Agree[1]

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1. Introduction

Agreement has come to occupy a central role in contemporary syntactic theory. In the early days of Generative Grammar (GG), agreement was barely taken into account, possibly because early GG was developed on the basis of English, a morphologically rather poor language.

In what follows, we will track a short history of agreement, starting from the transformational era up until Agree (Chomsky 2000, 2001). This overview aims to show the different implementation of the basic intuitions regarding agreement over the years, and how Agree has developed to take the shape that we know today. It will emerge that different ideas that were considered prominent in different periods have converged into the present model, but also that some concepts have never changed.

This overview will stop at the moment in which the "modern" formulation of Agree is drafted, when this operation becomes the engine of syntactic computation. After this shift, roughly corresponding to Chomsky (2001), generative syntax has witnessed an explosion of works on agreement. Specifically, the discussions regarding the locus of agreement Ackema and Neeleman (2003), Bobaljik (2008), D'Alessandro and Roberts (2008) Benmamoun *et al*. (2009), (Arregi and Nevins, 2012); its direction (Boeckx and Niinuma (2004), Holmberg and Hróarsdóttir (2003), Bošković (2007) and more recently Zeijlstra (2012), Preminger (2013) Wurmbrand (2012, 2014), Bjorkman and Zeijlstra (2019); Polinsky and Preminger (2019), and the timing of agreement with respect to other syntactic operations (Boeckx and Niinuma 2004, Holmberg and Hróarsdóttir 2003) have become a matter of intense debate. I will address only some of these issues in Section 5.

2. Agreement as a rule. Transformational grammar

Agree is a syntactic operation taking place between a probe P and a goal G between which a Matching relation holds. Chomsky's (2000:122) definition is as follows:

(1) "Matching is a relation that holds of a probe P and a goal G. Not every matching pair induces Agree. To do so, G must (at least) be in the *domain* D(P) of P and satisfy locality conditions. The simplest assumptions for the probe-goal system are:

(I) matching is feature identity
(II) D(P) is the sister of P
(III) locality reduces to 'closest c-command'"

This is a brief outline of the developments that have led to the formulation in (1). In this chapter I will only discuss argumental agreement, leaving aside adjectival agreement, or concord (Baker 2008).

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2.1. Agreement as a rule

One of the key concepts at the basis of every theory of agreement is that agreement is some sort of relation between two or more elements.

In *Syntactic Structures*, Chomsky (1957) conceives agreement as a rewrite rule, rewriting for instance the morpheme representing verbal inflection as *–s* in the context $NP_{sing,}$ and as *Ø* elsewhere. The inflectional morpheme is inserted directly into the verbal complex depending on the subject specification. No copy is involved, but simply a transformation of one category into another (an affix into its morphological specification) (see Harbour *et al.* 2008 for an extensive discussion).

In Chomsky (1957), auxiliaries are already treated separately from main verbs, since they are targeted by different transformational rules. This observation, which for the moment seems irrelevant, will later come to play a crucial role in the theory of agreement, when Infl/AGR heads begin to be discussed. Auxiliaries are treated as in (2):

(2) "We can state the occurrence of auxiliaries in declarative sentences by adding to the grammar the following rules:
(i) *Verb* → *Aux + V*
(ii) *V* → *hit, take, walk, read,* etc.
(iii) *Aux* → *C (M) (have+en) (be+ing) (be+en)*
(iv) *M* → *will, can, may, shall, must* "

(Chomsky 1957:39)

Around the same time, in his 1966 article, Paul Postal proposes an analysis of pronouns as underlying determiners. To describe pronouns/determiners he makes use of features, and to determine which pronoun will be selected in a sentence he proposes an ARTICLE ATTACHMENT rule, which basically consists in the copying of a subset of the features of the noun. Due to space limitations it is not possible to reproduce the whole argument here; however, it should be noted that Postal (1966) proposes a sort of predecessor of anaphoric and pronominal binding via Agree (an idea that has returned, for instance, in Rooryck and Van Wyngaerd 2011); that he considers agreement as a rule that operates on features rather than morphemes; and that he conceives of pronouns as a subset of the features of nouns, very much like articles (an intuition very similar to that exploited by Roberts 2010 for subject clitics). While Postal does not consider argumental agreement, his idea of working with copies of features will be one of the key ideas regarding agreement in the Minimalist Program (MP, Chomsky 1995).

Chomsky (1965) also moves almost entirely to a feature-based agreement system; he dedicates some time to discussing agreement rules, which he considers as expansion rules. According to Chomsky (1965:187), "rules of agreement clearly belong to the transformational component (cf. in this connection, Postal, 1964a pp. 43f.), and these rules add to Phrase-markers specified features that enter into particular formatives, dominating their phonological matrices." An example of an agreement rule is formulated as follows:

(3) "Article → $\begin{bmatrix} \alpha\ \text{Gender} \\ \beta\ \text{Number} \\ \gamma\ \text{Case} \end{bmatrix}$ / __ … $\begin{bmatrix} +\ \text{N} \\ \alpha\ \text{Gender} \\ \beta\ \text{Number} \\ \gamma\ \text{Case} \end{bmatrix}$

where Article … N is an NP" (Chomsky 1965:187)

Chomsky also states that "This formative, so categorized, would be converted to [the phonological string] by rules of the phonology" (Chomsky 1965:188). The phonological realization of a FORMATIVE, i.e. a set of morphemes, takes place after the agreement rule applies, which of course reminds us of post-syntactic morphological insertion (Halle & Marantz 1993).

The important aspect for contemporary theories of agreement is that Chomsky, like Postal, starts conceptualizing agreement as a rule that copies unordered features in a matrix. Furthermore, Chomsky (1965: 188) states that "Formally, rules of agreement […] are quite analogous to the rules of assimilation of the phonological component.". This interesting idea will be developed further by Nevins (2010), who analyzes agreement as some sort of feature spreading in contexts of vowel harmony.

