

Reprojection as a repair: A case of minimal look-ahead or a well-informed repair

Helene Streffer

Myopia in Grammar

April 5, 2024

Discontinuous agreement

- instance of extended exponence (Matthews, 1972)
- multiple exponents spelling out one syntactic terminal node (the head which carries out Agree)
(Noyer 1992; Halle 1997; Trommer 1999; Harbour 2008, 2023; Campbell 2012; Hewett 2023a,b among others)
- overexponence of agreement
- challenge: *one* underlying syntactic head – *two* exponents

(1) Modern Hebrew

(Hewett, 2023a, 1098)

- a.

ti

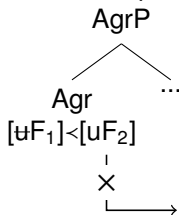
-xtev-

u

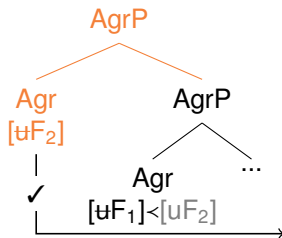
2-write-pl
'You (pl.) will write'

A reprojection-based account

- (2) 1st cycle of Agree,
unsaturated probe



- (3) Reprojection,
2nd cycle of Agree



- discontinuous agreement = result of *reprojection as a repair*

Today's talk

Minimal look-ahead

- reprojection as many repairs may include minimal look-ahead (for repairs in general see Heck 2021)

Today's talk

Minimal look-ahead

- reprojection as many repairs may include minimal look-ahead (for repairs in general see Heck 2021)

3 ways to remove *minimal* look-ahead
within the reprojection-based account of discontinuous agreement

- ① The size of a derivational step
- ② The domain size in an optimization procedure
- ③ Availability of information in the structure

Roadmap

1. A Reprojection-based account of discontinuous agreement

- ◊ Previous approaches
- ◊ Ingredients for a reprojection-based analysis
- ◊ Sample derivations
- ◊ Didinga

2. Ways to remove minimal look-ahead

- ◊ Size of a derivational step
- ◊ Optimization procedure
- ◊ A special type of repair

3. Conclusion

Roadmap

1. A Reprojection-based account of discontinuous agreement

- ◊ Previous approaches
- ◊ Ingredients for a reprojection-based analysis
- ◊ Sample derivations
- ◊ Didinga

2. Ways to remove minimal look-ahead

- ◊ Size of a derivational step
- ◊ Optimization procedure
- ◊ A special type of repair

3. Conclusion

Previous approaches

- Fission

(e.g. Halle 1997; Hewett 2023a,b; Kramer 2023)

Previous approaches

- Fission (e.g. Halle 1997; Hewett 2023a,b; Kramer 2023)
 - \$\$\$ Construction-specific operation (e.g. Trommer 1999)

Previous approaches

- Fission (e.g. Halle 1997; Hewett 2023a,b; Kramer 2023)
\$\$\$ Construction-specific operation (e.g. Trommer 1999)
- Vocabulary Insertion (e.g. Trommer 1999; Harbour 2008, 2023)

Previous approaches

- Fission (e.g. Halle 1997; Hewett 2023a,b; Kramer 2023)
\$\$\$ Construction-specific operation (e.g. Trommer 1999)
- Vocabulary Insertion (e.g. Trommer 1999; Harbour 2008, 2023)
✗ Timing (Discontinuity < VI) (Hewett, 2023a; Kramer, 2023; Streffer, 2023)

Previous approaches

- Fission (e.g. Halle 1997; Hewett 2023a,b; Kramer 2023)
\$\$\$ Construction-specific operation (e.g. Trommer 1999)
- Vocabulary Insertion (e.g. Trommer 1999; Harbour 2008, 2023)
✗ Timing (Discontinuity < VI) (Hewett, 2023a; Kramer, 2023; Streffer, 2023)
- Multiple Projections (e.g. Shlonsky 1989, 2023; Martinović 2019)

Previous approaches

- Fission (e.g. Halle 1997; Hewett 2023a,b; Kramer 2023)
\$\$\$ Construction-specific operation (e.g. Trommer 1999)
- Vocabulary Insertion (e.g. Trommer 1999; Harbour 2008, 2023)
✗ Timing (Discontinuity < VI) (Hewett, 2023a; Kramer, 2023; Streffer, 2023)
- Multiple Projections (e.g. Shlonsky 1989, 2023; Martinović 2019)
✗ Single syntactic head (e.g. Campbell 2012; Oxford 2019)

