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Constraint-driven Agree

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Abstract. Recent work (e.g. Deal 2015, Keine 2020) argues that the lexical specification of a probe has two components: (i) specification for constraints favoring Agree with prominent features on a person or discourse hierarchy and (ii) specification for constraints disfavoring Agree across particular features. In this paper, I propose that these are weighted, violable constraints (building on e.g. Murphy 2018, Georgi 2019). I provide a unified account of cross-clausal long-distance agreement, phi-feature hierarchy effects in multiargument agreement systems, dative intervention, and PCC effects.

Keywords. Agree; intervention; long distance agreement; PCC; Harmonic Grammar

1. Introduction. This paper presents a new implementation of Agree (Chomsky 2000), an operation which copies material from one syntactic node to another. Chomsky introduces Agree in order to account for syntactically non-local phenomena such as ϕ-agreement, which are difficult to model using Merge alone. In (1a), *seem* and *two problems* are not in a direct selectional relationship, but *seem* apparently has access to features of *two problems*, given that the agreement morpheme *-s* is required in (1b) but not (1a).

(1) a. There seem to be two problems.
b. There seem*(s) to be one problem.

In Agree-based frameworks, it is assumed that in (1a), the T head hosting the agreement morphology on *seem* Agrees with the agreement controller *two problems*, i.e. the relevant features of *two problems* are copied onto T. The copying operation is contingent on minimal search (Relativized Minimality, Rizzi 1990): the agreeing head T, called the *probe*, searches its c-command domain from top to bottom for some particular feature, in this case ϕ. Agree takes place with the syntactically highest element bearing ϕ, called the *goal*.

Chomsky's model predicts that in some cases, even if an element bearing a feature F is in the c-command domain of a probe searching for F, it can still fail to Agree. Certain domains are assumed to be opaque for Agree (2a): for instance, Agree across a C head into an embedded clause is assumed to be ruled out because CPs are phases for spellout. Another way that Agree can be blocked is if the probe has a closer goal to Agree with, as in (2b). (Arrows denote Agree; 'uF' denotes a probe searching for F; '...' denotes c-command.)

(2) *Two types of blocked Agree (Chomsky 2000)*
a. *If YP is opaque for Agree, X cannot Agree with Z:* X[uF] ... [$_{YP}$ Y ... Z[F]]
b. *The intervening goal Y blocks X from Agreeing with Z:* X[uF] ... Y[F] ... Z[F]

In this paper, I offer a new analysis of blocked Agree as arising from competition between violable constraints. The overall model of syntax I adopt is a standard Minimalist derivational

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model, with just one change: the operation Agree is assumed to be driven by constraint-based optimization, rather than by uF features. This falls in line with a body of work arguing that a step of optimization applies at each step of Agree (e.g. Broekhuis and Woolford 2013, Heck and Müller 2003, Murphy 2018, Georgi 2019, Hsu 2021).

Although some work posits that optimization drives every step of the derivation, including in the narrow syntax ('extremely local optimization', Heck and Müller 2007), I do not take such a radical position in this paper. I do argue that the structure-building operation Agree is constraint-driven. However, the only constraints in play are Agree-specific constraints, and each probe makes its own optimality calculation, completely insulated from other probes. This insulation of steps of optimization is crucial, as it allows the model to account for probe-driven derviational crashes, circumventing the ineffability problem faced by other optimizing models (see e.g. Fanselow and Féry 2002, Blaho and Rice 2009).[1] This modularity / self-containedness also has the consequence that my Constraint-driven Agree can simply swap in for standard Agree within a broadly-Minimalist framework, without any need to change the rest of the syntactic architecture.

I focus on instances of what I call *partial blocking* of Agree: blocking which applies to some potential goals but not others, depending on their features. The constructions in question involve a probe searching for features F and G which is blocked from Agreeing with an element bearing F, but is not blocked from Agreeing with an element bearing G in the same position. This is schematized in (3).

(3) *Schematic partial blocking paradigm: α blocks Agree with F but not G*

a. *The feature F can license Agree with X:* X ... Y[F]

b. *The feature G can license Agree with X:* X ... Y[G]

c. *Agree licensed by F is blocked by α:* X ... α ... Y[F]

d. *Agree licensed by G is not blocked by α:* X ... α ... Y[G]

Although existing implementations of Agree can account for some patterns which conform to the schema in (3), I claim that they do not adequately account for the range of attested patterns crosslinguistically. For instance, in the special case where α bears the feature F, in Chomsky's model a [uF,uG] probe will behave as in (3) – but this analysis is known not to generalize to all cases (e.g. Roversi 2020, Alam and Kumaran 2022).

I present a unified analysis of patterns like (3) using a new model of Agree, Constraint-driven Agree. The basic idea is that whether a given probe Agrees with a given element or not is determined entirely by competition between constraints favoring Agree and constraints disfavoring Agree. A pattern like (3) arises when the lexical specification of the probe X is such that the pressure not to Agree across the intervener α outweighs the pressure to Agree with F but does not outweigh the pressure to Agree with G.

