

Cyclic Agree (Béjar & Řezáč 2009)

Kongruenz und die Syntax-Morphologie-Schnittstelle

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Outline

- 1 Introduction
- 2 Person Hierarchy Effects
- 3 Cyclic Agree
 - Cyclic Agree and hierarchies
 - Conditions on Agree
 - Derivations
 - Second cycle effects
- 4 Added Probe (head marking)
- 5 Summary
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Goals and claims

- derivation of hierarchy effects found in verbal agreement within the minimalist program
- derivation of cross-linguistic variation with respect to the person hierarchy
- cyclic application of syntactic operations + decomposition of ϕ -features + conditions on valuation derive hierarchy effects
- extension of the analysis to direction marking and case splits

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Hierarchy-sensitive agreement

Guaraní (Gregores & Suárez 1967):

- active alignment of verbal agreement (prefixes)
- hierarchy in transitive contexts: $1 \succ 2 \succ 3$

Hierarchy-sensitive agreement

(1) *Intransitive verb, external argument:*

	sg	pl
1	a-	ro-
2	re-	pe-
3	o	

(2) *Intransitive verb, internal argument:*

	sg	pl
1	je-	ore-
2	ne-	pene-
3	i	

(3) *A part of the transitive paradigm:*

DP _{ext} \ DP _{int}	1sg	1pl	2sg	3
1pl			ro-	ro-
2sg	je	ore-		re-
2pl	je	ore-		pe-
3	je	ore-	ne-	o-

Agreement Displacement I

(4) *Basque:*

- a. ikusi z-in-t-u-da-n
 seen 2-x-PL-have-1-PAST
 'I saw you' $1 \rightarrow 2 = 2$
- b. ikusi n-ind-u-en
 seen 1-x-have-PAST
 'He saw me' $3 \rightarrow 1 = 1$
- c. ikusi n-ind-u-zu-n
 seen 1-x-have-2-PAST
 'You saw me' $2 \rightarrow 1 = 1$
- d. ikusi n-u-en
 seen 1-have-PAST
 'I saw him' $1 \rightarrow 3 = 1$

Observations

- EA and IA can control agreement, but only one agreement slot
- controller cannot be determined by its GF
- no unique person hierarchy can determine the controller (1>2 and 2>1 would be needed, cf. (1-a) and (1-c))

Generalizations

- preference for agreement with IA if it is 1/2
- agreement with EA only if IA = 3rd person (agreement displacement)
- failure of IA agreement feeds EA agreement
- same pattern in Itelmen (Chukotko-Kamchatkan), Georgian (Caucasian), Karuk (Hokan), Mordvin (Uralic), cf. Béjar (2003)

Agreement Displacement II

(5) Mordvin (Béjar (2003)):

Obj Subj	1sg	2sg	3sg	1pl	2pl	3pl
1sg	—	-t -n 2 1	-a(n) 1	—	-t -iz 2 pl	-iz -n pl 1
2sg	-m -k 1 2	—	-k 2	-m-iz 1 pl	—	-iz -t pl 2
3sg	-m -m 1 1	-nze -t 3 2	-ze 3	-m -iz 1 pl	-t -iz 2 pl	-iz -nze pl 3
1pl	—	-t -iz 2 pl	-iz -nek pl 1	—	-t -iz 2 pl	-iz -nek pl 1
2pl	-m -iz 1 pl	—	-iz -ŋk pl 2	-m -iz 1 pl	—	-iz -ŋk pl 2
3pl	-m -iz 1 pl	-t -iz 2 pl	-iz -∅ pl 3	-m -iz 1 pl	-t -iz 2 pl	-iz -∅ pl 3

Basic idea of Béjar & Řezáč 2009

- only one probe in syntax, can potentially Agree with two arguments
- probes with different feature structures which gives rise to different valuation potentials
- a preference for Agree with the IA which values the probe as much as it can
- contribution of EA is restricted (only if IA left something over to agree with); i.e., Agree with IA may *bleed* Agree with EA
- no direct IA-EA interaction

Two main ingredients and their implementation

- preference for Agree with the IA: derives from cyclicity
- encoding of hierarchies: decomposition of person features

