cases is that PCC effects are obviated by avoiding weak realizations of either the IO or the DO. Capturing this effect is our second desideratum for a theory of PCC.

- D2. The theory should capture Double Weakness conditions on PCC application in cases where such conditions hold.

The third desideratum, related to the second, concerns the fact that Double Weakness conditions do *not* hold in certain cases. Two types of patterns are of special interest. First, in certain cases PCC effects obtain even though either the IO or the DO is not realized in a weak way (Ormazabal and Romero 2007, Riedel 2009, Rezac 2011, Shklovsky 2012, Sheehan 2020). In

³ In this article, following Bonet (1991), I use *weak* as a cover term for agreement, clitics, and weak pronouns (in languages where these are distinguished from strong tonic pronouns; see Cardinaletti and Starke 1999). Some work on PCC effects holds that these effects are only found with a certain subtype of weak element: for example, Nevins (2011) proposes that PCC effects arise only with clitics; Baker (2008) proposes that they arise only with true agreement; Preminger (2019) proposes that they hold only with clitics and agreement, not weak pronouns; Bonet (1994), Ormazabal and Romero (2007), Anagnostopoulou (2017), and S. Foley and Toosarvandani (2022) suggest that the particular subtype of weak element found in a language correlates with its variety of PCC effect. Given the substantial difficulty inherent in reliably distinguishing agreement from clitics (esp. obligatory ones), I will take no stand on this set of questions here.

Tlaxcala Náhuatl (Uto-Aztecan), for instance, the verb hosts an object marker only for the IO; nevertheless, a PCC effect obtains, (5).

(5) *Tlaxcala Náhuatl*

o-Ø-tech-wal-titlani-li-h {se padre / pro_{3sg} / *teh / * pro_{2sg} }
PAST-3SG.SUBJ-1PL.OBJ-DIR-send-APPL-PERF {INDEF priest / 3SG / *2SG / *2SG }
'He sent a priest/him/*you to us.'
(Lucero Flores Nájera, pers. comm.)

The flip side of this pattern is found in languages in which both the IO and the DO *are* realized in a weak way, and yet there is no PCC restriction on their combination. This pattern is found, for instance, in Ubykh (NW Caucasian), (6), where verb forms bearing weak object markers for the IO and the DO are possible regardless of the person specifications of the two arguments.

(6) *Ubykh*

a. s-é-ç^w-t^w-p-n
1SG.ABS-3PL.DAT-2PL.ERG-give-PL-PRES
'You(pl) give me to them.'
b. p-sí-ç^w-t^w-p-n
3PL.ABS-1SG.DAT-2PL.ERG-give-PL-PRES
'You(pl) give them to me.'
(Dumézil and Esenç 1975:90, 92; Fenwick 2011)

The final desideratum is thus bipartite:

- D3. The theory should allow for PCC restrictions to hold even in cases where the Double Weakness condition is not met, as well as for cases where the Double Weakness condition is met but PCC restrictions do not hold.

Any theory that meets D2 as well as D3 will need to be one that allows for some degree of variation regarding the syntax-morphology interface. Accordingly, the theory proposed here will localize the basic heart of the PCC effect in syntactic computations pertaining to the operation Agree (rather than purely in morphological mechanisms, per Bonet (1991), or in mechanisms at the syntax-morphology interface, per Coon and Keine (2021)). Variation in the PF ramifications of syntactic operations as well as variation in the feature specification of probes will allow us to capture cases in which Double Weakness conditions are in force as well as both types of cases in which they are not.

The article is structured as follows. Section 2 introduces the interaction/satisfaction theory of Agree, along with a new notation for probe specifications that highlights this theory's most central properties. Section 3 applies the theory to the strong PCC. This work builds on Walkow's (2012, 2013) proposal that the probe enters into a relationship with the DO first—what I will call *DO preference*. The core proposal is that the strong PCC arises because the DO's person feature satisfies the probe (i.e., halts further probing), leading to no interaction with (i.e., feature transfer from) the IO. This typically has the result that the IO cannot be expressed in a weak form, for example, as a clitic. The section concludes with a discussion of exceptions to Double

Weakness from Tlaxcala Náhuatl, previewed above, as well as from certain causatives in French. Section 4 shows how progressive narrowing of the satisfaction condition accounts for two more (increasingly more permissive) language types: the me-first PCC and the (Ubykh-type) complete absence of a PCC effect. In the former case, the probe has the satisfaction condition [SPKR]; in the latter, the probe has no satisfaction condition at all—it is insatiable. Section 5 turns to the weak and strictly descending variants of the PCC, introducing the notion of dynamic interaction. Section 6 discusses two kinds of typological extensions to the theory: potential PCC patterns in which a distinctive second person feature [ADDR] plays a role, along with “reverse PCC” type patterns, as in Slovenian (Stegovec 2020). Finally, section 7 briefly compares the resulting theory with selected competitor proposals, and concludes.

2 Interaction and Satisfaction

Chomsky (2000, 2001) proposes the operation Agree as a device for repairing specific lexical deficiencies by feature transfer. Certain syntactic elements enter a derivation with unvalued, uninterpretable features (henceforth, u-features, or in general, uF). An element that bears such features is a *probe*. The operation Agree consists of (a) identification of an element within the c-command domain of the probe, henceforth the *goal*, which bears the valued, interpretable version of the u-feature(s) on the probe; (b) copying of the valued features in question from the goal to the probe; (c) deletion of the (now valued) features on the probe from the narrow syntax (see Chomsky 2001:5).⁴

At the heart of this conception is the idea that Agree exists to eliminate uninterpretable features from the input to semantic computation. This premise raises two central questions. The first is why the elimination of uninterpretable features should have to involve steps of feature copying, as in (a)–(b). (This point has been made elsewhere, for instance, by Pesetsky and Torrego (2007).) The most minimal system for eliminating uF would simply be an operation that identifies instances of uF and deletes them. Why should copying play a role?⁵ The second question concerns the notion of a feature being “uninterpretable” (and thus requiring deletion before semantic interpretation) as opposed to merely “uninterpreted.” One might, of course, very reasonably think that there are syntactic elements that receive no contentful semantic interpretation. (Indeed, this is Chomsky’s (2001) starting observation concerning ϕ -features borne by T.) How should a compositional semantic system deal with such elements? The simplest response is either to ignore them, leaving them out of the compositional machinery entirely as a matter of semantic rules, or alternatively to treat them as contributing identity functions.⁶ This is in a sense parallel to the way that much of the richness of syntactic structure is ignored in constructing prosodic representations—some constituent boundaries and labels are mapped to prosodic boundaries and labels,

⁴ Additional complexities of this algorithm related to “activity” and changes to the goal are discussed in Deal 2022.

⁵ Chomsky (2001) suggests that copying/valuation is connected with uninterpretability because the syntax uses unvaluedness as a proxy for uninterpretability: “The natural principle is that the uninterpretable features, and only these, enter the derivation without values, and are distinguished from interpretable features by virtue of this property” (p. 5). The question is why this conception should be preferred over the alternative proposed in a previous passage: “Though motivated at the interface, interpretability of a feature is an inherent property that is accessible throughout the derivation” (p. 4).

⁶ The first of these possibilities is raised by Preminger (2014:253), who suggests a parallel to c-selectional features.

and some are not, but this does not cast doubt on the syntactic reality of the latter class.⁷ Nor does it motivate a syntactic operation whose essential function is to remove boundaries or labels that cannot be interpreted prosodically.

These concerns raise the question of whether a distinct etiology for Agree might be identified—one that would avoid the postulation of uninterpretable features, on one hand, and provide a more straightforward explanation for feature copying, on the other. Perhaps the most direct resolution of both issues lies in the suggestion that fundamentally, Agree is exactly what it looks like: a device for introducing featural redundancies in syntax.⁸ Why should natural language syntax have an operation with this property? Because syntactic structures shape the input to morphological and in turn phonological structures, which are used in human communication; redundancy in communication is useful for information transfer in view of noise (see Ferguson and Barlow 1988, Levin 2001).⁹ The existence of an operation that generates redundancies in syntactic representations has the downstream effect of allowing communication to be redundant without requiring redundant information to be stored in the lexicon (e.g., in verbs that lexically select only for very particular classes of potential arguments). From this perspective, it might be further speculated that the operations Merge and Agree, between them, represent the two major functions for which human language is adapted: Merge facilitates recursive processes of cognition and thus higher-order thought, whereas Agree facilitates communication and thus collaboration and social organization.

Two types of limitations on a redundancy-forming algorithm are amply supported in natural language. The first concerns the particular types of syntactic information that will be made redundant. Probes copy back certain features and ignore others: for example, a probe on T generally ignores features on Asp (e.g., [PERF], [PROG]) while copying features from DPs. To capture such behavior, we must specify the features that a probe *interacts* with, that is, copies to itself. The second limitation concerns the fact that probes oftentimes are restricted to copying features from just one goal. For instance, in many languages a probe on T interacts with the subject's features only. To capture cases where a probe fails to Agree with all interaction features in its domain,

⁷ For instance, Selkirk's (2011) Match Theory ignores all intermediate projections and treats all nonclausal XPs identically.

⁸ This view is hardly revolutionary. As Barlow (1992:2) writes, "[T]he idea that agreement is some sort of redundancy relation is widely held in linguistics." For discussions of agreement redundancy from a functionalist point of view, see Haiman 1985:162–164, Lehmann 1988, Moravcsik 1988, Barlow 1992, and Levin 2001. Notably, Levin surveys the functionalist literature and concludes that although "there are a number of functions which are carried out by targets [i.e., agreement morphemes], and, although agreement phenomena are still somewhat mysterious in their nature, there does not appear to be much support in the functionalist literature for Jespersen's strong rejection of agreement as being 'superfluous' [i.e., redundant]" (2001:27).

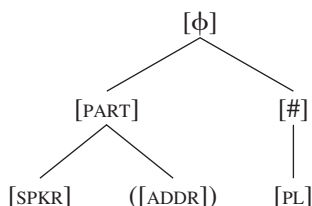
Here I note that my perspective on redundancy differs from those of functionalist theorists in that mine is situated in a modular theory in which a redundancy between two syntactic loci need not be reflected morphologically in a perfect match of information in the two, because the redundant information might not be overtly spelled out (realized by vocabulary) in both places. (See section 3.3.) An English noun like *deer*, for instance, lacks a morphological plural. I take this as a purely morphological fact; this noun and its projections may bear a [PL] feature like all other English count nouns. Thus, I do not take absence of morphological redundancy in *The deer is spotted* vs. *The deer are spotted* to indicate that the syntax of agreement is not redundancy-oriented. Syntax creates the input for redundancy in morphology, but cannot guarantee that the surface form is indeed redundant.

⁹ The point is made well by Ferguson and Barlow (1988:17): "As with any instances of apparent redundancy in language . . . [t]he most obvious [explanation] is the overcoming of 'noise' in the system: multiple cues are better than a single cue when the latter is attenuated, missing, or masked by other material."

we must specify at least an optional feature that *satisfies* the probe, that is, halts further probing. The minimal specification of a probe thus consists of two types of information, an interaction condition and a satisfaction condition; a natural null hypothesis is that the two conditions need not be the same. This is because features are copied to create redundancy, *not* to repair a defect in the features of the probe such as uninterpretability or unvaluedness. Indeed, uF need not play any role in the theory at all.

It will be helpful to introduce some simple notation for representing interaction and satisfaction information. I suggest that probes be represented, in general, as follows: [INT: α , SAT: β]. In principle, α and β might range over individual features or more complex objects, such as sets; here, for simplicity, I adopt the former.¹⁰ Let us suppose, following Harley and Ritter (2002), Béjar (2003), and others, that the “ ϕ set” (for which I will generally write Φ) consists of privative features organized into a feature geometry.¹¹ For a case like English T, the probe should interact with all ϕ -features and halt its search after copying features from the first bearer of ϕ -features. Feature geometries allow us to capture the behavior of ϕ -features as a natural class in this description. The interaction feature should be the root of the geometry, and interaction should be understood as copying the designated feature and all features that it geometrically dominates (or: is geometrically entailed by), for example, in a simple geometry such as (7).¹²

(7) A basic feature geometry for Φ



¹⁰ This is certainly a simplification as far as satisfaction features are concerned; see Oxford 2020, Roversi 2020, and Scott 2021 for discussion. As far as interaction features are concerned, perhaps the simplest sets-based theory is one where the interaction set consists of features any of which will be copied if encountered (as in Deal 2015a, 2022). Where Φ represents the ϕ -set (i.e., $\Phi = \{[\phi], [\text{PART}], [\text{SPKR}], [\text{ADDR}], [\text{PL}], [\text{FEM}]\}$, or similar, the details depending of course on the precise theory of features), the interaction condition of English T would be given as Φ . On the theoretical side, a set conception allows for the theory to proceed without any reference to feature geometries, following Harbour (2014, 2016), and would prove necessary for the modeling of PCC effects in an interaction/satisfaction theory paired with a bivalent, rather than privative, conception of ϕ -features (on which see footnote 42). On the empirical side, the set conception of interaction specifications is less restrictive than the feature conception in that it makes it perfectly possible to define probes that interact with ad hoc sets of features (e.g., INT: $\{[\text{SPKR}], [\text{PL}]\}$). One proposal along these lines is made by Alam and Kumaran (2021). It remains to be seen whether any cases of apparent interaction with nonnatural classes of features can be reanalyzed in terms of classes that are suitable for recognition as nodes in a feature geometry.

¹¹ This assumption helps to clarify the ways in which the interaction/satisfaction theory builds on earlier work, in particular Béjar 2003, as discussed later in this section. It is not, however, strictly necessary, as discussed in footnote 10. See also footnote 42.

¹² I parenthesize the [ADDR] feature in keeping with Harley and Ritter’s (2002) proposal that such a feature is made use of in some languages but not others (namely, they propose, only in languages with an inclusive/exclusive contrast). Gender features are obviously missing from (7), though of course they are required in a full account of ϕ -geometry. See Harley and Ritter 2002 for a fuller exploration of ϕ -geometry, and Toosarvandani 2021 for a recent exploration of animacy features.

Given a privative feature theory, the full set of features in (7) will be found only on first person plural inclusives (more precisely, following Harley and Ritter (2002): it will be found on first person plural inclusives in languages with an active [ADDR] feature). Other types of DPs will host a subset of Φ , such as [ϕ , PART,PL] (second person plural in a language without an active [ADDR] feature) or simply [ϕ] (third person singular). With an [INT: ϕ , SAT: ϕ] specification, an English-like T probe copies all features in the Φ set from all such DPs, and allows any such DP to meet its satisfaction condition.

- (8) *English-like T probe*: [INT: ϕ , SAT: ϕ]
- a. Interaction with [ϕ]: [ϕ] and all features that it geometrically dominates are copied to the probe.
 - b. Satisfaction by [ϕ]: Copying [ϕ] halts further probing of additional potential goals.

The system just outlined is distinct from its immediate predecessors in that it does not make use of deficiencies of probing features, either in terms of uninterpretability (as on Chomsky's (2000, 2001) original proposal) or in terms of mere unvaluedness (per, e.g., Pesetsky and Torrego 2007).¹³ One advantage of this change is that it allows for a particularly straightforward approach to the phenomenon of default agreement—as Schütze (1997:12) describes it, “[A]greement takes place if it can; if it cannot, for certain reasons, a valid sentence still results, and morphology supplies a default form of the verb.” From the perspective of the theory in Chomsky 2000, 2001, such cases (attested in numerous languages, such as Icelandic (Schütze 1997), Georgian (Béjar 2003), and Hindi-Urdu (Bhatt 2005)) might be thought of as *underagreement*: the probe does not copy features from any goal, and yet ungrammaticality does not result. On a uF theory, underagreement requires additional mechanisms to ensure that uF is not present in the final output of the syntax. For Schütze (1997), default agreement results when uF is not present in the numeration. To capture the requirement that agreement take place when it can, the *Accord Maximization Principle* is invoked, which requires the selection of a numeration that contains as many uninterpretable features as possible. The implementation of this principle involves competition among a set of numerations that differ in the presence or absence of uF. For Béjar (2003), the analysis of underagreement involves a more local operation, dubbed *Partial Default Agreement*, triggered when Agree has failed to value the features of the probe. Partial Default Agreement removes certain uF features from the probe (generally those that, on Schütze's view, would not have been present in the numeration to begin with), avoiding what would otherwise be a crashed derivation. On an interaction/satisfaction theory, by contrast, a probe that does not encounter any target bearing its interaction feature simply does not copy any features. Because this theory grounds Agree in the ability to create redundancy, rather than in the need to remove what Preminger (2014) calls “derivational time-bombs,” it does not predict derivation breakdown in cases where redundancy cannot be syntactically established. Therefore, it does not require a mechanism such as the Accord Maximization Principle or Partial Default Agreement to prevent such a breakdown from occurring.