Previous approaches

- Fission (e.g. Halle 1997; Hewett 2023a,b; Kramer 2023)
\$\$\$ Construction-specific operation (e.g. Trommer 1999)
- Vocabulary Insertion (e.g. Trommer 1999; Harbour 2008, 2023)
✗ Timing (Discontinuity < VI) (Hewett, 2023a; Kramer, 2023; Streffer, 2023)
- Multiple Projections (e.g. Shlonsky 1989, 2023; Martinović 2019)
✗ Single syntactic head (e.g. Campbell 2012; Oxford 2019)

Goal: Explore a novel (syntactic) account

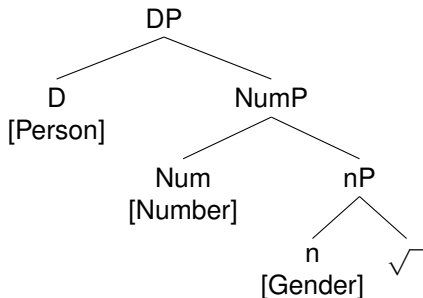
- ✓ No construction-specific operation
- ✓ Timing
- ✓ Single syntactic head
- ➡ Reprojection-based account

Ingredients I

φ -features on the goal

- In the DP, person features are located on D, number features on Num and gender on n (e.g. Ritter 1991; Danon 2011; Kramer 2016).
 - ⇒ [Person] is located higher than [Number] on the goal
 - ⇒ [Number] is located higher than [Gender] on the goal

(4)

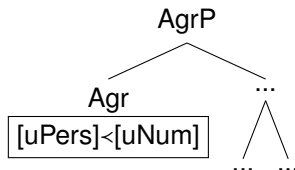


Ingredients II

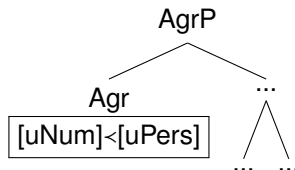
Ordered probes

- φ -features do not probe in a single bundle but separately (see e.g. Béjar 2003).
- Probes of a head are ordered and operations triggered by these features apply sequentially (see e.g. Koizumi 1994; Chomsky 1995 for ordered features).
- The order of probes is language-specific (see e.g. Georgi 2014 for the order of Merge and Move features).

(5) Language A



(6) Language B



Ingredients III

The interaction of multiple probes on the same head

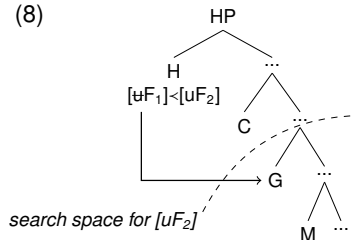
(7) **Nested Agree** (Amato, 2023, 24)

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 .

- 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 .
- No-backtracking:** If G is not a matching goal for F_2 , the search space of F_2 is the c-command domain of G (not of H)

☞ i.e. the search space of a probe starts at the point where the previous probe on the same head has carried out Agree.

(8)



Ingredients IV

Reprojection as a repair

- If Agree cannot be carried out, the respective probe undergoes reprojection as a repair mechanism and induces a new cycle of Agree.

cf. similar mechanisms

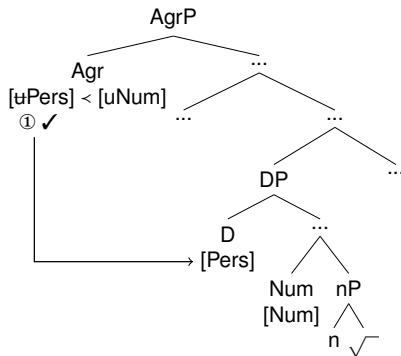
- *with Münchhausen-style features* e.g. in Fanselow (2004); Georgi & Müller (2010); Börjesson & Müller (2020)
- *the Head Splitting mechanism* in Martinović (2022)

One agreement exponent

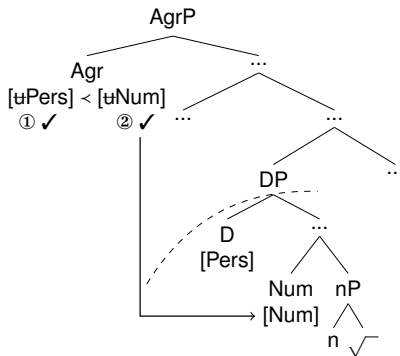
Order of the probes on Agr: $[uPers] < [uNum]$

