An Agree-based Analysis of Nominal Agreement: Evidence from Hindi-Urdu

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ABSTRACT

There are two different ways of understanding DP-internal agreement: Either as a result of an independent feature sharing mechanism, or as a consequence of the same Agree-based mechanism that explains verbal agreement. This paper makes an empirical argument in favour of an Agree-based account of nominal agreement: the operation Agree explains the diverse empirical facts found in nominal agreement, and it is sensitive to the structure of the various modificational relations that exist within the DP. The empirical domain is provided by Hindi-Urdu where adjectives and possession indicating morphemes agree with the head noun of the DP. By exploring these agreement relations in detail, this paper presents a case for analysing nominal agreement as arising out of Agree - the same operation that is understood to underlie verbal agreement.

1 Introduction

Within the generative tradition, there is a prevalent tendency to separate agreement on verbs from agreement on other functional heads (Baker, 2008). The former has received considerable attention with multiple models of agreement mechanisms being constantly developed and refined, while the latter has often been relegated to the peripheries with the label 'Concord' attached to it.

This paper contests the view that nominal agreement, *i.e.* agreement on functional heads inside the DP, is executed by a separate operation. The stance adopted here is that agreement on adjectives, determiners and other functional heads in the DP should be explained using the operation Agree. Empirical support for this claim comes from Hindi-Urdu, an agreement rich Indo-Aryan language. The chief rationale for this proposal stems from the failure of existing feature percolation accounts of Concord to explain some of the agreement patterns found inside the DP.

Using empirical evidence from Hindi-Urdu, an agreement rich Indo-Aryan language, it demonstrates that agreement on adjectives, determiners and other functional heads in the DP can be executed by the operation Agree. Additionally, the paper also presents that existing accounts of Concord fall short in explaining for these facts.

The paper is organized as follows: Section 2 introduces nominal agreement in Hindi-Urdu, and lays out the patterns of agreement that will crucially inform this analysis. Section 3 explains how existing accounts of agreement deal with such cases of nominal agreement. Section 4 takes up the current proposal and demonstrates how the existing account fails whereas the Agree-based account explains all the facts laid out. Section 5 provides a summary and concludes the argument.

2 Agreement in the Nominal Domain

It is a well known fact that there are several elements in the nominal domain, or the DP, that display the features of the head noun in the DP. This instance of agreement, often referred to as Concord, is not one of full phi feature agreement; there is only number and gender agreement. Person agreement is not a characteristic of this relation. This paper will specifically focus on gender agreement inside the DP. Hindi-Urdu has grammatical gender; all nouns, regardless of their animacy status, are assigned an inherent gender value that is either [MASC] or [FEM][1]. This value is then derivationally seen on certain functional heads. The agreeing elements in the DP includes determiners, adjectives, possession markers, among others. The following examples are from Hindi-Urdu, where adjectives (1), possessive determiners (2) and possession markers (3)[2] agree with the gender value of the noun they modify.

(1) a. nay-aa ghar
new-MSg house.MSg
'new house'

b. nay-ii ghaDi
new-FSg watch.FSg
'new watch'

(2) a. mer-aa ghar
my-MSg house.MSg
'my house'

b. mer-ii ghaDi
my-FSg watch.FSg
'my watch'

(3) a. kaanc k-aa ghar
glass **PSP-MSg house.MSg**
'glass house'

b. kaanc k-ii ghaDi
glass PSP-FSg watch.FSg
'glass watch'

The patterns recorded in (1), (2) and (3) constitute nominal agreement, and will be the prime focus of this paper. To elaborate, this paper will look into the mechanisms by which such agreement patterns are generated, and propose that these patterns do fall under the orbit of the operation Agree.

[1]For ease of exposition, all instances of [MASC] agreement are shown in bold typeface and all instances of [FEM] agreement are shown with underlined text

[2]Some possession relations in Hindi-Urdu are indicated by post-positions. This is glossed as PSP in all the forthcoming examples.