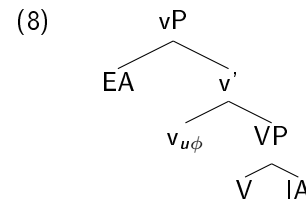
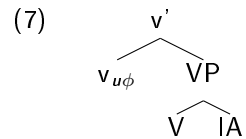
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Preference of Agree with IA

- Bleeding indicates that the ϕ -probe is low (on v) and has only IA in its search space at a certain point in the derivation.
- Given **incremental structure-building** that proceeds in a bottom-up fashion in conjunction with the **Earliness Principle** this derives the preference for IA-agreement in (6).

(6) $[_{vP} EA [_{v\phi} [_{VP} IA]]]$



Encoding of hierarchies I: $1 \succ 2 \succ 3$

The person features [1, 2, 3] are complex objects which consist of a bundle of privative features.

(9) *Privative person features:*
 $\underbrace{\begin{matrix} 1st\ person & 2nd\ person & 3rd\ person \\ [speaker] \hat{=} [Speak] \end{matrix}}_{[participant] \hat{=} [Part]} \underbrace{\hspace{10em}}_{[person] \hat{=} [\pi]}$

(10) 1st: $\begin{bmatrix} [\pi] \\ [Part] \\ [Speak] \end{bmatrix}$ 2nd: $\begin{bmatrix} [\pi] \\ [Part] \end{bmatrix}$ 3rd: $[[\pi]]$

(11) 1st: $\begin{bmatrix} [3] \\ [2] \\ [1] \end{bmatrix}$ 2nd: $\begin{bmatrix} [3] \\ [2] \end{bmatrix}$ 3rd: $[[3]]$ (representation in what follows)

Encoding of the hierarchy in person features

Person values which are high on a scale are represented by a superset of the features of values which are lower on the same scale (entailment relations).

Encoding of hierarchies II: $2 \succ 1 \succ 3$

(12) *Privative person features:*
 $\underbrace{\begin{matrix} 2nd\ person & 1st\ person & 3rd\ person \\ [addressee] \hat{=} [Addr] \end{matrix}}_{[participant] \hat{=} [Part]} \underbrace{\hspace{10em}}_{[person] \hat{=} [\pi]}$

(13) 2nd: $\begin{bmatrix} [\pi] \\ [Part] \\ [Addr] \end{bmatrix}$ 1st: $\begin{bmatrix} [\pi] \\ [Part] \end{bmatrix}$ 3rd: $[[\pi]]$

(14) 2nd: $\begin{bmatrix} [3] \\ [1] \\ [2] \end{bmatrix}$ 1st: $\begin{bmatrix} [3] \\ [1] \end{bmatrix}$ 3rd: $[[3]]$

Variation on probes

(15) *Structure of the probe:*

flat	partially articulated	fully articulated
[u3]	$\begin{bmatrix} [u3] \\ [u2] \end{bmatrix}$	$\begin{bmatrix} [u3] \\ [u2] \\ [u1] \end{bmatrix}$
no HE	1/2 > 3	1 > 2 > 3

↔ The hierarchy is determined by the structure of the probe, the feature structure of the goals is uniform throughout languages with different hierarchies.

Agree operation

- (16) Agree between a probe P and a goal G obtains if
- P bears at least one uninterpretable probe feature [uF] and thereby seeks a matching interpretable feature [F] of G
 - P c-commands G
 - G is the closest goal to P
 - G has a matching feature
 - As a result of Agree, G checks the uninterpretable features of P.

Additional assumptions

- Feature: $\begin{bmatrix} [segment] \\ [segment] \end{bmatrix}$
- Probes need to enter into Agree (Full Interpretation).
- Each probe segment probes separately and seeks for a matching segment on the closest goal.
- The probe fulfills Full Interpretation if at least one of its segments enters into Agree, i.e., not all probe segments have to find a matching goal segment.
- Agree = deactivation of the segment [uF] on P that found a matching goal segment + copying of all segments of G to v. (Agree is thus a mixture of checking and valuation!)
- Remaining active segments of the probe are deleted per default.