As in other constraint-based models (such as Harmonic Grammar (Legendre et al. 1990a,b) and its offshoot Optimality Theory (Prince and Smolensky 2004)), the set of possible constraints allowed by Universal Grammar is assumed to be small, but this small set of constraints predicts a large typology of possible grammars. This is because the relative strength of constraints – which constraints take priority over others – varies from probe to probe (this is in fact the only source of variation between probes). I implement this using Harmonic-Grammar-style weighted con-

[1] I thank Stefan Keine for discussion of this point.

straints. Each probe's lexical specification consists of a list of weights, one for each constraint. The probe Agrees with whatever set of goals will make the weighted sum of constraint violations (called the *harmony score*, denoted H) as close as possible to zero.

Constraint-driven Agree derives a range of complex partial blocking phenomena, which resist a straightforward analysis in other models, from just the familiar principles in (4):

(4) *Core principles driving agreement*
  a. Probes are under pressure to Agree with elements ranking high on a (e.g. person or discourse) prominence hierarchy (e.g. Woolford 1999, Béjar 2003)
  b. Agree dependencies are also under pressure not to cross certain features, which need not be the same features involved in a. (e.g. Deal 2015, Keine 2020)

The model predicts that blocking effects can disappear when the potential goal is sufficiently high on a prominence hierarchy (and that what counts as 'sufficiently high' varies across probes). I show that this accounts for a set of intricate, otherwise-puzzling partial blocking patterns, including the interaction of person, honorificity, and focus in Maithili (Indo-Aryan, Alam and Kumaran 2022); the interaction of case, person, and discourse prominence in Chukotko-Kamchatkan languages (Bobaljik and Wurmbrand 2002) and Sanzhi Dargwa (East Caucasian, Forker 2020); and cross-clausal long-distance agreement in Hinuq (East Caucasian, Forker 2013; cf. Polinsky and Postdam 2001).

One might worry that a model powerful enough to derive such patterns might overgenerate. However, I show that in at least one empirical domain, Person Case Constraint (PCC) effects, the model does not in fact overgenerate. Compared to the typology of blocking patterns attested in multiargument agreement systems, the typology of PCC patterns is quite small. This has posed a problem for past accounts seeking to unify PCC patterns and agreement patterns as emerging from the same core Agree mechanism. Accounts which focus on capturing the restricted PCC typology (e.g. Nevins 2011, Coon and Keine 2021) incorrectly rule out attested patterns in the domain of agreement (see e.g. Béjar's (2011) response to Nevins). On the other hand, accounts which do accommodate the rich typology of agreement systems overpredict in the domain of PCC patterns, treating unattested PCC patterns as an accidental typological gap (e.g. Deal 2021). I argue that Constraint-driven Agree resolves this paradox. I propose that there are fewer possible constraints *favoring* Agree than constraints *disfavoring* Agree, because the former must respect feature prominence hierarchies. This accounts for the large set of possible agreement systems and the restricted typology of PCC systems. And unlike other accounts, I do not rely on special mechanisms such as person licensing or dedicated filters which rule out Agreeing with particular combinations of goals – in the Constraint-driven Agree model, derivational crashes result from the probe specification itself, arising when no candidates have a harmony score above a grammaticality threshold.

Section 2 introduces the model. Sections 3, 4, 5, and 6 are brief case studies of four phenomena: multiargument agreement, cross-clausal agreement, dative blocking, and PCC effects. Section 7 concludes.

2. The model. A good model of Agree should account for (i) restrictions against multiargument agreement and (ii) restrictions against agreement across certain phrase boundaries. Crucially, both types of restriction can vary in strength depending on the features of the potential agreement controller. (Examples are given in the upcoming subsections.) This motivates a unified model which treats these restrictions as violable constraints disfavoring Agree across a particular feature. Such constraints act alongside other constraints disfavoring failure to Agree with a particular feature.

In Chomsky's (2000) original model, a head whose lexical specification contains the feature [uF] will Agree with the closest accessible goal bearing [F]. To increase the model's empirical coverage, Hiraiwa (2001) proposes that probes are also specified for a parameter [±multiple]. A [+multiple] probe Agrees with every accessible goal; a [–multiple] probe only Agrees with one goal. Further, recent work has argued that probes are specified for not only the feature(s) they are searching for, but also separately for the feature(s) that will block further search when encountered ('satisfaction criteria', Deal 2015; 'horizons', Keine 2020; cf. 'defective intervention', Chomsky 2000). The claim is that independent factors cannot fully predict which goals act as interveners for a given probe or which domains will be opaque for a given probe.