One more observation by Chomsky in *Aspects* will be almost completely neglected during the *Government and Binding* (GB) period, but will reappear with the advent of the *Minimalist Program* (MP) occupying a key position in the theory of agreement. Chomsky (1965: 192) observes the difference that exists between the English example in (4) and its translation into French (5) as far as copula deletion is concerned:

(4) These men are more clever than Mary
(5) Ces hommes sont plus intelligents que Marie Chomsky (1965: 193)

Assuming that deletion takes place under identity, Chomsky notices that the copula as well as the adjective in the elided site in (5) do not share the same inflection as in those of the matrix sentence. In order to justify ellipsis he speculates that "In particular, it seems from such examples as these that the features added to a formative by agreement transformations are not part of the formative in the same sense as those which are inherent to it or as those which it assumes as it enters a Phrase-marker." (Chomsky 1965:193)

In other words, he argues that those features that are added via agreement have a different status than those that come with the phrase marker. Many years have passed, and the way we would express this concept is by saying that the features that enter the derivation with a value are INTERPRETABLE; those that enter a derivation without a value (and therefore need to be evaluated via Agree, in syntax) are UNINTERPRETABLE. His conclusion is that "[...] a formative, in other words, is to be regarded as a pair of sets of features, one member of the pair consisting of features that are inherent to the lexical entry or the position of lexical insertion, the second member of the pair consisting of features added by transformation. Only the first set is considered in determining legitimacy of deletion in the manner previously described. Second, what is involved in determining legitimacy of deletion is not identity but rather nondistinctness in the sense of distinctive feature theory." (Chomsky, 1965: 194). We will return to this later on, in section 4.1.5.

3. Agreement as a relation. The GB era

The *Lectures on Government and Binding* (Chomsky 1981) introduces a shift in the paradigm and in the way of conceptualizing dependencies, which come to be seen more as structural relations than as operations. Within the GB framework many key generalizations are formalized, radically changing agreement with respect to the simple COPY+ADJOIN operation that was at work in Phrase Structure Rules (PSR, Chomsky 1957).

Starting from subject-verb agreement, one of the most important factors is the introduction of the idea that Nominative case is assigned to the external argument/subject by the INFL head. The INFL head, which already existed in PSR under the name Aux, has a much more refined definition in GB. In Chomsky (1981) we find the following rewrite rule:

(6) S → NP INFL VP

where INFL can have the values [± Tense]. Chomsky goes on specifying that if INFL is finite:

(7) "it will furthermore have the features person, gender and number; call this complex AGR ("agreement"). The element AGR is basically nominal in character; we might consider it to be identical with PRO and thus to have the features [+N, -V]. If so, then we may revise the theory of government, taking AGR to be the governing element which assigns Case in INFL. Since [+N, -V] is not generally a Case-assigner, we must extend the theory of Case so that [+N, -V, + INFL] is a Case-assigner along with [-N], regarding [INFL] as basically "verbal", if we take AGR to be nominal. INFL governs the subject if it contains AGR, then assigning nominative Case by virtue of the feature [+INFL]. It now follows that the only governors are categories of the form X^0 in the X-bar system (where X = [±N, ±V]). Subjects are nominative when they agree with the matrix verb – technically, with its inflection." (Chomsky 1981: 52)

The quote in (7) contains the "leap forward" for the theory of subject-verb agreement. The key ingredients needed to understand it are Case, Government, and AGR. As we stated above, syntactic Case in Chomsky (1981) is a structural notion: Nominative case is for instance associated to a specific position in the syntactic structure (Spec,INFL). The subject needs to occupy that position to receive Case (we will return to the Spec-head relation later on). Case and agreement are, in this system, strictly interdependent.

3.1. Agreement in a Spec-Head configuration

We saw in the previous section that Government is a key notion in GB. In particular, the part of government that is now almost completely disregarded in the MP but was crucial for many relations during GB was the Spec-head relation, under which agreement was believed to take place. The origin of this concept lies in Kayne's (1989 [2000]) work on participial agreement in French and Italian. Kayne considers the following agreement alternation:

(8) a. Paul a repeint l-es chais-es
Paul has painted.MSG the-F.PL chairs-F.PL
'Paul has repainted the chairs'

b. *Paul a repeintes les chaises

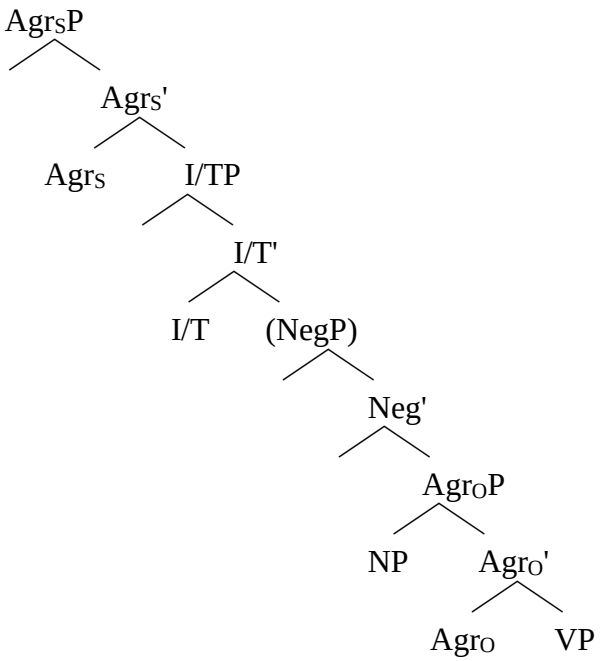
(9) Paul l-es a repeint-es
Paul them.F.PL has painted-F.PL
'Paul repainted them' (Kayne 2000: 25)

The agreement alternation we see in (8)-(9) is quite straightforward: whenever the DP object is postverbal, it does not agree with the past participle. In fact, this agreement is ungrammatical, as shown in (8). If the object has moved and appears somewhere before the participle, it does agree with it. Kayne concludes that there is a correlation between movement and agreement. Specifically, he proposes that agreement here stems from the movement of the object into the specifier of an AGR projection. The participle moves to this AGR head in languages like French and Italian; there, it enters a Spec-head relation with the object, resulting in agreement between the participle and the moved object.

Initially, Kayne only discusses the lower AGR projection, the one connected with the object. However, the idea that a specific syntactic configuration is required in order for agreement to take place was very appealing for the GB framework. Spec-head was therefore immediately extended to all kinds of agreement (including intra-DP agreement, see Koopman 1987).

The general structure for agreement, until early Minimalism, is the following:

(10)



Agreement takes place uniquely in a Spec-head configuration. The higher AGR and the lower AGR have become AGR_S (for the subject) and AGR_O (for the object) respectively.

While Kayne relies on the clitic nature of the moved object to justify obligatory movement out of the VP for the object, subject movement is linked to the Extended Projection Principle, which has been formulated in many ways and in essence amounts to a requirement for Spec,IP (former INFL, later T) to be filled (Williams 1980, Chomsky 1981, Chomsky 1982, Rothstein 1983, Lasnik 2001 and many others). If Spec,IP is filled independently, and if I must be split into I proper and AGR, movement of the subject to AGR is an obligatory requirement for subject agreement. This requirement is linked to finite verb agreement with the subject, as well as to Nominative case assignment (the I head governs the NP subject).