3 Conventional Approaches to Nominal Agreement

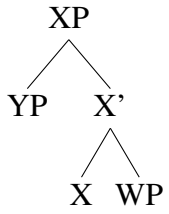
Arguments against Agree in the DP come from two major sources: Giusti's (2008) account of adjectival agreement in Bantu and Romance languages, and Norris's (2017a, b) account of nominal agreement in Estonian. In this section, we shall discusses both of those.

3.1 Giusti (2008)

Giusti (2008) develops an analysis for nominal agreement which is fundamentally based on the assumption that agreement on verbs is executed by a mechanism different from agreement on adjectives. At the outset, Giusti clarifies that the former involves a specific probing operation, matching under Agree and ultimately movement of the matched features. Adjectival agreement, or Concord, according to this account arises when a modifier with uninterpretable phi features is merged into the structure.

In this account, it is also argued that feature sharing between the head and its modifiers is done as a result of the feature of the head percolating to the modifiers, which are merged as specifiers of the head. This is illustrated below in (4), where X is a head and YP its modifier. The features of X are expected to percolate to YP by virtue of the Spec-Head configuration that they are in. There is no probing on the part of the modifier.

(4)

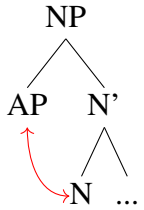


Using examples such as (5) from Italian, Giusti posits that features are transferred from a head to its specifiers. In (5), the determiner 'the', and the adjectives 'Italian' and 'beautiful' agree with the [FEM.PL] features of 'friends'.

(5) le belle amiche italiane di Maria
the.fem.pl beautiful.fem.pl friends.fem.pl Italian.fem.pl of Mary
'Mary's beautiful Italian friends' Italian(Giusti, 2008)

Giusti explains these agreement patterns as a result of feature sharing under a spec-head configuration, when the AP is merged as the specifier of NP, as shown below in (6)

(6)



Thus, according to this account, the structural proximity between the modifier and the head is not considered as a factor of the resulting nominal agreement. Features are expected to be shared between them simply by virtue of the modifier being located in the specifier position of the head in question.

However, with novel empirical data from Hindi-Urdu, it becomes apparent that such an account of feature sharing fails to generate several patterns of agreement found in natural language, thus forcing us to reject it in favour of a more nuanced approach.

3.2 Norris (2017)

Norris (2017a,b) also supports the idea that nominal agreement should be treated distinctly from verbal agreement. In his account of nominal agreement in Estonian, Norris presents some conceptual arguments against equating adjectival and verbal agreement. The main objection for treating the two as the same stems from the fact that while verbal agreement is expressed only once in a sentence (on the verb), adjectival agreement can occur multiple times in the same DP. Secondly, agreement within the DP occurs across a variety of categories - adjectives, adverbs, determiners etc. - and this diversity cannot be accounted for by Agree. Thirdly, verbal agreement has an established connection with structural case; nominal agreement does not have any such correlation, and therefore the two must be treated differently.

It is here that I depart from Norris's account; while these differences between nominal and verbal agreement are impossible to ignore and must be used to keep the two distinct, they do not imply that the underlying mechanism between the two be entirely different. It is certainly plausible for agreement on verbs be executed by the same underlying operation, and yet for the two to manifest differently in the derivation. Thus, I adopt the stance that the operation Agree can derive patterns of nominal and verbal agreement without obviating the aforementioned conceptual distinctions between the two.

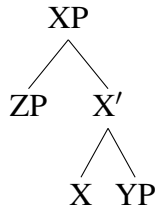
Further, this paper goes on to demonstrate that certain patterns can only be derived by an Agree-based account. This presents a strong albeit purely empirical argument in favor of understanding nominal agreement as a result of the same mechanism that has served explanations of verbal agreement so well.