Building on this work, I propose a further layer of complexity: probes are specified for the *extent to which* they face pressure to Agree and pressure against Agreeing across certain features. That is, the lexical entry for a probe is a list of weights (i.e. numbers between 0 and 1) for constraints of the following types:

(5) *The constraints*

a. MULTIPLEAGREE-F (MA-F): assign -1 for every element bearing [F] in the probe's c-command domain which the probe does not Agree with
b. SINGLEAGREE-F (SA-F): assign -1 if there is an element bearing [F] in the probe's c-command domain and the probe Agrees with no such element
c. OBSTRUCTION-F (O-F): for each goal Agreed with, assign -1 for each element bearing F in the search space which c-commands or dominates the goal

For instance, recall the partial blocking pattern in (3). X might have the probe specification [SA-F=0.1, SA-G=1, O-α=0.5]. This correctly derives (3), as shown in (6). If Y bears [F], it is not worth it for X to Agree with Y across an intervening α, because the incentive to Agree with [F] is too weak (6a). The pressure to Agree with [G], by contrast, is strong enough that it is worth it for X to Agree with Y in the same configuration if Y bears [G] instead of [F] (6b).

(6) *A constraint-based account of the pattern in (3)*

a.

X ... α ... Y[F]	SA-F w = 0.1	SA-G w = 1	O-α w = 0.5	H
X Agrees with Y	0	0	-1	-0.5
☞ X does not Agree with Y	-1	0	0	-0.1

b.

X ... α ... Y[G]	SA-F w = 0.1	SA-G w = 1	O-α w = 0.5	H
☞X Agrees with Y	0	0	-1	-0.5
X does not Agree with Y	0	-1	0	-1

There are two additional components to the model. First, I propose that if the harmony score (H) of the optimal candiate is –1 or below, the derivation crashes. This mechanism is responsible for PCC effects, as discussed in section 6. In standard constraint-based frameworks such as Harmonic Grammar or Optimality Theory (or even their serial counterparts), this type of grammaticality threshold cannot be implemented, because in those frameworks, violations add up over the course of the derivation, so long and complex sentences will accrue too many violations. In my framework, each probe calculates its own, separate harmony score based on its own constraints, so this problem does not arise.

Second, I propose a restriction on what features MA and SA constraints can reference – they must respect a person/discourse prominence hierarchy. I leave the details of this for section 6.

3. The interplay of person, honorificity, focus, case, and locality in Maithili agreement. One advantage of the Constraint-driven Agree model is its ability to capture agreement in languages where the verb agrees either just with the subject or with both the subject and the object, depending on the subject and object's features. Such patterns are generally analyzed using models such as standard cyclic Agree (e.g. Béjar 2003) or interaction/satisfaction Agree (Deal 2015). However, in Alam and Kumaran 2022, we argue that data from Maithili (Indo-Aryan)[2] challenge these models, and we present an analysis within a more powerful framework (using a version of dynamic interaction (Deal 2021)).

For reasons of space, I will not fully recapitulate the arguments and analysis presented in Alam and Kumaran 2022. I will just list what is important for my purposes here: 1. If the subject is non-nominative and the object is not focused, the subject Agrees and the object does not. 2. If the subject is nominative and a non-subject is focused, the subject and the focused element both Agree. This focused element need not be the object – it can also be internal to a DP or PP argument. 3. If the subject is nominative and there are no focused elements, either only the subject Agrees or both the subject and object Agree. This depends on the subject and object's ϕ-features. In Alam and Kumaran 2022, we argue that existing models of Agree cannot account for the data.

In Alam and Kumaran 2022, we provide an account for 3. couched in our ad hoc framework. To account for 2., we posit a separate focus probe responsible for focus agreement, as well as a movement operation which moves focused argument-internal material to an accessible position for the probe. We do not provide any explanation for 1., and we also fail to fully account for 2., because we do not explain the fact that focused ditransitive direct objects Agree instead of the indirect object (see Alam and Kumaran 2022:fn.11). In sum, our account in that paper is complicated and incomplete.

What I want to show here is that Constraint-driven Agree can provide a simpler and more complete account of patterns like this, without any additional mechanisms or assumptions. It is easy to identify the pressures involved in Maithili agreement: agreement with an object (i.e. across the intervening subject) is disfavored, agreement across a non-nominative argument is disfavored, agreement across a DP or PP boundary is disfavored, agreement with focused elements is favored, agreement with certain ϕ-features is favored, and agreement across certain ϕ-features is disfavored. We can understand the Maithili agreement system purely in terms of the relative strength of these pressures. I briefly show this in the remainder of this section.

Agreement is for person and honorificity. There are four degrees for honorificity for 2nd person (2R > 2H > 2M > 2L) and two degrees for 3rd person (3R > 3.non-R). In transitives with a nominative subject and no focused elements, the distribution of subject-only agreement vs. subject+object agreement is as follows:

[2] Specifically, we discuss the dialect of Maithili described in Yadava et al. 2019. The agreement system is subject to some dialectal variation.

(7) *Behavior of the Maithili probe for each subject>object combination (no focus)*
2>any; 3R>2R,2H,1; 1>3.non-R: only the subject Agrees
3R>2M,2L; 1>3R,2; 3.non-R>any: both the subject and object Agree

For explicitness' sake, I adopt following feature encoding of person and honorificity:

(8) *Feature representation of person and honorificity (Alam and Kumaran 2022)*
1st person = [ϕ, PART, SPKR]
2nd person = [ϕ, PART, ADDR]
3rd person = [ϕ]
R = [ϕ, H, R]
H = [ϕ, H]
M = [ϕ, M]
L = [ϕ, M, L]

The pattern in (7) is easy to describe in terms of pressure to Agree with certain features and pressure against Agreeing across certain features. 2nd person subjects block Agree with any (non-focused) object; R/H subjects block everything except M/L; 1st person subjects block 3.non-R and nothing else. This description can straightforwardly be translated to a probe specification – for instance, [O-ADDR=0.02, O-H=0.01, SA-M=0.01, O-SPKR=0.002, MA-ϕ=0.001].