Chomsky (1981:259) states that

(11) "the mechanism for assigning nominative Case under agreement [...] actually has two components:

(i) AGR is coindexed with the NP it governs […]

(ii) nominative Case is assigned to (or checked for) the NP governed by AGR"

In this approach, while Nominative is assigned under government and in a Spec-head configuration, Accusative remains assigned to the complement of the V head (still under government, but not in a Spec position). In his 1995 (Chapter 2) work, Chomsky proposes that Accusative assignment also takes place in a Spec-head configuration, hence that the object must move to Spec,Agr_O in order to receive Case. This movement can take place overtly or covertly, at LF.

4. Agreement as an operation. The Minimalist Program

The issue of argumental agreement was more or less resolved in the GB framework, but the advent of the Minimalist Program (Chomsky 1995, MP henceforth) introduced a number of complications to the idea of agreement as a Spec-head relation. Several assumptions that Spec-head agreement relied on no longer held, as the MP switched from a representational system with filters and intra-syntactic modules (like D-structure and S-structure, each of which was the locus for specific syntactic or operations or filters to apply) to a simplified, heavily derivational and operation-driven system. In the MP, the two levels of syntactic representation are unified into one, and there is no such thing as a dependency relation that applies at only one level (say, theta-role assignment, or Case assignment). Everything happens at a single level, in one module, which is now called Narrow Syntax. The minimalist structure is derivational in nature, and the only "filters" are those imposed at the interface by legibility conditions.

The guiding principle for this new program, which is now almost 30 years old, is the principle of Full Interpretation (FI), whereby "a syntactic expression must be legible at the interfaces with SM and CI", where SM is the sensory-motor system (known as PF, as it was previously), and CI is the conceptual-intentional system, also known as LF.

In Chapter 4 of the *Minimalist Program*, Chomsky discusses the notions of agreement (Agr) based on the MP assumptions.

4.1. What we need to know about the early Minimalist Program to understand agreement

In early MP, the structure assumed is that represented in (10). In chapter 2 of the MP monograph, Chomsky (1995) adopts the AGR$_S$ and AGR$_O$ projections, endorsing Pollock and Kayne's proposals as well as Koopman's (1987), according to which Spec-head agreement is the only possible configuration for agreement, and crucially links argumental agreement to Case assignment.

In the same volume, two chapters later, Chomsky discusses the ontology of AGR in the context of the Minimalist framework. Many of the assumptions about phrase structure that were valid in Chapter 2, where the two AGR heads were adopted, are no longer valid in Chapter 4.

Chomsky starts by claiming that economy principles should carry more weight in a theory with a minimalist design. Specifically, he states: "it seems that economy principles of the kind explored in early work play a significant role in accounting for properties of language. With a proper formulation of such principles, it may be possible to move toward the minimalist design: a theory of language that takes a linguistic expression to be nothing other than a formal object that satisfies the interface conditions in the optimal way." (Chomsky 1995:157).

Agreement should also be conceived as a last-resort, economy-driven operation. This is not always straightforward, as we will see below.

Two ingredients are required to follow the development of the argument: the first is the selection of a LEXICAL ARRAY, which refers to lexical items that are selected all at once (through an operation dubbed Satisfy, which will be immediately abandoned) and then enter the syntactic derivation. The syntactic derivation will take place in the syntactic component (so no D-structure or S-structure is needed).

The second key concept is LEGIBILITY of a syntactic derivation at the interface with PF and LF. A syntactic derivation can CONVERGE or CRASH at the interface, where convergence is determined by "independent inspection of the interface levels" (Chomsky 1995:171). Given the principles of economy driving computation, if there is more than one convergent derivation "the most economical convergent derivation" will be chosen (Chomsky 1995:201).

Until Chapter 3, everything was being discussed in terms of full morphemes. Chapter 4 takes a huge leap forward (or perhaps back) and assumes that syntactic operations are based entirely on features. Features enter the derivation as interpretable or uninterpretable (at the interfaces). A mechanism is necessary to ensure that uninterpretable features disappear from the derivation before the interface is reached. Elimination of uninterpretable features takes place through CHECKING. Uninterpretable features are checked against interpretable ones, and are consequently eliminated from the syntactic derivation.

4.1.1. Merge, Move, Procrastinate

With regard to agreement, one particular statement in Chapter 4 contains *in nuce* several concepts which will be discussed and adopted in different forms by formal linguistics in subsequent years.

There are only two possible operations in the C_{HL} (computational system of Human Language): MERGE and MOVE. Move is a Last Resort operation, as it is costly. Given a syntactic element α, and a target K c-commanding α, α can move only for the following reasons:

(12) "α can target K only if:
a. a feature of α is checked by the operation
b. a feature of either α or K is checked by the operation
c. the operation is a necessary step toward some later operation in which a feature of α will be checked" (Chomsky 1995: 257).

This first definition of the conditions under which movement applies is central to the subsequent debate on agreement. There are several key concepts in this definition that need to be emphasized here. The first is the question of whether or not α moves together with its feature. There are at least two conceptual alternatives:

1. α, a syntactic item, moves together with the feature on α that needs checking (pied-piping)
2. the feature that needs checking moves, while α stays behind (stranding).

In the beginning of Chapter 4, Chomsky selects option 1, before rejecting it later in the same chapter. The issue of detaching features from their host is not at all straightforward. The lexical morphological tradition up to GB considers morphemes as units, endowed with different sorts of features. Morphemes are listed in the lexicon with their phonological, semantic and syntactic specification. This means that they are, in principle, syntactic atoms, and that they enter the syntactic derivation as basic units. This concept was not under debate, for instance, in the *Generalized verb movement* approach (Belletti 1990), and was in fact the basic assumption of Baker's Mirror Principle (Baker, 1985).

4.1.2. Weak and strong features

One of the guiding principles in early MP is Procrastinate: Move is more costly than Merge, so movement should not happen if not absolutely necessary. The movement we see is determined, according to Chomsky, by *strong* features, which require "immediate" checking and result in movement; *weak* features also exist, but they are only visible at PF (according to Chomsky 1993, see also Lasnik 1999), and later at LF (Chomsky 1995), and therefore do not require overt movement in syntax. The option selected from (10b) is that of satisfying the "needs" of K.

