Auxiliary selection by Nested Agree

Overview In this paper I address the problem of auxiliary selection, which is the alternation between BE and HAVE as auxiliaries in the perfect tense (Bjorkman 2011: 126). In Standard Italian, the form of the perfective auxiliary depends on the argument structure (Sorace 2000, Bjorkman 2011), whereas in many Southern Italo-Romance varieties it depends on the person feature of the subject (Tuttle 1986, Ledgeway 2019). I argue that auxiliary selection is the result of Agree for the person feature in both cases. The analysis is based on the principle of *Nested Agree*, a constraint on ordered operations that affects search domains. Nested Agree contributes to ongoing discussion on the conditions on Agree for multiple probes. Finally, I derive the cross-linguistic variation via reordering of features (Georgi 2014).

Data In Standard Italian, the perfective auxiliary is HAVE for transitive verbs (1-a), BE for unaccusative verbs (1-b). If the (in)direct object is the reflexive clitic *si*, the auxiliary switches to BE (2-a). The unexpected auxiliary BE emerges also with impersonal *si* (2-b).

(1) a. Maria ha lavato la mela.
Maria have.PRS.3SG wash.PRTC the apple
'Maria has washed the apple.'

b. Maria è caduta.
Maria be.PRS.3SG fall.PRTC
'Maria has fallen down.'

(2) a. Maria si=è lavata.
Maria SELF=be.PRS.3SG wash.PRTC
'Maria has washed herself.'

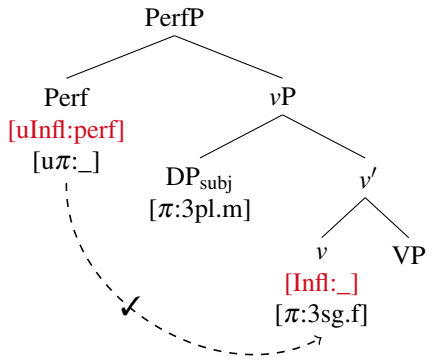
b. Si=sono mangiati gli spaghetti.
IMPERS=be.PRS.3PL eat.PRTC the spaghetti
'One has eaten the spaghetti.'

Differently, an example of person-driven system is Ariellese (D'Alessandro & Roberts 2010). With local person subjects the auxiliary is always BE, and with third person subjects HAVE, independently on the argument structure, even in reflexive clauses. Previous proposals for auxiliary selection consider either the external argument (Bjorkman 2011) or the features on *v* (D'Alessandro & Roberts 2010) as the constraining factor, failing to derive the switch in (2) (and in restructuring).

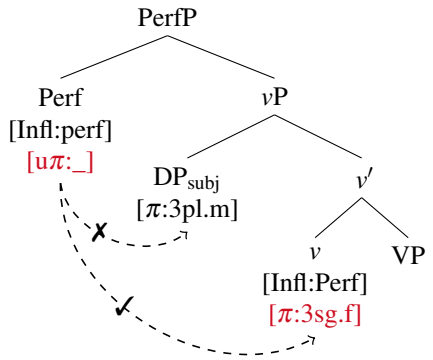
Analysis The Italian data show that the features of the arguments are relevant even in argument structure-based auxiliary selection. In transitive clauses, an object is present: the auxiliary is HAVE. If either there is no object (unaccusative verbs), or the object is ϕ-defective (reflexive, impersonal clitic pronouns), the auxiliary is BE. I propose that the head Perf (a functional head located between *v* and T, which brings in the perfective semantics) bears a person probe [uπ:_] and a probe valued for the perfective feature [uInfl:perf]. Evidence for [uInfl] is the form of the participle (Adger 2003). A probe (here marked with the diachritic [u]) is any feature that is able to initiate a search operation, independently of interpretability. In Italian, the person probe on Perf targets the π-feature of the object as it appears on *v* after Agree. However, a problem of minimality arises. The π-information on *v* is not local to the head Perf. At least the external argument intervenes as a closest goal. To solve this minimality problem, I propose a principle on ordered instances of Agree, *Nested Agree*, which stems from the combination of already proposed syntactic principles. Given the assumption that the features on the same head are extrinsically ordered (Müller 2009, Georgi 2014), Nested Agree states that a probe initiating an operation after another probe located on the same head should pick out the same goal as the preceding probe. If this is not possible, then the probe starts its search exactly from the goal of the previous operation, without going back to already skipped positions. Nested Agree contains a *Maximize* condition, similar to the principles of *Maximize Matching Effects* (Chomsky 2001: 15), *Multitasking* (Van Urk & Richards 2015: 132), *Economy condition on multiple probe satisfaction* (Pesetsky 2019: 27). It also contains a condition against *Backtracking*: if a head has already scanned a portion of structure for an operation, it

cannot go back to it for another operation. The order of the probes on Perf in Standard Italian is [uInfl:Perf] $\succ$ [uπ:_]. The effect of Nested Agree is shown in (5), (6).

