

Auxiliary selection by Nested Agree

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INTERACTION OF
GRAMMATICAL
BUILDING BLOCKS

The goal of this talk

- Auxiliary selection: alternation of BE/HAVE in the perfect tense (Perlmutter 1978; Kayne 1993; Sorace 2000; Bjorkman 2011)

(1) *Ieri* *ho* *mangiato una torta.*
yesterday **have**.PRS.1SG eat.PRTC a cake
'Yesterday I have eaten a cake.'

- argument-structure-driven systems (French, Italian)
- person-driven systems (Southern Italian dialects)
- ➔ In both types, the features of the arguments count (cf. reflexive and impersonal clauses in Italian)
- ? How does auxiliary selection work in Italian and in other languages?
- Analysis couched in Minimalism (Chomsky 2000, 2001) and Distributed Morphology (Halle & Marantz 1993; Halle 2000)
 - compatible with participle agreement (Amato 2021)
 - extended to Italian restructuring (Amato 2021)

Argument-structure-driven systems

- Sorace (2000); McFadden (2007); Bjorkman (2011)

- (2) a. *Maria è cadut-a.*
Maria **be**.PRS.3SG fall.PRTC-SG.F
'Maria has fallen down.' unacc: **BE**
- b. *Maria ha lavato la camicia.*
Maria **have**.PRS.3SG wash.PRTC the shirt
'Maria has washed the shirt.' trans: **HAVE**
- c. *Maria si=è lavat-a.*
Maria SELF=**be**.PRS.3SG wash.PRTC-SG.F
'Maria has washed herself.' refl: **BE**
- d. *Maria si=è lavat-a la camicia.*
Maria SELF=**be**.PRS.3SG wash.PRTC-SG.F the shirt
'Maria has washed her shirt.' refl: **BE**
- e. *Si=sono mangiat-i gli spaghetti.*
IMPERS=**be**.PRS.3PL eat.PRTC-PL.M the spaghetti
'One has eaten the spaghetti.' impers: **BE**

Person-driven systems

- Tuttle (1986); Kayne (1993); Ledgeway (2019)
- Ariellese: **BBH** (D'Alessandro & Roberts 2010: 43-44)

(3) a. *Ji so' fatte na torte.*
1 SG.NOM **be**.PRS.1 SG make.PRTC a cake
'I have made a cake.'

b. *Ji so' cascate.*
1 SG.NOM **be**.PRS.1 SG fall.PRTC
'I have fallen down.'

1st, 2nd: **BE**

c. *Esse a fatte na torte.*
3 SG.F.NOM **have**.PRS.3 SG make.PRTC a cake
'She has made a cake.'

d. *Esse a cascate.*
3 SG.F.NOM **have**.PRS.3 SG fall.PRTC
'She has fallen down.'

3rd: **HAVE**

The claim

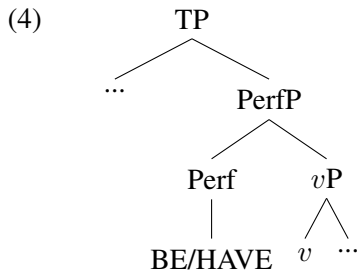
- Auxiliary selection is the result of person-Agree in both systems
- Same syntax in closely related varieties
- Differences due to feature ordering on Perf⁰ + Vocabulary Items

Nested Agree (Amato 2020, 2021)

If the features on a head are ordered, the domain of each operation is reduced by the application of the previous operation triggered by the same head.

Argument-structure-driven systems

The syntactic structure

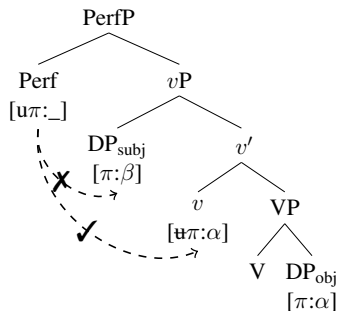


- Perf bears a probe for person [$u\pi: _$] (D'Alessandro & Roberts 2010; D'Alessandro 2017) and an [Infl] feature (Adger 2003).
- [$u\text{Infl:perf}$] assigns the value *perfect* to *v* (the lexical verb is realized as a past participle).
- A probe [uF] is a feature that can initiate an Agree operation (partially following Pesetsky & Torrego (2007)).
- Agree: (i) feature matching, (i) c-command, (iii) minimality.