→ all φ -features will be gathered on a single Agr node

(9) 1st cycle of Agree, step 1



(10) 1st cycle of Agree, step 2

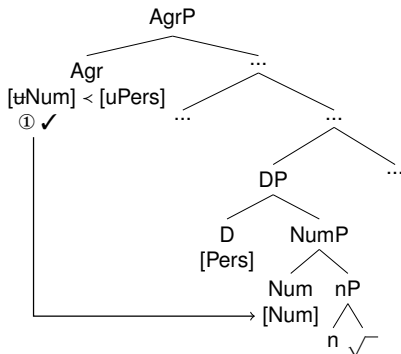


Two agreement exponents I

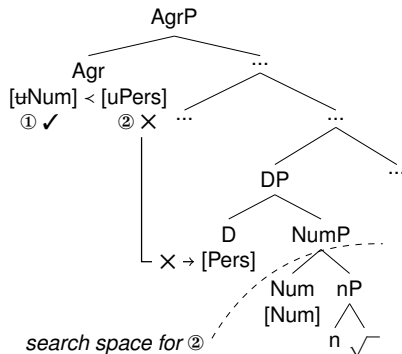
Order of the probes on Agr: $[u\text{Num}] < [u\text{Pers}]$

→ the φ -features will be distributed across two Agr nodes

(11) 1st cycle of Agree, step 1

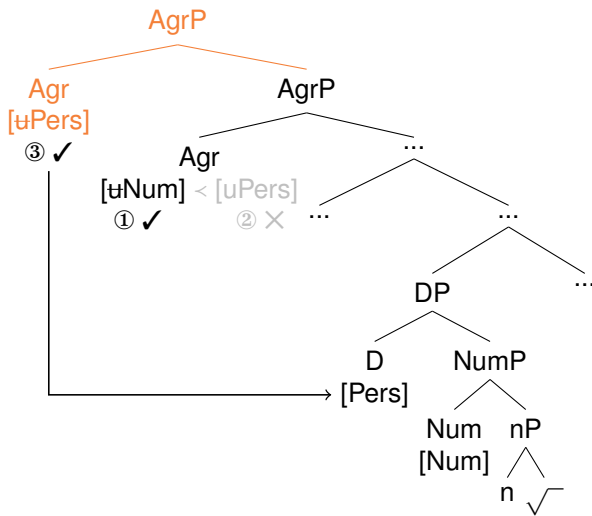


(12) 1st cycle of Agree, step 2



Two agreement exponents II

(13) Reprojection, 2nd cycle of Agree



Overview

Two possible situations:

- The order of probes *matches* the order of the features on the goal.
 - [uPers] < [uNum]
 - one terminal node = one exponent
- The order of probes *does not match* the order of the features on the goal.
 - [uNum] < [uPers]
 - reprojection, two terminal nodes = two exponents,
i.e. discontinuous agreement

Discontinuous agreement in Didinga I

Didinga (Surmic/South Sudan)

- (14) a. $\boxed{h}\text{-}\grave{a}\text{-}\grave{ir}\grave{it}\text{-}\boxed{\acute{i}}$
1-ASP-cough-1 SG
'I am coughing'
- b. $\boxed{h}\text{-}\grave{a}\text{-}\grave{ir}\grave{it}\text{-}\boxed{t\acute{a}}$
1-ASP-cough-1 PL.EXCL
'We (excl.) are coughing'
- c. $\boxed{h}\text{-}\grave{a}\text{-}\acute{ir}\grave{it}\text{-}\boxed{\grave{i}}$
1-ASP-cough-1 PL.INCL
'We (incl.) are coughing'

Discontinuous agreement in Didinga II

(Surmic/South Sudan)

(15) Didinga subject agreement, intransitive verbs, incomplete

	Singular			Plural	
1	h-	-i	(excl.)	h-	-Ca
			(incl.)	h-	-I
2		-i			-Cu
3		-I			-I

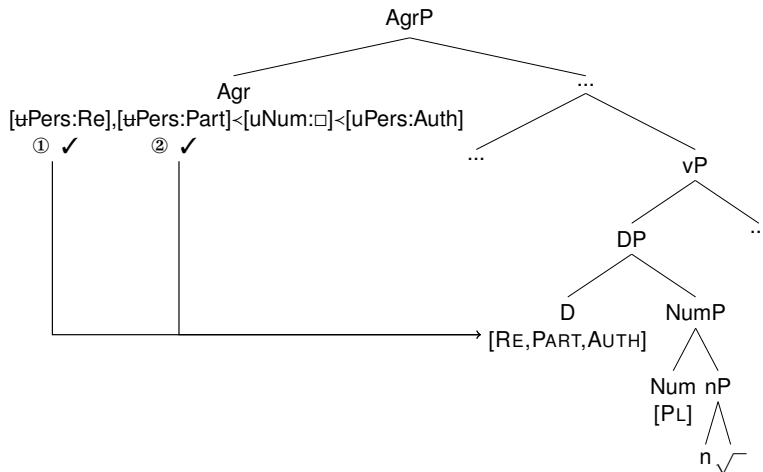
(16) Order of probes on Agr (Didinga):