4 The Current Proposal

In this work, I propose that instances of agreement such as the cases in (1), (2) and (3), which are traditionally explained as instances of Concord, should be in fact reanalysed as falling out from the operation Agree. Such an approach is not unprecedented; Toosarvandani & Van Urk (2014) have demosntrated for Zazaki, an Iranian language that an Agree-based account is the ideal one for explaining all the agreement patterns obtained in the language. Similarly, Carstens (2001) also presents the merits of an Agree based approach to analyse agreement on adjectives and possessors, using empirical support from Bantu languages.

The model of Agree adopted in this paper is referred to as Bidirectional Agree (Baker, 2008). According to this model, A probe bearing unvalued case or phi features can either C-Command or be C-Commanded by a goal that bears the matching valued features. Essentially, the relative hierarchical location of the probe and the goal does not matter as long as one of them C-Commands the other; Agree can happen in a configuration where either the probe is located higher than the goal, or the goal is located higher than the probe. This is illustrated below in (7), where the probe in X can potentially agree with two goals: one that it C-Commands (YP) and one that it is C-Commanded by (ZP). Between these two options, factors such as locality (closest out of the two) will play a role in determining ultimately which one of the two the probe agrees with.

(7)



In the following subsections, I show that this model of Agree can successfully derive all the patterns outlined above in Hindi-Urdu. This will be demonstrated by considering four domains of agreement within the DP, namely (i) Simplex adjectives (ii) Complex adjectives (iii) Possession indicators (iv) Participial modifiers inside the DP. Each of these domains will be explored individually in the following subsections.

4.1 Simplex Adjectives

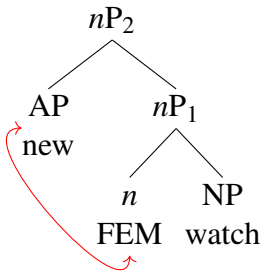
The first domain of agreement to be considered is the one where there is one adjective modifying a noun, such as the examples in (1) repeated here as (8). In (8a), the adjective 'new' agrees with the [MASC] feature of 'house' and in (8b) it agrees with the [FEM] feature of 'watch'.

(8) a. nay-aa ghar
new-MSg house.MSg
'new house'

b. nay-ii ghaDi
new-FSg watch.FSg
'new watch'

A structural representation of (8b) is given in (9), where the adjective 'new' is hosted as an adjunct specifier of the *n*P that houses the gender feature of the noun.

(9)



The feature percolation account propounded by Norris and Giusti would account for such cases by positing that the [FEM] feature of the noun percolates upwards to the adjective, as features are capable of percolating from head to specifier. An Agree account, on the other hand, would derive this agreement as a result of a probing exercise by the adjective. The adjective containing a probe for phi features extends a search for valuation. The closest item with matching valued features is the NP with its phi features placed at *n*. Agreement on the adjective can then be traced back to the probe-goal relation between the two.

Essentially, what we see is that in the case of simplex adjectives such as (8) above, both accounts are equally adequate at explaining the facts. In fact, a cursory evaluation of the two, the feature percolation account could appear as the more simple and natural one, and therefore the more appealing option of the two. Consequently, the feature percolation account gained widespread acceptance within the theory.

While this is perfectly logical, I go on to show that when we increase the complexity of the DP internal modifiers, the feature percolation account fails to hold up. In the following subsections, this shall be demonstrated by incrementally increasing the complexity of the DP. The first step would be to add another layer of modification. Then comes the domain of possession markers and then finally both the theories will be put to test with the introduction of a participle verb into the DP.

4.2 Complex Adjectives

This section is about what happens when we add another layer of modification in the DP, creating a complex adjective. What we now have are two modifers in the same DP, as illustrated in (10) below. The presence of two modifiers could lead to two distinct interpretations of the DP: one where both the modifiers iteratively modify the head noun (10a) , and another where the lower (and linearly second) modifier describes the head noun and the higher (and linearly first) modifier qualifies the lower modifier (10b).