To account for the fact that only single-argument agreement is possible when the subject is non-nominative, I posit that the probe is under pressure to Agree with a non-nominative element[3] (SA-K, where K is an underspecified non-nominative case feature), and that this pressure is what allows it to Agree across the subject, in violation of the locality constraint O-ϕ. When the subject is non-nominative, it satisfies SA-K, so it is not worth it to Agree across it. Finally, to account for the fact that focused elements always Agree, and DP-internal and PP-internal non-focused elements never Agree, I posit high-weighted O-D and O-P constraints and an even higher-weighted O-FOCUS constraint. Thus, to sum up, a complete account of this intricate agreement system is possible just by writing a single probe specification: [O-ADDR=0.02, O-H=0.01, SA-M=0.01, O-SPKR=0.002, MA-ϕ=0.001, SA-K=0.1, O-ϕ=0.1, O-D=0.4, O-P=0.4, SA-FOCUS=1].

I have not provided tableaus illustrating how this analysis plays out in specific constructions. This omission is mostly just for lack of space and time, but I would also like to point out that the number of different tableaus necessary to show off all the intricacies of the analysis would be quite large, given the complexity of the system. The relative compactness of the presentation above highlights what I perceive to be a strength of my model – it provides a framework to think about and describe highly complex agreement systems in a simple, manageable way.[4]

One broad criticism of my model might be that it is too powerful. The model places on equal footing (i.e. weighs in parallel) the constraints responsible for different kinds of intervention effects, locality effects, and feature hierarchy effects, and allows all of these constraints to contribute weight towards Agreeing or not Agreeing with a given element – one might take this as allowing too much chaos. In response to that criticism, I point to the Maithili data as evidence that intricate systems of the type predicted by the model are indeed attested.

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[3] Relevantly, nominative is morphologically unmarked.

[4] In the event that the reader has found my presentation difficult to follow – which I recognize is likely – I would like to suggest that this says more about my presentation skills than about the model itself.

4. Agreement across multiple clause boundaries in Hinuq. Another well-known type of partial blocking effect is cross-clausal agreement licensed by an $\bar{\text{A}}$ feature. For instance, in Tsez (East Caucasian), agreement across certain clause boundaries is banned unless the goal is a topic. An account in my framework is straightforward – the pressure against Agreeing across the clause boundary outweighs SA-ϕ but does not outweigh SA-TOPIC. This is different from Polinsky and Potsdam's (2001) influential analysis, which states that the embedded clause is a phase (Chomsky 2000) opaque for Agree, and that topics can Agree because they undergo obligatory covert syntactic movement to the phase edge, which renders them accessible for agreement, as in (9).

(9) *Polinsky and Potsdam 2001:* V_{main} [$_{TopP}$ <DP$_1$[TOPIC]> Top [$_{TP}$ ... DP$_1$[TOPIC] ...]]

I claim that evidence from the closely related language Hinuq favors a partial blocking analysis in my framework over the analysis in (9). In sentences with two layers of embedded clauses, it is possible for both embedding verbs to agree with a DP in the lowest clause, as in (10a). In the same configuration, it is also possible for just the lower embedding verb to agree, with the highest verb exhibiting default (class V) agreement, as in (10b). For some speakers, it is also possible for only the highest embedding verb to agree, skipping the intermediate verb, as in (10c).

(10) *Hinuq multiple embeddings: each embedding verb may or may not agree*

a. iyo -z b- eq'i -yo [Pat'imat -ez [tort b- ac' -a] b- eti -š -łi]
mother -DAT III- know -PRS [Patimat -DAT [cake(III) III- eat -INF] III- want -RES -ABST]
'The mother knows that Patimat wanted to eat the cake.' (Forker 2013:633)

b. diž r- ik -o [debez [idu -do ∅- aq'e -ƛ'os obu] ∅- ike -ƛ'os -łi]
1SG.DAT V- see -PRS [2SG.DAT [home -DIR I- come -HAB father(I)] I- see -HAB -ABST]
'I saw that you saw father coming home.' (Forker 2013:634)

c. %diž b- eti -n [debez r- eq' -a [łu -y gulu b- ik'ek' -iš -łi]]
1SG.DAT III- want -UWPST [2SG.DAT V- know -INF [who -ERG horse(III) III- steal -RES -ABST]]
'I want you to know who stole the horse.' (Forker 2013:633)

Under the analysis in (9), the fact that 'horse' is accessible for agreement with the highest verb in (10c) is evidence that 'horse' has undergone successive cyclic movement to the edge of each embedded clause. But this incorrectly predicts that 'know' should obligatorily Agree with 'horse' (analogously to (10a)), as 'horse' is accessible to the probe and is the only suitable goal. (Case-marked arguments cannot agree in this language.)[5]

