

Auxiliary Selection in Italo-Romance

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1. Introduction

In this paper I address the problem of auxiliary selection, which is the alternation between BE and HAVE as auxiliaries in the perfect (Perlmutter 1978; Burzio 1986; Sorace 2000; Bjorkman 2011).¹ In some languages, such as in Standard Italian, the auxiliary depends on the argument structure (Burzio 1986; Kayne 1993; Bjorkman 2011): transitive verbs select HAVE, and unaccusative verbs BE, with variation along a cline of intransitivity (Sorace 2000, 2004). In other languages, such as in many Southern Italo-Romance varieties, auxiliary selection is person-based (Tuttle 1986; Kayne 1993; Manzini & Savoia 2005): the morphophonological realization of the auxiliary depends on the person feature of the subject, independently of the argument structure in most cases. However, in both types of system, the features of the arguments play a role. For example, in Standard Italian when a transitive verb is combined with a reflexive clitic pronoun, the expected auxiliary HAVE “switches” to BE.

Since the features of the arguments are relevant for the choice of the perfect auxiliary, I argue that auxiliary selection is the result of Agree for the person feature both in argument-structure-based and in person-based systems. The syntactic analysis that I propose relies on the concept of *Nested Agree*, a principle that affects the search domains of ordered probes. I also show that cross-linguistic variation (and, hence, argument-structure-based splits and person-driven splits) can be derived via reordering of operation-inducing features. The present analysis is couched in Minimalism (Chomsky 1995, 2000, 2001) and Distributed Morphology (Halle & Marantz 1993; Harley & Noyer 1999).

2. Auxiliary selection in Standard Italian and in Southern Italo-Romance varieties

In Standard Italian, the perfect auxiliary is realized as HAVE for transitive verbs (1-a), and BE for unaccusative verbs (1-b). If the direct object is the reflexive clitic *si*, the auxiliary switches to BE (1-c). The same happens when there is a benefactive argument realized by the reflexive clitic pronoun (1-d). The unexpected auxiliary BE also emerges when a verb of any valency is constructed with impersonal *si* (1-e). Data in (1) are mine.

- (1) a. Ho lavato la mela.
 have.PRS.1SG wash.PRTC the apple
 ‘I have washed the apple.’
 b. Sono cadut-a.
 be.PRS.1SG fall.PRTC-SG.F
 ‘I have fallen down.’
 c. Mi=sono lavat-a.
 REFL.1SG=be.PRS.1SG wash.PRTC-SG.F
 ‘I have washed myself.’
 d. Mi=sono lavat-a la mela.
 REFL.1SG=be.PRS.1SG washed.PRTC-SG.F the apple
 ‘I have washed my apple.’

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¹ With the labels “BE” and “HAVE” in capital letters I refer to any instance of the roots $\sqrt{\text{BE}}$ and $\sqrt{\text{HAVE}}$, abstracting over the specific morphological inflection.

- e. Si=è lavato dieci mele.
 IMPERS=be.PRS.3SG wash.PRTC ten apples
 ‘One has washed ten apples.’

In contrast, in many Italo-Romance varieties auxiliary selection depends on the person feature of the subject. An example for such languages is Ariellese: first and second person subjects always select for BE (2-a),(2-c), third person subjects for HAVE (2-b),(2-d), independently of the argument structure, even in the context of reflexive pronouns, impersonal pronouns, and in restructuring (Roberta D’Alessandro, p.c.).

- (2) a. Ji so’ fatte na torte.
 1SG.NOM be.PRS.1SG make.PRTC a cake
 ‘I have made a cake.’
 b. Esse a fatte na torte.
 1SG.NOM have.PRS.1SG make.PRTC a cake
 ‘She has made a cake.’
 c. Ji so’ cascate.
 1SG.NOM be.PRS.1SG fall.PRTC
 ‘I have fallen down.’
 d. Esse a cascate.
 1SG.NOM have.PRS.1SG fall.PRTC
 ‘She has fallen down.’