¹³ In this connection, it should be noted that common locutions such as “the features a probe is looking for” or “a probe [not] finding what it is looking for” have no natural single interpretation on the interaction/satisfaction model. These, of course, are simply ways of talking about uF.

The interaction/satisfaction theory also responds straightforwardly to what we might describe as *overagreement*, or, from the perspective of the uF theory, cases in which a probe copies back features other than the ones that are uninterpretable/unvalued on the probe. As the mechanisms behind overagreement will be crucial for the theory of PCC effects to be developed here, it may be helpful to review a few case studies of this behavior. I begin with a type of case well-known in the literature subsequent to Béjar 2003 and Béjar and Rezac 2009. Béjar (2003) makes a distinction between *match* and *value*: a probe might match with potential goals on the basis of the feature [PART], for instance, but value both [PART] and [SPKR]. This, for Béjar, is the profile expected of a probe bearing [uPART]. Given Closest Match (minimality), a [PART]-matching ([uPART]) probe will be unable to probe past a [PART]-bearing DP. Such a probe on T would necessarily Agree with a [PART]-bearing subject. But the inclusion of a broader set of features under the heading of Valuation allows for a [uPART] probe to ultimately morphologically distinguish more than just a participant/nonparticipant distinction. This picture corresponds to the pattern of person agreement in Chirag Dargwa, (9). Person agreement is controlled by the subject whenever it bears [PART]; otherwise, it is controlled by the object.¹⁴ The forms of agreement reflect a distinction between first and second person.¹⁵

(9) *Chirag Dargwa*

- a. dicce {ŷu / it } r-iqqan-da
1SG.ERG {2SG(ABS) / 3SG(ABS)} F-lead-1
'I lead you/her.'
- b. ŷicce du r-iqqan-de
2SG.ERG 1SG(ABS) F-lead-2
'You lead me.'
- c. ite du r-iqqan-da
3SG.ERG 1SG(ABS) F-lead-1
'He/She leads me.'
- (Sumbatova 2011:135)

These insights are readily translated into the interaction/satisfaction theory. The person probe in a system like Chirag Dargwa can be modeled as [INT:PART, SAT:PART]. A [PART]-bearing subject meets the satisfaction condition and halts probing. But more than just the feature [PART] itself is copied to the probe: the interaction specification [PART] requires that [PART] and all features that entail it (i.e., are lower than it) in the feature geometry be transferred to the probe from an

¹⁴ In discussing a probe on T (rather than for instance v), I follow Béjar's (2003:99–100) discussion of what would be expected for a "high ϕ " language: there is a probe located above both arguments, able in principle to agree with either, but agreement is preferentially with the subject. (No such language was known to Béjar (2003:100).) I return below to the case of probes preferentially agreeing with objects (discussed at length in Béjar 2003 and Béjar and Rezac 2009). Note that for Béjar, in a high ϕ language, agreement with the object as in (9c) may require the subject (a potential intervener) to move out of the c-command domain of T. The verb-finality of Chirag Dargwa makes it difficult to assess if this is the case.

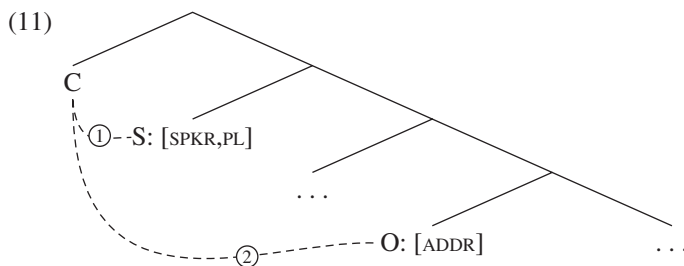
¹⁵ Chirag Dargwa also has gender agreement, expressed by a prefix on the verb, invariably controlled by the absolutive.

agreement target. Thus, the probe on T acquires not just [PART] but also [SPKR] upon agreement with a first person.

In general, for Béjar, the features that value a probe will be those that geometrically entail the match condition (i.e., either are or are lower than the match feature in the feature geometry, e.g., (7); Béjar 2003:40, Béjar and Rezac 2009:45, (12b)). The interaction/satisfaction theory relaxes this restriction, thereby making room for a broader space of pairings of interaction and satisfaction features. In Deal 2015a, I argue that this makes room for a pattern of overagreement in the Nez Perce complementizer (C) system that proves challenging for a Béjar (2003)–type theory. In this language, agreeing C copies all ϕ -features from all DPs until it encounters [ADDR]: the probe on C is [INT: ϕ , SAT:ADDR]. Crucially, both person *and number* features are copied. In (10a), the first [ϕ]-bearing element probed by C contains the [ADDR] feature; C copies features from this DP only, resulting in the second person agreement affix *-m*. Because the satisfaction feature has been encountered, there is no further probing by C. In (10b), by contrast, the subject meets the interaction condition (it bears ϕ -features) but not the satisfaction condition (it lacks [ADDR]). Accordingly, C copies [ϕ] and all entailing features from both the subject and the object, resulting in a form that encodes plural (from the subject), second person (from the object), and first person (from the subject). (Note that affix order is templatically determined.) The relation of C to its two goals in (10b) is depicted in (11).

(10) *Nez Perce C*: [INT: ϕ , SAT:ADDR]

- a. ke-m kaa *pro* nees-cewcew-teetu *pro*
 C-2 then 2SG O.PL-call-HAB.S.SG 1PL
2sg subj/1pl obj: ‘when you call us’
- b. ke-pe-m-ex kaa *pro* cewcew-tee’nix *pro*
 C-PL-2-1 then 1PL call-HAB.S.PL 2SG
1pl subj/2sg obj: ‘when we call you’



In the Nez Perce C-agreement paradigm, plural agreement appears on C whenever the feature [PL] occurs either alongside the feature [ADDR] (i.e., on a second person argument) or closer to C than [ADDR]. (10b) shows the latter type of case; (12) shows the former. These data reveal that plural features on C may originate either on the subject (10b) or on the object (12). However, plural features from the object are not accessible if the subject bears [ADDR], (10a).

(12) *Nez Perce*

ke-pe-m kaa A.-nim hi-cewcew-teetu *pro*_{obj}
C-PL-2 then A.-ERG 3SUBJ-call-HAB.S.SG 2PL
'when A. calls you(pl)'

The interaction/satisfaction analysis captures this behavior by treating all ϕ -features as interaction features, person and number alike.¹⁶

As I discuss in Deal 2015a, while a Béjar (2003)–style theory can capture the behavior of person agreement in this system, the analysis of number agreement is more challenging. A probe specified as [uPART,uADDR] (match conditions [PART] and [ADDR]), for instance, would capture the pattern of person agreement in (10a–b), but would not capture number agreement at all. Number features are not a match condition for the probe and do not entail any of the probe’s match conditions.¹⁷ Thus, the presence of plural features on C in (10b) and (12) remains unexplained. If the probe were to bear [uPART,uADDR,uPL], the explanatory situation would be reversed: the presence of plural agreement in (10b) and (12) would be accounted for straightforwardly, but the absence of plural agreement in (10a) would not be. In this example, the subject is singular and therefore does not match [uPL]. This is as in (12), and the expectation is that the system should respond in the same way: number agreement should be controlled by the object. But this is not possible. Finally, if the probe were to bear [uPART,uADDR] along with [u#] or [u ϕ], we would expect plural C-agreement with objects to be impossible. In this case, [#] or [ϕ] would invariably be located on the subject, meaning that plural C-agreement with objects, as in (12), would be unexplained.

These case studies of overagreement in Chirag Dargwa and in Nez Perce highlight two types of structural configurations for interaction with nonsatisfying features. In Chirag Dargwa, the nonsatisfying interacting feature [SPKR] is found on the same goal as the satisfying feature [PART]. In Nez Perce, in addition, nonsatisfying interacting features may be found on a goal higher than the satisfying feature; this is the case in (10a), for instance, where the interacting features [SPKR,PL] are found on the subject while the satisfying feature [ADDR] is found only on the object. In general, when a probe c-commands two elements meeting its interaction condition, we expect this type of “higher or both” agreement pattern. If the higher element contains the satisfaction feature, Agree transfers features from the higher element only. If, however, only the lower element contains the satisfaction feature (or neither element does), the probe copies the specified interaction features from *both* goals.

¹⁶ This entails that, provided third person singular arguments have some ϕ -features, ϕ -features are copied from both arguments in (12). However, neither third person nor singular corresponds to vocabulary entries that realize features on C. This is a language-particular fact, and we will see evidence for the copying of features from third person singular arguments in the discussion of Tupinambá below.

¹⁷ Here I assume, as I also did in Deal 2015a, that feature geometries are universal, and thus it could not be that (for instance) number features depend on [ADDR] as a language-particular fact about Nez Perce. (See also Coon and Keine 2021:664n8.) On the theoretical side, such a view would severely undermine Harley and Ritter’s (2002) proposals concerning feature geometries as an explanation for universals of pronoun inventory. On the empirical side, such a view might lead us to expect that the distribution of [PL] features is constrained by person in Nez Perce. This is not so; the language has a standard three-person, two-number system, with all combinations robustly attested.

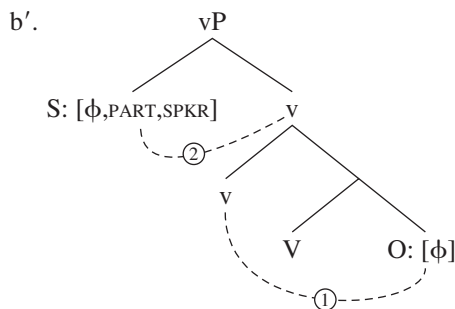
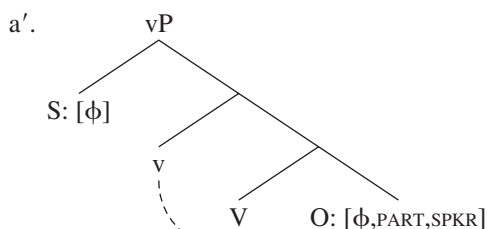
In addition to these two structural configurations, a final expected configuration for over-agreement yields what we might call a “lower or both” pattern. Here, the probe is associated to a head that undergoes Merge with two constituents, each of which contains (or is) an element meeting the interaction condition. One such constituent forms the standard c-command domain of the head; the other may be its specifier (as in the cases discussed in Béjar 2003, Béjar and Rezac 2009) or even a constituent to which the head’s projection is adjoined (as in the case discussed in Clem 2019a, to appear). Both versions produce the setup for the combination of Agree, Merge, and label projection that Rezac (2003) dubs *cyclic expansion*. Upon Merge of the first constituent, Agree applies; a probe on the head (*H*) scans the head’s c-command domain. The resulting constituent (call it *H'*) then receives a label from the head, as a result of which *H'* itself comes to host a probe. Upon Merge of the second constituent, Agree applies again: the probe on *H'* now has a c-command domain that can be scanned for potential goals. Suppose that the head in question is *v* (as in Béjar 2003, Béjar and Rezac 2009). The result is that the *v* probe Agrees first with elements in the complement of the *v* head and second with elements in *v*’s specifier.

A pattern of overagreement under cyclic expansion by *v* can be seen in the Tupi-Guarani language Tupinambá (Jensen 1990). In this language, *v* copies all ϕ -features from all DPs until it encounters [SPKR] (roughly—in section 5.2, I will add one detail, pertaining to second person); the [INT: ϕ , SAT:SPKR] probe on *v* first probes its c-command domain and then reprojects and Agrees with its specifier. Accordingly, when the object is first person, the probe is satisfied and there is no subject agreement, (13a,a'). When the object is not first person, the probe interacts with the object, fails to be satisfied, reprojects, and interacts with the subject, (13b,b'). The overall result is a lower-or-both pattern.

(13) *Tupinambá v*: [INT: ϕ , SAT:SPKR]

- a. syé=replyák
 1SG=see
 ‘He/She/It/They/You saw me.’

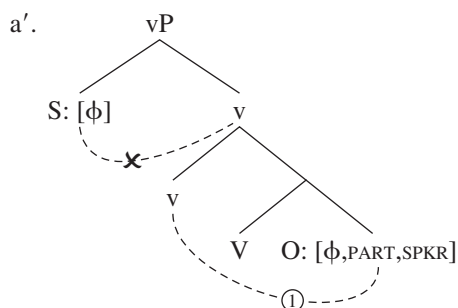
- b. a-i-kutúk
 1SG-3-pierce
 ‘I pierced him/her/it/them.’



In consideration of these examples, it should be emphasized that failure to Agree with certain arguments need not cause ungrammaticality, though it does limit the way that the results of Agree can be rendered morphologically. For instance, a Tupinambá example like (14a) cannot be generated. Given the probe's specifications and the structure it occupies, the only output for (14a') is (13a). Once the probe has encountered its satisfaction feature, in this case [SPKR], it cannot interact with further goals.

(14) *Tupinambá*

- a. *syé=i-(r)epyák
 1SG=3-see
 Intended: 'He/She/It/They saw me.'



The logic of this case is simply that satisfaction by a first goal prevents interaction with any subsequent goals, which in turn rules out morphological forms that could only be generated if multiple goals had Agreed. This is the core logic I will now exploit to explain PCC effects.

3 Deriving the Strong PCC

3.1 *The Central Approach*

The best-known and most studied PCC pattern is the strong PCC, found in Basque, French, and Greek (respectively, Laka 1993; Perlmutter 1971, Bonet 1991, Rezac 2011; Anagnostopoulou 2003), among many other languages around the world (e.g., Kiowa (Kiowa-Tanoan; Adger and Harbour 2007), Warlpiri (Pama-Nyungan; Hale 1973), Huichol (Uto-Aztecan; Comrie 1982), Mazahua (Oto-Manguean; Partida-Peñalva 2018), and Yimas (Lower Sepik Papuan; W. Foley 1991); see also the language lists in Haspelmath 2004 and Anagnostopoulou 2017).

(15) *Strong PCC*

In certain combinations of direct and indirect objects, the direct object must be third person.

In Basque, French, and Greek, the combinations in question are those in which both objects are clitics, as in (16a–c). Accordingly, the PCC effect may be “repaired” by taking one or more clitics away, generally by substituting a tonic pronoun or nonpronominal expression, as in (16d).

(16) *French*

- a. Lucille {me / te } la présentera.
 Lucille {1SG / 2SG} 3SG.F.ACC will.introduce
 ‘Lucille will introduce her to me/you.’

- b. Lucille {la / *me / *te } leur présentera.
Lucille {3SG.F.ACC / *1SG / *2SG} 3PL.DAT will.introduce
'Lucille will introduce her/*me/*you to them.'
- c. *Lucille {te me / me te } présentera.
Lucille {2SG 1SG / 1SG 2SG} will.introduce
Intended: 'Lucille will introduce you to me / me to you.'
- d. Lucille te présentera à {eux / moi }.
Lucille 2SG.ACC will.introduce to {them.TONIC / me.TONIC}
'Lucille will introduce you to them/me.'

The starting place for syntactic analyses of the PCC is the hypothesis that Agree builds the relationships necessary for cliticization (e.g., Anagnostopoulou 2003 et seq., Béjar and Rezac 2003, Walkow 2012, 2013, Stegovec 2015, 2020, Preminger 2019, Coon and Keine 2021).¹⁸ Without Agree, clitics cannot be generated.¹⁹ Given this premise, we can reason through an interaction/satisfaction approach to the strong PCC pattern as follows. By hypothesis, cliticization of both objects requires Agree with both. In the strong PCC pattern, there can be Agree with both objects when the DO is third person, but not when the DO bears the feature [PART]. This suggests that [PART] on the DO satisfies the probe, which in turn points to two further conclusions: the probe must have the satisfaction condition [PART], and it must interact with the DO before the IO.