I claim that there is a way of making sense of (10) from a Constraint-driven Agree perspective. I assume that these embedded clauses (call them XPs) are not strictly impenetrable phases, but just partial blockers – there is an O-X constraint which is only worth violating if the verb re-

[5] Mursell (2020:299), discussing a slightly different analysis which is for the relevant purposes identical to Polinsky and Potsdam's, acknowledges this prediction that skipping the intermediate verb should be ruled out, and in fact takes this prediction as borne out since some speakers reject (10c).

ally wants to Agree with TOPIC. I propose that the extent to which a verb wants to Agree with TOPIC – the weight of its SA-TOPIC constraint – is variable (i.e. a Noisy Harmonic Grammar (Boersma and Pater 2016)-style approach to optionality). The idea is that topicality is an extrasyntactic discourse factor, which is gradiently evaluated. Building on e.g. Adger and Smith's (2010) Minimalist analysis of sociolinguistic variation in agreement, I assume that variation in agreement sensitive to extrasyntactic factors is encoded as variability of lexical representations. Thus the weight of a given verb's SA-TOPIC constraint is higher if the TOPIC element's topicality is evaluated to be greater.[6] So my hypothesis is that in (10c), the topicality of 'horse' as evaluated with respect to 'want' is sufficiently strong that SA-TOPIC outweighs two violations of O-X for 'want'; while its topicality with respect to 'know' is sufficiently weak that SA-TOPIC does not outweigh one violation of O-X for 'know'. Under this analysis, the fact that some speakers reject (10c) reflects the oddness of this very particular interpretation.

I recognize that my reliance on this notion of 'topicality with respect to a verb', which I have provided no evidence for or precise formulation of, may seem like a weak point of my proposal. However, I really think I might be on the right track. Under the traditional analysis, cross-clausal agreement is licensed entirely by a syntactic reflex of topicality in the embedded clause, i.e. topic movement to the clause edge, whereas under my proposed analysis, it depends on the verb in the higher clause. So if there is evidence that topicality (or whatever discourse status licenses agreement) really has to be evaluated with respect to the higher clause, that might favor my analysis. One such piece of evidence is that in Algonquin (Algonquian), the controller of cross-clausal agreement on the matrix verb has a de re interpretation (Fry and Mathieu 2017) – i.e. it is interpreted in the world of the matrix clause. Another piece of evidence is that Polinsky (2015:367) reports that in the Tsez sentence in (11), the controller of cross-clausal agreement must be interpreted as (what I understand to be) a matrix topic – i.e. the statement must be interpreted as a comment on the Earth's properties: a property of Earth is that everyone knows it orbits the Sun.

(11) Nāzon b- iy -x [dunyal buq -qo šet'u b- äti -ru -łi]
all.OS III- know -PRS [earth(III) sun -POSS.ESS around III- turn -PST.PTCP -NMLZ]
'As for the Earth, everybody knows that it rotates around the Sun.' (Polinsky 2015:367)

There is one additional advantage of a weighted-contraint-based approach. We have seen that Hinuq agreement can cross two clause boundaries, as in (10a). But Forker (2013:634) reports that the following sentence, involving agreement across three clause boundaries, was rejected by some of her consultants, who offered the same sentence without the long-distance agreement as an alternative.

(12) %diž b- eq'i -yo [[[Madina -y č'ek'k'u tort b- ac' -iš -łi] iyo
1SG.DAT III- know -PRS [[[Madina -ERG all cake(III) III- eat -RES -ABST] mother
-z b- eq'i -ƛ'os -łi] debez b- eq'i -š -łi]
-DAT III- know -RES -ABST] 2SG.DAT III- know -RES -ABST]
'I know that you know that the mother knows that Madina ate all the cake.'

This is unsurprising if we assume that the pressure against agreeing across a clause boundary is gradiently represented, as in the Constraint-driven Agree model. Children are presumably not exposed to sentences like (12) often, so some learners will happen to posit constraint weightings

[6] Note that this proposal crucially hinges on the gradience of lexical representations. This cannot be made to work with traditional Agree.

which allow agreement across two but not three clause boundaries, while others will happen to posit weightings which allow agreement across a greater number of clause boundaries.

5. Partial dative blocking: partial defective intervention and partial case discrimination. In many languages, datives cannot Agree (‘case discrimination’). This is sometimes analyzed as an instance of blocked Agree (e.g. Řezáč 2008): the dative case marker heads a PP or KP layer above the DP which shields the DP from Agreeing. In my model, this could be analyzed as blocking due to an O-K constraint. But this would predict the existence of *partial* dative opacity. This prediction appears to be borne out in Chukotko-Kamchatkan languages (Bobaljik and Wurmbrand 2002).