[uPers: Re], [uPers: Part] < [uNum: □] < [uPers: Auth]

Discontinuous agreement (1st person) I

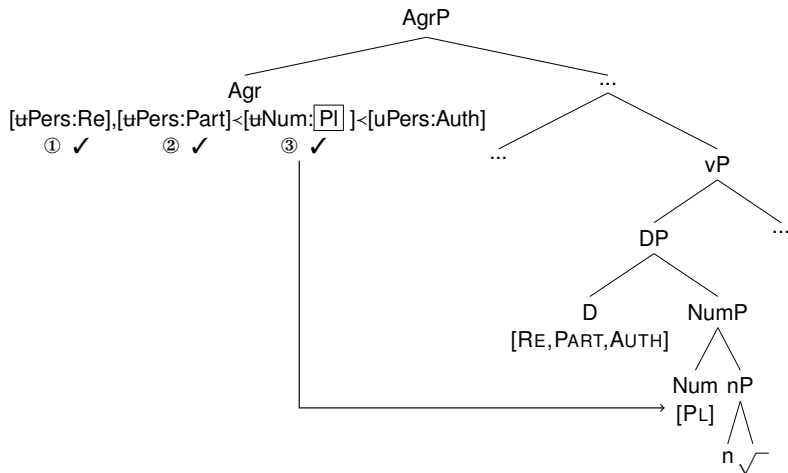
Example derivation for 1PL.EXCL in (17) - (20)

(17) 1st cycle of Agree, step 1 - 2



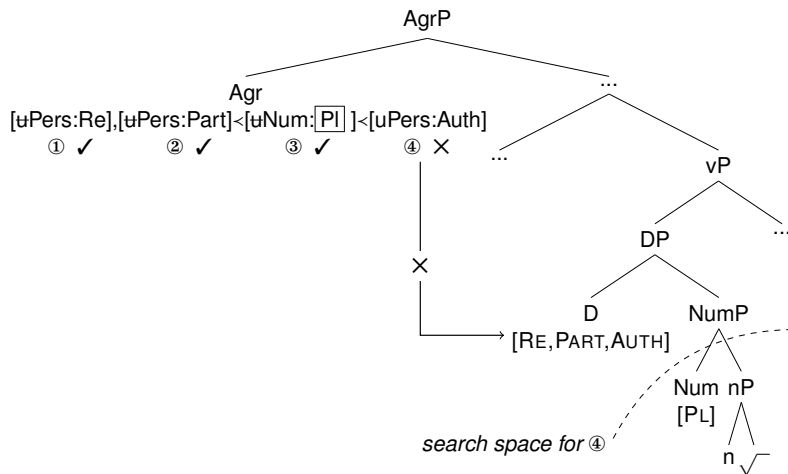
Discontinuous agreement (1st person) II

(18) 1st cycle of Agree, step 3



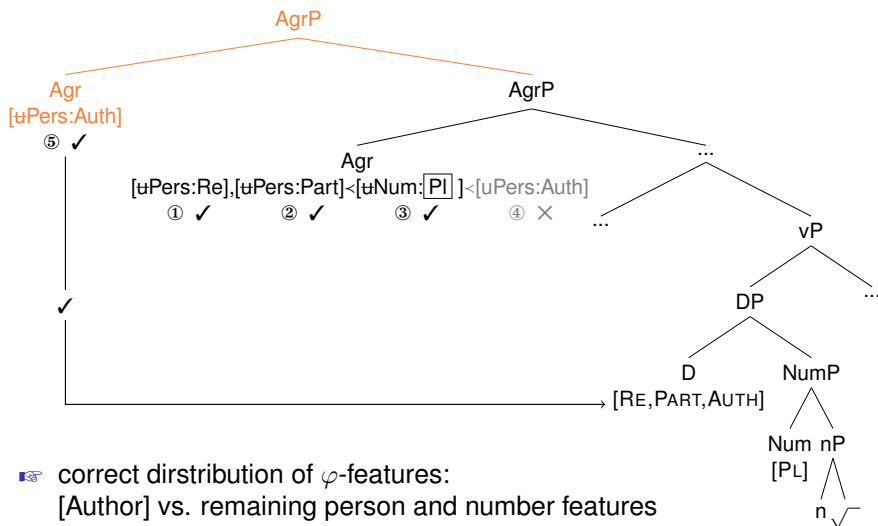
Discontinuous agreement (1st person) III