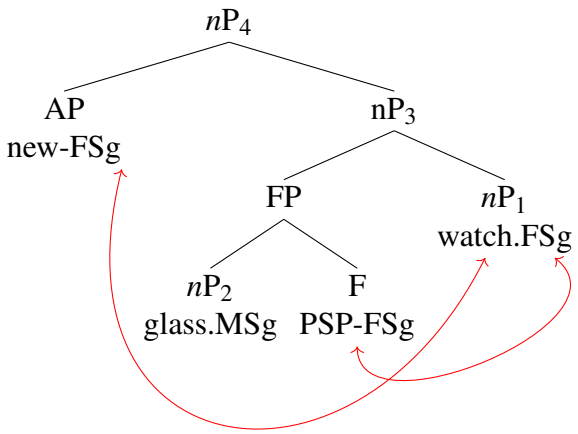
(10) a. nay-ii kaanc k-ii ghaDi
new-FSg glass.M PSP-FSg watch.FSg
'new watch which is made of glass'

b. nay-e kaanc k-ii ghaDi
new-M.OBL glass.M PSP-FSg watch.FSg
'watch which is made of new glass'

The two interpretations listed above have correlates in agreement patterns too. In (10a), where the head noun 'watch' is iteratively modified by both 'new' and 'of glass', both of these functional heads agree with the [FEM] value of 'watch'. Similarly, in (10b) where 'of glass' modifies 'watch' and 'new' modifies 'glass', the PSP morpheme in 'of glass' agrees with the [FEM] value of 'watch' and 'new' agrees with the [MASC] value of 'glass'.

Thus, the structural representation of the two are distinct. (10a) is represented as (11) below, where AP as well as PSP agree with the head noun 'watch'.

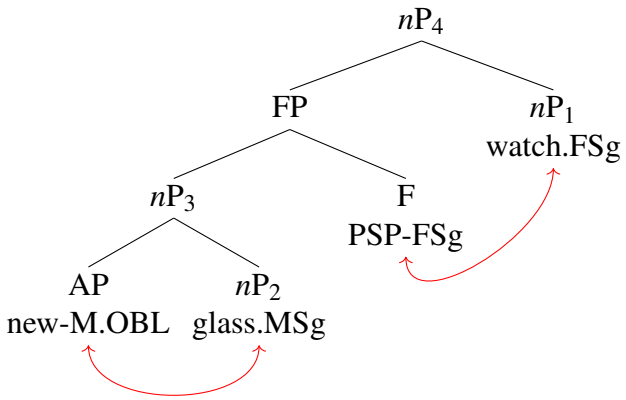
(11)



Once again, both, the feature percolation account as well as the Agree-based account can explain this pattern. According to the former, the gender values of the noun 'watch' will be percolated to its specifiers, AP and FP. This results in the obtained agreement patterns. According to the latter, the probes in F and AP find nP$_1$ as their closest goal, and therefore agree with it.

However, the picture is slightly different in the case of the alternative arrangement (10b), where two different agreement patterns exist in the same DP. (10b) is structurally represented as (12), where the adjective 'new' modifies and agrees with 'glass' and only PSP on 'glass' agrees with the head noun 'watch'.

(12)



The feature percolation account falters here, as it does not predict this pattern at all. According to standard percolation methods, features of a noun simply percolate to its specifier. The specifier here is FP. Thus, the percolation account expects all the elements internal to FP to agree with the head noun 'watch'. However, that is not what happens. There is an independent agreement relation taking place between two internal constituents of FP (AP and $n\text{P}_2$), which is beyond the ambit of the feature percolation account. An Agree-based account, on the other hand, can successfully account for both the agreement patterns obtained here. As expected by the Agree-based account, each probe would agree with the closest goal that it either C-Commands, or is C-Commanded by. With that in mind, we see that the closest goal to the probe in AP is $n\text{P}_2$ 'glass' and the closest goal to the probe in F is $n\text{P}_1$ 'watch', and thus, we get the appropriate agreement patterns. A feature percolation account is unable to capture such nuances, as we shall further demonstrate by introducing possessors into the equation.