(17) *Agreement potentials of different probes with the IA:*

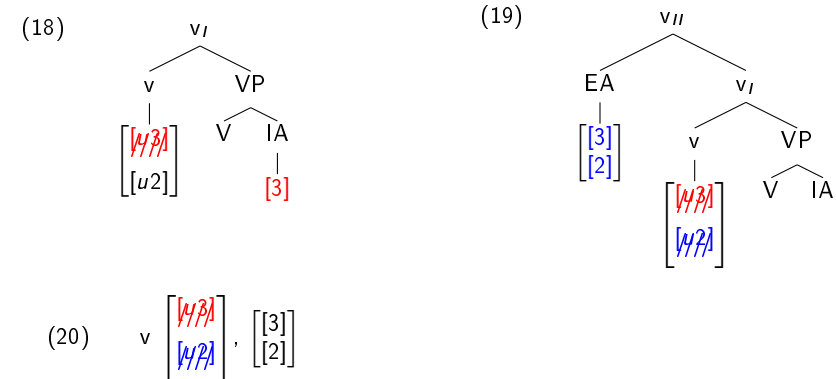
	v	DP	v	DP	v	DP
flat	[u3]	— [3]	[u3]	— [3] [2]	[u3]	— [3] [2] [1]
partially articulated	v	DP	v	DP	v	DP
	[u3]	— [3]	[u3]	— [3] [2]	[u3]	— [3] [2] [1]
fully articulated	v	DP	v	DP	v	DP
	[u3]	— [3]	[u3]	— [3] [2]	[u3]	— [3] [2] [1]
			[u2]	— [2]	[u2]	— [2] [1]
			[u1]	— [1]	[u1]	— [1]

Cyclic expansion of the search space

If the probe still has active segments after Agree with IA, the probe is projected and can enter into Agree with EA.

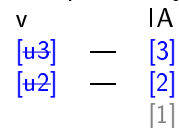
- Agree with IA: first cycle Agree
- Agree with EA: second cycle Agree

Agreement displacement: $1/2 \succ 3$



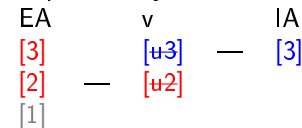
Basque: partially articulated probe

(21) *Local person object:*



IA controls agreement, no probe features left for Agree with EA.
 Agree v – IA *bleeds* Agree v – EA

(22) *3rd person object:*



The probe still has unvalued segments after Agree with IA; if EA is local person it controls agreement.

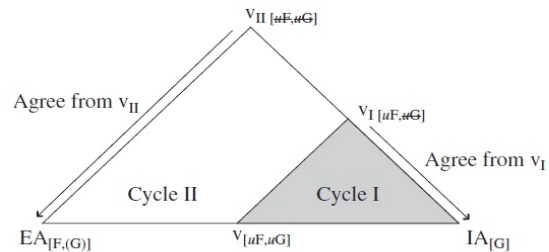
Discussion

- Agree requires c-command
- c-command v – EA is achieved by projection of the ϕ -probe to v'
- B & R: Agree v_I – IA, Agree v_{II} – EA
- But: v_I does not c-command IA and v_{II} does not c-command EA if sisterhood is defined over syntactic tree structures!
- Alternatives:
 - (i) Agree v – IA, v' – EA
 - (ii) v agrees with IA and EA under m-command (problematic for 1st/2nd cycle morphology)

Discussion

Agree $v_I - IA$, Agree $v_{II} - EA$ is possible because B & R define sisterhood over sets created by Merge:

“Under the bare phrase structure approach, but assuming labels in syntax, Merge of v with VP creates $\{v, \{v, VP\}\}$. x is the sister of y if and only if $x, y \in z$, then the sister of and search space of the lowest position of v is VP, and the sister and search space of the first label are both v and VP.” (p. 48, fn.7)



Second Cycle Effects

Morphology can be sensitive to the timing of valuation: some languages have distinct allomorphs for the same person value depending on the GF of the DP from which the value is copied.