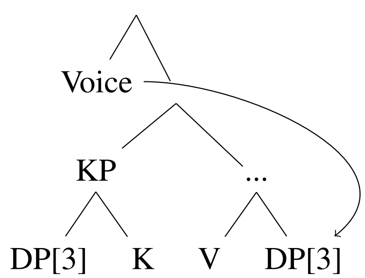
One example is ditransitive object agreement in Alutor. When the indirect object is 3rd person, object agreement is always with the direct object, which has unmarked nominative case, passing over the dative-marked indirect object (13a). This could be analyzed as an instance of dative opacity. A challenge for this analysis, however, is that if the indirect object is not 3rd person, it can in fact Agree. For example, if the indirect object is 2nd person and the direct object is 3rd person, the indirect object controls agreement instead of the direct object (13b).

(13) *Partial opacity in Alutor: 3rd person datives cannot Agree, but 2nd person datives can*

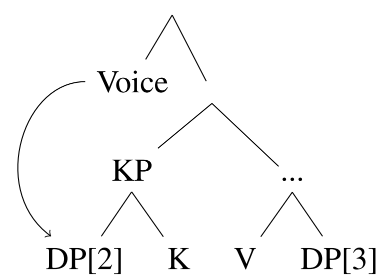
a. əlləγ -a jəl -nina -wwi ənək -əŋ şininkina -wwi ŋavakka -wwi
father -SG.INSTR give -3.OBJ -PL him -DAT his -PL.NOM daughter -PL.NOM
‘Father gave his daughters as wives to him.’ (Mel’čuk 1988:294)

b. əlləγ -a jəl -γət γənək -əŋ şininkin ŋavakək
father -SG.INSTR give -2SG.OBJ you -DAT his daughter
‘[Her] father gave his daughter as a wife to you.’ (Mel’čuk 1988:295)

(14) a. *3>3: direct object Agrees*



b. *2>3: indirect object Agrees*



In (14a), O-K is violated once, since the KP node is between the probe and the goal; while in (14b), O-K is violated twice, since the KP node and the K node are both between the probe and the goal. This means that a Constraint-driven Agree analysis of this type of pattern is easy: agreement with the dative is predicted to only be possible if it bears a feature which are sufficiently more heavily weighted by the probe’s SA constraints than the direct object’s features.

Specifically, the full pattern is that the indirect object Agrees only if it outranks the direct object on the person hierarchy 1st > 2nd > 3rd. Using the person feature set from (8), a probe specification which works is [O-K=0.1, SA-ϕ=1, SA-PART=0.2, SA-SPKR=0.2]. Agreeing with the indirect object rather than the direct object incurs an additional violation of O-K, which adds –0.1 to the harmony score. So all else equal, it is best to Agree with the direct object. However, if the indirect object outranks the object on the person hierarchy, Agreeing with the direct object will violate at least one of the SA constraints, adding at least –0.2 to the harmony score. So in this situation, Agreeing with the indirect object is optimal.

Supporting evidence for a Constraint-driven Agree analysis of this partial opacity effect comes from the related language Itelmen. Itelmen exhibits a similar pattern (agreement with datives is dispreferred; agreement with arguments ranking high on a person prominence hierarchy is preferred), but with the added factor that discourse prominence also plays a role in determining the agreement controller. For instance, if both objects are third person, it is very rare, but not impossible, for the direct object to Agree – the direct object just needs to have the right discourse status (Bobaljik and Wurmbrand 2002). This optionality can be analyzed in the exact same way as the optionality discussed in the previous section.

Another well-attested blocking effect involving datives is blocked agreement *across* a dative. (If the probe is case-discriminating, this is known as 'defective intervention', Chomsky 2000.) An O-K analysis of dative intervention would predict the possibility of *partial* dative intervention. This too seems to be borne out, in Sanzhi Dargwa (East Caucasian; Forker 2020). In monotransitives, if the subject and object are 1st and 2nd person, agreement can track either one. In ditransitives, indirect objects never control agreement. However, a 2nd person direct object can control agreement in a ditransitive with a 1st person subject (15a); but not vice versa (15b).

(15) *Sanzhi Dargwa: whether datives block agreement depends on person of the arguments*

a.

du	-l	u	Madina	-j	či-	w-	až	-aq	-ib	=da/=de
1SG	-ERG	2SG	Madina	-DAT	SPR-	M-	see.PFV	-CAUS	-PRET	=1/=2SG

'I showed you to Madina.' (Forker 2020:399)

b.

u	-l	du	Madina	-j	či-	w-	iž	-aq	-an	=de/*=da	-w
2SG	-ERG	1SG	Madina	-DAT	SPR	M-	see.IPFV	-CAUS	-PTCP	=2SG/*=1	=Q

'Will you show me to Madina?' (Forker 2020:399)

This does look like a partial defective intervention effect. For instance, it may be that this is a cumulative partial blocking effect, where O-ADDR and O-K add up to outweigh SA-SPKR in (15b). Forker's (2020) grammar does not contain enough data to verify this particular analysis, but the point is that partial dative blocking exists, as predicted by Constraint-driven Agree.

On the topic of datives and cumulative constraint interaction, I should also note that Murphy (2018) has argued on independent grounds that Icelandic (Germanic) defective intervention favors a weighted-constraint-based account. Evidence comes from data where agreement is not blocked across datives or across certain clause boundaries, but it is blocked when it crosses both a dative and a clause boundary. Weighted constraints predict this type of cumulative interaction.