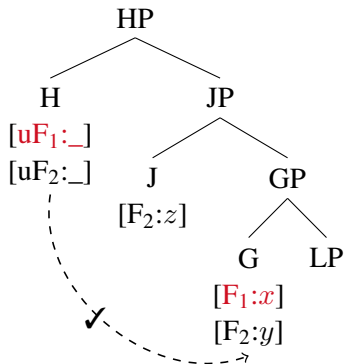
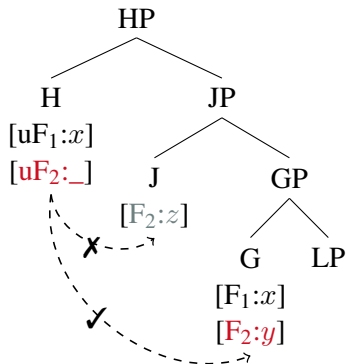
Standard Italian: a problem of minimality

- ➔ We need to track both the information on argument structure (v) and the features of the arguments (DP_{obj}):
 - object (transitive): **HAVE**
 - no object (unaccusative): **BE**
 - ϕ -defective object (reflexive): **BE**
- Perf agrees with v , which agrees with the DP_{obj} .
- \sim Cyclic Agree (Legate 2005).
- ☞ The π -information on v is not local to the head Perf: DP_{subj} intervenes.
- ☞ Solution: **Nested Agree**

(5)



Nested Agree (Amato 2020, 2021)

Feature ordering on H: $[uF_1:_]\succ [uF_2:_]$ (6) Agree for $[uF_1:_]$ (7) Nested Agree for $[uF_2:_]$ 

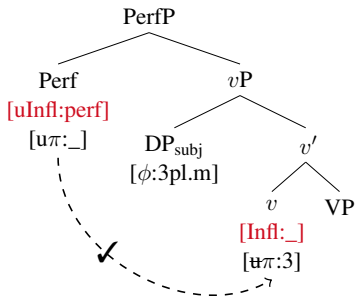
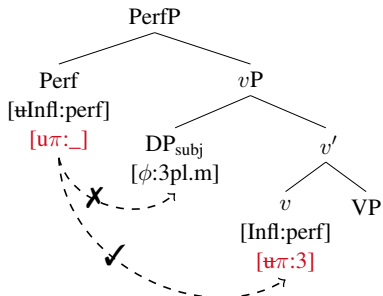
Nested Agree (Amato 2020, 2021)

- (8) 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) *Maximize*: 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) *Move-on*: 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).
- Assumption: the features on the same head are extrinsically ordered (Heck & Müller 2007; Müller 2009; Georgi 2014).
 - Nested Agree is similar to (but not identical): *Maximize Matching Effects* (Chomsky 2001: 15), *Multitasking* (Van Urk & Richards 2015: 132), *Economy condition on multiple probe satisfaction* (Pesetsky 2019: 27).

Standard Italian

(9) Perf: [uInfl:perf] \succ [u π :_]

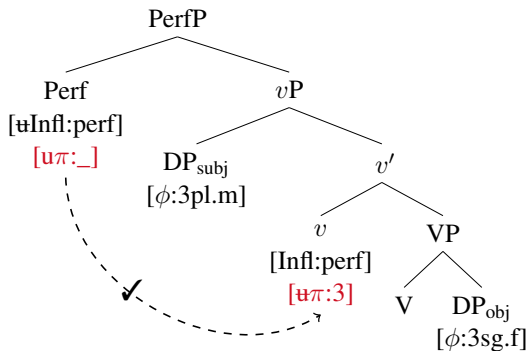
Step 1: Agree for [uInfl:perf]

Step 2: Nested Agree for [u π :_]

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

(π on Perf are realized as root selection,
 not as inflection)