(19) 1st cycle of Agree, step 4



Discontinuous agreement (1st person) IV

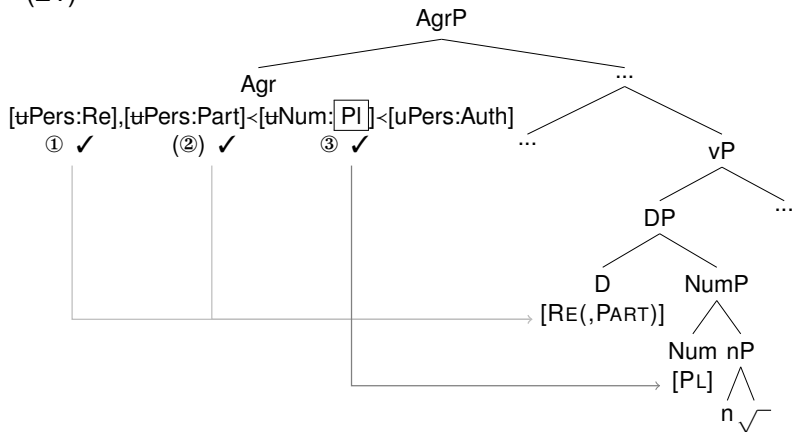
(20) Reprojection, 2nd cycle of Agree



- correct distribution of φ -features:
[Author] vs. remaining person and number features

Only one agreement exponent 3rd (+ 2nd) person

(21)



- all necessary person probes agree before $[\text{uNum:}\square]$ targets Num
- the probes match the order on the goal
- ⇒ all φ -features end up on a single terminal node (= one exponent)

Reprojection as a repair

What blocks reprojection (of [uPers:Auth]) in the 2nd+3rd person?

- Movement should be feature-driven and reprojection is not feature-driven. Thus, reprojection comes with a cost.
- The cost is not worth it in the 2nd+3rd person
 - no [Auth] present → reprojection wouldn't change anything
- The cost is worth it in the 1st person
 - [Auth] present → reprojection allows full Agreement

6d Seems like the derivation needs to now the immediate next step (successful Agree or not) in order to know whether reprojection will be worth it.

6d *minimal* look-ahead (cf. e.g. Georgi & Müller 2010, 16)

Roadmap

1. A Reprojection-based account of discontinuous agreement

- ◊ Previous approaches
- ◊ Ingredients for a reprojection-based analysis
- ◊ Sample derivations
- ◊ Didinga

2. Ways to remove minimal look-ahead

- ◊ Size of a derivational step
- ◊ Optimization procedure
- ◊ A special type of repair

3. Conclusion

① What is a derivational step

Georgi & Müller (2010, 16, footnote 19)

- every structure building operation comprises two pieces:
 - feature checking
 - the structure-building operation
 - same with reprojection (and Münchhausen features)
 - in the account here: reprojection + subsequent Agree operation
= one derivational step
- ⇒ avoids minimal look-ahead

① What is a derivational step

Georgi & Müller (2010, 16, footnote 19)

- every structure building operation comprises two pieces:
 - feature checking
 - the structure-building operation
 - same with reprojection (and Münchhausen features)
 - in the account here: reprojection + subsequent Agree operation
= one derivational step
- ⇒ avoids minimal look-ahead

Drawback: variability in the size of a derivational step

- Agree may be a derivational step on its own
- and a derivational step together with reprojection

② Domain size in an optimization procedure

- optimization procedure (Prince & Smolensky, 2004)
- which applies in a cyclic fashion
(in syntax see e.g. Heck & Müller 2000, 2007; Murphy 2017)
- domain size:
 - slightly bigger than just one derivational step
 - cyclic XP (Heck & Müller, 2000)