4.1.3. Delete and Erase

We have been assuming that checking uninterpretable features leads to their deletion before the interface with LF and PF is reached. The derivation will otherwise crash. Now consider case marking, or verbal inflection, both of which happen via agreement. So far, we have been assuming that uninterpretable features on T are deleted before the interface is reached, so that only interpretable features are passed on to the two submodules. Yet we do see verbal inflection on the verb, which is the result of φ-checking against the subject. How can PF know about these inflectional features, if they are deleted at narrow syntax? We also see Case marking on pronouns in English, as a result of uninterpretable Case checking on the DP against the dedicated Case head. Furthermore, if the features on Agr are deleted, we would send an "empty", ill-formed item to LF.

There are at least a couple of solutions to the deletion problem. The first is to begin with fully inflected items in the Numeration (i.e. going back to working with morphemes, not with features).

The second solution is to draw a distinction between deleting and erasing features. DELETION is in order to allow uninterpretable features to be checked against interpretable ones. Deleted features can however stay in syntax and be Spelled-Out at PF and LF. When features must disappear from syntax they will be deleted and then ERASED (recall also Section 2.1 for a similar discussion, in distant times).

4.1.4. *AGR*

What about the AGR heads? With the new strong vs weak feature system, they are no longer needed, primarily because they would only consist of uninterpretable φ-features, and would hence have no semantic content. Chomsky (1995:321) states: "We have considered four functional categories: T, C, D, and Agr. The first three have Interpretable features providing "instructions" at either or both interface levels. Agr does not; it consists of -Interpretable formal features only. We therefore have fairly direct evidence from interface relations about T, C, and D, but not Agr. Unlike the other functional categories, Agr is present only for theory-internal reasons".

We can simply add a strong D feature onto *v* to obtain the Agr_O effect and a strong D feature onto T to obtain the Agr_S effect (i.e. to have the object and the subject overtly moving to their specifiers).

When a strong feature is present, it will trigger overt movement, as we saw. Imagine a situation in which T has a strong uninterpretable D feature, which Attracts the first available element with an interpretable D feature, namely the external argument. The external argument raises overtly to Spec,T, carrying along with it a number of other features: its interpretable φ-features, and its uninterpretable Case feature. These features move to Spec,T with their host as FREE RIDERS. Case is hence a free rider, not what triggers movement. φ-agreement is also sometimes a free rider, in the case of a strong D feature (which is simply an EPP, a movement-triggering feature).

Observe that on this view movement and agreement begin to be independent: one can be parasitic on the other, but one does not trigger the other, as we assumed for Nominative assignment in Spec,T and for participial agreement (following Kayne's analysis). What is necessary is that there is Match of one feature between two elements, and that the feature on what we have been calling K attracts α overtly: the remaining features will follow as FREE RIDERS.

As an example, take for instance subject-verb agreement in French/Italian. Recall that T in French/Italian has a strong V feature, attracting the verb. Take a sentence like (13):

(13) Tu dorm-i
You.2SG.NOM sleep-2SG
'You sleep'

Tu is first-merged with the *v*P (as a specifier), where it receives its external θ-role. *Dormi*, being a verb, bears an interpretable V-feature. T enters the derivation with the following feature set:

- an uninterpretable V feature
- an uninterpretable D feature
- uninterpretable φ-features (person, number)
- interpretable Case (Nominative)
- tense/aspect/mood features

T is what we have so far called the target, K. The uninterpretable V-feature on T needs to be checked. The operation Move takes the verb in V (what we so far have called α) and Moves it to T (V-to-T movement). The verb checks the uninterpretable V-feature on T. This feature gets deleted (but possibly not erased).

The uninterpretable D-feature on T also needs checking; it is a strong feature, so the subject is attracted by it to Spec,T. Move takes α (the subject) and moves it to Spec,T. At this point the whole DP subject has moved, pied-piping unvalued features. What happens to them?

- Uninterpretable ([u] henceforth) Case ([u]Case) on the subject is checked against [i]Case=Nominative on T as a free rider and deleted.
- [u]φ on T are checked against [i]φ on the subject as free riders

Agreement now consists in the checking of interpretable features against uninterpretable ones. It does not drive computation.

4.1.5. Match and Agree

As we have seen, feature checking is assumed to initially involve pied-piping of the feature host. In principle, however, it is not inconceivable that a feature could be moved, leaving its host stranded. The two positions can be reconciled by assuming that *strong* features trigger pied-piping, while *weak* features do not. If a feature can participate in checking on its own, and if movement of the entire host is not necessary, why could there not be a system in which checking takes place "at a distance"?

In *Minimalist Inquiries* (MI, 1998/2000) Chomsky takes the extra step of finally dissociating agreement from movement formally as well, through the formulation of Agree. When listing imperfections, Chomsky wonders whether agreement and movement are really needed in the system, and whether one should be reduced to the other. The need for a strong feature to be checked is reinterpreted as the need for an uninterpretable feature to be made interpretable. Interpretability is not an absolute property: a feature can be interpretable on nouns but not on verbs. Agreement features are of exactly this type: they are uninterpretable on T but interpretable on DPs. Take for example number: number is interpretable on nouns (plural on a noun indicates a plurality of the items designated by that noun) but uninterpretable on T/verb (plural on a verb does not denote a plurality of events, but only that the verb has agreed with a plural noun phrase); while Chomsky claims that agreement and movement can and optimally should be reduced into one, he keeps the features responsible for the two operations (namely φ-features and EPP, which is now a movement-triggering feature) separate.

Uninterpretable features must be eliminated for the derivation to be able to converge at LF; however, they can remain legible at PF. In order to eliminate uninterpretable features from narrow syntax, the operation Agree piggy-backs on Match, which is defined as follows:

(14) "Matching is a relation that holds of a probe P and a goal G. Not every matching pair induces Agree. To do so, G must (at least) be in the domain D(P) of P and satisfy locality conditions. The simplest assumptions for the probe-goal system are shown in (40).

(40) a. Matching is feature identity.
b. D(P) is the sister of P.
c. Locality reduces to "closest c-command"." Chomsky (2000:122)

The Core Functional Categories (CFC: C, T, *v*) are thus introduced into the syntax with a set of uninterpretable φ-features (the nominal features [gender], [number], [person]) which must be deleted.

Agree takes place between a Probe, with uninterpretable features, and a Goal, with interpretable features (very much like Attract). Unlike Attract, Agree does not require movement, and features can be checked long-distance. In MI, Chomsky introduces a new concept of uninterpretability, which is linked to the absence of a value: if a feature is not specified, or UNVALUED, it will not be readable at the interface, and the derivation will crash.