Let us call the hypothesis that the probe interacts with the DO first *direct object preference*. In the basic proposal just sketched, DO preference is necessary in order for Agree with the DO to bleed Agree with the IO.²⁰ Why should this preference hold? If we set aside the possibility that the objects are first merged in such a way that the DO asymmetrically c-commands the IO (and the probe in turn c-commands both objects; see Ormazabal and Romero 1998), there are two basic avenues to explore. The first option is that, in a structure subject to the PCC, the DO obligatorily moves to a position above the IO but below a higher probe (see, e.g., Walkow 2012, 2013). DO preference then reflects a higher-or-both Agree pattern, as shown in (17a).²¹ The second option is that the probe occurs on the head that introduces the IO, presumably Appl, and thus between the two objects (see, e.g., Adger and Harbour 2007, Pancheva and Zubizarreta 2018, Yokoyama 2019b, Franks 2020). The probe cyclically expands, yielding the PCC pattern as a lower-or-both pattern as shown in (17b). Note that, given (17a), DO preference is parallel to subject preference in Nez Perce; given (17b), DO preference is parallel to object preference in Tupinambá.

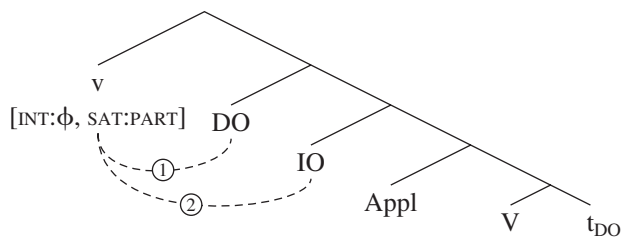
¹⁸ I assume a syntactic approach without argument here. See Albizu 1997, Ormazabal and Romero 1998, and Rezac 2008, 2011 for explicit arguments in favor of a syntactic approach as opposed to a purely morphological one.

¹⁹ In principle, this might be because clitics are directly a result of Agree, or because clitics require a type of movement that in turn requires Agree—a matter I will not attempt to do justice to here. See Anagnostopoulou 2003, Harizanov 2014, and Preminger 2019 for discussion.

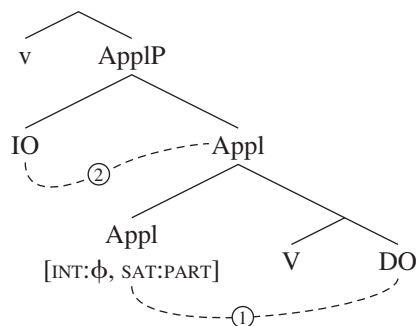
²⁰ If, on the contrary, the probe were to interact with the IO first, the same logic leads us to expect a restriction on IO features in cases where both arguments Agree. This is because it is now Agree with the IO that has an opportunity to bleed Agree with the DO. In section 6.2, dedicated to “reverse” PCC effects, I will argue that this does indeed occur.

²¹ Here I leave open the precise landing position of DO (e.g., as a specifier of Appl or as the specifier of a covert head).

(17) a.



b.



Either structure could be adopted for, say, simple ditransitives in French (a language where asymmetric c-command between objects is notoriously hard to establish, as Rezac (2011:106) notes), with the same results in terms of the basic interaction/satisfaction approach. It is also possible that there is variation between (17a)-style languages and (17b)-style languages. This would make for a crosslinguistic situation in which the pattern of c-command among objects is variable across the set of languages that show the PCC. Such a picture might help to reconcile Holmberg, Sheehan, and Van der Wal's (2019) argument for DO-over-IO movement in Italian, as in (17a), with Anagnostopoulou's (2003) arguments that DOs are c-commanded by IOs in Greek, as in (17b), and cannot A-move past them. Further work is certainly required to assess the viability of these possibilities.²² For the time being, I will indicate both routes to DO preference in tree structures below, referring to them as the *high probe structure* (17a) and the *low probe structure* (17b). I return to some questions raised by (17a)'s DO movement step (in particular, as a source of crosslinguistic variation) in section 6.

We can now return to the data points presented in (16). Consider first the structures with third person DOs. In these cases, the DO will not satisfy the probe; the probe will therefore interact with the IO as well, producing a double-clitic structure, as in (18). (Note here that the IO also does not satisfy the probe, but this is unremarkable; failure to reach the satisfaction condition doesn't crash the derivation.)

²² Two avenues for this work are suggested in footnote 41 and section 6.2. In footnote 41, I suggest that a further reason to adopt structure (17b) for certain languages is that, by associating the probe with the Appl head, it allows for different Appl heads within one language to host different probes, resulting in multiple types of PCC patterns within the same language. Such an analysis appears promising for Lai (Tibeto-Burman). In section 6.2, I suggest that a further reason to adopt (17a) for certain (other) languages lies in its ability to capture reverse PCC patterns (e.g., in Slovenian). See especially footnote 44.

(18) *French*

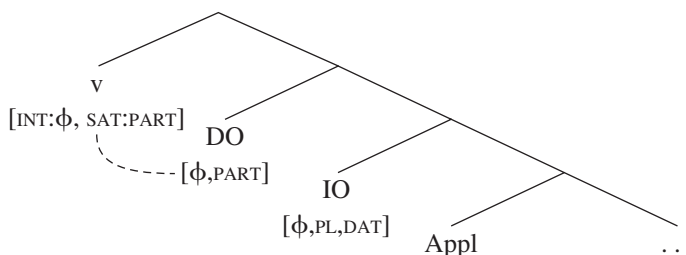
Lucille la leur présentera.
 Lucille 3SG.F.ACC 3PL.DAT will.introduce
 ‘Lucille will introduce her to them.’

By contrast, a local person DO *will* satisfy the probe. The probe will therefore not interact with the IO. Like the missing Tupinambá double-agreement form in (14a), a French double-clitic ditransitive structure with a [PART] DO cannot be generated. In (19), there will be no way for the clitic *leur* to be produced, since the probe does not Agree with the IO. Recall that this holds regardless of whether the high probe structure, (19b), or the low probe structure, (19c), is adopted.

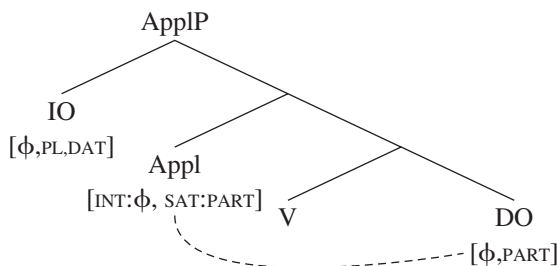
(19) *French*

a. *Lucille te leur présentera.
 Lucille 2SG.ACC 3PL.DAT will.introduce
 Intended: ‘Lucille will introduce you to them.’

b. *High probe structure*



c. *Low probe structure*



What actually *is* derived in structures (19b–c), if anything, depends on various assumptions, the choice among which is largely orthogonal to the primary arguments here. The question is the nature of PCC “repairs” (a topic richly explored in other work; see, e.g., Bonet 2008, Rezac 2008, 2011, Walkow 2012, 2013, Murphy 2019, Yokoyama 2019a,b, Driemel, Özdemir, and Popp 2020). One option is that the unavailability of Agree with the IO simply leads to a morphological output with an *à*-phrase (see (16d)) rather than a clitic pronoun.²³ Another, somewhat more

²³ Murphy’s (2019) discussion seems compatible with this view of the structure of “repair” in French: it is simply that a preposition is inserted in the output that is not present in the input. For counterarguments, see Rezac 2011:sec. 4.4.

complex option is that the pronominal arguments that give rise to clitics have a different syntax than those that do not; there are syntactically special pronouns that require Agree and (upon Agree) are realized as clitics (see, e.g., Stegovec 2020). If (19b–c) are constructed with such a pronoun in IO position, the derivation crashes, as the pronoun’s Agree requirement is not met. By contrast, if (19b–c) are constructed with a different type of pronoun in IO position, one that doesn’t require Agree, then that pronoun is simply realized as an independent dative in an *à*-phrase.²⁴ On these first two options, structures (19b–c) at least sometimes give rise to convergent derivations, producing PCC “repairs.” A third option, defended by Rezac (2011), is that PCC-violating applicative structures yield no output and the *à*-phrase arises in a quite different structure. If an applicative construction must be used, the PCC “repair” is impossible. From the present perspective, this suggests what we might call an *Applicative Agree Requirement*: it is not certain pronoun types that require Agree, as on Stegovec’s (2020) view, but rather all specifiers of the applicative construction (see also Rackowski and Richards 2005).

3.2 Capturing Double Weakness

Let us now consider how the approach at hand can capture the Double Weakness condition on PCC effects in languages such as French, Basque, and Greek. The proposal above is purely syntactic; it derives the PCC effect as a matter of what Agrees with a probe, with a downstream consequence for what clitics are generated. Accordingly, in a syntactic environment where no Agree takes place, we expect no clitics and no person restriction. This is the pattern of nonfinite clauses in Basque. Basque finite clauses contain a clause-final auxiliary that bears DO and IO clitics, subject to a strong PCC effect, (20). Nonfinite clauses, by contrast, lack the auxiliary and its clitics. In these clauses, no PCC effect is in place, (21).

(20) Basque

*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.’
(Laka 1993:27)

(21) Basque

Gaizki iruditzen \emptyset -zai-t [zu-k harakina-ri ni sal-tze-a].
wrong look.IPFV 3ABS-AUX-1DAT [you-ERG butcher-DAT me.ABS sold-NMLZ-ART.ABS]
‘It seems wrong to me for you to sell me to the butcher.’
(Laka 1993:27)

I assume with Albizu (1997), Ormazabal and Romero (1998), Preminger (2019), and Coon and Keine (2021) that Basque nonfinite clauses are syntactically distinguished; they lack (at least one

²⁴ On such a view, the choice of a full dative is presumably a “noneconomical” form that must be justified in some way (e.g., Cardinaletti and Starke 1999, Patel-Grosz and Grosz 2017)—either due to the impossibility of Agree, or because the pronoun is focused. These correspond to the two reasons why simple French ditransitives with pronominal IOs are realized with *à*-datives.

of) the probe(s) found in finite clauses. The connection of PCC effects to Double Weakness arises because the ditransitive-relevant probe is present in some types of Basque clauses but not others. When it is present, PCC effects and clitics arise, and when it is absent, PCC effects and clitics are absent.

Similar obviation of the PCC in connection with Double Weakness arises in cases where Agree does take place, but one argument is shielded from participation. In Greek, for instance, clitic doubling of DOs (accusatives) is optional (Anagnostopoulou 2003). I assume that this optionality arises because the DO's features may or may not be accessible to the probe for Agree.²⁵ If the DO does not Agree, its features being inaccessible to the probe, we expect no DO clitic and no person restriction. This is the case in (22a), where the DO is a strong pronoun. If the probe cannot access the DO's features, it cannot interact with or be satisfied by them. It therefore proceeds to interact with the IO, producing the IO clitic. By contrast, the ungrammatical (22b), with both DO and IO clitics, cannot be derived; if the probe is able to Agree with the DO, it is satisfied by it, bleeding Agree with the IO and creation of the IO clitic.

(22) *Greek*

- a. *pro* tha tu stilune esena.
3PL FUT CL.GEN.3M.SG send.3PL you.TONIC
'They will send you to him.'
(Anagnostopoulou 2003:253)
- b. **pro* tha tu se stilune.
3PL FUT CL.GEN.3M.SG CL.ACC.2SG send.3PL
Intended: 'They will send you to him.'
(Anagnostopoulou 2017:4)

In French simple ditransitives, in exactly the same way, the IO may be shielded from Agree by the choice of an *à*-phrase rather than a clitic. In (23a), the probe interacts with and is satisfied by the DO. There is no Agree with the IO. This poses no generation problem, as the IO is not a clitic (and, per Rezac (2011), is not in the ApplP structure). This again can be contrasted with a PCC-violating form, (23b), which cannot be generated.

(23) *French*

- a. Lucille te présentera à {moi / eux }.
Lucille 2SG.ACC will.introduce to {me.TONIC / them.TONIC}
'Lucille will introduce you to me/them.'
- b. *Lucille te {me / leur } présentera.
Lucille 2SG {1SG / 3PL.DAT} will.introduce
Intended: 'Lucille will introduce you to me/them.'

²⁵ I take it that any approach requires some similar assumption. The PCC effect in Greek, (22b), tells us that DO and IO clitics reflect the same probe. Therefore, given that the IO clitic is present in (22a), the probe is present. If a probe is present and the DO does not Agree with it, it must be that the DO is in some way shielded from Agree. See, for example, Coon and Keine 2021:sec. 3.5 for one implementation of this shielding.

I began this section with the fundamental assumption that Agree builds the relationships necessary for cliticization. It should be noted that this is a one-way implication: whenever a clitic is present, Agree has taken place. What has been highlighted in this section is the strengthening of this connection to a *biconditional* relationship between Agree with an object and a visible object clitic in certain Basque, Greek, and French data. This consistent relationship between a syntactic relation (Agree) and a morphological outcome (cliticization)—ultimately a fact related to the syntax-morphology interface—is what derives the Double Weakness generalization about the PCC in these data.

3.3 Capturing Exceptions to Double Weakness

If the PCC is really about Agree qua syntactic operation, considerations of modularity lead us to expect that Double Weakness should have exceptions. These are predicted to arise due to the several ways that Agree might take place without any effect on morphology. For instance, features may be transferred in syntax but not spelled out morphologically because there is no appropriate Vocabulary item. Features may be impoverished at PF, bleeding Vocabulary Insertion, or otherwise disfavored for pronunciation due to the interaction of morphological rules and principles. Or, features may simply be realized with a Vocabulary item whose phonology is null. As we will now see, at least one of these factors is available in certain cases where the syntax determines a strong PCC effect, with the result that the PCC holds even in the absence of Double Weakness.

A first such case is found in Tlaxcala Náhuatl (Uto-Aztecan).²⁶ In this language, objects control a dedicated set of person-number object markers; see (24). Ditransitives feature a single object marker from this table, controlled by the IO. Thus, in (25) the first person plural object marker must indicate a first person plural IO, rather than a DO. Indeed, no additional person-number marker for the DO is possible (e.g., *k-* ‘3SG.OBJ’, as in the monotransitive example in (26)). This makes for a contrast with ditransitives in languages such as French.²⁷

²⁶ I am grateful to Lucero Flores Nájera for her help with the Tlaxcala Náhuatl data. Note that strong PCC effects have previously been suggested in modern Náhuatl (Tetelcingo dialect) by the short discussion in Tuggy 1977:93–94, which however provides no negative data. For related comments on colonial-era Náhuatl, see Launey 1979:172–173.

²⁷ As Flores Nájera (2019) notes, this alignment pattern makes Tlaxcala Náhuatl (like other Uto-Aztecan languages) a primary object language, in the sense of Dryer 1986, or a language demonstrating a secundative alignment, in the sense of Haspelmath 2005. For the related language Huichol, Comrie (1982) notes that themes of ditransitives, while they do not control object markers, may nevertheless, when plural, condition special plural forms of the verb. This is the case in Tlaxcala Náhuatl as well: although the theme of a ditransitive cannot control object markers from table (24) (e.g., *k-* ‘3SG.OBJ’), the verb may optionally bear the prefix *in-* when the theme is plural. (A similar pattern is also noted in Launey 1979:174 for colonial Náhuatl, and in Lara Martínez 1976:33 and Schroeder 2014:31 for contemporary varieties.) Various complexities of this prefix require further research. Most notably, Lucero Flores Nájera (pers. comm.) notes that it is optional, unlike (other) agreement markers. This fact, together with its connection to theme arguments, might suggest that this prefix is not agreement, but a verbal plural marker or “participant number” affix (see Drummond 2020), as Comrie suggests for Huichol. Such patterns are well-attested elsewhere in Uto-Aztecan (e.g., Hale, Jeanne, and Pranka 1991, Bobaljik and Harley 2017). What should be emphasized is the difference between Tlaxcala Náhuatl and a language like French, where ditransitives allow full person-number marking of both the IO and the DO in a weak way (e.g., (18)).