Constraints

- (22) **LAST RESORT (LR)** (Chomsky, 1995)
Assign a violation * for movement without prior feature-deletion.
- (23) **AGREE CONDITION (AC)** (Heck & Müller, 2007; Chomsky, 2001)
Assign a violation * for every probe ([uF]) that does not participate in Agree.
- (24) **NESTED AGREE (NA)** (Amato, 2023)
Assign a violation * for every Agree operation of a head H1 that has already an established Agree link AL1 to a goal G1 in the input
- a. that does not agree with G1 as well
 - b. or that does not agree with a goal in the c-command domain of G1.
- (25) **ORDERED FEATURES (OF)** (e.g. Koizumi 1994; Chomsky 1995)
Assign a violation * for an operation triggered by a feature that is not the first active feature on a head in the input.
- (26) Constraint ranking:
OF >> NA >> AC >> LR

[uNum] agrees with Num

Probes on Agr in the Input: [μ Pers: Re], [μ Pers: Part] < [uNum: $\square$] < [μ Pers: Auth]

I: [AgrP Agr...[uNum:]<[μ Pers:Auth] [... [vP [DP D[...Auth] [NumP Num [$_{nP}$ n+ $\sqrt{\quad}$]]]] ...]]	OF	NA	AC	LR
O₁: No change [AgrP Agr...[uNum:]<[μPers:Auth] [... [vP [DP D[...Auth] [NumP Num [$_{nP}$ n+$\sqrt{\quad}$]]]] ...]]			**!	
 O₂: [μNum:PI] agreed with Num [AgrP Agr...[μNum:PI]<[μPers:Auth] [... [vP [DP D[...Auth] [NumP Num [$_{nP}$ n+$\sqrt{\quad}$]]]] ...]] 			*	
O₃: [μPers:Auth] agreed with D [AgrP Agr...[uNum:]<[μPers:Auth] [... [vP [DP D[...Auth] [NumP Num [$_{nP}$ n+$\sqrt{\quad}$]]]] ...]] 	*!		*	
O₄: [μNum:PI] agreed with Num & [μPers:Auth] with D [AgrP Agr...[μNum:PI]<[μPers:Auth] [... [vP [DP D[...Auth] [NumP Num [$_{nP}$ n+$\sqrt{\quad}$]]]] ...]] 	*!			

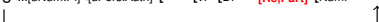
1st Person: Discontinuous Agreement

Probes on Agr in the Input: [μ Pers: Re], [μ Pers: Part] < [μ Num: Pl] < [μ Pers: Auth]

I: [_{AgrP} Agr...[μ Num:Pl]<[μ Pers:Auth] [... [_{VP} [_{DP} D[...,Auth] [_{NumP} Num [_{nP} n+√]]]] ...]]	OF	NA	AC	LR
O₂₁: No change [_{AgrP} Agr...[μNum:Pl]<[μPers:Auth] [... [_{VP} [_{DP} D[...,Auth] [_{NumP} Num [_{nP} n+√]]]] ...]]			*!	
O₂₂: [μPers:Auth] agreed with D [_{AgrP} Agr...[μNum:Pl]<[μPers:Auth] [... [_{VP} [_{DP} D[...,Auth] [_{NumP} Num [_{nP} n+√]]]] ...]]		*!		
 O₂₃: Reprojection & [μPers:Auth] agreed with D [_{AgrP} Agr[μPers:Auth] [_{AgrP} Agr...[μNum:Pl] [... [_{VP} [_{DP} D[...,Auth] [_{NumP} Num [_{nP} n+√]]]] ...]]				*

2nd Person: No Discontinuous Agreement

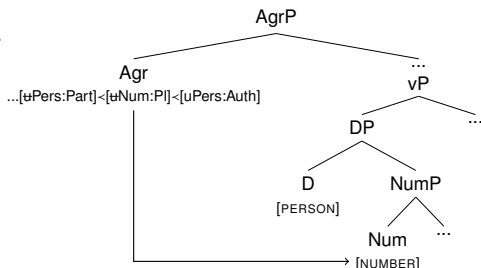
Probes on Agr in the Input: [μ Pers: Re], [μ Pers: Part] < [μ Num: Pl] < [μ Pers: Auth]

I: [AgrP Agr...[μNum:Pl]<[μPers:Auth] [... [vP [DP D[Re,Part] [NumP Num [nP n+$\sqrt{\quad}$]]]] ...]] 	OF	NA	AC	LR
 O₂₁: No change [AgrP Agr...[μNum:Pl]<[μPers:Auth] [... [vP [DP D[Re,Part] [NumP Num [nP n+$\sqrt{\quad}$]]]] ...]]			*	
O₂₂: Reprojection [AgrP Agr[μPers:Auth] [AgrP Agr...[μNum:Pl] [... [vP [DP D[Re,Part] [NumP Num [nP n+$\sqrt{\quad}$]]]] ...]]			*	*!