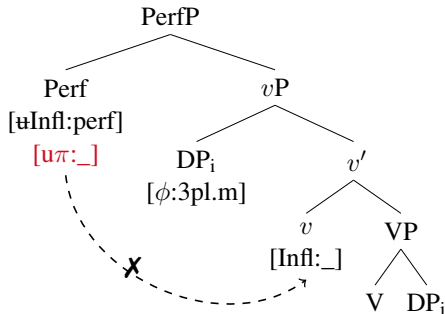
(11) Transitive verb



- Unergative verbs are transitive verbs (Hale & Keyser 1993).
- Transitive, unergative *v*: probe for π -feature (Chomsky 2000, 2001).
- $/\sqrt{\text{HAVE}}/ \leftrightarrow \text{Perf}[\pi:\alpha]$

The emergence of the unmarked

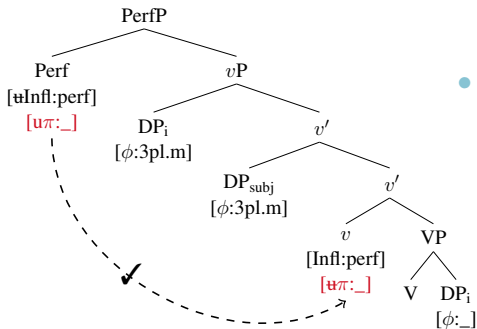
(12) Unaccusative verb



- Failed Agree (Preminger 2014)
- / $\sqrt{\text{BE}}$ / \leftrightarrow Perf elsewhere

- Unaccusatives: *v* is not a π -probe (Chomsky 2000, 2001)
- All *vs* are phases (Chomsky 2001; Legate 2003; Müller 2010; Abels 2012; Heck 2016) + *Phase Impenetrability Condition* (Chomsky 2000): internal argument moves to the edge

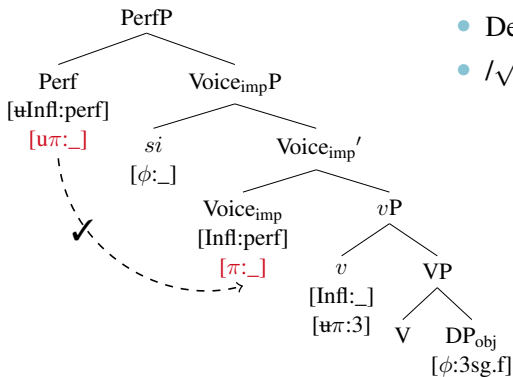
(13) Reflexive verb



- When v probes, reflexive clitic not bound yet: no π -value Agree on v
- $/\sqrt{\text{BE}}/ \leftrightarrow$ Perf elsewhere

- Reflexive clauses are transitive clauses (Reinhart & Siloni 2004; Alexiadou, Anagnostopoulou & Schäfer 2015).
- Reflexive clitics enter the derivation with unvalued ϕ -features (Reuland 2005; Heinat 2006; Rooryck & Vanden Wyngaerd 2011).

(14) Impersonal verb



- Voice_{imp}: [Infl:_], [π:_]
- Defective intervention
- /√BE/ ↔ Perf elsewhere

- Impersonal *si* bears some valued features (Cinque 1988; Dobrovie-Sorin 1998; D'Alessandro 2007): unvalued [π] feature.
- It must be licensed by a special Voice_{imp} (Legate 2014; Alexiadou et al. 2015).

Person-driven systems

Typology

- Cross-linguistic variation arises by reordering of operation-inducing features (Georgi 2014: 129).