(5) Step 1: Agree for [uInfl:_]



(6) Step 2: Nested Agree for [uπ:_]



In (5), Agree for [uInfl:_] on Perf targets the closest c-commanded matching goal, *v*. The second operation in (6) is Agree for [uπ:_]: [uπ:_] searches into *v*, exploiting the already established Agree-Link between Perf and *v*. If *v* contains [π], Agree stops. Otherwise, [uπ:_] goes on downwards from this more embedded position, without going back to items higher than *v*. Hence, a potential intervener (the subject) lies outside of the search domain of the probe ([uπ] on Perf), if its domain has been "reduced" by a previous operation ([uInfl] on Perf).

Perf is realized as HAVE whenever Agree has succeeded. This happens in transitive and unergative clauses (I assume that unergative verbs select a covert cognate object with syntactic features valued as default (Hale & Keyser 1993)). The unmarked BE emerges because of failed Agree or Agree with π-defective elements. The former is the case of unaccusatives: assuming that defective *v* is not a probe for the π-feature, no c-commanded matching goal is found by Perf. In fact, if all *v*s are phases (Legate 2005), the object has already moved to spec,*v* because of its unchecked case feature (and its trace is not accessible due to the Phase Impenetrability Condition). The latter is the case of reflexive *si*: assuming that the reflexive pronoun enters the derivation with an unvalued π-feature, Agree on transitive *v* for [uπ:_], and consequently on Perf, fails to copy a value. I also propose a similar analysis for impersonal *si* as bearing an unvalued person feature. In the lexical entries in (7), π on Perf is realized as root selection (not as inflection), and α represents any person value.

(7) a. /$\sqrt{\text{HAVE}}$/ $\leftrightarrow$ Perf[π:α] b. /$\sqrt{\text{BE}}$/ $\leftrightarrow$ Perf (elsewhere)

I argue that cross-linguistic variation arises by reordering of features (Georgi 2014: 129). In the Southern dialects (8-b), the person probe on Perf goes as first and it targets the DP_{subj} in spec,*v*.

(8) a. Perf [uInfl] $\succ$ [uπ] : π value from *v* Standard Italian
b. Perf [uπ] $\succ$ [uInfl] : π value from DP_{subj} Southern dialects

Different Southern varieties are characterized by different vocabulary entries. Here is Ariellese (9).

(9) a. /$\sqrt{\text{HAVE}}$/ $\leftrightarrow$ Perf[π:-part] b. /$\sqrt{\text{BE}}$/ $\leftrightarrow$ Perf (elsewhere)

Outlook The analysis can account for auxiliary selection in Standard Italian both in root clauses and in restructuring and it is compatible with an analysis of Italian participle agreement based on edge features. I also predict the existence of argument-structure driven systems with further person restriction (*mixed systems*, (Loporcaro 2007)), analysed with contextually sensitive vocabulary entries. In contrast, person-driven systems can never encode argument-structure dependencies (Ledgeway 2019), because of minimality. Nested Agree can be applied to further phenomena, such as multiple wh-fronting in Bulgarian and subject agreement in VOS structures in Spanish.

References • Bjorkman, B. A. M. (2011) *BE-ing default: The morphosyntax of auxiliaries*, PhD thesis, MIT. • Chomsky, N. (2001) *Derivation by Phase*, In: Ken Hale. A Life in Language. Cambridge, Mass., MIT Press, 1-52 • D'Alessandro, R. & I. Roberts (2010), *Past participle agreement in Abruzzese: split auxiliary selection and the null-subject parameter*, NLLT 28(1), 41-72 • Georgi, D. (2014) *Opaque interactions of Merge and Agree: On the nature and order of elementary operations*, PhD thesis, University of Leipzig. • Ledgeway, A. (2019), *Parameters in the development of Romance perfective auxiliary selection*, In: Historical Linguistics 2015: Selected papers from the 22nd International Conference on Historical Linguistics, 343-384. • Loporcaro, M. (2007), *On triple auxiliation in Romance*, Linguistics 45(1), 173âĂŞ222. • Pesetsky, D. (2019), *Exfoliation: towards a derivational theory of clause size*, https://ling.auf.net/lingbuzz/004440.