③ A special type of repair

- the information whether the cost to conduct the repair is worth it (presence or absence of [Auth]) is already present in the structure
- and the head responsible for agreement has already passed the relevant node (D)

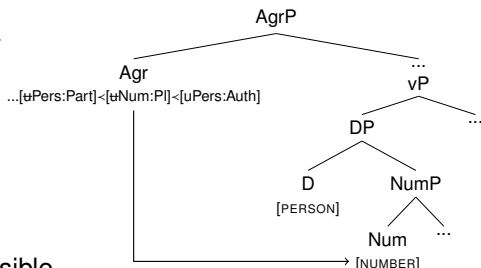
👉 well-informed repair



③ A special type of repair

- the information whether the cost to conduct the repair is worth it (presence or absence of [Auth]) is already present in the structure
- and the head responsible for agreement has already passed the relevant node (D)

👉 well-informed repair



This type of repair is possible

- in the Minimalist Program without optimization
- without (minimal) look-ahead

Roadmap

1. A Reprojection-based account of discontinuous agreement

- ◊ Previous approaches
- ◊ Ingredients for a reprojection-based analysis
- ◊ Sample derivations
- ◊ Didinga

2. Ways to remove minimal look-ahead

- ◊ Size of a derivational step
- ◊ Optimization procedure
- ◊ A special type of repair

3. Conclusion

Summary

- a novel syntactic account of discontinuous agreement using reprojection

3 ways to remove *minimal* look-ahead within the reprojection-based account

- ① reprojection forms one composite derivational step with the subsequent Agree operation
 - ② optimization + cyclic XP as the domain size
 - ③ special type of repair: information is already present in the structure
- Note that all these options to remove look-ahead apply only to case of *minimal* look-ahead vs. cases of *global* look-ahead

References I

- Amato, Irene. 2023. *Auxiliary Selection in Italo-Romance: A Nested-Agree Approach*. John Benjamins Publishing Company.
- Béjar, Susana. 2003. *Phi-Syntax: A Theory of Agreement*. University of Toronto, ON.
- Börjesson, Kristin & Gereon Müller. 2020. Long-distance agreement and locality: A reprojection approach. In *Agree to Agree: Agreement in the Minimalist Programme*, 307–346. Language Science Press.
- Campbell, Amy Melissa. 2012. *The Morphosyntax of Discontinuous Exponence*: University of California, Berkeley dissertation.
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2001. Derivation by Phase. In *Ken Hale: A Life in Language*, 1–52. MIT Press.
- Danon, Gabi. 2011. Agreement and DP-internal feature distribution. *Syntax* 14(4). 297–317.
- Fanselow, Gisbert. 2004. Münchhausen-style head movement and the analysis of verb second. *Linguistics in Potsdam* 22. 9–49.
- Georgi, Doreen. 2014. *Opaque interactions of Merge and Agree: On the nature and order of elementary operations*: Universität Leipzig dissertation.
- Georgi, Doreen & Gereon Müller. 2010. Noun-Phrase Structure by Reprojection. *Syntax* 13(1). 1–36.
- Halle, Morris. 1997. Distributed Morphology: Impoverishment and Fission. In Benjamin Bruening, Yoonjung Kang & Martha McGinnis (eds.), *Pf: Papers at the Interface*, vol. 30 MIT Working Papers in Linguistics, 425–449. Cambridge, MA: MITWPL.
- Harbour, Daniel. 2008. Discontinuous Agreement and the Syntax-Morphology Interface. In Daniel Harbour, David Adger & Susana Béjar (eds.), *Phi Theory: Phi-Features Across Modules and Interfaces*, 185–220. Oxford: Oxford University Press.
- Harbour, Daniel. 2023. Discontinuous Agreement: Nine Birds, Two Stones. *Brill's Journal of Afroasiatic Languages and Linguistics* 15(1). 23–66.
- Heck, Fabian. 2021. Syntactic repairs and cyclic optimization. Project Proposal, DFG Research Unit on Cyclic Optimization.
- Heck, Fabian & Gereon Müller. 2000. Repair-Driven Movement and the Local Optimization of Derivations. Ms., Universität Stuttgart & IDS Mannheim.