(24) *Object person-number markers in Tlaxcala Náhuatl*

	Singular	Plural
1st person	nech-	tech-
2nd person	mits-	amech-
3rd person	k-/h-/ki-	kin-

(25) *Tlaxcala Náhuatl*

in obispo kema o- \emptyset -tech-wal-titlani-li-h ihkón ye se
 DEF bishop VERUM PAST-3SG.SUBJ-1PL.OBJ-DIR-send-APPL-PERF PARTICLE FOC INDEF
 padre
 priest
 ‘The bishop did send a priest to us.’
 (Flores Nájera 2019:38)
 (Cannot mean: ‘The bishop did send us to a priest.’)
 (Lucero Flores Nájera, pers. comm.)

(26) *Tlaxcala Náhuatl*

y=o-ni-k-temo-skia se tekit-ki akin
 already=PAST-1SG.SUBJ-3SG.OBJ-look.for-COND INDEF work-NMLZ RP.HUMAN
 \emptyset -nech-palewi-s
 3SG.SUBJ-1SG.OBJ-help-IRR
 ‘I will look for a worker who will help me.’
 (Flores Nájera 2019:260)

Given that only one internal argument may be realized as an object marker (viz., the IO), theories of PCC that tie person restrictions tightly to Double Weakness contexts lead us to expect that no person restriction will be in force.²⁸ This expectation is not met. Rather, Tlaxcala Náhuatl shows a strong PCC effect. Thus in (27) the DO may be third person, but cannot be either a visible second person pronoun or a second person *pro*.

(27) *Tlaxcala Náhuatl*

*o- \emptyset -tech-wal-titlani-li-h teh / *pro*_{2sg}
 PAST-3SG.SUBJ-1PL.OBJ-DIR-send-APPL-PERF 2SG / 2SG
 Intended: ‘He sent you to us.’ (OK without *teh* as ‘He sent him to us.’)
 (Lucero Flores Nájera, pers. comm.)

A similar situation holds in various Meso-American languages, including in the related language Huichol (Comrie 1982:109); in Tzotzil (Aissen 1987:116–117), Tzeltal (Shklovsky 2012), and

²⁸ This holds, for instance, for approaches such as those of Bianchi (2006), Nevins (2007), Stegovec (2020), Coon and Keine (2021), and S. Foley and Toosarvandani (2022) (modulo a “zero clitic” analysis; see below). See in particular Preminger 2019 for a general articulation of the view that PCC effects hold only where agreement is morphophonologically overt.

Ch'ol Mayan (Little 2021, pers. comm.); and in Nuntajiyi [Highland Popoluca] (Mixe-Zoquean; Wendy López Márquez, pers. comm.). Beyond Meso-America, similar facts are found in Ojibwe (Algonquian; Lochbihler 2012), Lakhota (Siouan; Ullrich and Black Bear Jr. 2016:508; see footnote 34), Mohawk (Iroquoian; Baker 1996:206), and Lai (Tibeto-Burman; Peterson 1998).

The analysis of these data is straightforward on the interaction/satisfaction approach. In terms of the syntax, the probe is specified for [INT:ϕ, SAT:PART], as in French, Greek, and Basque. The DO participates in Agree in the syntax (and the probe is subject to DO preference). The morphological expression of an object marker for the DO is impossible for one of the reasons listed above (no Vocabulary item; impoverishment or other morphological rule; silent Vocabulary item); notably, the theory does not require choosing among these analyses, and in particular does not force a “zero clitic” analysis. (This is in contrast to theories like those of Bianchi (2006), Nevins (2007), Franks (2020), or Stegovec (2020), which implicate clitics in particular as the source of PCC effects; we will see a direct challenge to the null clitic response to Double Weakness violations later in this section.) Examples like (27) cannot be derived because Agree, featurally satisfied by the DO, does not reach the IO. The fact that person features transferred from the DO to the probe receive no morphological realization plays no role in this purely syntactic state of affairs.

A final note before leaving the discussion of Double Weakness and the strong PCC concerns a class of causative constructions in certain Romance languages, such as French (e.g., Postal 1989, Rezac 2011, Sheehan 2020), where causees have been noted to trigger a PCC effect even when *not* in clitic form. In (28), for instance, the DO is a third person clitic and the causee appears in an *à*-phrase. We see in (29a) that this same structure becomes impossible when the DO is a local person clitic. In this case, the causee cannot appear in an *à*-phrase and must be introduced by the preposition *par*, (29b).²⁹

(28) *French*

Marcel 1'-a fait dessiner à Ilse.
Marcel 3SG.DO-has made draw.INF to Ilse
'Marcel made Ilse draw her.'
(Rezac 2011:128)

(29) *French*

a. *Marcel vous a fait dessiner à Ilse.
 Marcel 2PL has made draw.INF to Ilse
 Intended: 'Marcel made Ilse draw you.'

²⁹ The pattern in (29) is sometimes dubbed the Fancy Constraint, following Postal (1989). Some evidence that this is simply another form of PCC effect in various Romance languages (as explored especially in Rezac 2011) comes from two sources. First, as Sheehan (2020) demonstrates, the person restriction can be obviated by making the DO a tonic pronoun rather than a clitic, just as for standard PCC violations in, say, Italian (see Bianchi 2006). Second, the type of person restriction found in the causative appears to correlate with the type of person restriction found in ordinary ditransitives: for example, French speakers have a strong PCC pattern in both cases whereas some Catalan speakers have a weak PCC pattern in both cases. Thanks to Michelle Sheehan for discussion of this latter point. See D'Alessandro and Pescarini 2016 for discussion of some remaining puzzles about the PCC in causatives in Italian. See also Rezac 2011:sec. 4.5.5 for an additional and similar argument against Double Weakness conditions based on *falloir*-constructions in French.

- b. Marcel vous a fait dessiner par Ilse.
Marcel 2_{PL} has made draw.INF by Ilse
'Marcel made Ilse draw you.'
(Rezac 2011:128)

Drawing on evidence from quantifier float, Rezac (2011:129) argues that there is no null clitic for the causee in structures like (28) and (29a). While cliticization generally licenses quantifier float in French, no floated quantifier is possible for *à*-phrase causees.

(30) *French*

- Elle a (**tous*) fait (**tous*) manger (**tous*) la tarte aux enfants.
she has (*all) made (*all) eat.INF (*all) the cake to.the children
'She made the children (*all) eat the cake.'
(Rezac 2011:129)

Such data pose a challenge for approaches such as Stegovec's (2020) and Coon and Keine's (2021) that respond to the Náhuatl-type challenge for Double Weakness by positing a null clitic for the DO (an approach with an antecedent in Albizu 1997). To the contrary, these data provide key evidence that the source of the person restriction cannot be found in principles that apply only in cases of Double Weakness—there is only one clitic in the ungrammatical (29a), not two.

The contrast between this type of example and ordinary ditransitives, where IOs in *à*-phrases are immune to PCC effects, provides evidence that *à*-phrases come in two varieties (e.g., Rezac 2011, Sheehan 2020). Compare, for instance, the ungrammatical (29a) with the perfectly grammatical (31).

(31) *French*

- Marcel vous a présentés à Ilse.
Marcel 2_{PL} has introduced to Ilse
'Marcel introduced you to Ilse.'

I suggest that one type of *à*, found unambiguously in (31), is a P head introducing notional goals in ditransitives, roughly with the meaning 'to'. This P head is necessary in (31) because the IO could not have Agreed in an ApplP structure (the DO having satisfied the probe). Given its lexical semantics, however, the P head *à* is not able to introduce causees; this is instead the job of P *par*, as in (29b). The other type of *à*, found unambiguously in (28), is a morphological mark of Agree with the object agreement head (e.g., *v*). It is the presence of this morphological mark of Agree in (29a) that makes the example impossible to generate. As in ordinary ditransitives like (31), the DO satisfies the probe, in this case bleeding Agree with the causee. The marker *à* on the causee is therefore impossible.³⁰

³⁰ Given this approach, example (i) is ambiguous. On one parse, the IO occupies Spec,Appl and Agrees after the DO does (the DO in this case *not* having satisfied the probe); *à* is a mark of agreement. On the other parse, the IO occupies a PP structure and *à* is the P head.

(i) *French*

- Marcel les a présentés à Ilse.
Marcel 3_{PL} has introduced to Ilse
'Marcel introduced them to Ilse.'

4 Narrowing the Satisfaction Condition

The analysis just given for French, Greek, Basque, and Tlaxcala Náhuatl derives a strong PCC effect due to the feature specification of the probe. In particular, because the probe is satisfied by [PART], all and only local person DOs are able to satisfy it, bleeding Agree with the IO. A satisfaction condition of this type for a given probe should be treated as a language-particular fact. A probe with a broader satisfaction condition—for instance, [ϕ]—would be satisfied by *all* DOs, making IOs universally unable to Agree. A language with a probe of this type would plausibly require a PP structure for the introduction of IOs—a profile that is richly attested. What about a probe with a satisfaction condition narrower than [PART]? In this section, I consider two particular subcases: a probe with the satisfaction condition [SPKR] and a probe with no satisfaction condition at all. (I defer consideration of potential [ADDR] satisfaction until section 6.1.) I will show how the first option gives rise to the me-first pattern found in Romanian and Bulgarian, whereas the second gives rise to the pattern of agreement with both the DO and the IO, regardless of person features, found in Ubykh.

The me-first pattern is demonstrated for Bulgarian in (32).³¹ In (32a), we see that a second person DO clitic is possible in combination with an IO clitic (in sharp contrast to the pattern of strong PCC languages). The person restriction emerges in (32b), where the DO clitic is first person. In this case, all IO clitics are ruled out.

(32) *Bulgarian*

- a. Preporâčaha {mu / mi } te entuziazarano.
recommended.3PL {3SG.M.DAT / 1SG.DAT} 2SG.ACC enthusiastically
'They recommended you to him/me enthusiastically.'
- b. *Preporâčaha {mu / ti } me entuziazarano.
recommended.3PL {3SG.M.DAT / 2SG.DAT} 1SG.ACC enthusiastically
Intended: 'They recommended me to him/you enthusiastically.'
(Pancheva and Zubizarreta 2018:1315)

(33) *Me-first PCC*

In certain combinations of direct and indirect objects, if there is a first person, it must be the indirect object.

This pattern results straightforwardly from a probe with the specification [INT:ϕ, SAT:SPKR]. A second person DO does not satisfy the probe, (32a); the probe therefore interacts with the IO as well, producing a double-clitic structure. A first person DO, however, does satisfy the probe, (32b). The probe therefore does not interact with the IO, meaning the double-clitic structure cannot be derived.

The satisfaction condition for the v probe in Bulgarian—[SPKR]—is narrower than its counterpart in French—[PART]—in that it occurs across fewer cells of a person paradigm; [PART] features

³¹ As for many other PCC languages, some speaker variation is reported in Bulgarian as well as in its me-first sister language Romanian; unfortunately, owing to gaps in reported data, it is not entirely clear which pattern(s) me-first alternates with. See Pancheva and Zubizarreta 2018 and Yokoyama 2019a:112–113 for Bulgarian data and references. On Romanian, see footnote 34.

are present on two of three persons, whereas [SPKR] features are present on only one. A still narrower satisfaction condition would be one that is not met in *any* cell of a person paradigm. I suggest that the simplest way to model such a probe is as lacking any satisfaction condition altogether; let us call such a probe *insatiable* (Deal 2015b).³² An insatiable probe with the interaction condition [ϕ] will copy all ϕ -features from all goals in its domain, regardless of the number of goals or the features these goals contain. We might indicate such a probe as [INT: ϕ , SAT:-]. In a language where Agree gives rise to clitics, this type of probe is expected to produce clitics for both DO and IO, regardless of person.

Various languages of this type are attested. In Ubykh (NW Caucasian) and in Moro (Kordofanian), for instance, weak object markers for both the DO and the IO occur in cases where both arguments are local person, as in (34a) and (35a), *and* in cases where one argument is local person whereas the other is third person, (34b) and (35b). (Note that Ubykh object markers occur in DO-IO order. Moro object markers have the same morphological form for the DO and the IO and are ordered templatically; this is parallel to the situation for first/second person in French, which by contrast shows a PCC effect.)³³

(34) *Ubykh*

- a. wi-sí-n-t^wi-n
2SG.ABS-1SG.DAT-3SG.ERG-give-PRES
'He gives you to me.'
- b. s-é-n-t^wi-n
1SG.ABS-3PL.DAT-3SG.ERG-give-PRES
'He gives me to them.'
(Dumézil and Esenç 1975, Fenwick 2011)

(35) *Moro*

- a. g-a-natʃ-ó-ɲó-ɲá-ɲo
SM.CL-RTC-give-PFV-1SG.OM-2SG.OM-ɲo
'She/He gave me to you / you to me.'
- b. g-a-natʃ-ó-ɲó-ɲo
SM.CL-RTC-give-PFV-1SG.OM-3SG.OM
'She/He gave me to her/him / her/him to me.'
(Jenks and Rose 2015:293)

³² The idea of an insatiable probe builds on numerous previous proposals in the literature for probes that Agree with all goals in their domain. See, for example, Hiraiwa 2001 on Multiple Agree, Collins 2002 on [+multiple] v, and Bošković 1999 on "elements that possess a formal inadequacy that is overcome by attracting all features F" (p. 169). In addition to the multiple nominative, multiple V-fronting, and multiple *wh*-movement applications highlighted by these authors, potential further applications of insatiable probing include person portmanteaux (Deal 2015b), "agreement displacement" (S. Foley 2017), and switch reference (Clem 2019a,b). (See also Branen and Erlewine to appear for the explicit suggestion that multiple nominative marking reflects insatiability, and Deal 2017 for an insatiability approach to multiple *wh*-fronting.)

³³ An alternative description is that Moro shows persistent DO/IO syncretism. Syncretisms of this type are, however, typically linked to the *presence* of PCC effects, not their absence; see Nicol 2005 and Adger and Harbour 2007 for discussion.

A similar absence of PCC effects obtains in Caquinte (Arawak; Drummond and O'Hagan 2020); Kinyarwanda (Bantu; Contini-Morava 1983); various additional NW Caucasian languages including Kabardian, Abkhaz, and Abaza (Peter Arkadiev, pers. comm.; however, see section 6.2 for a PCC effect in a variety of Adyghe); Ariellese (Romance; D'Alessandro and Pescarini 2016); Panará (Jê; Bardagil-Mas 2018); and perhaps also Paduan (Romance; Anagnostopoulou 2005: 231n2), Noon (Atlantic; Soukka 2000), and some varieties of Romanian (Reinheimer, Tasmowski, and Vasilescu 2013:259).³⁴ This language type reveals the flip side of the challenge to Double Weakness from Tlaxcala Náhuatl, rounding out a simple case for double dissociation between Double Weakness and PCC effects.

(36) *PCC vs. Double Weakness*

		Double Weakness	
PCC	Yes	No	
Yes	Italian with clitic pronouns	Tlaxcala Náhuatl	
No	Moro, Ubykh	Italian with a tonic pronoun	

³⁴ Published data in the sources cited above for Ariellese, Paduan, and Noon are limited to combinations with second person DOs, leaving open the possibility that perhaps these languages have a me-first PCC pattern. Roberta D'Alessandro (pers. comm.) confirms that this is not the case for Ariellese, as (i) shows.

(i) *Ariellese*

A Marije mi ji minnə pi sserve.
to Maria 1SG.ACC 3SG.DAT send.2SG for servant
'You send me to Maria as a servant.'
(Roberta D'Alessandro, pers. comm.)