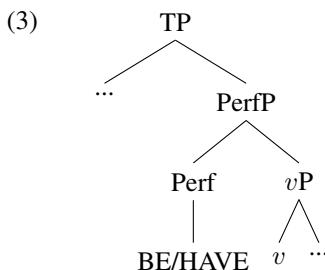
(D’Alessandro & Roberts 2010:43-44)

Previous analyses of auxiliary selection consider either the external argument (Bjorkman 2011) or the type of *v* (D’Alessandro & Roberts 2010) as the constraining factor. In Bjorkman (2011)’s proposal, the presence of an external argument leads to defective intervention in an Agree relation between a [D] feature on Perf and the lexical verb. The failure of Agree causes the incorporation of [D] into Perf, which is consequently realized by the more specific allomorph HAVE (following the idea that HAVE is equal to BE plus something else, cf. Kayne 1993). Instead, D’Alessandro & Roberts (2010) claim that Perf is realized differently depending on the type of *v* it selects. In Standard Italian, the generalization is as follows: the auxiliary is realized as HAVE when the *v* that it selects is non-defective (D’Alessandro & Roberts 2010:51). However, both approaches fail to derive the switch in (1-c), (1-d), (1-e) (and in restructuring, which lies outside the scope of this paper).

3. Auxiliary selection is person Agree

3.1. The head Perf

In this paper, I argue that auxiliary selection is the result of Agree for the person feature both in argument-structure-based systems (as in (1)) and in person-based systems (as in (2)). I assume a syntactic structure as in (3). Both allomorphs HAVE and BE realize the same syntactic node Perf, a functional head located between *v* and T, which brings in the perfect semantics via an [Infl] feature valued as *perf* (Bjorkman 2011). This feature causes *v* to be realized as a past participle by acquiring the value *perf* via Agree (Adger 2003).



The data in (1) show that even in argument-structure-driven systems the features of the arguments are relevant for the morphophonological realization of Perf. In particular, if an object is present (as for transitive verbs (1-a)), Perf is realized as HAVE. If either there is no surface object (as for unaccusative verbs (1-b), where the internal argument is promoted to the subject position), or the object is ϕ -defective (such as the anaphoric pronoun in reflexive constructions (1-c),(1-d)), then Perf is spelled out as BE.² In addition, BE also emerges when the c-command domain of Perf contains the impersonal *si* (1-e), which can also be considered to bear a defective set of ϕ -features. Hence, in order to derive the pattern in (1), it is not enough to consider either the presence of an external argument (Bjorkman 2011) or the flavour of v in a selectional fashion (D’Alessandro & Roberts 2010). The determining factors, next to the type of v , are the features of the object (or of another argument) as they appear on v .

In Minimalism (Chomsky 1995, 2000, 2001), Agree is the operation that transmits information across the syntactic spine. For this reason, I use Agree as the device that allows Perf to “see” both the argument structure (the type of v) and the features of the object (as they appear on v , given a prior Agree relation between v and the direct object). In other words, auxiliary selection depends on the result of Agree on v . In order to model this dependency, I propose that the head Perf bears the two probes [uInfl:perf] and [u π :_].³ Crucially, I assume that multiple features on the same head are extrinsically ordered (Koizumi 1994; Sabel 1998; Müller 2009, 2010; Georgi 2014; Assmann et al. 2015). I propose that in Standard Italian (and in other languages where auxiliary selection depends on the argument structure) the feature ordering on Perf is such that the inflectional probe precedes the person probe, as represented in (4).

(4) Perf: [uInfl:perf] \succ [u π :_]

In Standard Italian, the π -feature on Perf is morphologically realized as allomorph selection rather than person inflection, given the lexical entries in (5), where α represents any person value.