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

Person-driven systems

- Auxiliary depends on the person feature of the subject.
- Person-Agree between Perf and DP_{subj} (D'Alessandro 2017).
- Not only BBH:

| | 1sg | 2sg | 3sg | 1pl | 2pl | 3pl |
|-------------|-----|-----|-----|-----|-----|-----|
| L'Aquila | B | B | H | B | B | H |
| Vasto | H | B | B~H | H | H | H |
| Introdacqua | H | B | H | H | H | H |
| Notaresco | B | H | H | H | H | H |

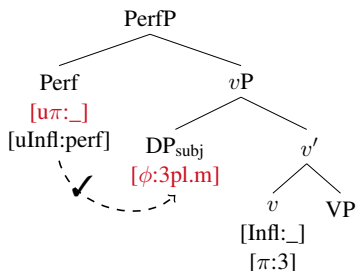
Table: Variation in auxiliary selection in Abruzzo (Loporcaro 2001).

- Variation due to lexical entries (D'Alessandro 2017).
- Contra split ergativity accounts (Kayne 1993; Manzini & Savoia 1998; D'Alessandro & Roberts 2010; Coon & Preminger 2012).

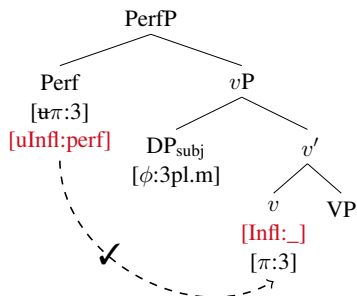
Arielli

(16) Perf: $[u\pi: _] \succ [u\text{Infl}: \text{perf}]$

Step 1: Agree for $[u\pi: _]$



Step 2: Nested Agree for $[u\text{Infl}: \text{perf}]$



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

(HAVE with 3 person subject)

- Prediction: the auxiliary is not be sensitive to the features of the object.
- ➔➔ Borne out: reflexives BBH.

- (18) a. *Me=so* *llavate.*
 self.1SG.ACC=**be**.PRS.1SG wash.PRTC
 ‘I washed myself.’
- b. *Marije s=a* *llavate.*
 Maria self.3SG.ACC=**have**.PRS.3SG wash.PRTC
 ‘Maria washed herself.’ (R. D’Alessandro, p.c.)
- (19) a. *Me=so* *llavate li vistite.*
 self.1SG.DAT=**be**.PRS.1SG wash.PRTC the clothes
 ‘I washed my clothes.’
- b. *Marije s=a* *llavate li*
 Maria self.3SG.DAT=**have**.PRS.3SG wash.PRTC the
vistite.
 clothes
 ‘Maria washed her clothes.’ (R. D’Alessandro, p.c.)

Mixed systems

Mixed systems

- Languages where auxiliary selection depends both on the subject and on the argument structure.
 - Abruzzo, Marche: Tufillo, Pietransieri, Amandola, Ortezzano (Manzini & Savoia 2005; Legendre 2010; D'Alessandro & Roberts 2010).
 - Generally interpreted as person-based systems (Loporcaro (2001, 2007)).
- ☞ Whenever there is a dependency on argument structure, auxiliary selection is argument-structure-driven.

Tufillo

- (20) Transitive, unergative verbs
- a. *Sɔ* *parl'æ:tə*.
 be.PRS.1SG talk.PRTC
 'I have talked.'
- b. *Si* *parl'æ:tə*.
 be.PRS.2SG talk.PRTC
- c. *ya* *parl'æ:tə*.
 have.PRS.3SG talk.PRTC
- (21) Unaccusative verbs
- a. *Sɔ* *mmə'neutə*.
 be.PRS.1SG come.PRTC
 'I have come.'
- b. *Si* *mmə'neutə*.
 be.PRS.2SG come.PRTC
- c. *ε* *mmə'neutə*.
 be.PRS.3SG come.PRTC

(Manzini & Savoia 2005: II: 690-691)

| | 1sg | 2sg | 3sg | 1pl | 2pl | 3pl |
|------------------------|-----|-----|-----|-----|-----|-----|
| transitive, unergative | B | B | H | B | B | H |
| unaccusative | B | B | B | B | B | B |
| reflexive | B | B | B | B | B | B |

Table: Auxiliary selection in Tufillo.

- Evidence: reflexive verbs as unaccusative verbs.
- In person-driven systems, reflexive verbs as transitive verbs.