B & R: *first vs. second cycle morphology* (probe valued by IA or EA)

(23) *Georgian* (1/2 > 3):

- | | | |
|----|---------------|--------------------------|
| a. | m-xedav-s | |
| | 1.I-see-x | |
| | 'He sees me.' | $3 \rightarrow 1 = 1.I$ |
| b. | v-xedav | |
| | 1.II-see | |
| | 'I see him.' | $1 \rightarrow 3 = 1.II$ |

Contextual allomorphy

- first cycle morphology: valued probe on v
- second cycle morphology: valued probe on v'
- VIs are sensitive to the syntactic configuration

- (24) a. First cycle VI: /m/ \leftrightarrow [3-2-1] / []_v
 b. Second cycle VI: /v/ \leftrightarrow [3-2-1] / []_v [...]_v

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Nishnaabemwin

(25) hierarchy: 2 \succ 1 \succ 3

(26) Probe: $\begin{bmatrix} [u3] \\ [u1] \\ [u2] \end{bmatrix}$

(27) Transitive paradigm:

EA \ IA	2	1	3
2		g-see-it 2-see-dflt.1	g-see-aa 2-see-dflt
1	g-see-in 2-see-1.inv		N-see-aa 1-see-dflt
3	g-see-ig 2-see-3.inv	n-see-ig 1-see-3.inv	w-see-igw-n 3-see-3.inv-obv

Cyclic Agree for the Nishnaabemwin singular agreement paradigm

EA→IA	2	1	3
2	—	EA Agr IA [3] [u3]—[3] [1] [u1]—[1] [2]—[u2]	EA Agr IA [3] [u3]—[3] [1]—[u1] [2]—[u2]
1	EA Agr IA [3] [u3]—[3] [1] [u1]—[1] [u2]—[2]	—	EA Agr IA [3] [u3]—[3] [1]—[u1] [u2]
3	EA Agr IA [3] [u3]—[3] [u1]—[1] [u2]—[2]	EA Agr IA [3] [u3]—[3] [u1]—[1] [u2]	EA Agr IA [3] [u3]—[3] [u1] [u2]

(28) Transitive paradigm:

EA \ IA	2	1	3
2		g-see-it 2-see-dflt.1	g-see-aa 2-see-dflt
1	g-see-in 2-see-1.inv		N-see-aa 1-see-dflt
3	g-see-ig 2-see-3.inv	n-see-ig 1-see-3.inv	w-see-igw-n 3-see-3.inv-obv

blue cells: only one agreement cycle (with IA) = inverse context
 red cells: two agreement cycles (with IA and EA) = direct context

- inverse contexts: second agreement slot (suffix) which realizes features of the EA
- direct contexts: second agreement slot filled by default exponent -aa

Additional assumption:

- (29) *Person Licensing Condition (PLC):*
 A ϕ -feature [F] must be licensed by Agree of some segment in a feature structure of which [F] is a subset. (i.e.: every DP must enter into ϕ -Agree)

Emergence of the second agreement slot

- PLC is violated in inverse contexts: no agreement with EA
- repair strategy: a π -probe is added to Agree with the EA
- *Property P (holds of the core probe, optional):*
 If the core probe α on v has property P, a probe is added to v upon Agree by α .

Inverse contexts

- P is added to v' and agrees with EA \rightarrow features of the EA are realized (compare second cycle effects)
- core probe: valued by IA, added probe: valued by EA
- Languages without a second agreement slot (e.g. Georgian): added probe is not spelled out
- added probe is convergent only in inverse contexts

- (30) *Inverse contexts, hierarchy 1 > 2 > 3:*

a. Agree $v - IA$:

v		IA
[u1]	-	[3]
[u2]	-	[2]
[u3]	-	[1]

b. Merge of EA

c. Addition of the second probe to v'

d. Agree added probe - EA:

v'	EA	v	IA
[u3]	- [3]	[u3]	- [3]
[u2]	- [2]	[u2]	- [2]
[u1]		[u1]	- [1]

Questions/problems with the added probe

- direct contexts: a segment of the core probe should enter into second cycle Agree with the EA; EA also agrees with the added probe
- added probe: must crash in direct contexts
- suggestions:
 - i) crash because two identical values on a single phrase-structure locus v_2 and are not distinguishable
 - ii) crash because of the Activity Condition: EA is deactivated upon Agree with the core probe; the added probe is thus unvalued
- default morphology in direct contexts might suggest that there is a 2nd probe, too (probe insertion is no repair)