- (5) Standard Italian
 a. $/\sqrt{\text{HAVE}}/ \leftrightarrow \text{Perf}[\pi:\alpha]$
 b. $/\sqrt{\text{BE}}/ \leftrightarrow \text{Perf}$ elsewhere

3.2. *Nested Agree*

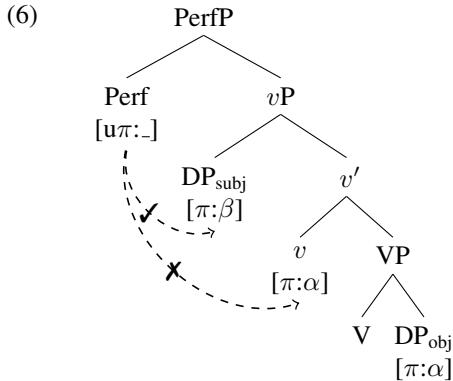
I follow the standard assumptions that Agree is subject to feature matching, c-command, and locality: for a probe P, the goal G is the feature of the same type as P that is c-commanded by G and is closer to P than other features within the c-command of P that are of the same type as P (Chomsky 2000, 2001). Under these conditions, Agree between Perf and v for person faces a problem of minimality.⁴

² As far as the movement of the internal argument of unaccusative verbs is concerned, I assume that this happens because all types of v are phases (Legate 2003; Müller 2010; Abels 2012; Heck 2016). Under this assumption, the principle of *Phase Impenetrability Condition* (Chomsky 2000:108) forces movement of the object out of the phase domain. In fact, since unaccusative v is not a case assigner (Chomsky 2001), case on the object remains unchecked. Hence, the object must escape the phase domain via movement to the edge of the phase, in order to remain accessible to higher case assigners, such as T.

³ I use the prefix *u* as a diacritic for recognizing a probe. A probe is a feature that is able to start a syntactic operation of search. A feature can be a probe even if it is lexically valued, under the assumption that interpretability and valuation are independent conditions (partially building on Pesetsky & Torrego 2007). The *u*-prefix simply represents the need to initiate a search operation for syntactic reasons.

⁴ I adopt a definition of minimality based on c-command, as is standard. The reader may wonder whether the problem of locality that arises under this version of minimality could maybe be avoided under another approach, such as *A-over-A* minimality (Chomsky 1964; Hornstein 2009; Roberts 2010; Preminger 2019). In *A-over-A* configurations, Perf would probe the maximal projection vP , whose features correspond to the features of the head v , thereby skipping the DP in Spec, v . If the vP is not a matching goal, then Perf goes on probing Spec, v . However, as it will become clear from the discussion of (11), *A-over-A* minimality would lead to the insertion of the more specific allomorph HAVE in the case of unaccusative verbs, contrary to what we see in (1-b). In fact, if Perf probes vP and fails to find a person value there (as is the case with defective v), then it probes Spec, v , where the DP_{obj} is located, thereby copying its person value. Hence, the *A-over-A* principle cannot solve the minimality issue.

The π -information on v (and on the object) is not local to the head Perf. At least a DP (either the external argument of a transitive verb, or the moved internal argument of an unaccusative verb) intervenes as a closer matching goal. The syntactic structure for a transitive verb is represented in tree (6).



To solve this minimality problem, I introduce *Nested Agree*, which is a principle on ordered instances of Agree.

(7) *Nested Agree*

Let F_1 and F_2 be two ordered probes on the same head H . The search space of F_1 is the c-command domain of H .

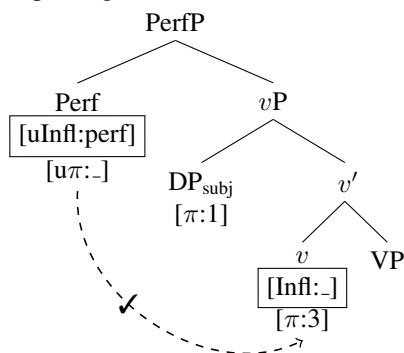
- (i) If the Agree operation A_1 for the feature F_1 has targeted the goal G , then the subsequent Agree operation A_2 for the feature F_2 must also target G .
- (ii) If G is not a goal for F_2 , the search space of F_2 is the c-command domain of G (not of H).

Given the assumption that the features on the same head are extrinsically ordered, a probe (F_2) initiating an operation after another probe (F_1) located on the same head (H) should pick out a matching feature on the goal-head (G) that has been targeted by the preceding probe (F_1). If the probe (F_2) cannot be satisfied by the goal-head of the previous operation (G), then it starts its search exactly from this position (G), without backtracking. In other words, the first probing operation has opened a channel of communication (an *Agree-Link* in the sense of an Agree dependency between two heads, cf. Arregi & Nevins 2012; Baker & Souza 2020) that must be parasitically used by other features, if possible.