I have been unable to gather any further information concerning ditransitives in Paduan or Noon. For Romanian, Reinheimer, Tasmowski, and Vasilescu (2013:259) report that some speakers allow 3IO/1DO (in addition to the generally permitted 3IO/2DO), though still not the 2IO/1DO combination ruled out by the me-first variety. There is substantial judgment variability (Ion Giurgea, pers. comm.). In the variety that allows 3IO/1DO, it could be that no PCC restriction is in place and that *2IO/1DO follows from morphological constraints on clitic clusters, though certainly more research is required on this question.

Additional languages sometimes cited as lacking a PCC effect, in spite of Double Weakness, are Haya (Duranti 1979), Lakhota (Van Valin 1977), and Polish (Haspelmath 2004). For Haya, Riedel (2009) was unable to replicate the crucial judgment; her consultant did in fact have a PCC effect (weak PCC). Similarly, Ullrich and Black Bear Jr. (2016: 508) report a strong PCC pattern in Lakhota, noting that speakers find examples such as the one provided by Van Valin ungrammatical. For Polish, the relevant data have been quite controversial, both empirically (judgments vary) and analytically, because the diagnosis of clitic pronouns is nonobvious. See Pancheva and Zubizarreta 2018, Stegovec 2019, and Franks 2020.

The proper analysis of languages with Double Weakness but no PCC effect has played only a minor role in the PCC literature to date. One suggestion that been made for this class, albeit tentatively, can be found in Anagnostopoulou 2003:317–319. Anagnostopoulou suggests that such cases might involve two probes, one for each object (see also Coon and Keine 2021:676n21), and suggests a possible correlation between PCC effects and (a)symmetry in passives: languages with PCC effects should have asymmetric passives, whereas languages without PCC should have symmetric passives. Moro and Kinyarwanda fit well into this picture, as they have symmetric passives and no PCC effects. Ariellese poses a challenge: it lacks PCC effects but has asymmetric, theme-only passivization (Roberta D'Alessandro, pers. comm.). Also challenging is Haya, as documented by Riedel (2009); here we find symmetric passives but still a PCC effect. This also appears to be the case for at least some English speakers. Neil Myler (pers. comm.) reports that his variety (NW England) shows a PCC effect with weak pronouns but has symmetric passives. (On PCC effects with weak pronouns in English, see Bonet 1991:186.)

This finding further strengthens the case for a theory of PCC effects that rejects an overly tight connection to the morphological or syntactic properties of weak elements. Rather, PCC effects arise due to constraints on what a probe can Agree with—constraints that may be determined by the probe's satisfaction conditions, yielding the four possible patterns discussed so far:

- (37) *Variation by probe satisfaction condition*
- [INT: ϕ , SAT: ϕ]: “Indirective” pattern (only DO Agrees, regardless of person)
 - [INT: ϕ , SAT:PART]: Strong PCC
 - [INT: ϕ , SAT:SPKR]: Me-first PCC
 - [INT: ϕ , SAT:-]: Double Weakness, no PCC

At this point, in terms of the three desiderata for a theory of PCC with which we began, the central pieces of a response to D2 and D3 are in place.

- D2. The theory should capture Double Weakness conditions on PCC application in cases where such conditions hold.
- D3. The theory should allow for PCC restrictions to hold even in cases where the Double Weakness condition is not met, as well as for cases where the Double Weakness condition is met but PCC restrictions do not hold.

Double Weakness conditions on PCC application arise where two conditions are met: the presence of weak elements in the morphological output is biconditionally correlated with the presence of Agree in the syntax (a fact about the syntax-morphology interface), and Agree with one argument may bleed Agree with another (a fact about probe specifications). The exceptions to Double Weakness summed up in D3 reflect two departures from this picture. First, cases of PCC effects without Double Weakness arise where the relationship between weak forms and Agree is merely one-way—weak forms are traceable to Agree, but not all instances of Agree give rise to weak forms. (They may give rise to no visible output at all, as in the case of DO Agree in Tlaxcala Náhuatl, or to morphological marks other than weak forms, as in French causatives.) Second, cases of Double Weakness without PCC effects arise where Agree with one argument is not able to bleed Agree with another, owing to the insatiable character of the probe.

5 Dynamic Interaction

The discussion thus far has highlighted satisfaction conditions as a source of variation related to PCC effects. An interaction/satisfaction theory also raises the possibility of potential variation related to interaction conditions. In the literature to date, interaction condition variation has remained considerably underexplored as compared to satisfaction condition variation. I have previously hypothesized, for instance, that interaction conditions are invariant (Deal 2015a): for a probe satisfied by any ϕ -feature, the interaction condition is always $[\phi]$.³⁵ This makes for a

³⁵ Baier (2018) challenges this proposal, showing that probes satisfied by ϕ -features may nevertheless interact with features from a broader set \mathcal{F} , which includes both Φ and various \bar{A} -features. Baier's view is still compatible with the claim that interaction conditions are invariant; for a probe satisfied by any ϕ -feature, the interaction condition is always $[\mathcal{F}]$.

notable contrast with uF theories, where what can be copied to the probe is a dimension with rich variation, dynamically affected by Agree; Agree with a first goal constrains what can be copied from a second goal (see esp. Béjar 2003, Béjar and Rezac 2009). Here, I pursue an intermediate hypothesis: a probe with $[\phi]$ as its initial interaction condition may undergo changes to that condition in the course of cycles of Agree. In particular, interaction conditions change when features of the goal are copied into the interaction specification of the probe. I will refer to changes to the interaction condition in the course of a derivation as *dynamic interaction*. In this section, I make an empirical case for dynamic interaction in the derivation of two additional types of PCC effect: weak PCC and strictly descending PCC.

5.1 Weak PCC

Weak PCC patterns are broadly attested in southern Romance languages, holding for various speakers of Italian (Monachesi 1998, Bianchi 2006), Catalan (Bonet 1991, 2008), and Spanish (Perlmutter 1971, Laenzlinger 1993), as well as Old Occitan (Nicol 2005).³⁶ They also obtain for some speakers of Slovenian (Stegovec 2020); in Yakkha, a Kiranti language of Nepal (Schackow 2012); as well as quite broadly in Bantu languages—for instance, Haya, Nyaturu, Sambia, and Swahili (Riedel 2009).³⁷

(38) Weak PCC

In certain combinations of direct and indirect objects, if there is a third person, the direct object must be third person.

In Italian, the relevant combinations are those where both objects are clitics. The weak PCC variety of Italian allows (39a) and finds it ambiguous: either the DO or the IO may be first person. (The ambiguity of this example suggests that clitic order is determined templatically; note that the opposite order of clitics is simply ungrammatical.) Example (39c), however, is ruled out: here, a third person clitic is present but the DO is nonthird.

(39) Italian

- a. %Mi ti ha affidato.
1SG 2SG has entrusted
'He entrusted me to you / you to me.'

³⁶ The patterns coexisting with the weak PCC vary; for example, the strong PCC coexists with the weak PCC in Italian (Monachesi 1998, Bianchi 2006); at least the strong and the strictly descending PCC coexist with the weak PCC in Catalan (Bonet 1991, Walkow 2013) and Spanish (Pancheva and Zubizarreta 2018). The weak PCC may also coexist with other patterns in Bantu; see footnote 37.

³⁷ This description follows Riedel (2009). Duranti's (1979) influential description of Haya involves no PCC effect, as noted above; in particular, the combination of 3IO and 1DO is reported to be grammatical. This would make Haya akin to fellow Bantu language Kinyarwanda (Contini-Morava 1983), or to Ubykh or Moro, discussed in section 4. However, Riedel's (2009) Haya consultant does not share the judgments Duranti reports. Duranti also reports a strong PCC pattern for Sambia (also known as Shambala), in contrast to the pattern found for Riedel's consultants. In the text, I refer only to the varieties of Haya and Sambia documented by Riedel, as it is unclear whether these differing reports reflect speaker variation, language change, or differences in documentary/analytic practices.

- b. Me lo ha affidato.
1SG 3SG.ACC has entrusted
'He entrusted him to me.'
- c. *Gli mi ha affidato.
3SG.DAT 1SG has entrusted
Intended: 'He entrusted me to him.'
(Bianchi 2006:2027)

Similarly, Bantu languages such as Haya and Sambia show the weak PCC effect in cases where both objects are indexed on the verb by object markers.³⁸ In Swahili, by contrast, the relevant combinations are those where only the IO is realized weakly. Like Náhuatl, Swahili is a primary object language; only one object marker appears in a ditransitive, and this marker must reflect the features of the IO, never the DO. (In the examples below, I use a box to enclose both the object marker and the corresponding constituent of the translation.) Accordingly, Swahili shows no ambiguity like Italian (39a). When the IO is first person, the verb bears a first person object marker only, (40a); when the IO is second person, the verb bears a second person object marker only, (40b).³⁹

(40) *Swahili*

- a. A-li-ni-onyesha wewe.
SM.CLASS1-PAST-OM.1SG-show you
'He showed you to me.'
- b. A-li-ku-onyesha mimi.
SM.CLASS1-PAST-OM.2SG-show me
'He showed me to you.'
- (Riedel 2009:152)

The weak PCC effect is seen in Swahili in examples like (41), where a third person argument is present but the direct object is nonthird; compare Italian (39c).

(41) *Swahili*

- *Ni-li-mw-onyesha Juma wewe.
SM.1SG-PAST-OM.CLASS1-show 1.Juma you
Intended: 'I showed you to Juma.'
- (Riedel 2009:151)

³⁸ Haya shows the Italian-like pattern where local person object markers are ordered templatically, giving rise to an ambiguous form (Riedel 2009:142). In Sambia, however, the order of first and second person object markers disambiguates (Riedel 2009:140).

³⁹ The Swahili glosses in this section follow Bantuist conventions, which require distinguishing class 1 (a subclass of third person; generally, singular humans) from first person. In verb glossing, I indicate class 1 agreement explicitly and use *1sg* to indicate first person singular. In noun glossing, class information is indicated by a prefixed number; for example, the gloss *9.mother* indicates a noun meaning 'mother', of class 9. Other abbreviations: *SM* = subject marker; *OM* = object marker.

A central generalization about the weak PCC pattern is that Agree with both arguments is possible regardless of the DO's features; that is, for any choice of DO, there is at least one well-formed choice of IO. Combinations of local IO/local DO are possible, as seen in (39a) and (40); so are combinations of 3IO/3DO.

(42) *Italian*

Gl'ie-lo ha affidato.
3SG.DAT-3SG.ACC has entrusted
'He entrusted him to him.'
(Bianchi 2006:2027)

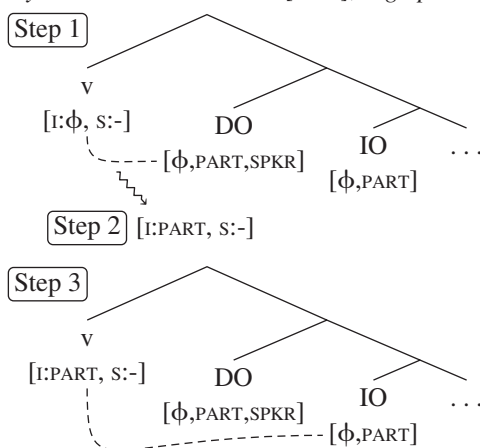
(43) *Swahili*

Stella a-li-mw-onyesha mtoto mama yake.
1.Stella SM.CLASS1-PAST-OM.CLASS1-show 1.child 9.mother 9.his
'Stella showed the child his mother.'
(Riedel 2009:131)

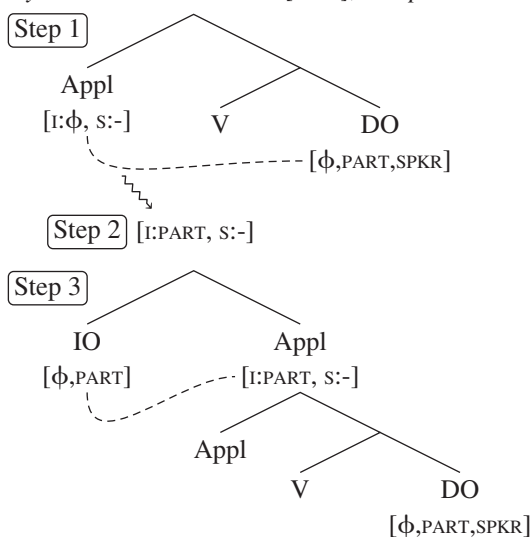
I conclude that the probe must be insatiable, as there is no choice of DO features that would cause it to stop probing. However, once the probe has Agreed with first/second person—bearers of the feature [PART]—it can only Agree with another argument that also has this feature. This suggests that Agree with the DO changes the specification of the probe. I propose that the change concerns the interaction specification. The weak PCC arises when interaction with [PART] on the DO results in copying [PART] into the interaction specification of the probe, preventing further Agree with a third person.

Let us first consider cases where both objects bear the feature [PART]. In keeping with the conclusion just reached concerning probe insatiability, I propose that the probe enters the derivation with the specification [INT:ϕ, SAT:-]. (This is the specification proposed above for Ubykh and Moro.) Agree first targets the DO, as discussed above; this results in a DO clitic in Italian but no morphological output in Swahili (as discussed for Náhuatl). The DO will not satisfy the probe, but will have its [PART] feature copied to the probe's interaction specification. The probe will therefore Agree with the [PART] IO as well. In Italian, this produces a double-clitic structure; in Swahili, it produces the lone overt object marker, indexing the IO. The derivations in (44) (high probe structure) and (45) (low probe structure) jointly correspond to the Italian and Swahili examples repeated in (46).

(44) *Dynamic interaction with [PART], high probe structure*



(45) *Dynamic interaction with [PART], low probe structure*



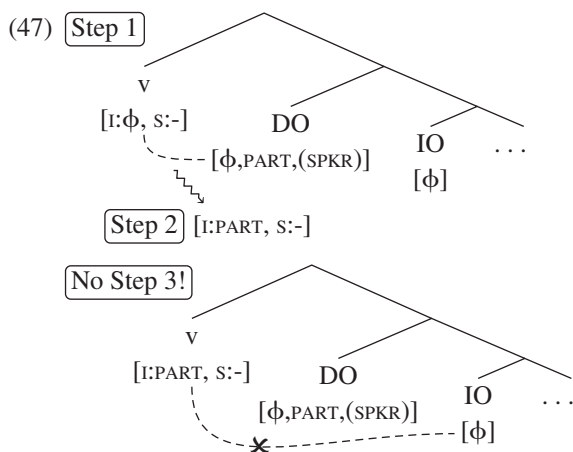
(46) a. *Italian*

Mi ti ha affidato.
 1SG 2SG has entrusted
 ‘He entrusted me to you.’
 (Bianchi 2006:2027)

b. *Swahili*

A-li-ku-onyesha mimi.
 SM.CLASS1-PAST-OM.2SG-show me
 ‘He showed me to you.’
 (Riedel 2009:152)

Dynamic interaction with the feature [PART] has the result that, when the IO is third person, a clitic or object marker for it can be derived *only if the DO lacks [PART]*. When the DO has [PART], the probe copies this feature into its interaction condition and therefore can only copy [PART] and features that geometrically entail it from an IO; third persons, lacking [PART] (and features that geometrically entail it), possess no features that the probe can interact with. In (47), which shows the attempted derivation of a structure with a local person DO and third person IO (high probe structure), the possibilities for feature copying are therefore exhausted upon DO interaction. The impossibility of interaction with the IO here underlies the ungrammaticality of examples such as (48a–b). (The reader can confirm that the low probe structure delivers the same results.)



(48) a. *Italian*

*Gli mi ha affidato.
 3SG.DAT 1SG has entrusted
 Intended: ‘He entrusted me to him.’
 (Bianchi 2006:2027)

b. *Swahili*

*Ni-li-mw-onyesha Juma wewe.
 SM.1SG-PAST-OM.CLASS1-show 1.Juma you
 Intended: ‘I showed you to Juma.’
 (Riedel 2009:151)

Crucially, narrowing of the interaction condition in these derivations (Step 2) must be understood as part of the process of copying features from the DO. Narrowing obtains only if the DO has the feature [PART]—if the DO is third person, no [PART] feature can be copied, and the probe’s interaction condition remains [φ]. The Italian and Swahili examples repeated below involve derivations where, by comparison to the derivations above, Step 2 is missing; the DO provides no [PART] feature that can be copied into the interaction condition. The probe’s interaction condition

therefore remains [ϕ], and interaction with the IO is fully possible. In Italian (49a) (= (42)), this produces the IO clitic *glie*; in Swahili (49b) (= (43)), it produces the object marker *mw*.