References II

- Heck, Fabian & Gereon Müller. 2007. Extremely Local Optimization. In *Proceedings of wecol*, vol. 26, 170–183.
- Hewett, Matthew. 2023a. Allomorphy in Semitic discontinuous agreement: Evidence for a modular approach to postsyntax. *Natural Language & Linguistic Theory* 41(3). 1091–1145.
- Hewett, Matthew. 2023b. Discontinuous first person agreement in Semitic and postsyntactic modularity. *Brill's Journal of Afroasiatic Languages and Linguistics* 15(1). 127–186.
- Koizumi, Masatoshi. 1994. Layered specifiers. In Mercè González (ed.), *NELS 24*, 255–269. Amherst: GLSA.
- Kramer, Ruth. 2016. The location of gender features in the syntax. *Language and linguistics Compass* 10(11). 661–677.
- Kramer, Ruth. 2023. The Morphosyntax of Imperative Agreement in Amharic: A Haplology Analysis. *Brill's Journal of Afroasiatic Languages and Linguistics* 15(1). 187–231.
- Martinović, Martina. 2019. Interleaving Syntax and Postsyntax: Spellout before Syntactic Movement. *Syntax* 22(4). 378–418.
- Martinović, Martina. 2022. Feature Geometry and Head Splitting in the Wolof Clausal Periphery. *Linguistic Inquiry* 54(1). 79–116.
- Murphy, Andrew. 2017. *Cumulativity in Syntactic Derivations*: Universität Leipzig dissertation.
- Noyer, Robert Rolf. 1992. *Features, Positions and Affixes in Autonomous Morphological Structure*: Massachusetts Institute of Technology dissertation.
- Oxford, Will. 2019. Fission in Algonquian and the Status of Morphological Templates. In *Proceedings of the 23rd Workshop on the Structure and Constituency of Languages of the Americas*, 78–92.
- Prince, Alan & Paul Smolensky. 2004. Constraint interaction in generative grammar. In J. J. McCarthy (ed.), *Optimality Theory in Phonology: A Reader*, 3–71. Oxford: Blackwell.
- Ritter, Elizabeth. 1991. Two functional categories in noun phrases: Evidence from Modern Hebrew. In *Perspectives on phrase structure: Heads and licensing*, 37–62. Brill.
- Shlonsky, Ur. 1989. The Hierarchical Representation of Subject Verb Agreement. Ms., University of Haifa.
- Shlonsky, Ur. 2023. Rescaffolding the Bundle in Afroasiatic Inflection: Tamazight and Hebrew. *Brill's Journal of Afroasiatic Languages and Linguistics* 15(1). 67–126.
- Streffer, Helene. 2023. An Elsewhere Exponent in Discontinuous Agreement. Poster presented at the MorrisHalle@100 conference.
- Trommer, Jochen. 1999. Morphology consuming Syntax' Resources: Generation and Parsing in a Minimalist Version of Distributed Morphology. In *Proceedings of ESSLI Workshop on Resource Logics and Minimalist Grammars*, Nijmegen.

Context of discontinuous agreement

→ order of probes

8 relevant combinations (with 4 probes)

- (27) No disc agr
[uPers: Re], [uPers: Part], [uPers:Auth] < [uNum:□/Pl]
- (28) Disc agr in 1st
[uPers: Re], [uPers: Part] < [uNum:□/Pl] < [uPers:Auth]
- (29) Disc agr in 2nd
[uPers: Re], [uPers:Auth] < [uNum:□/Pl] < [uPers: Part]
- (30) Disc agr in 3rd
[uPers: Part], [uPers:Auth] < [uNum:□/Pl] < [uPers: Re]
- (31) Disc agr in 1st+2nd
[uPers: Re] < [uNum:□/Pl] < [uPers:Part], [uPers: Auth]
- (32) Disc agr in 1st+3rd
[uPers: Part] < [uNum:□/Pl] < [uPers:Re], [uPers: Auth]
- (33) Disc agr in 2nd+3rd
[uPers: Auth] < [uNum:□/Pl] < [uPers:Re], [uPers: Part]
- (34) Disc agr in every person
[uNum:□/Pl] < [uPers: Re], [uPers: Part], [uPers:Auth]

Didinga vocabulary entries

	Singular			Plural	
1	h-	-i	(excl.)	h-	-Ca
			(incl.)	h-	-I
2		-i			-Cu
3		-I			-I

Table: Didinga subject agreement, intransitive verbs, incomplete

(35) Vocabulary entries

- I ↔ []
- h- ↔ [+auth]
- i ↔ [+part -pl]
- Ca ↔ [-addr +pl] / [+auth]
- Cu ↔ [-auth +addr +pl]