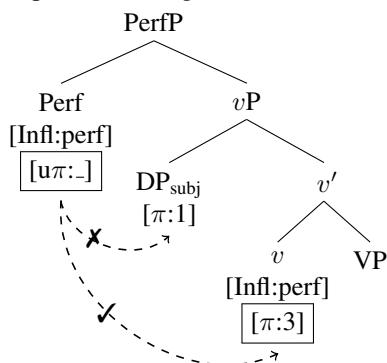
Note that this algorithm allows to circumvent a potential minimality violation. An alleged intervener lies outside the search domain of the probe, if its domain has been “reduced” by a previous operation initiated from the same syntactic head. Hence, the minimality violation is avoided by using an already established *Agree-Link*, which respects the minimality constraint for the previous Agree dependency that has generated it.

As an exemplification of *Nested Agree*, I represent in trees (8) and (9) the derivation involving a transitive verb in the perfect tense, as in (1-a).

(8) Step 1: Agree for [uInfl:–]



(9) Step 2: Nested Agree for [uπ:–]



In (8), Agree for [Infl] on Perf targets the closest c-commanded matching goal, v . The second operation in (9) is Agree for [u π :–]. The probe [u π :–] searches into v , exploiting the already established channel between Perf and v . If v contains [π], as is the case in (9), Agree stops. Otherwise, [u π :–] goes on downwards from this more embedded position, without going back to already skipped positions, (i.e., the DP_{subj}).

The principle of Nested Agree share some similarities with other constraints such as *Maximize Matching Effects* (Chomsky 2001:15), *General Specificity Principle* (Lahne 2012:2), *Multitasking* (van Urk & Richards 2015:132), *Economy condition on multiple probe satisfaction* (Pesetsky 2021:27).⁵ It contributes to the ongoing discussion on the conditions on Agree for multiple probes. In addition, it offers a new insight on intervention effects, contributing to the debate about minimality.

4. Analysis

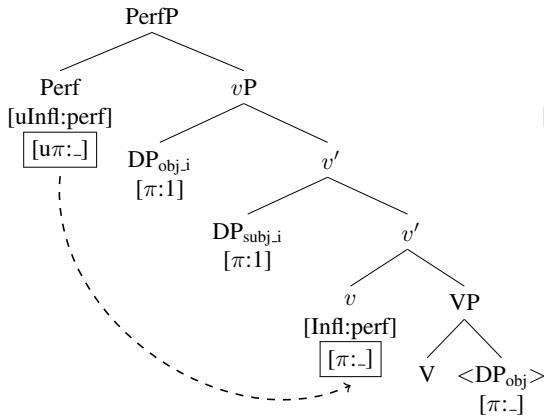
I now propose the derivation for the cases in (1). I distinguish between a transitive v (v^* in Chomsky (2001)’s definition) and a defective v . The former is an agentive v with full argument structure, which introduces the external argument and assigns it the external Θ -role, assigns accusative case to the internal argument of the lexical verb ([case:acc]), and contains a probe for the person feature ([u π :–]). The latter selects a monoargumental verb, where the sole argument is merged as the internal object. It is neither a case assigner, nor a probe for the person feature.

In the previous trees (8), (9), I have shown the derivation for a transitive verb such as in (1-a). In that scenario, transitive v copies the [π] value from the object. When Perf enters the derivation, it firstly checks its [Infl] feature with v . Then, given Nested Agree, it tries to agree with v also for person. The head v bears a person value in addition to the [Infl] feature: Agree on Perf succeeds in copying a person value from v . Therefore, Perf will be spelled out as HAVE, given the lexical entries in (5).