(49) a. *Italian*

Gl_{ie}-lo ha affidato.
3SG.DAT-3SG.ACC has entrusted
'He entrusted him to him.'
(Bianchi 2006:2027)

b. *Swahili*

Stella a-li-mw-onyesha mtoto mama yake.
1.Stella SM.CLASS1-PAST-OM.CLASS1-show 1.child 9.mother 9.his
'Stella showed the child his mother.'
(Riedel 2009:131)

5.2 Strictly Descending PCC

In terms of the first of our three desiderata for a theory of PCC effects, it remains to account for the strictly descending (or “ultrastrong”) PCC, found in some varieties of Spanish (Perlmutter 1971, Pancheva and Zubizarreta 2018) and Catalan (Bonet 1991), in Czech (Sturgeon et al. 2011), in Arabic (Nevins 2007, Walkow 2012, 2013), in Kabyle Berber (Baier 2020), and in Lai (Tibeto-Burman; Peterson 1998). (This is also the full pattern found in subject-object agreement in Tupi-nambá, discussed in section 2.)

(50) *Strictly descending PCC*

In certain combinations of direct and indirect objects, the IO must outrank the DO on the hierarchy $1 > 2 > 3$.

This pattern is shown for Spanish in (51), where the relevant combinations are those with two clitics.

(51) *Spanish*

- a. Me / Te / Se lo recomendaron.
1SG / 2SG / 3SG 3ACC recommended
'They recommended him to me/you/him.'
(Perlmutter 1970:230)
- b. El te me recomendó.
he 2SG 1SG recommended
'He recommended you to me.'
Cannot mean: 'He recommended me to you.'
(Pancheva and Zubizarreta 2018:1295)
- c. *Me / Te le recomendaron.
1SG / 2SG 3DAT recommended
Intended: 'They recommended me/you to him.'
(Perlmutter 1970:230)

The strictly descending pattern is essentially the combination of a me-first PCC with a weak PCC. Accordingly, a first way to capture this pattern is with the help of a probe showing both Bulgarian-like and Italian-like behaviors; it begins the derivation with [INT:ϕ, SAT:SPKR] and dynamically interacts with the feature [PART]. A first person DO, bearing the feature [SPKR], satisfies the probe; therefore, if the DO is first person, double clitics cannot be derived, (51b–c). A second person DO bears the feature [PART]; it doesn't satisfy the probe, but it does change the interaction condition for subsequent Agree. Accordingly, the IO must also be [PART], meaning only a first person IO is possible, (51b–c). Finally, a third person DO neither satisfies the probe nor dynamically interacts with it. Agree with an IO of any person is therefore possible when the DO is third person, (51a).

This account of the pattern builds on the case for dynamic interaction of [PART] presented above in connection with the weak PCC. The basic mechanism of dynamic interaction of course points to no special expectation for the feature [PART]. Dynamic interaction of other features—for instance, [SPKR]—should also be possible. Adopting dynamic interaction of [SPKR] paves the way for an additional account of the me-first PCC, as exemplified for instance in the Bulgarian data repeated in (52) (= (32)). On a dynamic interaction account of these data, upon Agree with a first person DO, the feature [SPKR] is copied into the interaction condition of the probe. Agree with a second or third person IO is then impossible, as these elements do not include the interaction feature for which the probe is now specified. Dynamic interaction with [SPKR] and probe satisfaction by [SPKR] each being sufficient to rule out (52b), the Bulgarian pattern may be derived in three ways. First, as above, the probe may have the satisfaction condition [SPKR], and there may be no dynamic interaction feature. Second, the probe may dynamically interact with [SPKR] and have no satisfaction condition (being insatiable). Third, there may be *both* dynamic interaction with [SPKR] and the satisfaction condition [SPKR] for the probe.

(52) *Bulgarian*

- a. Preporâčaha {mu / mi } te entuziazarano.
recommended.3PL {3SG.M.DAT / 1SG.DAT} 2SG.ACC enthusiastically
'They recommended you to him/me enthusiastically.'
- b. *Preporâčaha {mu / ti } me entuziazarano.
recommended.3PL {3SG.M.DAT / 2SG.DAT} 1SG.ACC enthusiastically
Intended: 'They recommended me to him/you enthusiastically.'
(Pancheva and Zubizarreta 2018:1315)

Combining the second and third of these possibilities with dynamic interaction by [PART] yields two additional derivations for the strictly descending pattern of Spanish (51). On both derivations, there are two features that interact dynamically, [SPKR] and [PART]. Dynamic interaction with [SPKR] on the DO rules out interaction with any second or third person IO; dynamic interaction with [PART] on the DO rules out interaction with any third person IO. The derivations differ in the satisfaction condition of the probe. This may be either empty (insatiable), in which case the restriction on IO person in the presence of a first person DO is ruled out purely by dynamic interaction. Or, it may be [SPKR], in which case satisfaction and dynamic interaction (redundantly) produce the same restriction.

6 Typological Extensions

Table (53) shows the overall space of PCC patterns derivable by manipulation of probe satisfaction conditions and dynamic interaction features in a system with the features [PART] and [SPKR]. (I turn to the typological impact of [ADDR] features later in this section.) The notation † is used to indicate features that dynamically interact. The table reflects the three ways just discussed to derive me-first patterns, and accordingly, strictly descending patterns as well. The derivations for Ubykh- and Moro-type PCC absence and for the weak PCC remain uniquely as described in sections 4 and 5.1. The strong PCC, for its part, may be derived in four ways, corresponding to total freedom in the choice of which features interact dynamically, if any.⁴⁰ Given that a [PART]-bearing DO satisfies the probe, and that [SPKR] entails [PART], there is no choice of dynamic interaction feature that will move the PCC restriction away from the strong PCC pattern.⁴¹

(53) *Typology of PCC effects by satisfaction condition and dynamic interaction feature*

Dynamic interaction feature(s)	Satisfaction condition		
	[PART]	[SPKR]	[-]
[PART]†	Strong	Strictly descending	Weak
[SPKR]†	Strong	Me-first	Me-first
[PART]† and [SPKR]†	Strong	Strictly descending	Strictly descending
None	Strong	Me-first	No PCC

In showing how the four types of PCC recognized by Nevins (2007) can be derived, this typology provides the response to our first desideratum for a theory of PCC effects:

- D1. The theory should capture all four types of PCC, without multiplying the number of basic Agree(-type) operations necessary in natural language.

⁴⁰ Note that I do *not* assume a correlation between the number of ways in which a particular pattern may be derived and the relative level of attestation of that pattern (as would parallel (e.g., Anttila's (1997)) treatment of probabilistic phonological patterns; see discussion in Coetzee and Pater 2011). It is notable that PCC patterns are highly variable across many populations, suggesting that such systems pose challenges for acquisition. This same fact also suggests that more empirical work is required in order to assess exactly how common, in statistical terms, various PCC patterns actually are—a dataset that would form a cornerstone of the assessment of any proposed acquisition model for the PCC. In the absence of a clear picture of the statistical distribution at present, I emphasize that the typology in (53) represents the *possible* grammars derivable by the present system and is neutral as to the (most) *probable* ones; I assume that facts concerning the relative attestation rate of PCC systems may reflect many factors, not all of them purely grammatical. See Newmeyer 2005.

⁴¹ Some reason to suspect that dynamic interaction with [PART] may coexist with [PART] as a satisfaction condition comes from Peterson's (1998) discussion of Lai (Tibeto-Burman). Peterson finds that different applicatives produce slightly different person restrictions: applicatives such as *-piak* 'affected object' produce a strictly descending PCC, whereas applicatives such as *-tse?m* 'benefactive' produce a strong PCC. I suggest the following analysis. In Lai, the PCC probe is hosted by Appl (the low probe structure, (17b)), and [PART] features interact dynamically—a fact independent of any particular probe. The Appl heads *-piak* and *-tse?m* differ in the probes they bear: the former is [SAT:SPKR] whereas the latter is [SAT:PART]. Thus, for *-piak* a strictly descending PCC results, whereas for *-tse?m* the PCC remains strong. In a language of this type, we might also expect to find applicative constructions showing a weak PCC; this results from dynamic [PART] in the context of an Appl head whose probe is insatiable. While Peterson finds no such pattern in Lai, this situation plausibly obtains in Iron Ossetic (Indo-Iranian), where the PCC is either strong, strictly descending, or weak, depending on the case marked on the two object clitics (Erschler 2014). I suggest that case variation reflects different Appl heads, and that the variation in PCC patterns results from the presence of [SAT:PART], [SAT:SPKR], and [SAT:-] Appl probes in a language with dynamic [PART].

It raises the further question of whether the four types of PCC listed in (53) exhaust the possibility space—a question to be asked in both theoretical terms (what additional patterns, if any, does the theory predict?) and empirical terms (what additional patterns, if any, are attested in natural language?). I take up two such typological extensions in this section. The first concerns the featural representation of second person and the potential impact of the feature [ADDR] on the predicted space of PCC patterns; the second concerns the relative structural position of the DO and the IO in the search space of the probe, and the corresponding possibility of “reverse PCC” effects.

6.1 The Feature [ADDR]

Thus far, the discussion has worked with a privative, geometrically organized feature system, (7), largely following Harley and Ritter (2002). Notably, geometry (7) contains three features related to the encoding of local person: [PART], [SPKR], and [ADDR]. The inclusion of an [ADDR] feature in the geometry is motivated by facts of several sorts. In the Nez Perce C-agreement data repeated in (54) (= (10)), for instance, the probe is satisfied only by a second person DP, not by a first person DP. This behavior is not readily captured in a system where second persons possess a strict subset of the features of first persons—for example, [PART] (2nd person) vs. [PART,SPKR] (1st person).

(54) *Nez Perce C*: [INT:ϕ, SAT:ADDR]

- a. $\left\{ \begin{array}{l} \text{ke-m kaa } pro \text{ nees-cewcew-teetu } pro \\ \text{C-2 then 2SG O.PL-call-HAB.S.SG 1PL} \\ \text{2sg subj/1pl obj: 'when you call us'} \end{array} \right\}$
- b. $\left\{ \begin{array}{l} \text{ke-pe-m-ex kaa } pro \text{ cewcew-tee'nix } pro \\ \text{C-PL-2-1 then 1PL call-HAB.S.PL 2SG} \\ \text{1pl subj/2sg obj: 'when we call you'} \end{array} \right\}$

Further evidence for a featural representation of second person that is not strictly a subset of first person comes from Kadiwéú (Guaykurúan; Sandalo 2011) and Icarí Dargwa (Nakh-Dagestanian; Sumbatova 2011), where verbs with both first and second person arguments must agree with the second person argument rather than the first person. Finally, in a privative feature system, [ADDR] features are necessary to represent the distinction between inclusive and exclusive first person plural.⁴²

⁴² As an alternative to postulating [ADDR] features, these data can be captured by a bivalent feature system with features [\pm PART] and [\pm AUTH] (e.g., Nevins 2007, Harbour 2016); in such a system, second person is [+PART,−AUTH] whereas first person is [+PART,+AUTH]. (On inclusive/exclusive distinctions, see the extensive discussion in Harbour 2016.) This type of feature system is readily compatible with an interaction/satisfaction approach *if* we model satisfaction features as sums, where every atomic part of the sum must be found on the same goal (see Scott 2021). Thus, Nez Perce C, for instance, would have the satisfaction condition [+PART] \oplus [−AUTH] (where \oplus is a sum-former). Both the privative and the bivalent feature theories predict the two additional types of PCC effects discussed in this section (viz., you-first and A-descending).

What is the impact of [ADDR] features on the predicted typology of PCC effects? Two additional types of PCC effects are now predicted. The first is a *you-first* PCC (so named by Nevins (2007)): if the ditransitive probe is satisfied by [ADDR], the result will be that there can be no Agree with the IO when the DO is second person. Nevins (2007) rules out this option by adopting a feature system that makes it impossible for Agree to target second persons featurally. A prohibition of this type faces an immediate challenge in accounting for agreement data such as Nez Perce (54); after all, a you-first PCC is simply the transposition into the ditransitive realm of the Nez Perce C-agreement pattern. In view of these data, I suggest that the you-first pattern is indeed possible and that it constitutes an accidental gap in the currently attested space of PCC patterns. Three factors make an accidental gap of this type particularly unremarkable. First, I assume with Harley and Ritter (2002) that not all languages make use of an [ADDR] feature; rather, it may be that children only posit such a feature in the face of positive evidence (e.g., from inclusive/exclusive contrasts). Languages without an [ADDR] feature in their grammar could not have a probe satisfied by (or dynamically interacting with) such a feature and thus could not have a you-first PCC. Second, it is worth remarking that, on the basis of current evidence, the me-first pattern itself is only attested in one linguistic area (in contrast to patterns such as the strong and weak PCC, attested around the world). It is described as holding broadly for essentially only two languages, Romanian and Bulgarian, in long-standing contact, and may be found as well for some speakers of other languages in the Balkan sprachbund such as Serbo-Croatian (Runić 2013) and Czech (Sturgeon et al. 2011), as well as nearby Polish (Cetnarowska 2003 *apud* Pancheva and Zubizarreta 2018). This notably limited geographical distribution might be taken to suggest that very narrow satisfaction conditions for the ditransitive probe are independently disfavored in some way, a condition that would apply to [ADDR] satisfaction equally as well as to [SPKR] satisfaction. Third, both the present approach and many other approaches to PCC effects find a close connection between patterns in ditransitives and similar person restrictions holding in monotransitives, between subjects and objects (e.g., Anagnostopoulou 2003, Béjar and Rezac 2003, 2009, Baker 2008, Coon and Keine 2021, S. Foley and Toosarvandani 2022). Among subject-object person restrictions, you-first patterns do appear to be found in various Quechua dialects (Weber 1976, Myler 2017).

We saw above how the strictly descending PCC can be captured as the consequence of [SPKR] satisfaction (which by itself yields the me-first PCC) along with dynamic interaction of [PART] (which by itself yields the weak PCC). The result is a system where the IO must outrank the DO on the hierarchy $1 > 2 > 3$. In much the same way, if [ADDR] satisfaction is a possibility in natural language, we expect a second additional type of PCC pattern, which I call *A-descending*: the IO must outrank the DO on the hierarchy $2 > 1 > 3$.⁴³ Descriptions that hint at a pattern like this can be found in Laenzlinger 1993:241n6 for some speakers of Italian and Bonet 2008 for some speakers of Catalan. In particular, while all Catalan speakers reject (55), Bonet reports

⁴³ The name *A-descending* can be understood as a mnemonic either for *addressee* (in reference to the role of the [ADDR] feature) or for *Algonquian* (in reference to classic claims of a $2 > 1 > 3$ hierarchy in this language family). Note that this pattern is discussed by Stegovec (2017a,b) under the label *mixed-2*.

that judgments divide four ways regarding (56). Some speakers reject it (strong PCC); others accept both readings (weak PCC). Notably, “An additional set of speakers of Catalan accept [such cases] in only one of the possible readings, but the judgments as to which one is preferable seem to vary from speaker to speaker” (p. 104). If speakers who accept only reading (a) show a strictly descending PCC, then speakers who accept only reading (b) show the A-descending pattern.

(55) *Catalan*

*Al director, me li ha recomanat la Mireia.
 to.the director 1SG 3SG.DAT has recommended the Mireia
 Intended: ‘As for the director, Mireia has recommended me to him.’
 (Bonet 2008:103)

(56) *Catalan*

%Te m’ ha recomanat la Mireia.
 2SG 1SG has recommended the Mireia
 a. ‘Mireia has recommended you to me.’
 b. ‘Mireia has recommended me to you.’
 (Bonet 2008:104)

Notably, it is again the case that the corresponding pattern occurs in subject-object person restrictions, with examples coming from Algonquian languages such as Delaware (Goddard 1979) and Potawatomi (Hockett 1939).

A full typology of expected PCC types in a system with [ADDR] features is given in table (57).