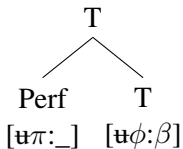
(22) *Tufillo*

- a. $M\theta = s\theta$ *arra'væ:tə.*
 1SG.ACC=**be**.PRS.1SG wash.PRTC.SG
 'I have washed myself'
- b. $T\theta = si$ *arra'væ:tə.*
 2SG.ACC=**be**.PRS.2SG wash.PRTC.SG
- c. $Ts = \varepsilon$ *arra'væ:tə.*
 3SG.ACC=**be**.PRS.3SG wash.PRTC.SG

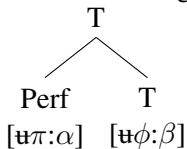
(Manzini & Savoia 2005: II: 690)

- Perf head-moves to T.
- Argument-structure-driven systems: Perf [uInfl] \succ [u π]
- Perf π -agrees with v .
- T π -agrees with the DP_{subj}.

(23) Unaccusative, reflexive



(24) Transitive, unergative



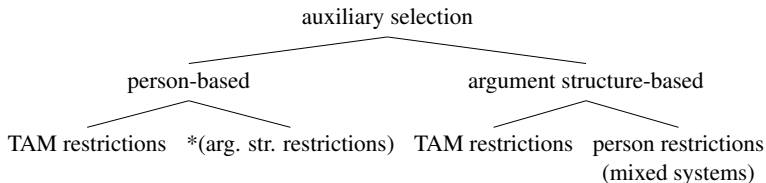
- Contextually sensitive vocabulary entries:

- (25)
- a. $/\sqrt{\text{HAVE}}/ \leftrightarrow \text{Perf}[\pi: \alpha] / \text{T}[\phi: \text{-part}]$
 - b. $/\sqrt{\text{BE}}/ \leftrightarrow \text{Perf elsewhere}$

Interactions between systems

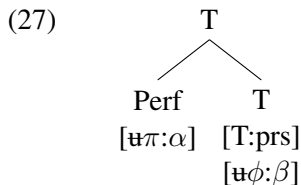
- Person-driven auxiliary selection never depends on argument structure restrictions, whereas the opposite is possible (Ledgeway 2019: 352-353)

(26)



- Explanation lies in Agree and in head-movement of Perf to T:
 - person-driven systems without argument-structure-restrictions: minimality.
 - argument-structure-driven systems with person restrictions: ϕ -features on T.

Argument-structure-driven systems



- Perf agrees with v
- T agrees with the DP_{subj}
- Contextually sensitive vocabulary entries

(28) Pure argument-structure-system:
Standard Italian

- $/\sqrt{\text{HAVE}}/ \leftrightarrow \text{Perf}[\pi:\alpha]$
- $/\sqrt{\text{BE}}/ \leftrightarrow \text{Perf elsewhere}$

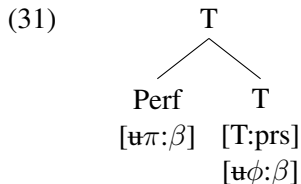
(29) TAM restrictions:
Procida (Ledgeway 2000: 624-626)

- $/\sqrt{\text{HAVE}}/ \leftrightarrow \text{Perf}[\pi:\alpha] / \text{T}[\text{T:prs}]$
- $/\sqrt{\text{BE}}/ \leftrightarrow \text{Perf elsewhere}$

(30) Person restrictions:
Tufillo (Manzini & Savoia 2005: 690)

- $/\sqrt{\text{HAVE}}/ \leftrightarrow \text{Perf}[\pi:\alpha] / \text{T}[\pi:-\text{part}]$
- $/\sqrt{\text{BE}}/ \leftrightarrow \text{Perf elsewhere}$

Person-driven systems



(32) TAM restrictions:
Arielli (D'Alessandro & Roberts 2010)

- a. $/\sqrt{\text{HAVE}}/ \leftrightarrow \text{Perf}[\pi:-\text{part}]$
- b. $/\sqrt{\text{BE}}/ \leftrightarrow \text{Perf}$ elsewhere
- c. $/\sqrt{\text{HAVE}}/ \leftrightarrow \text{Perf} / \text{T}[\text{T:subj}]$

- Same π -feature on Perf and T
- Impossible to have more fine-grained person distinctions because of **minimality**.
- if Perf probes the DP_{subj} , it cannot reach v .