Uninterpretable φ-features enter the derivation unvalued, and they need to get valued before the interface is reached (recall once again that this is not a new idea, cf. Section 2.1). They must be *valued* in narrow syntax. Uninterpretability corresponds to being unvalued, for a feature, and interpretability to being valued. As stated above, interpretability (i.e. being valued) is not an absolute characteristic of a feature, but is dependent on which element hosts the features: φ-features are interpretable on nouns, but uninterpretable on verbs. More specifically, φ-features are interpretable on DPs, but uninterpretable on CFCs.

In *Derivation by Phase* (DbP), Chomsky (2001) keeps the operation Agree in the same form, while slightly changing the Matching from "feature identity" to "non-distinctness", i.e. feature identity independently of value (cf., once again, Section 2.1). In substance, φ-Agree consists in dimension Matching under c-command with subsequent *copy* of the feature values. This COPYing of values is not very different from the system proposed by Postal (1966); terminological differences aside, the former idea of agreement as copying material from one element to another has returned, after a parenthesis in which agreement was a by-product of a specific syntactic configuration. The only substantial difference between Agree and Postal's system lies in the fact that Agree, taking place between a Probe bearing uninterpretable features and a Goal bearing interpretable ones, must take place under a c-command relation.

What has reappeared from the earlier accounts, after many years of absence, is the idea that features have different values, and that these values can be copied from one item to another. In a sense, we are back to the Postal models of agreement also because movement is no longer required for agreement to take place. All that is necessary for Agree to take place is now a (closest) c-command relation between Probe and Goal.

Furthermore, the concept of Q morphemes, as introduced by Halle & Marantz (1993), has brought back the idea that features, not lexical items are key to how syntax works. Features are probes, they are active or inactive, they drive computation. The wave of lexicalist vs " abstract" feature-driven computation seems to have been resolved in favor of features.

Now that the gist of the operation Agree is in place, let us look at it in more detail. Agree is a syntactic operation that takes place between two syntactic elements, usually a head and a phrase. It is not an external, extrinsic operation as Move was conceived: Move was the operation that took an element and displaced it. Agree is an operation that takes place between

a Probe and a Goal. It does not "operate on" anything: it happens to syntactic components. This is a further step towards a no-look ahead model for syntactic computation.

The fact that syntactic "blindness" has become more central is underlined by Chomsky's remark regarding the switch from Attract to Agree: "Reinterpretation of Attract in terms of Agree eliminates the need to introduce 'checking domains'. That is a step forward. the notion is complex, and furthermore unnatural in minimalist terms: feature checking should involve features, nothing more, and there is no simpler relation than identity. More importantly, the notion is irrelevant for the core cases: elements merge in checking domains for reasons independent of feature checking; and feature checking takes place without dislocation to a checking domain". (Chomsky 2000: 126)

In order for a Goal to be visible for Agree, it must be *active*, i.e. some of its features must be unvalued. Both in *MI* and in *DbP* the "visibility" feature is considered to be case.

5. The locus and timing of Agree

So far, we have briefly introduced the concepts that led to the formulation of the operation Agree. However, this conceptualization of syntactic agreement is far from being universally shared. A number of issues have come to light since the 2000 formulation. Debates are still ongoing on whether Agree is actually a narrow-syntactic operation or if it takes place at PF instead; if Agree precedes movement or follows it. A parallel discussion has revolved around the direction of Agree: keeping intact the idea of feature valuation (or even checking) and the c-command requirement, some scholars have argued that Agree actually takes place in the opposite direction, or both upwards and downwards.

In what follows I present a short overview of the main issues, and the first papers that raised them. The overview is not complete, and is intended only as a presentation of the issues, not necessarily of all the solutions proposed, which would each require a separate chapter.

Section 4.1 will be devoted to the issue around the module in which Agree or agreement takes place, and whether it is a narrow-syntactic or a PF operation. This section complements Preminger's vignette (this volume). Section 4.2 will discuss the timing of Agree, and in particular its timing with respect to movement. Finally, section 4.3 will introduce the issue of the directionality of Agree.

5.1 Agreement as a PF operation

So far, we have been working under the assumption that agreement happens in the syntax (see also Preminger (this volume)). There is, however, another possibility, namely that agreement is not a syntactic operation, but could take place in another module of grammar. This is the position put forward by Bobaljik (2008), according to whom agreement is necessarily post-syntactic. More specifically, agreement takes place at PF, in its Morphological subcomponent. Agreement in fact accesses the output of operations that are invariably defined as post-syntactic, such as morphological case assignment. It cannot therefore take place at narrow syntax.

The first distinction to be made is between abstract case or grammatical function on the one hand and morphological case on the other. According to Bobaljik it is only morphological (m-) case that is accessed by agreement. Taking ergative languages as a case study, Bobaljik proposes a reformulation of Moravcsik's grammatical function hierarchy in terms of case implication. The generalization regarding case in ergative languages is as follows:

(15) a. no agreement (Dyirbal, Lezgian)
b. ABS only (Tsez, Hindi)
c. ABS ERG (Eskimo-Inuit, Mayan)
e. * ERG only
f. * ERG DAT, no ABS
g. * DAT only

d. ABS ERG DAT (Basque, Abkhaz) h. (*ABS DAT, w/o ERG)

This means that if a language marks only one case, it will be absolutive. If it marks two, they will be ergative and absolutive. More specifically, if a language has ergative marking, it will also have absolutive marking. The implicational hierarchy is as follows:

(16) Absolutive > Ergative > Dative

which resembles the nominative/accusative hierarchy:

(17) Nominative > Accusative > Dative

According to Marantz (1991), Accusative and Dative are dependent and lexical cases, respectively. This means that the two hierarchies can be subsumed into a unique hierarchy, which is presented in (18):

(18) Unmarked Case > Dependent Case> Lexical/Oblique Case

What determines agreement is usually the most accessible element, which Bobaljik defines as the highest accessible NP in the Infl+V domain. In most cases, the computation of the highest accessible argument returns only one element, which will be the agreement controller. There are also exceptions to this general rule, however, which help us to identify the locus of agreement.