6. PCC effects. Canonically, a Person Case Constraint (PCC) is a ban on particular combinations of object clitic pronouns (though PCC-like effects are also attested elsewhere). The PCC typology is known to be small – there are generally thought to only be four varieties:[7]

(16) *Strong PCC:* banned combination: any indirect object + local person direct object
Weak PCC: banned combination: 3rd person indirect object + local person direct object
Me-First PCC: banned comination: any indirect object + 1st person direct object

[7] Other possibilities are attested – for instance, some languages ban 3rd person + 3rd person combinations, and some languages have different PCC types depending on number features of the arguments. For simplicity, I omit patterns like this from the discussion, since Agree-based accounts of PCC effects have often argued that these patterns are not relevant – see e.g. Pancheva and Zubizarreta 2018, Deal 2021, and references therein for discussion.

Ultrastrong PCC: Weak PCC + Me-First PCC

There have been two main types of Agree-based account of PCC effects. One set of approaches (e.g. Béjar and Rezac 2003, Preminger 2019) stipulates that certain objects have a licensing need: they must be Agreed with, and the derivation crashes if this does not occur. The other set of approaches (e.g. Nevins 2011, Pancheva and Zubizarreta 2018, Coon and Keine 2021) stipulates some sort of mechanism that causes the derivation to crash when the relevant probe Agrees with a PCC-violating set of goals. I present a new analysis which in a sense combines both of these ideas, but does not require either stipulation. I propose that PCC effects are not just the result of failure to Agree with a particular object, nor are they just the result of successful Agree with a bad combination of objects; rather, they arise when neither Agreeing nor failing to Agree with a particular goal is possible – the probe has no good options.

In section 2, I posited a grammaticality threshold for probes, repeated in (17):

(17) *Grammaticality threshold for probes:*
If a probe has no candidates with a harmony score above –1, the derivation crashes.

I claim that this mechanism can derive PCC effects *without overpredicting* – despite the fact as shown above in this paper, the model is very powerful in terms of the set of agreement systems that it predicts.

A challenge faced by any account which seeks to unify PCC effects with agreement patterns is that the typology of PCC effects is small, but the typology of agreement patterns is large. For instance, it is generally thought that there is no You-First PCC analogous to the Me-First PCC, nor a Number Case Constraint analogous to the PCC. However, in the domain of agreement systems, these asymmetries between 2nd person and 1st person and between person and number do not seem to apply. Models which attempt to be powerful enough to capture the agreement typology overpredict in the PCC domain – they have to treat unattested PCC patterns as an accidental typological gap (see e.g. Deal 2021). On the other hand, models which correctly restrict the PCC typology end up underpredicting in the agreement domain (see e.g. Béjar's (2011) response to Nevins 2011).

This paradox can be resolved in the Constraint-driven Agree model, crucially thanks to the fact that in my model, derivational crashes necessarily emerge from a conflict between O constraints and SA/MA constraints. I propose (building on e.g. Woolford 1999) that SA and MA constraints can only target features which are person- or discouse-prominent, in the sense defined in (18).

(18) *Prominence restriction on SA and MA:*
For every SA-F and MA-F constraint, F must be either a discourse feature (e.g. TOPIC, FOCUS) or a person feature. If F is a person feature, for any person P which entails F, it must be the case that every person which outranks P on the hierarchy 1st > 2nd > 3rd entails F.

For instance, a constraint like SA-ADDR cannot exist, because 2nd person entails ADDR, while 1st person, which outranks 2nd person on the universal hierarchy, does not entail ADDR.

One can imagine how this might capture the asymmetries between the PCC domain and the agreement domain. A 2nd person blocking effect just requires an O-ADDR constraint, whereas a hypothetical You-First PCC would require the banned SA-ADDR constraint. It is important to note, though, that the model allows many types of crash-inducing probes which produce patterns other than those listed in (16). This is not necessarily a bad thing. For example, a probe with specification [O-SPKR=0.5, O-SG=0.5, MA-PART=1] would derive a 'You-Over-Me' requirement which bans a 2nd person element lower than a 1st person singular element. This pattern is actually attested in Siwi (Berber): when the subject is 1st person singular, second person direct object clitics are banned (Souag 2013:47). There are no other bans on clitics in any other configuration in the language.

Although the model allows a wide range of non-PCC crash-inducing probes, I propose an analysis of true, canonical PCC effects – that is, bans on combinations of clitic pronouns – which predicts the typology in (16). I propose that this typology results from the syntax of clitic pronouns. Following e.g. Béjar and Rezac 2003, I assume that in constructions with two clitic pronouns, there are two separate probes – one for each clitic. In ditransitives, the probe responsible for Agreeing with the direct object is not responsible for the crash, because (again, following e.g. Béjar and Rezac 2003), I assume that the indirect object is not an accessible potential goal for it. It is the other probe – the one responsible for agreeing with the indirect object – which is the source of PCC effects. This probe always Agrees with the indirect object (the highest potential goal in its search space). It cannot also Agree with the direct object (the second highest potential goal), because clitic pronouns need one dedicated probe to Agree only with them. That is, a learner who sees a clitic pronoun will posit that the probe responsible for it is banned from Agreeing with more than one goal, i.e. it has O-ϕ=1 or equivalent. Given these conditions, it is clear that PCC crashes occur exactly when the indirect object probe's failing to Agree with the direct object yields a harmony score of –1 or worse.