Conclusion

- Auxiliary selection is π -Agree.
- Cross-linguistic variation: ordering of features + Vocabulary Items.
- Argument structure driven-systems:
 - BE inserted if: either failed Agree or Agree with ϕ -defective items.
 - Possible further person restrictions on T (mixed systems).
- Person-driven systems:
 - Auxiliary selection never influenced by argument structure (minimality).
- Auxiliary selection is the same syntactic process in all languages.
- Ordered instances of Agree are subject to the principle of Nested Agree.

Thank you!

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Appendix I: participle agreement

- In Standard Italian, participle agreement is a morphological reflex of A-movement (Kayne 1989; Déprez 1998; Belletti 2005; D’Alessandro & Roberts 2008; Longenbaugh 2019)

- (33) a. *Maria è* *uscit-a.*
 Maria **be**.PRS.3SG go.out.PRTC-SG.F
 ‘Maria has gone out.’
- b. *Maria l=ha* *lavat-a.*
 Maria 3SG.F.ACC=**have**.PRS.3SG wash.PRTC-SG.F
 ‘Maria has washed her/it.’
- c. *Maria si=è* *lavat-a.*
 Maria SELF=**be**.PRS.3SG washed.PRTC-SG.F
 ‘Maria has washed herself.’
- (34) a. A-movement (either overt or covert) → Agree
 b. no Agree → no A-movement (either overt or covert)

- Every v is a phase (Chomsky 2001; Legate 2003).
- XP with unvalued features must move to the edge of the phase (PIC) (Chomsky 2000).
- Edge features are inserted on v to trigger successive cyclic movement (Chomsky 2001; Müller 2010; Abels 2012).
- Proposal: gender and number probes on the edge feature (EF).

(35) EF: [uF] \succ [u#], [u γ] \succ [\cdot F \cdot]

- Past participle morphology is the Spell-out of these features on v .
- Participle agreement with in-situ unaccusative argument: covert A-movement (tests: control into an infinitival adjunct clause, binding of possessives, and scope interactions between quantifiers).
- No interaction with auxiliary selection: the EF inserts a [#] and [γ] probe, while Perf is sensitive to [π].

Different sources for participle agreement:

- Italian: EF
- Old Italian: EF + u[ϕ] on transitive v (object agreement)
- Arielli: relativized probe [u(#:pl):_] (Béjar 2003; Béjar & Rezac 2009; Nevins 2007; Preminger 2014)
 - either on v + cyclic expansion (Béjar & Rezac 2009),
 - or on higher Part⁰

Participle agreement and auxiliary selection are independent phenomena (Manzini & Savoia 2005, 2007; Legendre 2010; Loporcaro 1998, 2016).

| language | participle | why | auxiliary | why |
|---------------------------------|------------------------------------|----------------------|-------------------------|---|
| Italian | with DP _{unacc} , clitics | EF[u#,u γ] | arg. str. split | [uInfl] \succ [u π] |
| Ortezzano, Servigliano | with DP _{unacc} , clitics | EF[u#,u γ] | mixed split | [uInfl] \succ [u π] + [ϕ] |
| Pescocostanzo | with DP _{unacc} , clitics | EF[u#,u γ] | pers. split | [u π] \succ [uInfl] |
| Carmiano? | with DP _{unacc} , clitics | EF[u#,u γ] | 1 aux or free variation | lexicon |
| Old Italian | with DP _{obj} or others | [u ϕ] | arg. str. split | [uInfl] \succ [u π] |
| Tufillo | with DP _{obj} or others | [u ϕ] | mixed split | [uInfl] \succ [u π] + [ϕ] |
| Arielli, Genzano | with DP _{obj} or others | [u ϕ] | pers. split | [u π] \succ [uInfl] |
| Trebisacce, Castrovillari | with DP _{obj} or others | [u ϕ] | 1 aux or free variation | lexicon |
| | with clitics | clitic reduplication | arg. str. split | [uInfl] \succ [u π] |
| | with clitics | clitic reduplication | mixed split | [uInfl] \succ [u π] + [ϕ] |
| Viticuso? | with clitics | clitic reduplication | pers. split | [u π] \succ [uInfl] |
| Catanzaro, Catalan | with clitics | clitic reduplication | 1 aux or free variation | lexicon |
| Ranrupt (Gallo-Romance)? | no | no | arg. str. split | [uInfl] \succ [u π] |
| Secinaro, Colledimacine | no | no | mixed split | [uInfl] \succ [u π] + [ϕ] |
| Acquafondata | no | no | pers. split | [u π] \succ [uInfl] |
| Calascibetta, Montebello Ionico | no | no | 1 aux or free variation | lexicon |