4.3 Introducing Possessors

We shall now consider how the two accounts fare with the addition of another element in the DP: possessors. In Hindi-Urdu, possessive determiners agree with the phi features of the possessum, as illustrated in (2) above. Consider the examples below, where the possessor is 'my' and the possessum is 'watch'. In (13a), all the modifiers iteratively modify the head noun 'watch' and also exhibit agreement with its [FEM] value. In (13b), the possessive determiner and PSP modify 'watch' and agree with it, whereas 'new' qualifies 'glass' and agrees with it. The final pattern (13c) is an ungrammatical one, where the possessive determiner agrees with 'glass' while the other modifiers agree with 'watch'.

(13) a. mer-ii nay-ii kaanc k-ii ghaDi
my-FSg new-FSg glass.MSg PSP-FSg watch.FSg
'my new glass watch' (my watch which is new and made of glass)

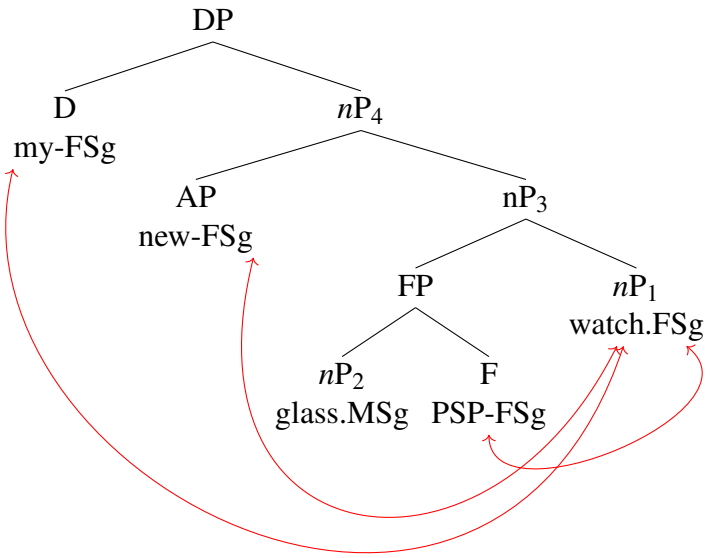
b. mer-ii nay-e kaanc k-ii ghaDi
my-FSg **new-M.OBL** **glass.MSg** PSP-FSg watch.FSg
'my watch made of new glass'

c. *mer-e nay-ii kaanc k-ii ghaDi
my-M.OBL new-FSg **glass.MSg** PSP-FSg watch.FSg
'(Intended: new watch made of my glass)'

A cursory look at these facts suggests that there is nuance in this agreement system which cannot be captured efficiently by a simple percolation account. The presence of such variation suggests that structural factors must be at play, and we shall probe further into each of them.

The iterative agreement pattern in (13a) is represented as (14) below, where the possessive determiner, adjective and PSP, all agree with the [FEM] value of the head noun 'watch.'

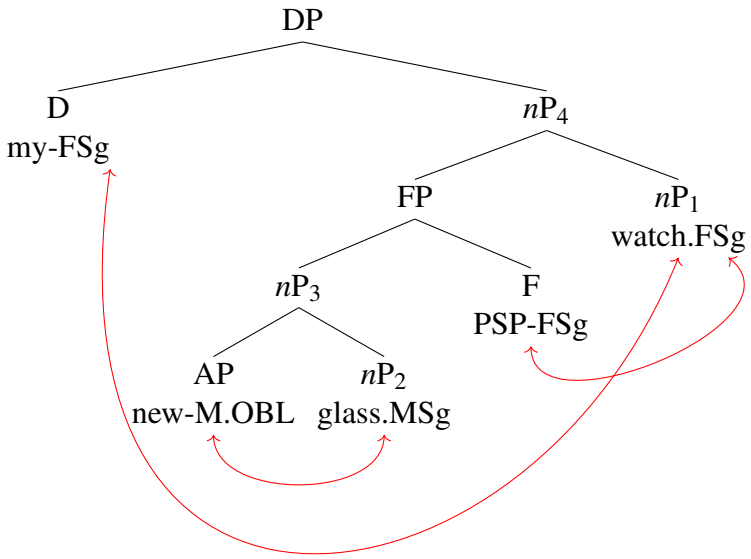
(14)