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Summary

- Agrees applies cyclically (preference for Agree with the IA).
- The person hierarchy is encoded in the representation of different person values (bundles of privative features with entailment relations).
- Depending on the specification of the probe and the arguments either only the IA or the IA and the EA value features on the probe.
 - If the IA has a proper subset of the segments of the probe on v , the EA can Agree with the probe as well (=agreement displacement).
 - If the IA has more segments than the probe or the same amount of features as the probe, Agree $v - IA$ bleeds Agree $v - EA$.
- Due to the PLC, a probe is added in inverse contexts, which leads to a second agreement slot.

Final remarks I

- Although hierarchy effects are well-known for a long time, formal accounts of these effects have only been proposed since the year 2003, mainly on PCC effects.
- Literature: Anagnostopoulou (2003, 2005); Adger and Harbour (2007); Řezáč (2008); Richards (2008); Heck and Richards (2010); Béjar and Řezáč (2009); Keine (2010); Georgi (2012)
- The basic idea in all of these papers is as follows (originally proposed by Anagnostopoulou (2003)):

(31) *Two-arguments-against-one-head-configuration:*
 A single probe can potentially enter into Agree with more than one goal.

Effect: The goal that is the first target of the probe restricts the properties of the second goal (scarcity of resources).

Final remarks II

- Béjar and Řezáč (2009) is a very influential paper, it is one of the most prominent and most cited articles of the last years.
- The analysis is based on ideas in Béjar (2003) and Řezáč (2004).
- Big question: morphological vs. syntactic account
 - Béjar and Řezáč (2009) propose a syntactic account of hierarchy effects / agreement displacement
 - There is evidence from PCC effects in Basque (cf. Řezáč 2008) that this is indeed the correct approach to hierarchy effects (the presence of the PCC effect is sensitive to syntactic concepts like intervention and closest c-command).
- Hierarchies are not primitives of the theory; rather, they are derived from the decomposition of person features.

References

- Adger, David and Daniel Harbour (2007): 'Syntax and Syncretisms of the Person Case Constraint', *Syntax* 10(1), 2-37.
- Anagnostopoulou, Elena (2003): *The Syntax of Ditransitives: Evidence from Clitics*. Mouton de Gruyter, Berlin, New York.
- Anagnostopoulou, Elena (2005): Strong and Weak Person Restrictions. A Feature Checking Analysis. In: L. Heggie and F. Ordonez, eds, *Clitics and Affix Combinations: Theoretical Perspectives*. John Benjamins, Amsterdam, pp. 199-235.
- Béjar, Susana (2003): Phi-Syntax: A Theory of Agreement. PhD thesis, University of Toronto, Toronto.
- Béjar, Susana and Milan Řezáč (2009): 'Cyclic Agree', *Linguistic Inquiry* 40(1), 35-73.
- Georgi, Doreen (2012): A Local Derivation of Global Case Splits. To appear in A. Alexiadou, T. Kiss & G. Müller (eds.), *Local Modelling of Non-Local Dependencies in Syntax*, *Linguistische Arbeiten*, Niemeyer.

References

- Gregores, Emma and Jorge A. Suárez (1967): *A description of colloquial Guaraní*. Janua Linguarum: Series Practica 27, Mouton, The Hague.
- Řezáč, Milan (2004): Elements of Cyclic Agree: Agree and Merge. PhD thesis, University of Toronto, Canada.
- Heck, Fabian and Marc Richards (2010): 'A probe-goal approach to agreement and non-incorporation restrictions in Southern Tiwa', *Natural Language and Linguistic Theory* 28, 681-721.
- Keine, Stefan (2010): *Case and agreement from Fringe to Core: a minimalist approach*. *Linguistische Arbeiten* 536, de Gruyter, Berlin.
- Řezáč, Milan (2008): 'The syntax of eccentric agreement: the Person Case Constraint and absolute displacement in Basque', *Natural Language and Linguistic Theory* 26, 61-106.
- Richards, Marc (2008): Defective Agree, Case Alternations, and the Prominence of Person.Ms., University of Leipzig.