This analysis predicts the PCC typology in (16). We can assume without loss of generality that the probe has O-ϕ=1. PCC crashes occur when SA and MA constraints penalize the failure to Agree with the direct object to the point of ungrammaticality. Given that SA and MA constraints must respect (18), the set of possible patterns is as follows:

(19) *PCC types predicted (all specifications listed are for the indirect object probe):*
All clitic combinations allowed (e.g. Kinyarwanda): e.g. [O-ϕ=1, SA-ϕ=1]
No true double object constructions (e.g. Fijian): e.g. [O-ϕ=1, MA-ϕ=1]
Strong PCC: e.g. [O-ϕ=1, SA-ϕ=1, MA-PART=1]
Weak PCC: e.g. [O-ϕ=1, SA-ϕ=1, SA-PART=1]
Me-First PCC: e.g. [O-ϕ=1, SA-ϕ=1, SA-SPKR=1]
Ultrastrong PCC: e.g. [O-ϕ=1, SA-ϕ=1, SA-PART=1, SA-SPKR=1]

The only thing omitted from (19): ĀCC effects, involving discourse features instead of person features, are also predicted by the model. I think this prediction is unproblematic – we might expect discourse-prominent arguments to generally prefer to be realized as strong pronouns rather than clitics. (The ability of the model to account for Ā-targeting crashes outside of the domain of clitic combinations is also useful, since some such patterns are attested, e.g. Coon et al. 2021.) Otherwise, there is no way to produce any other patterns outside of (19).

An illustration of the analysis of the Strong PCC is provided in (20). A 3rd person direct object is licit because there is no constraint which penalizes failure to Agree with it (20a). A local person direct object is illicit because SA-PART fatally penalizes failure to Agree with it (20b). (An ✗ indicates a candidate below the grammaticality threshold.)

(20) *Strong PCC*

a.

probe ... DP_1 ... DP_2[3rd]	SA-ϕ w = 1	O-ϕ w = 1	MA-PART w = 1	H
✗ Agree with DP_1 and DP_2	0	-1	0	-1
☞ Agree with DP_1 only	0	0	0	0

b.

probe ... DP_1 ... DP_2[local]	SA-ϕ w = 0	O-ϕ w = 1	MA-PART w = 1	H
✗ Agree with DP_1 and DP_2	0	-1	0	-1
✗ Agree with DP_1 only	0	0	-1	-1

7. Conclusion. This paper has built on recent work (e.g. Deal 2015, Keine 2020) arguing that the lexical specification of a probe has two components: (i) specification for constraints favoring Agree with prominent features on a person or discourse hierarchy and (ii) specification for constraints disfavoring Agree across particular features. My main contribution has been the proposal that these are weighted, violable constraints. The primary motivation for this came from *partial blocking* patterns as in (3) (repeated here as (21)).

(21) *Schematic partial blocking paradigm: α blocks Agree with F but not G*

a. *The feature F can license Agree with X:* X ... Y[F]

b. *The feature G can license Agree with X:* X ... Y[G]

c. *Agree licensed by F is blocked by α:* X ... α ... Y[F]

d. *Agree licensed by G is not blocked by α:* X ... α ... Y[G]

The Constraint-driven Agree model predicts that patterns like the one in (21) should emerge when the probe specification of X weighs the constraint disfavoring Agree across α above the constraint(s) favoring Agree with F but below the constraint(s) favoring Agree with G. I have argued that this prediction is borne out for a variety of values of F, G, and α in a variety of languages. The case study of Maithili in Section 3 suggested that partial blocking effects attested in multiargument agreement systems which have previously been analyzed within in a dynamic interaction (Deal 2021, Alam and Kumaran 2022) framework are better suited to a Constraint-driven Agree analysis. In Section 4, I argued that cross-clausal long-distance agreement, which has standardly been analyzed as fed by covert movement of the agreement controller to the edge of the embedded-clause phase (e.g. Polinsky and Potsdam 2001), can instead be analyzed as a partial blocking pattern within a Constraint-driven Agree model, drawing primarily on data from Hinuq. In Section 5, I showed that two well-attested blocking patterns involving datives – inaccessibility of datives for agreement and defective intervention – can surface as *partial* blocking patterns in some languages (in particular Alutor, Itelmen, and Sanzhi Dargwa), as predicted by the Constraint-driven Agree model. This is consistent with past work (Murphy 2018) arguing on independent grounds that dative intervention patterns in Icelandic result from weighted constraint competition. Finally, I proposed in Section 6 that the model can also account for Person Case Constraint effects, by deriving derivational crashes from a grammaticality threshold for harmony scores.

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