(57) *Typology of PCC effects, recognizing [ADDR] features*

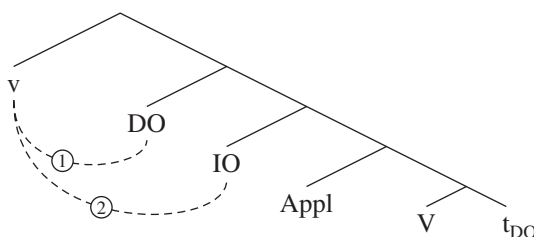
Dynamic interaction features	Satisfaction condition			
	[PART]	[SPKR]	[ADDR]	[-]
[PART] [†]	Strong	Strictly descending	A-descending	Weak
[SPKR] [†]	Strong	Me-first	Strong	Me-first
[ADDR] [†]	Strong	Strong	You-first	You-first
[PART] [†] and [SPKR] [†]	Strong	Strictly descending	Strong	Strictly descending
[PART] [†] and [ADDR] [†]	Strong	Strong	A-descending	A-descending
[SPKR] [†] and [ADDR] [†]	Strong	Strong	Strong	Strong
[PART] [†] , [SPKR] [†] , [ADDR] [†]	Strong	Strong	Strong	Strong
None	Strong	Me-first	You-first	No PCC

As the table indicates, no additional PCC types beyond you-first and A-descending are introduced by the recognition of [ADDR] features. Rather, a full theory with [ADDR] features provides for additional ways in which strong PCC effects may be derived. When the probe’s satisfaction condition is [ADDR] and [SPKR] dynamically interacts, or vice versa, a strong PCC effect results.

6.2 Reverse PCC

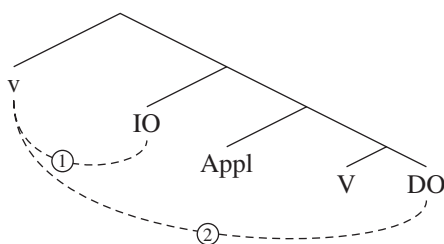
Central to the derivation of PCC effects is DO preference: the probe interacts with the DO before the IO. DO preference may be derived in multiple ways, as we saw in (17). One of the routes I have consistently represented throughout this article—the high probe structure—the involves a probe that c-commands both the DO and the IO, where the DO has moved to a position between the probe and the IO, (58). This movement presumably is to be modeled as a type of short scrambling, obligatory for the DO in various languages with PCC effects (e.g., Italian, per Holmberg, Sheehan, and Van der Wal 2019).

(58) *DO preference in a high probe structure: Classic PCC*



An immediate typological prediction concerns potential structures in which the probe is indeed merged above both objects, but DO movement is *not* obligatory (potentially as well as structures in which DO movement is obligatory but is followed by additional “leapfrogging” movement of the IO to a position between *v* and the highest copy of the DO). In such structures, we predict the emergence of IO preference, and accordingly, the type of effect that Stegovec (2017a,b, 2020) dubs the *reverse PCC*. It is now the IO that has a first chance to satisfy the probe, or to dynamically interact with it.⁴⁴

(59) *IO preference in a high probe structure: Reverse PCC*



⁴⁴ Unlike the classic “forward” PCC, reverse PCC effects are not readily captured in a system where the probe occurs between the two objects, on Appl, per the low probe structure represented above. Even if the DO were to move to an outer specifier of ApplP, one would still expect DO preference: the Appl probe has access to a copy of the DO within its complement, and probes this copy before proceeding to probe the IO. Reverse PCC effects thus suggest that ditransitive probes are not *always* on Appl.

Reverse PCC effects are attested in natural language. Known examples can be found in Shapsug Adyghe (Driemel, Özdemir, and Popp 2020) as well as varieties of Swiss German (Werner 1999 *apud* Stegovec 2020), Czech (Sturgeon et al. 2011), and Slovenian (Stegovec 2015, 2017a, 2020)—grammars that, between them, attest to reverse strong, weak, and strictly descending PCC types.⁴⁵ Shapsug Adyghe shows a reverse strictly descending PCC: without a “repair,” the only permissible combinations of DO and IO are those in which the DO outranks the IO on the scale $1 > 2 > 3$.⁴⁶

(60) *Shapsug Adyghe grammatical forms: DO outranks IO*

- a. Se wo Ali-jəm wə-sə-tə.
1SG 2SG Ali-OBL 2SG-1SG-give
3IO, 2DO: ‘I give you to Ali.’
- b. Wo se Ali-jəm sə-wə-tə.
2SG 1SG Ali-OBL 1SG-2SG-give
3IO, 1DO: ‘You give me to Ali.’
- c. Sine-m se wo sə-wə-rə-tə.
Sine-OBL 1SG 2SG 1SG-2SG-3SG-give
2IO, 1DO: ‘Sine gives me to you.’
(Driemel, Özdemir, and Popp 2020)

(61) *Shapsug Adyghe ungrammatical forms: IO outranks DO*

- a. *Se Ali-jə wo wə-sə-tə.
1SG Ali-ABS 2SG 2SG-1SG-give
2IO, 3DO: ‘I give Ali to you.’
- b. *Wo Ali-jə se sə-wə-tə.
1SG Ali-ABS 2SG 1SG-2SG-give
1IO, 3DO: ‘You give Ali to me.’
- c. *Hasan-əm wo se wə-sə-rə-tə.
Hasan-OBL 1SG 2SG 1SG-2SG-3SG-give
1IO, 2DO: ‘Hasan gives you to me.’
(Driemel, Özdemir, and Popp 2020)

Derivation of this pattern may proceed in any of the ways described for Spanish in section 5.2 (see also table (57)), with the exception of the fact that probing now occurs in structure (59) rather than (58) (or, alternatively, the low probe structure, (17b)).⁴⁷ The obligatoriness of the reverse PCC pattern in Shapsug Adyghe suggests that structure (58) is not possible in this language;

⁴⁵ I take the absence of known reverse me-first, you-first, and A-descending patterns to be accidental, recalling that these patterns are generally attested the least.

⁴⁶ This pattern holds both for morphologically simplex ditransitives, as in (60)–(61), and for benefactives with a visible applicative marker (Driemel, Özdemir, and Popp 2020).

⁴⁷ Note that the structural proposal in (59) is in accordance with Driemel, Özdemir, and Popp (2020), who note that it helps to explain the order of person clitics in Adyghe.

the DO is not able to occupy a position between IO and *v*. Also ruled out is the low probe structure, (17b) (see footnote 44).

Zurich German, Czech, and Slovenian occupy a typological position between Shapsug Adyghe and classic PCC languages in that they permit both classic and reverse PCC patterns. In such languages, both the IO-preference structure (59) and at least one of the DO-preference structures (high probe (58) or low probe (17b)) are possible, with disambiguation largely determined by clitic order.⁴⁸ Varieties of Slovenian, for instance, differ as to whether they feature a strong or weak PCC restriction; Stegovec (2020) reports that both classic and reverse PCC patterns are found for both groups of speakers, with no interaction between PCC type and classic/reverse directionality. In both cases, a person restriction holds for the clitic linearly second in the object clitic string, whether DO or IO.

(62) *Slovenian IO before DO: DO person is restricted (i.e., classic PCC)*

- a. Mama {mi / ti / mu } ga bo predstavila.
Mom {1.DAT / 2.DAT / 3.M.DAT} 3.M.ACC will.3 introduce.F
'Mom will introduce him to me/you/him.'
- b. *Mama mu {me / te } bo predstavila.
Mom 3.M.DAT {1.ACC / 2.ACC} will.3 introduce.F
Intended: 'Mom will introduce me/you to him.'
(Stegovec 2020:264)

(63) *Slovenian DO before IO: IO person is restricted (i.e., reverse PCC)*

- a. Mama {me / te / ga } mu bo predstavila.
Mom {1.ACC / 2.ACC / 3.M.ACC} 3.M.DAT will.3 introduce.F
'Mom will introduce me/you/him to him.'
- b. *Mama ga {mi / ti } bo predstavila.
Mom 3.M.ACC {1.DAT / 2.DAT} will.3 introduce.F
Intended: 'Mom will introduce him to me/you.'
(Stegovec 2020:264)

The weak PCC Slovenian grammar may be derived as indicated for Italian in section 5.1. The strong PCC version may be derived by any of the paths to the strong PCC indicated in table (57). The key difference from the classic strong and weak PCC lies merely in the fact that Slovenian permits the DO to remain in situ in the domain of a ditransitive probe on *v* whereas (e.g.) Italian does not.

7 Conclusions and Brief Remarks on Competitor Proposals

The advantages of an interaction/satisfaction approach to PCC effects are both theoretical and empirical. On theoretical grounds, this view affords a syntactic approach to PCC effects while avoiding all invocation of uninterpretable or unvalued features. In this way, it contributes to an

⁴⁸ See Stegovec 2020 for details of some contexts in which clitic order does not disambiguate.

emerging picture of Agree dependencies that avoids the complications for a uF theory raised by overagreement and underagreement effects, as discussed in section 2. On empirical grounds, it responds to the three desiderata with which we began: it accounts for Nevins's (2007) four types of PCC effects within a unified theory of Agree (D1), while allowing both for cases in which PCC effects are constrained by Double Weakness (D2) and for those in which no such constraint is in place (D3). Beyond this, it extends naturally to an account of reverse PCC effects of several varieties, as discussed in section 6.2. Last but not least, it is perhaps advantageous that the core interaction/satisfaction syntactic machinery is in principle compatible with a variety of approaches to PCC "repairs," themselves a rich topic of ongoing inquiry (e.g., Bonet 2008, Rezac 2008, 2011, Walkow 2012, 2013, Murphy 2019, Yokoyama 2019a, Driemel, Özdemir, and Popp 2020). The theory of Agree explains why certain forms are not derived, but leaves open various options for how the notional meaning expected for those forms might alternatively be expressed. Thus, one might expect the basic interaction/satisfaction approach to remain applicable in view of future developments in our understanding of PCC repair across languages.

I contend that this range of advantages is not shared with any alternative theory of PCC effects. While space precludes a properly in-depth assessment of the body of previous approaches, it may nevertheless be helpful to roughly categorize various previous proposals according to the empirical advantages listed above.⁴⁹ For instance, the present approach holds an explanatory advantage over certain theories targeted toward particular types of PCC patterns, such as just the strong PCC (e.g., Bonet 1991, Anagnostopoulou 2003, Béjar and Rezac 2003, Adger and Harbour 2007, Ormazabal and Romero 2007, Baker 2008, Rezac 2011), and over theories that invoke different basic Agree mechanisms for different PCC patterns (e.g., Anagnostopoulou 2005); both of these fall short of our first desideratum (D1). In addition, as discussed above in connection with data from Náhuatl, Swahili, and causatives in French, the present theory also compares favorably with alternatives that tie PCC effects too tightly to Double Weakness contexts, failing to capture PCC restrictions in syntactic environments where one or both objects is not subject to weak realization, per desideratum D3 (e.g., Bianchi 2006, Nevins 2011, Stegovec 2020, Coon and Keine 2021, S. Foley and Toosarvandani 2022). In still other cases, the advantage over alternative accounts lies in accounting for reverse PCC effects. These effects are unexpected on theories that posit special properties of datives and/or goal arguments (e.g., Anagnostopoulou 2003, Béjar and Rezac 2003, Pancheva and Zubizarreta 2018, Yokoyama 2019b), rather than tying reverse PCC effects to the order in which the probe interacts with the IO and the DO.

It must of course be asked whether competing proposals offer compensatory empirical advantages that may nevertheless tip the scoreboard in the opposite direction. I will briefly offer some evaluatory comments on this topic as concerns two recent approaches, Coon and Keine's (2021) and Pancheva and Zubizarreta's (2018), each of which accounts for all four core PCC effect types and thus meets desideratum D1. These approaches are quite different from the present theory, as well as from each other, in the type of grammatical phenomenon in which they seek to ground PCC effects. On the present approach, PCC effects are a matter of pure syntax, in the sense that

⁴⁹ For a general review of a range of proposals in accounting for PCC effects, see Anagnostopoulou 2017.

they arise when Agree with one object bleeds Agree with another. By contrast, for Coon and Keine (2021), PCC effects arise from factors tied to the syntax-morphology interface; for Pancheva and Zubizarreta (2018), they arise from factors tied to the syntax-semantics interface. I will target my comments toward the aspects of these articles that highlight distinctive predictions and that aim to justify this localization in the grammatical architecture.

7.1 Coon and Keine 2021: PCC Effects at the Syntax-Morphology Interface

Coon and Keine (2021) approach PCC effects involving clitics in a uF model of Agree with the following central properties. First, probes may consist of multiple *segments*, each represented as a distinct u-feature—for example, $[u\phi - \text{UPART}]$.⁵⁰ Second, the different segments of a probe seek their goals simultaneously, but may ultimately find different goals. For instance, in a *probe* $> 3 > 2$ c-command configuration, $[u\phi]$ on the probe finds the higher third person argument whereas $[\text{UPART}]$ finds only the lower second person argument, but crucially, this happens in the same derivational step. Third, probes that require clitic doubling are subject to a condition that requires every DP they Agree with to cliticize onto them *as soon as Agree with the DP is established*. Fourth, it is not possible for two DPs to cliticize in the same derivational step.⁵¹ Because, by assumption, segments probe simultaneously, this setup leads to an ordering problem when (as in the $3 > 2$ example above) two segments of the same probe Agree with different goals. The two goals must each cliticize immediately, and cannot do so simultaneously. Any attempt to order them leads to a fatal violation of the requirement that cliticization immediately follow Agree. (Whichever step is ordered second does not count as taking place immediately.) Accordingly, pairs of clitics that would reflect Agree with different segments of the same probe are ruled out.⁵² Coon and Keine emphasize that the PCC prohibition results not from the syntax of Agree—no ungrammaticality is incurred per se by two segments of the same probe Agreeing with different goals—but from a factor related to the externalization of the relevant structures, namely, the proposed principle requiring that cliticization immediately follow Agree.

While Coon and Keine confine their discussion of PCC effects proper to cases involving clitics,⁵³ their approach extends to hierarchy effects involving simple agreement as well. When two segments of a probe Agree with different goals and cliticization is *not* triggered (this being a matter of some type of feature specification of the probe), issues at the syntax-morphology interface may nevertheless arise in relation to the process of Vocabulary Insertion. In particular,

⁵⁰ Coon and Keine (2021) represent third persons with a $[\text{UPERS}]$ feature rather than $[u\phi]$; as the choice has no effect on the central argumentation reviewed here, I use the latter for consistency with previous assumptions.

⁵¹ Coon and Keine (2021) posit that this is because cliticization involves Merge, which is binary, and thus could not move two clitics in the same step. Note though that the same assumption is not made for Agree.

⁵² The central explanatory role accorded to simultaneous probing raises questions about the compatibility of this approach with cyclic expansion (Rezac 2003, Béjar and Rezac 2009), given that (as discussed in section 2) the latter requires Agree with two different goals to be interspersed with Merge. In this type of circumstance, the ordering of cliticization should pose no particular challenge, and PCC-type effects would not be derived. This prediction is worthy of further study as concerns hierarchy effects between subject and object clitics, given that the analysis of these often features cyclic expansion (Béjar and Rezac 2009).

⁵³ This is in keeping with Nevins's (2011) claim that all PCC effects involve clitics. See footnote 3 for discussion.

Vocabulary Insertion for probes is assumed to proceed on a segment-by-segment basis; each segment is matched to the best Vocabulary item (in keeping with standard principles of underspecification) *for that segment*. However (modulo a morphological rule of Fission), only one Vocabulary item (VI) may be inserted for the overall node hosting the probe, no matter how many segments this may subdivide into. This leads again to an unresolvable conflict. By assumption, it is not possible to insert multiple VIs, and there is no way to rank VIs or otherwise to choose among them, such that only one is inserted. The result, arising again in a case where different segments of the same probe have Agreed with different goals, is ineffability.