In Hindi/Urdu, the agreement controller is the highest caseless (i.e. unmarked) NP in the verbal domain. Ergative markers appear in this language on the external argument of transitive verbs only in the perfective. Dative is used to mark goals or experiencers, and the remaining arguments of the verb are usually caseless. Case is assigned in Hindi/Urdu according to the following scheme (from Bobaljik 2008: 308):

(19)	Perfective:	a. SUBJ-ne	OBJ-Ø	V	
		b. SUBJ-ne	OBJ-ko	V	default
	Imperfective:	c. SUBJ-Ø	OBJ-Ø	V	
		d. SUBJ-Ø	OBJ-ko	V	
	Psych:	e. SUBJ-ko	OBJ-Ø	V	

A sentence like (20), for instance, illustrates the pattern in (19a):

(20) Hindi, Bobaljik (2008: 309)

raam-ne	roṭii	khaayii	thii
Ram.M-ERG	bread.F-Ø	eat.F.PERF	be.F.PAST

'Ram had eaten bread.'

In this sentence, the subject is marked as ergative. If agreement were determined on the basis of the grammatical function, we would expect the verb to show gender agreement with the ergative subject. Agreement is instead controlled by the unmarked element, i.e. the object in this case. Bobaljik concludes that it is hence the unmarked case that determines agreement, not the highest grammatical function. Observe the case in which there are two unmarked items, as in the following sentence:

(21) Hindi, Bobaljik (2008: 309)

siitaa	kelaa	khaatii	thii
Sita.F-Ø	banana.M-Ø	eat.F.IMPERF	be.F.PAST

'Sita (habitually) ate bananas.'

In (21) it is the highest argument with unmarked case that controls agreement (the subject in this example).

To provide further evidence for the fact that agreement is determined by the highest accessible element in the m-case hierarchy in (18), Bobaljik also examines agreement in Nepali. This language is described as having grammatical function-driven agreement by Bickel & Yādava (2000), on the basis of the fact that usually the nominative agrees if it is the subject. Bobaljik interprets Nepali data by arguing that the first two layers of the hierarchy are accessible for agreement, and that in fact it would be expected to have agreement with nominative objects if they were more prominent. The fact that it is usually the subject that seems to drive agreement is purely accidental, and is due to the fact that nominative subjects are usually the highest accessible m-case marked NPs in Nepali. In other words: it is nominative (i.e. morphological case) that determines agreement, and not the grammatical function of the NP. The following sentence is used as evidence by Bobaljik for the fact that it is also m-case that controls agreement in Nepali:

(22) Nepali, Bickel & Yādava (2000:348) in Bobaljik (2008: 311)

malāī	timī	man	par-ch-au.	(*parch-u)
1SG.DAT	2M.HON.NOM	liking	occur-NPST-2M.HON	occur-1SG.HON

'I like you.'

Here, a nominative object, not a dative subject, controls agreement. Agreement thus builds on the output of morphological case assignment. Assuming post-syntactic morphological insertion, it is shown that agreement cannot take place before morphological insertion, which takes place at PF. Hence, agreement cannot take place at narrow syntax.

Several counterarguments to this analysis have been proposed, most notably by Preminger (2014, this volume), who shows that morphological agreement actually feeds some syntactic operations and cannot therefore take place outside syntax. Other proposals have been put forward stating that agreement takes place partially in syntax, most notably Benmamoun, Bhatia & Polinsky (2009). See Preminger (this volume) for an overview.

5.2 The timing of syntactic operations

If agreement takes place under closest c-command, as Agree does, than locality problems may arise. Just like for Relativized Minimality effects for movement of constituents (Rizzi 1990), agreement selects the closest matching element to the probe. This also means that if there are two potential goals for a probe, the closest will be the first one to Agree, and if silent it will in any case "intervene". This concept is formalized in Chomsky (2000, MI), and named *defective intervention*. Defective intervention obtains in the following configuration:

(23) $\alpha > \beta > \gamma$ (where > = c-command) (Chomsky 2000:123)

where α is the probe and β and γ are potential goals. The operation Agree (as well as Move) can only take place if a goal is active, which means that it has uninterpretable features. Now, if β is inactive, it will still intervene and block agreement between α and γ. Intervention takes place under feature identity, not under value identity. Feature deletion after Agree takes place in one

fell swoop, and features cannot be checked one-by-one. According to Chomsky, there cannot therefore be multiple agreement of one probe with many goals. This view is not shared by most analyses of agreement, starting from Ura (1996), who proposes a Multiple Agree analysis for Japanese. We will not discuss Multiple Agree models in this chapter.

The intervention effect and the requirement for c-command for Agree to take place are two powerful tools that have been exploited over the years to draw conclusions about the order of operations, the point of Spell-out, and the first-merge position of elements.

5.2.1 Agreement before movement

One of the first analyses to exploit the idea of intervention in agreement to establish the precedence of one syntactic operation with respect to another was Boeckx & Niinuma's (2004) analysis of honorifics in Japanese. Japanese is known to feature a complex system of honorifics, which appear as verbal suffixes. What is of interest for us here is object marking. Boeckx & Niinuma examine the dative intervention effect in object honorification agreement in Japanese. The verb in Japanese displays an object honorific agreement in transitive clauses, and an indirect object honorific agreement in ditransitive clauses, as in (24) and (25).

(24) Taro-ga Tanaka sensei-o o-tasuke-si-ta
Taro-NOM Prof. Tanaka-ACC help-OH-PAST
'Taro helped Prof. Tanaka'

(25) Hanako-ga Tanaka sensei-ni Mary-o go-syookai-si-ta
Hanako-NOM Prof. Tanaka-DAT Mary-ACC introduce-OH-PAST
'Hanako introduced Mary to Prof. Tanaka'
(Boeckx & Niinuma 2004:456)

If the honorific suffix refers instead to a direct object in ditransitive constructions, while the indirect object is not marked for honorifics, the sentence is ungrammatical, as illustrated in (26).

(26) ∗Hanako-ga Mary-ni Tanaka sensei-o go-syookai-si-ta
Hanako-NOM Mary-DAT Prof. Tanaka-ACC introduce-OH-PAST
(intended reading: 'Hanako introduced Prof. Tanaka to Mary')

This ungrammaticality can be formulated in agreement terms by saying that honorific agreement between the verb and the object is blocked in the presence of an intervening dative. The dative NP, despite being unable to take case, acts as a defective intervener blocking Agree between the verb and the object. The indirect object is in fact in a closer c-command relation with the verb (the probe, in this case) than the object. Using the notation adopted in (23), the dative *Mary-ni* is the β element, and the accusative Tanaka *sensei-o* is γ. β is a defective intervener between α and γ: it cannot trigger honorific agreement, but it still prevents it from taking place between the verb and the object. Observe that this analysis only holds on the assumption that the indirect object is c-commanded by *v* in Japanese, and that it c-commands the direct object. This order must be fixed, or the defective intervention effect might be prevented in some cases, contrary to fact. The Japanese data also offer insights regarding the time at which Agree takes place. If Agree took place after movement (or scrambling), we would not be able to have object honorific agreement in Japanese with scrambled objects, contrary to fact.