Table: Participle agreement and auxiliary selection

Appendix II: previous analyses of auxiliary selection

- Only the external argument counts (Bjorkman 2011).
- Only the argument structure as encoded by v counts (D'Alessandro & Roberts 2010).
 - BE with reflexive and impersonal clauses,
 - optional auxiliary switch in restructuring,
 - cross-linguistic variation.
- Lexico-aspectual constraints that derive the Auxiliary selection hierarchy (Legendre 2007).
- Obsolete assumptions (Kayne 1993; Cocchi 1995).

Appendix III: Auxiliary selection hierarchy

- Different categorizations of verbs along a cline of intransitivity (Sorace 2000, 2004).
- Unaccusativity Hypothesis (Perlmutter 1978; Burzio 1986).
- Given the position of a verb on the cline, the verb is merged into a particular argument structure.
- Given the syntactic structure, one or the other auxiliary is chosen as the realization of the terminal node Perf.

| | |
|-------------------------------------|------|
| change of location | BE |
| change of state | |
| continuation of a preexisting state | |
| existence of state | |
| uncontrolled process | |
| controlled process (motional) | |
| controlled process (non-motional) | HAVE |

Table: Auxiliary selection hierarchy

Appendix IV: Against A-over-A minimality

- A-over-A: XP bears the same features of X (Chomsky 1964; Hornstein 2009; Roberts 2010)
- Order of probing: (i) XP=X, (ii) spec,X, (iii) comp,X
- Perf probes (i) $vP=v$, (ii) DP_{subj} , (iii) DP_{obj}
- ☞ It cannot account straightforwardly for the difference between person-based and argument-structure based systems.
- ☞ Unaccusatives cannot be derived!
 - 1 Perf probes vP (defective v): Agree fails
 - 2 Perf probes the DP in spec, v : Agree succeeds
 - 3 HAVE is inserted
- If Perf raises the DP out of the way via a [D]-feature
- ☞ This violates the Strict Cycle Condition
- ☞ Different feature ordering among heads

Appendix V: Nested Agree and other principles

- (36) 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) *Maximize*: 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) *Move-on*: 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).
- *Maximize* is similar to:
 - *Maximize Matching Effects (MME)* (Chomsky 2001),
 - *General Specificity Principle (GSP)* (Lahne 2012),
 - *Multitasking (MT)* (Van Urk & Richards 2015),
 - *Economy condition on multiple probe satisfaction* (Pesetsky 2019).

Nested Agree is different because:

- not specificity-driven
 - not transderivational
 - *Move-on*
 - possible (apparent) minimality violations (cf. also *Principle of Minimal Compliance* (Richards 1998), or *Agree-Link* (Arregi & Nevins 2012))
- ☞ It results from the combination of different principles: (i) feature ordering, (ii) MME, (iii) downward Agree

Other applications of Nested Agree (Amato 2021)

- Subject agreement on T across Perf (Italian).
- Subject agreement on T in SOV structures (Spanish, Italian).
- Subject agreement on T across an intervening dative (Icelandic, Italian).
- Absolutive case assignment across the subject in ergative languages.
- Multiple wh-fronting with order preserving movement (Bulgarian).
- Movement of a lower XP across an higher one (adverbials).