Coon and Keine marshal two central types of evidence for the position that PCC and hierarchy effects arise at the syntax-PF interface in this way. First, they note a connection between obviation of PCC/hierarchy effects and lack of Double Weakness in certain cases (see D2): PCC effects in Basque and related subject-object hierarchy effects in Icelandic and German are obviated in (nonfinite) contexts that lack visible agreement. Note, though, that to account for the absence of agreement morphology in these cases, Coon and Keine posit that Agree does not take place in the syntax; this is in parallel to the approach pursued in section 3.2 on the interaction/satisfaction approach. Thus, PCC obviation in certain contexts without visible agreement does not decide between the theories. To the contrary, cases that show a dissociation between PCC/hierarchy effects and Double Weakness (see D3) force the postulation of either a silent clitic or a silent VI on Coon and Keine's approach, though not on the approach pursued here. (This means that, in the case of French causatives with *à*-phrase causees (section 3.3), for instance, the current approach is better able to account for Rezac's (2011) argument against null cliticization.) Overall, the central challenge from D3 for an approach based at the syntax-morphology interface is to account for why, in some cases but not others, removal of visible agreement morphology bleeds PCC/hierarchy effects. On the present approach, this is the difference between the absence of Agree and the presence of Agree with no phonological output (for whatever reason). On Coon and Keine's approach, this is the difference between the absence of Agree and the presence of Agree, which, while leading to no observable phonological output, nevertheless has specific morphological properties that lead to PF ineffability.

The second type of argument for a syntax/morphology approach comes from the behavior of syncretic verb forms in certain types of hierarchy effect contexts. Icelandic, for instance, forbids certain nominative objects from being first or second person (Sigurðsson 1996), a pattern reminiscent of the strong PCC (Boeckx 2000, Anagnostopoulou 2003, Béjar 2003).

(64) *Icelandic*

- a. Henni leiddust strákar.
her.DAT bored.3PL the.boys.NOM
'She found the boys boring.'
- b. *Henni leiddumst við.
her.DAT bored.1PL we.NOM
Intended: 'She found us boring.'
(Sigurðsson 1996:21, 24)

Sigurðsson (1996) notes that nominative objects in such sentences show improvement when the verb is syncretic between the appropriate local person form and third person. This is the case in (65), for instance, where the form *líkaði* occurs in both first and third person singular cells of the verbal paradigm.

- (65) *Icelandic*
??Henni líkaði ég.
her.DAT liked.1SG~3SG I.NOM
'She liked me.'
(Sigurðsson 1996:27)

Coon and Keine follow Schütze (2003) in taking the improved status of (65) vis-à-vis (64b) as evidence that (64b) is degraded for morphological reasons, thus supporting a PF approach to hierarchy effects. On their proposal, syncretism reflects cases in which two probe segments each demand the *same* exponent. In this case, insertion of the syncretic exponent counts as realizing the features of both segments, avoiding the ineffability otherwise triggered by an unresolvable choice among VIs. The challenge lies in accounting for the fact that the acceptability of sentences like (65) is still degraded for many speakers (including Sigurðsson, whose ?? judgment is reproduced here): syncretism has an ameliorating effect, but it does not restore full acceptability. In perhaps the most extensive experimental study of this phenomenon, involving 60 native Icelandic speakers, Hartmann and Heycock (2018) find both that syncretism ameliorates rating scores and that scores for examples with local person nominative objects overall remain quite low, syncretism or no, as compared with grammatical controls. If “rescuing by syncretism” is to be taken as support for a PF approach to hierarchy effects, an account for this remaining degradation is required.

An alternative (and, so far as I am aware, novel) approach to the partial rescuing effect of syncretism, compatible with the interaction/satisfaction proposal, would treat the intermediate status of cases like (65) as indicative of an agreement attraction effect in language processing (see, e.g., Bock and Miller 1991, Hartsuiker, Antón-Méndez, and van Zee 2001, Wagers, Lau, and Phillips 2009). This effect is found in judgments on sentences such as *The key to the cabinets are on the table*, wherein the verb fails to agree with the subject, being instead “attracted” to another DP.⁵⁴ In their intermediate status, judgments on agreement attraction sentences are notably parallel to judgments on cases like (65); these examples, too, are not as acceptable as fully grammatical controls (e.g., *The keys to the cabinets are on the table*) nor as unacceptable as certain other ungrammatical sentences (e.g., *The key to the cabinet are on the table*). A preliminary hypothesis connecting agreement attraction and cases like (65) would draw a parallel between the “attractor” in the English sentences—a DP that is not in a structural position to Agree with the verb/T, like *cabinets* in the current example—and the low nominative in the Icelandic examples, given that the latter is structurally barred from participation in Agree in the relevant sentences. Despite this prohibition in the grammar, the nominative is sufficiently surface-similar to agree-

⁵⁴ This DP may be an object; see Hartsuiker, Antón-Méndez, and van Zee 2001.

ment controllers in other contexts to create an attraction effect in processing.⁵⁵ This effect boosts the acceptability of (ungrammatical) forms that show sufficient similarity to the form or features that would result from the nominative agreeing. On this view, the findings from syncretism can be connected with a further finding reported by Sigurðsson (1996): forms that match the nominative in number, though not in person, are also improved with respect to fully agreeing person forms. This result perhaps reflects the frequent role of number in particular in triggering agreement attraction. For (66), Sigurðsson's survey of nine speakers finds that the default, third person singular form, *leiddist*, is most acceptable; *leiddust*, a form that reflects plural number, though is not syncretic with first person plural, has a medial status; finally, a fully agreeing first person plural form, *leiddumst*, is least acceptable.

(66) *Icelandic*

Henni {leiddist > leiddust > leiddumst} við.
her.DAT {bored.3SG > bored.2PL~3PL > bored.1PL} we.NOM
Intended: 'She found us boring.'
(Sigurðsson 1996:29–30)

Such effects suggest that syncretism in particular may not be the sole source of the amelioration in (65), as the medial form *leiddust* is not syncretic with first person. Example (65) may be improved by the fact that its verb form can be parsed as default third person singular, and furthermore, by the fact that its verb form nevertheless resembles in some way the form the nominative would control. The further development of such a hypothesis of course calls for additional research, both theoretical and experimental. What emerges nevertheless is the possibility of an account for the somewhat improved status of examples like (65) even under a view that locates PCC/hierarchy effects in the syntax proper, rather than at the syntax-PF interface.

7.2 Pancheva and Zubizarreta 2018: PCC Effects at the Syntax-Semantics Interface

Pancheva and Zubizarreta (2018) approach PCC effects in a model that draws on the basic intuition that person hierarchy effects are connected to point of view. They propose that a locus of point of view is established for each syntactic phase and that this includes a phase delimited by Appl. Agreement plays a crucial role in determining PCC effects because the Appl head bears an interpretable, valued person feature that undergoes agreement of some type with the DP in Spec, ApplP, which establishes this DP, the IO, as a perspectival center.⁵⁶ In addition, Appl also possesses an uninterpretable, unvalued person feature that undergoes Agree with the DO. The result is an Appl head that contains two sets of person features, one interpretable and one uninterpretable.

⁵⁵ Notably, forms that are merely surface-identical with nominative have been found to exert an attraction effect by Hartsuiker, Antón-Méndez, and van Zee (2001) and Slioussar (2018); thus, truly grammatically nominative objects might be expected to exert a particularly strong attraction effect. Thanks to Brian Dillon for bringing this work to my attention.

⁵⁶ Pancheva and Zubizarreta (2018) do not clarify the syntactic mechanism by which this agreement takes place, though their discussion perhaps implies (see esp. pp. 1302, 1330) that they do not intend to reduce it to Agree (which they connect, following Chomsky (2000), to uninterpretable features). They also do not clarify the compositional mechanism by which the IO comes to be interpreted as a perspectival center, and in particular, why this mechanism (in contrast to standard matters such as the agentive interpretation of the specifier of Voice_{AG}) requires Spec-head agreement.

Constraints on combinations of various persons within the ApplP arise from a series of filters on these features and their combinations, which work to ensure that “the most appropriate argument in the ApplP domain is marked as the point of view center (with the appropriateness metric being subject to some crosslinguistic variation)” (p. 1303). One such filter requires that the IO bear the feature [+proximate]—the default setting—or, failing this, that it be restricted to [+participant] or [+author].⁵⁷ Pancheva and Zubizarreta assume that first and second persons are inherently [+proximate], and that third person IOs are also [+proximate] *only if the DO is third person as well*. Therefore, in the default case, the filter has the effect of restricting IO person to either first or second, or to third person in the special case where both arguments are third person. Combinations of a third person IO and a first or second person DO are filtered out; this restriction is in common across weak and strong PCCs. An additional filter, active by default, requires that the DP that matches the designated feature on Appl (e.g., [+proximate]) be the *only* DP with this feature within the ApplP phase. This filter is implemented by a comparison between the two sets of person features, interpretable and uninterpretable, that are found on the Appl head. Where the feature in question is [+proximate], this has the effect of also filtering out cases where both the DO and the IO are local person. Together with the previous filter, this derives the strong PCC. Finally, two additional filters (also subject to default and marked settings) require that ApplP indeed possess an interpretable person feature, leading to the calculations above, and that DPs with a [+author] feature have priority for the IO position. These final filters play a central role in deriving the me-first and strictly descending PCCs.

An empirical aspect of this view emphasized by Pancheva and Zubizarreta is its ability to capture not just Nevins’s (2007) four main PCC patterns, but also a series of patterns that impose restrictions on combinations of two third person arguments. The Malayo-Polynesian language Kambera, for instance, shows a strong PCC pattern and in addition rules out all third person IOs (Klamer 1997).⁵⁸ (This pattern has been dubbed the *superstrong PCC* by Haspelmath (2004).) This results, in Pancheva and Zubizarreta’s system, from a requirement that IOs bear the feature [+participant], rather than simply [+proximate] (as in strong PCC grammars). Typologically, their theory predicts that versions of a PCC pattern that additionally impose a *3-on-3 requirement should be found for strong, weak, and strictly descending PCC types, but not for the me-first PCC. While this prediction is borne out for those few grammars in which me-first patterns are attested, the overall low (and highly areally confined) attestation rate of the me-first PCC makes it hard to confirm that this is not just an accidental gap. An alternative, widely pursued approach to *3-on-3 requirements handles these as essentially morphological clitic dissimilation patterns

⁵⁷ Pancheva and Zubizarreta (2018) work in a system of bivalent features, rather than privative ones. On this choice, see Béjar 2003, Nevins 2007, Harbour 2016, and discussion in footnote 42.

Reference to “default” (vs. “marked”) choices here is intended to capture quantitative aspects of PCC typology; in general, by assigning greater degrees of markedness to particular filter settings, Pancheva and Zubizarreta aim to capture not only which PCC grammars are possible but also which are (most) probable. On this issue, see footnote 40.

⁵⁸ Pancheva and Zubizarreta (2018) also report that this pattern is found in Matsigenka (Arawak), citing O’Hagan 2014. In closely related Caquinte, however, both local > 3 and 3 > local object combinations are permitted, though 3 > 3 combinations are ruled out (Drummond and O’Hagan 2020). Zachary O’Hagan (pers. comm.) notes that further research is required to firmly establish whether Matsigenka indeed disallows the 3 > local possibility attested in Caquinte.

distinct in origin from PCC effects (e.g., Perlmutter 1971, Bonet 1991 et seq., Nevins 2007, 2011, Stegovec 2015, Drummond and O’Hagan 2020; see also Grimshaw 1997 for a dissimilation analysis that is less clearly morphological). Notably, an approach that severs the PCC proper from clitic dissimilation allows several ditransitive object-marking patterns to be captured that *are* attested but are *not* predicted by Pancheva and Zubizarreta’s theory. These include the patterns in Caquinte (Drummond and O’Hagan 2020) and Ubykh (Dumézil and Esenç 1975, Fenwick 2011), where combinations of a third person IO and a first person DO are allowed, but 3IO/3DO combinations remain restricted.⁵⁹ On an interaction/satisfaction approach, such systems can be simply captured by means of an insatiable probe and a postsyntactic rule of dissimilation.

In terms of the proposed localization of the PCC restriction at the syntax-semantics interface, the arguments offered by Pancheva and Zubizarreta are indirect. It is certainly true, as they emphasize, that point of view is in some way involved in a variety of lexical and grammatical phenomena of natural language. Such phenomena have drawn substantial interest in recent years in formal semantics (see Lasersohn 2005, Anand 2006, Oshima 2006, Stephenson 2007, Pearson 2015, Roberts 2015, Barlew 2017, Deal 2020, among a great many others), where they have been largely modeled with tools related to context-dependence and *de se* quantification. Of course, the existence of such phenomena elsewhere in grammar does not demonstrate that PCC effects themselves involve perspective; nor does the availability of semantic explanations for other types of patterns show that PCC effects are semantically motivated. One phenomenon that seems on the surface somewhat similar to PCC effects, and for which Pancheva and Zubizarreta endorse a fully semantic solution, is the Clitic Logophoric Restriction (CLR; Bhatt and Šimík 2009, Charnavel and Mateu 2015): in French, certain other Romance languages, and Czech, a DO clitic in a ditransitive clitic cluster cannot refer to an attitude holder *de se*.

(67) *Spanish*

Según el niño_i, las maestras se_k lo_{*i,j} encomendarán, a la asistent_k.
according.to the boy the teachers 3_{DAT} 3_{ACC.M.SG} entrust.FUT.3_{PL} to the assistant
‘According to the boy_i, the teachers will entrust him_{*i,j} to the assistant.’
(Pancheva and Zubizarreta 2018:1297)

Pancheva and Zubizarreta propose that the CLR effect arises due to a semantic principle that is violated when one of the DPs within ApplP denotes an attitude holder, but this is not the IO. Positing that first and second persons are natural attitude holders, they suggest that the mechanisms of the PCC, by privileging alignments between attitude holders and the IO grammatical role / point-of-view center logophoric role, “[result] in a syntactic representation that is optimally interpretable” (p. 1328). Notably, while drawing an indirect connection between the two, this account does not reduce the CLR to the PCC—after all, clitic combinations as in (67) are PCC-compliant. Rather, it relies on an independent semantic principle to derive CLR effects on top of the basic

⁵⁹ Caquinte also restricts combinations of two local person arguments, which Drummond and O’Hagan (2020) argue should be treated as a morphological effect; Ubykh has no parallel restriction.

PCC grammar. Thus, an approach such as the interaction/satisfaction theory could in principle adopt largely the same semantic principle (whether as stated by Pancheva and Zubizarreta (2018) or in the form proposed by Charnavel and Mateu (2015), for instance) with no loss of coverage and with no increase in the relative number of independent mechanisms needed. More work is certainly needed to understand the origins and more foundational motivations of the semantic generalizations behind the CLR, as well as the overall typology of CLR effects. Intriguingly, Pancheva and Zubizarreta observe that CLR effects are not found in Bulgarian, a fact that they connect to the me-first PCC grammar of this language. It remains to be shown, however, that CLR obviation and the me-first PCC correlate in a broader data sample that includes (for instance) those Czech and Polish speakers with the me-first PCC.

Overall, the connection between PCC effects and perspective- or point-of-view-related phenomena—whether these are taken narrowly, for instance to include just the CLR, or broadly, to include logophoricity, predicates of taste, perspectival verbs, and other matters—is somewhat reminiscent of the connection between PCC effects and matters of discourse frequency highlighted by Haspelmath (2004). Haspelmath notes that PCC-compliant IO/DO person pairs are more frequently observed in a German corpus than are non-PCC-compliant pairs, and he hypothesizes that the relative discourse usefulness of the former combinations has led to grammaticalization of discourse patterns as PCC effects. See Anagnostopoulou 2017:sec. 7 for some critical discussion (as well as Driemel, Özdemir, and Popp 2020 for a perspective from reverse PCC effects). For present purposes, I would like to highlight simply that the existence of a correlation between discourse frequency and PCC effects does not show that either may be reduced to the other, whether synchronically or diachronically (the latter being Haspelmath's proposal). It may be that an improved understanding of the acquisition of PCC effects—a matter I have left open here—points a way to better understand some aspect of both types of patterns, and for that matter the relationship between them. At present, such discoveries remain more a hope for the future than a way to decide between competing analyses of the PCC.

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