This pattern can be explained equally well by both, the feature percolation and the Agree-based accounts. According to the former, the features of the noun percolate to all of its modifiers, including the possessive determiner. The Agree-based account posits that there are probes in all the functional heads, and that agreement happens with the closest C-Commanding *n*P, which is 'watch' when the structure is built bottom up. This particular pattern is not helpful in evaluating between the two accounts.

However, the choice between the two becomes immediately clear when we consider the agreement patterns in (13b). This is structurally represented as (15): there are two distinct agreement relations at play. 'new' qualifies glass, whereas 'my' and PSP modify 'watch', and this correlates with the agreement patterns obtained.

(15)



A feature percolation account would expect the features of the head noun to percolate to all the modifiers inside the DP - the determiner, adjective as well as PSP. However, as outlined in (12), there is an independent agreement relation between AP and nP$_2$, which is distinct from agreement with the head noun. Thus, (15) is another instance where the feature percolation account is inadequate while explaining agreement patterns inside the DP.

The Agree account then emerges as the more suitable alternative: According to this approach, the probe in AP locates nP$_2$ in its closest search domain. For the other probes, namely D and PSP, the closest available nP is 'watch', and they agree with its [FEM] value. These two agreement patterns have the ancillary benefit of capturing the modificational relations in the DP too; 'new' modifies and agrees with 'glass', and 'my' and PSP modify and agree with 'watch'.

(13c), which is an ungrammatical sentence, can also be explained by an Agree-based account. Under the given structural configuration, the probe in D will never find 'glass' as its closest goal. Thus, [MASC] agreement on D will never be obtained, as predicted correctly by the Agree based account. This is another instance that a feature percolation account would not be able to foresee and preempt.

Essentially, adopting an Agree-based account makes it possible to formally capture the relation between modificational and agreement patterns, and this is done using the fundamental principle of Closest C-Command. We do not have to invoke additional conditions or constraints unique to DP internal constituents to explain these facts. In the next subsection, I present the case of yet another agreement relation inside the DP, and compare the two accounts in those terms.

4.4 Participial Modifiers

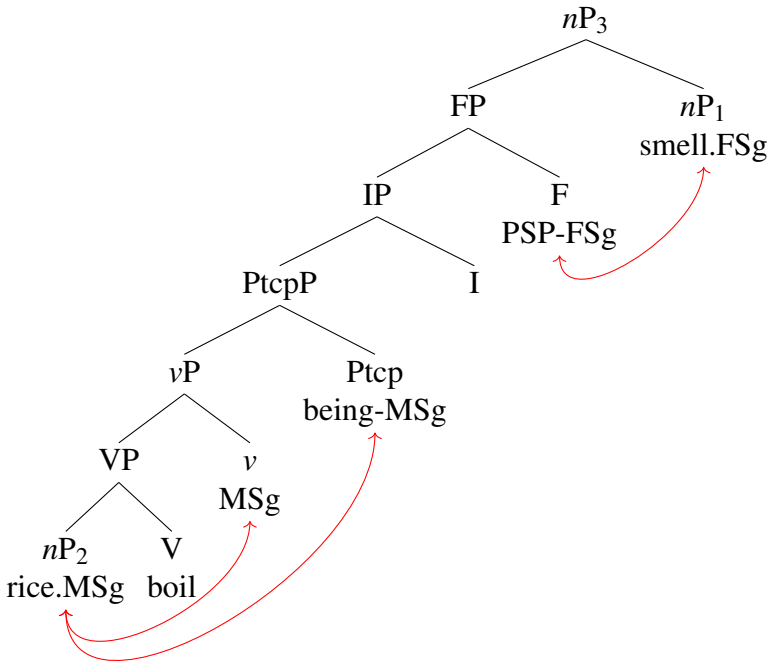
We have already seen in Sections 4.1, 4.2 and 4.3 that the feature percolation account fails to explain the existence of more than one agreement pattern in a DP. An Agree-based account that takes into consideration structural relations correctly predicts these facts. In continuation with that, another piece of evidence in support of an Agree-based account comes from DPs containing a non-finite participle, such as (16a) and (16b) below. In (16a), there are two agreement relations inside the DP. The participial form of the verb 'boil' and the non finite AUX 'being' agree with 'rice' whereas PSP agrees with 'smell'. (16b), where all the agreeing heads exhibit [FEM] agreement, is ungrammatical.