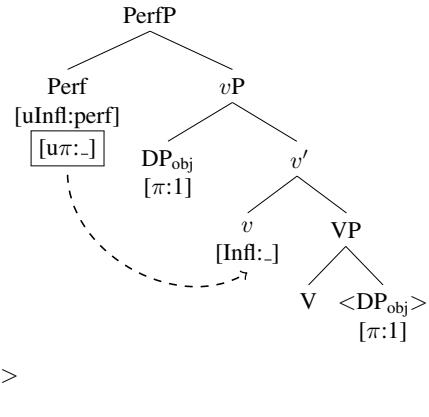
In contrast, the auxiliary “switches” to BE when there is some kind of defectiveness in the structure, either in the features of the argument (cf. reflexive pronoun (1-c), (1-d)) or in the functional head (cf. defective v for unaccusative verbs (1-b)). The unmarked BE emerges either because of Agree with π -defective elements or because of failed Agree (Béjar 2003; Preminger 2014). In trees (10), (11), I illustrate the two types of derivation that lead to BE insertion (cf. clauses (1-d) and (1-c)).

⁵ The main differences between these principles and Nested Agree result from feature ordering. Nested Agree is neither specificity-driven (a particular order of features can give rise even to anti-minimality effects), nor transderivational (there is just one possible derivation, due to the feature ordering). For a discussion about the precedents of Nested Agree and how this principle can be derived from other syntactic constraints, cf. Amato (2021).

(10) Reflexive verb



(11) Unaccusative verb



The tree in (10) represents the case of a transitive clause with a reflexive clitic direct object, as in (1-c). I assume that the reflexive anaphor enters the derivation with unvalued ϕ -features, which get valued by a c-commanding antecedent DP (Reuland 2001, 2005; Heinat 2006; Rooryck & Vanden Wyngaerd 2011). Very generally, I consider binding as a form of co-indexation, which leads to ϕ -valuation if one of the involved items carries a set of unvalued ϕ -features. The other crucial point concerns the order of operations on the head v : I argue that v probes for person before introducing the external argument (v : $[u\pi:-] \succ [\bullet D\bullet]$). This follows from the *Strict Cycle Condition* (Chomsky 1973): the introduction of the external argument (which involves the head and the specifier) must come after the probing of $[u\pi:-]$ (since it involves the head and the complement). Hence, at the point in which v probes for person, the anaphoric pronoun in the object position has not been bound yet because there is no other DP in the structure. Since the internal argument bears an unvalued person feature, valuation of $[u\pi:-]$ on v is not successful. In other words, binding by the subject counter-feeds Agree for the person feature on v . As a consequence, Agree on Perf, which is carried out in the same way as in (9), leads to unsuccessful valuation, too. In fact, Perf first probes v for [Infl], then for $[\pi]$. The head v contains an unvalued instance of the feature $[\pi]$: the condition on feature matching is satisfied and Agree stops, although valuation is not possible. This is a case of defective intervention: the unvalued person feature on v stops Agree, but it cannot value the probe.⁶ Since Perf could not copy any π -value, at Spell out it is substituted by the elsewhere form BE (cf. (5)).

For the reflexive pronoun in the indirect object position in (1-d), I assume that it is introduced by an applicative head Appl below v . Being located in Spec,Appl, it will be the target for Agree on v . Then the derivation proceeds exactly as in (10). For the detailed analysis of these and other clauses (such as impersonal sentences), I refer the reader to Amato (2021).

As shown in tree (11), BE also emerges with unaccusative verbs (1-c). If defective v is not a probe for the π -feature, Perf does not find any c-commanded matching goal. Firstly, Perf successfully probes v for [Infl]; then, it goes on to $[\pi]$. Given Nested Agree, it probes v again, but v is not a matching goal because it does not contain any person feature. Now Perf proceeds its search downwards from this more embedded position, but it does not find any goal. In fact, under the assumption that every v is a phase (Legate 2003; Müller 2010; Abels 2012; Heck 2016), the complement of v is opaque for Perf (because of the *Phase Impenetrability Condition*, Chomsky 2000:108). Hence, v is the lowest possible goal for Perf. Note that the DP_{obj} lies outside the search domain of Perf. In fact, assuming that v is a phase, the DP_{obj} has moved to the edge of v (in order to remain accessible for the head T for case assignment). Nested Agree states that a probe cannot backtrack, after a portion of syntactic structure has already been bypassed by another probe located on the same head. Since Perf has already probed v , the DP_{obj} is not