Japanese displays quite a straightforward case of defective intervention, which is determined by an intervening NP that is not endowed with the relevant honorific feature. A similar, and perhaps better known, case, is dative intervention in quirky subject constructions

in Icelandic, where a dative intervener, which does not have an active, uninterpretable case feature, intervenes in long-distance assignment of Nominative case to the internal argument.

5.2.2. Wh- agreement in Chamorro

In Chamorro, morphological agreement reflects syntactic agreement between T and a moved *wh*-element (Chung 1994, 2013). An example of this sort of agreement is in (27):

(27) a. Hayi f**um**a'gasi *t* i kareta?
who? Wh-NOM.wash the car
'Who washed the car?'

b. Hafa f**in**a'gase-**nña** si Antonio *t*?
what? wh-OBJ.wash-3.SG Antonio
'What did Antonio wash?'

c. Hafa fa'gase-**nña** si Antonio ni kareta *t*?
what? wh-OBL-wash-3.SG Antonio OBL car
'What did Antonio wash the car with?' (Chung 2013:258)

These data do not clearly indicate whether T has agreed with the *wh*- before or after movement. However, Chung draws on another set of data on long distance dependencies, showing that T agrees with the *wh* when this is still *in situ.* In embedded *wh*- sentences, for instance, the only verb agreeing with the moved *wh*- is the lower one:

(28) Hafa ha-sangan si Juan pära godde-**tta** ni chiba *t*?
what 3.SG.TR.RL-say Juan FUT wh-OBL.tie-1.PL OBL goat
'What did Juan say we would tie the goat with?'

(29) * Hafa sangan-**ña** si Juan pära godde-**tta** ni chiba *t*?
what? Wh.OBL.say-3.SG Juan FUT wh-OBL.tie-1.PL OBL goat

The verb in the embedded T agrees with the oblique *wh*-phrase, while the higher one does not. If agreement took place after movement, we would expect the reverse situation, or at least multiple agreement of the oblique *wh*- phrase with both the root T and the embedded T. *Wh*-agreement in Chamorro thus takes place before (long) movement.

5.2.3. Agreement both before and after movement

The Icelandic facts are rather well known: in Icelandic, some raising verb constructions may take an optional dative experiencer, which can stay in its first-merge position, within the VP (according to Holmberg & Hróarsdóttir 2004), or alternatively raise to the canonical Spec,T subject position. Nominative is assigned to the DP in the dependent clause by the matrix T, unless the dative experiencer DP intervenes between T and the subject DP. If the dative is moved, it may or it may not intervene.

An example of this is in the following sentences:

(30) Mér virðast [hestarnir vera seinir]
me-DAT seem-PL horses-NOM be slow
'It seems to me that the horses are slow.'

(31) Það virðist/*virðast einhverjum manni [hestarnir vera seinir]
EXPL seems/seem some man.DAT the.horses.NOM be slow
'It seems to some man that the horses are slow.'
(Holmberg & Hróarsdóttir 2004: 998)

Observe that the dative cannot value the unvalued features on T. This is shown by the fact that even if the dative DP is the only DP present in the clause, the verb will not show agreement with it. In (29), for instance, there is no plural agreement between the verb and the plural dative DP, and the verb shows a 3rd singular default inflection:

(32) Strákunum leiddist/*leiddust
boys.PL.DAT bored.3SG/*3PL
'The boys were bored.' (Sigurðsson 1996:1)

Despite the fact that the dative cannot value T's φ-features, nor can it get Nominative from T, it acts as an intervener in long-distance agreement, as we see in (31).

Take now a transitive expletive construction like the one in (33). Agreement between T and the Nominative object is blocked by an intervening singular dative experiencer (as shown in 34).

(33) a. Manninum virðist hestarnir vera seinir
man.DAT seem.SG horses.PL.NOM be slow.NOM
b. Manninum virðast hestarnir vera seinir
man.DAT seem.PL horses.PL.NOM be slow.NOM
'The man finds the horses slow'

(34) a. það virðist einhverjum manni hestarnir vera seinir
EXPL seem.SG some man.DAT horses.PL.NOM be slow.NOM
b. *það virðast einhverjum manni hestarnir vera seinir
EXPL seem.PL some man.DAT horses.NOM be slow.NOM
'A man finds the horses slow'
(Holmberg & Hróarsdóttir 2004:1000)

Holmberg & Hróarsdóttir propose that this blocking is due to a violation of the Minimal Link Condition, which means that the dative DP works as an intervener. If the dative is moved, the intervention effect may, but does not have to, disappear. Agreement is thus blocked in raising constructions by an intervening dative NP, and by the trace of this NP if it is wh- moved, focused, or topicalized. Observing these data provides a clue on the order of operations. Consider the following examples. They are ungrammatical because in (35a) the dative NP intervenes between the matrix verb and the object, preventing the assignment of Nominative.

In (35b) the dative NP has been wh- moved, and its trace intervenes. In (35c) the dative NP has been relativized, in (35d) it is topicalized.

(35)
a. *það finnast einhverjum stúdent tölvurnar ljótar
EXPL find.PL some student.DAT computers.NOM ugly.NOM
b. *Hvaða stúdent veist þu að finnast **t** tölvurnar ljótar?
which student.DAT know you that find.PL computers.NOM ugly.NOM
c. *Þetta er stúdentinn sem finnast **t** tölvurnar ljótar
this is student.NOM that find.PL computers.NOM ugly.NOM

d. *Þessum	stúdent	veit	ég	að	finnast	**t**	tölvurnar	ljótar
this	student.DAT	know	I	that	find.PL		computers.NOM	ugly.NOM

(Holmberg& Hróarsdóttir 2004:1000-1003)

The fact that the dative *wh*- trace intervenes between T and the object in (35b) means that the wh- movement has taken place after T has probed for the object. Moreover, we have seen that the dative NP trace does not intervene, while the wh- NP does. This tells us two things: the first is that the NP has moved before Agree has taken place, because otherwise it would have intervened. The second is that the wh- moves directly from Spec,V to Spec,C, because it cannot pass through Spec,T, which is filled by the moved NP. Agree between T and the object takes place after the dative NP has raised to TP and before the whP has moved to Spec,C. The wh- in fact triggers an intervention effect. There is thus no distinction between traces, but only between times of application of Agree and Move.