(16) a. ubalt-e hu-e caawal k-ii khushboo
boil.PTCP-M.OBL being-M.OBL rice.MSg PSP-FSg smell.FSg
'the smell of rice being boiled'

b. *ubalt-ii hu-ii caawal k-ii khushboo
boil.PTCP-FSg being-FSg **rice.MSg** PSP-FSg smell.FSg
(Intended: the smell of rice being boiled)

The structural representation of (16a) is given below in (17), where the probe in PSP agrees with the head noun 'smell', whereas the probes in *v* and Ptcp agree with 'rice'.

(17)



An Agree-based account can efficiently explain these patterns; in a bottom up approach to structure building, the closest goals for the probes in Ptcp and *v* is nP_2 inside the IP. The closest goal for the probe in F is nP_1. These agreement patterns are also reflective

of the modificational relations inside nP_3: the elements inside the IP modify the object of the verb 'rice', and FP is a modifier of the head noun of the *n*P 'smell'. Once again, we see that the Agree-based account equips us to find structural correlates for the different modificational relations in a domain. Essentially, the Agree-based account thus manages to offer a uniform explanation for different agreement relations because it is sensitive to the underlying structural relations, a lacuna in the percolation approach.

There is some cross-linguistic evidence coming from the same domain of participial agreement. Polinsky (2016) presents DPs such as (18) from Archi. Nouns in Archi are specified with a noun class marker, which is then reflected in verbal agreement. (18) contains two agreement patterns within it: there are two probes in the participial form of the verb 'bake'; one of them agrees with the object of 'bake' (bread = (noun class III)) and the other agrees with the head noun 'smell' (smell = noun class IV).

(18) Archi

x:alli b-aˆcar-t:u-t di
bread.III.SG.ABS III.SG-bake-IPFV-ATTR-IV.SG smell.IV.SG.ABS

'the smell of bread being baked'

In this instance, agreement between the object 'bread' and the participle 'bake' is analysed as an anomaly, because it is not expected under the feature percolation approach. However, when we turn to the Agree-based account, we have a way to explain these patterns sufficiently: the probe in 'bake' finds 'bread' in its C-command domain and agrees with it. The other instance of agreement in (18), between the same verb and 'smell', can be explained as 'smell' being in the C-command domain of the entire verbal complex.

This goes on to show yet another instance where the Agree-based acccount can capture the agreement patterns effectively with the help of a single underlying mechanism: Probe-Goal relations under closest C-command.

5 Conclusion

To summarise, we see multiple instances of agreement patterns inside the DP where the feature percolation account fails to hold up because it cannot explain complex agreement patterns. The Agree-based account prevails because it is sensitive to underlying structural relations and can provide sufficient motivation for each instance of agreement relation between two items. This point became evident as we considered cases of complex adjective agreement, possessor agreement and participial agreement inside the DP. An Agree-based account rooted in structural relations such as C-Command was able to provide explanations for all the agreement patterns outlined above.

Having an Agree-based account for DP internal agreement is also beneficial to a general theory of agreement, as it lets us explain nominal and verbal agreement using the same mechanism, without having to invoke special constraints for the former, thus reducing the overall theoretical machinery needed to explain agreement in natural language.

Acknowledgements

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