⁶ Even if one assumes that an unvalued matching feature is not able to stop Agree, the result on Perf does not change. In fact, under the assumption that every v is a phase, v is the only possible goal for Perf because of the *Phase Impenetrability Condition* (Chomsky 2000:108). Hence, the probe $[u\pi:-]$ cannot further search into the vP , and Agree fails (Preminger 2014).

accessible anymore, and Agree for person on Perf fails. Consequently, Perf will be realized at Spell out by the elsewhere form BE (cf. (5)).

Nested Agree is essential to derive the distribution of auxiliary selection in argument-structure-driven systems, because it allows the person probe on the head Perf to get past the subject of transitive verbs (leading to BE insertion in the presence of a reflexive argument), and to skip the subject of unaccusative verbs (causing BE insertion). In particular, the emergence of BE with unaccusative verbs cannot be derived by any other principle that is not based on feature ordering. As briefly discussed in footnote 4, *A-over-A* minimality leads to wrong predictions. Other specificity-driven principles such as *Multitasking* (van Urk & Richards 2015) do not help either, because in the case of unaccusative verbs the two possible goals for the two probes on Perf ([u π :_], [uInfl:perf]) are equally specific: DP_{subj} contains [π : α], *v* bears [Infl:_].

5. Cross-linguistic variation

The difference between argument-structure-driven auxiliary selection, as it exists in Standard Italian, and person-driven systems, as in other Italo-Romance varieties, arises by reordering of features (Georgi 2014:129). In those Southern Italian dialects where auxiliary selection is person-driven, the feature ordering on Perf is as in (12-b). Consequently, the person probe on Perf goes first and targets the DP_{subj} in Spec,*v*, which is the highest matching goal in the c-command domain.

- (12) a. Perf [uInfl:perf] \succ [u π :_] (π value from *v*) Italian
 b. Perf [u π :_] \succ [uInfl:perf] (π value from DP_{subj}) Southern dialects

In fact, when Perf enters the derivation, there is always a DP located in Spec,*v*: either the transitive/unergative subject, or the unaccusative object (under the assumption that *v* is a phase; in case this is not assumed, then Perf is able to reach the object in its base position, copying its person feature anyway). The lexical entries are specified for different π -values, reducing the difference within person-driven systems to morpho-phonology. For example, the *BBH* pattern (BE with first and second person subjects, HAVE with third person) of Ariellese and the opposite *HHB* pattern (HAVE with first and second person subjects, BE with third person) of the varieties spoken in Aliano and Morcone (Manzini & Savoia 2005:33) are due to the following lexical entries.

- (13) *Arielli*
 a. $/\sqrt{\text{HAVE}}/ \leftrightarrow \text{Perf}[\pi:-\text{part}]$
 b. $/\sqrt{\text{BE}}/ \leftrightarrow \text{Perf}$ elsewhere
- (14) *Aliano, Morcone*
 a. $/\sqrt{\text{HAVE}}/ \leftrightarrow \text{Perf}[\pi:+\text{part}]$
 b. $/\sqrt{\text{BE}}/ \leftrightarrow \text{Perf}$ elsewhere

6. Summary and outlook

In this paper I have argued that auxiliary selection is the result of Agree for the person feature. Argument-structure-based systems and person-driven systems are unified under the syntactic operation Agree. Cross-linguistic variation is derived by reordering of features and by language-specific vocabulary inventories. The present analysis can account for all cases of auxiliary selection in Standard Italian (among the cases left out from this paper: passives, quirky verbs, restructuring) and it is compatible with an analysis of past participle agreement based on edge features (Amato 2021).

I have also introduced the principle of Nested Agree: when a syntactic head triggers more than one operation, the search domains of these operations are relativized by their respective order. Nested Agree has further potential applications outside the domain of auxiliary selection: it can account for other cases of anti-minimality, such as multiple wh-questions in Bulgarian and subject agreement in the context of object shift in Spanish VOS clauses (Amato 2021).

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