Agree can therefore take place before movement (in the case of wh- movement) but also after movement, in the case of the dative NP.

5.2.3. Agreement after movement

The Icelandic data are also examined by Koopmans (2006), who maintains that agreement can only be accounted for within a Spec-head configuration. Koopmans underlines the fact that the data examined by Holmberg & Hróarsdóttir are incomplete, in particular because dative NPs do not act as interveners in simple experiencer constructions. She cites the following data in support of her claim:

(36)	Það	likuðu	mörgum	þessir	tómatar
	EXPL	liked.3.PL	many.DAT	these.NOM	tomatoes.NOM

'Many liked these tomatoes'

(37)	Það	leiddust	sumum	þessar	rœdur
	EXPL	found.boring.3PL	some.DAT	these.NOM	speeches.NOM

'Some people found these speeches boring'

(Koopmans 2006:178)

It is clear that in these data an intervening dative NP does not block agreement between T and the Nominative object. Koopmans shows that the same is true for passives, as in (38) and in auxiliary selection, in (39):

(38)	Það	voru	konungi	gefnar	ambáttir	í vetur
	EXPL	were.3PL	king.DAT	given.PL.NOM	slaves.NOM	in winter

'There was a king given maidservants in winter'

(Koopmans 2006:178 from Zaenen, Maling & Thráinsson 1984)

(39)	Það	hafa	sumum	leist	þessar	rœdur
	EXPL	have.3PL	some.DAT	bore	these	speeches.NOM

'Some people have found these speeches boring'

(Koopmans 2006:178)

Dative NPs cannot be treated as interveners, according to Koopmans: they act as such only in raising constructions.

5.3 Long-distance agreement

We have seen throughout the chapter that the theory of agreement has slowly moved from Spec-head, government-centered, to Agree, which is defined in terms of c-command. One of the important gains that Agree brought about is the easy way to account for long distance agreement (LDA).
The easiest way to check whether agreement takes place under c-command or in a Spec-head configuration is, as we saw, to check what happens in constructions with agreement where it is clear that no movement has taken place. If we find cases of subject-verb agreement where it can be shown that the subject has not moved from its base position in the VP, and yet it has received Nominative case, this will be a strong piece of evidence for a c-command analysis of agreement. English existential constructions offer this evidence. In English existential constructions, like (40), the verb agrees with the object in situ. These constructions were analyzed in different ways before Agree. For instance, it was claimed that the subject would move covertly, at LF, to check its case, or that there would be massive remnant movement across the verb, after agreement between the subject and the verb had taken place in a Spec-head fashion:

(40) There *seems/seem to be three cats in the garden

Three cats agrees overtly with *seem*, although it has not raised. Assuming that *seem* occupies the raising verb position in T, *there* occupies its specifier. We would therefore expect agreement between the expletive and the verb, but that is not what is found. What we see instead is that the verb agrees with the associate *three cats*, suggesting that agreement has taken place in a c-command configuration.

5.3.2 Icelandic Long Distance Agreement

Another set of constructions that are often used as an example of agreement under c-command are found in Icelandic, where the matrix verb agrees with a Nominative object that has not moved to the Spec,TP position:

(41) a. Mér virð-ast [þeir vera skemmtilegir]
me.DAT seem-3PL they.NOM be interesting
'It seems to me that they are interesting.'
b. Mér virð-ast [hafa verið seldir margir hestar]
me.DAT seem-3PL have been sold many horses.NOM
'It seems to me that many horses have been sold.'
(Boeckx 2009: 5-6)

The agreement pattern in Icelandic Nominative object constructions can easily be explained through c-command-determined Agree. A Spec-head analysis would require extra stipulations, such as covert movement or multiple null expletives. Long distance agreement (LDA) is one of the strong pieces of evidence offered for agreement under c-command. Before looking into this phenomenon in detail, two remarks are in order: first, long distance agreement in Icelandic is subject to locality restrictions. Specifically, the finite verb cannot agree with the low Nominative argument when a CP boundary intervenes:

(42) Mér fannst/*fundust henni leiðast þeir
me.DAT seemed.3SG/3PL her.DAT bore they.NOM
'I thought she was bored with them'. (Boeckx 2004:28)

Secondly, LDA is subject to intervention effects. An intervening dative in Nominative object constructions blocks agreement between the matrix verb and the lower subject. Observe the contrast between the following two sentences. In the first one, LDA takes place between the matrix verb and the low Nominative argument, while in the second one the intervening dative blocks this agreement. Recall dative intervention effects, here repeated as (43) and (44):.

(43) Mér virðist/virðast [hestarnir vera seinir]
me.DAT seem.3SG/3PL the.horses.NOM to.be slow
'It seems to me that the horses are slow'

(44) Það virðist/*virðast einhverjum manni [hestarnir vera seinir]
EXPL seem.3SG/3PL some.DAT man.DAT horses.NOM to.be slow
'It seems to some man that the horses are slow'

The intervening dative blocks LDA, suggesting that agreement has taken place under c-command.

6. Conclusions

In this short chapter, I have tried to provide an overview of the development of the theory of Agree (Chomsky 2001) and have attempted to highlight all the different components that have contributed to the final definition of Agree as it is.

As might be obvious, the story does not end with Chomsky (2001) and Agree is not at all uncontroversial. I have outlined some of the possible issues that Agree might help to solve, such as the timing of syntactic operations, but many others are still pending.

Other issues were intentionally omitted: one of the most controversial concerns the directionality of Agree, which can still be assumed to take place between a valued and an unvalued feature under c-command, but either in the opposite direction or both upwards and downwards, as proposed by Adger (2003), Wiklund (2005), Boskovic (2007), Haegeman and Lohndal (2010), Zeijlstra (2012, 2014), Merchant (2011), Wurmbrand (2014), Bjorkman & Zeijlstra (2019). We left these out, mainly because these analyses do not target only phi-features, but are concerned with several other phenomena, like negative concord, ellipsis, and others. I also omitted any discussion of other syntactic operations that have been considered to be parasitic on agreement, such as control (Landau 1999), theta-role assignment (Hornstein 1999), and binding (Reuland 2001, Fischer 2004, Kratzer 2009, Rooryck and Vanden Wyngaerd 2011).

Agree and agreement have been the subject of lively debate, as testified by the number of articles and volumes that have been published on the topic in the last few years (see for instance the very recent Smith, Mursell & Hartmann 2020). The road to agreement is still very long.

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